

# TransAct Packager User Guide

Release 5.4

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			Feature Modifications
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			<ul> <li>Ancillary features for RGB's nDVR solution (continuous record, HLS ingest, Stitcher)</li> </ul>
			Added Object Store support for output mount
			New bulk Configurator tool
			SCTE35 Input/Output stream support
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			HLS manifest file extended support
			Mezzanine key encryption
			HLS v4 output format audio additions
			Package-level redundancy additions
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			Package-level node redundancy
			Linear DASH output
			Thumbnail support
			JITP HLS Ingest
			JITP Dash Ingest
			Feature Modifications:
			Irdeto DRM for MSS
			NDS/Cisco DRM for HLS
			Support for MSS / PlayReady using KeySeed
			Data PID selection on input
			Local and HTTP backup and restore features
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			Audio map profile rules (linear & JITP)
			HLS audio-only profile (linear & JTP)
			Dashboard field additions (linear & JTP)
			HDS to webday light output support (linear & JTP)
			Trick play support for JITP (linear support already)
			IITP profile table source server additions
			POIS ad support (linear & JITP POIS for linear
			only)
			Feature Modifications
			Multiple IGMPv3 stream sources
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**CHAPTER 1** 

## Introduction

Network bandwidth, firewalls and infrastructure support can all create issues for video and audio network traffic. The advent of adaptive streaming technology to reach these devices has helped alleviate these challenges. RGB Networks' TransAct *Packager* enables adaptive streaming and video delivery to mobile devices, PCs, and set-top boxes in a cost-effective, distributed deployment architecture.

RGB's TransAct *Packager* segments streams using adaptive streaming technology to deliver video and audio to PCs, mobile devices, and set-top boxes. TransAct *Packager* ingests H.264 encoded video streams carried in an MPEG-2 transport stream (TS) and produces segmented output in numerous protocols<sup>1</sup>.

Additionally, *Packager* can encrypt content using a variety of methods and is integrated with leading DRM<sup>2</sup> vendors and key exchange servers.

RGB Networks offers the TransAct *Packager* as either a software license or as an appliance. The software license-only solution can be downloaded, or optionally shipped on a DVD and allows customers to deploy on their choice of server-based hardware platform running Linux CentOS<sup>3</sup>. Note that performance will be impacted by the hardware platform running the software. Running on an RGB supported appliance – the Application Media Server (AMS) – the TransAct *Packager* provides a minimum MTBF of 100,000 hours as the AMS is an extremely durable hardware appliance requiring minimal ongoing maintenance.

#### Figure 1. RGB Application Media Server



This guide describes the installation and configuration for the TransAct *Packager*. Refer to TransAct AMS Hardware Setup Guide for instructions on installing the RGB Application Media Server.

## In This Chapter:

- "Document Organization," next;
- "Document Audience" on page 12;
- "Document Conventions" on page 13;
- "Graphics Used" on page 13;
- "Video Processing Acronyms Used" on page 13.

<sup>1.</sup> This release supports the following output formats: Apple HTTP Live Streaming (HLS), Microsoft Smooth Streaming (MSS), Microsoft Smooth Streaming - remote, MPEG Dash, Adobe HTTP Dynamic Streaming (HDS), Adobe RTMP, and Adobe HTTP Dynamic Streaming - HTTP File Format (HDS-HTTP)

<sup>2.</sup> This release supports the following DRM servers: Verimatrix HLS, Buy DRM, CKM, Nagravision (Nagra), Internal HLS, Verimatrix Playready, Internal Flash Access, Latens, Secure Media, Conax, Irdeto, Internal Playready, NDS/Cisco, RgbAPI, Mezzanine, and KPN.

<sup>3.</sup> Refer to the Release Notes for compatible versions of CentOS.

## **Document Organization**

This guide is organized as follows:

- Chapter 1, "Introduction," (this chapter) describes the contents and conventions used in the TransAct Packager User Guide.
- Chapter 2, "Overview," provides a detailed description of the TransAct Packager and its features.
- Chapter 3, "Management Console," describes how to use the *Packager* GUI-based management console.
- Chapter 4, "System Configuration," describes the system configuration tasks you can perform on the **System** tab of the *Packager* Management Console.
- Chapter 5, "Global Output Configuration," provides configuration guidelines on global output packaging configuration tasks.
- Chapter 6, "Linear Packaging," covers how to configure linear packaging to deliver appropriate media to devices at the edge of your content delivery network.
- Chapter 7, "Just-in-Time Packaging," covers how to configure JIT packaging to deliver appropriate media to devices at the edge of your content delivery network.
- Chapter 8, "Managing Packages," describes all package management options, including session management and modifying linear and JITP packages.
- Chapter 9, "Configuring Players and Mounts," provides configuration steps and guidelines for *Packager's* supported media player formats and directory mounts.
- Chapter 10, "Reporting," describes all the reports and statistics you can view using the **Reports** tab in the *Packager* Management Console.
- Appendix , "Troubleshooting and Advanced Topics" provides troubleshooting information and advanced topics for *Packager*.

## **Document Audience**

This guide is for system administrators and operators who are responsible for installation and maintenance of the TransAct *Packager*. You should be familiar with general video and networking terminology, and should be familiar with basic installation of hardware.

## **Document Conventions**

Table 1 provides an easy way to recognize important information in the text.

When you see:	It means:	
i	<b>Notes</b> are indicated by the icon shown at left, and point out information that may not be part of the text but provide tips and other helpful advice.	
$\wedge$	<b>Cautions</b> are indicated by the icon on the left, and let you know that an action may have undesirable consequences if the instructions are not followed correctly. Cautions also indicate that failure to follow guidelines could cause damage to equipment or loss of data.	
4	<b>Warnings</b> are indicated by the icon on the left, and indicate that failure to take the necessary precautions or to follow guidelines could cause harm to equipment and personnel.	
	<b>Chapter Home</b> is a PDF navigation tool indicated by the icon on the left and appearing at the bottom right of each page. Clicking on the icon takes you to the table of contents list for the current chapter or appendix.	
Clicking any blue link takes you to the item to which the link refers.		

## **Graphics Used**

In some cases, the screens shown in this manual may have been slightly modified after the manual was released, or may appear slightly different on different browsers.

All efforts have been made to ensure that the latest images are used. In all cases, the functionality described is current at the time of writing.

## Video Processing Acronyms Used

Table 2 provides is a list of acronyms that are commonly used in video processing and adaptive bitrate streaming. Note that some of these acronyms may not be used in this user guide

Acronym	Meaning
AAC	Advanced Audio Coding
ABR	Adaptive Bitrate
AC3	Audio Coding Version 3 (Dolby Digital 5.1, or DD)
ADM	Ad Management Service (function of AWE)
ADS	Ad Decision Service
AIM	Ad Insertion in Multi Screen (RGB term)
AMS	Application Media Server (RGB term)
API	Application Programming Interface
AU	Access Unit

Table 2. Video Processing and Adaptive Bitrate Streaming Acronyms

Acronym	Meaning
Avail	Available opportunity for ad placement
AWE	Ad Workflow Engine (RGB term)
B-Frame	Bidirectional compression picture frame
CDN	Content Delivery Network
CIFS	Common Internet Files System (Microsoft based)
CNS	Content Name Server
CR	Continuous Recording
DAI	Digital Ad Insertion
DD	Dolby Digital (same as AC3)
DD+	Dolby Digital Plus (same as E-AC-3)
DASH	Dynamic Adaptive Streaming over HTTP
DMA	Designated Market Area
DMM	Dynamic Manifest Manipulation
DRM	Digital Rights Management
DTS	Decoding Time Stamp
DTS	Digital Theater Systems
DVR	Digital Video Recorder
E-AC-3	Enhanced Audio Coding 3 (Dolby Digital Plus 7.1, or DD+)
EBP	Encoder Boundary Point
EIDR	Entertainment Identifier Registry (CableLabs sponsored registry for TV & movie programming)
ENC	Encoder
ES	Elementary Stream
ESAM	Event Signaling and Messaging
GOP	Group of Pictures
GPFS	General Parallel File System
GUI	Graphical User Interface
HDS	HTTP Dynamic Streaming (Adobe)
HD	High Definition
HLS	HTTP Live Streaming (Apple)
HRD	Hypothetical Reference Decoder
HTTP	Hypertext Transfer Protocol
IAB	Interactive Advertising Bureau
IDR	Instantaneous Decoder Refresh
I-Frame	Intracoded compression picture frame
IIS	Internet Information Services (Microsoft based)
JIT	Just-in-time (RGB term)
JITP	Just-in-time Packaging (RGB term)
KMS	Key Management Server

Table 2. Video Processing and Adaptive Bitrate Streaming Acronyms

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Acronym	Meaning			
MBR	Multi-Bit Rate			
MSS	Microsoft Smooth Streaming (HTTP based)			
NAS	Network Attached Storage			
nDVR	Network cloud-based digital video recording			
NFS	Network File System (Linux based)			
NTP	Network Time Protocol			
PAT	Program Association Table			
PCM	Pulse Code Modulation			
PCR	Program Clock Reference			
PES	Packetized Elementary Stream			
P-Frame	Predicted compression picture frame			
PID	Packet ID			
PMT	Program Map Table			
PO	Placement Opportunity (aka. ad-break, avail)			
POIS	Placement Opportunity Information Service			
PRRS	Playlist Rebuilder, Redirection Server (Now referred to as PS)			
PS	Playlist Server (formerly referred to as PRRS)			
PTS	Presentation Time Stamp			
RTMP	Real Time Messaging Protocol			
SAP	Stream Access Point			
SD	Standard Definition			
SIS	Subscriber Information Service			
SSM	Source Specific Multicast			
TAC	TransAct Commander (RGB)			
TAP	TransAct <i>Packager</i> (RGB)			
TAT	TransAct Encoder/Transcoder (RGB)			
TS	Transport Stream			
UDP	User Datagram Protocol			
URI	Universal Resource Identifier (contains URL & URN)			
URL	Universal Resource Locator (always a URI)			
URN	Universal Resource Name (not necessarily a URI)			
UPID	Unique Program ID			
UUID	Universally Unique Identifier (See RFC 4122)			
VAST	Video Ad Serving Template			
VES	Video Elementary Stream			
VMG	Video Multiprocessing Gateway (RGB)			
VOD	Video on Demand			

Table 2. Video Processing and Adaptive Bitrate Streaming Acronyms

#}

Acronym	Meaning
XML	Extensible Markup Language
XML-RPC	Extensible Markup Language - Remote Procedure Call

Table 2. Video Processing and Adaptive Bitrate Streaming Acronyms



#### **CHAPTER 2**

## Overview

This chapter describes how TransAct *Packager* enables adaptive streaming and video delivery to mobile devices, PCs, and set-top boxes in a cost-effective, distributed deployment architecture.

## In This Chapter:

- "Product Overview," next.
- "How Packager Works" on page 18.
- "Packager Features" on page 23.
- "Scalability" on page 23.

## **Product Overview**

Streaming video to PCs and mobile devices presents significant challenges. Network bandwidth, firewalls and infrastructure support can all create issues for video and audio network traffic. The advent of adaptive streaming technology to reach these devices has helped alleviate these challenges.

RGB's TransAct *Packager* segments streams using adaptive streaming technology to deliver video and audio to PCs, mobile devices, and set-top boxes. TransAct *Packager* ingests H.264 encoded video streams carried in an MPEG-2 transport stream (TS) and produces segmented output in numerous formats<sup>1</sup>. *Packager* can also ingest files and output streams as stored files. Additionally, *Packager* can encrypt traffic using AES-128 for HLS and PlayReady for Smooth Streaming, integrating key exchange with leading Digital Rights Management (DRM) servers<sup>2</sup>.

### **General Content Delivery Methods**

Media content is delivered to customers in two ways: Live or On-demand.

- **Live** Delivery—This method ingests content in either a (stored) file or (live) stream format and delivers that content in real-time to the consumer. An example of live delivery could be either a (stream) sporting event or a (file) network prime time TV show. In both cases, the ingest manner is different, but the output delivery method is the same: real-time delivery.
- **On Demand** Delivery<sup>3</sup>—This method also ingests content in either a file or stream format, however, rather than delivering the content immediately in real-time, it is stored on a server (in file format)

<sup>1.</sup> This release supports the following output formats: Apple HTTP Live Streaming (HLS), Microsoft Smooth Streaming (MSS), Microsoft Smooth Streaming - remote, MPEG Dash, Adobe HTTP Dynamic Streaming (HDS), Adobe RTMP, and Adobe HTTP Dynamic Streaming - HTTP File Format (HDS-HTTP)

<sup>2.</sup> This release supports the following DRM servers: Verimatrix HLS, Buy DRM, CKM, Nagravision (Nagra), Internal HLS, Verimatrix Playready, Internal Flash Access, Latens, Secure Media, Conax, Irdeto, Internal Playready, NDS/Cisco, RgbAPI, Mezzanine, and KPN.

<sup>3.</sup> Another format for on demand content delivery is network-based DVR (nDVR). Rather than the client storing desired recorded content to a local set-top box, the recorded content is stored in the cable operator's content delivery network.

and made available for the consumer to watch at some point in the future (otherwise known as Video On Demand, or VOD).

#### Packaging Benefits for Mobile and PC Delivery

- Adaptive streaming segments video into chunks that are reliably delivered using HTTP and can be easily buffered, compensating for packet drops and temporary bandwidth changes that are common on wireless networks.
- The video is encoded at multiple bitrates and resolutions creating segments of different sizes. A mobile client can select different adaptive segments depending on the currently available delivery bandwidth, giving users the best possible video experience.
- Leveraging standard HTTP infrastructure (including Content Delivery Networks—CDNs) results in a significant cost savings over legacy streaming technologies.
- Eliminates the guesswork for content providers when choosing encoding bitrates for end devices.
- Works seamlessly with firewalls by leveraging HTTP as the transport protocol.
- Live and Video On Demand (VOD) workflows are almost identical.
- When a provider creates a live stream, the chunks can be kept for later VOD delivery.

## How Packager Works

The TransAct *Packager* works seamlessly with RGB's *Video Multiprocessing Gateway (VMG)*, TransAct *Transcoder*, or any other third party transcoder to provide a complete transcoding and packaging solution. A key advantage of separating transcoding from packaging functionality is the ability to leverage both centralized and distributed deployment architectures.



Figure 2. Packaging Architecture for IP Video Delivery

The VMG provides a high-density, carrier-class hardware platform for the delivery of advanced video services, including high definition (HD) and standard definition (SD) video, as well as MPEG-4/H.264 and MPEG-2 video streams. The VMG transcodes multi-bitrate, multi-resolution streams that are suitable for multiple Apple and Android mobile devices, as well as for consumption on PCs. Those streams are then sent directly to a co-located TransAct *Packager* or distributed over the network to edge locations for packaging the stream into Apple HLS, Microsoft Smooth Streaming, Adobe HTTP Dynamic Streaming, RTMP or MPEG-DASH.

Packaged streams are delivered directly to origin web servers or to a content delivery network (CDN) for wider distribution to end devices.



**Note:** For live smooth streaming output, you can output to an IIS server, or deliver directly to client devices.

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**Note:** HTTP-based streaming has the advantage of not requiring any firewall ports being opened outside of the normal ports used by web browsers. HTTP-based streaming also allows video fragments to be cached by browsers, proxies, and CDNs, drastically reducing the load on the source server.

As shown in Figure 2 on page 18, the VMG handles all transcoding and then forwards transcoded media to the *Packager* using H.264 video and encoded audio (e.g., AAC, DD+) over MPEG-2 TS/UDP. The *Packager* simply packages the transcoded media with bitrates, resolutions and protocols appropriate for the various devices at the edge of the content delivery network (CDN).

### **Manifest and Content Files**

HTTP-based (client-based) streaming utilizes two types of files in order to accomplish dynamic streaming:

- **Manifest** files—contain metadata that describes the identity and location of all alternate multibitrate streams. Client players use manifest files (also referred to as "playlists") to determine information about the content including (but not limited to) available bitrates, codecs, video resolutions, markers, captions, and the location of segments. See Table 3 for a list of supported manifest formats.
- **Content** files—contain the actual video and audio that has been specially encoded in order for the client player to retrieve discrete file segments during playback. See Table 3 for a list of supported content formats.

Player	Manifest Format	Content Format
HDS	F4M	FMP4
HLS	M3U8	TS
MSS	ISM	FMP4
DASH-TS	MPD	TS
DASH-ISO	MPD	FMP4

Table 3. HTTP-based supported manifest & content

Server-based streaming also utilizes manifest and content files. However, a server-based manifest file contains information that is used by the server and not the client, such as the relationship between media tracks, bitrates, file location, and so forth.

## **Packaging Modes**

The *Packager* can perform three different modes of packaging: *Linear*, *File*, and *Just-in-Time*. Each of these modes is described in this section.

#### How Packager Delivers Linear Packaging

With traditional linear packaging, "nailed up" inputs of linear streams arrive as MPEG-2 TS over UDP while adaptive streaming outputs are continuously running. As with live or broadcast TV in which control is performed once and left alone with an expectation of 24/7 operation without interruption, linear packaging performs continuous packaging, regardless of user demand.

### How Packager Delivers File Packaging

With file packaging, the inputs are files instead of streams, however, an operator begins the packaging / encryption task via the TransAct *Packager* Console (GUI) or via an external system such as an Application Programming Interface (API). File packaging output is also used when *Packager* is part of the RGB *nDVR* ecosystem.

#### How Packager Delivers Just-in-Time Packaging

With just-in-time delivery, packaging of assets is performed only when content is requested by a user; this saves storage costs associated with pre-packaging video-on-demand assets, and simplifies migration to new packaged formats. JITP inputs are *files*, not streams, which correspond to timeshifted TV or video on demand content. JITP acts as an origin server for these files whereby initial requests from clients always experience cache misses (an unfulfilled request for data from the cache server). At that point, the JITP origin server then performs the packaging and delivers the requested content to the client via the CDN. The CDN then caches the content corresponding to the specific protocol and profile, thus allowing for a cache hit opportunity if the other clients later request the same content. If there are no client requests or the CDN is delivering previously cached content (cache hits), the JIT *Packager* sits idle.

Alternatively, the JITP output can be saved to a file as VOD. Live content is first transcoded into multibitrate outputs, and live streams are captured and converted into files in a chosen *mezzanine format*<sup>4</sup>.

File assets can also be transcoded into a mezzanine format which uses H.264/AAC for the video/audio codecs and a pre-selected container format. MPEG-2 TS container format is a natural choice for the mezzanine files, since it can contain the signaling (e.g. SCTE 35 cues or other PID data) present in the original signals.

<sup>4.</sup> A mezzanine format is a TS file-based format which is a "super set" of all packaged formats and is packaged/ encrypted on the fly ("just in time"). In this case, only one format is stored corresponding to the multiple profile encoding of a given asset.

When clients connect to *Packager* in just-in-time mode, it extracts the requested chunks (or computes the manifests) from the mezzanine files and delivers them to the requesting clients.



Figure 3. Just-in-Time Packaging Architecture

Used in combination with a content delivery network (CDN), Just-in-Time packaging can service all types of content requests. As shown next, the CDN caches and delivers short tail content, or content that is frequently requested. Long tail content is served directly from the *Packager*.

Figure 4. Short- and Long-tail Content, JITP



#### Just-in-Time Packaging Benefits

- Storage cost savings—Assets need only be stored in a single mezzanine format with Just-in-Time packaging. With HTTP streaming, every asset *must* be stored in multiple formats, increasing storage costs.
- Encryption "on-the-fly"—Assets can be encrypted "on-the-fly", preventing DRM lock-in by not requiring pre-encryption<sup>5</sup> to store on disk.
- "Cablevision ruling" Network DVR<sup>6</sup> (nDVR) copies—Service providers can meet this requirement by only storing a single mezzanine format for each asset that users record for nDVR playback.
- Format future-proofing—VOD libraries do not need to be repackaged when new HTTP streaming protocols emerge.
- One system for all uses—Using JITP for VOD with a caching CDN can automatically lead to caching
  of short tail assets in the CDN and the use of JITP for un-cached long-tail assets.
- Simplified Operations—Enabling additional package formats do not require changes to existing content processing work flows; changes are instead made on the JITP server.

#### How Packager Works with nDVR

RGB's Network Digital Video Recording (nDVR) solution is a software based, cloud enabled system that provides end-to-end video recording delivery using the service provider's own data center or a hosted private cloud. Key features of nDVR include: event based recordings, continuous record; operator or user scheduling of recordings; support for Catch-up TV, Time-shift, Hot Record; and support for fast-forward, resume, and sliding window playback modes.

#### **nDVR** Components

Three components comprise the nDVR solution:

- 1. TransAct Recording Manager a GUI-based application that provides a RESTful set of APIs in order for middleware to schedule and playback recordings.
- 2. **TransAct Packager** as **Recorder** a TAP licensed for recording MBR IDR aligned streams, which creates HLSv4 mezzanine format for delivery to a JITP-ready TAP.
- **3. TransAct Packager** as **JITP (and Stitcher)**<sup>7</sup> a TAP licensed for JITP and, in the case of continuous recording, manifest stitching. The JITP server creates content on demand from either event-based or continuous recordings. For CR, the Stitcher function then creates virtual assets by producing a variant manifest from the correct set of fragmented CR files.

#### nDVR Configuration in Packager

If you are using RGB's nDVR solution, configuration is done via the TransAct *Recording Manager* (except for licensing, HLS version format, and *Recorder* redundancy configuration). Refer to the *nDVR User Guide* and the *nDVR Quick Start Guide* for detailed configuration steps.

#### Additional Information

For instructions on how to configure and use RGB's nDVR solution, please refer to the nDVR documentation.



<sup>5.</sup> RGB also supports an encrypted mezzanine format that can be pre-encrypted prior to storage, then unencrypted and encrypted with an operator's choice of DRM "on-the-fly."

<sup>6.</sup> Network DVR (nDVR) provides DVR functionality in the CDN rather than at the set-top box or end user location.

<sup>7.</sup> Stitcher is required for CR.

## **Packager** Features

- Ingests H.264/AAC over MPEG-2 transport streams (MPEG-2 TS/UDP);
- Works seamlessly with RGB's Video Multiprocessing Gateway (VMG) to receive transcoded ingest streams, supporting up to 432 IDR-aligned streams from the VMG;
- Supports other encoders that can generate IDR-aligned streams;
- Outputs segmented "packaged" streams suitable for HTTP or RTMP delivery;
- Supports TS-based linear Dash output;
- Thumbnail support;
- Provides multiple storage methods, including NFS, GPFS, CIFS, and Object Store;
- Supports stream encryption and integration with leading third-party DRM servers;
- Manifest publishing of late binding audio with multiple codecs and languages for HDS, HLS, and MSS players;
  - For HLS: supports audio-only manifest publishing;
- Supports DD and DD+ audio codec;
- JITP ingest support for RGB Packager Asset and MPEG Dash TS HTTP File Format;
- Continuous recording to Mezzanine format (encrypted or unencrypted);
- JITP HLS ingest from Mezzanine format;
- HLSv4 support for trick play and multiple audio tracks;
- SCTE-35-based ad insertion with POIS support;
- EBP Segmentation support (linear only);
- Supports package-level redundancy (this feature requires 2 Packagers to function);
- Provides API-based bulk configuration, control, and auto-generated APIs (RGB Configurator tool);
- Available as a software license or AMS software+hardware solution.

## **Scalability**

Scalability will depend on whether clients are being served directly, through an origin server, or via a Content Delivery Network (CDN). For optimal scalability, streams from *Packager* should be fed to a CDN or origin web server<sup>8</sup>.

For specific benchmark capacity, please refer to the *Release Notes* for this version of software.

For deployment scenarios, RGB recommends the Network File System (NFS) or General Parallel File System (GPFS) protocol for all external storage mounts. Common Internet File Services (CIFS) can be used but is not recommended due to decreased performance (refer to the *Release Notes* for this version of software for test data). If used, CIFS should be limited to non production deployment situations.

Object Store is also an available storage architecture. For more information, refer to, "How Packager Works With Object Store (Swift API)" on page 217.



<sup>8.</sup> When using *Packager* as the origin server, note that the number of simultaneous channel / segment requests is more limited than a CDN can provide. For scaling beyond hundreds of clients, a CDN should be used for origin servers.

For additional information on file system mounts, refer to the section titled, "Options for Mounts" on page 220.



#### **CHAPTER 3**

## Management Console

This chapter introduces the GUI Management Console for TransAct Packager.

## In This Chapter:

- "Overview," next
- "Logging into Packager" on page 25
- "Packager GUI Organization" on page 26
- "Understanding the Dashboard" on page 28
- "Adding User Accounts and Passwords" on page 33

## **Overview**

RGB provides two methods for configuring the Packager:

- Management Console (GUI)—a Web-based GUI management interface
- Command Line Interface (CLI)—a Linux-based command line management interface

The GUI provides management and access for the TransAct *Packager*. By interfacing with the application program interface (API), the GUI provides a graphical medium to perform all system configuration, management, and reporting features.

## Logging into Packager

### **Prior to Installing**

Before you can login to Packager, you must do one of the following:

- Install the TransAct Packager software on your own server. Refer to the TransAct Software Installation and Upgrade Guide for instructions.
- If your *Packager* is running on AMS, install the hardware. Refer to the *Application Media Server* (*AMS*) Hardware Setup Guide for instructions.



**Note:** You can access the Packager GUI from the latest versions (as of this release date) of Mozilla Firefox, Internet Explorer, Apple Safari, and Google Chrome.

### Log in to the Web GUI

To login to Packager:

1. Navigate a web browser to the IP address of the *Packager* Management Console (GUI). For example, http://10.10.83.213

The **Packager Login** screen appears.

r620p-07.lab.ripcode.com (10.10.83.213)
Username
Password
Remember on this computer
License Agreement
Login

2. Enter the **Username** and **Password** in their respective fields. The default login is as follows: login: admin

pass: ripcode

3. Click Login.

The Packager management console GUI opens to its default Dashboard view.

RGB (Stitcher-109.cslab. ×						
← → C 🕑 https://10.32.12	28.109					☆ O
			Host IP Softwa Current User: a	: Stitcher-109.cslab. re Version 5.4, Build 23 t system time: 2014-0 admin   Logout	rgbnetworks. 968 9-15 19:29:10	.com (10.32.128.109 ) PDT
E System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Sconnection
Packaging					In	Progress:0   Waiting:0
🕥 🔻 Hardware			CI	PU (% in use):1   Memo	ory (% in use):1	7   Disk (% in use):27
▼ Input/Output		<b>⊗</b> Input	Groups:0 🞯Output	Streams:0 🕥Input D	irectories:1 📀	Output Directories:0
▼ Events					Critical:2	Major:10   Warning:1
	©2014 RGB Networ	ks All Rights Rese	ved. <u>License Agreer</u>	nent		

## Packager GUI Organization

The *Packager* GUI is organized in a tree-branch fashion with *trunk* category tabs, main *tree* category menus, and *branch* category sub-menus. Main tree and branch category menus are arranged alphabetically (rather than procedurally) for ease of use.

## **Trunk Category Tabs**

The GUI contains the following trunk tabs:

- **Dashboard**—Shows statistics and events for the *Packager*.
- **Configuration**—Allows you to configure linear and JIT packaging workflows, inbound and outbound directories and streams, view supported formats, and configure audio profiles.
- Reports—Allows you to view system events and packaging statistics.
- **System**—Lets you perform system configuration tasks including: viewing version information, performing backup/restore of the configuration database, starting/stopping services, configuring IP network parameters, software updates, key server assignment, POIS, etc.

## Main Tree and Branch Category Menus

Each trunk tab contains a main tree menu under the specified category. Each main tree contains branch menus and sub-menus based on feature. Except for the **Dashboard**, all menus are arranged in alphabetical order per tab category as shown in Table 4:

Configuration Tab	Reports Tab	System Tab
configuration     audiomap     input     jitp     output     package     session     stitcher	<ul> <li>reports</li> <li>event</li> <li>log</li> <li>packages</li> <li>systemstatus</li> </ul>	Sysconfig      Config      Config      Config      database      debug      defaults      debug      d

#### Table 4. Packager GUI Menus



## **Understanding the Dashboard**

The following topics are covered in this section:

- Dashboard Overview
- Just-In-Time Packaging
- Packaging
- Hardware
- Input/Output
- Events

### **Dashboard Overview**

The **Dashboard** tab of the Management Console presents statistics for JITP and linear packaging operations, hardware utilization, input/output directories or streams, and events. Each section can be expanded or collapsed by clicking on the triangle next to the title of each section.

Dashboard	Configuration	Reports	System				
🛕 System Status		st-In-Time Pack		Packaging		Input/Output	Connection
$\sim$							
Just-In-Time P	ackaging						
▼ Packaging							In Progress:27   Waiting:0
<u> </u>							
🔻 Hardware					CPU (%	% in use): 19   Memory (%	in use):9   Disk (% in use):22
~							
▼ Input/Output				Input Groups:	27 🧭 Output Stream	ns:0 买Input Directories	:0 Output Directories:54
-							
▲ Events						Crit	ical:0   Major:100   Warning:0

#### Icons

The icons displayed in the Dashboard indicate current system or line item status. Each item will display the highest error condition state for that category.

- Solution Indicates the current status is good; no errors are present on the *Packager* or the specified task.
- 🔼 Indicates there is a major or warning condition present; some errors have occurred during packaging operations.
- 🔢 Indicates the presence of a critical error condition.

## **Just-In-Time Packaging**

This section displays statistics about JITP operations, including period durations and success / error statistics for Segment Counts and Asset Counts.

System Status	Just-	In-Time Packaging	Packaging		Input/Output	Connectiv
System Status	5050	In Think Fuckaging	ruckuging	nurumure	input/output	Connecto
¥						
🔺 Just-In-Time Pack	aging					
,	Period	Success	Error			
	5 second	0	0			
<ul> <li>Segment Counts</li> </ul>	1 minute	0	0			
	5 minute	0	0			
	Lifetime	5	0			
	Period	Success	Error			
	5 second	0	0			
<ul> <li>Asset Counts</li> </ul>	1 minute	0	0			
	5 minute	0	0			
	Lifetime	222	1			

## Packaging

This section shows all *active* packaging, which is indicated by blue dots spinning in a counter-clockwise direction.

(	Packaging	In Progress: 1   Waiting: 0
	🛃 🔅 TestHLS	Packaging (5/5)
	C TestHLS	Frames Packaged: 21844
	TestHLS	Frames Packaged: 22231
	TestHLS	Frames Packaged: 22231
	C TestHLS	Frames Packaged: 21845
	TestHLS	Frames Packaged: 21846

• Click on an individual package to view detailed statistics as seen below:

Packaging				
🛃 🔅 TestHLS		Packaging (5/5)		
C TestHLS		Frames Packaged: 579		
C TestHLS	1 Details			
zestHLS	Transcoding Task:hls1/			•
	Step State	inProgress		
	Step Туре	encode		
	Total Frames Packaged	136		
	Segment generated	0	1	Е
	Maximum queue depth	0		
	Current queue depth	0		
	Frames per second	31.770 / 29.970		
	Bit Rate Stats	4091698 / 2941000		
	Transport/Usage	file		-
	Output	0		
	In Sync	0		Ŧ
	Close			

#### Hardware

This section displays information about the status of the *Packager* hardware including CPU, Real-Time Utilization Data, Memory, Disk Partitioning and Usage, Temperature, Fans, and Voltage.

🕥 🔺 Hardware		CPU (% in use):1   Memory (% in use):3   Disk (% in use)
+ CPU	Idle/Available: 99% (U	ser: 0%, System: 0%, Nice: 0%, IO/Wait: 0%)
• Real-Time Utilization Data	FPS Status: Bitrate: Utilization: File (F2F) Operations: File RealTime (ODT) Operations: Stream Operations:	Pass (Target 0, Actual 0) 0 0% 0 passed, 48 test in-progress, 0 failed (0 running, 0 stopped) 0 passed, 0 test in-progress, 0 failed (0 running, 0 stopped) 0 passed, 0 test in-progress, 0 failed (0 running, 0 stopped)
• Memory	Free: 62174MB (Total: 6 Available: 62732MB (In	4377 MB, Used: 2203MB, Shared: 0MB, Buffers: 56MB, Cached: 502MB) cludes buffers and cache)
• Disk	/dev/sda2 (Mount: /) Available: 8.6G (Size: tmpfs (Mount: /dev/shm) Available: 32G (Size: /dev/sda6 (Mount: /opt Available: 127G (Size /dev/sdb1 (Mount: /opt Available: 127G (Size /dev/sdb1 (Mount: /tmp Available: 4.4G (Size: /dev/sda1 (Mount: /var/ipcor Available: 23G (Size: tmpfs (Mount: /var/ipcor Available: 45G (Size: tmpfs (Mount: /var/ipcor Available: 318G (Size r2-inv12:/data/jitp/ta Available: 318G (Size kios:/data/JITP_asset Available: 12G (Size: r2-inv12:/data/jitp (M Available: 12G (Size)	12G, Used: 2.4G) 32G, Used: 4.0K) localmnt) 139G, Used: 410M) localmnt2) 2 30G, Used: 650M) ) 4.9G, Used: 214M) ////////////////////////////////////
• Temperature	IPMI sensor ID (IPMI sen Temp (0x01): ok (-70 o Temp (0x02): ok (-70 o Temp (0x05): ok (27 d Ambient Temp (0x05): ok (27 d Ambient Temp (0x06): ok (33 d Ambient Temp (0x06): Planar Temp (0x06): ok (34 d Temp (0x08): ok (33 d Temp (0x08): ok (33 d	sor number): status (sensor value) legrees C) grees C) grees C) grees C) : ok (31 degrees C) : ok (34 degrees C) : ok (24 degrees C) dk (37 degrees C) grees C) grees C) grees C) jegrees C)
• Fans	IPMI sensor ID: status (s FAN MOD 1A RPM: ok ( FAN MOD 2A RPM: ok ( FAN MOD 3A RPM: ok ( FAN MOD 3A RPM: ok ( FAN MOD 5A RPM: ok ( FAN MOD 1B RPM: ok ( FAN MOD 2B RPM: ok ( FAN MOD 3B RPM: ok ( FAN MOD 3B RPM: ok ( FAN MOD 5B RPM: ok ( FAN MOD 5B RPM: ok ( FAN MOD 5B RPM: ok (	ensor value) 9120 RPM) 9600 RPM) 9240 RPM) 9240 RPM) 8880 RPM) 6600 RPM) 6600 RPM) 6600 RPM) 6600 RPM) 6640 RPM) 6640 RPM)
+ Voltage	<i>IPMI sensor ID: status (s</i> <b>Voltage: ok</b> (202 Volts)	ensor value)

## Input/Output

This section displays information about the Output Streams and Input/Output Directories that have been configured on *Packager*.

- **Output Stream** listings include the type of stream, name and host that is sending the stream (if applicable).
- **Input/Output Directory** listings include the type of directory (input or output), the host for the directory, its share name, and the mount type.



	Input/Output		SInput Groups:0 Output Streams: 10 SInput Directories:3	Output Directories:2
				Auto-Refresh
*	Output Strea	ims		
Status	Туре	Hostname	Cast Type	
$\otimes$	Output	http://10.10.81.35/1.isml	N/A	
$\otimes$	Output	http://10.10.81.35/2.isml	N/A	
$\bigcirc$	Output	http://10.10.81.35/3.isml	N/A	
$\otimes$	Output	http://10.10.81.35/4.isml	N/A	
$\otimes$	Output	http://10.10.81.35/5.isml	N/A	
$\bigcirc$	Output	http://10.10.81.35/6.isml	N/A	
$\otimes$	Output	http://10.10.81.35/7.isml	N/A	
$\otimes$	Output	http://10.10.81.35/8.isml	N/A	
	Output	http://10.10.81.35/9.isml	N/A	
$\otimes$	Output	http://10.10.81.35/10.isml	N/A	
	Directories			
Status	Туре	Hostname	Share Name	Mount Type
$\overline{\mathbf{A}}$	Input	r2-inv12	/data/jitp/tap480	NFS
$\overline{\mathbf{A}}$	Input	r2-inv12	/data/jitp/tap490	NFS
$\overline{\mathbf{A}}$	Input	r2-inv12	/data/jitp	NFS
$\overline{\mathbf{A}}$	Output	/opt/localmnt2	out:-1	LOCAL
S	Output	kios	/data/JITP_assets/tap50	NFS

## **Output Stream Detail**

Click on an individual output stream to open the **Details** window and view statistics for the stream.



#### Events

This section displays current and historical events on the system for critical, major, and warning severity levels. Many filtering options are available from the Events summary, including the ability to sort events based on category or acknowledged state.

F	Events Critical:41   Major:52   Warning:6							
Ī	Ack/ Auto-Re	Jnack: Ackr efresh	nowledge Selected 💌	Severity: Warning 💌	Filter: All	•	Page Size: 100 💌 Previous   Next   Refresh	
	Seq.No.	Severity	Time	Acknowledger	Ack. Time		Detail	
	947	MAJOR	Sep 21, 2013 00:01:06	-	-		Transcoder: 1 has changed state to: In-Service.	
	945	CRITICAL	Sep 21, 2013 00:01:05	-	-		There are no valid License Keys installed for this	
	926	MAJOR	Sep 20, 2013 17:31:35	-	-		Software Update has completed successfully.	
	924	MAJOR	Sep 20, 2013 17:30:56	-	-		Transcoder: 1 has changed state to: In-Service.	
	922	CRITICAL	Sep 20, 2013 17:30:56	-	-		There are no valid License Keys installed for this	
	902	MAJOR	Sep 20, 2013 17:30:48	-	-		Transcoder: 1 has changed state to: Out-Of-Service.	
	900	WARNING	Sep 20, 2013 17:30:40	-	-		CPU utilization high threshold cleared	
	899	WARNING	Sep 20, 2013 17:30:30	-	-		CPU utilization high threshold crossed, CPU usage	
	897	MAJOR	Sep 20, 2013 00:00:51	-	-		Transcoder: 1 has changed state to: In-Service.	

i

**Note:** Informational events are not displayed in the Dashboard, but are available from the **reports** >> **log** >> **system** >> **show** menu. See "Viewing Informational Messages" on page 229 for additional information.

#### Acknowledging and Unacknowledging Events

An active event condition may be cleared by either remedying the event or *acknowledging* its status. When you *unacknowledge* an event, its active severity status is reinstated on the system.

To acknowledge or unacknowledge one or more events:

- 1. Select the desired events from the summary list.
  - To select a group of consecutive events, click on the first event in the group, hold down the SHIFT key on your keyboard, and click on the last event in the group.
  - To select a group of non-consecutive events, hold down the CTRL key on your keyboard while clicking on the desired events.
- 2. From the **Severity** field, choose the *minimum* severity level by which to filter the events.



**Note:** The severity filter will return events that match the minimum severity criteria. Choosing **Critical** will return events that are only critical severity. Choosing **Major** will return Major severity events and higher. Choosing **Warning** will return all Warning and higher events.

- **3.** From the **Filter** field, choose whether to sort events based on acknowledged state, or select *All* to display both acknowledged and unacknowledged events.
- 4. From the Ack/Unack field, select whether to Acknowledge or Unacknowledge the selected events.

5. Click on Ack/Unack next to the drop down box.

The selected event(s) are immediately acked or unacked.

#### Unacknowledged Events Shown

<b>•</b> • •	vents				Critical:41   Major:52   Warning				
Adk/	Unack: Ack	nowledge Selected  nowledge Selected	Severity: Warning 👻	Filter: All	Page Size: 100     Previous   Next   Refresh				
Seq.No. Severit Unacknowledge Selected Acknowledge All 947 MAJOR Sep 21, 2013 00:01:06			Acknowledger	Ack. Time	Detail				
			-	-	Transcoder: 1 has changed state to: In-Service.				
945	CRITICAL	Sep 21, 2013 00:01:05	5		There are no valid License Keys installed for this				
926	MAJOR	Sep 20, 2013 17:31:35	-	-	Software Update has completed successfully.				
924	MAJOR	Sep 20, 2013 17:30:56			Transcoder: 1 has changed state to: In-Service.				
922	CRITICAL	Sep 20, 2013 17:30:56	-	-	There are no valid License Keys installed for this				
cknow	ledged E	vents Shown							
cknow	ledged E	vents Shown			Critical:38   Major:50   Warning				
Cknow	Vents Unada: Ack	vents Shown	Severity: Warning 💌	Filter: All	Critical:38   Major:50   Warning           Page Size: 100          Previous   Next   Refresh				
Cknow	Vents Vents Unack: Ack tefresh Severity	vents Shown	Severity: Warning 💌 Adknowledger	Filter: All Adk. Time	Critical:38   Major:50   Warning           Page Size: 100          Previous   Next   Refresh             Detail				
Cknow Adk/ Auto-R Seq.No. 947	ledged E vents Unadc: Ack tefresh Severity MAJOR	vents Shown	Severity: Warning 💌 Acknowledger admin	Filter: All Adk. Time Sep 22, 2013 02:42:24	Critical:38   Major:50   Warning Page Size: 100  Previous   Next   Refresh    Detail Transcoder: 1 has changed state to: In-Service.				
Adk/ Auto-R Seq.No. 947 945	ledged E vents Unack: Ack tefresh Severity MAJOR CRITICAL	vents Shown	Severity: Warning 💌 Acknowledger admin admin	Filter: All Adk. Time Sep 22, 2013 02:42:24 Sep 22, 2013 02:42:24	Critical:38   Major:50   Warning Page Size: 100  Previous   Next   Refresh    Detail Transcoder: 1 has changed state to: In-Service. There are no valid License Keys installed for this device: License				
Auto-R Seq.No. 947 926	Vents Vunack: Acck Lefresh Severity MAJOR CRITICAL MAJOR	vents Shown           nowledge Selected           Time           Sep 21, 2013 00:01:06           Sep 21, 2013 00:01:05           Sep 20, 2013 17:31:35	Severity: Warning 💌 Acknowledger admin admin admin	Filter: All Ack. Time Sep 22, 2013 02:42:24 Sep 22, 2013 02:42:24 Sep 22, 2013 02:42:24	Critical:38   Major:50   Warning     Page Size: 100      Previous   Next   Refresh       Detail     Transcoder: 1 has changed state to: In-Service.     There are no valid License Keys installed for this device: License     Software Update has completed successfully.				
Cknow Adt/ Auto-R Seq.No. 947 945 926 924	Vents Vents Vunack: Acek tefresh Severity MAJOR CRITICAL MAJOR MAJOR	Time           Sep 21, 2013 00:01:06           Sep 21, 2013 00:01:05           Sep 20, 2013 17:31:35           Sep 20, 2013 17:30:56	Severity: Warning 💌 Acknowledger admin admin admin -	Filter: All Ack. Time Sep 22, 2013 02:42:24 Sep 22, 2013 02:42:24	Critical:38   Major:50   Warning         Page Size:       100           Page Size:       100           Detail       Inscoder:         Transcoder:       1 has changed state to:         Inservice.       Inservice.         There are no valid License Keys installed for this device:       License         Software       Update has completed successfully.         Transcoder:       1 has changed state to:         In-Service.       1				

(1

Note: For a complete list of event messages, refer to the RGB List of System Events & Traps.

## Adding User Accounts and Passwords

*Packager* has two user accounts by default: **oper** (*staff* account) and **admin**. You can add more user accounts to control access to the *Packager* using the GUI. You can also add remote authentication servers for secured login.

To manage user accounts, see "Viewing User Accounts on the Packager" on page 90.

To manage remote authentication, see "Managing Remote Authentication Servers" on page 90.

#### **CHAPTER 4**

# System Configuration

This chapter provides instruction for system-wide configuration and maintenance tasks available from the **System** tab of the *Packager* GUI Management Console, which includes parameters such as license server, IP and routing, key server, ad insertion, database management, and software upgrades. The structure of the chapter is organized in the same alphabetical tree-branch order as it appears in the GUI. System configuration that is necessary prior to configuring linear and JIT packaging is listed at the beginning of this chapter.

## In This Chapter:

- "Prerequisite System Configuration Packaging Operations," next
- "Backing Up, Resetting and Restoring the Packager System Configuration" on page 35
- "Configuring Database Logging, and Thresholds" on page 38
- "Configuring the Hostname" on page 41
- "Viewing System Information for the Packager" on page 43
- "Retrieving Ingest URLs Via Proxy Server (For Testing Only)" on page 44
- "Managing the Key Server" on page 45
- "Managing Licensing" on page 50
- "Configuring or Removing Network Bonds" on page 57
- "Configuring DNS and Domain Settings" on page 59
- "Viewing Ethernet Settings for Packager" on page 63
- "Configuring a Firewall for Packager" on page 63
- "Viewing or Assigning Interfaces" on page 65
- "Configuring IP Addresses" on page 67
- "Managing Network Routing" on page 69
- "Managing NTP Servers" on page 71
- "Configuring POIS" on page 74
- "Managing Progressive Downloads Policies" on page 75
- "Rebooting the Packager" on page 76
- "Restarting the Packager" on page 77
- "Shutting Down the Packager" on page 77
- "Managing the Packager's SNMP Service" on page 78
- "Performing Software Upgrades for the Packager" on page 82
- "Sending Messages to a Remote Syslog Server for the Packager" on page 84
- "Managing Time Zones" on page 87
- "Managing User Accounts" on page 88

## **Prerequisite System Configuration — Packaging Operations**

Before performing any packaging operations or configuration (from the Configuration tab), ensure the *system* configuration parameters listed in Table 5 are configured.

Parameter	For more information, see:	Requirement		
Hostname	"Configuring the Hostname" on page 41	Optional, but recommended		
Key server	"Managing the Key Server" on page 45	Required if using key server		
License key	"Managing Licensing" on page 50	Required		
DNS	"Configuring DNS and Domain Settings" on page 59	Required		
Network interface assignment	"Viewing or Assigning Interfaces" on page 65	Required		
Packager IP address	"Configuring IP Addresses" on page 67	Required		
Network routes	"Managing Network Routing" on page 69	Required		
NTP server(s)	"Managing NTP Servers" on page 71	Optional, but recommended		
POIS	"Configuring POIS" on page 74	Required if using ad insertion		
Syslog server	"Sending Messages to a Remote Syslog Server for the Packager" on page 84	Optional, but recommended		
Timezone	"Managing Time Zones" on page 87	Required if not using NTP server		

Table 5. Required system configuration before configuring packaging

## Backing Up, Resetting and Restoring the Packager System Configuration

The *Packager* has a database that stores its system configuration. You can backup the system configuration to either a remote Trivial File Transfer Protocol (TFTP) or an HTTP server. You can reset application configuration to factory defaults; this action does not reset the entire system to factory defaults, and only resets the License Server configuration if that configuration is stored in **/var/ripcode/DB**. You can also restore system configuration to a *Packager* from a remote TFTP or HTTP server.

### **Backup System Configuration**

- 1. From the **System** tab, click through to **sysconfig** >> **config** >> **backup**.
- **2.** Determine whether to use TFTP or HTTP as the method of backup. If you are using TFTP, ensure that a valid TFTP server (or service) is running on the desired TFTP host.



#### 3. Provide the information in Table 6 and click **Submit**.

#### TFTP Backup

Dashboard Configura	tion Reports Syste	m				
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
i⊟ sysconfig i⊟ config in backup	sysconfig >> co This method does a back	ponfig >> back	<b>up</b> Iration to a remote TFT	P server or local file for l	later HTTP dowr	nload/retrieval.
backupfile reset restore	Mode	TFTP	,	Mode to use for bad to remote server. Fo for file retrieval.	kup. For TFTP, or HTTP, URL is	file is copied provided
database	Host			[text, max. length o	f 72] For TFTP, ed for HTTP.	the remote
<b>⊞</b> ∵debug	File Name			[text, max, length o	f 256] For TFTP	, the name
t defaults	File Name			<ul> <li>of the backup file (fil , taz extension), Not</li> </ul>	e will be append used for HTTP.	ded with
± nostname						
inno ingestproxy		Submit				

HTTP Backup

Dashboard	Configuration	Reports	System					
💀 System Status	3	ust-In-Time Pac		Packaging		Input/Output		Connection
id"sysconfig id"config id"config idackup		<b>sysconfig</b> This method doe	>> confi es a backup of t	<b>g &gt;&gt; backu</b> the system configur	<b>IP</b> ration to a remote TFT	TP server or local file for l	ater HTTP dow	nload/retrieval.
···backupfile ···reset ···restore			Mode HTT	TP		<ul> <li>Mode to use for bad to remote server. For for file retrieval.</li> </ul>	kup. For TFTP, or HTTP, URL is	file is copied provided
tatabase ⊡ debug ⊡ defaults			Su	bmit				

#### Table 6. Backup the *Packager*'s system configuration.

Field	Description
Mode	Select the mode to use for the database backup. Choices are: TFTP or HTTP.
	If you select <b>TFTP</b> , the backup files will be saved to the host and directory location you specify in the Host and File Name fields.
	If you select <b>HTTP</b> , there are no options for location or file name as the backup files will automatically be saved to <i>Packager</i> 's hard drive.
Host	<b>Required for TFTP.</b> The remote Trivial File Transfer Protocol (TFTP) server hostname or IP address to which the backup file should be sent.
File Name	<b>Required for TFTP.</b> The name to assign to the backup file. The file will automatically be appended with <b>.tgz</b> .

### **View HTTP Backup File Location**

If you used HTTP as the mode of backup, you can view where the last backed up file was stored on *Packager*. To do so, proceed as follows:

1. From the **System** tab, click through to **sysconfig** >> **config** >> **backupfile**.


#### 2. Click Submit.

The backup file location will look similar to the following:

🖶 System Status						
		n-Time Packaging				Section Section
i⊐ sysconfig i⊐ config i mbackup	<b>Sy</b> This	sconfig >> con	fig >> back	upfile generated by the last	HTTP backup operation.	
-backupfile reset ∵restore ⊕ database ⊕ debug		Submi	t			

### **Reset Application Configuration**

- 1. From the **System** tab, click through to **sysconfig** >> **config** >> **reset**.
- 2. Click Submit.



**Caution!** Resetting Packager's configuration to factory defaults will cause all services to restart.

### **Restore System Configuration from Remote TFTP Server**

1. From the **System** tab, click through to **sysconfig** >> **config** >> **restore**.

2. Provide the information in Table 7 and click Submit.

Dashboard Configur	ation Reports System					
👭 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
iarsysconfig iarconfig iarbackup	sysconfig >> co This method restores the s	nfig >> resto ystem configuration fro	<b>re</b> om a remote TFTP or HT	IP server.		
backupfile reset	Mode	TFTP	•	Mode to use for rest remote server using	ore. File is copi appropriate pro	ed from ptocol.
testore testore	Host			[text, max. length o server. Not used for	f 72] The remot HTTP.	te TFTP
D debug D defaults D hostname	File Name			[text, min. length of TFTP, the name of the appended with .tgz full URL of the file to	1, max. length he backup file ( extension). For be retrieved.	of 256] For file will be HTTP, the
<ul> <li>info</li> <li>ingestproxy</li> <li>keyserver</li> <li>incesse</li> </ul>	Restore Redundancy	No	T	Restore Redundancy Yes, any Redundancy restored and this ho Redundancy Group, settings will be resto configured as a stan	y settings from ty settings foun st may become If No, no Redu red and this ho dalone.	backup. If d will be part of a ndancy st will be
network     ntp		Submit				

Table 7. Restore the system configuration.

Field	Description						
Mode	Select the mode to use for the database restore. Choices are: TFTP or HTTP.						
	If you select <b>TFTP</b> , the backup files will be restored from the host and file name you specify in the Host and File Name fields.						
	If you select <b>HTTP</b> , the backup file will be restored from the URL you specify in the File Name field.						
Host	<b>Required for TFTP.</b> The remote Trivial File Transfer Protocol (TFTP) server hostname or P address from which the backup file should be restored.						
	This field is not used for HTTP mode.						
File Name	Required.						
	For <i>TFTP</i> , enter the name of the backup file to restore. If you do not specify a <b>.tgz</b> extension in this field, <i>Packager</i> will append one.						
	For <i>HTTP</i> , enter the full URL (including file name) of the backup file to restore. For example: https://10.10.30.187/backups/DBBackup_jax-vml_Packager-5.2- 22183_2014-03-10T21.53.03-CDT.tgz						
Restore Redundancy	Choose whether redundancy settings (if found) from the backup file will be restored to <i>Packager</i> .						
	Selecting <b>yes</b> will restore all discovered redundancy settings to <i>Packager</i> and will allow <i>Packager</i> to join its configured Redundancy Group.						
	Selecting <b>no</b> will not restore any discovered redundancy settings and will automatically configure <i>Packager</i> as a standalone host.						

# **Configuring Database Logging, and Thresholds**

From the **sysconfig >> database** menu on the **System** tab, you can:

- Configure database logging of system stats and streaming operations by clicking config.
- Set high watermark threshold levels for system events by clicking threshold.



## **Configuring Database Logging**

To configure database logging of system stats and streaming operations:

- 1. From the **System** tab, click through to **sysconfig** >> **database** >> **config** >> **set**.
- 2. Provide the information in Table 8 and click **Submit**.

Dashboard Configuration	Reports System	n				
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
database ⊡	<b>sysconfig &gt;&gt; da</b> This method is used to con	atabase >> co	onfig >> set g of system stats and	package and streaming o	operations.	
Config Show B threshold C debug C defaults C hostname S info S ingestproxy C keyserver C ficense D network	Days to Keep Package and Stream Logs Days to Keep Package and Stream Stats Days to Keep System Performance Logs System Performance Stats Interval	7 30 3 15		[numeric] The numb and stream log data never remove entrie [numeric] The numb database entries. St entries. The default [numeric] The numb performance log dat never remove entrie [numeric, min. value Time interval (in sec stats. The default is	er of days to ke base entries. Si s. The default i er of days to ke to '-1' to nevr is 30 days. er of days to ke tabase entries. s. The default i ==10, max. valu onds) used to sconds.	eep package et to '-1' to s 7 days. eep stats eer remove eep system Set to '-1' to s 7 days. ie=3600] cquire
1 ntp		Submit				

Table 8. Configure logging for the Packager.

Field	Description
Days to keep Package and Stream logs	The number of days to keep package and stream log database entries. Set to '-1' to never remove entries. The default is 7 days.
Days to keep Package and Stream stats	The number of days to keep package and streaming stats in the database. Set to '-1' to never remove stats. The default is 30 days.
Days to keep System Performance logs	The number of days to keep system performance log database entries. Set to '-1' to never remove entries. The default is 3 days.
System Performance stats interval	The interval (in seconds) at which to acquire system performance stats. The default is 15 seconds.

# Show Database Logging Settings

1. From the System tab, click through to **sysconfig** >> **database** >> **config** >> **show**.



#### 2. Click Submit.

Dashboard Configuration	Reports System					
🐺 System Status	Just-In-Time Packaging	Packaging		Input/Output	🛛 🥶 Conne	ction
ि sysconfig ि config ि database	sysconfig >> data This method returns the data	abase >> co	nfig >> show alues.	I		
erconfig set show threshold	Submit					
⊡ defaults	Days to Keep Package an	d Stream Logs			7	
• hostname	Days to Keep Package an	d Stream Stats			30	
⊡∵info	Days to Keep System Per	formance Logs			3	
<b>⊞</b> ingestproxy	System Performance Sta	ts Interval			15	
• keyserver	Log CPU Information				1	
■ license	Log Disk Information				1	
the network	Log RAM Information				1	
	Log Network Information				1	

The **System Performance stats interval** is up to 15 seconds delay by default. This interval affects how the system behaves if a threshold is crossed. If a threshold is crossed then *Packager* will stop accepting just-in-time requests until below the threshold.

### **Setting Event Thresholds**

To set high watermark threshold levels for system events:

- 1. From the System tab, click through to sysconfig >> database >> threshold >> set.
- 2. Provide the information in Table 9 and click Submit.

Dashboard	Configuration Reports	System					
🖶 System Status	Just-In-Time Pac		Packaging		Input/Output		Connection
in sysconfig in config in database	sysconfig This method set	>> datab is high watermark	ase >> th k threshold levels	reshold >> s	et		
€ config	CPU Thi	reshold 75			[numeric, min. value utilization high thres	e=1, max. value hold (1 - 100 pe	=100] CPU rcent)
show ⊕∵debug	Memory Th	reshold 90			[numeric, min. value System memory utili 100 percent)	=1, max. value zation high thre	= 100] shold (1 -
ter defaults	Disk Thi	reshold 90			[numeric, min. value System disk utilizatio percent)	e=1, max. value on high threshold	=100] d (1 - 100
Info Info Ingestproxy	Network Th	reshold 75			[numeric, min. value Network utilizationhi percent)	e=1, max. value igh threshold (1	= 100] - 100
ticense	UD Thi	P Error 0 reshold			[numeric, min. value interval high thresh	e=0] UDP error o old	ount over
trnetwork Trntp Trpois		Sub	mit				



Field	Description				
CPU Threshold	The high threshold for CPU utilization from 1-100 percent.				
Memory Threshold	The high threshold for memory utilization from 1-100 percent.				
Disk Threshold	The high threshold for system disk utilization from 1-100 percent.				
Network Threshold	The high threshold for network utilization from 1-100 percent.				
UDP Error Threshold	The high threshold for UDP error counts over an interval. The value is an integer designating the number of UDP error counts.				

Table 9.	Set event	thresholds	for	Packager.
10010 0.	000000000	000101000		, aonagon

### **Show Event Thresholds**

- 1. From the System tab, click through to sysconfig >> database >> threshold >> show
- 2. Click Submit.

Dashboard (	Configuration Report:	System					
💀 System Status		Packaging	Packaging		Input/Output	Events 🛛 😴 Conn	ection
ersysconfig erconfig erdatabase	<b>SYSCON</b> This metho	<b>fig &gt;&gt; data</b> d sets high waterm	abase >> t ark threshold leve	threshold >> els for system events	show		
threshold		Submit					
ter debug	CPU Three	hold Memory	y Threshold	Disk Threshold	Network Threshold	UDP Error Threshold	
⊕ hostname	75	90		90	75	0	

## **Configuring the Hostname**

Setting the hostname on Packager requires an IP service restart from the sysconfig >> network >> ip >> restart menu. Once the hostname has been set it is displayed in the top right portion of the GUI as well as at the login screen.

#### Set Hostname

**1.** From the **System** tab, click through to **sysconfig** >> **hostname** >> **set**.



2. Provide the information in Table 10 and click **Submit**.

Dashboard Co	onfiguration Reports System	1				
💀 System Status	Just-In-Time Packaging			Input/Output		Connection
ersysconfig erconfig erdatabase	<b>sysconfig &gt;&gt; hc</b> This method configures the	stname >> so hostname.	et			
debug defaults hostname	Host Name			[text, min. length of new hostname to be	f0, max. length e set.	of 255] The
show		Submit				

Table 10. Configure the hostname for *Packager*.

Field	Description
Host Name	Required. The host name to use for Packager, up to 255 characters.

## Show Hostname

- 1. From the System tab, click through to **sysconfig** >> **hostname** >> **show**
- 2. Click Submit.

System Status	Just-In-Time Packaging sysconfig >> hosti This method returns the curren	Packaging	Hardware	Input/Output	Events	Connection
i∃:sysconfig i∃:config	sysconfig >> hosti This method returns the curren	name >> sho	\M/			
database		tly configured hostnar	ne.			
⊕ debug ⊕ defaults ⊡ hostname set show	Submit					

# Viewing System Information for the Packager

To view system information (including software/hardware versions, IP address, and system serial number) From the **System** tab, click through to **sysconfig** >> **info** >> **show**. Click **Submit** and a screen similar to the following appears.

Dashboard Configuration	Reports System				
🔡 System Status	Just-In-Time Packaging	Packaging Hardv	vare Input/Output	Events 🥪 Con	nection
sysconfig     drabase     drabase	<b>sysconfig &gt;&gt; info</b> This method returns the syste number.	<b>&gt;&gt; show</b> m info including - SW/HW ver	sion; IP/netmask address; extern	nal MAC address; and system s	serial
⊕ defaults ⊕ hostname ⊖ info	Submi	t			
<b>⊡</b> •ingestproxy	SW Product		TAP Packager		7
the server	SW Version		5.4		
Tretwork	SW Build		23968		
1 ntp	OS Version		AMS5.0-22525 Thu Apr 10 11	:05:06 CDT 2014	
• pois	OS Patch Level		TAP5.4-23884 Wed Sep 10 00	):49:09 CDT 2014	
<b>⊡</b> policy	HW Version		HVM domU		
reboot	HW Part Number		Not Specified		
restart	CPU Version		Intel(R) Xeon(R) CPU E5-2620	0 0 @ 2.00GHz	
shutdown	Serial Number		a7550e0a-fdbd-e8ea-43c0-47	c7300d0dfb	
<b>⊡</b> snmp	External IP Address		10.32.128.109		
T swupdate	Management IP Address		10.32.128.109		
"syslog	Current System Time		2014-09-21 17:41:56 PDT		
t timezone	System Uptime		32 days, 3:15		
± user	Current Active RTSP Stream	n	0		
	Current Active Progressive	Stream	0		
	Current Active F2F/Ondem	and Transcode	0		
	System Xcode Capabilities		11		
	System Streaming Capabili	ities	3		
	System Platform		1		



# Retrieving Ingest URLs Via Proxy Server (For Testing Only)

You can configure an ingest proxy server that the *Packager* uses to retrieve HTTP or FTP ingest URLs.

 $\mathbf{M}$ 

**Caution!** Do not use this command in a deployment solution. This command is sometimes useful in lab environments when an open connection to the Internet is not available. In this case, all HTTP traffic is forced through a corporate proxy gateway which is useful for small-scale testing, but completely insufficient for real-world deployment.

To configure the ingest proxy:

From the **System** tab, click through to **sysconfig** >> **ingestproxy** >> **set**. Provide the information in Table 11 and click **Submit**.

Dashboard	Configuration	Reports	System						
💀 🖶 System Status		Just-In-Time Pac		Packaging		Input/Output		Connection	
ersysconfig		sysconfig This operation is	>> inges	stproxy >> ure an ingest proxy	set y to be used by the sy	vstem when retrieving ht	tp or ftp ingest	URL.	
⊕ debug ⊕ defaults ⊕ hostname ⊕ info		Proxy Server for [text] Proxy server to be used for all ingest in the form of host;port (if port is not specified then 1080 is assumed) - set to empty string to disable the use of ingest proxy. Default to disable.							
set			Su	bmit					

Table 11. Define a proxy server for ingest.

Field	Description
Proxy Server for Ingest	<b>Required.</b> Enter the host name and port number for the proxy server in this format— <i>host:port.</i> If no port number is specified, then 1080 is used by default. To disable the use of an ingest proxy server, clear the contents of this field and click <b>Submit</b> .
	After clicking <b>Submit</b> you will receive the following message "This configuration will not take affect until after a system reboot! Continue?"
	Click <b>OK</b> or <b>Cancel</b> at this point and reboot to save the new configuration.

To view settings for the proxy server used for ingest,

- 1. From the **System** tab, click through to **sysconfig** >> **ingestproxy** >> **show**.
- 2. Click Submit.

Dashboard	Configuration	Reports System	_				
🔡 System Status		ust-In-Time Packaging	Packaging		Input/Output		Connection
⊡-sysconfig ⊡-config ⊡-database		<b>sysconfig &gt;&gt; inge</b> This method is used to show t	estproxy >> he current ingest pr	oxy setting - if this is a	an empty string then pro	oxy is not used for	r ingest.
debug     defaults     defaults     defaults     defaults     defaults     defaults     defaults     defaults		Submit					
set		Proxy Server for Ingest			10.32.128.20:8080		



## Managing the Key Server

You can configure a key server for *Packager* that manages the encryption key with the client player. When a key server is configured, encryption keys can be generated from *Packager* for use in encrypting packages.



**Note:** Key server URLs and Packager credentials must also be provisioned.

#### Adding a Key Server

1. From the **System** tab, click through to **sysconfig** >> **keyserver** >> **add**.

The menu fields are customized based on which Key Server Vendor Name is selected.

- 2. Enter data based on the guidelines provided in Table 12 on page 45.
- 3. Click Submit.

The following screen provides an example of the types of fields which appear on the **sysconfig** >> **keyserver** >> **add** menu based upon choice of key server vendor. In this example, **CKM** has been selected from the **Key Server Vendor Name** field.

Dashboard Configuration	n Reports System					
👭 System Status						Connection
⊡ sysconfig ⊕ config ⊕ database	sysconfig >> keys	server >> ac <sup>er.</sup>	ld			
<sup>⊕</sup> defaults	Key Server URL			[text	t] Key server URL	
<ul> <li>Destration</li> <li>Destration</li></ul>	TCP port number	0		[num serve	eric, min. value=0, max. va er port	lue=65535] Key
<sup>⊕</sup> ingestproxy □ keyserver	Key Server Vendor Name	СКМ		• Key:	el URL to download Client Ce	urtificate file
" <mark>add</mark> ⊡ flashaccess	Client Certificate Client Key			[text	t] URL to download Client Ke	y file
show	Client Key Password			[text	t] Client Key password	- 41- 61-
<ul> <li>Bicense</li> <li>Binetwork</li> </ul>	Trust Bundle			[text	(j urkl to download Trust Bui	naie nie
⊕ ntp ⊕ pois		Submit				

Table 12 below provides a description of all available Key Server Vendor Name + field options.

Table 12. A	dd a ke	v server.
-------------	---------	-----------

Field	Description
Key Server Vendor Name	The name of the vendor for the key server you are adding. Choices include VerimatrixHLS, BuyDRM, CKM, Nagra, InternalHLS, VerimatrixPlayready, InternalFlashAccess, Latens, SecureMedia, Conax, Irdeto, InternalPlayready, NdsCisco <sup>a</sup> , RgbAPI, Mezzanine, and KPN.
TCP port number	Only appears when Verimatrix, CKM, Nagra, NdsCisco, RgbAPI, or KPN are chosen. The port number under which the key server is running on the URL provided.
Subdirectory path	<b>Only appears when Internal is chosen.</b> The subdirectory on the output mount where <i>Packager</i> will place the key files.



Table 12. Add a key server.

Field	Description
Key Server URL	Only appears when BuyDRM, CKM, Verimatrix or Nagra are chosen. The URL where the key server is running.
Key Server User Key	<b>Only appears when BuyDRM is chosen.</b> An authentication key sent during registration from the key server.
User Name	Only appears when Conax, Irdeto, or KPN is chosen. Enter the user name to use for logging in to the key server.
User Password	<b>Only appears when Conax, Irdeto, or KPN is chosen.</b> Enter the user password to use for logging in to the key server.
Account ID	<b>Only appears when Irdeto is chosen.</b> Enter the Account ID to use for the key server.
Client Certificate	<b>Only appears when CKM is chosen.</b> The URL for downloading the key server certificate used for authenticating the client.
Client Key	<b>Only appears when CKM is chosen.</b> The URL for downloading the private key used for authenticating the client.
Client Key Password	<b>Only appears when CKM is chosen.</b> The password for the private key that is used to authenticate the client.
Trust Bundle	<b>Only appears when CKM is chosen.</b> The URL for downloading the Trust Bundle used with CKM authentication.
Client key request URL	<b>Only appears when InternalHLS<sup>b</sup>, InternalFlashAccess, or InternalPlayready</b> <b>is chosen.</b> Enter the URL from which the client should request a key. Syntax as follows:
	<pre>http://<hostname address="" ip="" or="">/<subdirectory> e.g. http://10.10.5.6/HlsKeys or</subdirectory></hostname></pre>
	http://KeyHost/HlsKeys
Output type	<b>Only appears when InternalHLS is chosen.</b> Select <b>file</b> if <i>Packager</i> is serving keys, or if key files are being stored on a remote nfs/cifs mount. Select <b>stream</b> if key files are to be sent to a remote HLS Key Server via Webdav or edgeware.
Output ID	<b>Only appears when InternalHLS is chosen.</b> Enter 0 if <i>Packager</i> is serving keys; otherwise pick the desired output directory. For example, <i>1 U OutDir</i> .
Subdirectory path	<b>Only appears when InternalHLS is chosen.</b> Enter the subdirectory in the output mount. This entry should match the subdirectory configured in the <i>Client key request URL</i> field. Syntax as follows:
	<subdirectory></subdirectory>
	<pre><hlskeys></hlskeys></pre>
Playready key seed	Only appears when InternalPlayready is chosen. Enter the Playready key seed.

a. If you add more than one NdsCisco keyservers to *Packager*, note that all keyserver requests will be round-robin'd between all configured NdsCisco keyservers.

b. InternalHLS has been optimized for small-scale deployments such as lab environments, demo systems, etc.

## **Show Key Server Configuration**

1. From the **System** tab, click through to **sysconfig** >> **keyserver** >> **show**.



- **2.** Select the **Key Server URL** for which you wish to view configuration, or select *All* from the dropdown box.
- 3. Click Submit.

sysconfig >> keyserver >> sho This method shows key server data.	w														
Key Server URL AI Key server URL Submit															
Key Server URL	TCP port number	Key Server Vendor Name	UserKey	Client Certificate	Client Key	Client Key Password	Trust Bundle	Client key request URL	Output Type	Output ID	Subdirectory Path	Account ID	User Name	User Password	Playready key seed
http://74.62.179.10/CAB/keyfle	12684	VerimatrixHLS				****			0	0				****	
http://vcas3.rgbnetworks.com/CAB/keyfile	12684	VerimatrixHLS				****			0	0				****	
/opt/ripcode/www/pages/HisKeys	0	InternalHLS				****		http://10.10.107.31	0	0	HisKeys			****	
http://10.10.88.145:8080/flashaccessserver/rgbtest	0	InternalFlashAccess				****		http://10.10.88.145:8080/flashaccessserver/robtest	0	0				****	

For more information on key server configuration, see "Generating Encryption Keys from Packager" on page 242.

### **Remove a Key Server**

- **1.** From the **System** tab, click through to **sysconfig** >> **keyserver** >> **remove**.
- 2. Select the Key Server URL that you wish to remove.
- 3. Click Submit.

Dashboard	Configuration	Reports	System				
🔥 A System Status		st-In-Time Pac		Packaging		Input/Output	Connection
ë∵sysconfig ⊕∵config ⊕∵database		<b>sysconfig</b> This method rema	>> keys oves a key ser	erver >> re	emove		
debug     defaults     fostname		Key Serve	er URL http	os://csd11.ccp.xca	l.tv:5280 (CKM)	Key server URL	
<b>1</b> info ∎ ingestproxy			Su	bmit			

### **Configuring Adobe Flash Access**

You can configure *Packager* to access an Adobe Flash Access Server.

#### Add a Flash Access Certificate File

1. the System tab, click through to sysconfig >> keyserver >> flashaccess >> add.

2. Provide the information in Table 13 and click **Submit**.

Dashboard Configuration	Reports System							
🖶 System Status	lust-In-Time Packaging	Packaging		Input/Output		Section Section		
i sysconfig ▲ i config i database	sysconfig >> ke This method loads certificate	yserver >> f	lashaccess > s URL	> add				
⊕ director ⊕ hostname ⊕ info	Flash Access Server URL Flash Access Server Transport			[text, max. length of 499] Flash Access key license acquisition URL [text, max. length of 499] URL to download Flash Access Server Transport Certificate file				
	Certificate Flash Access Server Certificate			[text, max. length o Flash Access Server	f 499] URL to do Certificate file	wnload		
□flashaccess add ⊕ credential		Submit						

Table 13. Add a Flash Access key server.

Field	Description
Flash Access Server URL	The URL at which a license for Flash Access Server can be obtained.
Flash Access Server Transport Certificate	The URL at which a Transport Certificate file can be downloaded for Flash Access Server.
Flash Access Server Certificate	The URL at which a Certificate file can be downloaded for Flash Access Server.

#### Show Flash Access Certificate File

To view certificate files that have been acquired for Flash Access Server:

- **1.** From the **System** tab, click through to **sysconfig** >> **keyserver** >> **flashaccess** >> **show**.
- 2. Select the **Flash Access Server URL** for which you wish to view configuration, or select *All* from the drop-down box.
- 3. Click Submit.

Dashboard Config	uration Reports Syste	em				
A System Status	Just-In-Time Packaging			Input/Output	Events	Connection
e sysconfig e config e database	<b>sysconfig &gt;&gt; k</b> This method shows certifi	eyserver >> flas cate files for Flash Access U	haccess >> s	show		
debug     defaults     bostname     info     ingestproxy	Flash Access Server URL	All	×	Flash Access key lic	cense acquisition URL	
e keyserver add flashaccess	Flash Access Server U	RL	Flash Access Serv Certificate	ver Transport	Flash Access Serv Certificate	/er
□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□	http://10.10.88.145:8080	)/flashaccessserver/rgbtest	transport-license.de	er	server-license.der	



#### **Remove Flash Access Certificate File**

To remove certificate files that have been acquired for Flash Access Server:

- **1.** From the **System** tab, click through to **sysconfig** >> **keyserver** >> **flashaccess** >> **remove**.
- 2. Select the Key Server URL of the Flash Access Server you wish to remove.
- 3. Click Submit.

#### Add Packager Credential File

To load a Packager credential file for the Flash Access Server:

- 1. From the System tab, click through to sysconfig >> keyserver >> flashaccess >> credential >> add.
- 2. Provide the information in Table 14 and click **Submit**.

Dashboard	Configuration	Reports	System					
👭 System Status		st-In-Time Pac		Packaging		Input/Output		Connection
ë∵sysconfig tirconfig tirdatabase		sysconfig This method load	>> keys ds a Packager (	Server >> f	lashaccess > ash Access	> credential >	> add	
<ul> <li>debug</li> <li>director</li> <li>hostname</li> <li>info</li> <li>ingestproxy</li> <li>keyserver</li> <li>add</li> </ul>		Pac crec Pac crec pas	ckager dential ckager dential ssword	ıbmit		[text, max. length o Flash Access Packag [text, max. length o Password	f 499] URL to d er Credential fil f 255] Packager	ownload e • Credential

Table 14. Add a certificate file for Flash Access Server.

Field	Description
Packager credential	The URL at which a Credential file for Flash Access can be downloaded by <i>Packager</i> .
Packager credential password	The password for accessing the Credential file.

#### Show Packager Credential File

To view the credential file loaded on Packager for Flash Access:

1. From the System tab, click through to sysconfig >> keyserver >> flashaccess >> credential >> show.



#### 2. Click Submit.

Dashboard	Configuration	Reports	System					
🛕 System Status	J	lust-In-Time Pac				Input/Output		S Connection
⊡-sysconfig ⊡-config ⊕-database		sysconfig This method sho	>> keys	erver >> fla er credential file for	ashaccess >	> credential >>	► show	
debug     defaults     ⊕ hostname     ⊕ info			Submit					
Reyserver		Packager cred	lential		Packager crede	ntial password		
add		packager-license	.pfx		****			

#### Remove Packager Credential File

To remove a Packager credential file for Flash Access:

- 1. From the System tab, click through to sysconfig >> keyserver >> flashaccess >> credential >> remove.
- 2. Click Submit.

## **Managing Licensing**

Each *Packager* appliance has a built-in License Server that manages licenses for packaging. If desired, the *Packager* can use an external License Server; in this case, you must configure the *Packager* to point to the IP address or host name (DNS name) for the external server where the Licensing Application is installed.

For a *Packager* appliance that leverages the localhost License Server, you must upload a new license key file to update licensing for the *Packager*.

Using the Management Console, you can:

- View, set, and test access to the License Server for the Packager
- Show the current licensing for the Packager
- Update the license key file for the Packager
- Refresh the licensing for the *Packager*
- Show the current lockcode for the Packager's licensing

#### Setting the License Server for the Packager

To set the address of the License Server to be used by the Packager:

From the **System** tab, click through to **sysconfig** >> **license** >> **server** >> **set**. You would also execute this function if you were using an external license server. Provide the information in Table 15 and click **Submit**.

Dashboard Configure	Packag	jer m		Current system time: Apr 23 18:31:15 Welcome admin   Connected to 10:10.1 Logout
💀 System Status	Packaging Hardw	rare Input/Output	Events	S Connectio
<ul> <li>ingestproxy</li> <li>keyserver</li> <li>ticense</li> <li>iockcode</li> <li>refresh</li> </ul>	sysconfig >> I This method specifies th To unset, specify a value NOTE: Subsequent requ NOTE: Do not use 'locall	license >> server e License Server to use. e of '0.0.0.0' to broadcast and ests will use the new server. It host' when part of a cluster. Th	>> set use the first server found. f unsetting, the current server he address must be an actual	r will be used until the next application restart. hostname or IP address
set set show	Server Addres	55	[t th ad	ext] Address or hostname of desired server. For le local server on the host, use either an IP iddress of the host or 'localhost'.
test		Submit		

Table 15. Update the License Server.

Field	Description
Server Address	<b>Required.</b> The IP address or host name of the License Server that will manage licensing for the <i>Packager</i> .

To test access to the License Server:

From the **System** tab, click through to **sysconfig** >> **license** >> **test**. Click **Submit**. You may want to perform this function after defining an external License Server for the *Packager*.

	/ORKS	Packager			Current system time: Apr 23 18:33:01 Welcome admin   Connected to 10.10. Logout
Dashboard	Configuration	Reports System	Teentlouteut	Franks	
System Status	Paci	caging Hardware	Input/Output	Events	Connecto
H'ingestproxy H'keyserver	<b>5</b>	Sysconfig >> licens This tests License Server access	se >> test by momentarily acquirin	g and releasing a dumn	ny token.
		Submit	]		

### Updating the License Key File for the Packager

In order for the *Packager* to function, the License Server must have a current license key file. To update the license key file:



From the **System** tab, click through to **sysconfig** >> **license** >> **update**. Provide the information in Table 16 and click **Submit**.

Dashboard Configurat	ion Reports Syste	em				
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
e config database debug director	<b>sysconfig</b> >> I This method updates the When copying key string: NOTE: Internal file URL o NOTE: Verify the current	icense >> upo Licenses on the current s, select all of the string nly works for License file ly configured or active L	late ly active License Serve s in the file and paste is accessible on the low icense Server to ensu	er using TFTP, HTTP, loca into the File URL box. cal filesystem of the host re you are updating the c	I file, or copied running this Tra Jesired Server!	key strings. ansAct software.
<ul> <li>hostname</li> <li>info</li> <li>ingestproxy</li> <li>keyserver</li> <li>license</li> <li>lockcode</li> <li>refresh</li> </ul>	License File URL	Submit		[text] Full HTTP, TFT the License Key file I (for example: http:// licenseFile.key, tftp /licenseFile.key, file: /licenseFile.key)	IP, or internal f to retrieve, or k /remotehost/pa c://remotehost/ ///full/path/to	ile URL to sey strings th/to path/to

Table 16. Update the license key file on the Packager's License Server.

Field	Description
License File URL	The full HTTP or TFTP URL to the remote license key file. For example: http://remotehost/path/to/licenseFile.key tftp://remotehost/path/to/licenseFile.key
	Notes:
	This field can also accept a path to a file located on the local host.
	<ul> <li>Format should be: file://<full_path_to_file></full_path_to_file></li> <li>For example: file:///tmp/file.key</li> </ul>
	The easiest method of updating a license is to copy and paste the entire license key strings from the key file you received from RGB Customer Support

## Viewing the Current License for the Packager

To show the current license for the *Packager*:



#### From the System tab, click through to

**sysconfig** >> **license** >> **show**. Click **Submit** to view licensing information.

System Status       Just-In-Time Packaging       Packaging       Hardware       Input/Output       Event       C < C	Dashboard Conf	figuration Reports System			
Sysconfig       Sysconfig >> license >> show         B database       This method shows the details of the current License Keys on the Server.         B debug       Iticense         B director       Iticense         B info       Iticense         B ingestproxy       Iticense Key Features         B lockcode       enc         refresh       B server         B server       Iticense         B support       test         update       enc         MAX OUTPUT STRM       unlimited         MAX OUTPUT STRM       unlimited         MAX OUTPUT STRM       unlimited         MAX OUTPUT STRM       enc         MAX OUTPUT STRM       unlimited         MAX OUTPUT STRM       unlimited         MAX OUTPUT STRM       enc         Size       enc         MAX OUTPUT STRM       unlimited         Size       enc         Size       enc         Size       enc         Size       enc         MAX OUTPUT STRM       unlimited         Size       enc         Size       enc         Size       enc         Size       enc         Siz	System Status	Just-In-Time Packaging	Packaging Hardware	Input/Output	Events   🧐 Co
P debug   P director   P hostname   Imagestproxy   P info   P ingestproxy   P ingestproxy </td <td>ë∵sysconfig tirconfig tirdatabase</td> <td><b>sysconfig &gt;&gt; licen</b> This method shows the details of</td> <td>ISE &gt;&gt; show of the current License Keys on the !</td> <td>Server.</td> <td></td>	ë∵sysconfig tirconfig tirdatabase	<b>sysconfig &gt;&gt; licen</b> This method shows the details of	ISE >> show of the current License Keys on the !	Server.	
Heeyserver       License Key Features       Feature       Count/Limit       Type/Supported         ADOBE       ADOBE       ADOBE       enc       ADOBE       enc         ADOBE FLASH ACCESS       enc       HLS       enc       ITP MAX SESSIONS       0       count         B support       test       update       enc       MAX OUTPUT STRM       unlimited       count         Packager       20       Token       SS       enc       Packager       SS       enc         VOD       enc       VOD       enc       SS       enc       SS       enc	<ul> <li>debug</li> <li>director</li> <li>hostname</li> <li>info</li> <li>ingestproxy</li> </ul>	[Submit]			
Hicense       ADOBE       enc         ADOBE FLASH ACCESS       enc         ADOBE FLASH ACCESS       enc         HLS       enc         HLS       enc         HLS       out         Brupport       UVE STRM         Update       enc         Pretvork       Packager         Packager       20         Token         SS       enc         VOD       enc	• keyserver	License Key Features	Feature	Count/Limit	Type/Supported
<ul> <li>blockcode</li> <li>refresh</li> <li>blockcode</li> <li>refresh</li> <li>blockcode</li> <li>refresh</li> <li>blockcode</li> <li>hLS</li> <li>enc</li> <li>hLS</li> <li>count</li> <li>JITP MAX SESSIONS</li> <li>0</li> <li>count</li> <li>LIVE STRM</li> <li>enc</li> <li>max output</li> <li>MAX OUTPUT STRM</li> <li>unlimited</li> <li>count</li> </ul> <ul> <li>MAX OUTPUT STRM</li> <li>unlimited</li> <li>count</li> </ul> <ul> <li>Pedkager</li> <li>20</li> <li>Token</li> <li>SS</li> <li>enc</li> </ul> <ul> <li>VOD</li> <li>enc</li> </ul>	license		ADOBE		enc
Pretresh     HLS     enc       Strow     JTTP MAX SESSIONS     0     count       Support     LIVE STRM     enc       -test     MAX OUTPUT STRM     unlimited     count       Where     Packager     20     Token       B network     SS     enc       Wodd     VOD     enc	<b>⊡</b> lockcode		ADOBE FLASH ACCESS		enc
Show       ITP MAX SESSIONS       0       count         Show       LIVE STRM       enc         update       MAX OUTPUT STRM       unlimited       count         B network       Packager       20       Token         B policy       VOD       enc	refresh		HLS		enc
Bisupport     LIVE STRM     enc       update     MAX OUTPUT STRM     unlimited     count       Binetwork     Packager     20     Token       Binetwork     SS     enc       Update     VOD     enc	show		JITP MAX SESSIONS	0	count
test     MAX OUTPUT STRM     unlimited     count       update     MPEGD     enc       Impretwork     Packager     20     Token       Implicy     VOD     enc	t support		LIVE STRM		enc
update     MPEGD     enc       Enetwork     Packager     20     Token       Enetwork     SS     enc       VOD     enc	test		MAX OUTPUT STRM	unlimited	count
Packager     20     Token       Packager     20     Token       SS     enc       VOD     enc	update		MPEGD		enc
B ntp B policy enc	• network		Packager	20	Token
Policy VOD enc	<b>⊞</b> ntp		SS		enc
	• policy		VOD		enc

The **Count/Limit** column displays either the number of instances of a feature that may exist on each appliance (the count), or the number of valid licenses you have for the item (the limit). In the example, there is licensing for 20 *Packager* instances running on the network, and each *Packager* instance can have an unlimited number of output streams configured.

The **Type/Supported** column displays either the type of counter used in the **Count/Limit** column, or the supported operations in the **Feature** column. In the example, licensing for *Packager* instances is handled using Tokens retrieved from the License Server, and encoding operations are supported for HLS packaging.

#### **Refreshing Licensing for the Packager**

If you have recently updated licensing on the *Packager*, you can force a manual license update by performing a refresh. Licensing will be updated automatically without taking this step, but you can execute the refresh immediately if you desire.



**Note:** *Refreshing licensing causes all Packagers that reference this License Server to also refresh.* 

To refresh licensing for the Packager:

From the **System** tab, click through to **sysconfig** >> **license** >> **refresh**. Click **Submit**.



#### Viewing the Lock Code for the Packager

If you want to change your license, you will need to contact RGB support. You will need to provide the lock code for the *Packager*. To view the lockcode for the *Packager*:

From the **System** tab, click through to **sysconfig** >> **license** >> **lockcode** >> **show**.

Dashboard Co	nfiguration Reports System				
💀 System Status	Just-In-Time Packaging	Packaging		Input/Output	Connection
e sysconfig di config database debug	sysconfig >> lice This method shows the Lockin For a Redundant license serve The Locking Codes are require	nse >> lock g Codes for the curr r, Locking Codes wi d for generating lice	ccode >> sho rent license servers b Il be returned for eac enses.	DW eing used. h server in the group.	
B director B hostname D info show B ingestproxy	Submit	]			
t. keyserver	Server	LockCode	:		
⊡·license ⊡·lockcode	10.10.88.143	ETH: 0x10	- *12LED4HGHVR8DC	'N	

### **Obtaining Licensing Information for Support**

To obtain licensing information that RGB Customer Support will need to assist you:



From the **System** tab, click through to **sysconfig** >> **license** >> **support** >> **show**. Select which features on the server to display. Click **Submit**.

i

**Note:** This command should only be used under the direction of RGB Customer Support.

SYSCOI This metho NOTE: This	sysconfig >> license >> support >> show This method displays raw details of the licenses on the configured License Server. NOTE: This command should only be used under the direction of Customer Support.										
	features All Which Features on Server to display. Current displays only features applicable to the current application. All displays all installed licenses.										
	Submit										
License Key	0										
Support		Packager									
Details		u energe.	Packager	Туре	Normal						
	Status				Active						
				NumLicenses	20						
				StartDate	Thu Apr 5 00:00:00 2012						
				EndDate	No Expiration						
				PublicVendor	MAX_OUTPUT_STRM:4:-1 HLS:2 SS:2 VOD:2 LIVE_STRM:2 ADOBE:2 ADOBE_FLASH_ACCESS:2 MPEGD:2 JITP_MAX_SESSIONS:4:0						
				PrivateVendor							
				Redundant	No						
				RedundantDistCrit							
				Locking	Server Locked						
	LockCriteria Ethernet, (0x10)										
			LockInfo 10-*12LED4HGHVR8DCN, 0								
	TrialStatus Unused										
				TrialPrecedence	0						
				TrialDays	0						
				TrialCalendarLeft	0						
				Version	8230000						

If requested to do so by RGB Customer Support, you can decode license key strings to display key settings. From the **System** tab, click through to **sysconfig** >> **license** >> **support** >> **decode**. Enter the license key string to decode in the **keyStrings** field and click **Submit**.

Dashboard	Configuration	Reports System	1					
💀 🔛 System Status		st-In-Time Packaging			Input/Output		Connection	
⊡°sysconfig ⊕°config ⊕°database ⊕°debug		sysconfig >> lid This method decodes licens NOTE: This command shou	ense >> support >> decode key strings and displays the key settings. only be used under the direction of Customer Support.					
		keyStrings			[text] One or more copied directly from	Key strings to d a keyfile.	ecode,	
show Tingestproxy			Submit					

To configure a recently installed Trial License to have priority over an already installed license:

From the **System** tab, click through to **sysconfig** >> **license** >> **support** >> **override**. In the **trialIndex** field, enter the value listed for **License Index of Trial License** when you select **sysconfig** >> **license** >> **support** >> **show**.





To reset *Packager* licensing to use the most current installed normal license, rather than the Trial License:

From the **System** tab, click through to **sysconfig** >> **license** >> **support** >> **reset**.

G

**Note:** This command should only be used under the direction of RGB Customer Support.





# **Configuring or Removing Network Bonds**

To display configured network bonds:

From the **System** tab, click through to **sysconfig** >> **network** >> **bond** >> **show**. Click **Submit**.

	Packager			Current system time: Apr 24 11:57:14 CDT Welcome admin Connected to 10.10.88.71 Logout
Dashboard Configuration	Reports System			
🖶 System Status	Packaging Hardware	Input/Output		Connection
□ network ▲ □ bond □ configure	sysconfig >> netw Shows the current settings for o	<pre>vork &gt;&gt; bond &gt; configured Bonds.</pre>	> show	
show Show Er dns Er ethernet	Submit	]		

To configure a network bond:

From the **System** tab, click through to **sysconfig** >> **network** >> **bond** >> **configure**. When you have provided the information in Table 17, click **Submit**.

Dashboard Configurati	Packag	er		Durrent system time: Apr 24 11:58:15 CDT Velcome admin Connected to 10.10.88.71 ogout
E System Status	Packaging Hardwa	re Input/Output E	vents	S Connection
enetwork bond configure remove	sysconfig >> n Create a bond from an ex Creating a bond will also	etwork >> bond >> c isting configured interface and uncon update the static routes and assigned	onfigure figured interface. interfaces as appropriate.	
show ⊕rdns	Bond Mode	balance-rr	Bond mode	
• ethernet	Base Interface	ethO	Pre-configured the base for the	Network Interface to be used as e Bond
⊡•interface	■ Slave Interface	eth1	Unconfigured N the Bond	etwork Interface to be added to
t p t route	Xmit Hash Policy	layer2	Transmit Hash balance-xor mo	Policy used for 802.3ad and des
it ntp				
policy     reboot		Submit		

Field	Description
Bond Mode	<b>Required.</b> The type of network bond to make. Bonding allows you to aggregate multiple ports into a single group, effectively combining the bandwidth into a single connection. Bonding also allows you to create multi-gigabit pipes to transport traffic through the highest traffic areas of your network. For example, you can aggregate three megabits ports (1 mb each) into a three-megabits trunk port. That is equivalent with having one interface with three megabits speed. Choices include:
	<b>balance-rr</b> —Round-robin policy. Transmit packets in sequential order from the first available slave through the last. This mode provides load balancing and fault tolerance.
	<b>active-backup</b> —Active-backup policy: Only one slave in the bond is active. A different slave becomes active if, and only if, the active slave fails. The bond's MAC address is externally visible on only one port (network adapter) to avoid confusing the switch.
	<b>balance-xor</b> —XOR policy. Transmit based on [(source MAC address XOR'd with destination MAC address) modulo slave count]. This selects the same slave for each destination MAC address. This mode provides load balancing and fault tolerance.
	<b>broadcast</b> —Broadcast policy. Transmits everything on all slave interfaces. This mode provides fault tolerance.
	<b>802.3ad</b> —IEEE 802.3ad Dynamic link aggregation. Creates aggregation groups that share the same speed and duplex settings. Utilizes all slaves in the active aggregator according to the 802.3ad specification.
	<b>balance-tlb</b> —Adaptive transmit load balancing. Channel bonding that does not require any special switch support. The outgoing traffic is distributed according to the current load (computed relative to the speed) on each slave. Incoming traffic is received by the current slave. If the receiving slave fails, another slave takes over the MAC address of the failed receiving slave.
	<b>balance-alb</b> —Adaptive load balancing. This mode includes <b>balance-tlb</b> plus receive load balancing (rlb) for IPV4 traffic, and does not require any special switch support. The receive load balancing is achieved by ARP negotiation. The bonding driver intercepts the ARP Replies sent by the local system on their way out and overwrites the source hardware address with the unique hardware address of one of the slaves in the bond such that different peers use different hardware addresses for the server.
Base Interface	<b>Required.</b> The pre-configured network interface to use as the base of the bond. Choices are dynamically populated with valid interfaces.
Slave Interface	<b>Required.</b> The unconfigured network interface to be added to the network bond. Choices are dynamically populated with valid interfaces.
Xmit Hash Policy	<b>Required for 802.3ad and balance-xor modes.</b> Transmit Hash Policy used for 802.3ad and balance-xor modes. Choices include <b>layer 2</b> or <b>layer3+4</b> . This field is ignored for all other modes.

Table 17. Create a network bond.

**Note:** When creating a bond, any affected static route entries and assigned interfaces are automatically moved from the Base Ethernet interface to the Bond.

To remove configured network bonds from *Packager*:

From the **System** tab, click through to **sysconfig** >> **network** >> **bond** >> **remove**. Provide the information in Table 18 and click **Submit**.



NETWORKS			Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Configuration	Reports System		
System Status Packa	iging Hardware Iı	nput/Output Events	Connection
Denetwork S Denetwork S Denet	ysconfig >> network move a configured Bond and conver ee Bond is converted into one Networ moving the bond will also update the	>> bond >> remove t into two separate Network Interface rk Interface with the same settings as e static routes and assigned interface	es. s the Bond, and a second unconfigured interface. s as appropriate.
e dns e thernet e firewall	Bond	Y	The configured Bond to remove

#### Table 18. Remove a network bond.

Field	Description
Bond	Required. The configured network bond to be removed.



**Note:** When removing a bond, any affected static routes and assigned interfaces are automatically moved from the Bond to the Base Ethernet interface.

## **Configuring DNS and Domain Settings**

You can configure *Packager* with Domain Name System (DNS) server addresses and domain entries. From the **dns** menu, you can click:

- **add**—Adds a DNS server entry to the *Packager*.
- remove—Deletes a DNS server entry from the Packager.
- show—Shows information about DNS server entries on the Packager.
- domain—Adds or removes domain entries for a DNS server entry.
- **search**—Add DNS searches to a DNS server entry on the *Packager*.

### Adding a DNS Server Entry

To add a DNS server entry:



From the **System** tab, click through to **sysconfig** >> **network** >> **dns** >> **add**. Provide the information in Table 19 and click **Submit**.

Dashboard Configuration	Package Reports System	r		Current system time: Apr 24 12:07:16 CDT Welcome admin   Connected to 10.10.88.71 Logout
🖶 System Status	Packaging Hardware			Connection
⊡ bond ⊡ dns	sysconfig >> ne This method adds a DNS se	t <b>work &gt;&gt; dns &gt;&gt;</b> ver address.	▶ add	
<u>add</u>	Index IP Address			[numeric, min. value=1] Index of this entry in the server list [text] IP address of the server
show ⊕:ethernet ⊕:firewall		Submit		

Table 19. Add a DNS server entry.

Field	Description
Index	Required. The index of this DNS server address entry in the server list.
IP Address	Required. The host name or IP address to which to add a DNS server entry.

### **Removing a DNS Server Entry**

To remove a DNS server entry:

From the **System** tab, click through to **sysconfig** >> **network** >> **dns** >> **remove**. Provide the information in Table 20 and click **Submit**.

	Pac	kager			Current system time: Apr 24 12:08:46 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Configurat	tion Reports Packaging	System	Input/Output	Events	Connection
e network bond c dns	sysconfig This method re	g >> netw emoves a DNS ser	ork >> dns >> ver address.	> remove	
<sup></sup> add ⊡∙domain <mark>remove</mark>	IP	Address 10.1	0.80.80		IP address of the server to remove
ersearch show		Sub	omit		

Table 20. Remove a DNS server entry.

Field	Description
IP Address	Required. The host name or IP address of the DNS server entry you want to remove.

#### **Viewing DNS Server Entries**

To view the DNS server entries that have been configured:



From the **System** tab, click through to **sysconfig** >> **network** >> **dns** >> **show**. Click **Submit**.

Deshboard Configure	ation	Pac	ckager				Current system time: Apr 24 12:13:02 CDT Welcome admin   Connected to 10.10.88.71 Logout
System Status	P	ackaging	Hardware	Inpu	ut/Output	Events	Section Section
remove     Story	^	sysconfi This method g	ig >> netwo gets the current list	of DNS s	> dns >> erver addresses	show	
terethernet	-	Index			Server		
the interface		Search			lab.ripcode.com	1	
the in		2			10.10.80.80		
+ route		3			10.10.10.10		

### Adding and Removing Domain Entries for a DNS Server Entry

You can add domain entries to a DNS server entry on a *Packager*, or remove a domain entry. To add a domain entry:

From the **System** tab, click through to **sysconfig** >> **network** >> **dns** >> **domain** >> **add**. Provide the information in Table 21 and click **Submit**.

		Pac	ckager			Current system time: Apr 24 12:13:47 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Configurat	tion	Reports	System			
🕂 System Status	P	ackaging	Hardware	Input/Output	Events	Connection
⊡ network ⊕ bond ⊡ dns —add	^	<b>sysconfig</b> This method av NOTE: Setting	<b>g &gt;&gt; netw</b> dds a Domain entr a Domain entry w	ork >> dns >> y. ill remove the Search pa	> domain >	> add
add remove		Doma	in Name			[text, min. length of 1, max. length of 128] Domain Name to be set
remove ⊡ search	Ξ		Sub	ornit		

Table 21. Add a domain entry.

Field	Description
Domain Name	Required. The name of the DNS domain to create.

To remove a domain entry:



From the **System** tab, click through to **sysconfig** >> **network** >> **dns** >> **domain** >> **remove**. Click **Submit**.



### Adding and Removing Search Paths for a DNS Server Entry

To add search paths for a DNS server entry:

From the **System** tab, click through to **sysconfig** >> **network** >> **dns** >> **search** >> **add**. Provide information in Table 22 and click **Submit**.

		Pac	kager			Current system time: Apr 24 12:16:47 CDT Welcome admin   Connected to 10.10.88.71 Logout
	Dashboard Configuratio	on Reports	System			
C	🖶 System Status	Packaging	Hardware	Input/Output	Events	Connection
	⊡ network	Sysconfi This method ar NOTE: Setting	<b>J &gt;&gt; netw</b> dds a Search path a Search path will	ork >> dns >>	search > try if configured.	> add
		Sea	rch Path			[text, min. length of 1, max. length of 128] Search Path to be set
	remove	E	Sub	omit		

Table 22. Add a search path to the Packager.

Field	Description
Search Path	Required. The search path to create.

To remove a search path:



From the **System** tab, click through to **sysconfig** >> **network** >> **dns** >> **search** >> **remove**. Click **Submit**.



## Viewing Ethernet Settings for Packager

#### To view the current ethernet settings for Packager:

From the **System** tab, click through to **sysconfig** >> **network** >> **ethernet** >> **show**. Click **Submit**. Results show the ethernet settings for all network interfaces available on the 'host' or equivalent.

	ion	Package	er		Current system time: Apr Welcome admin   Connec Logout	<b>24 12:20:33 CDT</b> ted to <b>10.10.88.71</b>
System Status	Pi	ackaging Hardware	nput/Output	Events	(	Connection
ersysconfig erconfig erdatabase		<b>sysconfig &gt;&gt; ne</b> This method retrieves the e	twork >> ethernet	:>> shov	N	
debug     director     bostname     info     ingestproxy	ш	Subm	iit :			
± keyserver		Settings for eth0	Supported ports		[TP]	
license			Supported link modes		10baseT/Half 10baseT/Full	
thend					100baseT/Half 100baseT/Full	
± dns					1000baseT/Full	
erethernet			Supports auto-negotiatio	n	Yes	
show			Advertised link modes		10baseT/Half 10baseT/Full	
<b>⊞</b> ∙firewall					100baseT/Half 100baseT/Full	
interface					1000baseT/Full	
			Advertised auto-negotiat	ion	Yes	
± route			Speed		1000Mb/s	
The	-		Duplex		Full	-

## Configuring a Firewall for Packager

You may want to place the *Packager* outside of your corporate firewall, perhaps due to existing infrastructure issues or strict firewall policies, to allow it to stream RTSP and HTTP content to end user devices. However, you still want to protect the *Packager* from various Internet traffic.



In this case, you can configure a software firewall using IPTables for any of *Packager*'s ethernet interfaces using preconfigured rules that simulate popular configurations used in many hardware firewalls. The preconfigured rules available in this release provide the following protection for the interface on the *Packager*:

- Most unsolicited inbound traffic is dropped except for Real Time Streaming Protocol (RTSP) control packets, Reliable Transport Protocol (RTP) packets with a destination port in the range of 61002– 61513, or Internet Control Message Protocol (ICMP) packets.
- Unsolicited inbound traffic on port 80 (HTTP) is explicitly rejected with an ICMP Port Unreachable message.

**Note:** Before enabling the firewall, be certain that you have configured the Management Interface Assignment to be different than the External Interface Assignment. If the External Firewall rules are applied to the interface assigned for Management, you will not be able to administer the Packager.

#### External firewalls use these rules:

- Allow existing established and related TCP connections
- Allow ICMP destination-unreachable, time-exceeded, echo-request and echo-reply messages
- Allow incoming TCP/RTSP connections on port 554
- Allow incoming TCP connections on port 60002
- Allow incoming UDP/RTP packets on ports 9402 9913 and 10000 65535
- Allow incoming multicast packets
- Drop all forwarded packets and connections
- Drop all other packets and reject all other connections
- Allow all outgoing packets and connections

#### Internal firewalls use these rules:

- Allow all incoming packets and connections
- Drop all forwarded packets and connections
- Allow all outgoing packets and connections

To show the current firewall settings for the Packager:

From the System tab, click through to sysconfig >> network >> firewall >> show. Click Submit.

Dachboard Configurati	Pac on Reports	kager			Current system time: Apr 24 12:22:34 CDT Welcome admin   Connected to 10.10.88.71 Logout
E System Status	Packaging	Hardware	Input/Output	Events	Connection
□ network □ bond □ dns □ firewall □ firewall □ set Show □ interface	E Sysconfig	J >> netwo eturns the current	ork >> firewal	II >> show <sub>aration</sub> .	
	eth0: INTERNA	L - No filtering			



To configure firewall settings for the Packager:

From the **System** tab, click through to **sysconfig** >> **network** >> **firewall** >> **set**. Provide the information in Table 23 and click **Submit**.

	Packa	ger		Current system time: Apr 24 12:23:19 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Configuratio	n Reports Sys	stem		-
😸 System Status	Packaging Hard	ware Input/Output	Events	V Connection
in bond ⊡ dns	sysconfig >> This method configures	network >> firewa s firewal filters for the given inter	<b>ill &gt;&gt; set</b> face.	
□ firewall □ firewall □ show	Mod	le Disable firewall on all interfa	ices	Filtering mode to apply to the interface Network Interface (ignored for Disable mode)
⊕ interface ⊕ ip ⊕ route		Submit		

Table 23. Configure firewall settings for Packager.

Field	Description			
Mode Required. Whether to disable the firewall, or to enforce the firewall. Choi				
	<ul> <li>Disable firewall on all interfaces. With this choice, all incoming, outgoing, and forwarded packets and connections are allowed for all interfaces.</li> </ul>			
	<ul> <li>Internal/unfiltered interface - no filtering performed</li> </ul>			
	<ul> <li>External/public interface - only allow RTSP/RTP and HTTPS packets inbound. With this choice, only inbound RTSP packets, RTP packets with a destination port in the range of 61002–61513, or ICMP packets are allowed.</li> </ul>			
Interface	<b>Required.</b> The network interface on the <i>Packager</i> with which to associate the firewall. Choices are automatically populated with valid interfaces.			

## **Viewing or Assigning Interfaces**

To view the network interfaces available to Packager:

From the **System** tab, click through to **sysconfig** >> **network** >> **interface** >> **show**. Click **Submit**.

Ensusconfig						
± config tratabase	sysconfig This method get	s the current li	work >> int st of available Netw	erface >> s ork Interfaces.	how	
⊕ debug ⊕ director ⊕ hostname ⊕ info ⊕ ingestproxy		Submit				
• keyserver	eth0: eth0					

**Note:** All IP traffic will be interrupted when the network IP stack is restarted.

To view network interface assignments for Packager:

From the **System** tab, click through to **sysconfig** >> **network** >> **interface** >> **assignment** >> **show**. Results show which interface on the *Packager* is being used for external traffic versus the Management Console.

	Packager			Current system time: Apr 24 12:32:36 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Configuration	Reports System	Tanut / Output	Evente	Connection
retwork     Dond     dns     rethernet	sysconfig >> network This method gets the Network Ir Values displayed in brackets are	ork >> interface Iterfaces assigned to traff changes that will take eff	<b>te &gt;&gt; assignment</b> ic types. ect at the next restart.	:>> show
firewall     interface     assignment     set     Show	Submit			
show ⊕†ip ⊑	ExternalIface: eth0 ManagementIface: eth0			

To set network interface assignments for Packager:

From the **System** tab, click through to **sysconfig** >> **network** >> **interface** >> **assignment** >> **set**. When you have provided the information in Table 24, click **Submit**.

Dashboard Configuration	Packager Reports System		Current system time: Apr 24 12:33:20 Welcome admin   Connected to 10.10.6 Logout	CDT 88.71
💀 System Status	Packaging Hardware	Input/Output Events	ts 🧭 Connectio	
□ network ▲ □ bond □ dns □ ethernet	sysconfig >> netw Changes made will take effect This method configures IP for	vork >> interface >> a at the next restart static or DHCP on the Commander or s	assignment >> set selected managed object(s).	
⊕ firewall □ interface □ assignment - set	External ett Management ett	0	Network Interface used for external (public)     traffic     Network Interface used for management     (internal) traffic	
show	s	ubmit		

Table 24. Change interface assignment.

Field	Description
External	<b>Required.</b> The network interface to use for external (public) traffic. Valid choices are automatically populated based on available interfaces.
Management	<b>Required.</b> The network interface to use for the Management Console (internal) traffic. Valid choices are automatically populated based on available interfaces.



# **Configuring IP Addresses**

To view IP address settings:

From the **System** tab, click through to **sysconfig** >> **network** >> **ip** >> **show**. Click **Submit**.

	Pa	ackager			Current system time: Apr 24 12:34: Welcome admin   Connected to 10. Logout	36 CDT 10.88.71
Dashboard Configurati	ion Reports	System				
System Status	Packaging	Hardware	Input/Output	Events	S Conne	ction
retwork	*					~
	syscon	fig >> netw	ork >> ip >>	show		
t∃∵dns	This method	gets the current IP	Address.			
• ethernet						
1. firewall						
		C.J.				
		Compiling				
restart						
set	Gateway Add	dress: 10.10.88.1				
snow	Gateway Int	erface: Unconfigured				=
± route	eth0 Address	s: 10.10.88.71				
policy	eth0 Gatewa	y: 10.10.88.1				
reboot	eth0 Netmas	k: 255.255.255.0				
restart	eth0 Status:	UP				

To change the IP address settings for the *Packager*:

From the **System** tab, click through to **sysconfig** >> **network** >> **ip** >> **set**.

Provide the information in Table 25 and click **Submit**.

Dashboard Co	onfiguration Reports Syste	em		
🔡 System Status	Just-In-Time Packaging	Packaging Hardware	Input/Output	Events 🧭 Connection
E sysconfig Config Catabase	Sysconfig >> r This method configures II To disable an Ethernet in To disable an bond interf If the system has multiple used for the Default Gate NOTE: Changes will not to	P for static or DHCP, or sets a Default Gat erface if it has been enabled, configure i ace, use the bond->remove command. DHCP interfaces, select defaultGateway way. Otherwise the last configured inter ake effect until the ip->restart command i	eway entry. with a static IP address of 0.0 and set Network Interface to a face will be used. s executed.	0.0.0. set a specific interface to be
<ul> <li>info</li> <li>ingestproxy</li> <li>keyserver</li> <li>license</li> <li>network</li> <li>bond</li> <li>dns</li> <li>ethernet</li> </ul>	Mode Interface DHCP Hostname	eth0 Submit	Configuration type  Network Interface [text] Hostname to se assignment.	end to server for DHCP IP



Field	Description
Mode	The method used to set the IP address:
	• <b>static</b> —Recommended. Manually configures the external management IP address of the <i>Packager</i> , and optionally sets the subnet mask and gateway address. When this command is issued, the IP address change is stored and takes effect when the network service is restarted. You will need to reconnect to the Management Console using the new IP address. When configured in <b>static</b> mode, the <b>Gateway Address</b> field is used for the iptable rule and not for the host default gateway.
	<ul> <li>dhcp—Configures the Packager to use DHCP (Dynamic Host Configuration Protocol) to automatically obtain its IP address and network settings.</li> </ul>
	defaultGateway—If the system has multiple interfaces, select defaultGateway and choose a specific interface to be used for the default gateway from the Interface field. If multiple DHCP interfaces are configured, the subsystem will use the first interface to be configured for the default gateway.
IP Address	<b>Only displayed when static is chosen.</b> The host name or IP address to be assigned to the <i>Packager</i> .
Subnet Mask	<b>Only displayed when static is chosen.</b> The subnet mask address for subnetwork to which the <i>Packager</i> is being added. For example, 255.255.255.0.
Gateway Address	<b>Optional.</b> The IP address for the network node through which this subnetwork is accessed. When <b>static</b> configuration is used, this field is used for configuring an iptable rule for the interface. When defaultGateway is used, the value in this field specifies the default gateway route to the host.
Interface	<b>Required.</b> The interface to which the configuration applies. Valid choices are automatically populated based on available interfaces.
DHCP Hostname	<b>Only displayed when dhcp is chosen.</b> For DHCP assignment of IP address, enter a name to uniquely identify this <i>Packager</i> to the DHCP server.

Table 25. Change IP address settings for the Packager.

To restart the network service and RGB software:

From the **System** tab, click through to **sysconfig** >> **network** >> **ip** >> **restart**. Click **Submit**.

Dashboard Configure	ation Reports	ckager			Current system time: Apr 24 12:37:06 CDT Welcome admin   Connected to 10.10.88.71 Logout
System Status	Packaging	Hardware	Input/Output	Events	Connection
⊡rip ⊡ <mark>restart</mark> ∵set	Sysconf This method	ig >> netw restarts the Networ	ork >> ip >> i k Service and Ripcode aj	restart	
E route E ntp E policy		Submit			



# **Managing Network Routing**

You can manage the network routing by adding and removing entries in the network routing table on the *Packager*.

## **Adding Network Entries**

To add an entry to the network routing table of the Packager:

From the **System** tab, click through to **sysconfig** >> **network** >> **route** >> **add**. Provide the information in Table 26 and click **Submit**.

Dashboard Configurati	on Reports System	er	Current system time: Apr 24 12:38:21 CDT Welcome admin   Connected to 10.10.88.71 Logout
System Status	Packaging Hardwa	re Input/Output Events	S Connection
network Dond dns	sysconfig >> n     This method adds a netwo	etwork >> route >> add ork entry into the network routing table.	
• ethernet	Destination	1	[text] Destination subnet
⊡ interface	Genmask		[text] Subnet mask
□ route	Gateway		[text] Gateway to use for this subnet (leave empty to use default gateway)
"add	Interface	eth0 📼	Target Interface
ntp Dicy	applyImmediate	True	Apply this setting immediately. If false, route is added during next ip->restart.
reboot		Submit	

Table 26. Add a network entry to a *Packager*.

Field	Description
Destination	Required. The address of the subnet.
Genmask	<b>Optional.</b> The subnet mask address for subnetwork to which the network entry belongs. For example, 255.255.255.0.
Gateway	<b>Optional.</b> The gateway to use for this subnet. Leave this field blank to use the default gateway.
Interface	<b>Required.</b> The network interface on the <i>Packager</i> to be used by the network entry. Choices are automatically populated based on valid and available interfaces.
applyImmediate	<b>Required.</b> Whether to apply the route settings immediately or the next time the <i>Packager</i> is restarted. To apply settings immediately, select <b>True</b> .



## **Removing Network Entries**

To remove a network entry:

From the **System** tab, click through to **sysconfig** >> **network** >> **route** >> **remove**. Provide the information in Table 26 and click **Submit**.

	P	ackag	er				Current sys Welcome a Logout	stem time admin   C	Apr 24 12:4 onnected to 1	10:37 CDT 0.10.88.71
Dashboard Configura	tion Report Packaging	s Syste Hardwa	are 1	Input/Output	Events			_	S Conr	nection
⊡ network ⊕ bond ⊕ dns	Syscol This metho	n <b>fig &gt;&gt; n</b> od removes a r	network	x >> route >> y from the network rou	remove uting table.					
• ethernet	Destinat	ion (	Gateway	Genmask	Flags	6 Metric	Ref	Use	Iface	1
⊞ firewall	10.10.88	0 (	0.0.0.0	255.255.255.0	U	0	0	0	eth0	
	169.254.	0.0 (	0.0.0.0	255.255.0.0	U	0	0	0	eth0	
± ip	0.0.0.0	:	10.10.88.1	0.0.00	UG	0	0	0	eth0	1
<ul> <li>route</li> <li>add</li> <li>remove</li> <li>show</li> <li>ntp</li> <li>policy</li> <li>reboot</li> <li>restart</li> <li>shutdown</li> <li>snmp</li> </ul>	appl	Destination Genmask Interface yImmediate	eth0 True Submit		×	[text] Destinat [text] Subnet n Target Interfar Apply this sett added during n	ion subnet mask ce ing immedi next ip->re	ately. If fa	lse, route is	

### **Viewing Network Entries**

You can view the network entries in the network routing table for the *Packager*. From the **System** tab, click through to **sysconfig** >> **network** >> **route** >> **show**. Click **Submit**. Results appear.

Dashboard Configurat	ion	Packa Reports s	IGE <b>r</b>			Curr Welc	ent system come <b>adm</b> out	m time: Ap nin   Conr	pr 24 12:41 hected to 10.	:22 CDT .10.88.71
💀 System Status		ackaging Har	dware Inpu	ut/Output Even					🥑 Conne	
retwork     bond     dns     rethernet     firewall     interface     ip     route	•	sysconfig >> This method returns	> network > the network routing t	<b>&gt; route &gt;&gt; sho</b> <sub>table.</sub>	w					
add		Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface	
remove		10.10.88.0	0.0.00	255.255.255.0	U	0	0	0	eth0	
		169.254.0.0	0.0.0.0	255.255.0.0	U	0	0	0	eth0	
	E	0.0.0.0	10.10.88.1	0.0.0.0	UG	0	0	0	eth0	



## **Managing NTP Servers**

You can add Network Time Protocol (NTP) server entries to the *Packager*, remove NTP server entries, view the status of NTP servers configured on the *Packager*, and restart NTP servers.

From the **ntp** menu, you can click:

- **add**—Adds an NTP server entry to the *Packager*.
- **remove**—Deletes an NTP server entry from the *Packager*.
- restart—Restarts an NTP server associated with the Packager.
- servers—Shows information about NTP server entries on the Packager.
- **status**—Displays the current status of NTP server entries.

### Adding an NTP Server Entry



**Note:** For the modified NTP server list to take effect, you must click **sysconfig** >> **ntp** >> **restart** and then click **Submit**.

To add an NTP server entry:

From the **System** tab, click through to **sysconfig** >> **ntp** >> **add**. Provide the information in Table 27 and click **Submit**.

Dashboard	Configuration	Reports	System				
💀 💀 System Status	J	ust-In-Time Pa			Input/Output		Connection
i⊂:sysconfig ⊡:config ⊡:database		<b>sysconfig</b> This method add	<b>I &gt;&gt; ntp</b> ds an NTP serve	>> add er address.			
<sup>⊕</sup> debug <sup>⊕</sup> director			Index		[numeric, min. value: the server list	=1] Index of th	is entry in
⊡ info			Server		[text, min. length of address or hostname	1, max. length of the server	of 128] IP
ingestproxy ∎ringestproxy			Su	ıbmit			

Table 27. Add an NTP server entry.

Field	Description
Index	Required. The index of this NTP server entry in the server list.
Server	<b>Required.</b> The host name or IP address of the NTP server for which to add an NTP server entry.



### **Removing an NTP Server Entry**



**Note:** For the modified NTP server list to take effect, you must click **sysconfig** >> **ntp** >> **restart** and then click **Submit**.

To remove an NTP server entry:

From the **System** tab, click through to **sysconfig** >> **ntp** >> **remove**. Provide the information in Table 28 and click **Submit**.

Dashboard	Configuration	Reports	System					
💀 🖶 System Status		ist-In-Time Pao				Input/Output		Connection
ë∵sysconfig ⊕∵config ⊕∵database		<b>sysconfig</b> This method ren	) >> ntp : noves an NTP s	>> remove erver address.	2			
debug     director     fostname			Server 0.ce	entos.pool.ntp.org		IP Address or hostn remove	ame of the serve	er to
info show			Su	ubmit				

#### Table 28. Remove an NTP server entry.

Field	Description
Server	<b>Required.</b> The host name or IP address of the NTP server for which to remove an NTP server entry.

### **Restarting an NTP Server**

To restart an NTP server (required to make NTP server modifications take effect):

From the System tab, click through to sysconfig >> ntp >> restart. Click Submit.

Dashboard Configuration	Reports System			
System Status	Just-In-Time Packaging	Packaging	Input/Output	Connection
⊡-sysconfig ⊕-config ⊕-database	sysconfig >> ntp This method restarts the NTP	>> restart		
e debug director hostname info show	Submit			
<ul> <li>Bingestproxy</li> <li>Bikeyserver</li> </ul>	Operation Successful			

**i** 1

**Note:** For a modified NTP server list to take effect (as with adding or removing an NTP server) you must perform this action.

### **Viewing NTP Server Entries**

To view entries for the NTP server:
From the **System** tab, click through to **sysconfig** >> **ntp** >> **servers** >> **show**.

Click **Submit**. Results appear.

Dashboard Config	uration Reports System	n			 
💀 System Status	Just-In-Time Packaging	Packaging		Input/Output	Connection
e sysconfig e config e database	<b>sysconfig &gt;&gt; ni</b> This method gets the curre	tp >> servers ent list of NTP server ad	>> show dresses.		
debug     director     bostname     info     info     ishow	Subm				
<b>⊡</b> ingestproxy	Index	Server			
• keyserver	1	0.centos.pool.r	tp.org		
⊡ license	2	1.centos.pool.r	tp.org		
<b>⊡</b> network ⊡ntp	3	2.centos.pool.r	tp.org		

# Checking the Status of NTP Servers

To view the status of NTP servers:

From the **System** tab, click through to **sysconfig** >> **ntp** >> **status** >> **show**. Click **Submit**.

Dashboard Configuration	Reports Syst	em									
🔡 System Status 🛛 🕽	ust-In-Time Packaging	Packaging					input/Out			🥑 Conne	ction
⊡∵sysconfig	sysconfig >> I This method retrieves th	ntp >> statu e status of the NTP s	I <b>S &gt;</b> > erver a	> <b>S</b> ind p	how eers.						
⊕ debug ⊕ director ⊕ hostname ⊖ info show	Submit										
<b>⊡</b> ingestproxy	Remote	Ref ID	ST	т	When	Poll	Reach	Delay	Offset	Jitter	
teyserver	5.2.16.151	131.188.3.221	2	u	20	64	7	158.209	-12.332	23.233	
• license	69.50.231.130	209.81.9.7	2	u	17	64	7	55.924	0.792	22.13	
1 network	209.242.224.97	18.26.4.105	2	u	16	64	7	43.875	-30.912	27.546	
add	127.127.1.0	.LOCL.	10	I	16	64	7	0	0	0.001	

# **Configuring POIS**

Packager supports SCTE-35 Type 6-based ad insertion with or without connecting to an external POIS server. In order for ad insertion to work on individual packaging, you must first enable placement opportunity handling for the system in general. You can configure *Packager* to handle placement opportunity requests using a POIS server (for linear packaging) or using *Packager's* built-in template (linear and JITP) to generate ad markers for inserting into the manifest playlist<sup>1</sup>.

# **Setup POIS Handling**

1. From the System tab, click through to sysconfig >> pois >> modify.

Dashboard Config	guration Reports Syste	m				
💀 System Status	Just-In-Time Packaging	Packaging		Input/Output		S Connection
ë∵sysconfig ∎∵config ∎∵database	<b>sysconfig &gt;&gt; p</b> This method configures th	ois >> modify e placement opportunit	y behaviors.			
⊕ debug ⊕ defaults ⊕ hostname ⊕ info	Enable URL	true		Enable Placement Op [text] POIS endpoint	p Handling URL	
• ingestproxy • keyserver		Submit				

2. From the **Enable** drop-down box, select *true* to enable placement opportunity handling.

**Note:** When the Enable field is set to false, all SCTE-35 cues will be dropped.

- **3.** In the URL field, do one of the following:
  - Enter the URL to the external POIS end-point server.
     —OR—
  - Leave the field blank to use *Packager's* internal template for placement opportunity handling.
- 4. Click Submit.

Field	Description
Enable	When set to <i>true</i> , SCTE-35 cues will be processed for placement opportunity handling.
	When set to false, all SCTE-35 cue messages will be dropped.
	Default is false.
URL	For linear packaging only: To use an external POIS end-point server for generating ad markers, enter the URL of the POIS server.
	<b>For linear or JIT packaging:</b> To use <i>Packager's</i> internal template to generate the ad marker and insert it into the manifest file, <i>leave this field blank</i> . Internal template can be viewed at the following location from the <i>Packager</i> CLI:
	/etc/ripcode/adtemplate.conf

Table 29. Set progressive download bandwidth.

<sup>1.</sup> Blackout support will be available in an upcoming release.

## **Show Placement Opportunity Handling**

- 1. From the **System** tab, click through to **sysconfig** >> **pois** >> **show**.
- 2. Click Submit.

Depending on which option you configured from step 3 above, one of the two results will be displayed as seen below:



# **Managing Progressive Downloads Policies**

To set the maximum bandwidth for progressive downloads (in bits per second):



From the **System** tab, click through to **sysconfig** >> **policy** >> **set**. Provide the information in Table 30 and click **Submit**.

	Packager			Current system time: Apr 24 12:52:24 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Configuration	Reports System Packaging Hardware	Input/Output	Events	S Connection
info     ingestproxy     keyserver	sysconfig >> polic This method configure various	cy >> set operational policies.		
<ul> <li>ticense</li> <li>network</li> <li>ntp</li> <li>policy</li> </ul>	Progressive Download Maximum BW			[numeric, min. value=0, max. value=5120000] The maximum BW (in bits per second) limit for progressive download - set to 0 for unlimited.
show =	Su	ıbmit		

Table 30. Set progressive download bandwidth.

Field	Description
Progressive Download Maximum BW	<b>Required.</b> The maximum bandwidth (in bits per second) to allow for progressive downloads.

To see the current progressive download policies:

From the **System** tab, click through to **sysconfig** >> **policy** >> **show**. Click **Submit**.

Dashboard Configuration	Reports System		 	 
🖶 System Status	Just-In-Time Packaging		Input/Output	Connection
Enter Marker Text	sysconfig >> polic This method returns the system	r <b>y &gt;&gt; show</b> n policy setting.		
B debug B director B hostname B info B ingestproxy	[Submit]			
*keyserver	Progressive Download Max	imum BW		0

# Rebooting the Packager

**Warning:** This action will reboot the entire host; it is the equivalent of a power-cycle. All current packaging operations for the Packager will terminate.

To reboot the Packager:

From the System tab, click through to sysconfig >> reboot. Click Submit.



# **Restarting the Packager**



**:** This action will restart the packaging application. All current packaging operations for Packager will terminate.

To restart the software running on the Packager:

From the **System** tab, click through to **sysconfig** >> **restart**. Click **Submit**. The software running on the *Packager* will restart.

Dashboard	Configuration		System					
💀 💀 System Status	Ju	ist-In-Time Pac	kaging	Packaging	Hardware	Input/Output	Events	Connection
idense in sysconfig in config in database in debug		sysconfig This method cau WARNING: This	>> rest ses an immedia command will t	<b>art</b> ate restart of the T erminate all outsta	ransAct Application. nding jobs!			
director     finfo			Submit	]				

# Shutting Down the Packager



**g:** All current packaging operations for Packager will terminate. Packager will be powered down and will require a manual power-on.

To shut down the Packager:

From the **System** tab, click through to **sysconfig** >> **shutdown**. Click **Submit**.

	P	ackager			Current system time: Apr 24 12:54:39 CDT Welcome admin Connected to 10.10.88.71 Logaut
Dashboard	Configuration Report	s System			
💀 System Status	Packaging		Input/Output		S Connection
treense     network     ntp     policy	Syscol This meth WARNING	nfig >> shut od causes a shutdowr This command will t	<b>down</b> n and power-off. rerminate all outstanding	jobs!	
-reboot -restart <mark>shutdown</mark>		Submit	]		

# Managing the Packager's SNMP Service

You can configure settings for the Simple Network Management Protocol (SNMP) service for the *Packager*, view current settings, and enable or disable the SNMP service.



**Note:** Only SNMP trap forwarding is supported; management of the Packager can not be done via SNMP.

When you click **sysconfig** >> **snmp** you have these choices:

- **enable**—Enables the SNMP service as configured for the *Packager*.
- **disable**—Disables the SNMP service.
- set—Configures one or more of the user-modifiable SNMP service parameters.
- **show**—Shows your SNMP service settings.
- trapsink—Allows you to add a trap server hostname, and specify which traps will be sent to it.

### Enabling the SNMP Service

To enable the Packager's SNMP service:

From the **System** tab, click through to **sysconfig** >> **snmp** >> **enable**. Click **Submit**.

	WORKS	Pa	ckager			Current system time: Apr 24 13:01:25 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard	Configuration	Reports	System			
🔢 System Status	Pa	ackaging	Hardware	Input/Output	Events	S Connection
□ <sup>-</sup> snmp <sup></sup> disable • <mark>enable</mark>	*	<b>sysconfi</b> This method (	i <b>g &gt;&gt; snmp</b> enables the SNMP s	<b>&gt;&gt; enable</b>		
"set "show ⊕ trapsink			Submit			

## **Disabling the SNMP Service**

To disable the *Packager's* SNMP service:

From the **System** tab, click through to **sysconfig** >> **snmp** >> **disable**. Click **Submit**.

	WORKS	Pad	ckager		Current system time: Apr 24 13:01:55 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard	Configuration	Reports	System		
👭 System Status	Pa				Connection
<b>⊟</b> "snmp " <mark>disable</mark> "renable	•	<b>sysconfi</b> This method d	g >> snmp lisables the SNMP	>> disable	
set show ⊡ trapsink			Submit		

# **Setting SNMP Service Parameters**

#### To configure the SNMP service:

- 1. From the **System** tab, click through to **sysconfig** >> **snmp** >> **set**.
- **2.** In the **Community** field, enter the password used to authenticate access to MIB objects. The password may be up to 32 characters long and include the following characters: a-z, A-Z, 0-9, hyphen, underscore. Do not include spaces.
- 3. In the System Location field, enter the host on which the SNMP agent (service) is running.
- 4. In the System Contact field, enter the email address of the contact person.
- **5.** In the **Forward** field, enter the address for the remote host used for forwarding traps from the SNMP service.
- 6. Click Submit.

	Pa on Reports	ckager			Current system time: Apr 24 13:02:55 CD Welcome admin   Connected to 10.10.88. Logout
System Status	Packaging	Hardware	Input/Output	Events	Connection
<ul> <li>ntp</li> <li>⇒ policy</li> <li>¬reboot</li> </ul>	sysconf This method	ig >> snmp sets one or more us	>> set er-modifiable SNMP par	ameters.	
···restart ···shutdown	c	ommunity			[text] Community String
⇒"snmp	Syster	n Location			[text] System Location
enable	Syste	m Contact			[text] System Contact
<mark>set</mark>		Forward			[text] Remote host for forwarding traps. Enter 'none' to disable forwarding.
E trapsink E swupdate	E	Sub	mit		

## **Viewing SNMP Service Parameters**

To view the SNMP service parameters:





From the **System** tab, click through to **sysconfig** >> **snmp** >> **show**. Click **Submit**.

## Managing SNMP Trap Server Configuration

You can configure SNMP trap server host names from **sysconfig** >> **snmp** >> **trapsink**:

- add—Adds an SNMP trap server and configures its hostname and type of traps to send.
- remove—Removes an SNMP trap server.
- **modify**—Allows the configuration of an SNMP trap server to be changed.
- **show**—Displays all SNMP trap servers that have been configured.

To add an SNMP trap server:



From the **System** tab, click through to **sysconfig** >> **snmp** >> **trapsink** >> **add**. Provide the information in Table 31 and click **Submit**.

		er	Current system time: Apr 24 13:03:40 CD Welcome admin   Connected to 10.10.88.7 Logout		
System Status	Packaging Hardwa	re Input/Output Events	Connection		
reboot restart shutdown	Sysconfig >> Si This method allows the us	nmp >> trapsink >> add er to add a trap sink hostname, and specify whic	h types of traps will be sent to it.		
⊡rsnmp "disable "enable	Host Name Send Critical Traps	true 💌	[text] Hostname of the trap sink Indicates whether to send critical traps		
set show	Send Major Traps	true	Indicates whether to send major traps		
add	Send Warning Traps	true 💌	Indicates whether to send warning traps Indicates whether to send info traps		
remove show	Traps	Submit			

#### Table 31. Add an SNMP trap server.

Field	Description
Host Name	Required. The hostname of the trap server.
Send Critical Traps	Required. Indicates whether to send critical traps.
Send Major Traps	Required. Indicates whether to send major traps.
Send Warning Traps	Required. Indicates whether to send warning traps.
Send Informational Traps	Required. Indicates whether to send informational traps.

To remove an SNMP trap server:

1. From the **System** tab, click through to **sysconfig** >> **snmp** >> **trapsink** >> **remove**.

			Pad	ckager			Current system time: Apr 24 13:04:40 C Welcome admin   Connected to 10:10.88 Logout
	Dashboard Configura	ation	Reports	System			
Syst	tem Status	P	ackaging	Hardware	Input/Output	Events	Connection
	"snmp "disable "enable	*	<b>sysconfi</b> This method a	g >> snm allows the user to	p >> trapsink > remove a trap sink hostna	> remove ame	3
	"set "show ⊡ trapsink		Н	ost Name			[text] Hostname of the trap sink
	add modify	=		Su	lbmit		

- 2. Enter the name of the host for which to remove a trap server in the Host Name field.
- 3. Click Submit.

To modify an SNMP trap server:



From the **System** tab, click through to **sysconfig** >> **snmp** >> **trapsink** >> **modify**. Modify the settings as in Table 31 on page 81. Click **Submit**.

<b>FG</b> NETWORKS	Package	er		Current system time: Apr 24 13:04:10 CDT Welcome admin Connected to 10.10.88.71 Logout
Dashboard Configuratio	n Reports System Packaging Hardwa	n re Input/Output	Events	S Connection
"reboot "restart "shutdown	sysconfig >> su This method allows the us	nmp >> trapsink > ser to modify a trap sink hostnar	> modify me, and specify which	types of traps will be sent to it.
⊡ snmp ⊡disable enable	Host Name		[ti	ext] Hostname of the trap sink
set show	Send Critical Traps	true true	• In	dicates whether to send critical apps
add <mark>modify</mark>	Send Warning Traps Send Informational Traps	true false	v In	dicates whether to send info traps
show	E	Submit		

To show SNMP trap servers and configuration, click the **System** tab, select **sysconfig** >> **snmp** >> **trapsink** >> **show**, and click **Submit**.

	кs Pa	ackager			Current system time: Apr 24 13:05:11 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Con	figuration Reports	System			
👭 System Status	Packaging		Input/Output		Connection
set show	Syscon This metho	fig >> snmp d allows the user to r	>> trapsink >	>> show mes and trap configu	uration
add modify remove show		Submit			

# Performing Software Upgrades for the Packager

You can upgrade the software for the *Packager* from the Management Console. This section describes steps to upgrade for appliance-based *Packagers* on the AMS hardware platform or for *Packagers* running on virtual machines (VMs). For detailed instructions on upgrading or installing the *Packager* application, refer to the *TransAct Packager Software Installation and Upgrade Guide* for this software release.

## This Version of Software

This version of the software upgrades the following:

- All RGB applications.
- Kernel modules and Operating System software packages to the latest or required versions.



## Steps to Upgrade

To upgrade software for the Packager, proceed as follows:

- 1. Place the software update package (named **ripcode-packager-5.4-23968.x86\_64.rampx**) on a network-accessible directory share on a TFTP (Trivial File Transfer Protocol) or HTTP server.
- 2. Login to the TransAct Packager Console as described in "Logging into Packager" on page 25.
- **3.** From the **System** tab, click through to **sysconfig** >> **swupdate** >> **update**.

Dashboard C		orts System	_				
🔡 System Status		me Packaging	Packaging		Input/Output		Connection
e sysconfig e config e database e debug	SYSCO This mei NOTE: T update i	thod performs a sys this process may up is complete.	update >> u tem software update date this web client. P	<b>pdate</b> of the TransAct applian lease perform a forced	ce. reload of this page, or	restart the brov	wser after the
⊕ director ● hostname ⊕ info ⊕ ingestproxy		Upgrade File			[text] HTTP or TFTP software upgrade pa http://host/path/pac tftp://host/path/to/p	URL referring to ackage (e.g. ckage.file or backage.file	o the
Heyserver     Heyserv		options	none	•	Optional flags to pas process.	s to software up	pdate
network     ∎ ntp			Submit				

**4.** In the **Upgrade File** field, enter the address to the location of the RGB software update package on your network. Example:

```
http://10.10.165.123/TransAct/ripcode-packager-5.4-23968.x86_64.rampx
-or-
```

```
tftp://10.10.165.123/TransAct/ripcode-packager-5.4-23968.x86_64.rampx
```

- **5.** Select whether to allow internet connection during the update from the **options** field. RGB recommends using **none**.
- 6. Click Submit.

## Viewing the Results of a Software Update

To view the results of a software update:

From the **System** tab, click through to **sysconfig** >> **swupdate** >> **show**. Click **Submit**. Results appear similar to the following:

Dashboard	Configuration	Reports	System					
💀 System Status		-In-Time Pack	aging	Packaging		Input/Output		Section Section
E sysconfig E config E database E debug	S Ti N U	his method retur IOTE: This proces pdate is complet	>> swup ons the status ss may update e.	date >> sl of the current or la these web pages	<b>NOW</b> ast software upgrade . Please perform a for	operation. ced reload of this page,	or restart the br	owser after the
defaults     b hostname     b info     b ingestproxy     B keyserver			Submit					
<ul> <li>license</li> <li>network</li> <li>ntp</li> <li>pois</li> <li>policy</li> <li>reboot</li> <li>restart</li> <li>shutdown</li> <li>snmp</li> <li>swupdate</li> </ul>	3: 20 7 9: 10 22 26 30 55 66 80 0 9 9 9 9 10	0: [0] Download 0:44/bkg/ripcode 0: [0] Uncompri 0: [0] Verifying 1: 0: [0] Execution 5: 0: Creating ba 1: 0: Updating R/ 0: 0: Updating C/ 0: 0: Updating C/ 0: 0: Updating C/ 0: 0: Optimizing E/ 0: 0: Updating C/ 0: 0: Optimizing E/ 0: 0: SWU Postpr 3: 0: Cleanup 00: 0: Complete!	ding the RGB si = packager -5.6 essing and una downloaded p ng Software Up cessing tokup archive of GB Binaries perating Syste BIOS Configura rocessing	oftware package is ). 1-20644.x86_64 rediving from the ackage matches e date via the soft if persistent data. m Packages tion	from "http://build.ripcc i.rampx". self-executing softwa xisting system softwa ware update stage 2 s 	ode.com/systemtest/tap5 re tarball. re. cript.	5.0.1/build-	

# Sending Messages to a Remote Syslog Server for the Packager

You can relay messages from the *Packager* to a remote syslog server, remove a syslog server configuration, or view the status of the current remote syslog server for the *Packager*.

From the **syslog** >> **server** menu, you can click:

- add—"Configuring Access to a Remote Syslog Server for the Packager" on page 84.
- remove—"Removing Access to a Remote Syslog Server from the Packager" on page 85.
- **show**—"Viewing Remote Syslog Server Information for the Packager" on page 86.

### Configuring Access to a Remote Syslog Server for the Packager

To configure access to a remote syslog server for the *Packager*:



From the **System** tab, click through to **sysconfig** >> **syslog** >> **server** >> **add**. Provide the information in Table 32 and click **Submit**.

Deshboard Configuration	Package Reports System	er		Current system time: Apr 24 13:11:57 CDT Welcome admin   Connected to 10.10.88.71 Logout
System Status	Packaging Hardwa	re Input/Output	Events	Connection
reboot restart shutdown ⊕ snmp	sysconfig >> s This method adds a remo Events of a given log type If a remote syslog server	yslog >> server > te syslog server. are relayed to the specified se for a given type is already defi	> add erver. ned, it will be over	written.
swupdate     syslog     i⇒server     add     remove    ≡     show	Syslog Message Type IP Address	linfo		Syslog message type (info, event) [text, max. length of 256] IP address or Hostname of the server to add
		SUDMIE		

Table 32. Configure access to a remote syslog server for the Packager.

Field	Description
Syslog Message Type	<b>Required.</b> The type of messages to be sent to the syslog server: <b>info</b> , <b>event</b> , or <b>all</b> .
IP Address	Required. The host name or IP address where the syslog will be relayed.

## Removing Access to a Remote Syslog Server from the Packager

To remove access to a remote syslog server for the *Packager*:

From the **System** tab, click through to **sysconfig** >> **syslog** >> **server** >> **remove** from the **System** tab. Provide the information in Table 33 and click **Submit**.

Dashboard Configuration	Packag Reports Syste	er m		Current system time: Apr 24 13:12:27 CDT Welcome admin   Connected to 10.10.88.71 Logout
💀 System Status	Packaging Hardwa	are Input/Output		S Connection
reboot -restart	sysconfig >> s This method removes the	syslog >> server > e remote syslog server for a gi	>> remove iven log type.	
⊕ snup ⊕ swupdate	Syslog Message Type	info		Syslog message type
add remove	IP Address	Submit		[text, max. length of 256] IP address of the server to remove

Table 33. Remove access to a remote syslog server.

Field	Description
Syslog Message Type	Required. Type of message for which to remove a log: info, event, or all.
IP Address	Required. The IP address of the remote syslog server to remove.

e onl f



## Viewing Remote Syslog Server Information for the Packager

To view the remote syslog servers that have been configured for the *Packager*:

From the **System** tab, click through to **sysconfig** >> **syslog** >> **server** >> **show**. Click **Submit**. Results similar to the following appear if the syslog is stored locally on the *Packager*.

Dashboard Configuration	Packager Reports System			Current system time: Apr 24 13:12:57 CDT Welcome admin   Connected to 10.10.88.71 Logout
🖶 System Status	Packaging Hardware	Input/Output		S Connection
restart ▲ shutdown ⊕ snmp	sysconfig >> syslog This method retrieves the syslog	<b>J &gt;&gt; server &gt;&gt;</b> configuration.	show	
	Submit No remote hosts configured			

# Locking and Unlocking the Packager

The unlock / locking command in *Packager* is used for real-time processing information. This menu should only be used at the direction of RGB Customer Support.

To view the current state of sessions on the Packager:

From the System tab, click through to sysconfig >> system >> show. Click Submit.

S) Thi	sysconfig >> system >> show This method returns real state of all sessions															
	Submit															
	Submit															
Slo	t Ao St	lministrat ate	tive	Operational State	Usage State	Ver	sion	Percentage Utilization	e CPUutilization	MEMutilizatio	n	TranscoderTotal				
1	UN	ILOCK		ENABLE	ACTIVE	HD Tran	scoder	7	7	44		Bitrate	Fps		TargetFps	RtState
												0	119.96	60325	104.243478	Pass
-			_											_		
File	File Stream FileRt															
In	ſest	RtPass	RtFa	ilInProgress	RtFailSt	top	InTes	st RtPass	RtFailInProgress	RtFailStop	1	inTest	RtPass	RtFa	ilInProgress	RtFailStop
0		0	0		0		0	4	0	0	0	)	0	0		0

To lock the *Packager*:



Dashboard Configuration	Reports System					
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
ersysconfig erconfig erdatabase	<b>sysconfig &gt;&gt; sys</b> This method locks system.	stem >> lock				
debug     director     hostname	Lock Type	raceful	T	If system lock is force are aborted	ed, executing t	asks on it
<ul> <li>Info</li> <li>Ingestproxy</li> </ul>		Submit				

From the **System** tab, click through to **sysconfig** >> **system** >> **lock**. Click **Submit**.

To unlock the *Packager*:

From the **System** tab, click through to **sysconfig** >> **system** >> **unlock**. Click **Submit**.

Dashboard	Configuration	Reports	System				
🔡 System Status		lust-In-Time Pa		Packaging		Input/Output	Connection
ë∵sysconfig ë∵config ®∵database		sysconfig This method unl	<b>&gt;&gt; syst</b> ocks system.	em >> unle	ock		
debug     director     brostname     info     bringestproxy			Submit	]			
• keyserver		Operation Succe	ssful				

To restart the *Packager*'s packaging sessions without restarting the complete *Packager* application:

From the **System** tab, click through to **sysconfig** >> **system** >> **restart**. Click **Submit**.

Dashboard	Configuration	Reports	System					
🔡 System Status	յլ	ist-In-Time Pa	ckaging	Packaging	Hardware	Input/Output	Events	Connection
⊡ sysconfig ⊡ config ⊡ database		<b>sysconfig</b> This method re	<b>J &gt;&gt; syst</b> start system.	tem >> rest	tart			
⊕ debug ⊕ director ⊕ hostname ⊕ info			Submit	]				

# **Managing Time Zones**

You can view and set the time zone for the *Packager* from the **timezone** menu:

- set—Sets the timezone for the Packager.
- **show**—Displays the timezone for the *Packager*.

To set the timezone:



From the **System** tab, click through to **sysconfig** >> **timezone** >> **set**. Provide the information in Table 34 and click **Submit**.

	Pa	ickager			Current system time: Apr 24 13:14:43 CDT Welcome admin   Connected to 10:10:88.71 Logout
Dashboard Configu	Packaging	System	Toput/Output	Events	Connection
restart shutdown ⊕ snmp	Syscon This method	fig >> timez sets the time zone.	cone >> set		
⊕ syslog ⊕ timezone	т	ime Zones		Ta	arget Time Zone 🗧
show	=	Sub	mit		

Table 34. Set the timezone for the Packager.

Field	Description
Time Zones	Required. The timezone to apply to the Packager.

To view the timezone:

From the **System** tab, click through to **sysconfig** >> **timezone** >> **show**. Click **Submit**. Results appear.

		ckager			Current system time: Apr 24 13:14:13 CDT Welcome admin   Connected to 10.10.88.71 Logout
System Status	Packaging	Hardware	Input/Output	Events	Connection
Policy reboot restart	Sysconfi This method r	ig >> timez returns the current	time zone.		
= shutdown ⊕ snmp ⊕ swupdate ⊕ syslog		Submit			
timezone "set	E Timezone CDT (-05:00:0	)0)			

# **Managing User Accounts**

You can manage user accounts for the *Packager* from the Management Console. From the **user** menu, you can click:

- **add**—Adds a user account to the *Packager*.
- **remove**—Deletes a user account from the *Packager*.
- **show**—Shows information about user accounts on teh*Packager*.
- authentication—Manages integration with Authentication Servers for verifying users.



# Adding a User Account

To add a user account:

From the **System** tab, click through to **sysconfig** >> **user** >> **add**. Provide the information in Table 35 and click **Submit**.

Dashboard Configuration	Reports System					
💀 💀 System Status	ust-In-Time Packaging	Packaging		Input/Output		Connection
⊖ sysconfig ⊕ config ⊕ database	sysconfig >> us This method adds a user to	<b>Ser &gt;&gt; add</b> the system.				
⊕ debug ⊕ director ⊕ hostname	User Name			[text, min. length of 1 name/ID	l, max. length	of 32] User
<ul> <li>Info</li> <li>Ingestproxy</li> </ul>	Group Password	users	•	[text, max. length of	vel). 128] User pas r local authen	sword.
B keyserver B license	Authentication	local	•	ignored for remote au User authentication m (Radius, Tacacs, etc.)	thentication. ode - local or	remote
<ul> <li>ntp</li> <li>policy</li> </ul>		Submit				

#### Table 35. Add a user.

Field	Description
User Name	Required. The login name of the user account to add.
Group	Required. The group to which to add the user: users, staff, or admin.
Password	Required. The password to assign to the user.
Authentication	<b>Required.</b> Select whether to use <b>local</b> authentication or for added security a <b>remote</b> server (Radius or TACACS+, etc) to authenticate login.

# **Removing a User Account**

To remove a user account from the Packager:



From the **System** tab, click through to **sysconfig** >> **user** >> **remove**. Provide the information in Table 36 and click **Submit**.

		Pad	ckager			Current system time: Apr 24 13:19:28 CDT Welcome admin   Connected to 10.10.88.71 Logout
1	Dashboard Configurati	ion Reports	System	Toput/Output	Fuents	Connection
	snmp     swupdate     syslog	sysconfi This method r	<b>g &gt;&gt; user</b> emoves a user fro	>> remove m the system.		
	timezone     user     add	Us	er Name admi	n(admin : root staff)	User	name E
	remove	E	Sub	rmit		

Table 36. Remove a user account.

Field	Description
User Name	Required. The user account to remove.

## Viewing User Accounts on the Packager

To view the user accounts that have been configured for the *Packager*:

From the **System** tab, click through to **sysconfig** >> **user** >> **show**. Click **Submit**.

	:KS	Pa	ckager			Current system time: Apr 24 13:19:58 CDT Welcome admin   Connected to 10.10.88.71 Logout
Dashboard Con	figuration F	Reports Packaging	System Hardware	Input/Output	Events	Connection
reboot restart shutdown	*	<b>sysconfi</b> This method (	ig >> user returns the list of s	>> show /stem users: UserName(	(Group).	
e smp swupdate syslog			Submit			
e user add	ш	admin(admin	: root staff)			
show		oper(oper r op	Jul Bully			

## **Managing Remote Authentication Servers**

Remote authentication servers can be used to verify users accessing *Packager*. To view the authentication servers that have been configured on *Packager*:

From the **System** tab, click through to **sysconfig** >> **user** >> **authentication** >> **show**. Click **Submit**.

Dashboard	Configuration	Reports	System				
System Status	]	ust-In-Time Pac				Input/Output	Section Section
ë∙sysconfig ≣∙config ₽∙database		<b>sysconfig</b> This method ret	I >> user	>> authe configured remote	ntication >> authentication server	show <sup>s.</sup>	
debug     director     hostname     info     ingestproxy			Submit				
• keyserver		127.0.0.1 (type	=Radius secret	=secret timeout=:	1)		
<sup>⊕</sup> license		other-server (ty	pe=Radius secr	ret=other-secret t	imeout=3)		
t network		1.1.1.1 (type=T	ACACS+)				
⊕ ncp ⊕ policy		2.2.2.2 (type=T	ACACS + secret	t=SAME-SECRET)			

To access a remote authentication server:

From the **System** tab, click through to **sysconfig** >> **user** >> **authentication** >> **add**. Provide the information in Table 37 and click **Submit**.

Dashboard Confi	guration Reports Syste	m					
👭 System Status	Just-In-Time Packaging	Packaging		Input/Output		Section Section	
⊡'sysconfig ⊕'config ⊕'database	<b>sysconfig &gt;&gt; u</b> This method adds a remot	<b>sysconfig &gt;&gt; user &gt;&gt; authentication &gt;&gt; add</b> This method adds a remote authentication server to the system.					
⊡ debug ⊡ director	authType	Radius	T	Authentication Serve	er type		
t±"hostname tinfo	Index			[numeric, min. value the server list	=1] Index of th	is entry in	
<sup>⊕</sup> ingestproxy <sup>⊕</sup> keyserver	Server Address			[text, max. length of Use the form ipAddre non-standard port, of is assumed	f 128] Server A ess:port to spec otherwise the de	ddress. cify a efault port	
⊕ license ⊕ network	serverSecret			[text, max. length of to authenticate with	f 128] Server Se the remote ser	ecret used ver	
t≢"ntp ∎"policy	timeout	1		[numeric, min. value: timeout delay in seco for Radius, global for	=1] Server resp onds. Value is po TACACS.	oonse er-server	
restart		Submit					
±"snmp							

Field	Description
authType	<b>Required.</b> The type of authentication server to access. Current choices include Radius and TACACS+.
Index	<b>Required.</b> The position of this authentication server in the list of authentication servers to be accessed by <i>Packager</i> .
Server Address	<b>Required.</b> The IP address or hostname where the authentication server resides. To specify a non-standard port number, use the format <i>ipAddress:port</i> ; otherwise the default port is assumed.
serverSecret	Required. The passcode used to authenticate communications with the remote server.
timeout	<b>Required.</b> The number of seconds to wait for response from the server before accessing the next authentication server in the list.

To remove a remote authentication server from the list on the Packager:

From the **System** tab, click through to **sysconfig** >> **user** >> **authentication** >> **remove**. Provide the information in Table 38 and click **Submit**.

Dashboard Configuration	Reports System	n				
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
⊖sysconfig ⊕ config ⊕ database	sysconfig >> us This method removes a rem	ser >> authen	ver from the system.	emove		
debug     director     hostname     info	authType Server Address	Radius 127.0.0.1 (type=Radius	secret=secret tin	Authentication Serve [text, max. length o' to be removed	er type f 128] Address (	ofserver
ingestproxy     keyserver     ficense		Submit				

Table 38. Remove a remote authentication server from Packager.

Field	Description
authType	<b>Required.</b> The type of authentication server to remove. Current choices include Radius and TACACS+.
Server Address	Required. Choose a server address to remove from the drop-down box.

#### **CHAPTER 5**

# **Global Output Configuration**

This chapter describes all global output packaging configuration tasks including audio mapping, packaging start time delays, and various output format options such as HTTP headers, subtitles, trick play, and ad insertion.

# In This Chapter:

- "Prior to Configuring Packaging," next.
- "Overview" on page 93.
- "Configuring Audio Mapping" on page 93.
- "Global Start Time Delay (Optional)" on page 99.
- "Configuring Global Output Formats" on page 100.

# **Prior to Configuring Packaging**

Prior to performing any Packager configuration, ensure that you have configured the necessary system parameters from the **System** tab of the GUI. See "Prerequisite System Configuration — Packaging Operations" on page 35 for more information.

## **Overview**

You can configure global parameters that will apply to all packaging operations, either for the system as a whole or for specific packaging output players and mounts. Global packaging parameters should be configured prior to configuring input sources or creating linear or JITP packages.

# **Configuring Audio Mapping**

*Packager* supports late-binding audio, which allows for the inclusion of one or more alternative audio tracks to be published within a single package. Audio map rules determine how (or if) content audio tracks are packaged (or "published") by evaluating each input audio track against a set of user-configured rules. Defining audio map rules allows for delivery protocols to adjust for variations in audio language and quality based on the end device's parameters and bandwidth capacity.

Audio mapping is available for both linear and JIT packaging.

## **Audio Output Publishing Options**

Four types of output publishing options are available when a rule condition is matched. Based on the delivery protocol, each publishing option has a specific behavior. Table 39 describes each condition:

Output Publishing Type	HLS Behavior	HDS Behavior	MSS Behavior
Primary	Matching audio will be published as the <i>default</i> audio with the video.	Matching audio will be published as the <i>default</i> audio with the video.	Matching audio will be published.
Primary + Audio Only	Matching audio will be published as the <i>default</i> audio with video <b>-and-</b> offered as an <i>audio-only</i> feed.	Same as Primary: matching audio will be published as the <i>default</i> audio with the video.	Same as primary: matching audio will be <i>published</i> .
Audio Only	Matching audio will be published by itself as an <i>audio-only</i> feed (no video)	<i>Ignores</i> this rule, and proceeds to next rule for a match. If no match is found, audio is considered <i>alternate</i> .	<i>Ignores</i> this rule and proceeds to next rule for a match.If no match is found, audio is <i>published</i> .
Drop	Matching audio will be <i>dropped</i> at the input and will not appear in any generated output.	Matching audio will be <i>dropped</i> at the input and will not appear in any generated output.	Matching audio will be <i>dropped</i> at the input and will not appear in any generated output.
No Rule Match	Input audio that does not match any rule will be published as a <i>non- default</i> feed.	Input audio that does not match any rule will be published as an <i>alternate</i> feed.	Input audio that does not match any rule will be <i>published</i> .

Table 39. Audio map behavior based on delivery protocol

## **Defining an Audio Map Template**

Before creating rules for audio map behavior, you must first create an audio map template under which you will configure your desired rules.

1. From the **Configuration** tab, click through to **configuration** >> **audiomap** >> **add**.

Dashboard Configuration	Reports System					
🕂 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
☐ configuration ☐ audiomap 	configuration >> This method adds an audio ma	audiomap >	> add se in workflows			
rule → show	Name			[text, max. length o	f 23] Audio map	name
e input e jitp	S	ubmit				

- 2. Enter a Name up to 23 characters that will define the audio map template.
- 3. Click Submit.

## Adding Audio Map Rules

After creating an audio map template, up to 8 rules may be defined for each template. A rule consists of several configurable input audio conditions that, when met, will produce a specified output audio

publishing option as described in Table 39 on page 94. Audio map rules are applied on an exclusive basis, which means that once the rule conditions are met for the highest priority rule, no further rules are processed for the matching input audio track.



**Note:** Since audio map rules are applied exclusively based on highest priority rule match, the rule priority should be set with the most specific audio characteristics as the highest, and each less specific characteristic (more generic) as subsequently lower priorities. Click here to see an example.

Caut

**Caution!** Packager does not support segmentation for multiple audio tracks where the language code, codec, and bitrate are identical. That is, each audio input track being fed to Packager of the same content must be unique, either in language, codec, or bitrate. If such identical audio input tracks are fed to Packager, packaging will not work correctly, which can result in "Out-of-Sync" messages and incorrect audio track publishing.

To add an audio map rule:

1. From the **Configuration** tab, click through to **configuration** >> **audiomap** >> **rule** >> **add**.

A Sustan Status	Reports Syste	De che cin r	Handurana	In put / Output	Fuenta	Connection	
	Jusc-In-Time Packaging	Packaging	naroware	πιρατ/Ουτρυτ	Events	Connection	
Configuration     add     remove	<b>configuration</b> > This method adds a rule are met.	>> audiomap to determine how an o	>> rule >> ac	<b>id</b> De published when all	specified input	audio conditions	
⊟-rule _add _modify	Name	aac_eng_Prm_all_Alt	· · · · · · · · · · · · · · · · · · ·	[text, max. length identifier. Rule priority; an inp	of 23] User de out track can or	îned Ily match	
remove				one rule. (Selectir use" will shift all the next availabl	ng a priority t rule priorities e priority.)	hat is "in down to	
⊡rinput	Input Codec	any	•	Input audio codec			
∎ jitp ∎ output	Input Channels	any	•	The number of input audio channels.			
<sup>⊕</sup> package	Audio Bitrate Low	0		[numeric] Input au value between 0 t	idio bitrate rang o 640000 bps (	e start, inclusive).	
Bistitcher	Audio Bitrate High	128000		[numeric] Input au value between 80 (inclusive).	idio bitrate rang 00 to 640000 b	e end, ps	
	Language	any		[text, max. length language code of t characters, 'any' is	of 3] The ISO6 the input audio a valid option).	i39-2 (3	
	Output Publishing Type	Primary	T	If all input conditio published: Primary:As a defa Primary: + AudioO HLS also offers it a AudioOnly: HLS of exclusively, other f Drop: Not publishe ( <i>No rule match</i> : As	ns met, output ult, with the vio <b>nly:</b> Same as Pri s audio-only too fers it as audio- fers it as audio- ormats ignore t ad alternate/non-	will be mary, but only his rule default)	
		Submit					

#### **2.** Provide the information in Table 40 and click **Submit**.

Field	Description
Name	Select the name of the audio map for which to create the rule. See "Defining an Audio Map Template" on page 94.
Priority	Sets the order in which rules are evaluated against the audio input tracks, 1 being the first (or highest priority) and 8 being the last (or lowest). Once a rule matches an audio track, no subsequent rules will be evaluated.
	<i>Note</i> : Priority should be configured from most specific audio characteristics (highest priority) to least specific audio characteristics (lower priority).
	<i>Note</i> : If the priority you select is listed as "in use," then all rule priorities will be shifted down priority level when changes are submitted. For example, assume audiomaps "alpha," "bravo," and "charlie" are listed as priorities 1, 2, and 3 respectively. Now assume you wish to add "foxtrot" at rule priority #1. This means that "alpha" shifts to priority 2, "bravo" shifts to priority 3, and "charlie" shifts to priority 4.
Input Codec	Select the input codec to which this rule will apply. Options are:
	<ul> <li>Any (rule will apply for any audio codec provided it matches all other conditions)</li> <li>Advanced Audio Coding Low-Complexity (AAC-LC)</li> <li>Advanced Audio Coding Low-Complexity + SBR (AAC-HE)</li> <li>Dolby Digital (AC-3)</li> </ul>
	<ul> <li>Advanced Audio Coding Low-Complexity + SBR + PS (AAC-HEv2)</li> <li>Dolby Digital Plus (E-AC-3)</li> </ul>
Input Channels	Select the number of input channels to which this rule will apply. Options are:
	<ul> <li>Any (rule will apply for any number of audio channels provided it matches all other conditions)</li> </ul>
	• Mono
	Stereo
Audio Ritrato Low	5.1 Surround     Enter the lowest input audie bit rate for which the rule will apply. Acceptable value
Audio Biliale Low	is any number between 0 and 24500000 bps.
	<i>Note</i> : If you want the rule to apply to an input track of any bit rate range, enter 0 here and 640000 in the <b>Audio Bitrate High</b> field.
Audio Bitrate High	Enter the highest input audio bit rate for which the rule will apply. Acceptable value is any number between 8000 and 24500000 bps.
	<i>Note</i> : If you want the rule to apply to an input track of any bit rate range, enter 640000 here and 0 in the <b>Audio Bitrate Low</b> field.
Language	Enter the language of the audio track for which this rule will apply.
	<ul> <li>This field may contain only 3 characters and must comply to the <u>ISO639-2</u> language code standard.</li> </ul>
	• The code "any" is a valid entry option and will apply the rule to an audio track of any language.
Output Publishing Type	Select the type of audio output that will be published when all input conditions have been met. Choices are: <b>Primary</b> , <b>Primary+AudioOnly</b> , <b>AudioOnly</b> , <b>Drop</b> .
	See Table 39 on page 94 for a detailed description of these publishing types and how they may vary based on player.

Table 40. A	Adding	an	audio	map	rule
-------------	--------	----	-------	-----	------



## **Managing Audio Maps**

This section describes tasks associated with managing existing audio map templates and rules, including removing audio maps, viewing audio map properties, and modifying audio map characteristics.

#### **Remove an Audio Map Template**

To remove an audio map template and all its rules from Packager, proceed as follows:

- **1.** From the **Configuration** tab, click through to **configuration** >> **audiomap** >> **remove**.
- 2. Select the name of the audio map to remove from the drop-down list.
- 3. Click Submit.

The audio map and its rule set are removed.

#### **Remove an Audio Map Rule**

To remove a specific audio map rule from a template, proceed as follows:

- 1. From the **Configuration** tab, click through to **configuration** >> **audiomap** >> **rule** >> **remove**.
- 2. Select the name of the audio map to remove from the drop-down list.
- 3. Click Submit.

The audio map and its rule set are removed.

#### Modify an Audio Map Rule

**Caution!** When modifying an audio map that JITP uses, the asset cache will be flushed and ongoing playback may fail and need to be restarted. It is advisable to perform this action only during a scheduled maintenance window.

To modify characteristics for an existing audio map rule, proceed as follows:

- **1.** From the **Configuration** tab, click through to **configuration** >> **audiomap** >> **rule** >> **modify**.
- 2. Select the Name and Priority of the audio map you wish to modify from the drop-down list.

Dashboard Configuration	Reports System							
💀 💀 System Status	Just-In-Time Packaging			Input/Output		Connection		
configuration     audiomap     add     remove	<b>configuration &gt;</b> This method modifies a ru conditions are met.	<pre>configuration &gt;&gt; audiomap &gt;&gt; rule &gt;&gt; modify This method modifies a rule to determine how an output audio track will be published when all specified input audio conditions are met.</pre>						
add remodify remove show	Name Priority	aac-lc_2ch_44kb_96kh aac-lc_2ch_44kb_96kh passthrough chk new_bysteve none	Z 💌	[text, max. length o identifier. Rule priority; an inpu one rule. (Selecting use" will shift all r the next available	of 23] User def ut track can on g a priority th ule priorities e priority.)	ìned ly match bat is "in down to		
⊡input	Input Codec	any	•	Input audio codec.				

- **3.** Modify the **input audio characteristics** (codec, channels, bitrate range, & and language) and the **Output Publishing Type** as desired.
- 4. Click Submit.





**Note:** Once you have assigned a rule priority to a set of audio characteristics, you cannot change the priority of those characteristics, however, you can change the audio characteristics to match the desired priority.

### Show Audio Maps and Rules

To view configured audio maps and their rules, proceed as follows:

- **1.** From the **Configuration** tab, click through to **configuration** >> **audiomap** >> **show**.
- 2. Select the specific Name of the audio map to view or All from the drop-down list.

#### 3. Click Submit.

The audio map(s) and rule priority characteristics are displayed as seen below:

Dashboard	Configuration Reports	s System					
🖶 System Status	Just-In-Time	Packaging	Packaging Ha	ardware	Input/Output	Events	Connection
ë∵configuration ⊡∵audiomap	<b>configu</b> This method	uration >> d displays audio ma	audiomap >> st apping rule sets for use in w	10W orkflows			
Trule Show		Name te	st_3rules	•	[text, max. length o	f 23] Audio map	name
⊕ jitp ⊕ output ⊕ package		S	ubmit				
± session	Name	rules	1				
	test_3rules	Priority	Input		Output Pub	lishing Type	
		1	Input Codec	aac_lc(2)	Primary(0)		
			Input Channels	any(0)			
			Audio Bitrate Low	0			
			Audio Bitrate High	128000		Primary+AudioOnly(2)	
			Language	eng			
		2	Input Codec	aac_he(11)	Primary+Aud		
			Input Channels	any(0)	-		
			Audio Bitrate Low	48000			
			Audio Bitrate High	56000			
			Language	eng			
		3	Input Codec	eac3(30)	Drop(3)		
			Input Channels	any(0)	-		
			Audio Bitrate Low	380000	-		
			Audio Bitrate High	640000			
			Language	any			
		4	Input Codec	eac3(30)	Primary(0)		
			Input Channels	any(0)			
			Audio Bitrate Low	0			
			Audio Bitrate High	320000			
			Language	any			

## Linear vs. JITP Audio Map Behavior

This section describes differences between linear packaging audio map behavior and JIT packaging audio map behavior.

## Linear Audio Map Behavior

When you configure an audio map rule for linear packaging, you will associate a specific rule with a package. When you start the package, *Packager* will expect to receive an input audio track that matches at least one audio map rule configured as Primary. If there is no input audio track that matches at least one primary audio map rule, packaging will not occur when the package is started. This status can be seen by executing a **configuration >> package >> show** command from the menu.

Dashboard Configuration	Report									
🔺 System Status		e Packa	ging Pa	ckaging		Input/0			Section 2010	
⊡-configuration ⊟-audiomap ⊡add	configuration >> package >> show This method shows the configuration of a package.									
⊤remove □ rule □ add □ modify		Package Disp	e ID hls-01 blay status		T	Package	ID (0=all). information	desired.		
show remove show remove show remove show remove show			Submit					<b></b>		
⊡ routput	Package ID	Name	Package Type	Package Mode	Administrative State	Operational State	Output Stream	Status		
-add ⊕∵config	2	hls-01	Apple HTTP Live Streaming(1)	live(1)	started(1)	disabled(1)		No primary audio found in input sti 1 using audiomap	etrack ream group o spa-test	

#### **JITP Audio Map Behavior**

When you configure an audio map rule for JIT packaging, you will apply this rule when creating a JITP profile. When a JITP session is requested, *Packager* will expect to have an input audio track that matches at least one audio map rule configured as the primary. If there is no input audio track that matches at least one primary audio map rule, Packager will determine a primary audio track according to the following rules (bullets are listed in order of priority starting with highest priority):

- If at least one audio track is AAC-LC, the primary audio will be AAC-LC and the bitrate will be the highest available of all AAC-LC tracks.
- If no AAC-LC, but at least one is HE-AAC, the primary track will be HE-AAC, and the bitrate will be highest available of all HE-AAC.
- If no AAC-LC **and** no HE-AAC, **and if** all tracks are E-AC-3 (DD+), the primary track will be E-AC-3 and the bitrate will be highest available of all E-AC-3.

# **Global Start Time Delay (Optional)**

*Packager* provides the ability to optionally modify the minimum delay between the initiation of each package's session when multiple packages are started at the same time. This feature is useful in the event of a network outage or a system reboot in order to avoid overloading a remote file server will a burst of packages beginning at the same time. In this sense, *Packager* acts as a traffic meter for consistent traffic flow.

To configure Packager's start time delay, proceed as follows:

1. From the **Configuration** menu, click through to **configuration** >> **package** >> **config** >> **mod**-**ify**.



- 2. Enter a number between 1 and 30, which represents the delay in seconds to occur between each started package.
- 3. Click Submit.

Dashboard Configurat	ion Reports System				
🛛 🖶 System Status	Just-In-Time Packaging			Input/Output	Connection
Configuration input jitp	configuration >> This method modifies the pac	package >	> config >>	modify	
B output	Start Delay 1			[numeric, min. value = : Delay in seconds betw of all those in 'started'	1, max. value=30] een each package start admin state
modify	s	Submit			

# **Configuring Global Output Formats**

You can set parameters that define delivery of various outputs on a global scale for either linear packaging or JITP, or both. In this release, the following output formatting options are available: MPEG-TS Dash, Adobe HDS manifest file structure, linear and JITP HTTP Header values, Apple HTTP Live Streaming (HLS) structure, ad signaling, closed captioning, and thumbnail support.

This section contains the following sub-sections:

- Dash Output Configuration
- HDS Output Configuration
- HTTP Header Configuration (Linear and JITP)
- HLS Output Configuration
- Closed Captioning
- Thumbnail Output Configuration

#### **Dash Output Configuration**

This option configures global parameters for manifest files and content packaged for MPEG-DASH (dynamic adaptive streaming over HTTP) player output. Output format configuration in this menu only applies for linear Dash packaging (MPEG Dash TS - HTTP File Format).

#### **Configuring Dash Output Format**

To configure Dash output format:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **dash** >> **modify**.
- 2. Provide the information according to Table 41 and click Submit.



**Caution!** Modifying Dash Output Format options will impact services: All linear and JITP packages using this protocol will be restarted<sup>1</sup>.



<sup>1.</sup> If you are only modifying the *Expired Content Retention* duration, the protocol will not be restarted.

Dashboard Configuration	Reports System					
🔡 System Status	Just-In-Time Packaging	Packaging	Hardware	Input/O	utput Events	Connection
Configuration     draudiomap     input     drectory     group	configuration >> This method modifies the line outputs generated from inpu NOTE: If package-level redu redundancy group.	• output >> 1 ear MPEG-Dash (HTTP it streams to restart! indancy is in use, all co	Format >> da -File-Format) configur  onfiguration paramete	ationChan ers in this men	nodify ging this table will cause all MPA u must match on both Package	EG-Dash (HTTP-File-Format) rs in the same N+1
add 	Segment Timeline Trick Play Ad Signaling Expired Content Retention	both(3) none(0) false 12 Submit		▼ C S ▼ t V U U U	Content to generate based on t egment, IDR, RAI). Sienerate an I-frame adaptation rack. Include ad signaling in manifest numeric, min. value=0, max. v uration (seconds) to keep on d ut of the manifest.	he main timeline (EBP 1 for each video alue=300] Content Isk after it has aged

Table 41. Configure DASH output

Field	Description
Segment Timeline	Describes, in the manifest file, whether the type of content being generated is based on the main segment timeline (EBP segment, IDR, or RAI) for a particular package. Choices are:
	muxed(1)—Audio and video content is being delivered together
	unmuxed(2)—Audio and video content is being delivered separately
	both(3)—A mix of muxed and unmuxed audio and video content is being delivered.
Trick Play	Describes, in the manifest file, whether the video content will contain IDR frames for the purpose of trick play (fast-forward, rewind, etc.) and which method is being used for I-Frame to IDR-Frame adaptation. Choices are:
	none(0)—No trick play adaptation will be used
	segment(1)—Trick play adaptation will contain the starting IDR of each segment
	idr(3)—Trick play adaptation will contain every IDR frame
Ad Signaling <sup>a</sup>	Specifies whether to include ad signaling markers in the manifest file in order to support SCTE-35 ESAM cues.
	Select <b>true</b> to include ad signaling markers. Select <b>false</b> to exclude ad signaling markers.
Expired Content Retention	Specifies how long to keep content on the output storage device after it has aged out of the manifest.
	<ul><li>Value is in seconds, with a range of 0 to 300.</li><li>Default is 22.</li></ul>
	Enter 0 to delete content immediately upon aging out.

a. In order for *Packager* to perform ad insertion signaling, the relevant input group stream must be enabled to pass data PIDs in the **Configuration** tab, and POIS must be enabled in the **System** tab. Additionally, the input stream (from the transcoder) must be conditioned with its own interaction to POIS for SCTE-35 and *Packager* must interact with the same POIS for SCTE-35 manifest markup.

## Show DASH Output Format

To view configuration for DASH streaming:

1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **dash** >> **show**.



2. Click Submit to view results.

Dashboard Configuration	Reports System					
🐺 System Status						Connection
ট configuration 현 audiomap 다input	configuration >> This method shows the linear	output >> f MPEG-Dash (HTTP-F	ormat >> da ile-Format) configurat	ash >> show		
⊕ directory ⊖ group −add −modify − remove	Subm	it				
show	Segment Timeline				both(3)	
⊡ stream	Trick Play				none(0)	
add	Ad Signaling				false(0)	
modify	Expired Content Retentio	n			12	
redetect	-					

## **HDS Output Configuration**

This feature provides a global configuration table that defines how HDS player outputs are generated (specifically the manifest files), for linear and JIT packaging.

This software release supports three types of HDS manifest formats:

- HDS Version 1 Initial HDS manifest file version.
- HDS Version 2 supports live DVR rolling windows in the manifest file.
- HDS Version 3— incorporates version 2 additions as well as: digital ad signaling and blackout markers (for SCTE-35 ESAM), multiple audio codecs and bit rates in the manifest file, and multi-level manifests.

When selecting HDS Version 3, you are provided with the option to enable or disable the inclusion of ad signaling in the manifest file.



**Note:** VOD is currently not supported in HDS Version 3 mode.

## **Configuring HDS Output Format**

To configure HDS output format:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **hds** >> **modify**.
- 2. Provide the information according to Table 42 and click Submit.



**Caution!** Modifying HDS Output Format options will impact services: All linear and JITP packages using this protocol will be restarted.



Dashboard Configuration	Reports System					
🖶 System Status						Connection
⊡-configuration ⊡-audiomap ⊕ input	configuration >> This method modifies the HD	• output >> f	ormat >> hds	<b>S &gt;&gt; MO(</b> e will cause all F	<b>dify</b> HDS outputs generated from in	put streams to restart!
<ul> <li>⊕ jitp</li> <li>⊖ output</li> <li>⊕ directory</li> <li>⊖ format</li> <li>⊕ dash</li> <li>⊖ hds</li> </ul>	Version Expired Content Retention	2 12 Submit		Pro     [n.     du     ou	otocol version to generate. umeric, min. value=0, max. val ration (seconds) to keep on dis t of the manifest.	ue=300] Content ik after it has aged

#### HDS output format: version 2 (above); version 3 (below)

Dashboard Configuration	Reports System					
🔡 System Status	Just-In-Time Packaging	Packaging	Hardware	Input/	Output Events	Connection
⊡-configuration ⊕-audiomap ⊕ input	configuration >> This method modifies the HD	• output >> f	format >> ho	<b>ds &gt;&gt; n</b> ole will cause	<b>10dify</b> all HDS outputs generated from	input streams to restart!
i jitp ⊡output	Version	3		•	Protocol version to generate.	
format	Ad Signaling	false		•	Include ad signaling in manifes	t
i dash □ hds	Multi-Level	false		•	Multi-Level manifest	
modify	License Rotation	false		•	Enable license rotation	value=2001 Content
theaders     the the the the the the the the the	Expired Content Retention	12			duration (seconds) to keep on out of the manifest.	disk after it has aged
B-subtitle B-thumbnail		Submit				

Table 42. Configure HDS output.

Field	Description
Version	Select which protocol version of HDS to generate (Version 1, 2, or 3).
	Versions 1 and 2 are earlier versions of HDS. When Version 3 is selected, the <b>Ad Signaling</b> and <b>Multi-Level</b> fields appear below it. Default is 2.
	Note: HDS Version 3 currently does not support VOD output.
Ad Signaling <sup>a</sup>	Specifies whether to include ad signaling markers in the manifest file in order to support SCTE-35 ESAM cues.
	Select <b>true</b> to include ad signaling markers. Select <b>false</b> to exclude ad signaling markers.
	This field only appears when the <b>Version</b> field is set to <b>3</b> .
	Default is <i>false</i> .
Multi-Level	Select <b>true</b> to enable different bootstrap sections (manifest file hierarchies) being included in the same f4m manifest file.
	Select <b>false</b> to disable the inclusion of manifest file hierarchies in the f4m file.

Field	Description
License Rotation <sup>b</sup>	Select true if the content is using license rotation protocol for encryption.
	Select false if the content is not using license rotation protocol for encryption.
Expired Content Retention	Specifies how long to keep content on the output storage device after it has aged out of the manifest.
	Value is in seconds, with a range of 0 to 300.
	Enter <b>0</b> to delete content immediately upon aging out.

Table 42. Configure HDS output.

a. In order for *Packager* to perform ad insertion signaling, the relevant input group stream must be enabled to pass data PIDs in the **Configuration** tab, and POIS must be enabled in the **System** tab. Additionally, the input stream (from the transcoder) must be conditioned with its own interaction to POIS for SCTE-35 and *Packager* must interact with the same POIS for SCTE-35 manifest markup.

b. License Rotation is different from Key Rotation. With key rotation, the client has one key that is used to decrypt rotating encryption keys sent during the stream playback. With license rotation, multiple encryption keys are exchanged during the stream playback, effectively forcing the client to continually request new license keys in order to continue receiving the content.

## **Show HDS Output Format**

To view configuration for HDS streaming:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **hds** >> **show**.
- 2. Click Submit to view results.

Dashboard Configuration	Reports System	
🖶 System Status		S S Connection
⊖ configuration ⊕ audiomap ⊕ input	<b>configuration &gt;&gt; output &gt;&gt; format &gt;&gt; hds &gt;&gt; show</b> This method shows the HDS format configuration.	
B jitp output directory format dash	Submit	
modify	Version	2
show	Ad Signaling	false(0)
🖻 hds	Multi-Level	false(0)
modify	License Rotation	false(0)
show theaders	Expired Content Retention	12

## HTTP Header Configuration (Linear and JITP)

An HTTP header is the portion of packaged content that contains key identification information about the requested content, such as if the content has been modified since the last request, whether and when the freshness of the content is set to expire, and additional headers defined within the HTTP 1.1 specification.

Various cache control and custom headers that help identify the *Packager* have been made configurable to assist devices that consume packaged content. This information is used by either origin servers or Web cache servers in order to deliver content and determine its freshness. A Web cache allows for faster content delivery while conserving valued bandwidth so that when a request for unchanged content is received, the web cache can deliver it directly to the client without the origin server having to redeliver the content. Using a Web cache requires the ability to decipher and configure HTTP headers.



*Packager* provides the ability to configure caching and other HTTP headers when delivering content for both linear and JITP packaging. The nature of MBR content requires that extra care be taken when crafting caching rules. For example, you may wish to create different caching configurations for segments over manifests. Additionally, you may wish to configure header parameters based on the type of package on the output (HLS, MSS, or HDS) or based on the package mode (i.e., live or VOD). The *Packager* provides the flexibility to customize the following HTTP version 1.1 header categories:

- Expires & Cache-Control Header
- Etag Header
- Source-Server Header (only applies to JITP)
- Server-ID Header

## **Expires & Cache-Control Header**

The Expires and Cache-Control header category allows configuration of 3 separate headers and is designed to reduce network load in two significant ways:

- Guaranteeing to the requestor that content will not change until a stated expiration time;
- Allowing the requestor to determine whether content has changed before the expiration time.

The 3 headers that perform the actions above are stated and described as follows:

- Expires—Provides the date and time after which the response is considered stale. This header can be generated based on when content (files) was last accessed or when it was last modified. Example: Expires: Wed, 12 Dec 2012 23:35:18 GMT
- 2. Last-Modified<sup>2</sup>—Specifies the last modified date for the requested content in <u>RFC 2822</u> format. <u>Example</u>: Last-Modified: Wed, 12 Dec 2012 18:55:47 GMT
- **3. Cache-Control**—Used for HTTP 1.1, this requires that validation occur between cache server and origin server before a cache response is delivered. This header may be ignored by some cache servers and browsers; as such, the HTTP 1.0 **Expires** header can perform the same validation function. <u>Example</u>: Cache-Control: max-age=0 (Where max-age = number of seconds).

#### Guidelines For Configuring Expires & Cache Control.

- Consider your package configuration before setting the expiration time. For example, VOD assets can have a much longer expiration time than live assets.
- Live content expiration time should not be any longer than the play list lifespan.
- Live content *manifest* expiration time should be shorter than the play list lifespan (for example, 1 second) because of how often it will be updated in live packaging mode.

## **Etag Header**

The Etag header is an alternative to and a more reliable method than using timestamps when comparing the differential of content changes. Due to network latency and time synchronization differences, a timestamp may vary. An Etag is considered a strong validator, and conveys through <u>numeric representation</u> whether the content has changed from the last time it was requested and served. If an Etag value matches from one response to another, then the content's freshness has not expired and an HTTP 304 (Not modified) response is returned. If an Etag value does not match, then the HTTP request for new content is forwarded to the origin server for fulfillment.



<sup>2.</sup> The Last-Modified header is automatically included within the Expires & Cache-Control header in the event some cache servers use this value. It is not directly configurable from the *Packager* GUI, but it is included here for descriptive purposes.

#### How an *Etag* value is obtained.

The Etag value is given in the initial content response that is delivered to the requestor. When a new request is sent to the server, an additional validator of requesting whether the Etag value is the same as the original is sent in the request. If the response contains the same number, no new content will be delivered from the origin server. An example of this behavior is shown below:

#### 1. Original Content Request

```
GET RGBPkg/audio_eng=126000-adobe708_CC1=18000-video=2229611.bootstrap HTTP/1.1
User-Agent: curl/7.22.0 (x86_64-pc-linux-gnu)
Host: v6-11
Accept: */*
```

#### 2. Server (Packager) Response

```
HTTP/1.1 200 OK
Expires: Wed, 12 Dec 2012 23:35:18 GMT
Cache-Control: max-age=0
Content-Type: application/octet-stream
Accept-Ranges: bytes
ETag: "3016389868"
Last-Modified: Wed, 12 Dec 2012 18:55:47 GMT
Content-Length: 1426
Date: Wed, 12 Dec 2012 23:35:18 GMT
Server: RGB Networks TA Packager
```

Connection #0 to host v6-11 left intact Closing connection #0

Now that the Etag value is known, the same request is sent with the *If-None-Match* validator in the header.

#### 3. Header Request

```
GET RGBPkg/audio_eng=126000-adobe708_CC1=18000-video=2229611.bootstrap HTTP/1.1
User-Agent: curl/7.22.0 (x86_64-pc-linux-gnu) libcurl/7.22.0 OpenSSL/1.0.1 zlib/
1.2.3.4 libidn/1.23 librtmp/2.3
Host: v6-11
Accept: */*
If-None-Match: "3016389868"
```

#### 4. Server (Packager) Response

```
HTTP/1.1 304 OK
Content-Type: application/octet-stream
Accept-Ranges: bytes
ETag: "3016389868"
Last-Modified: Wed, 12 Dec 2012 18:55:47 GMT
Date: Fri, 14 Dec 2012 15:37:29 GMT
Server: RGB Networks TA Packager
```

Guidelines For Configuring Etag.



- Consider the Etag Basis when configuring parameters. The Etag basis is the attribute of the file that will be used to generate the numeric value.
- Linear packaging allows an Etag basis of file inode, last modified time, or file size.
- JITP requires that you use the **Application specific** option, which uses a customized method to validate Etag changes.

## Source-Server Header

This header only applies to JITP. It allows the content requester to know the source server that was used to created the JITP content. This value is taken from the **Hostname** field in the JIT *Packager's* **configuration** >> **jitp** >> **source** >> **show** menu.

#### Server-ID Header

The Server-ID header allows for a global Server Identification number that will be used to identify the source server from where the request originated. Enabling this field is a system-wide setting and will apply to every header request from the *Packager*.

## **Configuring HTTP Headers**

To configure HTTP headers in *Packager*, proceed as follows:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **headers** >> **modify**.
- **2.** Use the information provided in Table 43 on page 111 to configure each header field. Refer to the preceding HTTP Header Configuration (Linear and JITP) section for details on this feature.
- 3. Click Submit.

The following screens show the output format header menus for each **Header Name**. You can scroll through each menu, or jump to the one you want to see from here:

Etag Expires & Cache-Control Source-Server Server-ID



Dashboard Configuration	Reports System	n					
System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection	
⊡ <sup>.</sup> configuration input ijitp	configuration >> output >> format >> headers >> modify This method is used to configure headers and values for HTTP package delivery.						
output     directory     format     for	Header Name	Etag	The header name that will be included in HTTP requests. Some headers may only apply to particular package types and operational modes. Refer to the documentation for more information.				
	Operational Mode	Both	•	Apply configuration to Just-in-time or Linear packaging.			
	Package Type	All Packages		Select package type.			
	Package Mode	Both		Select package mode.			
	Request Type	Both		Select manifest or segment requests.			
	Enable Header	Disable	•	Enable or disable he combination (i.e., h package type, pack type).	inable or disable headers for specified combination (i.e., header, operation mode, vackage type, package mode, and request ype).		
	Etag Basis	Application-Specific - JF	TP 💌	Select the attribute the Etag header ha	that is used to d sh.	etermine	
		Submit					


Dashboard Configuration	Reports Syste	em				
🔜 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
e audiomap input	configuration > This method is used to co	>> output >> for nfigure headers and values	rmat >> hea for HTTP package del	ders >> mod	lify	
⊕ jitp □ output □ directory □ format	Header Name	Expires & Cache-Control		The header name th requests. Some hea particular package to modes. Refer to the information.	at will be include ders may only a ypes and opera documentation	ed in HTTP pply to tional for more
⊡•hds ─modify	Operational Mode	Just-in-time		Apply configuration packaging.	to Just-in-time (	or Linear
show	Package Type	All Packages	•	Select package type		
□ headers 	Package Mode	Both	•	Select package mode	e.	
show	Request Type	Both	-	Select manifest or se	egment request	5.
this     modify     show     subtitle	Enable Header	Disable		Enable or disable he combination (i.e., he package type, packa type). If the configu subset of the combin	aders for specif ader, operatior age mode, and i iration does not nation selected,	ied 1 mode, request apply to a it will be
€rstream				ignored.	,	
package session	Expiration Basis	Last accessed time		Select the attribute the expiration time f supports "Last access is not configurable for Streaming.	that is used to o or a resource. ssed time." Expi or linear Microso	letermine ITP only ration basis ft Smooth
	Expire Time	0		[numeric, min. value value=31622400] N resource expires rela selected. Set to 0 if Cache-Control head	=0, max. umber of secon ative to the exp not configuring ers.	ds before iration basis Expires &
	Stale-If-Error Time	0		[numeric, min. value value=31622400] Ti content may still be cachedeven if the long as the clients ": that this value. Set the "stale-if-error" di control header serve should be greater th and is in seconds. Th applicable to just-in-	=0, max. his value indicat used by the clie server returns : stale-if-error" so to 0 to prevent incetive in the c er response. Th han the expire ti his directive aging.	es that the nt if an error-as etting is less the use of ache- e value me if used nly
		Submit		that this value. Set i the "stale-if-error" d control header serve should be greater th and is in seconds. Th applicable to just-in-	to u to prevent irrective in the c er response. Th an the expire ti his directive is o time packaging.	rne use of ache- e value me if used nly



#### Source-Server

Dashboard Configuration	Reports Syste	m Packaging	Hardware	Input/Output	Events	Connection
Configuration	configuration > This method is used to cor	•> output >> f nfigure headers and value	ormat >> hea es for HTTP package de	ders >> mod	ify	
B jitp Poutput D directory P format	Header Name	Source-Server		The header name the requests. Some head particular package ty modes. Refer to the information.	at will be include lers may only a pes and operat documentation	ed in HTTP pply to tional for more
⊡•hds ──modify	Operational Mode	Just-in-time	•	Apply configuration t packaging.	o Just-in-time o	or Linear
show	Package Type	All Packages	-	Select package type		
⊡ headers modify	Package Mode	Both	•	Select package mode	e.	
show	Request Type	Both	-	Select manifest or se	gment request:	5.
B - subtite B - stream	Enable Header	Disable		Enable or disable hea combination (i.e., he package type, packa type). If the configu subset of the combin ignored.	aders for specifi ader, operation ge mode, and r ration does not ation selected,	ied mode, equest apply to a it will be
D'session		Submit				

#### Server-ID

Dashboard Configuration	Reports System	n				
System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
in configuration in audiomap in input	<b>configuration &gt;</b> This method is used to cor	> output >> for a second secon	ormat >> hea es for HTTP package de	ders >> mod	ify	
⊕ jitp ⊖output ⊕ directory	Header Name	Server-ID	•	The header name the requests. Some hear particular package ty modes. Refer to the	at will be include ders may only a /pes and operat documentation	ed in HTTP pply to ional for more
□ format □ hds □ modify	Enable Header	Disable	×	information. Enable or disable here combination (i.e., here package type, package type). If the configu	aders for specifi ader, operation age mode, and r	ed mode, equest
snow ⊡ headers ⊡ modify	Identifier			subset of the combin ignored. [text] String used to	identify the sou	it will be
show ⊡ this				HTTP requests. If se for all requests for t	t, this value wil ne server-id hea	be used ader.
show		Submit				



Field	Description
Header Name	Select the name of the header that will be included in HTTP requests. Selecting a name from this field does not limit the HTTP request to containing <i>only</i> this header; it is an inclusive setting and can be added to other header names in this drop-down box for any number of Package Types.
	Choices are:
	<b>Etag</b> —A numeric value that represents whether content has been changed between the last HTTP request and the current one.
	<b>Expires &amp; Cache-Control</b> <sup>a</sup> —Uses a date value to validate whether content has been changed from the last HTTP request and the current one. Expires is included with Cache-Control in the event that a device does not recognize Cache-Control as a header.
	<b>Source-Server</b> —Allows the content requester to validate content against the source server used to created Just-In-Time content. Applies to JITP only.
	<b>Server-ID</b> —Adds a header that will be used to identify the source server from where the request originated. Enabling the inclusion of this header will add the name to every header for the <i>Packager</i> system-wide.
Operational Mode	Select which type of packaging to which the header should be added. Choices are:
	Linear Packaging—the header name will be added for only linear packaged content. Just-in-time—the header name will be added for only JITP content Both—the header will be added for both linear and JITP content
Package Type	Select the type of packaging to which the header should be added. Choices are:
	All Packages Adobe HTTP Dynamic Streaming Apple HTTP Live Streaming Microsoft Smooth Streaming MPEG Dash
Package Mode	Select the mode of packaging to which the header should be added. Choices are:
	Live packaging On-Demand Both live and on-demand
Request Type	Select the type of request to which the header should be added. Choices are:
	Segment—Will only add the header to segment header requests Manifest—Will only add the header to manifest header requests Both—Will add the header to both segment and manifest requests
Enable Header	Select whether to <b>Disable</b> or <b>Enable</b> the header combination chosen in all preceding fields (Header Name, Operational Mode, Package Type, Package Mode, and Request Type)
Expiration Basis	Select the attribute of the <i>Expires &amp; Cache-Control</i> header against which an expiration validation of will occur. Choices are:
(For Expires & Cache-Control	Last accessed time—The expiration validation will be based on the last time the content was accessed by the requestor.
headers only)	Last modified time—The expiration validation will be based on the last time the content was modified by the originator.

Table 43. HTTP Header configuration



Field	Description					
Etag Basis	Select the file attribute that is used to determine the <i>Etag</i> header hash (the number value). Choices are:					
(For <i>Etag</i> headers	<b>Application-Specific - JITP</b> —For JITP only. This basis is the only available option for JITP.					
Unity)	<b>File inode - Linear Packaging</b> —Etag basis is determined by validating the index node of the file <sup>b</sup> . Applies to linear packaging only					
	<b>File modified time - Linear Packaging</b> —Etag basis is determined by validating the last time the content was modified. Applies to linear packaging only.					
	File size - Linear Packaging—Etag basis is determined by validating the size of the requested file.					
Expire Time	Enter the number of seconds before the resource will expire relative to the type of Expiration Basis selected (Last accessed or Last modified).					
(For Expires &	Enter an integer value between 1 and 31622400.					
Cache-Control header only)	An entry of 0 will cause this value to be ignored.					
	Note: This field only applies to Expires & Cache-Control headers.					
Stale-If-Error Time	For JITP only.					
(For Expires & Cache-Control	If the client's "stale-if-error" setting is less than the value entered here, then the content may still be used by the client <i>if</i> the content is cached, even if the server returns an error.					
header only)	<ul> <li>Value is in seconds and should be greater than the Expire Time.</li> </ul>					
	<ul> <li>Range is from 0 - 31622400</li> </ul>					
	<ul> <li>To disable using the "stale-if-error" directive in the cache-control header server response, set this value to 0.</li> </ul>					
Identifier	Enter an alphanumeric identifier string that will be used to identify the source of HTTP					
(Applies to Server- ID headers only)	requests. If set, this value will be added to all Server-ID headers.					

Table 43. HTTP Header configuration

a. Expires & Cache-Control is supported for all Linear package types except MSS. Expires headers are included for MSS but they are not configurable. These headers can also be enabled or disabled for ALL JITP package types but the values cannot be modified. If enabled for JITP, the expiration time will be based on the Last accessed time + 1 second.

b. An inode defines the data structure of the Linux server; it stores all information about a file system (ownership, permissions, access modes) except for the data content and file name.



# **Viewing HTTP Header Configuration**

To view HTTP header configuration that has been applied to the *Packager*, click the Configuration tab, and click through to **configuration** >> **output** >> **format** >> **headers** >> **show**.

Header Name	Configuration						
Etag	Package Type	Package Mode	Request Type	Operational Mode	Enabled	Etag Basis	
	Adobe HTTP Dynamic Streaming	Live	Manifest	Just-in-time	True	Application-Specific - JITP	
	Adobe HTTP Dynamic Streaming	Live	Segment	Just-in-time	True	Application-Specific - JITP	
	Apple HTTP Live Streaming	Live	Manifest	Just-in-time	True	Application-Specific - JITP	
	Apple HTTP Live Streaming	Live	Segment	Just-in-time	True	Application-Specific - JITP	
	Microsoft Smooth Streaming	Live	Manifest	Just-in-time	True	Application-Specific - JITP	
	Microsoft Smooth Streaming	Live	Segment	Just-in-time	True	Application-Specific - JITP	
	Adobe HTTP Dynamic Streaming	On-Demand	Manifest	Just-in-time	True	Application-Specific - JITP	
	Adobe HTTP Dynamic Streaming	On-Demand	Segment	Just-in-time	True	Application-Specific - JITP	
	Apple HTTP Live Streaming	On-Demand	Manifest	Just-in-time	True	Application-Specific - JITP	
	Apple HTTP Live Streaming	On-Demand	Segment	Just-in-time	True	Application-Specific - JITP	
	Microsoft Smooth Streaming	On-Demand	Manifest	Just-in-time	True	Application-Specific - JITP	
	Microsoft Smooth Streaming	On-Demand	Segment	Just-in-time	True	Application-Specific - JITP	
	Adobe HTTP Dynamic Streaming	Live	Manifest	Linear Packaging	True	File modified time - Linear F	ackaging
	Adobe HTTP Dynamic Streaming	Live	Segment	Linear Packaging	True	File modified time - Linear F	ackaging
	Apple HTTP Live Streaming	Live	Manifest	Linear Packaging	True	File modified time - Linear F	ackaging
	Apple HTTP Live Streaming	Live	Segment	Linear Packaging	True	File modified time - Linear P	ackaging
	Microsoft Smooth Streaming	Live	Manifest	Linear Packaging	True	File modified time - Linear P	ackaging
	Microsoft Smooth Streaming	Live	Segment	Linear Packaging	True	File modified time - Linear P	ackaging
	Adobe HTTP Dynamic Streaming	On-Demand	Manifest	Linear Packaging	True	File modified time - Linear P	ackaging
	Adobe HTTP Dynamic Streaming	On-Demand	Segment	Linear Packaging	True	File modified time - Linear P	ackaging
	Apple HTTP Live Streaming	On-Demand	Manifest	Linear Packaging	True	File modified time - Linear F	ackaging
	Apple HTTP Live Streaming	On-Demand	Segment	Linear Packaging	True	File modified time - Linear F	ackaging
	Microsoft Smooth Streaming	On-Demand	Manifest	Linear Packaging	True	File modified time - Linear F	ackaging
	Microsoft Smooth Streaming	On-Demand	Segment	Linear Packaging	True	File modified time - Linear P	ackaging
Expires & Cache-Control	Package Type	Package Mode	Request Type	Operational Mode	Enable	d Expiration Basis	Seconds
	Adobe HTTP Dynamic Streaming	Live	Manifest	Linear Packaging	True	Last access time	1
	Adobe HTTP Dynamic Streaming	Live	Segment	Linear Packaging	True	Last access time	10
	Apple HTTP Live Streaming	Live	Manifest	Linear Packaging	True	Last access time	1
	Apple HTTP Live Streaming	Live	Segment	Linear Packaging	True	Last access time	10
	Adobe HTTP Dynamic Streaming	On-Demand	Manifest	Linear Packaging	True	Last access time	86400
	Adobe HTTP Dynamic Streaming	On-Demand	Seament	Linear Packaging	True	Last access time	86400

# Resetting HTTP Headers in Packager

To reset the HTTP headers back to default configuration, you must do so through the *Packager's* command line interface (CLI) by running the following command in the /opt/ripcode/bin directory:

/opt/ripcode/bin/reset\_db.sh



**Warning:** Initiating this command will reset all postgresql data statistics.

# **HLS Output Configuration**

This feature provides a global configuration table that defines how HLS segment file outputs are generated, which versions of HLS are used, and whether to enable trick play when generating HLS.



# **Configure HLS Output Format**

To configure HLS streaming output format:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **HLS** >> **modify**.
- 2. Provide the information according to Table 44 and click Submit.

**Caution!** Modifying HLS Output Format options will impact services: All linear and JITP packages using this protocol will be restarted.

Dashboard Configuration	Reports Syste	em				
👭 System Status	Just-In-Time Packaging	Packaging Ha	irdware	Input/Output	Events	Connection
⊡ configuration ⊡ audiomap ⊕ input	<b>configuration &gt;</b> This method modifies the	>> output >> form HLS format configurationCha	at >> nging this	hls >> modify table may cause all HLS outp	uts to restart!	
∃jitp						
output	Version	2	•	Protocol version to generate	e. (causes restart)	
<sup>⊕</sup> directory □ format	Ignore Out-Of- Sync	false	•	Keep publishing content eve (HLS version 2 only)	en when the content is r	not IDR aligned
⊡ dash ⊡ hds	Variant Name			[text, max. length of 90] Na extension). Leave empty to	ame of the top variant p use package names. (c	laylist (without auses restart)
the	Template File Name	%stim%-%strn%-%seqn%%m	ode%.ts	[text, max. length of 99] Se %ptim%, %stim%, %strn%, Refer to documentation, lea %strn%-%seqn%%mode%	egment name template. ,%seqn%,%name%,% ave empty to use defaul %.ts	Valid keywords: .mode%, %spts%. t: %stim%-
show	Segment Time	false	•	Add a program-time tag in t	he playlists before each	segment.
⊞ subtitle ⊞ thumbnail	Keep Live Segments	false	•	Do not delete aged out live :	segments. (causes rest	art)
<sup>⊕</sup> ·stream ⊕·package	Live Immediate Stop	false	•	Immediately remove live con phasing it out.	ntent on stop instead of	gracefully
session     session     tritcher	Bit Rate Sub-Dir	false	۲	Store segments for each bit restart)	rate in a separate sub-	directory. (causes
	Ad Signaling	true	•	Include ad signaling in playlis	st	
	Expired Content Retention	22		[numeric, min. value=0, max (seconds) to keep on disk af	x. value=300] Content fter it has aged out of t	duration ne manifest.
		Submit				

Table 11	Configure	HI S	output
1 abie 44.	Configure	ாடல	oulpul.

Field	Description
Version	Select which protocol version of HLS to generate.
	Default is 2.
	When Version <b>4</b> is selected, the <b>Trick Play</b> field is displayed.
Trick Play	Specifies whether to generate an I-frame-only manifest file. This feature allows players to fast-forward and rewind.
	Select <b>true</b> to enable generation of I-frame only manifests. Select <b>false</b> to disable generation of I-frame only manifests. Default is <i>false</i> .
	This field only appears when the <b>Version</b> field is set to <b>4</b> .
Ignore Out-Of-Sync	Specifies whether to keep publishing content regardless, even if the content is not IDR-aligned. When this field is <b>false</b> , out-of-sync content will not be published. When this field is <b>true</b> , out-of-sync content will be published.
	This field only appears when the <b>Version</b> field is set to <b>2</b> .



Table 44. Configure HLS output.

Field	Description
Variant name	The name to assign to the top variant playlist. Leave this field blank to use package
	Note: This feature applies to linear packaging only
Sogmont time	True or Folge. When not to true, and according only.
Segment time	program time tag which displays the approximate wall clock time of the segment's original broadcast.
	Example: ()
	EXT-X-PROGRAM-DATE-TIME:2010-02-19T14:54:23+08:00
	EXTINF:6,1
	20120309T100226-01-1vod.ts
	EXT-X-PROGRAM-DATE-TIME:2010-02-19T14:54:29+08:00
	EXTINF:6,2
	20120309T100226-01-2vod.ts
	Note: This feature applies to linear packaging only.
Template File Name	Specifies the creation of a template to define how segment file names are constructed. The following keywords are allowed:
	<b>%ptim% =</b> Segment program time (ISO 8601:2004) <sup>a</sup>
	<b>%stim%</b> = Package start time (ISO 8601:2004) <sup>b</sup>
	%strn% = Stream number (2 digits)
	%seqn% = Segment sequence number %name% = Package name
	%mode% = Package mode ("live" or "vod")
	In addition to the above keywords, any alphanumeric or special character may be added to the syntax, with the exception of the "%" character.
	Default is set to: %stim%-%strn%-%seqn%%mode%.ts
	Example of a default filename: 20121101T103824-01-1vod.ts
	Note: This feature applies to linear packaging only.
Keep live segments	<b>True</b> or <b>False</b> . Specifies whether to delete expired live segments. If set to <b>true</b> , live segments will be kept always. If set to <b>false</b> , live segments will be deleted after an elapsed time period that is equal to twice the playlist duration.
	Note: This feature applies to linear packaging only.
Live Immediate Stop	<b>True</b> or <b>False</b> . Specifies whether live content is removed immediately upon a stop instead of gracefully phasing out. If set to true, content is removed immediately. If set to false, content is gracefully phased out.
	Default is false
Bit rate sub-dir	Whether to store segments for each bitrate in a separate subdirectory. Select <b>true</b> to store segments in separate subdirectories based on bitrate.
	Note: This feature applies to linear packaging only.
Max segments per sub-dir	Enter the maximum number of segments that will be created per sub-directory so as to avoid having too many entries in a single directory. This field is used in conjunction with the Bit rate sub-dir or the Keep live segments parameter.
	<ul> <li>This field only appears when <b>Bit rate sub-dir</b> is set to true. When segments are preserved either by generating VOD content or by enabling the <b>Keep live</b> segments field, the configuration for <b>Max segments per sub-dir</b> will take effect.</li> <li>A setting of 0 disables this feature.</li> </ul>
	Note: This feature applies to linear packaging only.



Field	Description
Ad Signaling <sup>c</sup>	Specifies whether to include ad signaling markers in the manifest file in order to support SCTE-35 ESAM cues.
	Select <b>true</b> to include ad signaling markers. Select <b>false</b> to exclude ad signaling markers.
	Default is <i>true</i> .
Mux Primary Audio V4	When <i>true</i> , all HLS V4 video output will be published with the audio track that matches the highest priority audiomap rule with an <i>Output Publishing Type</i> set to Primary (as long as the video feed contains the specified audio track).
	When false, HLS V4 video is published as video-only.
	<u>For example:</u> Assume an audiomap priority 1 rule in which the input audio codec of AAC-LC on any channel, in any language, and in the range of 12000 to 628000 bps is published as the Primary audio output. When the Mux Primary Audio V4 value is set to true, and the input video feed contains the audio track specified above, this track will then be packaged with each HLS V4 video output.
	This field only appears when the <b>Version</b> field is set to <b>4</b> .
Expired Content Retention	Specifies how long to keep content on the output storage device after it has aged out of the manifest.
	Value is in seconds, with a range of 0 to 300.
	Enter <b>0</b> to delete content immediately upon aging out.

Table 44. Configure HLS output.

a. Since %ptim% represents the program time of each segment, this number will change per segment.

b. Since %stim% represents the package start time, this number will not change per segment.

c. In order for *Packager* to perform ad insertion signaling, the relevant input group stream must be enabled to pass data PIDs in the **Configuration** tab, and POIS must be enabled in the **System** tab. Additionally, the input stream (from the transcoder) must be conditioned with its own interaction to POIS for SCTE-35 and *Packager* must interact with the same POIS for SCTE-35 manifest markup.

# **Segment Name Template Guidelines**

*Packager* allows you to customize how HLS segment files are named upon creation. In prior releases, segment names were pre-assigned by *Packager*. Any combination of the keywords described in Table 44 may be used, in addition to any combination of alphanumeric or special characters up to 99 characters. The "%" character is reserved only for delineating the start and end of a keyword.

The diagram below provides an explanation of the default naming structure that *Packager* uses for the **Template File Name** field:

#### %stim%-%strn%-%seqn%%mode%.ts%



To allow for maximum flexibility, *Packager* does not demand a particular combination of keywords or characters. As such, care must be taken by the operator in order to ensure a unique naming structure



so as not to overwrite existing segment names. RGB recommends using a combination of <code>%seqn%</code> or <code>%ptim%</code> in the template in order to maintain file uniqueness. An example of this would be:

```
%strn%_%seqn%_%ptim%.ts%
```

which would create unique file names as follows:

```
01_1_20120831T121748.ts
01_2_20120831T121759.ts
01_3_20120831T121810.ts
(...)
```

Alternatively, placing each segment in its own sub-directory would also allow for unique naming, however this could potentially be impractical for file management purposes.

#### Show HLS Output Format

To view configuration for HLS streaming:

- From the Configuration tab, click through to configuration >> output >> format >> hls >> show.
- 2. Click Submit to view results.

Dashboard Configuration	Reports System	
🕂 🔛 System Status	lust-In-Time Packaging Packaging Har	rdware Input/Output Events 🤗 Connection
i∃-configuration i∃-audiomap input	configuration >> output >> forma This method shows the HLS format configuration.	at >> hls >> show
i jitp □ output i directory □ format i dash	Submit	
±) hds	Version	2
• headers	Trick Play	false(0)
E hls	Ignore Out-Of-Sync	false(0)
modify	Variant Name	
	Template File Name	%stim%-%strn%-%seqn%%mode%.ts
tt subtitle	Segment Time	false(0)
± thumbnail	Keep Live Segments	false(0)
	Live Immediate Stop	false(0)
• session	Bit Rate Sub-Dir	false(0)
€stitcher	Max Segments Per Sub-Dir	0
	Ad Signaling	true(1)
	Expired Content Retention	22

# **Closed Captioning**

*Packager* allows for the configuration of various types of closed captioning, including TTML subtitles for Microsoft Smooth Streaming, 708 CC Tunnel for Adobe HDS closed captioning, and ID3 Tags in HLS output.

# Modify Subtitle Configuration:

1. From the **Configuration** tab, click through **configuration** >> **output** >> **format** >> **subtitle** >> **modify.** 



- 2. Follow the guidelines in Table 45 on page 118 to make changes.
- 3. Click Submit.

**Caution!** Modifying Closed Captioning options will impact services: All linear and JITP packages using this protocol will be restarted.

Dashboard Configuration	Reports Syste	m			_	
🕂 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
configuration audiomap input jitp output	configuration > This method modifies the : be restarted. Should be e NOTE: If package-level re N+1 redundancy group.	>> output >> f subtitle format configura xecuted during maintena dundancy is in use, all co	ormat >> sub tionLocal asset cach ince window onfiguration parameters	title >> mod e will be flushed. Ongo in this menu must mat	<b>ify</b> ing playback mi tch on both Pac	ay fail and need to kagers in the same
□ directory □ format	Enable JITP TTML	true	T	Enable/disable TTML Microsoft Smooth-St	format subtitle reaming with JI	s for TP.
± dash ± hds	Enable ID3	true	۲	Enable/Disable ID3 T Input) in HLS output	Tag (from DVB S	ubtitle
<ul> <li>Deaders</li> <li>Deaders</li> </ul>	Enable Adobe 708 CC Tunnel	true	T	Enable/disable Adob HDS.	e 708 CC Tunn	el for Adobe
⊡ <sup>-</sup> subtitle modify		Submit				

#### Table 45. Configure subtitles (closed captioning)

Field	Description
Enable JITP TTML	Select whether to enable or disable TTML subtitles for JITP streams.
	From this menu, this option applies for JITP only.
Enable ID3	Select whether to enable or disable ID3 Tags (received from DVB subtitle input) in the HLS output.
Enable Adobe 708 CC Tunnel	Select whether to enable or disable the Adobe 708 Tunnel subtitles for HDS JITP and Linear streams.

# Show Subtitle Configuration:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **subtitle** >> **show**.
- 2. Click Submit to view results.

Dashboard Configuration	Reports System					
🖶 System Status 🛛 🕽	ust-In-Time Packaging	Packaging		Input/Output		Connection
i configuration i audiomap i input	<b>configuration &gt;&gt;</b> This method shows the subtit	output >> 1	format >> sı	ıbtitle >> show	,	
⊕ jitp □ output □ directory □ format ⊕ dash	Submit	:				
	Enable JITP TTML				true(1)	
• headers	Enable ID3				true(1)	
thls	Enable Adobe 708 CC Tuni	nel			true(1)	



# **Thumbnail Output Configuration**

This menu provides global configuration options for packages where thumbnails<sup>3</sup> are in use. Configuring parameters in this menu will apply to all linear packages enabled for thumbnails.



Note: Thumbnail support is not applicable for JITP.

### **Configuring Thumbnail Output Format**

To configure thumbnail output format:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **thumbnail** >> **modify**.
- 2. Provide the information according to Table 46 and click Submit.

Dashboard Configuration	Reports System						
🔡 System Status	Just-In-Time Packaging	Packaging	Hardware	Inpu	t/Output	Events	Connection
configuration     audiomap     input	<b>configuration &gt;</b> This methods configures the	> output >> f	ormat >> th n in use by a packag	umbn <sup>e.</sup>	ail >> m	odify	
i jitp □ output □ directory	Template Name	%name%/%seq%.%c	ft%		[text, max. le template. Valio %name%, %s documentation	ngth of 99] Package d keywords: seq%,%oft%. Refer n, leave empty to us	r thumbnail to e
ternat ternation ter	Horizontal Size	0			[numeric, min. Horizontal size	. value=48, max. va	o. lue=1920]
theaders	Vertical Size	0			[numeric, min. Vertical size.	value=32, max. va	lue=1080]
⊡ hls ⊡ subtitle	Sample Rate	0			[numeric, min. in seconds bei	. value=5, max. valu tween each thumbna	e=3600] Interval al generation.
	Output Type	file		•	Output type		
show	Output ID	None		•	[numeric] Out	put Id	
⊡°stream ⊡°package	Image Format	jpeg		•	Image format		
session     stitcher	Max Images	0			[numeric, min. number of ima output directo	value=0, max. valu ages per package to ory,0 means never de	e=50] Max retain in the elete.
	Aspect Ratio	pad-to-maintain-aspe	ect(letter-box)	•	Aspect ratio p	ropagation method.	
		Submit					



<sup>3.</sup> A thumbnail is a snapshot still image from a given video stream, usually in .jpeg or .png format. Thumbnails are smaller in resolution relative to the video stream and are meant to provide location reference points for the content.

Field	Description
Template Name	Specifies the creation of a template to define how thumbnail file names are constructed. Maximum length of 99 characters. The following keywords are allowed:
	<pre>%name% = Package name (pulled from the configuration &gt;&gt; package menu) %seq% = Sequential number of the thumbnail (number increments for each thumbnail) %.oft% = Output file type (jpeg or png)</pre>
	In addition to the above keywords, any alphanumeric or special character may be added to the syntax, with the exception of the "%" character.
	Default is set to: %name%/%seq%.%oft%
	<i>Configuration tip:</i> To return to the default values for this field, delete the contents from the <b>Template Name</b> field entry and click <b>Submit</b> .
	For <i>Template Name</i> samples and additional descriptions, refer to "Customizing Thumbnail Filenames" on page 121
Horizontal Size	Sets the horizontal size of the thumbnail in pixels.
	Valid range: 48 to 1920.
Vertical Size	Sets the vertical size of the thumbnail in pixels.
	Valid range: 32 to 1080.
Sample Rate	Sets the interval in seconds between each thumbnail generation.
	Valid range: 5 to 3600 seconds.
Output Type	Select whether the configuration applies to stream or file outputs.
Output ID	Select the Output ID (either directory or stream) where the thumbnails will be saved. The drop-down menu provides all configured output IDs from the configuration.output.directory and configuration.output.stream menus.
Image Format	Choose the image format for all thumbnails. The selection here will be the %.oft% file extension from the <i>Template Name</i> . Choices are:
	jpeg or png

Table 46. Configure Thumbnail output.



Field	Description
Max Images	Enter the maximum number of thumbnail images that will be saved in the output directory per package.
	Valid range: 0 to 50
	Enter 0 to never delete images
Aspect Ratio	This setting provides the ability to determine whether and how the aspect ratio of the packaging input video is preserved when configuring the thumbnail resolution. Choices are:
	<b>pad-to-maintain-aspect(letter-box)</b> —rescales input video frame if necessary in order to create a thumbnail that will fit the dimensions specified in Vertical Size + Horizontal Size fields. This option produces a 1:1 pixel aspect ratio (PAR) thumbnail. If necessary, padding will be added (top and/or bottom black bars) to fill the specified thumbnail dimensions.
	<b>scale-output-resolution</b> —similar to pad-to-maintain-aspect, this option will rescale the input video frame if necessary in order to create a thumbnail that fits the dimensions specified in Vertical Size + Horizontal Size fields. If the Display Aspect Ratio (DAR) of the input and the thumbnail are different, then one of the dimensions specified in the Vertical Size or Horizontal Size fields will be made smaller in order to preserve the PAR.
	<b>crop-to-maintain-aspect</b> —cropping (or chopping off the sides or top/bottom of the picture) will be performed to conform to the input's aspect ratio while also conforming to the resolution set in the Vertical Size and Horizontal Size fields.
	<b>stretch</b> —the thumbnail size will be rescaled and stretched to fit the Vertical and Horizontal size fields, regardless of the input's aspect ratio. No padding or cropping will be performed. The picture is simply stretched in order to completely fill the boundaries of the thumbnail's configured size.
	<i>Configuration Tip:</i> For best results, the selection here should be inline with the actual input so as to avoid having a stretched or black-barred image.See "Aspect Ratio Settings" on page 123 for samples of each setting.
	<i>Recommended Setting:</i> When in doubt, use pad-to-maintain-aspect(letter-box) to preserve aspect ratio while maintaining the desired thumbnail size.

Table 46. Configure Thumbnail output.

# **Customizing Thumbnail Filenames**

*Packager* allows you to customize how thumbnail files are named upon creation. Any combination of keywords as described in the Template Name field in Table 46 may be used, in addition to any combination of alphanumeric or special characters up to a maximum of 99 characters. The "%" character is reserved only for delineating the start and end of a keyword.

The first time a linear package is started, *Packager* creates a directory named "**thumbnails**" under the output directory or URL (which you selected from the *Output ID* drop-down menu) wherein all thumbnail images will be saved.



Caution! The "thumbnails" directory is created only one time (when the first thumbnail-enabled linear package has been started) and applies to all thumbnail-enabled packages on a given system. If, for any reason, you are compelled to manually delete the "thumbnails" directory on the server itself, Packager will no longer save thumbnails since it cannot find the directory. In order to re-create the directory, you can do one of two things:

1) Manually re-create the "thumbnails" directory in the proper output location. -or-

2) Restart or reboot Packager from the System tab (sysconfig >> restart / reboot). The



thumbnails directory will be automatically re-created once the first thumbnail-enabled package has been started after the Packager restart/reboot.

The diagram below provides an explanation of the default naming structure that *Packager* uses for the **Template Name** field with a sample stream and file structure.

Default structure: %name% SOIL Package Image Sequence # Name Type Sample stream structure: http://10.10.80.100/dav/foo/thumbnails/NBC/1.jpeg Output ID URL Auto-generated Seg# directory Image Type Package Name Sample file structure: \var\opt\content\files\thumbnails\NBC\1 jpeg **Output ID Directory** Auto-generated Seq# directory Image Type Package Name

Table 47 below provides a few examples of how thumbnail file names and locations would be structured given various keyword formats from the **Template Name** field. The names in the gray-shaded cells are automatically created by *Packager*.

Template Name Structure	Output ID Type	Output ID Location	RGB-auto Directory <sup>a</sup>	Package Name (%name%)	<b>Seq. No.</b> (%seq%)	Image Type (.%oft%)
<pre>%name%/%seq%.%oft%</pre>	stream	http://10.10.10.20/mss/	thumbnails	packA	5	png
Actual File Path & Name:	http://	http://10.10.20/mss/thumbnails/packA/5.png				
<pre>%name%-content- %seq%.%oft%</pre>	file	\outmount\foo\	thumbnails	packB	4	jpeg
Actual File Path & Name:	\outmou	nt\foo\thumbnails\packB	-content-4.	jpeg		
<pre>%name%/%seq%/thumb/ HLS.%oft%</pre>	stream	http://10.10.40.50/dash/foo	thumbnails	packC	1	jpeg
Actual File Path & Name:	http://	http://10.10.40.50/dash/foo/thumbnails/packC/1/HLS.jpeg				
<pre>%name%/files/%seq%- MSS_thumbnail.%oft%</pre>	file	\var\output\	thumbnails	packD	7	png
Actual File Path & Name:	\var\ou	\var\output\thumbnails\packD\files\7-MSS_thumbnail.png				

a. The "thumbnails" directory is created once and only once when the first thumbnail-enabled package is started.



# **Aspect Ratio Settings**

Table 48 provides examples of how a thumbnail might look based on the Vertical and Horizontal size settings, and the Aspect Ratio setting chosen. The sample below uses an input aspect ratio of 16:9 and an output thumbnail resolution size configured as 4:3 in order to demonstrate each aspect ratio setting.

Input Resolution & Aspect Ratio	Thumbnail Size Configured	Thumbnail Aspect Ratio Set	Actual Output Resolution & Aspect Ratio	Thumbnail will look like:	
Resolution: 1920x1080	Res: 80x60	pad-to-maintain-	Res: 80x60		
Aspect Ratio: 16:9	(Aspect: 4:3)	aspect(letter box)	Aspect: 16:9	<b>2</b> ,	
			Black bars added to keep aspect (active picture is 80x45)		
Original input looks like:	Res: 80x60	scale-output-resolution	Res: 80x45 <sup>b</sup>		
	(Aspect: 4:3)		Aspect: 16:9		
			Output size changed to keep input aspect ratio		
	Res: 80x60	crop-to-maintain-aspect	Res: 80x60		
	(Aspect: 4:3)		(Aspect: 16:9 chop)		
			No scaling or stretching, but picture is chopped to match thumbnail		
	Res: 80x60	stretch	Res: 80x60		
	(Aspect: 4:3)		(Aspect: 4:3)		
			Input not preserved, picture stretched.		

Table 48. Thumbnail aspect ratio sample<sup>a</sup>

a. For purposes of space conservation, the graphics depicted in this table do not equal the actual resolution pixel sizes, but they do maintain the correct input and output aspect ratios.

b. When *scale-output-resolution* is chosen, the size of the rescaled thumbnail will exceed neither the Horizontal nor Vertical sizes configured in the output thumbnail menu.

# **Thumbnail Functionality Notes**

The following points should be kept in mind if you are generating thumbnails for packages:

- Thumbnails are generated from the input stream with the *highest* video bitrate (VBR).
- If the stream with the highest VBR is out of service, then thumbnails will be generated from the input stream with the next highest VBR.
- When the highest VBR is back in service, the thumbnails will revert back to using the highest VBR as their generation source.
- Any changes in global thumbnail configuration will immediately affect any active packages with thumbnails enabled.
- Live vs. VOD behavior: When thumbnails are enabled for live content, stopping a package will *remove* thumbnail content from the specified storage location. When thumbnails are enabled on VOD content, stopping a package will *not* remove thumbnail content from the specified storage location.



# Show Thumbnail Output Format

To view thumbnail configuration:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **format** >> **thumbnail** >> **show**.
- 2. Click Submit to view results.

Dashboard Configuration	Reports System				
🖶 System Status	Just-In-Time Packaging Packag		Input/Output		Connection
⊖ configuration ⊕ audiomap ⊕ input ⊕ jitp	configuration >> output This method shows the packager thumbn	: >> format >> th ail configuration.	umbnail >> sho	w	
eroutput directory format directory	Submit				
⊞ hds	Template Name	%name%/%seq%.%oft%			
<b>⊡</b> headers	Horizontal Size	150			
₽°hls	Vertical Size	113			
⊡ subtitle	Sample Rate	5			
⊡ thumbnail	Output ID	1			
modify	Output Type	file(0)			
show	Image Format	jpeg(0)			
±"stream	Max Images	50			
session	Aspect Ratio	pad-to-maintain-aspect(lette	r-box)(0)		



### **CHAPTER 6**

# Linear Packaging

This chapter covers how to perform integrate *Packager* within your overall website to package and deliver appropriate media to devices at the edge of your content delivery network.

# In This Chapter:

- "Prior to Configuring Packaging," next.
- "Overview of Steps" on page 125.
- "Configuring an Input Source" on page 126.
- "Configuring an Output Source" on page 135.
- "Configuring a Package" on page 142.
- "Starting a Package" on page 156.
- "Package-level Redundancy" on page 157.

# **Prior to Configuring Packaging**

Prior to performing any linear packaging configuration, ensure that you have configured the following:

- **1. System** tab parameters as described in the section titled, "Prerequisite System Configuration Packaging Operations" on page 35.
- **2.** Global output packaging configuration as described in Chapter 5, "Global Output Configuration" on page 125.

# **Overview of Steps**

The following steps are necessary in order to configure linear packaging:

- **1. Define an input source.** *Packager* can receive inbound media by ingesting a file from an input directory or by accessing inbound streams consisting of multiple bit rates organized in groups.
- **2. Define an output source**<sup>1</sup>. For HTTP Live Streaming (HLS), the output is a directory; for Smooth Streaming, the output can be a directory or a stream associated with an IIS Server publishing point. For RTMP the output is a stream. For Adobe HTTP Dynamic Streaming the output is a directory.
- **3.** Add a package. In this step, output source, audio map name, and other configuration parameters for the package are defined.
- 4. Start the package. Packaging of content does not begin until you start the configured package.

<sup>1.</sup> If the output consists of a URL (as with an IIS server, RTMP, or webdav-light), it is considered a stream output. Otherwise, the output is considered a file output regardless of whether the files are local to the Packager or mounted to a remote file system.

# Configuring an Input Source

*Packager* can ingest IDR-aligned videos from both streams and files; when ingested from files, ingest is paced to reproduce the load and throughput of input streams. The following sections provide details.

# **Defining Input Directories**

If the ingest content is stored on a file server, you must define an input directory. Proceed as follows:

- 1. From the **Configuration** tab, click through to **configuration** >> **input** >> **directory** >> **add**.
- 2. Provide the information in Table 49 and click Submit.

The screens below show menu fields that are displayed for each **File System Type**. You can scroll through each menu, or jump to the one you want to see from here:

CIFS File System DAVFS File System NFS or NFS4 File System Local File System GPFS File System

**CIFS** File System

Dashboard Configuration	Reports Syste	em				
🔡 System Status	Just-In-Time Packaging	Packaging H		Input/Output		Section Section
idiconfiguration input indirectory	configuration > This method adds an inpu	>> input >> direct it or output directory.	ory >> ad	d		
add modify remove	Directory Name	-16		[text, max. length of identifier Remote file share ty	f 24] User define pe	ed
⊡ group ⊕ gitp	Host			[text, max. length of not used for local mo	f 254] File serve ounts	r host -
⊕ output ⊕ package	Remote Share Name			[text, max. length of not used for local mo	f 498] Remote fi ounts	le share -
• session	Remote Mount Options	rsize=4096,wsize=4096,atime	3	[text, max. length of	f 127] Mount Op	tions
	Usage	on-demand		Intended use of the	directory	
	Source File Deletion	none	•	Source file disposition	n for auto input	directory
	Priority	1		[numeric, min. value: Priority level for auto lowest priority, 10 =	=1, max. value= input directory highest priority	=10] - 1 =
	Remote Domain			[text, max. length of domain - used for CI	f 23] Remote wir FS mount	ndows
	Remote Username			[text, max. length of CIFS and DAVFS mou	f 23] Username unt ( 22] D	- used for
	Remote Password			[text, max. length of CIFS and DAVFS mou	r 23j Password - unt	used for
		Submit				



# DAVFS File System

Dashboard Configuration	Reports System					
🔡 System Status	Just-In-Time Packaging	Packaging		Input/Output		Section Section
⊡-configuration ⊡-audiomap □-input	<b>configuration &gt;</b> This method adds an input	> input >> di	recto <b>ry</b> >> ao	ld		
directory add modify	Directory Name			[text, max. length o identifier	f 24] User define	d
remove	File System Type	davfs	•	[text, max. length o	rpe f 254] File server	r host -
⊞-group ⊕-jitp	Remote Share Name			not used for local m [text, max. length o not used for local m	ounts f 498] Remote fil ounts	e share -
⊕°output ⊕ package	Remote Username			[text, max. length o CIFS and DAVFS mo	f 23] Username - ount	- used for
til session	Remote Password			[text, max. length o CIFS and DAVFS mo	f 23] Password - ount	used for
		Submit				

#### NFS or NFS4 File System

Dashboard Configuration	Reports System					
System Status D	ust-In-Time Packaging	Packaging	Hardware	Input/Output	Events	S Connection
© configuration ☐ input ☐ directory	<b>configuration &gt;</b> This method adds an input	> input >> d	lirectory >> ad	d		
-add -modify -remove	Directory Name File System Type	nfs		[text, max. length o Remote file share ty	of 24] User defin ype	ed identifier
frishow ⊡group	Host			[text, max. length o used for local mount	of 23] File server ts	host - not
i jitp ∎∵output	Remote Share Name			[text, max. length on not used for local m	of 498] Remote f ounts	ile share -
⊕ package ⊕ session	Remote Mount Options	soft,vers=3,acdirmin=	1,acdirmax=1,acregmin=	[text, max. length o	of 127] Mount Op	otions
	Usage	on-demand	-	Intended use of the	directory	
	Source File Deletion	none	•	Source file dispositio	on for auto input	directory
	Priority	1		[numeric, min. value Priority level for aut lowest priority, 10 =	e=1, max. value to input directory = highest priority	= 10] - 1 =
		Submit				

# Local File System

Dashboard Configuration	Reports Syster	n				
🔡 System Status	Just-In-Time Packaging	Packaging		Input/Output		Sconnection
⊖ configuration input ⊡ directory	configuration > This method adds an input	> input >> di	rectory >> ad	d		
<mark>add</mark> modify remove	Directory Name File System Type	local		[text, max. length o Remote file share ty	f 24] User define pe	ed identifier
show ⊡-group	Usage	on-demand	<b>_</b>	Intended use of the	directory	
B output	Source File Deletion	none	<b></b>	foumeric, min, value	= 1. max. value=	=10]
* session	Priority	1		Priority level for auto lowest priority, 10 =	b input directory highest priority	- 1 =
	Local Mount Size	0		[numeric] Local mour Used for loop device Ensure local filesyste to create the mount	nts - size of mou s, ignored for pa em has sufficient	nt in MB. artitions. free space
	Local Mount Loop Device	localmnt	•	Local mounts - loop of for this mount.	device or partitio	n to use
		Submit				

# GPFS File System

Dashboard Configuration	Reports System					
🔡 System Status	Just-In-Time Packaging	Packaging				Connection
⊡ configuration ⊕ audiomap ⊖ input	<b>configuration &gt;</b> This method adds an input	> input >> c or output directory.	lirectory >>	add		
ic directory	Directory Name	gpfs		[text, max. length identifier Remote file share t	of 24] User defii type	ned
show ⊕rgroup ⊕jitp		Submit				

Table 49	Configure an	inbound	directory	1
	Configure an	mbound	ancolor	,.

Field	Description
Directory Name	An identifier for the directory, up to 24 characters. Only use alphanumeric characters, periods, underscores, or hyphens.
File System Type	The method to be used to access files in the directory: CIFS <sup>a</sup> , NFS/NFS4, local, davfs (Webdav), or GPFS. For information about local mounts or GPFS, see "Using Local Directory Mounts" on page 220 and "GPFS Storage Details and Setup" on page 222. For information about using Webdav web shares, see "Using Webdav Web Shares" on page 222.

Table 49. Configure an inbound directory.

Field	Description
Host	The hostname or IP address of the file system server, up to 254 alphanumeric characters
	<b>Note:</b> To use a hostname, you must use a hostname that is not a fully qualified domain name and supply the remaining domain name in a search field for the DNS configuration. For example, if you enter <i>xcoder01</i> in the <b>Host</b> field and want it to resolve to <i>xcoder01.rgbnetworks.com</i> , then the <b>DNS search</b> field must be configured with <i>rgbnetworks.com</i> . See "Adding and Removing Search Paths for a DNS Server Entry" on page 128.
	For Local: Does not apply.
	For Webdav: The IP address or fully qualified domain name (FQDN) of the Webdav server.
	For GPFS: Does not apply.
Remote Share Name	<b>For CIFS:</b> The name of the shared directory to mount. This is the share name assigned to the directory when it is configured for sharing on the network.
	For NFS: The path to the directory to mount.
	For Local: Does not apply.
	For Webdav: The directory on the Webdav server that is to be mounted.
	For GPFS: Does not apply.
Remote Mount Options	<pre>For CIFS, NFS, NFS4: Mount options for the remote shared directory to mount, up to 127 characters, fields separated by commas. For example: soft,vers=3,acdirmin=0.5,acdirmax=1,acregmin=3,acregmax=60, atime,timeo=1,retrans=3,tcp</pre>
	<i>Note</i> : For NFS and NFS4, you may configure either <b>hard</b> or <b>soft</b> mounts. The example above shows a <b>soft</b> mount configuration.
	For GPFS: Does not apply.
Usage	Whether the directory is intended for use with an on-demand or file-to-file/stream- to-file (auto) transcoding workflow. If you are configuring a directory on the <i>Packager</i> , <b>on-demand</b> is selected by default and cannot be changed.
	For GPFS: Does not apply.
Source File Deletion	Required. Select how to manage source file deletion:
	<b>none</b> —The successfully transcoded file is moved to the Success directory and transcode errors are moved to the Error directory. The source input file is not deleted.
	<b>success</b> —Delete source files if the transcode was successful. Transcode errors are moved to the Error directory.
	<b>always</b> —Delete source files regardless of whether the transcode was successful or not.
	For GPFS: Does not apply.
Priority	<b>Required.</b> Enter the priority level (1-10) that should be assigned to the files in this directory; higher priority directories are processed before lower priority directories. 1 is the lowest priority, 10 is the highest priority.
	For GPFS: Does not apply.
Remote Domain	<b>For CIFS:</b> The domain or workgroup that has permission to access the shared directory on the remote file server. This optional command line parameter must be preceded by its keyword.
	For GPFS: Does not apply.



Table 49. Configure an inbound directory.

Field	Description
Remote Username	For CIFS: A username that has permission to access the shared directory on the remote file server.
	For Webdav: The username to use to connect to the Webdav server.
	For GPFS: Does not apply.
Remote Password	For CIFS or Webdav: The password associated with the username.
	For GPFS: Does not apply.
Local Mount Size	Enter the mount size (in MB) for a virtual file system, or enter 0 for a partition.
	For GPFS: Does not apply.
Local Mount Loop Device	Select the appropriate loop device when using a virtual file system, or a mount partition when using a partition on disk. By default if a partition is present, this field is restricted to only the available partition options.
	For GPFS: Does not apply.

a. For deployment scenarios, RGB recommends the Network File System (NFS) protocol for all external storage mounts. Common Internet File Services (CIFS) can be used but is not recommended due to decreased performance (refer to the Release Notes for this version of software for test data). If used, CIFS should be limited to non-deployment situations.

# **Defining Input Streams**

If the ingest content originates from a live stream, you must:

- Ensure the input streams (external to *Packager*) exist and are fully functional.
- Within *Packager*, you must then create a name for the input group.
- Within *Packager*, you must then add the pre-existing external input streams to the group.

This section provides steps for adding an input group and stream to Packager.

# Add Input Group

- 1. From the **Configuration** tab, click through to **configuration** >> **input** >> **group** >> **add**.
- 2. Provide the information in Table 50 and click **Submit**.

Dashboard Configuration	Reports System					
💀 System Status 🛛 🕽	ust-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
☐ configuration ☐ input ☐ directory	<b>configuration &gt;&gt;</b> This method creates a group	input >> g of input streams.	roup >> add			
ergroup add modify remove show ergroup er	Name	Submit		[text, max. length identifier. Must cont characters; periods are allowed.	of 40] User defin tain only alphanu , underscores ar	ed unique imeric id hyphens

Table 50. Configure a group.

Field	Description
Name	An identifier for the group, up to 40 characters. Only use alphanumeric characters, periods, underscores, or hyphens.



# Add Input Stream

- 1. From the **Configuration** tab, click through to **configuration** >> **input** >> **group** >> **stream** >> **add**.
- 2. Provide the information in Table 51 and click **Submit**.
- **Note:** When setting up input groups, add streams to the group starting at the lowest bit rate and add streams with increasingly higher bit rates. This ensures that the lowest bit rate streams are used

Dashboard Cont	figuration Reports System			_	_			
🖶 System Status	Just-In-Time Packaging			Input,			- (	Connection
inconfiguration inconfiguration input input information input	configuration >> This method adds a new inpu NOTE: Ensure the route tabl NOTE: If package-level redu	t stream. e has proper static rou ndancy is in use, input	oup >> strea	am >> cast stream cs must mai	add is to be prope tch on both Pa	rly received. ackagers in the same	N+1 redundancy	/ group.
modify remove	Input Stream Group			¥	Group ID.		e 11- 1	
show ⊡rgroup	Publishing Video Bit Rate	0			be published	as (0=As Detecto	ed).	viii
add modify	Monitor Only	false		•	be packaged [text, max.]	length of 24] User de	efined identifier.	
remove	Name	[			Must contain underscores	n only alphanumeric of and hyphens are all	haracters; period owed.	is,
⊟ <sup></sup> stream <mark>add</mark>	Protocol IP Cast Type	udp/rtp multicast		•	Unicast or m	ulticast		
"modify "redetect	Host	0.0.0.0			[text, max. Remote mult http: URL	length of 499] udp/r ticast address [224.>	tp:(Multicast only (.x.x - 239.x.x.x]	)
show	Port				[numeric, mi the CTR to r	n. value=1, max. va eceive the stream.	lue=65535] Port	on
er jitp	IGMPv3 Source IP 1				[text] Multic Leave empty	ast only - IGMPv3 so y for no source filteri	urce IP address 1 ng.	L.
add	IGMPv3 Source IP 2				[text] Multic Leave empty [text] Multic	ast only - IGMPv3 so y for no source filteri ast oply - IGMPv3 so	urce IP address 2 ng. urce IP address 3	2.
	IGMPv3 Source IP 3				Leave empty [text] Multic	y for no source filteri ast only - IGMPv3 so	ng. urce IP address 4	
format	SCTE35 Stream ID				[text] SCTE: number enter	y for no source filteri 35 stream ID of the p ered with decimal stri	ng. program. It is 64-l ng (empty=none.	pit
±rstream ∎rpackage	Interface	eth0		•	Maximum=9 Interface to	2233720368547758 receive input stream	06) 1 on.	- 1
± session ± stitcher	Format	mpeg2_ts		•	Input contai	ner format.		- 1
	Program	0			[numeric, min. value=0, max. value=65535] Program number to select in the stream. (0=detect stream, auto-fill for SPTS))		ram '	
	Video PID	-1			[numeric, min. value=-1, max. value=8190] Packet ID of the video track in the program. (0=none, -1=all, ignored if program=0)		et	
	Audio PID	-1			[numeric, min. value=-1, max. value=8190] Packet ID of the audio track in the program. (0=none, -1=all, ignored if program=0)			et
	Data PID				[text] Packe Multiple trac form. (empt	t ID of the data trac ks are entered with o y=none, -1=all, igno	k in the program. comma delimited red if program=0	)
		Submit						Ţ

first if the selected distribution mode for packaging simply selects the first stream without considering bit rates.

#### Table 51. Configure an input stream.

Field	Description
Input Stream Group	Select the group to which you want to add this input stream.
Publishing Video Bit Rate	The video bit rate at which the stream will be published. Enter 0 (zero) to have <i>Packager</i> use the bit rate it detects from the input stream.
Monitor Only	Select <b>true</b> if the stream is only for monitoring and capturing, and <i>Packager</i> will not package the stream. Otherwise, select <b>false</b> .
Name	An identifier for the inbound stream, up to 23 characters. Must contain only alphanumeric characters, periods, underscores and hyphens.



Field	Description
Protocol	The IP protocol of the stream. For this release, only udp/rtp (User Datagram Protocol over Real-Time Transport Protocol) is supported for inbound streams.
IP Cast Type	Whether the stream is unicast (serves content to a single user at a time) or multicast (serves content simultaneously to multiple destinations).
Host <sup>a b</sup>	Applicable and required for multicast streams only.
	Enter the destination multicast IP address where the stream will be published.
	Valid entries are: 224.0.0.1 – 239.255.255.254. Refer to iana.org for details.
	<i>Note:</i> If using Source Specific Multicasting (SSM), you <i>must</i> use only this range: 232.0.0.1 – 232.255.255.254.
Port	For multicast, enter the UDP port (User Datagram Protocol) of the multicast source in a range of 1 – 65535.
	For unicast, enter the UDP port opened on the <i>Packager</i> to receive the input stream in a range of 10000–65535.
IGMPv3 Source IP 1	For SSM only. Max length of 72 characters.
	Provide the <i>unicast</i> IP address of the source that is publishing the stream to the destination multicast IP (configured in the <b>Host</b> field).
	Leave empty if you do not want to perform source filtering.
	• If using <i>source-level redundancy</i> , this unicast IP address must be unique from <i>IGMPv3 Source IP</i> 2, 3, and 4.
	<i>Note</i> : If using redundant IGMPv3 Source IPs 2, 3, or 4, the input sources must be identical (PIDs, program numbers, number of elementary streams, etc).
IGMPv3 Source IP 2	For SSM source-level redundancy only. Max length of 72 characters.
	Provide the alternate <i>unicast</i> IP address of the source that is publishing the stream to the destination multicast IP (configured in the <b>Host</b> field).
	Leave empty if you do not want to perform source filtering.
	• This unicast IP address must be unique from <i>IGMPv3 Source IP</i> 1, 3, and 4
	Note: If using redundant IGMPv3 Source IPs 1, 3, or 4, the input sources must be identical (PIDs, program numbers, number of elementary streams, etc).
IGMPv3 Source IP 3	For SSM <i>source-level redundancy</i> only. Max length of 72 characters.
	Provide the 2nd alternate <i>unicast</i> IP address of the source that is publishing the stream to the destination multicast IP (configured in the <b>Host</b> field).
	Leave empty if you do not want to perform source filtering.
	• This unicast IP address must be unique from <i>IGMPv3 Source IP</i> 1, 2, and 4 <i>Note</i> : If using redundant IGMPv3 Source IPs 1, 2, or 4, the input sources must be identical (PIDs, program numbers, number of elementary streams, etc).
IGMPv3 Source IP 4	For SSM source-level redundancy only. Max length of 72 characters.
	Provide the 3rd alternate <i>unicast</i> IP address of the source that is publishing the stream to the destination multicast IP (configured in the <b>Host</b> field).
	Leave empty if you do not want to perform source filtering.
	• This unicast IP address must be unique from <i>IGMPv3 Source IP</i> 1, 2, and 3 <i>Note</i> : If using redundant IGMPv3 Source IPs 1, 2, or 3, the input sources must be identical (PIDs, program numbers, number of elementary streams, etc.)

Table 51. Configure an input stream.



Table 51. Configure an input stream.

Field	Description
SCTE35 Stream ID	Enter the SCTE35 stream ID of the input program. The value is a 64-bit decimal string. Valid entries:
	blank = no SCTE35 stream ID specified (0 is the same as empty)
	Minimum: 1
	Maximum: 9223372036854775806
Interface <sup>c</sup>	The network interface the <i>Packager</i> should use to receive the stream; choices include <b>any</b> or one of the currently available valid interfaces (dynamically populated). If <b>any</b> is selected, <i>Packager</i> listens on all available interfaces. If a specific interface is selected, <i>Packager</i> only listens on that interface.
Format	The container format that will be received from the inbound stream. For this release, only MPEG2TS format can be received by <i>Packager</i> .
Program	The number of the program channel within the multi-program stream that you want to target.
	<ul> <li>For SPTS, enter 0 (zero) to automatically determine the program numbers and track PIDs.</li> </ul>
	For MPTS, enter 0 (zero) to detect the stream.
	<b>Note:</b> In order to modify Program and PID values for an input stream, the stream must be active and detected by Packager.
Video PID	Enter the number of the video track in the program channel that you want to target.
	<ul> <li>Entering "-1" will select all tracks of the selected program.</li> </ul>
	<ul> <li>Entering "0" means no video is desired.</li> </ul>
	If <b>Program</b> is set to 0 and SPTS is detected, system will automatically select the first PID of the video track detected.
Audio PID	Enter the number of the audio track in the program channel that you want to target.
	<ul> <li>Entering "-1" will select all tracks of the selected program.</li> <li>Entering "0" means no video is desired</li> </ul>
	If <b>Program</b> is set to 0 and SPTS is detected, the system will automatically select PIDs of all audio tracks detected.
Data PID	Enter the Packet ID of the data track in the input. The system will <i>drop</i> any data track that is not selected (unless <b>-1</b> is entered).
	• To enter multiple tracks, separate each number with a comma (e.g., 4, 20, 30, 55, 244).
	<ul> <li>To pass all data tracks for the program, enter -1</li> </ul>
	<ul> <li>To discard these tracks during packaging, leave the field empty.</li> </ul>
	(This field is ignored if <i>program</i> is "0".)
	<b>Note:</b> If performing ad insertion and POIS has been enabled on the system, this field must be set to -1 or the specific value of the desired Data PID in order to process MPEG sections that contain SCTE-35 signals.

a. For *Host*: When configuring an input stream to use a multicast source that does not use the default gateway, a static route must be added to the multicast address. A static route can only exist for one interface (e.g., eth0 or eth1), to an IP address regardless of ports, and can have a mask that enables receiving a range of multicast addresses with a single route entry (e.g., 225.1.2.0/24 would apply to all multicast addresses from 225.1.2.1 to 225.1.2.255).

b. For *Host*: The *Packager* has an internal implementation restriction that limits the number of static route entries to 9 per interface. Configure *Packager* to optimize the maximum number of input streams into minimal route entries.

c. For Interface: If a specific interface is selected, the setting is *not* automatically updated if the selected interface is converted to or from a bond.



# Source Specific Multicast (SSM) Redundancy Functionality

Protocol IGMPv3 allows for the joining of a multicast group to be filtered based on the originating host's source IP address. Adding redundancy to SSM provides a client with alternate sources of the same multicast in the event of failure. *Packager* allows up to 3 redundant source streams to be configured per multicast input stream, for a total of 4 sources. Functionality and configuration guidelines are described below:

- All redundant input streams used for the multicast source must be identical (i.e., matching PIDs, program numbers, program names, elementary streams, codecs, etc.).
- IGMPv3 Source IP addresses 1-4 must be unique *unicast* IPs for the input stream.
- If using SSM, the destination multicast IP address configured in the **Host** field must be in the range of 232.0.0.1 232.255.255.254. See iana.org for details on reserved multicast ranges.
- *Packager* will signal upstream routers to join the first configured SSM stream and will wait a maximum of two seconds to receive the PAT.
- If the PAT times out or is missing for greater than 2 seconds, *Packager* will signal a switch to the next configured SSM IP address.
- There is no priority associated with configured SSM sources.

# 2 Configuring an Output Source

*Packager* can publish packages to an outbound directory on its own hard drive locally or on a remote NAS server. *Packager* can also publish packages to a group of outbound streams. The following sections provide details for each outbound source configuration.

# **Defining Output Directories**

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **directory** >> **add**.
- 2. Provide the information in Table 52 and click Submit.

The screens below show menu fields that are displayed for each **File System Type**. You can scroll through each menu, or jump to the one you want to see from here:

CIFS File System DAVFS File System NFS or NFS4 File System Local File System GPFS File System



# CIFS File System

Dashboard Configuration	Reports Syste	m				
🖶 System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
⊡·configuration ⊕·audiomap ⊕·input	<b>configuration &gt;</b> This method adds an input	> output >> d t or output directory.	lirectory >> a	add		
Ditp Doutput	Directory Name			[text, max. length of	f 24] User defin	ed identifier
="directory "add	File System Type	cifs	•	Remote file share typ	De	
modify	Host			[text, max. length of used for local mounts	f 254] File serve s	er host - not
show	Remote Share Name			[text, max. length of not used for local mo	f 498] Remote f Junts	ile share -
ttrormat ∎•stream	Remote Mount Options	rsize=4096,wsize=4096	atime),atime	[text, max. length of	f 127] Mount Op	otions
	Remote Domain			[text, max. length of domain - used for CI	f 23] Remote wi FS mount	ndows
€stitcher	Remote Username			[text, max. length of CIFS and DAVFS mou	f 23] Username unt	- used for
	Remote Password			[text, max. length of CIFS and DAVFS mou	f 23] Password unt	- used for
		Submit				

### DAVFS File System

Dashboard Configuration	Reports System	1				
🖶 System Status	lust-In-Time Packaging	Packaging		Input/Output		Connection
⊡ configuration ® audiomap ® input	configuration > This method adds an input	> output >> d or output directory.	lirectory >> a	add		
B jitp output directory	Directory Name	davfs	Ţ	[text, max. length o	f 24] User defin pe	ed identifier
······································	Host			[text, max. length o used for local mount	f 254] File serve s	er host - not
show	Remote Share Name			[text, max. length o not used for local mo	f 498] Remote f ounts	file share -
tt format tt stream	Remote Username			[text, max. length o CIFS and DAVFS mo	f 23] Username unt	- used for
■ package ■ session	Remote Password			[text, max. length o CIFS and DAVFS mo	f 23] Password unt	- used for
Bistitcher		Submit				

# NFS or NFS4 File System

Dashboard Configuration	Reports Syste	m				
🔡 System Status	Just-In-Time Packaging	Packaging I	lardware	Input/Output	Events	Connection
erconfiguration audiomap erinput	<b>configuration &gt;</b> This method adds an inpu	>> output >> dire	ctory >> a	dd		
i jitp ⊡ output	Directory Name			[text, max. length of	f 24] User defin	ed identifier
⊡'directory '''add	File System Type	nfs	۲	Remote file share typ	pe	
modify	Host			[text, max. length of used for local mounts	f 254] File serve s	r host - not
show	Remote Share Name			[text, max. length of not used for local mo	f 498] Remote f junts	ile share -
to format	Remote Mount Options	soft,vers=3,acdirmin=1,acdir	max=1,acregmin=	[text, max. length of	f 127] Mount Op	otions
Terr package						
+ stitcher		Submit				

# Local File System

Dashboard Configuration	Reports Syste	m					
🕂 System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	S Connection	
i configuration i audiomap i input	configuration > This method adds an inpu	> output >> c t or output directory.	lirectory >> a	dd			
iitp ⊡output	Directory Name			[text, max. length o	f 24] User defin	ed identifier	
add	File System Type	local	•	Remote file share type [numeric, min. value = 10, max. value = 2147483647] Local mounts - size of mount in MB. Used for loop devices, ignored for partitions or if a loop device mount has already been created. Ensure local filesystem has sufficient free space to create the mount. Mount file is created when first Local Mount is added and shared with all subsequent Local Mounts.			
remove show ⊕ format ⊕ stream ⊕ package							
⊕ session ⊕ stitcher	Local Mount Loop Device	localmnt2 Submit	•	Local mounts - loop of for this mount.	device or partiti	on to use	



Dashboard Configuration	Reports System	1				
🖶 System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
⊡-configuration ⊕-audiomap ⊕-input	<b>configuration &gt;</b> This method adds an input	> output >> t or output directory.	<ul> <li>directory &gt;&gt;</li> </ul>	add		
⊕ jitp ⊡output	Directory Name			[text, max. length identifier	of 24] User defin	ed
	File System Type	gpfs	•	Remote file share t	уре	
remove		Submit				

Field	Description				
Directory Name	An identifier for the directory, up to 24 characters. Only use alphanumeric characters, periods, underscores, or hyphens.				
File System Type	The method to be used to access files in the directory: CIFS <sup>a</sup> , NFS/NFS4, local, davfs (Webdav), or GPFS. For information about local mounts or GPFS, see "Using Local Directory Mounts" on page 220 and "GPFS Storage Details and Setup" on page 222. For information about using Webdav web shares, see "Using Webdav Web Shares" on page 222.				
Host	The hostname or IP address of the file system server, up to 254 alphanumeric characters.				
	<b>Note:</b> To use a hostname, you must use a hostname that is not a fully qualified domain name and supply the remaining domain name in a search field for the DNS configuration. For example, if you enter <i>xcoder01</i> in the <b>Host</b> field and want it to resolve to <i>xcoder01.rgbnetworks.com</i> , then the <b>DNS search</b> field must be configured with <i>rgbnetworks.com</i> . See "Adding and Removing Search Paths for a DNS Server Entry" on page 128.				
	For Local: Does not apply.				
	<b>For Webdav:</b> The IP address or fully qualified domain name (FQDN) of the Webdav server.				
	For GPFS: Does not apply				
Remote Share Name	<b>For CIFS:</b> The name of the shared directory to mount. This is the share name assigned to the directory when it is configured for sharing on the network.				
	<b>For NFS:</b> The path to the remote directory to mount. <i>Packager</i> supports the ability to add the same output mount point multiple times. This means the Remote Share Name field may be configured with the same directory. A unique path will be automatically configured on the NFS server for each package without having to explicitly specify each path here. For an example, see "Managing Output Directories" on page 192				
	For Local and GPFS: Does not apply.				
	For Webdav: The directory on the Webdav server that is to be mounted.				
Remote Mount Options	<pre>For CIFS, NFS, NFS4: Mount options for the remote shared directory to mount, up to 127 characters, fields separated by commas. For example: soft,vers=3,acdirmin=0.5,acdirmax=1,acregmin=3,acregmax=60, atime,timeo=1,retrans=3,tcp</pre>				
	<i>Note</i> : For NFS and NFS4, you may configure either hard or soft mounts. The example above shows a soft mount configuration.				
	<i>Note</i> : When using NFS mounts for live content playback, RGB highly recommends using <b>hard</b> mounts.				
	For GPFS: Does not apply				
Source File Deletion	Required. Select how to manage source file deletion:				
	<b>none</b> —The successfully transcoded file is moved to the Success directory and transcode errors are moved to the Error directory. The source input file is not deleted.				
	<b>success</b> —Delete source files if the transcode was successful. Transcode errors are moved to the Error directory.				
	<b>always</b> —Delete source files regardless of whether the transcode was successful or not.				

Table 52. Configure an outbound directory.

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Table 52. Configure an outbound directory.

Field	Description
Remote Domain	<b>For CIFS:</b> The domain or workgroup that has permission to access the shared directory on the remote file server. This optional command line parameter must be preceded by its keyword.
Remote Username	For CIFS: A username that has permission to access the shared directory on the remote file server.
	For Webdav: The username to use to connect to the Webdav server.
Remote Password	For CIFS or Webdav: The password associated with the username.
Local Mount Size	Enter the mount size (in MB) for a virtual file system, or enter 0 for a partition.
Local Mount Loop Device	Select the appropriate loop device when using a virtual file system, or a mount partition when using a partition on disk. By default if a partition is present, this field is restricted to only the available partition options.

a. For deployment scenarios, RGB recommends the Network File System (NFS) protocol for all external storage mounts. Common Internet File Services (CIFS) can be used but is not recommended due to decreased performance (refer to the Release Notes for this version of software for test data). If used, CIFS should be limited to non-deployment situations.

# **Defining Output Streams**

To publish output as streams from *Packager*:

- 1. From the **Configuration** tab, click through to **configuration** >> **output** >> **stream** >> **add**.
- 2. Provide the information in Table 53 on page 141 and click Submit.

The following screen shows fields that are displayed when each player is selected as the **Protocol**. You can scroll through each menu, or jump to the one you want to see from here:

RTMP protocol Microsoft Smooth Streaming protocol Webdav-light protocol HTTP-Edgeware protocol Swift-API protocol

#### RTMP protocol

Dashboard Configuration	Reports System					
System Status J	ust-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
input jitp	configuration >: This method adds an output	> output >> stream.	stream >> ad	d		
e output directory format	Name	4.000		[text, max. length o identifier IP protocol of the st	f 24] User define	ed
⊡-stream -add modify	Host	imp://		URL to post to the F	MS server	
remove		Submit				



# Microsoft Smooth Streaming protocol

Dashboard Configuration	Reports System					
🖶 System Status	lust-In-Time Packaging	Packaging		Input/Output		Connection
⊡-configuration input ipjitp	<b>configuration &gt;</b> This method adds an outpu	> output >> s t stream.	tream >> ac	ld		
e output directory format stream	Name Protocol	Microsoft Smooth-Strea	ming 🗨	[text, max. length o identifier IP protocol of the st	f 24] User define ream	ed .
add modify remove	Host	Submit		URL to post to the re	emote server	

# Webdav-light protocol

Dashboard Configuration	Reports System	n				
🔛 System Status	lust-In-Time Packaging			Input/Output		S Connection
input jipp	<b>configuration &gt;</b> This method adds an outp	>> output >> s ut stream.	tream >> ad	d		
e output e directory	Name			[text, max. length of identifier	24] User define	ed
⊡rstream	Protocol	webdav-light	•	IP protocol of the stre	eam	
add	Host	http://		URL to post to the re	mote server	
modify remove	Validate Output URL	true		Validate output serve it	er by pushing a t	test file on
package     ⊡ session		Submit				

# HTTP-Edgeware protocol

Dashboard Configuration Reports System						
System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
⊡·configuration input ipitp	configuration >> output >> stream >> add This method adds an output stream.					
output						
directory	Name			[text, max. length of identifier	f 24] User defin	ed
III format				TD protocol of the str		
⊡rstream	Protocol	http-Edgeware	-	IP protocor or the su	eam	
add	Host	http://		URL to post to the re	mote server	
modify	Validate Outout	true		Validate output serve	er by pushing a	test file on
remove	URL	100		it		
show						
<b>₽</b> package		Colora				
		Submit				



# Swift-API protocol

Dashboard Configuration	Reports Syster	n				
💀 System Status	ust-In-Time Packaging			Input/Output		Connection
⊡ configuration	<b>configuration &gt;</b> This method adds an outpu	> output >> s ut stream.	stream >> add	1		
Brjitp ⊡°output	Name			[text, max. length of identifier	f 24] User defin	ed
⊕ format	Protocol	swift-api	•	IP protocol of the str	eam	
⊟ <sup>-</sup> stream	Host	http://		URL to post to the re	emote server	
<mark>add</mark> modify	Validate Output URL	true(1)	•	Validate output serve it	er by pushing a	test file on
"remove show	Authorized User Name			[text, max. length of (only applicable when	f 63] Authorized n using Swift AF	d Name vI).
⊕ package ⊕ session	Authorized User Key			[text, max. length of (only applicable when	f 255] Authorize n using Swift AF	ed Key Y]).
⊡stitcher		Submit				

### Table 53. Configure an output stream.

Field	Description		
Name	An identifier for the outbound stream on the <i>Packager</i> , up to 23 characters. Must contain only alphanumeric characters, periods, underscores and hyphens.		
Protocol	The transport protocol used to publish the outbound stream. The supported protocols for this release are:		
	RTMP (Real Time Messaging Protocol)		
	Microsoft Smooth Streaming		
	Webdav-Light		
	HTTP-Edgeware		
	Swift-API		
Host	For RTMP: The URL to post to the Adobe Media Server. For example, rtmp://1.2.3.4/livepkgr/anyname		
	For Microsoft Smooth Streaming: The IIS Server publishing point. For example, http://1.2.3.4./pubpoint.isml.		
	<b>For Webdav-Light:</b> Corresponds to an HTTP PUT operation. Enter the URL to the Web server for output.		
	For HTTP-Edgeware: The URL to the Edgeware device for output.		
	<b>For Swift-API:</b> The protocol followed by the hostname or IP address of the object store server. Do <i>not</i> include any URL path after the hostname. (For example: http://1.2.3.4)		
	Note: For detailed information player functionality, see "Configuring Players and Mounts" on page 206.		
Validate Output URL	True or False. Only available for webdav-light, http-Edgeware, and swift-api protocols. Validates the output server by pushing a test file to it.		

Field	Description
Authorized User Name	For Swift-API only. Enter the user name to use when sending an object store authorization request.
	Valid entries: Up to 63 alphanumeric characters
Authorized User Key	For Swift-API only. Enter the authentication key to use when sending an object store authorization request.
	Valid entries: Up to 255 alphanumeric characters

Table 53. Configure an output stream.

# 3 Configuring a Package

Once you have defined audio map rules, an input source, and an output source, you can configure a package.

- **1.** From the **Configuration** tab, click through to **configuration >> package >> add**.
- 2. Provide the information in Table 54 on page 151 and click Submit.

The following screen shots show the **package** >> **add** menu fields when each player is selected from the **Package Type** menu. You can scroll through each menu, or jump to the one you want to see from here:

Apple HTTP Live Streaming	Adobe HTTP Dynamic Streaming	MPEG Dash TS - HTTP File Format
Microsoft Smooth Streaming - remote	Adobe RTMP	Adobe HTTP Dynamic Streaming - HTTP File Format
Microsoft Smooth Streaming	MPEG Dash ISO	RGB Packager asset.



# Apple HTTP Live Streaming

<b>configuration &gt;&gt; packa</b> This method creates a package. NOTE: If package-level redundancy is in	age >> add n use, packaging configuration, including the Name, must match on both Pa	ackagers in the same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	Apple HTTP Live Streaming	Type of distribution
Package Mode	live 🗸	Mode of distribution
Tuckage Houe	-	Formation and the American select (FFOF) Decided in second software which
Duration	U Contraction of the second se	the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR periodic •	Segmentation mode
Segment Duration		[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
Segment Life Span	0	[numeric, min. value=0, max. value=18000] Time a live segment will figure in the playlist manifest.
Redundancy Mode	none 🗸	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream 🔻	Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name
Subdirectory Path		[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	Content to output
Output Type	file 🔻	Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	[numeric] Output Id
Content Type Alt 1	none <b>v</b>	Content to output to secondary publishing point
Output Type Alt 1	file 🔻	Output type
Output ID Alt 1	0 •	[numeric] Output Id
Content Type Alt 2	none	Content to output to secondary publishing point
Output Type Alt 2	file •	Output type
Output ID Alt 2	0 •	[numeric] Output Id
Thumbnail	false	Thumbnails generation
Key Server Vendor Name	None	Key Server Vendor
Content ID		[text] Encryption Media Content ID

# Microsoft Smooth Streaming - remote

configuration >> package >> add This method creates a package. NOTE: If package-level redundancy is in use, packaging configuration, including the Name, must match on both Packagers in the same N+1 redundancy group.				
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.		
Package Type	Microsoft Smooth Streaming - remote	Type of distribution		
Package Mode	live •	Mode of distribution		
Duration	0	[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.		
Segment Mode	IDR periodic	Segmentation mode		
Segment Duration		[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.		
Redundancy Mode	none	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.		
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.		
Input Type	stream	Input type		
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory		
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name		
Content Type	all	Content to output		
Output Type	stream 🔻	Output type		
Output ID	· · · · · · · · · · · · · · · · · · ·	[numeric] Output Id		
Thumbnail	false V	Thumbnails generation		
Enable TTM	falsa	) Enable TTML		
Eliable TTPL	Idize	Key Server Vender		
Key Server Vendor Name	None <b>v</b>	Ney Server Vendor		


## **Microsoft Smooth Streaming**

configuration >> package >> add This method creates a package.		
NOTE: If package-level reduitdancy is in	use, packaging conliguration, including the Name, must match on both Pack	agers in the same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	Microsoft Smooth Streaming	Type of distribution
Package Mode	live •	Mode of distribution
Duration	٥	[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR periodic	Segmentation mode
Segment Duration		[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
Segment Life Span	0	[numeric, min. value=0, max. value=300] Time a live segment will figure in the playlist manifest.
Redundancy Mode	none 🔻	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream 🔻	Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name
Subdirectory Path		[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	Content to output
Output Type	file 🔻	Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	[numeric] Output Id
Thumbnail	false	Thumbnails generation
Enable TTML	false	Enable TTML
Key Server Vendor Name	None	Key Server Vendor



## Adobe HTTP Dynamic Streaming

<b>Configuration &gt;&gt; packa</b> This method creates a package. NOTE: If package-level redundancy is in	age >> add n use, packaging configuration, including the Name, must match on both Pa	ackagers in the same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	Adobe HTTP Dynamic Streaming	Type of distribution
Package Mode	vod	Mode of distribution
Duration	3600	[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR periodic	Segmentation mode
Segment Duration		[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
Redundancy Mode	none	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream 🔻	Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name
Subdirectory Path		[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	Content to output
Output Type	file <b>v</b>	Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	[numeric] Output Id
Thumbnail	false 🗸	Thumbnails generation
Key Server Vendor Name	None <b>v</b>	Key Server Vendor

#### Adobe RTMP

configuration >> packa This method creates a package. NOTE: If package-level redundancy is in	age >> add n use, packaging configuration, including the Name, must match on both Pa	ackagers in the same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	Adobe RTMP	Type of distribution
Package Mode	live 🗸	Mode of distribution
Duration	3600	[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	none	Segmentation mode
Segment Life Span	0	[numeric, min. value=0, max. value=300] Time a live segment will figure in the playlist manifest.
Redundancy Mode	none v	Package-level redundancy mode, must match on both Packagers in the same $N\!+\!1$ redundancy group.
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream 🔻	Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name
Content Type	ali 🗸 🗸	Content to output
Output Type	stream	Output type
Output ID		[numeric] Output Id
Thumbnail	false	Thumbnails generation
Key Server Vendor Name	None	Key Server Vendor



configuration >> packa This method creates a package. NOTE: If package-level redundancy is i	age >> add n use, packaging configuration, including the Name, must match on both	Packagers in the same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	MPEG Dash ISO	Type of distribution
Package Mode	live	▼ Mode of distribution
Duration	3600	[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR periodic	▼ Segmentation mode
Segment Duration	0	[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
Segment Life Span	0	[numeric, min. value=0, max. value=300] Time a live segment will figure in the playlist manifest.
Redundancy Mode	none	<ul> <li>Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.</li> </ul>
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream	▼ Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	▼ [text, max. length of 23] Audio map name
Subdirectory Path		[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	▼ Content to output
Output Type	file	▼ Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	▼ [numeric] Output Id
Thumbnail	false	Thumbnails generation
Key Server Vendor Name	None	▼ Key Server Vendor



<b>configuration &gt;&gt; packa</b> This method creates a package. NOTE: If package-level redundancy is in	ge >> add use, packaging configuration, including the Name, must match on both Pack	agers in the same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	MPEG Dash TS - HTTP File Format	Type of distribution
Package Mode	live 🗸	Mode of distribution
Tuckage Houe		[numeric_min_value=0_may_value=65525] Daried in seconds after which
Duration	3600	the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR periodic T	Segmentation mode
Segment Duration	0	[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
Segment Life Span	0	[numeric, min. value=0, max. value=18000] Time a live segment will figure in the playlist manifest.
Redundancy Mode	none T	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream 🔻	Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name
Subdirectory Path		[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	Content to output
Output Type	file 🔻	Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	[numeric] Output Id
Content Type Alt 1	none v	Content to output to secondary publishing point
Output Type Alt 1	file •	Output type
Output ID Alt 1	0 •	[numeric] Output Id
Content Type Alt 2	none <b>v</b>	Content to output to secondary publishing point
Output Type Alt 2	file <b>v</b>	Output type
Output ID Alt 2	0 •	[numeric] Output Id
Thumbnail	false	Thumbnails generation
Key Server Vendor Name	None T	Key Server Vendor
Content ID		[text] Encryption Media Content ID

#### **MPEG Dash TS - HTTP File Format**

CONTIGUTATION >> pac This method creates a package. NOTE: If package-level redundancy	C <b>Kage &gt;&gt; add</b> is in use, packaging configuration, including the Name, must match	on both Packagers in the same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	Adobe HTTP Dynamic Streaming - HTTP File Format	Type of distribution
Package Mode	live •	Mode of distribution
Duration	3600	[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR periodic •	Segmentation mode
Segment Duration	0	[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
Segment Life Span	0	[numeric, min. value=0, max. value=300] Time a live segment will figure in the playlist manifest.
Redundancy Mode	none	Package-level redundancy mode, must match on both Packagers in the same $N+1$ redundancy group.
Redundancy Peer		[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream 🔻	Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name
Subdirectory Path		[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	Content to output
Output Type	file •	Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	[numeric] Output Id
Thumbnail	false	Thumbnails generation
Key Server Vendor Name	None	Key Server Vendor

## Adobe HTTP Dynamic Streaming - HTTP File Format



configuration >> pad This method creates a package. NOTE: If package-level redundancy	C <b>kage &gt;&gt; add</b> r is in use, packaging configuration, including the Name, must	match	n on both Packagers in the same N+1 redundancy group.
Name			[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	RGB packager asset	•	Type of distribution
Package Mode	vod	T	Mode of distribution
Duration	3600		[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR	۲	Segmentation mode
Redundancy Mode	none	۲	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.
Redundancy Peer			[text, max. length of 72] Package-level redundant peer host/IP where an identical package is provisioned.
Input Type	stream	•	Input type
Input ID	fox_ebr1 (1)	v	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	۲	[text, max. length of 23] Audio map name
Subdirectory Path			[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	۲	Content to output
Output Type	file	۲	Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	۲	[numeric] Output Id
Thumbnail	false	۲	Thumbnails generation
Key Server Vendor Name	None	Ŧ	Key Server Vendor
Content ID			[text] Encryption Media Content ID

#### RGB Packager asset<sup>2</sup>.

# Table Description — package >> add

Table 54 below provides a description of each field in the **configuration** >> **package** >> **add** window.

**Note:** Depending on which **Package Type**, **Package Mode**, and **Input Type** you select, some of the fields described below will or will not be displayed.

Table 54.	Configure a	package.

Field	Description
Name	A unique identifier for the package. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed. Up to 90 characters is allowed.
Package Type	The type of distribution to use for the package. Choices for this release include Apple HTTP Live Streaming, Microsoft Smooth Streaming - remote, MPEG Dash ISO, Adobe HTTP Dynamic Streaming, Adobe RTMP, RGB packager asset, Microsoft Smooth Streaming, Adobe HTTP Dynamic Streaming - HTTP File Format, and MPEG Dash TS - HTTP File Format.

<sup>2.</sup> **RGB packager asset** is a package type used when creating the mezzanine format for JITP. It is not used for linear packaging.



Field	Description	
Package Mode	The mode of distribution to use for the package: either live or vod.	
	Choices depend upon the selection in the <b>Package Type</b> <sup>a</sup> field.	
	<ul> <li>Choose either live or vod: For Apple HTTP Live Streaming, Microsoft Smooth Streaming, Adobe HTTP Dynamic Streaming, and MPEG Dash TS - HTTP File Format. For these modes above, the Segment Life Span field appears for live.</li> <li>Only choice is live: For Microsoft Smooth Streaming - remote, MPEG Dash ISO, Adobe RTMP, and Adobe HTTP Dynamic Streaming - HTTP File Format.</li> </ul>	
	Only choice is <b>vod</b> :     For <i>RGB packager asset</i>	
Duration	Period in seconds after which the package will stop after being started. (0 = never stop).	
Segment Mode <sup>b</sup>	The type of segmentation to use for the package. Choices include:	
	<ul> <li>IDR—A segment file is built on each IDR frame.</li> <li>IDR periodic—A segment file is built on the first IDR frame after the time</li> </ul>	
	trame specified in the <b>Segment Duration</b> field.	
	<ul> <li>RAI periodic—A segment file is built on the first RAI flag after the time frame specified in the Segment Duration field.</li> </ul>	
	• <b>EBP Frag</b> —A segment file is built on each EBP (Encoder Boundary Point) fragment. <sup>c</sup>	
	• <b>EBP Frag periodic</b> <sup>d</sup> —A segment file is built on the first EBP fragment after the time frame specified in the <b>Segment Duration</b> field.	
	EBP Seg—A segment file is built on each EBP segment.	
	• <b>EBP Seg periodic</b> —A segment file is built on the first EBP segment after the time frame specified in the <b>Segment Duration</b> field.	
Segment Duration	The time frame (in seconds) for each segment.	
	<ul> <li>The first frame for each segment is an IDR frame.</li> <li>The segment duration specified with periodic modes is not an absolute, but a minimum target.</li> </ul>	
	• The final duration will be based on how far the IDR frame, RAI flag, or EBP marker is from the segment duration.	
	• For example: an IDR periodic segment duration of 3 seconds with incoming IDRs at 2-second intervals will produce 4-second segments.	
	<b>Note:</b> When MPEG Dash TS - HTTP File Format is used for the Package Type in conjunction with MPEG Dash JITP ingest and playback, the Segment Duration number in this field must be set to match the playback type. If HLS, HDS, or MSS is the intended playback, the Segment Duration (2 or 4 seconds) should be set to match the transcoder feeding Packager.	
Segment Life Span	Only for Live mode. The time a live segment will appear in the playlist manifest. This option only appears when live is selected from the Package Mode field (except for Microsoft Smooth Streaming - remote, for which Segment Life Span is controlled by the remote server.).	



Field	Description		
Redundancy Mode	When using package-level peer redundancy, select how the <i>Packagers</i> will handle their output.		
	Choices are:		
	<b>none</b> — the package will not use redundancy.		
	<b>duplicate output</b> — both <i>Packager</i> s will publish their own output synchronized together to separate locations. Option available for <i>live</i> mode.		
	<b>single output</b> <sup>e</sup> — in single output mode, only one <i>Packager</i> will output each feed to a single location while the other <i>Packager</i> 's corresponding feed will be muted. Option available for <i>VOD</i> and <i>continuous record</i> modes.		
Redundancy Peer	When using package-level redundancy, enter the IP address or hostname of the redundant <i>Packager</i> 's management interface hosting the redundant (and identically configured) package. Up to 72 characters max.		
Input Type	Whether the input media is file- or stream-based.		
Input ID	The input directory or input group (stream) from which to receive content.		
Input File Name	This field only appears when the <b>Input Type</b> is set to <b>file</b> . Enter the name of the input group file specified with a file path that is relative to the location of the PCK file. The relative file path allows you to move the entire sub-directory without having to change the PCK file. The input group file is a simple text file pointing at the location of each input file part of the group with a few fields.		
	Following is an example of a system auto-generated input group file. (Lines starting with "#" are informational comments only.)		
	<pre># Manifest for Package: NewPCK</pre>		
	# Recording Started: Tue May 1 16:38:21 2012		
	Version:1		
	SegmentMode: IDR		
	GroupName:NewPCK		
	<pre># (Format: Path from the pck file for each video, Pub- lished video bit rate, Published audio bit rate)</pre>		
	01/1.ts 3888951 125680		
	02/1.ts 1711974 125718		
	The Version is 1 and the SegmentMode can be either IDR or RAI, depending upon how the material is expected to align.		
	This simple file can be manually created for externally generated input files, or it is automatically generated along with an MPEG2TS straight file output session which will create a directory structure as follows in the output directory:		
	<package_name>/<group name="">_S1/</group></package_name>		
	/ <group name="">_S2/</group>		
	/ <group name="">_S3/</group>		
	/ <group name="">.pck</group>		
	<group name="">.pck is the auto-generated text file to resubmit later for file ingest packaging.</group>		
	If the whole directory structure shown above was copied to an input mount, or if a mount point exists both as an input and an output, specify <pre><pre>cpackage_name/<group name<="" pre="">.pck</group></pre> as the input file group name.</pre>		
Audio Map	Select the audio map profile table (set of rules) to apply to the package. See "Configuring Audio Mapping" on page 93 for configuration instructions.		



Field	Description
Subdirectory Path	For Apple HLS, MPEG Dash ISO, RGB packager asset, Adobe HDS, Microsoft Smooth Streaming, Adobe HDS - HTTP File Format, and MPEG Dash TS - HTTP File Format.
	Enter the name of the output sub-directory (up to 93 alphanumeric characters) after the mount point and preceding the package name.
	For example: /mount/sub-dir1/package-name/video.ts
Content Type	The type of content to be output to the primary publishing point. Only option is <b>all</b> .
Output Type	Specifies whether the output media is file- or stream-based. The value in this field is dependent upon the selection in the <b>Package Type</b> field. For <b>Microsoft Smooth Streaming - remote</b> and <b>Adobe RTMP</b> the output type is automatically <b>stream</b> . For all other package types, the output type is automatically <b>file</b> .
Output ID	From a drop-down list, choose the output directory or stream to which to publish content. The value in the drop-down is a combination of unique Directory ID, Directory Name, NAS server hostname or IP, and the Remote Share Name as defined at the time of output directory creation.For example:
	1 U nfs_directory_1(10.10.82.29://mount-point)
Content Type Alt 1 Content Type Alt 2	The type of content to be output to a secondary publishing point: <b>none</b> , <b>all</b> , <b>manifests only</b> , or <b>media only</b> .
Output Type Alt 1 Output Type Alt 2	Whether the output media for the secondary publishing point is file- or stream- based.
Output ID Alt 1 Output ID Alt 2	The output directory or stream to which to publish content for the secondary publishing point.
Out-of-Sync Restart	Whether to re-synchronize stream-based content if the streams are not synchronized. Synchronization of streams is determined using IDR frames. For example, if there are 3 streams and streams #1 and #2 have IDR frames at 0, 2, 4, 6 seconds but stream #3 has IDR frames at 0,2,4,5 seconds, then an out-of-sync stream condition has occurred.
	Essentially, if a player switches between streams that are not synchronized, then the video will jump because the frames will not be continuous.
Thumbnail	Select whether to generate thumbnails for this package.
	<b>True</b> = generate thumbnails for this package; <b>False</b> = do not generate thumbnails
	If set to <i>True</i> , you must configure global output thumbnail parameters in the configuration >> output >> format >> thumbnail menu. Refer to "Thumbnail Output Configuration" on page 119 for detailed thumbnail descriptions and configuration guidelines.
Enable TTML	For Microsoft Smooth Streaming - remote and Microsoft Smooth Streaming only.
	Select whether to enable subtitles at the package level for <i>linear</i> packaging output <sup>f</sup> .



Field	Description				
Key Server Vendor Name	Select the Key Server to use to manage the encryption key with client players or select None if the package will not use a key server.				
	The following options are available based on <b>Package Type</b> selection:				
	<u>Apple HLS</u> — VerimatrixHLS, CKM, Nagra, Internal HLS <sup>g</sup> , Internal Flash Access, Secure Media, Conax, NdsCisco, rgbAPI, Mezzanine, and KPN.				
	<u><i>Microsoft SS - remote</i></u> — BuyDRM, CKM, VerimatrixPlayready, Latens, Conax, Irdeto, InternalPlayready, rgbAPI, and KPN.				
	<u><i>Microsoft SS</i></u> — BuyDRM, CKM, VerimatrixPlayready, Latens, Conax, Irdeto, InternalPlayready, rgbAPI, and KPN				
	Adobe HDS — CKM, Internal Flash Access				
	Adobe HDS - HTTP File — CKM, Internal Flash Access				
	The following Package Types do not have Key Server options: MPEG Dash ISO, MPEG Dash TS - HTTP File Format, RGB packager asset, Adobe HTTP Dynamic Streaming, and Adobe RTMP.				
Key Rotation	The duration of time (in minutes) that a particular encryption key will be used. After the time period expires, a new encryption key will be used to encrypt content. Enter 0 for no rotation.				
Content ID	Used by some key management servers to identify the content. Example: demo:RC001				
Content ID Type	Used by some key management servers to identify the content.				
Key Deletion Policy	Used by some key management servers to specify whether the package will be deleted at the conclusion of packaging, or not deleted.				
Policy ID	A string that identifies the policies to be applied to the content. Example: demo:P001:FIXED:EFF:NA:EXP:NA				
Content Name	Used by some key management servers (Irdeto) provide a name for the content				
Content Description	Used by some key management servers (Irdeto) provide a description for the content				
Subcontent Type	Used by some key management servers (Irdeto) to describe the type of Subcontent. Leave this field blank to use the default value.				
Policy Group ID	32 bit value. Used by some key management servers (Irdeto) to enter the Policy Group ID of the content.				

a. The option **continuous record** is available when the *Package Type* is set to *Apple HTTP Live Streaming*. This option will record continuous content based on user-defined start and end time. However, the continuous record choice only relates to RGB's nDVR solution, which is configured from the RGB Recording Manager. In other words, this setting should not be chosen from the TransAct *Packager* GUI.

b. Segment cache cleanup duration is twice the duration of the playlist. Once a segment has fallen off the playlist, it remains for another Segment Life Span duration. For example, if the Segment Duration is 10 and Segment Life Span is 60, there will be 6 segments in the playlist, and there will be an extra 6 segments aged out for a total of 12 segments on disk. Cleanup is periodic every 10 seconds.

- c. EBP Frag mode aligns audio track based on video track timing.
- d. EBP Frag periodic mode aligns audio track based on video track timing.
- e. Single output mode is available for HLS VOD, HLS Continuous Record, and DASH-TS VOD only in this release.

f. To configure subtitles for MSS JITP packaging output, see, "Modify Subtitle Configuration:" on page 117.

g. InternalHLS has been optimized for small-scale deployments such as lab environments, demo systems, etc.

# Starting a Package

The last step to deploying a linear package is to start it.

- **1.** From the **Configuration** tab, click through to **configuration** >> **package** >> **start**.
- 2. If you wish to modify the search criteria, click the "F" button in the window to filter the data.

FILTER Filtered Selector	
Filter Value: Filter value can be a simp	le group of characters or a Regular Expression.
	All BIO-SD CLOOVod H2_5_6 HLS-No_Restart HLS_Restart MSS_Euro Volia_Football_again
	T
	OK Cancel

- 3. If you chose to filter the data, click **OK** after making your choice.
- 4. If you did not filter the data, select the package you want to start from the Package ID field.
- 5. Click Submit.

**Note:** When a package is started, a status message indicates whether the package was started successfully.

Dashboard C	Configuration	Reports	System				
💀 System Status		st-In-Time Pacl		Packaging		Input/Output	Section Section
©·configuration ⊕ input ⊕ jitp		configural	tion >> p ts a packaging	package >: session.	> start		
⊕ output ⊖ package add modify		Packa	nge ID All	hmit	F)	Package ID.	
remove			50				

Click to select search criteria

6. Confirm the package has started by viewing its packaging status in the Dashboard under Packaging.

6	A Packaging	In Progress: 1   Waiting: 0
	🔁 🔅 TestHLS	Packaging (5/5)
	TestHLS	Frames Packaged: 21844
	C TestHLS	Frames Packaged: 22231
	C TestHLS	Frames Packaged: 22231
	TestHLS	Frames Packaged: 21845
	() TestHLS	Frames Packaged: 21846



## **Managing Packages**

- To show an existing package, see "Show Configured Packages" on page 196.
- To modify an existing package, see "Modify Configured Packages" on page 198.
- To remove an existing package, see "Removing Configured Packages" on page 199.

# **Package-level Redundancy**

Linear package-level peer redundancy is available as an optional feature. This section describes functionality and configuration parameters for redundancy implementation.

# **Functionality Overview**

Linear Package-level redundancy allows for two concurrently running packages that are identically configured on two separate *Packagers* to act as synchronous active-active or active-muted redundant packaging outputs. Both *Packagers* are receiving matching transcoded inputs and packaging duplicate packages. Two modes of package redundancy are available: duplicate output or single output.

•

**Duplicate Output** — in duplicate output mode, each packager is actively writing its own copy of the content using its own input that is verified as in-sync with the peer. Neither *Packager* should be configured to output to the same location as this would cause content to be overwritten. Duplicate output mode is only available for live packaging mode.

• **Single Output** — in single output mode, both redundant inputs are packaged, but only one *Packager* is publishing content per feed to the CDN at a time<sup>3</sup>. If a published output feed fails, the *Packager* that is packaging the redundant content immediately begins publishing that feed to the same output location. Single Output mode can be used for VOD and CR packaging modes with HLS or DASH-TS output formats.

## **Duplicate Output Sample**

Figure 5 shows a basic network architecture for package-level redundancy in which two *Packagers* (A and B) are configured as active-active duplicate output hosts. In this example, Packager-A receives two separate inputs (*Golf-2-TxCode & ABCW-TxCode*) from VMG-A, while Packager-B receives two separate (but identical) inputs from VMG-B (*Golf-2-TxCode & ABCW-TxCode*). The important component here is that while the input streams can come from either the same source or a different one, both streams of *Golf-2-TxCode* must share the same input characteristics, and both streams of *ABCW-TxCode* must share the same input characteristics.

Both Packager-A & B are configured to output the package, *Golf-2-PKG*, which is configured identically on both nodes. As well, both Packager-A & B are configured to publish the package *ABCW-PKG*, also configured identically on both nodes. As a result, both instances of *Golf-2-PKG* are simultaneously



<sup>3.</sup> Both sides must be configured to write to the same location.

published: one feed transmits to Content Server #1, while its redundant feed transmits to Content Server #2. The same applies for *ABCW-PKG*.





#### Single Output Sample

Figure 6 shows a basic network architecture for package-level redundancy in which two *Packagers* (A and B) are configured as active-muted single output hosts. In this example, Packager-A receives two separate inputs (*Golf-2-TxCode & ABCW-TxCode*) from the VMG, while Packager-B receives two separate (but identical) inputs from VMG-B (*Golf-2-TxCode & ABCW-TxCode*). The important component here is that while the input streams can come from either the same source or a different one, both streams of *Golf-2-TxCode* must share the same input characteristics, and both streams of *ABCW-TxCode* must share the same input characteristics.

Both Packager-A & B are configured to package the *Golf-2-PKG*, which is configured identically on both nodes. As well, both Packager-A & B are configured to package *ABCW-PKG*, also configured identically



on both nodes. But only one instance of *Golf-2-PKG* and *ABCW-PKG* is published to the Content Server, while its redundant feed is packaging, but not publishing to the content server.



Figure 6. Package-level Redundancy Network Architecture

#### **Primary/Secondary Behavior**

In package-level peer redundancy, neither *Packager* controls the other per se; reference timing control is based on a first-come first-serve basis. The redundant package that starts first becomes the effective 'primary' package, on which the 'secondary' package will base its PTS timing, segment number, encryption key, and various other points of reference. If the primary fails, the secondary not only continues to transmit, it then becomes the new primary on which the old primary will base its reference timing if and when it recovers. The same behavior ensues for a secondary package that is manually stopped (rather than having stopped due to network error or outage).

Additionally, it is possible, and quite likely, that there will be a mix of primary/secondary packages on a given *Packager* at a given time. Using the example in Figure 6 above, *ABCW-PKG* could have been started first on Packager-A (and thus the primary), while *Golf-2-PKG* could have been started first on Packager-B (thus the primary).

The *Packager* GUI will always show which package is primary/secondary. Refer to "Verifying / Showing Redundant Packaging Sessions" on page 167 for additional information.

#### Hardware Requirements

The following hardware is required for package-level redundancy:

- Two (2) *Packagers*, either running as virtual machine software instances or using the AMS hardware platform (or a combination of both).
  - The redundant *Packagers* must be able to communicate with each other through UDP unicast on ports 9001 & 9036 via their management interfaces.
- Two (2) identical input streams per desired redundant package, each one feeding a *Packager*, either from the same source or two separate ones. The input streams must share the same characteristics and timestamp as described in Table 55 on page 160.



# **Redundant Package Requirements**

In order for two packages on two *Packagers* to act as redundant outputs, their configuration must match. Table 55 provides a list of all menus and relevant fields that are required to match. :

Menu & Path	Fields required to match	Fields not required to match.	Special Notes	
Audio map name configuration.audiomap.add	Name	n/a	The name of the audiomap must match exactly for Packager-A and Packager-B	
Audio map rule configuration.audiomap.rule.add	All fields in this menu must match for redundant packages using the same rule.	n/a	Priority levels within each rule must also match.	
<u>Global output format</u> configuration.output.format: dash, hds, headers, hls, subtitle, thumbnail	All fields must match. See "Configure Matching Global Parameters" on page 162 for details.	n/a	The fields in the Global Output Format menu must match for all <i>redundant</i> packages using that particular output format.	
Keyserver system config sysconfig.keyserver.add sysconfig.keyserver.flashaccess.add	All fields must match for redundant packages who share the same keyserver configuration	n/a	Example: If the Key Server Vendor Name from the package.add menu uses VerimatrixHLS for both packages, then the system.keyserver configuration for VerimatrixHLS must use the same Key Server URL and TCP port number	
Input group name configuration.input.group.add	None	All	The input group Names and ID do <i>not</i> have to match	
Input stream characteristics configuration.input.group.stream	Video PID, Audio PID	Input Stream Group, Monitor Only, Name, Publishing Video Bit Rate,Protocol, IP Cast Type, Host, Port, IGMPv3 Source IP 1-4, Interface, Format,Program, Data PID	Redundancy functionality does not make assumptions on where the input is coming from, or even what is programmed for video bitrate; rather, redundancy functionality looks for matching characteristics of the actual stream.	

Table 55. Configurations that must match among redundant packages



Menu & Path	Fields required to match	Fields not required to match.	Special Notes
Output locations output.directory.add output.stream.add	No fields in either of these menus need to match	All fields	Output Names, IDs, or locations do not need to match between <i>Packager-A</i> and <i>Packager-B.</i>
			Special note: the physical locations mapped to the outputs MUST NOT be the same, otherwise the redundant packages will cross.
Package creation configuration.package.add	All fields in this menu must match <i>except</i> those listed in the next column.	Content Type, Output Type, Output ID, Content Type Alt 1-2, Type Alt 1-2, Output ID 1-2	n/a
Package Start Delay configuration.package.config.modify	None	All	The start delay of redundant packages do not need to match; however, if this setting is different it will determine which package starts first and therefore which package becomes the "master."

Table 55. Configurations that must match among redundant packages

# **Configuration Steps**

Redundant package configuration consists of the following steps:

- 1. Ensure Unicast Connectivity between both Packagers
- 2. Configure Matching Audio Map Parameters
- 3. Configure Matching Global Parameters
- 4. Create Matching Key Server Parameters
- 5. Configure Matching Input Stream Parameters
- 6. Create Matching Packages
- 7. Start Redundant Packages

Each of these steps is broken down in the subsequent sections. For easy reference, the names "*Packager-A*" and "*Packager-B*" will be used in the examples that follow.

**Caution!** While it is possible to copy the database file from one redundant Packager to another for ease of configuration, care must be taken to ensure the outputs of both Packagers are physically routed to different locations. Additionally, if a Packager is running a mix of redundant and



non-redundant packages, copying the database from one Packager to another may not be advised.

#### Ensure Unicast Connectivity between both Packagers

Ensure that the network over which the *Packagers* communicate are able to send and receive unicast messages over ports 9001 and 9036. Both *Packagers* use these unicast UDP ports to communicate via their respective *management interfaces*.

#### **Configure Matching Audio Map Parameters**

As described in Table 55 on page 160, audio map parameters for both *Packagers* in the same redundancy group must be identical for redundant packages making use of the audio map. To configure (or verify) matching parameters, proceed as follows from the GUI of both *Packagers*:

- 1. From the **Configuration** tab, click through to **configuration** >> **audiomap** >> **add**.
- 2. Create (or verify) the name of the audio map is the same.
- 3. Click through to configuration >> audiomap >> rule >> add.
- 4. Verify matching of (or modify accordingly) the following fields between Packagers:

configuration >> audiomap >> rule >> add
Name
Priority
Input Codec
Input Channels
Audio Bitrate Low
Audio Bitrate High
Language
Output Publishing Type

#### **Configure Matching Global Parameters**

As described in Table 55 on page 160, global output parameters for both *Packagers* in the same redundancy group must be identical for redundant packages making use of those output formats. To configure (or verify) matching parameters, proceed as follows from the **Configuration** tab in both Packager-A and Packager-B:

- If you are using dash for the output format of redundant packages, click through to output >> format >> dash.
- 2. Verify matching of (or modify accordingly) the following fields between *Packagers*:

output >> format >> dash
Segment Timeline
Fragment Timeline
Trick Play
Ad Signaling
Expired Content Retention

**3.** If you are using **hds** for the output format of redundant packages, click through to **output** >> **format** >> **hds** 



4. Verify matching of (or modify accordingly) the following fields between *Packagers*:

output >> format >> hds
Version
Ad Signaling
Multi-Level
License Rotation
Expired Content Retention

- 5. If you are using **headers** for the output format of redundant packages, click through to **output** >> **format** >> **headers**
- 6. Verify matching of (or modify accordingly) the following fields between *Packagers*:

output >> format >> headers
Header Name
Operational Mode
Package Type
Package Mode
Request Type
Enable Header
Etag Basis
Expiration Basis
Expire Time
Stale-If-Error Time
Identifier

- 7. If you are using hls for the output format of redundant packages, click through to output >> format >> hls
- 8. Verify matching of (or modify accordingly) the following fields between *Packagers*:

output >> format >> hls
Version
Trick Play
Ignore Out-Of-Sync
Variant Name
Template File Name
Segment Time
Keep Live Segments
Live Immediate Stop
Bit Rate Sub-Dir
Max Segments Per Sub-Dir
Ad Signaling
Expired Content Retention



- **9.** If you are using **subtitles** for the output format of redundant packages, click through to **output** >> **format** >> **subtitle**
- **10.**Verify matching of (or modify accordingly) the following fields between *Packagers*:

output >> format >> subtitle
Enable TTML
Enable ID3
Enable Adobe 708 CC Tunnel

**11.**If you are using **thumbnails** for the output format of redundant packages, click through to **output** >> **format** >> **thumbnail** 

12. Verify matching of (or modify accordingly) the following fields between Packagers:

output >> format >> thumbnail
Template Name
Horizontal Size
Vertical Size
Sample Rate
Output Type
Output ID
Image Format
Max Images
Aspect Ratio

#### **Create Matching Key Server Parameters**

For all redundant packages, the *Packager* system key server parameters must match. To configure matching parameters on both Packager-A and Packager-B, proceed as follows from the GUI of both devices:

- 1. From the **System** tab, click through to **sysconfig** >> **keyserver**.
- **2.** Verify that the key server being used for the redundant packages is configured exactly the same.

For example, if the package, "*Golf-2-PKG*" on Packager-A and Packager-B is configured to use **InternalHLS** as a key server, the InternalHLS settings from **sysconfig** >> **keyserver** >> **show** on both Packager-A and B should have matching entries for: Client key request URL, Output Type, Output ID, and Subdirectory Path.



**Note:** When two redundant packages are configured to use a key server, the "master" package communicates with the key server and then passes the encryption key to the slave. This is done to reduce the traffic to and from the key server.

## **Configure Matching Input Stream Parameters**

As described in Table 55 on page 160, various input stream parameters for both *Packagers* in the same redundancy group must be identical for the redundant packages. To configure (or verify) matching parameters, proceed as follows from the GUI of both *Packagers*:

1. From the **Configuration** tab, click through to **configuration** >> **input** >> **group** >> **stream** >> **add**.



2. Create (or verify) the required input parameters are the same.

The screen shot below shows the **input** >> **group** >> **stream** >> **add** menu with all required matching fields outlined in red.

-		
onfiguration >> input nis method adds a new input stream. OTE: Ensure the route table has prop OTE: If package-level redundancy is	t >> group >> stream >> add per static routes defined for multicast streams to be properly received. in use, input stream characteristics must match on both Packagers in the su	ame N+1 redundancy group.
Input Stream Group	vmg3 (1) 🔻	Group ID.
Publishing Video Bit Rate	0	[numeric] Video bit rate outputs from this stream will be published as (0=As Detected).
Monitor Only	faise •	Stream is for monitoring and capturing only, will not be packaged.
Name		[text, max. length of 24] User defined identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Protocol	udp/rtp 🔻	IP protocol of the stream
IP Cast Type	multicast V	Unicast or multicast
Host	0.0.0	[text, max. length of 499] udp/rtp:(Multicast only) Remote multicast address [224.x.x.x - 239.x.x.x], http: URL
Port		[numeric, min. value=1, max. value=65535] Port on the CTR to receive the stream.
IGMPv3 Source IP 1		[text] Multicast only - IGMPv3 source IP address 1. Leave empty for no source filtering.
IGMPv3 Source IP 2		[text] Multicast only - IGMPv3 source IP address 2. Leave empty for no source filtering.
IGMPv3 Source IP 3		[text] Multicast only - IGMPv3 source IP address 3. Leave empty for no source filtering.
IGMPv3 Source IP 4		[text] Multicast only - IGMPv3 source IP address 4. Leave empty for no source filtering.
Interface	em1 •	Interface to receive input stream on.
Format	mpeg2_ts	Input container format.
Program	0	[numeric, min. value=0, max. value=65535] Program number to select in the stream. (0=detect stream, auto-fill for SPTS))
Video PID	-1	[numeric, min. value=-1, max. value=8190] Packet ID of the video track in the program. (0=none, -1=all, ignored if program=0)
Audio PID	-1	[numeric, min. value=-1, max. value=8190] Packet ID of the audio track in the program. (0=none, -1=all, ignored if program=0)
Data PID		[text] Packet ID of the data track in the program. Multiple tracks are entered with comma delimited form. (empty=none, -1=all, ignored if program=0)

#### **Create Matching Packages**

For every pair of redundant packages, you must ensure their configuration matches on Packager-A and Packager-B. Table 55 on page 160 describes the fields that must match between packages. To configure matching packages, proceed as follows from the GUI of both devices:

**1.** From the **Configuration** tab, click through to **configuration >> package >> add**.



**2.** Configure matching parameters for both packages.

The screen shot below shows the **package** >> **add** menu with all required matching fields outlined in red.

onfiguration >> package is method creates a package. DTE: If package-level redundancy is in use	e >> add e, packaging configuration, including the Name, must match on both Packagers in th	he same N+1 redundancy group.
Name		[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
Package Type	Apple HTTP Live Streaming	Type of distribution
Package Mode	vod	Mode of distribution
Duration	3600	[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
Segment Mode	IDR periodic	Segmentation mode
Segment Duration		[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
Redundancy Mode	single output	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.
Redundancy Peer	10.32.128.109	[text, max. length of 72] Package-level redundant peer host/IP where an identical
Input Type	stream 🔻	Input type
Input ID	fox_ebr1 (1)	[numeric] Input stream group / Input directory
Audio Map	aac_eng_Prm_all_Alt	[text, max. length of 23] Audio map name
Subdirectory Path		[text, max. length of 93] Output sub-directory preceding the package name
Content Type	all	Content to output
Output Type	file 🗸	Output type
Output ID	1 U Storage_1(10.10.104.20://data/many_mounts/mnt21)	[numeric] Output Id
Content Type Alt 1	none	Content to output to secondary publishing point
Output Type Alt 1	file 🔻	Output type
Output ID Alt 1	0	[numeric] Output Id
Content Type Alt 2	none	Content to output to secondary publishing point
Output Type Alt 2	file 🔻	Output type
Output ID Alt 2	0	[numeric] Output Id
Thumbnail	false	Thumbnails generation
Key Server Vendor Name	None	Key Server Vendor
Content ID		[text] Encryption Media Content ID

#### **Start Redundant Packages**

Once all matching parameters have been configured for both *Packagers*, you can start the redundant packages. Proceed as follows:

- **1.** Determine (if desired) which package is to be the reference package for timing, segment number, and key server.
- 2. From Packager-A (or B), click through to configuration >> package >> start.
- 3. Select the Package ID corresponding to the desired redundant package you wish to start.
- 4. Click **Submit** to start the package.
- 5. From Packager-B (or A), click through to configuration >> package >> start.
- 6. Select the Package ID matching the package you just started in step 3.
- 7. Click **Submit** to start the package.



# Verifying / Showing Redundant Packaging Sessions

The **configuration** >> **session** >> **show** menu provides important information for viewing and verifying the status of redundant packages once they have been started.

To view package redundancy status, proceed as follows:

- 1. Obtain and log in to both the IP addresses of both *Packagers* that are employing package-level peer redundancy.
- **2.** Ensure that the desired redundant packages have been started and are actively packaging on both *Packagers*.

For instructions on starting a package, see "Starting a Package" on page 156.

- **3.** From the **Configuration** tab, click through to **configuration** >> **session** >> **show**.
- **4.** Select the desired Session  $ID^4$  of the package, or leave the default at 0 to show all.
- 5. Click Submit.

Results will look similar to the screen shot below (depending on which package is Primary or Secondary):

Packager A

							/	<u> </u>																
State	Session ID	Workorder ID	Time Started	Workflow Name	Input File Name	Input	Redundancy Mode	Redundancy Peer	Workorder S	rder Step														
inProgress(3)	1	4	Sat Jun 28 22:54:52 2014	Package 3/Group 1	HLS- DO	1	Primary	10.10.107.31	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retry Count	Publishing
									inProgress(3)	encode(2)	1	47199	295	0	0	0	0.000 / 29.970	0 / 2904000	fie(1)	/HLS- DO	0	1	0	true(1)
inProgress(3)	2	5	Sat Jun 28 22:54:53 2014	Package 1/Group 1	hds	1	Primary	10.10.107.31	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retri Coun:	Publishing
									inProgress(3)	encode(2)	2	47457	295	0	0	0	29.834 / 29.970	2300070 / 2904000	fle(1)	/hds	1	1	0	true(1)
inProgress(3)	3	6	Sat Jun 28 22:54:54 2014	Package 2/Group 1	HLS	1	Primary	0.0.0.0	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retry Count	Publishing
									inProgress(3)	encode(2)	3	47199	295	0	0	0	0.000 / 29.970	0 / 2904000	fie(1)	/HLS	0	1	0	true(1)

Packager B

	9.																							$\sim$
State	Session ID	Workorder ID	Time Started	Workflow Name	Input File Name	Inpu	Redundancy Mode	Redundancy Peer	Workorder Sl	tep														
inProgress(3)	1	10	Sat Jun 28 22:54:53 2014	Package 1/Group 1	hds	1	Secondary	10.10.88.150	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retry Coun	Publishing
									inProgress(3)	encode(2)	1	53844	334	0	0	0	30.196 / 29.970	2301887 / 2904000	fie(1)	/hds	1	1	0	true(1)
inProgress(3)	2	12	Sat Jun 28 22:54:52 2014	Package 3/Group 1	HLS- DO	1	Secondary	10.10.88.150	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retry Coun	Publishing
									inProgress(3)	encode(2)	2	53439	334	0	0	0	0.000 / 29.970	0 / 2904000	fie(1)	/HLS- DO	0	1	0	true(1)

- 6. The important columns to review are circled in red above and listed below.
  - Redundancy Mode On a per package basis, shows whether the specified package is the Primary or Secondary package. A primary package manages encryption keys (when encryption is enabled). In single-output format, a primary package is the one that publishes the manifests.
  - Redundancy Peer On a node basis, shows the other *Packager* that has an identical (redundant) package configured to use redundancy.
  - Publishing On a per package basis, shows whether the packaged output for the referenced peer is actually being published.



<sup>4.</sup> To obtain the Session ID of a package, click through to configuration >> package >> show (select Status).

### **CHAPTER 7**

# Just-in-Time Packaging

This chapter covers how to configure and initiate JIT packaging tasks on *Packager* within your overall website to deliver just-in-time media to devices at the edge of your content delivery network.

# In This Chapter:

- "Prior to Configuring JIT Packaging," next.
- "JITP Overview" on page 168.
- "Configure Profile Values for JITP Tables" on page 169.
- "Defining a Just-in-Time Input Source" on page 173.
- "Setting Prefetch Values for JITP" on page 175.
- "Creating the JITP Asset Package" on page 177.
- "JITP Management Tasks" on page 178.

# **Prior to Configuring JIT Packaging**

Prior to performing any JITP configuration, ensure that you have configured the following:

- **1. System** tab parameters as described in the section titled, "Prerequisite System Configuration Packaging Operations" on page 35.
- 2. Global output packaging configuration as described in Chapter 5, "Global Output Configuration" on page 93.

# **JITP Overview**

With just-in-time delivery, packaging of assets is performed only when content is requested by a user; this saves storage costs associated with pre-packaging video-on-demand assets, and simplifies migration to new packaged formats. JITP inputs are *files*, not streams, which correspond to timeshifted TV or video on demand content.

This section provides an overview of JITP asset preparation and configuration steps.

## **Asset Preparation**

Asset Preparation is an offline process that is run to pre-condition MPEG-TS media assets in preparation for VOD packaging. MPEG-TS files typically have their audio and video (A/V) interleaved 2-3 seconds apart. For efficiency, files are re-interleaved, removing this 2-3 second difference so that when files are segmented all the audio and video packets will be contained within a single segment. The asset preparation process is responsible for the following operations:

- Re-multiplexing the content to A/V interleave the file such that audio and video are aligned in time. This allows the file to be cut at an IDR frame while the respective audio and video is contained within the segment.
- Creating a closed caption DFXP file (only used for JITP). The DFXP file is used for creating the Closed Caption data track for Microsoft Smooth Streaming.
- Creating the RGB index files (only used for JITP). These files contain a map of all the IDR frames within a file so that segments can be created quickly. An index file is created for each bit rate.
- Create an RGB .pck file. The .pck file is a <u>manifest file</u> that describes the asset and the location of each bit rate file.

## **JITP Configuration Steps**

With JITP, packaging operations are performed once assets have been requested. While linear packaging requires that a package operation be manually started, JITP is entirely on demand; once a source server is configured with content assets, clients can request the content immediately.

To configure JITP on the *Packager*, four basic steps are involved:

- 1. Configure profile values;
- 2. Define an input source;
- 3. Configure prefetch values (optional);
- **4.** Create the mezzanine file<sup>1</sup> using the *RGB Packager Asset*, *MPEG Dash TS HTTP File Format*, or *HLS* package on a storage device.

The combination of the steps above result in a URL that a client requests for JITP. The JITP URL consists of:

- The Source Server Pattern and Directory Mount ID entries from the configuration >> jitp >> source menu
- The JITP profile table from the **configuration** >> **jitp** >> **profile** menu, which defines the protocol setting for the source server.

# Configure Profile Values for JITP Tables

Packager provides the ability to set variables for JITP profile tables that determine whether an output format is allowed for packaging and how that format is handled. You can change the settings for the existing default profile or you can create new profiles and settings.



**:** When modifying system values for JITP, the asset cache will be flushed and ongoing playback may fail and need to be restarted. It is advisable to perform these actions only during a scheduled maintenance window.

# Modifying the Default JITP Profile

1. From the **Configuration** tab, click through to **configuration** >> **jitp** >> **profile** >> **modify**.



<sup>1.</sup> A mezzanine format is a TS file-based format which is a "super set" of all packaged formats and is packaged/ encrypted on the fly ("just in time"). In this case, only one format is stored corresponding to the multiple profile encoding of a given asset.

A System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
Configuration	configuration > This method sets values should be executed durin	> jitp >> profile Tables. ng a maintenance wind	ofile >> moo Local asset cache w ow.	dify vill be flushed which may	interrupt JITP	sessions. Changes
assets     prefetch     profile	Profile Package Type	DEFAULT	aming	<ul> <li>JITP profile name.</li> <li>Type of distribution</li> </ul>	1	
_add _ <mark>modify</mark>	Allowed	false	[	<ul> <li>Format allowed</li> <li>[numeric, min. valu</li> </ul>	e=1, max. valu	e=10]
show ■ source	Audio Map	aac_eng_Prm_all_Al	t [	<ul> <li>Output segment d for DASH HTTP acc</li> <li>[text, max. length</li> </ul>	uration in seco cess type) of 23] Audio n	nds. (N/A nap name
<ul> <li>output</li> <li>package</li> <li>session</li> </ul>	Key Server Vendor Name	None		<ul> <li>Key Server Vendor</li> </ul>		
⊞ stitcher		Submit				

2. Provide the information in Table 56 on page 170 and click Submit.

**Note:** Depending on the combination of **Package Type** and **Key Server Vendor Name** options, additional fields will appear in this menu. All fields are described in Table 56 below.

Field	Description							
Profile	Select the name of the profile for which to make changes.							
Package Type	Select a package format to configure its JITP settings.							
	Choices for this release include <b>Apple HTTP Live Streaming</b> , <b>MPEG DASH ISO</b> , <b>Adobe HTTP Dynamic Streaming</b> , and <b>Microsoft Smooth Streaming</b> .							
Allowed	Indicates whether the package format is available for JITP packaging.							
Segment Duration <sup>a</sup>	The time frame (in seconds) for each segment.							
	This field is not applicable for the MPEG Dash ISO Package Type.							
Audio Map	Select the_audio map rule to be used for the profile.							
Key Server Vendor Name	Select the Key Server to use to manage the encryption key with client players or select <i>None</i> if no key server is to be used.							
	Choices for this release include:							
	For Apple HTTP Live Streaming — VerimatrixHLS, CKM, Nagra, InternalHLS <sup>b</sup> , InternalFlashAccess, SecureMedia, Conax, NdsCisco, and Mezzanine.							
	For Adobe HTTP Dynamic Streaming — CKM, InternalFlashAccess.							
	For Microsoft Smooth Streaming — BuyDRM, CKM, VerimatrixPlayready, Latens, Conax, InternalPlayready, RgbAPI, and KPN.							
	Note: For MPEG Dash ISO, there are no Key Server Vendor options.							
Key Server URL	Displays the URL for the specified key server. This field is read-only.							
Content ID Type	Select the type of content that the key server will use for identification. This field appears when <b>CKM</b> is selected as the <b>Key Server Vendor Name</b> .							
	Select from: ROVI, MERLIN, PUB, UUID, mediaContentID, and recordingID.							

Table 56. Configure formats for Just-in-Time packaging.



Field	Description							
Policy ID	Enter a string that identifies the policies to be applied to the content. This field can contain any alphanumeric or special character.							
	Example: demo:P001:FIXED:EFF:NA:EXP:NA							
	To remove an existing <b>Policy ID</b> , set the <b>Key Server Vendor Name</b> to <b>None</b> and click <b>Submit</b> .							
Key Rotation	Enter the duration of time (in minutes) that a particular encryption key will be used. After the time period expires, a new encryption key will be used to encrypt content. Enter 0 for no rotation.							

Table 56. Configure formats for Just-in-Time packaging.

a. The first frame for each segment is an IDR frame or RAI flag. Therefore, the segment duration specified with periodic modes is not an absolute, but a minimum target. The final duration will be based on how far the IDR or RAI frames are from the segment duration. For example: an IDR periodic segment duration of 3 seconds with IDRs inbound at a 2 second interval will produce 4-second segments.

b. InternalHLS has been optimized for small-scale deployments such as lab environments, demo systems, etc.

# Adding a New JITP Profile

1. From the **Configuration** tab, click through to **configuration** >> **jitp** >> **profile** >> **add**.

Dashboard Configuration	Reports System					
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
erconfiguration audiomap erinput	<b>configuration &gt;&gt;</b> This method creates a JITP pr	jitp >> prof	file >> add			
⊡ jitp ⊡ assets ⊡ prefetch	Profile			[text, max. length of	255] JITP profile	e name.
<b>□</b> •profile #add	S	ubmit				

- 2. Enter a name up to 255 characters in the Profile field.
- 3. Click Submit.
- 4. Navigate to configuration >> jitp >> profile >> modify.
- 5. From the **Profile** field, select the name of the profile you just created.
- 6. Modify the fields according to the guidelines in Table 56 on page 170.

#### 7. Click Submit.

Dashboard Configuration	Reports Syste	em		
A System Status J	ust-In-Time Packaging	Packaging Hardware	Input/Output	Events 😔 Connection
configuration     audiomap     input     iito	configuration : This method sets values should be executed duri	>> <b>jitp &gt;&gt; profile &gt;&gt; n</b> for JITP profile Tables. Local asset cacl ng a maintenance window.	<b>10dify</b> he will be flushed which may	interrupt JITP sessions. Changes
⊕ assets ⊕ prefetch	Profile	DEFAULT	JITP profile name.	
(Profile	Package Type	Apple HTTP Live Streaming	Type of distribution	
add <mark>modify</mark>	Allowed	false	<ul> <li>Format allowed</li> </ul>	
-remove show	Segment Duration	10	[numeric, min. valu Output segment de for DASH HTTP acc	e=1, max. value=10] uration in seconds. (N/A ress type)
	Audio Map	aac_eng_Prm_all_Alt	▼ [text, max. length	of 23] Audio map name
⊡ package	Key Server Vendor Name	None	<ul> <li>Key Server Vendor</li> </ul>	
🖶 session 🖻 stitcher		Submit		

## **View JITP Profiles**

To view the system values that have been set for different JITP profiles, proceed as follows:

- **1.** From the **Configuration** tab, click through to **configuration** >> **jitp** >> **profile** >> **show.**
- 2. Select the Profile you wish to view from the drop down menu.
- 3. Click Submit.

Dashboard Configuration	Repor	ts Syste	m											
🛕 System Status	Just-In-Tim	e Packaging	Pac			Input/C			🕘 📀 Con	nection				
erconfiguration audiomap erinput	configuration >> jitp >> profile >> show This method displays a JITP profile record.													
itp itp it assets it prefetch it profile it add it modify		Profile All II JITP profile name.												
show	Profile	rofile Profile Information												
source      output      package	DEFAULT	DEFAULT	DEFAULT	Package Type	Allowed	Segment Duration	AudioMap	Key Server Vendor Name	keyServerURL	Key Resource ID	Content ID Type	Policy ID		
Bession		Apple HTTP Live Streaming(1)	false(0)	10	aac_eng_Prm_all_Alt	None(0)		0	None(0)					
		Microsoft Smooth Streaming(7)	false(0)	2	aac_eng_Prm_all_Alt	None(0)		0	None(0)					
		Adobe HTTP Dynamic Streaming(5)	false(0)	4	aac_eng_Prm_all_Alt	None(0)		0	None(0)					
		MPEG Dash(3)	false(0)	10	aac_eng_Prm_all_Alt	None(0)		0	None(0)					



### **Remove a JITP Profile**

To remove the system values that have been set for different JITP profiles, proceed as follows:

- 1. From the **Configuration** tab, click through to **configuration** >> **jitp** >> **profile** >> **remove**.
- 2. Select the Profile you wish to remove from the drop down menu.
- 3. Click Submit.



**Caution!** Only delete the DEFAULT JITP profile if no other source server is using this profile.



# Defining a Just-in-Time Input Source

To enable Just-in-Time (JIT) packaging of content, you must first define the source server where inbound content is stored.

- 1. From the **Configuration** tab, click through to **configuration** >> **jitp** >> **source** >> **add**.
- 2. Provide the information in Table 57 on page 175 and click Submit.

# Menu Options For Access Type

The screens in this section depict the fields available when different options are selected from the **Access Type** field.

#### **File System Mount:**

Dashboard Configuration	Reports Syste	m				
🔡 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
⊡-configuration ® audiomap ® input	configuration > This method adds an sour	> jitp >> source ce server where input conte	e >> add ent is stored.			
i⊐ jitp i∄ assets i∄ prefetch i∄ profile	Source Server Pattern			[text, max. length of identifies source serv to a valid hostname b a file system mount. ' 9, '-', and '.'. The pat with a '-'	255] Unique key ver. This key is us selow or a directo Valid characters a tern cannot begi	that ed to map ry ID for are a-z, 0- n or end
-add -modify -remove 	Access Type	File System Mount	•	Indicates how files ar server. If a file syste must correspond to a mount. If HTTP or C2 a valid hostname to a be provided.	re retrieved from m mount, then th provisioned dire 2 HTTP or DASH H an HTTP web serv	source he source ctory ITTP then ver must
⊕ output ⊕ package	Directory Mount ID		•	[numeric] Valid mount (using configuration.i field is ignored for an	t id of provisioned input.directory.ad HTTP source ser	d directory dd). This ver.
e session e stitcher	Allow 05 Caching	Enable	×	This option can only be be ignored or rejecte types or access types of subsequent just-in better at the expens memory consumption will be impacted but n used.	be disabled for NF d for other file sy s. If enabled, per -time requests w e of greater OS of . If disabled perf nuch less memory	=S. It will /stem formance ill be aching ormance / will be
	Profile	DEFAULT	T	[text, max. length of table.	255] Select JITP	profile
		Submit				



HTTP, C2 HTTP, HLS	or DASH HTTP	(HTTP shown):
--------------------	--------------	---------------

Dashboard Configuration	Reports Syste	m				
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
⊡-configuration ⊕-audiomap ⊕input	<b>configuration &gt;</b> This method adds an sour	> jitp >> source ce server where input co	rce >> add			
□ jitp	Source Server Pattern			[text, max. length identifies source se to a valid hostname a file system mount 9, '-', and '.'. The p.	of 255] Unique ke rver. This key is e below or a direc Valid characters attern cannot be	ey that used to map tory ID for s are a-z, 0- gin or end
-source -add -modify -remove	Access Type	HTTP	,	<ul> <li>with a '-'</li> <li>Indicates how files server. If a file sys must correspond to mount. If HTTP or ( a valid hostname to</li> </ul>	are retrieved fro tem mount, then a provisioned dii 22 HTTP or DASH an HTTP web se	m source the source rectory HTTP then rver must
show ⊕routput ⊕rpackage	Host Name			Itext] Valid URL for field is ignored for a server.	an HTTP source mounted file sys	server. This stem source
B session B stitcher	Profile	DEFAULT		<ul> <li>[text, max. length a table.</li> </ul>	of 255] Select JT	IP profile
		Submit				

#### **HLS HTTP:**

Dashboard Configuration	Reports System Just-In-Time Packaging	n Packaging	Hardware	Input/Output	Events	Sonnection
e configuration audiomap input	configuration > This method adds an source	> jitp >> sour	rce >> add ntent is stored.			
⇒ jitp ⊕ assets ⊕ prefetch ⊕ profile	Source Server Pattern			[text, max. length of identifies source set to a valid hostname a file system mount 9, '-', and '.'. The pa with a '-'	of 255] Unique k rver. This key is below or a direc Valid character attern cannot be	ey that used to map tory ID for s are a-z, 0- gin or end
add modify remove show	Access Type	HLS HTTP	Ŧ	Indicates how files server. If a file syst must correspond to mount. If HTTP or C a valid hostname to be provided.	are retrieved fro tem mount, then a provisioned di 22 HTTP or DASH an HTTP web se	m source the source rectory HTTP then erver must
⊕ routput ⊕ rpackage	Host Name			[text] Valid URL for field is ignored for a server.	an HTTP source mounted file sy	server. This stem source
€ stitcher	Alternate Host Name			[text] Valid alternat server. This field is system source serv ingest to specify th separate from locat	e URL for an HT ignored for a mo er. This is used f e location of mar ion of content).	TP source unted file for HLS nifests (if
	Profile	DEFAULT	•	[text, max. length a table.	of 255] Select JI	TP profile
		Submit				

Field	Description
Source Server Pattern	An identifier for the source server that contains the inbound content for Just-in- Time packaging. It is used to map to a valid hostname, or a directory ID for a file system mount.
	• Can be up to 255 characters (a - z, 0 - 9, - [dash] and . [dot])
	<ul> <li>Pattern cannot begin or end with a dash</li> </ul>
	Cannot be the management IP address or host name.
Access Type	Indicates how files are retrieved from the source server.
	File System Mount—If this is selected, the Source Server Pattern must correspond to a provisioned directory mount ID.
	<b>HTTP / C2 HTTP, DASH HTTP</b> , or <b>HLS HTTP</b> —If any of these options are selected, the <b>Source Server Pattern</b> must correspond to a valid HTTP web server hostname.
Directory Mount ID	Appears when File System Mount is selected from the Access Type field.
	A valid mount ID for a valid inbound directory; see "Managing Input Directories" on page 181.
Host Name	Appears when HTTP / C2 HTTP, DASH HTTP, or HLS HTTP is selected from the Access Type field.
	A hostname (domain name or IP address) for an HTTP source server.
Alternate Host Name	Appears when <b>HLS HTTP</b> is selected from the <b>Access Type</b> field.
	A valid alternate URL for an HTTP source server. Used to specify the locations of manifests for HLS ingest if the manifests are separate from the content location.
Allow OS Caching	Enables memory caching for faster responses to JITP requests. Enabling increases memory consumption with performance; disabling decreases memory consumption at the expense of performance.
	For NFS only. CIFS, HTTP and C2 HTTP will ignore this setting.
Profile	Select a JITP profile for which to apply the source server configuration. If no other profiles were created besides DEFAULT, the drop-down box is not available.

Table 57. Configure a source server for Just-in-Time packaging.

# 3 Setting Prefetch Values for JITP

Prefetching allows *Packager* to retrieve requested JITP content early in order to minimize the number of times the storage system is accessed. In this sense, prefetching acts as a memory buffer for quicker response to the client. By default, prefetching is enabled on *Packager*.



To change or configure prefetch values, proceed as follows:

1. From the **Configuration** tab, click through to **configuration** >> **jitp** >> **prefetch** >> **modify**.

Dashboard Configuration	Reports Syste	em				
🔡 System Status	lust-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
configuration audiomap binput litp	<b>configuration &gt;</b> This method modifies the Changes should be execu	>> jitp >> prefe prefetch configuration for 2 uted during a maintenance v	tch >> modif ITP, Local asset cach vindow.	F <b>y</b> e will be flushed which	may interrupt J	ITP sessions.
⊕ assets ⊖ prefetch	Enable Prefetching	true	•	Enable/disable pre-fe	tching for JITP.	
"modify "show	First Level Threshold	3		[numeric] Number of before starting first   Default Value = 3	consecutive seg evel of pre-fetc	gment hing.
<ul> <li>Profile</li> <li>Source</li> </ul>	First Level Chunk Duration	8		[numeric] Chunk pref level. Default Value =	fetch duration ir = 8	the first
● output ● package	Second Level Threshold	5		[numeric] Number of before starting secor Default Value = 5	consecutive see nd level of pre-f	gment etching.
± <sup>™</sup> session	Second Level Chunk Duration	16		[numeric] Chunk pref second level. Default	fetch duration in Value = 16	1 the
		Submit				

- **2.** Modify the fields according to the guidelines in Table 58 on page 176.
- 3. Click Submit..

Table 58. Modify JITP prefetch menu fields.

Field	Description
Enable Prefetching	Select true or false to enable and disable whether Packager will use prefetching system-wide.
	<b>Note:</b> Prefetch settings affect RAM disk usage. Disabling prefetch will keep only 5 seconds worth of ingested streams on RAM. Enabling prefetch will keep ingested stream content on RAM for as long as you specify in the <i>Second Level Chunk Duration</i> field.
First Level Threshold	Enter the number of consecutive chunks that must be present before first level prefetching can begin. Default value is 3.
First Level Chunk Duration	Enter the duration of content (in seconds) that Packager will retrieve for the first level of prefetching. Default is 8.
	Example: Using a default First Level Threshold of 3 and First Level Chunk duration of 8, then when content chunks 1, 2, and 3 are requested back to back, Packager will prefetch 8 seconds worth of content.
Second Level Threshold	Enter the number of consecutive chunks that must be present before second level prefetching can begin. Default value is 5.
Second Level Chunk Duration	Enter the duration of content (in seconds) that Packager will retrieve for the second level of prefetching after first level prefetching has been performed. Default is 16.
	Example: Using a default Second Level Threshold of 5 and Second Level Chunk duration of 8, then when content chunks 4, 5, 6, 7, 8 are requested back to back, Packager will prefetch the 16 seconds worth of content.





# **Creating the JITP Asset Package**

The Packager allows for two different methods of creating JITP asset packages.

- Stream-to-File: Ingests IDR aligned streams and packages them to JITP package asset files.
- File-to-File: Ingests IDR aligned *files* and packages them to JITP package asset files.

## Stream-to-File Basic Steps

1. Create an input group.

From the **Configuration** tab, click through to **configuration** >> **input** >> **group** >> **add**.

2. Add IDR aligned streams to the group.

From the **Configuration** tab, click through to **configuration** >> **input** >> **group** >> **stream** >> **add.** 



**Note:** Both AAC and DD+ are supported in this method. It is recommended that you filter out all <u>non</u>-AAC and <u>non</u>-DD+ audio codec PIDs.

3. Create a package. From the Configuration tab, click:

#### configuration >> package >> add

Use the following settings: Package Type: RGB Packager Asset -OR- MPEG Dash TS - HTTP File Format Duration: [Duration of the recording in seconds] (Ensure storage capacity is not exceeded) Input Type: Stream Input Id: [Name of the input group you wish to record] Output Type: File Output Id: Output mount where you want to store your RGB asset

- 4. Start the package. (configuration >> package >> start)
- 5. The package will automatically stop after the specified duration.
- 6. The JITP package assets will be created in the "package\_name" directory of the output mount point.

## File-to-File Basic Steps

- 1. Log in to the *Packager's* CLI via SSH to the IP address.
- 2. Enter your root login and password.
- Copy the IDR aligned files to the input mount in a new directory (as an example, we will use a directory name of "test")



**Note:** RGB recommends that you use a different input mount for these temporary TS files.



4. Create a pack file (assetABCD.pck for example) of the following format (Lines starting with "#" are informational comments only.):

```
GroupName: assetABCD
```

# (Format: Path from the mount point for each video, Published video bit rate, Published audio bit rate)

```
test/profile1.ts 3800000 62833
test/profile2.ts 2900000 62847
test/profile3.ts 1900000 62821
```

5. In the GUI, create a package. From the Configuration tab, select:

#### configuration >> package >> add

Use the following settings: Package Type: RGB Packager Asset -OR- MPEG Dash TS - HTTP File Format Duration: Keep default Input Type: File Input Id: [Enter the name of the input mount from which to retrieve the content] Input File Name: [Enter the name of the pack file, such as: test/assetABCD.pck] Output Type: File Output Id: [Enter the output mount to which the JITP asset will be stored]

6. Start the package. From the **Configuration** tab, select:

#### configuration >> package >> start

- **7.** The package will automatically stop once the content has been re-packaged to the *RGB Packager Asset* or *MPEG Dash TS HTTP File Format.*
- 8. The JITP packager assets will be created in the "package\_name" directory of the output mount point.
- 9. Delete the package. From the **Configuration** tab, select:

#### configuration >> package >> remove

**10.**From the *Packager*'s CLI, delete the temporary TS files which you created in step 3 as they are no longer being used.

# **JITP Management Tasks**

To view JITP assets that are available on the source server, see "Viewing JITP Assets" on page 201.

To perform management tasks of input JITP sources, including viewing and modifying input sources, see "Managing Input JITP Sources" on page 203.

To flush the JITP cache, see "Flushing the JITP Cache" on page 202.



#### **CHAPTER 8**

# Managing Packages

This chapter provides details on managing both linear and JIT packaging; it includes viewing, modifying and removing inputs and outputs, covers how to configure and initiate JIT packaging tasks on *Packager* within your overall website to deliver just-in-time media to devices at the edge of your content delivery network.

# In This Chapter:

- "Managing Sessions," next.
- "Managing Input Directories" on page 181.
- "Managing Input Streams and Groups" on page 183.
- "Managing Output Directories" on page 192.
- "Managing Output Streams" on page 194.
- "Managing Packages" on page 196.
- "Viewing JITP Assets" on page 201.
- "Flushing the JITP Cache" on page 202.
- "Managing Input JITP Sources" on page 203.

# **Managing Sessions**

When the *Packager* is started, a session is created. The session keeps track of the number of segments generated and of the state of each stream associated to with the package.

# **Show Active Sessions**

To view the sessions currently underway on Packager:

1. From the **Configuration** tab, click through to **configuration** >> **session** >> **show**.

2. Provide the information in Table 59 on page 180 and click **Submit**.

Dashboard Configuration	Reports System	n				
🔡 System Status	Just-In-Time Packaging			input/Output		Connection
i configuration i audiomap i input jitp	configuration > This method returns one o Paging only applies when r Dynamic and Paging value	> session >> sl r more session information retrieving all sessions. s are ignored when retriev	how as requested. ing a specific session ID			
e output □ package □ add	Session ID Show JITP Sessions	0 false		[numeric] Session Include just-in-tim	ID to retrieve (0 - ne sessions in result	to get all). ts.
modify	Page Size	0		[numeric] Number display on a page	of entries to retrie (0 - display all on o	eve and one page).
"show	Page Starting Session ID	0		[numeric] Session - start from first a	ID to start from or available session ID	n this page (0 ).
stop	Workorder ID	0		[numeric] Work O all). This is an opt	rder ID to retrieve ional parameter	(0 - to get
abort		Submit				

After clicking **Submit**, a results table similar to the graphic shown below will appear:

State		Session ID	Workorder ID	Time Started	Workflow Name	Input File Name	Input	Redundancy Mode	Redundancy Peer	Workorder St	tep														
inProgres	ss(3)	1	7	Fri Jun 27 01:33:16 2014	Package 1/Group 1	hds	1	Primary	0.0.0.0	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retry Count	Publishing
										inProgress(3)	encode(2)	1	86	0	0	0	0	32.061/ 29.970	2890334 / 2904000	file(1)	/hds	1	0	0	true(1)
inProgres	ss(3)	2	8	Fri Jun 27 01:33:17 2014	Package 2/Group 1	HLS	1	Primary	0.0.0.0	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retry Count	Publishing
										inProgress(3)	encode(2)	2	0	0	0	0	0	0.000 / 29.970	0 / 2904000	file(1)	/HLS	0	0	0	true(1)
inProgres	ss(3)	3	9	Fri Jun 27 01:33:18 2014	Package 3/Group 1	HLS- DO	1	Primary	0.0.0.0	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment Generated	Total Frames	Maximum Queue Depth	Current Queue Depth	Frames Per Second	Bit Rate Stats	Transport/Usage	Output File Name	Output	In Sync	Retry Count	Publishing
										inProgress(3)	encode(2)	3	0	0	0	0	0	0.000 / 29.970	0 / 2904000	file(1)	/HLS- DO	0	0	0	true(1)

#### Table 59. View session information.

Field	Description
Session ID	The ID assigned to the session by the <i>Packager</i> .
Show JITP Sessions	Whether to show Just-in-Time packaging sessions in the results: true or false.
Page Size	How many entries to retrieve and display on one results page. Enter 0 to display all results on one page.
Page Starting Session ID	The session ID from which to retrieve results. Enter 0 to retrieve results from the first available session ID.
Workorder ID	The workorder ID from which to retrieve results. Enter 0 to retrieve results from all sessions.

When evaluating session results, the package is functional when the results are as follows:

- Step State—inProgress(3)
- Step Type—encode(2)
- Total Frames Transcoded—Increasing
- Segment generated—Increasing once per segmentation interval
- In Sync—1
- Retry count—Very low. If this value is high, then the input stream is not IDR aligned or there is another issue.


# **Abort Active Sessions**

To abort a session currently underway on Packager:

- **1.** From the **Configuration** tab, click through to **configuration** >> **session** >> **abort**.
- 2. Provide the information in Table 60 and click Submit.

Dashboard Configuration	Reports System					
System Status	lust-In-Time Packaging			Input/Output		Section Section
Configuration  audiomap  input  jitp  output	<b>configuration &gt;&gt;</b> This method is used to abort set to 0 then all sessions are ID or session ID will be abort is ignored.	Session >>     (terminate) an active     aborted on otherwis     ted. If both are non-z	abort e session given sessior e if either is non-zero ero then the session I	n or workorder ID. If bot then the session associa D will be used to abort th	h session ID an ted with the sp ne session and	d workorder ID are edfied workorder the workorder ID
B package □ session abort show	Session ID 🤇			[numeric] Session ID workflow IDs must be [numeric] Optional W session & workflow II default to 0 if not set	to abort (both e 0 to abort all) orkorder ID to Os must be 0 to t.	session & abort (both .abort all) -
	5	Submit				

#### Table 60. Abort a session.

Field	Description
Session ID	The ID assigned to the session by the <i>Packager</i> . Enter 0 (zero) to abort all sessions; you must also enter 0 (zero) in the <b>Workorder ID</b> field.
Workorder ID	An optional workorder identification to abort a specific session.

# **Managing Input Directories**

You can receive inbound media by ingesting a file from an inbound directory, and publish packages to an outbound directory or stream.

## **Show Input Directories**

Refer to "Defining Input Directories" on page 126 for instructions on adding a directory.

- To show the input directories configured on Packager:
- 1. From the Configuration tab, select: configuration >> input >> directory >> show.

#### 2. Click Submit.

Dashboard Configuration	Reports	s Syste	em						
System Status	ust-In-Time	Packaging	Packaging	Hardy	vare	Input/Ou	tput	Events 😔	Connection
⊡·configuration ☐ input ☐ directory	<b>config</b> This method	Iration >	>> input >> di	rectory	>> sho	w			
add modify remove <u>Stow</u> ⊕rgroup		Sub	omit						
⊕ jitp ⊕`output	Directory Type	Directory ID	Directory Name	File System Type	Usage	Source File Deletion	Priority	Administrative State	Operational State
⊕ package ⊕ session	inbound(0)	1	local-in	local(2)	on- demand(1)	none(0)	1	unlocked(1)	enabled(2)
	inbound(0)	2	local-SCT	local(2)	on- demand(1)	none(0)	1	unlocked(1)	enabled(2)
	inbound(0)	3	kios-tap49_test	nfs(1)	on- demand(1)	none(0)	1	unlocked(1)	enabled(2)

# **Modify Input Directory**

To modify an input directory, proceed as follows:

- 1. Click the **Configuration** tab then select **configuration** >> **input** >> **directory** >> **modify**.
- 2. Provide the information in Table 61 and click **Submit**.

Dashboard Configuration	Reports System			
💀 System Status	ust-In-Time Packaging		Input/Output	Events 🥰 Connection
⊡-configuration □ input □ directory □ add	<b>configuration</b> > This method changes the ac directories are always unloc	> input >> directory >> min state or the name of a directory. Onl ked.	modify y an input directory can be	explicitly locked/unlocked. Input
-modify -remove -show	Directory ID Source File Deletion	1 U Local-Directory(/opt/localmnt:/Local-D	[numeric] Directory	ID (L-locked, U-unlocked).
e group € jitp € output	Priority	1	[numeric, min. value Priority level for aut lowest priority, 10 =	= 1, max. value = 10] o input directory - 1 = = highest priority
package     session	Directory Name	.ocal-Directory	[text, max. length o name.	of 24] User-defined directory
		Submit		

#### Table 61. Modify an input directory.

Field	Description					
Directory ID	Displays the list of identifiers which were created via the <b>configuration</b> >> <b>input</b> >> <b>directory</b> >> <b>add</b> menu. Select the package you wish to modify from this field.					
Source File	Required. Select how to manage source file deletion:					
Deletion	<b>none</b> —The successfully transcoded file is moved to the <b>Success</b> directory and transcode errors are moved to the <b>Error</b> directory. The source input file is not deleted.					
	<b>success</b> —Delete source files if the transcode was successful. Transcode errors are moved to the Error directory.					
	always—Delete source files regardless of a successful transcode.					



Field	Description
Priority	<b>Required.</b> Enter the priority level (1-10) that should be assigned to the files in this directory; higher priority directories are processed before lower priority directories. 1 is the lowest priority, 10 is the highest priority.
Directory Name	An identifier for the directory, up to 24 characters. Only use alphanumeric characters, periods, underscores, or hyphens.

Table 61. Modify an input directory.

To remove an input directory:

- 1. Click the **Configuration** tab then select **configuration** >> **input** >> **directory** >> **remove**.
- 2. Provide the information in Table 62 and click Submit.

	Packag	er		Current system time: Apr 22 14:42:17 Welcome admin Connected to 10.10. Logout
System Status	Packaging Hardwa	are Input/Output	Events	S Connection
input	configuration > This method removes an	>> input >> direct input or output directory.	tory >> remo	ve
add modify <u>remove</u>	Directory II	0 1 U (10.10.100.215:/input3	)	Directory ID (L-locked, U-unlocked)
show 		Submit		

Table 62. Remove an input directory.

Field	Description
Directory ID	An identifier assigned to the directory by <i>Packager</i> . Select the package you want to remove from this field.

# **Managing Input Streams and Groups**

You can receive inbound media from input streams by creating groups and defining input streams that are part of those groups. You can also publish media to output streams.

## **Managing Input Streams and Groups**

See "Defining Input Streams" on page 130 for adding groups and input streams.

#### To view the input stream groups:

- 1. Click the **Configuration** tab, then select **configuration** >> **input** >> **group** >> **show**.
- 2. Select the stream group for which you want to view details from the **Input Stream Group** field. Or select **All** to view all stream groups defined on *Packager*.
- 3. Click Submit.



Dashboard Configuration	Reports System					
🐺 System Status 🛛 🛛 🤀	ust-In-Time Packaging	Packaging		Input/Output Eve	nts 🛛 🎯 Connect	tion
i⊂ configuration input input i directory	configuration > This method shows an inpu	> input >> it group.	> group >> show			
d group add ⊡modify	Input Stream Group	All		Group ID.		
remove <mark>-show</mark> ⊕stream	[	Submit				
output	Input Stream Group		Name	Input Stream	Enabled	
package	1	k	KNXA_NBC_201	4	4	

When selecting **All** from the **Input Stream Group**, a similar window as seen below will appear:

When selecting a single input from the **Input Stream Group**, a similar window as seen below will appear:

Config This met	guration >> inp nod shows an input group.	ut >>	group >	> shov	v													
	Input Stre	am Grou	P HD1_KNX	A_NBC_7.1	101 (1)					Ţ G	roup ID.							
Input Stream Group	Name	Input S	tream														Capture Se	ttings
1	HD1_KNXA_NBC_7.101	Index	Publishing Video Bit Rate	Monitor Only	Input ID	Name	Host	Port	Interface	IP Cast Type	IGMPv3 Source IP	Protocol	Container Format	Operational State	Configurat	ion	Output Directory	0
		1	0	false(0)	1	1280x720	234.5.7.101	10001	any	multicast	not set	udp(4)	mpeg2_ts(3)	enabled(2)	Program Video PID Audio PID Pass Data PIDs	1 101 -1 false(0)	Out-Of- Sync	false(0)
		2	0	false(0)	2	768x432	234.5.7.101	10002	any	multicast	not set	udp(4)	mpeg2_ts(3)	enabled(2)	Auto Detect Program Video PID Audio PID Pass Data	false(0) 1 1 101 -1 false(0)		
															PIDs Auto Detect	false(0)		

# To modify an input group:

1. Click the **Configuration** tab then select **configuration** >> **input** >> **group** >> **modify**.



2. Provide the information in Table 64 and click **Submit**.

Dashboard	Configuration	Reports Syste	em				
System Status		ust-In-Time Packaging			Input/Output		Connection
Configuration		<b>configuration</b> > This method creates a gro	>> input >> g oup of input streams.	roup >> modi	fy		
⊡ <sup></sup> group <sup></sup> add "modify		Input Stream Group	KNXA_NBC_201 (1)	v	Group ID.		
show		Name	KNXA_NBC_201		[text, max. length o identifier. Must cont characters; periods, are allowed.	f 40] User defin ain only alphanu underscores an	ed unique meric d hyphens
⊕ stream ⊕ jitp ⊕ output		Capture Output Dir	None	T	Output directory ID input streams on bas capture).	to put 5 minutes sed on events ((	s capture of ) = no
• package		Underrun	false	T	Input bit rate while a than 25% of publish	actively packagir ed rate for 10 s	ng is less econds
±"session		Out-Of-Sync	false	•	The output generate frame aligned	ed from this inpu	it is not key
			Submit				

Table 63. Modify an input stream group.

Field	Description
Input Stream Group	An identifier assigned to the input stream group by <i>Packager</i> . Select the group you want to modify from this field.
Name	An identifier for the inbound stream, up to 23 characters. Must contain only alphanumeric characters, periods, underscores and hyphens.
Capture Output Dir	<i>Packager</i> can capture individual streams within an input stream group and save them to an output directory. Select the output directory from this field where you want the streams to be stored.
	<b>Note:</b> If a selected event happens with any input stream that is part of the stream group, every stream will output a capture segment to this directory.
	Files saved appear as follows:
	<time event="" of=""> + <ip and="" input="" of="" port=""> + <group and="" id="" stream<br="">Id&gt; + <event name(s)=""></event></group></ip></time>
	For example:
	Mon_Mar_21_16_04_17_2011_capture_ip_234.5.6.102_port_1001_Group2 _Stream3_Underrun.ts
	Mon_Mar_21_16_04_17_2011_capture_ip_234.5.6.102_port_1002_Group2 Stream4_Underrun.ts
	Mon_Mar_21_16_04_17_2011_capture_ip_234.5.6.102_port_1003_Group2 _Stream5_!Underrun!.ts
	If the event has "!" around its event name, then this stream experienced the problem.
Underrun	Whether the input bit rate should remain at less than 25% of the published bit rate for 10 seconds while actively creating packages. Select <b>true</b> or <b>false</b> .
Out-Of-Sync	Whether the output generated from this operation is IDR-aligned. Select true or false.

When capturing streams, keep in mind segments are being assembled on RAM disk to minimize impact on normal operations. RAM disk space is limited (4G) and can quickly become consumed. Monitor RAM disk usage to ensure that captures do not raise RAM usage higher than 90%.

#### To remove an input stream group:

- 1. Click the **Configuration** tab then select **configuration** >> **input** >> **group** >> **remove**.
- 2. Provide the information in Table 64 and click **Submit**.



**Note:** All of the streams within the group will also be removed.

Dashboard Configuration	Reports System	Packaning	Upudurana	Terrent /Outerast	Events	Connection
System Status	Just-III-Time Packaging	Packaging	naroware	πραι/Οατραι	Events	Connection
□°configuration □ input □ directory	configuration >> This method removes an inpu	input >> gr ut group.	oup >> remo	ove		
⊡-group add modify	Input Stream R Group	GB_Test (1)	•	Group ID.		
" <mark>remove</mark> "show	S	Submit				

#### Table 64. Remove an input stream group.

Field	Description
Input Stream Group	An identifier assigned to the input stream group by <i>Packager</i> . Select the group you want to remove from this field.

You can view status, statistics and content information for any stream that is part of an input group.

#### To view the input streams that are defined on *Packager*:

1. Click the **Configuration** tab then select **configuration** >> **input** >> **group** >> **stream** >> **show**.



2. Provide the information in Table 65 and click **Submit**.

Dashboard Configuration	Reports System	Packaging	Hardware	Input/Output	Events	S Connection
configuration     input     directory	configuration > This method retrieves info	> input >> gro for a given stream.	up >> strear	n >> show		
□ group □ add □ modify	Input Stream Group Stream ID	RGB_Test (1)	•	The input group ID. Stream ID.		
show	Display	configuration		Type of information d	desired.	
"add "modify "redetect	[	Submit				

Table 65. Show input streams.

Field	Description
Input Stream Group	An identifier assigned to the input stream group by <i>Packager</i> . Select the group to which the input stream belongs.
Stream ID	The ID assigned to the stream by the Packager. Select All to view all streams.
Display	The type of information you want to view. You can view stream configurations on the <i>Packager</i> (select <b>configuration</b> ), statistics for a particular stream (select <b>statistics</b> ), or stream properties including the program channels and audio/video in a stream (select <b>content</b> ).

**Configuration** results appear similar to the following:

Input ID	Name	Host	Port	Interface	IP Cast Type	IGMPv3 Source IP 1	IGMPv3 Source IP 2	IGMPv3 Source IP 3	IGMPv3 Source IP 4	SCTE35 Stream ID	Protocol	Container Format	Operational State	Configuration		Detection Status
1		234.100.35.1	10001	em1	multicast					0	udp(4)	mpeg2_ts(3)	enabled(2)	Program	1	Stream detected
														Video PID	101	
														Audio PID	102	
														Data PID		
														Auto Detect	false(0)	
2	GroupB	225.0.0.55	4500	em1	multicast	224.0.0.25	225.0.0.68			546	udp(4)	mpeg2_ts(3)	disabled(1)	Program	0	Not detected
														Video PID	0	
														Audio PID	0	
														Data PID	-1	
														Auto Detect	true(1)	



Statistics results will appear similar to the graphic below:

**Note:** The selected program row indicates how many bytes were sent on the associated package object. A sign of a well functioning input stream is a rising UDP packet count with a low error counter.

Input ID	Name	Detection Status	Statistics																	
1	1280x720	Stream detected	Level	UDP packets	RTP packets	MPEG2T5 packets	MPEG2TS bit rate (Kb/sec)	Unknov packet	vn RTP s version errors	RTP payload errors	RTP sequence # errors	RTP timestamp errors	MPEG2TS sync errors	5 MPEG2TS transpor errors	5 MPEG2TS t continuity errors	HTTP bytes	HTTP bit rate (Kb/sec)	HTTP errors	Current queue depth	Maximum queue depth
			Complete stream	538944158	0	3772609106	4976	0	0	0	0	0	0	0	109	0	0	0	0	26768
			Selected program session 1-1	384705273	0	2486291321	3289		2	°	0	0	0	0	106	0	0	0		
2	864x486	Stream detected	Level	Inpu ID	t Nan	ne	Detec Statu	tion :	Statisti	cs					MPEG2TS continuity errors	HTTP bytes	HTTP bit rate (Kb/sec)	HTTP errors	Current queue depth	Maximum queue depth
			Complete stream	1	1280	)x720	Stream	.	Level	UD	Р	RTP	MPE	G2TS	95	0	0	0	0	13384
			Selected program session 1-2				detecte	ed		pa	kets	packet	s pack	ets	94	0	0	0		
3	640x360_lq	Stream detected	Level						Comple stream	te 539	074822	0	3773	523754	MPEG2TS continuity errors	HTTP bytes	HTTP bit rate (Kb/sec)	HTTP errors	Current queue depth	Maximum queue depth
			Complete stream						Selecter	d 384	798628	0	2486	895165	98	0	0	0	0	11472
			Selected program session 1-3						session 1-1						92	0	0	0		
4	320x180_mq	Stream	Level	UDP	RTP	MPEG2T5	MPEG2TS	Unknown	RTP	RTP	RTP	RTP	MPEG2T5	MPEG2T5	MPEG2T5	НТТР	HTTP bit	нттр	Current 1	flaximum
		detected		packets	packets	packets	bit rate (Kb/sec)	packets	version errors	payload errors	sequence # errors	timestamp errors	sync errors	transport errors	continuity errors	bytes (	rate (Kb/sec)	errors	queue d depth d	jueue lepth
			Complete stream	78257509	0	547802563	722	0	0	0	D	0	0	0	35	0 (	)	0 (	0 3	1824
			Selected program session 1-4	71410523	0	283055054	373	0	0	0	D	0	0	0	31	0 (	)	D		



Input ID	Name	Detection Status	Detected St	tream De	tails (	* = encrypted	I)									
1	1280x720	Stream detected	Program	Name	PID	Data PIDs	Video Tracks						Tracks			
			1		100		PID	Video Codec	Video Info		]	PID	Audio Codec	Audio Info		
							101	H264	Video Bit Rate	4841834		102	AAC LC	Audio Channels	stereo(2)	
									Frame Rate	29.97				Audio Bit Rate	125746	
									Horizontal Size	1280				Sample Frequency	48000	
									Vertical Size	720				Sample Size	0	
									Scan Type	progressive(1)						
2	864x486	Stream detected	Brogram	Name	PTD	Data PIDc	Video	Tracks				Audio	Tracke			-
			1	name	100	Data PIDS	Video	Video Tracks A				Audio				-
							PID	PID Video Codec Video Info				PID	Audio Codec	Audio Into		
								H264	Video Bit Rate 2229494			102	AACLC	Audio Channels	stereo(2)	
									Frame Rate 29.97				Audio Bit Rate	125746		
									Horizontal Size	496				Sample Frequency	48000	
									Scan Type	progressive(1)				Sample Size	•	
									<u> </u>							
3	640x360_lq	Stream detected	Program	Name	PID	Data PIDs	Video	Tracks				Audio Tracks				
			1		100		PID	Video Codec	Video Info				Audio Codec	Audio Info		
							101	H264	Video Bit Rate	1836194		102	AAC LC	Audio Channels	stereo(2)	
									Frame Rate	29.97				Audio Bit Rate	125746	
									Horizontal Size	640				Sample Frequency	48000	
									Vertical Size	360				Sample Size	0	
									Scan Type	progressive(1)						
4	320x180_mq	Stream detected	Program	Name	PID	Data PIDs	Video	o Tracks				Audio	Tracks			1
			1		100		PID	Video Codec	Video Info		PID	Audio Codec	Audio Info		1	
							101	H264	Video Bit Rate 595574		102	AACLC	Audio Channels	stereo(2)		
									Frame Rate	29.97				Audio Bit Rate	125746	
									Horizontal Size	480				Sample Frequency	48000	
									Vertical Size	320				Sample Size	0	
									Scan Type	progressive(1)		L		<u>.</u>		
									·		J					

#### **Content** results will appear similar to the graphic below:

# To modify an input stream:

- 1. Click the **Configuration** tab, select **configuration** >> **input** >> **group** >> **stream** >> **modify**.
- 2. Provide the information in Table 66 on page 191 and click Submit.





**Note:** In order to modify Program and PID values for an input stream, the stream must be active and detected by Packager.

Dashboard Configuration	Reports System				
🕂 System Status	Just-In-Time Packaging	Packaging Hard	ware Inpu	ut/Output Events	Connection
i configuration audiomap input	<b>configuration &gt;</b> This method modifies an exi NOTE: If package-level red	input >> group > sting input stream. undancy is in use, input stream of	> stream >>	> modify natch on both Packagers in the sa	ame N+1 redundancy group.
⇔ directory ⊖group add	Input Stream Group	vmg3 (1)	T	Group ID.	
	Index Publishing Video Bit	1 [NoName]	•	[numeric] Video bit rate outputs	s from this stream
⊡ <sup>-</sup> stream	Rate Monitor Only	false	۲	Stream is for monitoring and ca	pturing only, will not
	Name			[text, max. length of 24] User Must contain only alphanumeric periods, underscores and hyph	defined identifier. : characters; ens are allowed.
	Protocol	udp/rtp	۲	IP protocol of the stream	
in jitp ∎∵output	IP Cast Type	multicast	•	Unicast or multicast	
package     session	Host	234.100.35.1		[text, max. length of 499] udp, Remote multicast address [224 http: URL	/rtp:(Multicast only) .x.x.x - 239.x.x.x],
stitcher	Port	10001		[numeric, min. value=1, max. v on the CTR to receive the stream	value=65535] Port am.
	IGMPv3 Source IP 1			[text] Multicast only - IGMPV3 s Leave empty for no source filte [text] Multicast only - IGMPV3 s	ring. source IP address 2.
	IGMPv3 Source IP 3			Leave empty for no source filte [text] Multicast only - IGMPv3 s	ring. source IP address 3.
	IGMPv3 Source IP 4			[text] Multicast only - IGMPv3 s Leave empty for no source filte	ring. source IP address 4. ring.
	SCTE35 Stream ID	0		[text] SCTE35 stream ID of the number entered with decimal st Maximum=9223372036854775	rpogram. It is 64-bit ring (empty=none, 806)
	Interface	em1	•	Interface to receive input strea	am on.
	Format	mpeg2_ts	T	Input container format.	
	Program	1	۲	[numeric, min. value=0, max. v Program number to select in the stream, auto-fill for SPTS)	/alue=65535] e stream. (0=detect
	Video PID	101 AVC High@L3.1(768x432	) 🔻	[numeric, min. value=-1, max. ID of the video track in the pro- -1=all, ignored if program=0)	value=8190] Packet gram. (0=none,
	Audio PID	102 AAC Version 2 LC(44.1KH	z) 🔻	[numeric, min. value=-1, max. ID of the audio track in the pro- -1=all, ignored if program=0)	value=8190] Packet gram. (0=none,
	Data PID	None	^ <b>D</b>	[text] Packet ID of the data tra Multiple tracks are entered with form. (empty=none, -1=all, ign	ack in the program. n comma delimited nored if program=0)
			*		

#### To redetect an input stream:

- 1. Click the **Configuration** tab, select **configuration** >> **input** >>**group** >> **stream** >> **redetect**.
- 2. Provide the information in Table 66 and click Submit.

You can verify that the stream has successfully been detected by selecting **configuration** >> **input** >> **group** >> **stream** >> **show** with the **Display** field set to **configuration**.



#### 1 Configuration Connection configuration configuration >> input >> group >> stream >> redetect input This method forces the redetection of an incoming input stream. Note: This operation effects all streams listening on the same stream input! • directory group •add The input group ID. Input Stream KNXA\_NBC\_201 (1) modify Group remove Stream ID Stream ID All show [numeric] Delay before redetecting in 9 second increments. Actual redetect may take additional time following delay period. Detect Delay 0 stream ---add modify redetect Submit remo

**Note:** This operation affects all streams already detected that share the same input stream group.

Table 66. Redetect an input stream.

Field	Description
Input Stream Group	An identifier assigned to the input stream group by <i>Packager</i> . Select the group to which the input stream belongs.
Stream ID	The ID assigned to the stream by the <i>Packager</i> . Select <b>All</b> to redetect all streams.
Detect Delay	The amount of time (in seconds) to delay connection with the stream before resuming attempts to reconnect (in 9 second increments). For example, if you're aware that an input stream or group will be going out of service for a period of time, use this field to disable the stream input until it will be available once more.

#### To remove an input stream:

1. Click the Configuration tab, select configuration >> input >> group >> stream >> remove.



2. Provide the information in Table 67 and click **Submit**.

	Pac	kager			Current system time: Apr 22 14:55:49 ( Welcome admin   Connected to 10.10.8 Logout
Dashboard Configuration	n Reports	System		-	
⊟ group add ™modify	configura This method ren	tion >> in noves an input str	put >> group <sub>eam.</sub>	>> stream :	>> remove
remove show ⊟stream add	Input Strear	m Group Mix ( Index 10 Te	3) estMonitor1		Group ID. [numeric, min. value=1, max. value=16] Index in the Group.
-modify -redetect -remove		Sub	mit		

Table 67. Remove an input stream.

Field	Description
Input Stream Group	An identifier assigned to the input stream group by <i>Packager</i> . Select the group to which the input stream belongs.
index	The index value assigned to the stream by the <i>Packager</i> .

# **Managing Output Directories**

Refer to "Defining Output Directories" on page 135 for instructions on adding a directory.

# **Show Output Directory**

To show the output directories configured on *Packager*:

- 1. Click the **Configuration** tab, then select **configuration** >> **output** >> **directory** >> **show**.
- 2. Click Submit.

<b>configu</b> This method	configuration >> output >> directory >> show This method retrieves info for an input or output directory.												
			Submit										
Directory	Directory	Directory	File	llsage	Source	Priority	Administrative	Operational	Host	Share	Remote	Remote	Remote
Туре	ID	Name	System Type	Usage	File Deletion	Thoricy	State	State	nosc	Name	Domain	Username	Password
outbound(1)	1	nfs_v6_29_1	nfs(1)	auto(0)	none(0)	1	unlocked(1)	enabled(2)	10.10.82.29	/ramdisk			****
outbound(1)	2	nfs_v6_29_2	nfs(1)	auto(0)	none(0)	1	unlocked(1)	enabled(2)	10.10.82.29	/ramdisk			****
outbound(1)	3	nfs_v6_29_3	nfs(1)	auto(0)	none(0)	1	unlocked(1)	enabled(2)	10.10.82.29	/ramdisk			****
outbound(1)	4	nfs_v6_29_4	nfs(1)	auto(0)	none(0)	1	unlocked(1)	enabled(2)	10.10.82.29	/ramdisk			****
outbound(1)	5	nfs_v6_29_5	nfs(1)	auto(0)	none(0)	1	unlocked(1)	enabled(2)	10.10.82.29	/ramdisk			****
outbound(1)	6	nfs_v6_29_6	nfs(1)	auto(0)	none(0)	1	unlocked(1)	enabled(2)	10.10.82.29	/ramdisk			****
outbound(1)	7	nfs_v6_29_7	nfs(1)	auto(0)	none(0)	1	unlocked(1)	enabled(2)	10.10.82.29	/ramdisk			****



# **Modify Output Directory**

To modify an output directory:

- 1. Click the **Configuration** tab, then select **configuration** >> **output** >> **directory** >> **modify**.
- 2. Provide the information in Table 68 and click **Submit**.

Dashboard Configuration	Reports Syste					
System Status	lust-In-Time Packaging			Input/Output		Connection
configuration     input     jitp     contrast	<b>configuration &gt;</b> This method changes the directories are always unle	> output >> o admin state or the name ocked.	firectory >> of a directory. Only a	modify n input directory can be	explicitly locked	d/unlocked. Input
in directory	Directory ID	1 U nfs_v6_29_1(10.10	.82.29://ramdisk)	<ul> <li>[numeric] Directory unlocked).</li> </ul>	y ID (L-locked,	U-
modify remove show	Directory Name	nfs_v6_29_1		[text, max. length directory name.	of 24] User-de	fined
⊕ format		Submit				

Table 68. Modify an output directory.

Field	Description
Directory ID	An identifier assigned to the directory by <i>Packager</i> . Select the package you want to modify from this field.
Directory Name	An identifier for the directory, up to 23 characters. Only use alphanumeric characters, periods, underscores, or hyphens.

To remove an output directory:

- 1. Click the **Configuration** tab then select **configuration** >> **output** >> **directory** >> **remove**.
- 2. Provide the information in Table 69 and click Submit.

	Pad	ckager			Current system time: Apr 22 14:45:33 Welcome admin   Connected to 10.10 Logout
Dashboard Configuration	Reports Packaging	System Hardware	Input/Output	Events	🧭 Connecti
Configuration	<b>configur</b> This method re	ation >> o emoves an input o	utput >> dire	ctory >> ren	nove
icitectory add modify remove show	Di	rectory ID 10	(10.10.100.215:/input7	)	Directory ID (L-locked, U-unlocked)

Table 69. Remove an output directory.

Field	Description
Directory ID	An identifier assigned to the directory by <i>Packager</i> . Select the package you want to remove from this field.



# **Managing Output Streams**

See "Defining Output Streams" on page 139 for adding output streams.

To view the output streams that are defined on Packager:

- **1.** From the **Configuration** tab, click through to **configuration** >> **output** >> **stream** >> **show**.
- 2. Provide the information in Table 70 and click Submit.

**Note:** The output stream will be disabled when the package is stopped for statistics retrieval. Once the package is started, the output stream will be enabled if content is being successfully sent to it; otherwise, the output stream will remain disabled.

Dashboard	Configuration	Repo	rts	System										
🛛 🖶 System Status					Packaging Ha									Connection
Configuration	n 🄺	<b>confi</b> This met	gurat	ion >> ou eves info for a g	i <b>tput &gt;&gt; strea</b> ven stream.	m >>	• shov	v						
B directory B group add modify remove show B stream				Stream ID Display	All configuration				• •	Stream Type of	ID. Information des	ired.		
ai m	dd nodify edetect	Output ID	Name	Host		Video Port	Audio Port	IP Cast Type	Protocol	Time To Live	Operational State	Max Clients	Authorized User Name	Authorized User Key
±:iito	how	1	NBC- WEST- MUX	http://10.10.6	<u>0.134</u>	0	0	N/A	swift-api (11)	1	unknown(0)	0	brian:swift	2ecHLyAgJOwgySH5dXmv\
eroutput terdirecto	iry	2	NBC- WEST- MUX-2	http://10.10.3	0.187/opt/new/mount2	0	0	N/A	webdav- light(8)	1	unknown(0)	0	N/A	N/A
⊕ format ⊡ stream		3	CBS- MSS	http://10.10.3	D. 187/opt/new/mount	0	0	N/A	Microsoft Smooth- Streaming(7)	1	unknown(0)	0	N/A	N/A
add			_											

Table 70.	Show	output	streams.
-----------	------	--------	----------

Field	Description
Stream ID	The ID assigned to the stream by the <i>Packager</i> . Select <b>All</b> to view all streams.
Display	The type of information you want to view. You can view stream configurations on the <i>Packager</i> (select <b>configuration</b> ), statistics for a particular stream (select <b>statistics</b> ), or stream properties including the program channels and audio/video in a stream (select <b>content</b> ).

To modify an output stream:

1. Click the **Configuration** tab then select **configuration** >> **output** >> **stream** >> **modify**.



Dashboard Configuratio	n Reports System	n				
💀 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
e directory group add	configuration > This method modifies an ex	> output >> s xisting output stream.	stream >> moo	lify		
remove show	Stream ID	1 NBC-WEST-MUX(ht	tp://10.10.60.134:0/0)	[numeric] Stream	ID.	
Erstream	Name	NBC-WEST-MUX		User defined ider	ntifier	
add	Protocol	swift-api	•	IP protocol of the	e stream	
···redetect	Host	http://		[text, max. lengt or multicast addr http/rtmp: URL to (dient mode)	h of 230] udp/rtp: u (in range 224.x.x.x p post to the remote	unicast addr :-239.x.x.x), e server
show ⊡_jitp	Validate Output URL	true(1)	,	Validate output s	erver by pushing a	test file on it
• output	Authorized User Name	user:swift		[text, max. lengt applicable when u	h of 63] Authorized using Swift API).	Name (only
i format ⊡•stream	Authorized User Key	2ecHLyAgJnotthereal	passwordXmvWoX4euGl	URL to post to th	e remote server	
add <mark>modify</mark>		Submit				

2. Provide the information in Table 53 on page 141 and click **Submit**.

To remove an output stream:

- **1.** From the **Configuration** tab, click through to **configuration** >> **output** >> **stream** >> **remove**.
- 2. Provide the information in Table 71 and click **Submit**.

	Pac	kager			Current system time: Apr 22 15:01:09 Welcome admin   Connected to 10.10.8 Logout
Dashboard Configuration	Reports	System	2		-
👯 System Status	Packaging	Hardware	Input/Output	Events	S Connectio
்-configuration போறயt ுoutput	<b>configura</b> This method re	ation >> o moves an existing	utput >> strea g stream.	m >> remo	ove
directory     stream     add	S	Stream ID 1(	10.10.100.215:10050/0)		Stream ID.
"modify "remove		Si	ubmit		

Table 71. Remove an output stream.

Field	Description
Stream ID	The ID assigned to the stream by the Packager.



# **Managing Packages**

See "Configuring a Package" on page 142 for adding packages.

## **Show Configured Packages**

- **1.** From the **Configuration** tab, click through to **configuration >> package >> show**.
- 2. Provide the information in Table 72 and click Submit.

Dashboard Configuration	Reports System	Packaging	Hardware	Input/Output	Events	Connection
⊡-configuration ⊕ input ⊕ jjtp	<b>configuration &gt;</b> This method shows the con	> package >> figuration of a package.	show			
⊕ output □ package □ add □ modify	Package ID Display	All		Package ID (0=all). Type of information des	ired.	
-remove -show -start		Submit	Click to sele	ct search criteria	1	

If you wish to modify the search criteria, click the "F" button in the window to filter the data.

Filtered Selector	P Filtered Selector							
Filter Value: Filter value can be a simple group of characters or a Regular Expression.								
	All Package-1_HLS Package-2_HDS SSTest		▲					
	OK	Cancel						

#### Table 72. View packages.

Field	Description
Package ID	The name assigned to the package when it was configured.
Display	The type of information you want to view. You can view package configurations on the <i>Packager</i> (select <b>configuration</b> ), status for a particular package (select <b>status</b> ), or summarized package information (select <b>summary</b> ).

Results displayed depend on your selections. Following are examples of results from the **configuration**, **summary**, and **status** selections:



Package ID	Name	Package Type	Package Mode	Administrative State	Operational State	Output Stream	Configuration			
1	hds	Adobe HTTP Dynamic Streaming - HTTP File Format(8)	live(1)	stopped(0)	unknown(0)		Segment Mode	IDR period	lic(2)	
							Segment Duration	4		
							Segment Life Span	40		
							Redundancy Mode	duplicate o	output(2)	
							Duration	0		
							Input Type	stream(1)		
							Input ID	1		
							Input File Name	N/A		
							Audio Map	aac_eng_f	Prm_all_Alt	
							Subdirectory Path			
							Outputs	Output ID	Output Type	Content Type
								1	file(0)	all(1)
							Thumbnail	false(0)		
							Enable TTML	false(0)		
							Key Server Vendor Name	None(0)		
							Key Resource ID	0		
							Content ID			
							Content ID Type	None(0)		
							Policy ID			
							Key Rotation	0		
							Key Deletion Policy	NoDeletion	n(0)	
							Content Name			
							Content Description			
							Subcontent Type			
							Policy Group ID	0		

## Display configuration:

## Display **summary:**

Package ID	Name	Package Type	Package Mode	Administrative State	Operational State	Output Stream	Input Type	Input ID	Input File Name	Audio Map	Outputs			Thumbnail	Enable TTML
1	hds	Adobe HTTP Dynamic Streaming - HTTP	live(1)	stopped(0)	unknown(0)		stream(1)	1	N/A	aac_eng_Prm_all_Alt	Output ID	Output Type file(0)	Content Type all(1)	false(0)	false(0)
		File Format(8)													



#### Display **status:**

Package ID	Name	Package Type	Package Mode	Administrative State	Operational State	Output Stream	Status					
1	hds	Adobe HTTP Dynamic Streaming -	live(1)	started(1)	enabled(2)	http://10.10.107.31/hdsl/1/hds/hds.f4m	Session ID	2				
		HTTP File Format(8)					Running Time	0h 0m 6s	1			
							Info	Index	Input Stream	Output Stream	State	Last Failure
								1	enabled(2)	enabled(2)	Success	None
2	HLS	Apple HTTP Live Streaming(1)	vod(2)	started(1)	enabled(2)	http://10.10.107.31/hlsv/2/HLS/HLS.m3u8	Session ID	3				
		g contraction (c)					Running Time	0h 0m 5s	1			
							Info	Index	Input Stream	Output Stream	State	Last Failure
								1	enabled(2)	enabled(2)	Success	None
3	HLS- DO	Apple HTTP Live Streaming(1)	live(1)	started(1)	enabled(2)	http://10.10.107.31/hlsl/1/HLS-DO/HLS- DO.m3u8	Session ID	1				
		ou cunnig(1)					Running Time	0h 0m 7s	;			
							Info	Index	Input Stream	Output Stream	State	Last Failure
								1	enabled(2)	enabled(2)	Success	None

# Modify Configured Packages

**1.** From the **Configuration** tab, click through to **configuration** >> **package** >> **modify**.

Dashboard Configuration	Reports System				
🖶 System Status	Just-In-Time Packaging				Dutput Events 🥰 Connection
ं configuration में audiomap में input में jitp	configuration >> This method modifies a packa NOTE: If package-level redur redundancy group.	package >> 	modify aging configuration, inclu	uding the I	Name, must match on both Packagers in the same N+1
	Package ID	hds		₹ F	Package ID.
el config ™modify	Name	hds			[text, max. length of 90] User defined unique identifier. Must contain only alphanumeric characters; periods, underscores and hyphens are allowed.
remove	Package Type	Adobe HTTP Dynam	ic Streaming - HTTP File	For <b>v</b>	Type of distribution
	Package Mode	live		•	Mode of distribution
stop ∎ session	Duration	0			[numeric, min. value=0, max. value=65535] Period in seconds after which the package will stop after being started. (0 = never stop). Duration of each record folder for the Continuous Record mode.
E succier	Segment Mode	IDR periodic		۲	Segmentation mode
	Segment Duration	4			[numeric, min. value=1, max. value=10] Output segment duration in seconds for periodic mode.
	Segment Life Span	40			[numeric, min. value=0, max. value=300] Time a live segment will figure in the playlist manifest.
	Redundancy Mode	duplicate output		۲	Package-level redundancy mode, must match on both Packagers in the same N+1 redundancy group.
	Input Type	stream		۲	Input type
	Input ID	vmg3 (1)		۲	[numeric] Input stream group / Input directory
	Audio Map	aac_eng_Prm_all_A	It	۲	[text, max. length of 23] Audio map name
	Subdirectory Path				[text, max. length of 93] Output sub-directory preceding the package name
	Content Type	all		۲	Content to output
	Output Type	file		۲	Output type
	Output ID	1 U local(/opt/localm	nt:/local:-1)	۲	[numeric] Output Id
	Thumbnail	false		•	Thumbnails generation
	Key Server Vendor Name	None		۲	Key Server Vendor
		Submit			

2. Provide the information in Table 54 on page 151 and click **Submit**.

If you wish to modify the search criteria, click the "F" button in the window to filter the data.

# **Removing Configured Packages**

- **1.** From the **Configuration** tab, click through to **configuration >> package >> remove**.
- 2. Provide the information in Table 73 and click Submit.

Dashboard Configuration	Reports System					
🕂 🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
input input ipp	<b>configuration &gt;&gt;</b> This method removes a pack	• package >>	> remove			
output     package     add     modify     remove	Package ID	ackage-1_HLS Submit	Click to se	Package ID.	ria	



If you wish to modify the search criteria, click the "F" button in the window to filter the data.

Table 73. Remove a package.

Field	Description
Package ID	The ID assigned to the package when it was configured.

To start a package so that it starts transmitting content by *Packager*:

- **1.** From the **Configuration** tab, click through to **configuration >> package >> start**.
- 2. Provide the information in Table 74 and click Submit.

Dashboard Configuration	Reports System					
🔜 🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
input jitp	<b>configuration &gt;</b> This method starts a packag	> package >>	> start			
eroutput □ package add	Package ID	All	F	Package ID.		
remove		Submit	Click to se	lect search crite	ria	

If you wish to modify the search criteria, click the "F" button in the window to filter the data.

Table 74. Start a package.

Field	Description
Package ID	The ID assigned to the package when it was configured.

To stop a package so that it stops transmitting content via Packager:

- 1. From the **Configuration** tab, select **configuration** >> **package** >> **stop**.
- 2. Provide the information in Table 75 and click Submit.

Dashboard Config	guration Reports System					
🖶 System Status	Just-In-Time Packaging	Packaging		Input/Output		Connection
Configuration	configuration > This method stops a packa	> package >> ging session.	> stop			
• output     □ · package     • add	Package ID	All	•	Package ID.		
modify remove		Submit	Click to se	lect search crite	ria	

If you wish to modify the search criteria, click the "F" button in the window to filter the data.

Table	75.	Stop	а	pac	kage.
-------	-----	------	---	-----	-------

Field	Description
Package ID	The ID assigned to the package when it was configured.



# **Viewing JITP Assets**

You can list all active publishing points available through the source server; only assets that contain valid PCK files are displayed. This process returns the asset URLs (for playing) according to the JITP profile for the source server of each input mount point.

- 1. From the **Configuration** tab, click through to **configuration** >> **jitp** >> **assets** >> **play**.
- 2. Click Submit.
- 1

**Note:** This option does not perform any action to start or stop JIT packaging. This procedure performs a scan of all current JITP assets that are available for packaging

Depending on the size of the file system mount point and the content, the process of scanning assets may time intensive and system performance impacting.

Dasiboard Comguration	Reports System					
🖶 System Status	lust-In-Time Packaging	Packaging		Input/Output		Connection
configuration     input     jitp     hassets	<b>configuration &gt;</b> This method displays availa access type.	>> jitp >> ass able just-in-time package	ets >> play es based on asset files	on provisioned jitp sour	ce servers with	n a "File System"
Day ⊕ config ⊕ source	Scan RGB Assets	No	×	Scan all input mounts This can take a long and remote mount us	for publishing time depending tage.	point files. on local
output     package     session	[	Submit				



configuration >> jitp >> assets >> play This method displays available just-in-time packages based on asset fil	es on provision	ed jitp source servers with a "File System" access type.
Scan RGB Assets Yes		Scan all input mounts for publishing point files. This can take a long time depending on local and remote mount usage.
Submit		
Publish Index File	Package Type	URL
perf_test/original_assets/RGB_5stream_aac- heV2_ddp_audio_NBC101_1800/RGB_5stream_aac- heV2_ddp_audio_NBC101_1800.pck	Microsoft Smooth Streaming	Disabled
perf_test/original_assets/RGB_5stream_aac- heV2_ddp_audio_NBC101_1800/RGB_5stream_aac- heV2_ddp_audio_NBC101_1800.pck	Adobe HTTP Dynamic Streaming	http://10.10.88.51/StrobeMediaPlayback_adobe_jan19_2012/StrobeMediaPlayback.html? src=http://org83213.lab.ripcode.com/perf_test/original_assets/RGB_5stream_aac- heV2_ddp_audio_NBC101_1800/RGB_5stream_aac-heV2_ddp_audio_NBC101_1800.f4m
perf_test/original_assets/RGB_5stream_aac- heVZ_ddp_audio_NBC101_1800/RGB_5stream_aac- heV2_ddp_audio_NBC101_1800.pck	MPEG Dash	Disabled
perf_test/original_assets/RGB_5stream_aac- heVZ_ddp_audio_NBC101_1800/RGB_5stream_aac- heV2_ddp_audio_NBC101_1800.pck	Apple HTTP Live Streaming	Disabled
RGB_5stream_aac- heV2_ddp_audio_NBC101_300/RGB_5stream_aac- heV2_ddp_audio_NBC101_300.pck	Microsoft Smooth Streaming	Disabled
RGB_5stream_aac- heVZ_ddp_audio_NBC101_300/RGB_5stream_aac- heV2_ddp_audio_NBC101_300.pck	Adobe HTTP Dynamic Streaming	http://10.10.88.51/StrobeMediaPlayback_adobe_jan19_2012/StrobeMediaPlayback.html? src=http://org83213.lab.ripcode.com/RGB_5stream_aac- heV2_ddp_audio_NBC101_300/RGB_5stream_aac-heV2_ddp_audio_NBC101_300.f4m
RGB_5stream_aac- heV2_ddp_audio_NBC101_300/RGB_5stream_aac- heV2_ddp_audio_NBC101_300.pck	MPEG Dash	Disabled

Sample Return Values

Table 76. View Just-in-Time assets.

Field	Description
Scan RGB Assets	<b>Yes</b> or <b>No</b> . Specifies whether or not to scan all input mounts for publishing point files. Depending on local and remote mount usage, choosing Yes will take additional time. Recommended setting is <b>No</b> .

# **Flushing the JITP Cache**

JITP holds both a short and long term cache. Sometimes it is necessary to erase one or both of the cache types from the JITP's memory.

For example, suppose in July a source asset named, "ABC-Sports\_2014" is generated. This asset will be stored in the JITP cache. Then, in August, a source asset of the same name, "ABC-Sports\_2014" is generated. Since asset with the same name has already been cached, asset information based on the August source will not be created. Thus, when the asset named, "ABC-Sports\_2014" is called upon for playback, the playback will fail due to an asset mismatch (the source asset generated in August does not match the cached asset from July).

The JITP cache retains two types of cache:



- **Short term** short term cache is used to store asset information on the RAM disk; this asset corresponds to the one currently playing.
- Long term long term cache is used to store asset information on the hard disk; this asset corresponds to an asset that has not been played for a longer period of time than what's held in RAM.

To flush the JITP cache, proceed as follows:

**1.** From the **Configuration** tab, click through to **configuration >> jitp >> cache >> flush**.

Dashboard Configuration	Reports System	n			
🖶 System Status	Just-In-Time Packaging	Packaging			Sonnection
i configuration i audiomap i input	<b>configuration &gt;</b> This method flushes the J	>> jitp >> cad ITP cache.	che >> flush		
jitp					
• assets	Flush	all	•	Flush Cache Type	
⊡ cache		all short term			
flush		long term			
<b>⊕</b> prefetch		Submit			

2. From the Flush drop-down menu, select whether to flush short term, long term, or all cache types.



**Note:** *RGB* recommends that **all** *JITP* cache types be flushed at the same time.

3. Click Submit. Action is immediate.

# Managing Input JITP Sources

This section describes management actions available for input JITP sources, including modifying, removing, or viewing input sources.

## **Modify Input JITP Source**

- 1. From the **Configuration** tab, click through to **configuration** >> **jitp** >> **source** >> **modify**.
- 2. See "Defining a Just-in-Time Input Source" on page 173 for information you must provide.
- 3. Click Submit.



Dashboard Configuration	Reports System	m				
🔺 System Status	Just-In-Time Packaging	Packaging	Hardware	Input/Output	Events	Connection
in configuration in audiomap in input	<b>configuration &gt;</b> This method modifies an e	> jitp >> sour xisting source server.	ce >> modify			
ijitp ir assets ir prefetch ir profile	Source Server Pattern	myv6.lab.ripcode.com	Ŧ	Unique key that ider key is used to map t a directory ID for a characters are a-z, l cannot begin or end	ntifies source ser o a valid hostna file system mour 0-9, '-', and '.'. T with a '-'	rver. This me below or it. Valid The pattern
i⊐ source add modify remove	Access Type	File System Mount	×	Indicates how files a server. If a file syst must correspond to mount. If HTTP or C hostname to an HTT provided.	ere retrieved fro em mount, then a provisioned dir 2 HTTP then a v P web server mo	m source the source rectory alid ust be
er output	Directory Mount ID	1 U r2inv12(r2-inv12.la	b.ripcode.com://dat 🚽	[numeric] Valid mour (using configuration field is ignored for a	nt id of provision input.directory. n HTTP source s	ed directory add). This erver.
Bession	Allow OS Caching	Enable	V	This option can only be ignored or reject types or access type of subsequent just-i better at the expen- memory consumption will be impacted but used.	be disabled for i ed for other file es. If enabled, p n-time requests se of greater OS n. If disabled pe much less memo	NFS. It will system erformance will be caching rformance ry will be
	Profile	DEFAULT	<b>▼</b>	Select JITP profile ta	able.	

# **Remove JITP Input Source**

- **1.** From the **Configuration** tab, click through to **configuration** >> **jitp** >> **source** >> **remove**.
- 2. Select the Source Server Pattern (input source) to remove.
- 3. Click Submit.

Dashboard Configuration	Reports System	n				
🔺 System Status	lust-In-Time Packaging	Packaging		Input/Output		S Connection
⊡-configuration ∎ audiomap ∎-input	<b>configuration &gt;</b> This method removes an se	> jitp >> sour	rce >> remove	5		
⊖ jitp ⊕ assets ⊕ prefetch	Source Server Pattern	myv6.lab.ripcode.com		Regular expression source server.	on pattern of a pro	visioned
		Submit				



# Show JITP Input Source

- **1.** From the **Configuration** tab, click through to **configuration** >> **jitp** >> **source** >> **show**.
- 2. Select the Source Server Pattern (input source) you wish to view, or select All to view all sources.
- 3. Click Submit.

Dashboard Configuration	Reports Syster	n					
A System Status	lust-In-Time Packaging	Packagi			Input/Output		Sconnection
configuration     audiomap     finance     input	<b>configuration &gt;</b> This method displays an so	> jitp >>	source >	> show			
itp assets prefetch profile	Source Server Pattern	All		×	Source Pattern		
and	Source Server	Access	Host	Directory Mou	nt Cache Req	uests In Memory	Profile
show • output	myv6.lab.ripcode.com	File System(0)	N/A	1	Enabled		DEFAULT

## **CHAPTER 9**

# **Configuring Players and Mounts**

This chapter provides configuration steps and guidelines for configuring TransAct *Packager* for supported media player formats and options for directory mounts.

# In This Chapter:

- "How Packager Works With Microsoft Smooth Streaming," next.
- "Adding a Publishing Point for Microsoft Smooth Streaming" on page 208
- "Enabling Microsoft Smooth Streaming" on page 211
- "How Packager Works With Adobe HTTP Dynamic Streaming" on page 211
- "Configuring an Adobe Media Server for Packager" on page 214
- "Enable Adobe HTTP Dynamic Streaming" on page 215
- "How Packager Works With Apple HTTP Live Streaming" on page 215
- "How Packager Works With Object Store (Swift API)" on page 217
- "How Packager Works With MPEG DASH" on page 218
- "Configuring HTTP Apache Web Server for Webdav-Light" on page 219
- "Options for Mounts" on page 220
- "GPFS Storage Details and Setup" on page 222

# How Packager Works With Microsoft Smooth Streaming

For MSS, *Packager* receives multiple MPEG-TS streams that are IDR aligned (e.g., the streams have the same timestamp), and are essentially the same channel of information at different bitrates. *Packager* receives these MPEG-TS videos as streams or files from an encoder, combines inbound streams into an input group which can be reused by different packages, defines an output stream that is compatible with Live Smooth Streaming format, and publishes the segments (packages) via manifests. External players can request the segments/manifests through an external web server using links provided by *Packager*.

*Packager* transmits fragments to the IIS Server using the HTTP protocol (Figure 7), or directly to client devices (Figure 8). An external HTTP server is necessary for obtaining the Player HTML and configuration files since the *Packager* only delivers the manifest and content; file management and delivery to client Players is performed outside of *Packager*. If one of the streams goes out-of-sync, then the *Packager* automatically attempts to re-synchronize the stream.



The output stream can be packaged as H.264 BP/MP/HP video codec and AAC LC audio codec.

## **Basic Steps**

The steps for configuring Packager for MSS are:

- Create an input stream group (configuration >> input >> group >> add) and add streams to it (configuration >> input >> group >> stream >> add). See "Defining Input Streams" on page 130.
- Create an output directory<sup>1</sup> to which MSS client fragments will be copied (configuration >> output >> directory >> add). See "Defining Output Directories" on page 135.
- **3.** Create a package of type *Microsoft Smooth Streaming* set to *live* package mode. The name of the package is used as the publishing point name. See "Adding a Publishing Point for Microsoft Smooth Streaming" on page 208 for information about enabling publishing points. See "Configuring a Package" on page 142.
- 4. Start the package (configuration >> package >> start). See "Starting a Package" on page 156.
- **5.** Install the latest version of Silverlight Player<sup>2</sup> on an HTTP Server with the recommended settings. It is recommended that Silverlight player be configured with a buffering time of 10 seconds and a retry duration of 60 seconds.

*Windows*—Silverlight Player is supported on Windows 7, Windows XP, Windows Server 2008 with Microsoft Internet Explorer or Mozilla Firefox.

Macintosh—Silverlight Player is supported on Mac OS X Version 10.6.3 (Snow Leopard).



<sup>1.</sup> If you are using an external IIS server, you do not need to add an output directory, however you do need to add an output stream configured for Microsoft Smooth Streaming - remote.

<sup>2.</sup> At the time of this writing, the latest version is 5.1.20913.0.

If you are using an external IIS server for transmission, follow Steps 6 and step  $7^3$ .

- **6.** Configure an IIS Server publishing point as described in "Adding a Publishing Point for Microsoft Smooth Streaming" on page 208.
- **7.** Once the *Packager* is able to transmit to an IIS Server publishing point, you can play live content using Silverlight in a compatible browser.
- **8.** Point your browser to the URL of the content which will be: the server's IP address combined with the publishing point name as follows:

http://HTTP\_SERVER\_IP\_ADDRESS/RgbNetworksSilverlightPlayerPage.html?MediaUrl=http:// PACKAGER\_IP\_ADDRESS/OUTPUT\_DIRECTORY\_ID/PACKAGE\_NAME.isml/Manifest

For example, the following URL points to a server with an IP address of *10.10.0.125* and the publishing point named **ocean.isml**:

http://10.10.0.125/RgbNetworksSilverlightPlayerPage.html?MediaUrl=http://192.168.0.53/1/ ocean.isml/Manifest

**Note:** The PTS for smooth streaming is 64 bits and the PTS for MPEG-TS is 34 bits, but the IIS Server does not support PTS rollover. Therefore, the Packager increases bits from 34 to 64 to avoid a PTS rollover every 27 hours. Bits 34-64 are stored in a file for each output. This allows the Packager to continue at the correct PTS value when it is restarted. To reset the PTS, remove the Packager output, re-add it, and restart the IIS Server publishing point.

You can monitor the status of the transfer using the same command as used for other package types. Notice the segments being created in the **/opt/ripcode/mnt/out/OUTPUT\_DIRECTORY\_ID/PACKAGE\_NAME.isml** directory.

## Adding a Publishing Point for Microsoft Smooth Streaming

To enable MSS with RGB *Packager*, you must ensure that Microsoft Internet Information Services is installed and configured to run IIS Media Services on an HTTP Server. *Packager* has been tested with IIS versions 4.0.0938.54 and 4.1.0938.420. The files in the **IISServerFiles** directory for *Packager* need to be copied to the root directory on the HTTP Server.

The following files must be present: **clientaccesspolicy.xml**, **crossdomain.xml**, **RgbNetworksSilverlightPlayer.xap** and **RgbNetworksSilverlightPlayerPage.html**. It is recommended that IIS Server be configured with 2 lookahead fragments (assuming a segment duration of 2 seconds), a buffering time of 10 seconds, and a retry duration set to 60 seconds.

Refer to the following reference material for instructions to enable IIS Server:

- Installing IIS 7 on Windows Vista and Windows 7: http://learn.iis.net/page.aspx/28/installing-iis-7-on-windows-vista-and-windows-7/
- Installing IIS 7 on Windows Server 2008 or Windows Server 2008 R2: http://learn.iis.net/page.aspx/29/installing-iis-7-on-windows-server-2008-or-windows-server-2008r2/



<sup>3.</sup> The *Packager* incorporates IIS server functionality, however it is not a full-service IIS server. You have the option of configuring *Packager* to use its built-in (local) IIS function, or you may configure *Packager* to use a separate external IIS server.

Refer to the following reference material for instructions to enable Live Smooth Streaming on the IIS Server: http://learn.iis.net/page.aspx/620/getting-started-with-iis-live-smooth-streaming/

## To add a publishing point for Live Smooth Streaming:

1. Navigate to the default website directory for IIS and double-click Live Smooth Streaming Publishing Points.

internet Information Services (IIS) Man	ager	1000									
S NB-MTREMBLAY	► Sites ► De	fault Web Site	•								
File View Help											
Connections	Q De	efault Wel	o Site Hor	ne							
B-MTREMBLAY (RGBNETWOR     Application Pools     Sites	Filter:		• 🔐 Go - 🕻	Show All	Group by: A	rea	•				
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	Output Caching Managem	Request Filtering	SSL Settings	WebDAV Authori							
	Configurat Editor Media Sen Dit Rate Throttling	Live Smooth Streaming Publishing Points	Smooth Streaming	Web Playlists	8						

2. Click Add... and the Add Publishing Point dialog box appears.

View     Norw     Use this feature to configure and manage your top is the tarm of cocan.imm is like to tarm is good top is the tarm of cocan.imm is like to tarm is good top is the tarm of tarm	Manager AY → Sites → Default Web Site →	Add Publishing Point
Im Features View     Im Features View     OK     Cancel	Image: State stat	Basic Settings       Advanced Settings       Mobile Devices         File marre:       packager       Publishing Point         Title:       Publishing point for packager demol       Actions         Estimated guration:       00:00:00       Ive source type:         Push       •
OK Cante	Features View Kan Content View	OK Cancel
nHost.config , Clocation path="Default Web Site">	Host.config , <location path="Default Web Site"></location>	

3. Enter packager in the File name field.



- 4. Enter a description of the publishing point in the **Title** field.
- 5. Click the Advanced Settings tab.

MTREMBLAY	Sites      Default Wel	b Site 🕨	(	Add Publishing Point	
RGBNETWOR	Use this feature to cor	OOth Stream	ing Pub	Basic Setting Advanced Settings Mobile Devices           Archive media <ul></ul>	Actions Publishing Point Add
b Site client :Bunny	File Name * ocean.isml record.isml test.isml	State Idle Idle Idle	Arch Disat Stop Disat	<ul> <li>Archive as segmented presentation</li> <li>Segment length (in minutes):</li> <li>Allow client connections</li> <li>Enable DVR for the entire event</li> <li>Enable DVR for recent content DVR window length (in minutes):</li> <li>2</li> <li>Allow server connections</li> <li>Push to the following publishing points:</li> <li>Publishing Point URL</li> <li>Credential</li> <li>Add</li> <li>Remove</li> <li>Start publishing point automatically upon first client request</li> <li>Number of lookahead fragments:</li> </ul>	Manage Credentials Philp Online Help
,	📧 Features View 歳 (	Content View		Number of lookshead tragments: 2 OK Cancel	

- 6. Deselect the Archive media and Allow server connections options.
- 7. Select the Allow client connections and Enable DVR for recent content options and set the DVR window length timeframe to around 5 minutes to avoid the disk becoming full.
- 8. Set the the Number of lookahead fragments option to 2.
- 9. Click OK.
- 10.Click Start Publishing Point.

Uve Sm	ooth Stream	ing Publishin	g Points		Publishing Point
Use this feature to co	nfigure and manage	e your Live Smooth S	treaming publishing	points.	Add
File Name	State	Archive	Fragment	Stream	X Delete Edit
ocean.isml	Idle	Disabled	Stopped	Disabled	Details
packager.isml	Idle	Disabled	Stopped	Disabled	A Shart Dublishing Da
record.isml	Idle	Stopped	Stopped	Disabled	Start Publishing Pu
test.isml	Idle	Disabled	Stopped	Disabled	Manage Credential
					Help

11.Next, copy the files located in the IISServerFiles directory of the Packager installation media to the IIS installation directory which is typically c:\inetpub\wwwroot (for Windows 7) or C:\wmpub\wmroot (for Windows 2008).

Copy several files to the IIS server root directory including: the client policy, the Silverlight client application, and the HTML page that provides access to the Silverlight client application. The example at the following address provides information:

http://learn.iis.net/page.aspx/558/getting-started-with-iis-smooth-streaming



## **Enabling Microsoft Smooth Streaming**

Microsoft Smooth Streaming requires a cross-domain policy file that grants a web client—such as the Smooth Streaming Player—permission to handle data across multiple domains. This is because the content is typically being hosted from one domain, while clients that are requesting the content belong to different domains and therefore need permission to access the content. The **clientaccesspolicy.xml** and **crossdomain.xml** files grant read access to the data, permitting a client to access the content across domain lines.

These files are stored on the *Packager* in the **opt/ripcode/www/pages/** directory. If you want to change these files, you can read more about how these files are used at the following URL:

#### http://msdn.microsoft.com/en-us/library/cc197955%28v=vs.95%29.aspx

**Note:** If you are using an origin server to deliver content versus servicing clients directly from Packager, you must include these files in the root directory of the origin server.

# How Packager Works With Adobe HTTP Dynamic Streaming

With Adobe HDS, streaming video is delivered to users by dynamically switching among different streams of varying quality and size during playback, providing users with the best possible viewing experience that their bandwidth and local computer hardware (CPU) can support.

*Packager* receives multiple MPEG-TS streams that are IDR aligned (e.g., the streams have the same timestamp), and are essentially the same channel of information at different bitrates. *Packager* receives these MPEG-TS videos as streams or files from an encoder, combines inbound streams into an input group which can be reused by different packages, defines an output stream that is compatible with Adobe HTTP Dynamic Streaming format, and publishes the segments (packages) via manifests.

External players can request the segments/manifests through a local web server using links provided by the *Packager*. In the case of linear HDS, the *Packager* acts as the origin server, receiving and responding to HTTP requests from and to the CDN. The delivery process is as follows: The Flash Player (client) sends an HTTP request to the CDN, which relays the HTTP request to the *Packager* (server). The *Packager* (server) then sends an HTTP response to the CDN, which in turn delivers the requested content to the Flash Player (client).

## Adobe HTTP Streaming Options

The latest versions of Flash Player and Adobe Media Server (10.2 and above) support adaptive bit-rate streaming over HTTP. Adobe HTTP Dynamic Streaming content can be streamed directly to an HTTP Dynamic Streaming Server, or *Packager* can send unencrypted RTMP feeds to Adobe Media Server for packaging and encryption (Figure 9). An external HTTP server is necessary for obtaining the Player HTML and configuration files since the *Packager* only delivers the manifest and content; file management and delivery to client players is performed outside of *Packager*.

For streaming direct to Adobe HTTP Dynamic Streaming, Packager creates packages that are associated with an input group and an output directory. The input group is the same channel of information at different bitrates where the input streams are IDR aligned (e.g., the streams have the same timestamp). If one of the streams goes out-of-sync, then the Packager automatically attempts to re-synchronize the stream. An input group can be reused by different packages.



*For RTMP streaming, Packager* creates a package that includes the input group and output stream, and transmits this package to the Adobe Media Server using the RTMP protocol.



Figure 9. Packager with Adobe RTMP output to an Adobe Adobe Media Server.

## Configuring Packager for Adobe HTTP Dynamic Streaming

In this case, content is streamed direct to Adobe HTTP Dynamic Streaming client.

The basic steps for configuring Packager for Adobe HTTP Dynamic Streaming are:

- Create an input stream group (configuration >> input >> group >> add) and add streams to it (configuration >> input >> group >> stream >> add). "Defining Input Streams" on page 130.
- Create an output directory to which Adobe HTTP Dynamic Streaming client fragments will be copied (configuration >> output >> directory >> add). See "Defining Output Directories" on page 135.
- **3.** Create a package of type *Adobe HTTP Dynamic Streaming* set to *live* package mode. The name of the package is used as the publishing point name. See "Configuring a Package" on page 142.
- 4. Start the package (configuration >> package >> start). See "Starting a Package" on page 156.
- **5.** Install a Flash-compatible player that supports Adobe HTTP Dynamic Streaming on an HTTP Server. The OSMF player is available from **http://sourceforge.net/projects/smp.adobe/files/**.
- **6.** Once the *Packager* is able to transmit to a local server, you can play live content using a Flash Player in a compatible browser.

Open a browser and enter the URL to the content which will be the *Packager's* local server IP address combined with the publishing point name.

http://PACKAGER\_IP\_ADDRESS/OUTPUT\_DIRECTORY\_ID/PACKAGE\_NAME.hdsl/PACKAGE\_NAME.f4m





**Note:** You can monitor the status of the transfer using the same command as used for other package types. Notice the segments being created in the **/opt/ripcode/mnt/out/ OUTPUT\_DIRECTORY\_ID/PACKAGE\_NAME.hdsl** directory.

#### Configuring Packager for Adobe RTMP Streaming

In this case, *Packager* feeds an external Adobe Media Server a series of IDR-aligned streams over RTMP, and the Adobe Media Server performs end-user distribution by converting the streams from RTMP to fMP4, encrypting the streams as needed, and generating the appropriate manifests.



The basic steps for configuring Packager for RTMP streaming are:

- 1. Create an input stream group (configuration >> input >> group >> add) and add streams to it (configuration >> input >> group >> stream >> add).
- Create an output stream for each Adobe Media Server destination of type RTMP (configuration >> output >> stream >> add).

The RTMP link is typically **rtmp://<Adobe Media Server IP>/<Adobe Media Server application>/<base stream name>**. *Packager* sends each individual stream to the Adobe Media Server with an extra number appended to it that corresponds to the stream's position within the MBR stream group.

For example, given the RTMP link **rtmp://10.10.100.145/livepkgr/KVUE\_ABC**, the first stream is sent to the Adobe Media Server as *rtmp://10.10.100.145/livepkgr/KVUE\_ABC1*. The second stream is sent to the Adobe Media Server as *rtmp://10.10.100.145/livepkgr/KVUE\_ABC2*. And so forth.



**Note:** The **livepkgr** application is an Adobe Media Server application that converts RTMP to Adobe HTTP Dynamic Streaming. Since you can create custom applications on an Adobe Media Server, Packager does not enforce what application is specified in the links it generates. However, links must be configured according to Adobe Media Server requirements.

- **3.** Create a package of type *Adobe HTTP Dynamic Streaming* set to *live* package mode with a stream output to the RTMP destination.
- 4. Start the package (configuration >> package >> start).



**Note:** If an Adobe Media Server is not running at the IP address specified in the output stream, or if network connectivity to the specified IP address is lost, the Packager session will fail with Progress Stopped.



**Note:** If the name of the application performing RTMP to ADS conversion is not correct (e.g., **livepkgr**), the Packager session will execute, but the Adobe Media Server will simply ignore the incoming streams. The name is case sensitive.

- **5.** Install a Flash-compatible player that supports Adobe HTTP Dynamic Streaming on an HTTP Server. The OSMF player is available from **http://sourceforge.net/projects/smp.adobe/files/**.
- Copy the following folders and files from the OSMF Player installation directory to the Adobe\Flash Media Server 4\webroot directory:
  - assets
  - scripts
  - OSMFPlayer.html
  - OSMFPlayer.swf
- 7. Copy all the files from the **images** directory in the OSMF Player installation directory to the **Adobe\Flash Media Server 4\webroot\images** directory.
- 8. Open the following URL in the browser to launch the OSMF Player: http://localhost/OSMFPlayer.html
- 9. A small rectangular window is embedded at the bottom of the player. Click the eject button and enter a stream link. For example: http://localhost/live/events/livepkgr/events/\_definst\_/liveevent.f4m



# Configuring an Adobe Media Server for Packager

You must first install Adobe Media Server which can be found on the Adobe website. *Packager* has been tested with Adobe Media Server version 4.5.

#### After installing Adobe Media Server, you must configure it as follows:

- 1. Disable Windows firewall on the Adobe Media Server machine.
- Modify the main.asc file in the Adobe\Flash Media Server 4\applications\livepkgr\ directory as follows:
  - Comment this line: var liveEventName = streamName.name;
  - Add this line: var liveEventName = "liveevent";
  - Comment this line:
    - s.record("append");
  - Add this line:
    - s.record("record");
- 3. Modify the fms.ini file in the Adobe\Flash Media Server 4\conf\ directory.
  - In the following line, remove , 80 ADAPTOR.HOSTPORT = :1935
  - In the following line, remove :8134 and leave it blank.
     HTTPPROXY.HOST =
- 4. Modify the Server.xml file in the Adobe\Flash Media Server 4\conf\ directory.
  - Search for MaxFlushTime and change this value from 5 to 1.
- 5. Modify the httpd.conf file in the Adobe\Flash Media Server 4\Apache2.2\conf\ directory.
  - Change Listen 8134 to Listen 80
- 6. Modify the Manifest.xml file in the Adobe\Flash Media Server 4\applications\livepkgr\ events\\_definst\_\liveevent\ directory.
  - By default there are three streams with livestream1 livestream2 livestream3. You can add as many streams as you need and enter the associated bitrates. If you want to change the stream names you can, but must also make the same change in the Transcoder's Manifest.xml file. For example: KVUE\_ABC.

#### 7. Modify the **Event.xml** file in the following directory:

#### Adobe\Flash Media Server 4\applications\livepkgr\events\\_definst\_\liveevent\

- Update the value of Fragmentduration to the key frame interval you want to use for packaged streams. By default, the value is set to 4000 milliseconds (4 seconds). Change this value to the key frame interval derived from your packaged streams:
  - Divide the GOP of the RTMP workflow by the Frame Rate of the RTMP workflow
  - Multiply that quotient by 1000, which becomes the "Fragmentation" value in milliseconds.
  - For example: GOP 60 / Frame Rate 30 = 2 \* 1000 = 2000
- 8. Restart the following Adobe Media Server Services:
  - Flash Media Administration Server
  - Flash Media Server (FMS)
  - FMSHttpd
- 9. Create an RTMP stream output on the *Packager* and start the package.



## **Enable Adobe HTTP Dynamic Streaming**

Adobe HTTP Dynamic Streaming requires a cross-domain policy file that grants a web client—such as the Adobe Flash Player—permission to handle data across multiple domains. This is because the content is typically being hosted from one domain, while clients that are requesting the content belong to different domains and therefore need permission to access the content. The **clientaccesspolicy.xml** and **crossdomain.xml** files grant read access to the data, permitting a client to access the content across domain lines.

These files are stored on the *Packager* in the **opt/ripcode/www/pages/** directory. If you want to change these files, you can read more about how these files are used at the following URL:

#### http://kb2.adobe.com/cps/142/tn\_14213.html

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**Note:** If you are using an origin server to deliver content versus servicing clients directly from Packager, you must include these files in the root directory of the origin server.

# How Packager Works With Apple HTTP Live Streaming

For Apple HTTP Live Streaming, *Packager* creates packages that are associated with an input group and an output directory. The input group is the same channel of information at different bitrates where the input streams are IDR aligned (e.g., the streams have the same timestamp). If one of the streams goes out-of-sync, then the *Packager* automatically attempts to re-synchronize the stream; this behavior is configurable. An input group can be reused by different packages. With HLS, the stream can feed into a server or be viewed by clients directly.

Figure 10. Packager with Apple HTTP Live Streaming.



## **HLS Packaging Modes**

HLS can use either Live or VOD mode for its output:

- Live—Segments are referenced in the manifests and exist on disk according to a rolling window, defined by the **Segment Life Span** field (configured when defining the package) which factors into the length of time that segments will be retained within a manifest. The segment itself remains on disk for twice that duration. The *Packager* publishes a URL to access the video content that will remain valid until after the packaging session is stopped, for as long as the material is available.
- VOD—Segments and manifest entries are continuously added and never deleted by the *Packager*, even when the package is stopped and deleted. The data must be manually published to end users, and then manually removed. *Packager* publishes a link to the content while the segment generation is occurring that will remain usable as long as the content is left in its original location. While the



content is being generated, playback appears as a live event. Only when VOD packaging is terminated will playback start from the beginning when the content is restarted.

#### HLS Publishing Options to an HTTP Server

There are two options to publish HLS content to an external HTTP server:

- 1. Webdav & Webdav-light—entails configuring a directory mount in addition to the output stream.
- 2. HTTP-Edgeware—only requires configuration of an output stream.

#### Webdav Configuration

- WebDAV mount—uses a full WebDAV implementation with file locking and user authentication. In this case, create an output directory to which Apple HTTP Live Streaming client fragments will be copied.
- Webdav-light output stream—webdav-light supports publishing and removal of HTTP content without authentication or file locking. Removing these additional features allows more HLS packages to be delivered remotely. In order to use this method, the remote Web server must support HTTP methods PUSH, DELETE, and MKCOL and each method must behave according to RFC 4918. In this case, create an output stream of the webdav-light protocol and an HTTP URL that has WebDAV enabled. For each package, a separate output stream must be created and each stream must point to a different host; for example, http://hlscontent/upload/stream1 and http://hlscontent/upload/stream2. When the output stream is added, the Packager attempts to publish and remove a temporary file to make sure the web server configuration is valid. If this fails, the webdav-light mount cannot be provisioned.

#### To configure *Packager* for Webdav, proceed as follows:

- Create an input stream group (configuration >> input >> group >> add) and add streams to it (configuration >> input >> group >> stream >> add). See "Defining Input Streams" on page 130.
- 2. Create an output to which Apple HTTP Live Streaming client fragments will be copied:
  - WebDAV mount—Create an output directory of type *davfs* (configuration >> output >> directory >> add). See "Defining Output Directories" on page 135.
  - Webdav-Light stream—Create an output stream (configuration >> output >> stream >> add) of type Webdav-Light. See "Defining Output Streams" on page 139.
- 3. Create a package of type Apple HTTP Live Streaming with an output source:
  - WebDAV mount—file output directory, either on a local drive or remote mount.
  - Webdav-Light stream—output stream with the appropriate output ID for the stream.
  - See "Configuring a Package" on page 142.
- 4. Start the package (configuration >> package >> start). See "Starting a Package" on page 156.

**Note:** To use this feature with an Apache Web server, WebDAV must be enabled. See "Configuring HTTP Apache Web Server for Webdav-Light" on page 219.

#### **HTTP-Edgeware Configuration**

HTTP-Edgeware is another version of Webdav-Light which includes functionality for edgeware devices.


#### To configure Packager for HTTP-Edgeware, proceed as follows:

- Create an input stream group (configuration >> input >> group >> add) and add streams to it (configuration >> input >> group >> stream >> add). See "Defining Input Streams" on page 130.
- 2. Create an output to which Apple HTTP Live Streaming client fragments will be copied:
  - HTTP-Edgeware stream—Create an output stream (configuration >> output >> stream >> add) of type http-Edgeware. See "Defining Output Streams" on page 139.
- **3.** Create a package of type *Apple HTTP Live Streaming* with an output source:

- HTTP-Edgeware—output stream with the appropriate output ID for the stream. See "Configuring a Package" on page 142.

4. Start the package (configuration >> package >> start). See "Starting a Package" on page 156.

**Note:** When viewing HLS content, validate output by using either an iPad or iPhone with a Safari browser.

# How Packager Works With Object Store (Swift API)

OpenStack *Object Store* (also known as *Swift*) is open source software that facilitates creation of redundant, scalable data storage by using clusters of servers to store readily accessible petabytes of data. Rather than a typical file system hierarchy, Object Store uses objects (programming that identifies a thing's state and behavior), which are written to multiple hardware devices and replicated across a cluster of hardware. Due to being a fully distributed architecture, Object Store is a an API-accessible, efficient and cost-effective solution that can easily be scaled as storage space requires.

For Object Store streaming, *Packager* creates packages that are associated with an input group and an output directory. The input group is the same channel of information at different bitrates where the input streams are IDR aligned (e.g., the streams have the same timestamp). If one of the streams goes out-of-sync, then the *Packager* automatically attempts to re-synchronize the stream; this behavior is configurable. An input group can be reused by different packages. With Object Store, the stream can feed into a server or be viewed by clients directly.

### **Object Store Publishing Functionality in Packager**

Object Store publishes content via HTTP (though the API can also be integrated with NFS) similar to webdav and webdav-light. An output stream with a URL is created, but rather than specify the URL manually (as is required for HLS), the Object Store protocol only requires that you enter a hostname; the protocol then automatically appends different URNs depending on the state of the communication between the package, the object store, and the authentication scheme. In Object Store, there is no base path specified by the user.

### Authentication

Client-server interaction is achieved using a two-step process.

- **1.** The client sends an HTTP GET to the server with the username and key to the authentication URL, which includes the authentication version being used (currently, only v1 is supported).
- **2.** After successful authentication, the server responds with an HTTP RESPONSE that includes the storage and authentication tokens.



 $<sup>\</sup>mathbf{i}$ 

### **Basic Flow & Concepts**

Once initial authentication is established, the goal is to reduce authentication steps by storing the token on disk. When additional requests are made, a check is done to see if the token first exists on disk. If no token exists, an authentication request for a new token is sent.

Rather than requiring that the user understand Object Store concepts such as containers and objects, *Packager's* implementation of Object Store resembles the Webdav implementation. Thus, when configuring Object Store through the GUI or via an API method call, the URL format is similar, with the exception that nothing is entered after the hostname.

#### To configure *Packager* for Object Store, proceed as follows:

- Create an input stream group (configuration >> input >> group >> add) and add streams to it (configuration >> input >> group >> stream >> add). See "Defining Input Streams" on page 130.
- 2. Create an output to which object client fragments will be copied:
  - Create an output directory of type *swift-api* (configuration >> output >> stream >> add).
     See "Defining Output Streams" on page 139.
- **3.** Create a package of a desired type with an output source of *stream*. See "Configuring a Package" on page 142.
- 4. Start the package (configuration >> package >> start). See "Starting a Package" on page 156.

### How Packager Works With MPEG DASH

MPEG DASH is a new standard for multimedia streaming over the Internet known as MPEG Dynamic Adaptive Streaming over HTTP. MPEG DASH offers a universal standard for the delivery of adaptive streaming media. DASH is a video streaming solution where small chunks of video streams/files are requested using HTTP and then spliced together by the client. DASH presents available stream content to the media player in a manifest (or index) file – called the Media Presentation Description (MPD) – and then supports HTTP download of media segments.

For MPEG DASH, *Packager* creates packages that are associated with an input stream group or input file, and an output directory. The input stream group is the same channel of information at different bitrates where the input streams are IDR aligned (e.g., the streams have the same timestamp). If one of the streams goes out-of-sync, then the *Packager* automatically attempts to re-synchronize the stream; this behavior is configurable. An input stream group can be reused by different packages. With MPEG DASH, the stream can feed into a server or be viewed by clients directly.



Figure 11. *Packager* with MPEG DASH.

MPEG DASH can use only Live mode as described below:



• Live—Segments are referenced in the manifests and exist on disk according to a rolling window, defined by the **Segment Life Span** field (configured when defining the package) which factors into the length of time segments will be retained within a manifest. The segment itself remains on disk for twice that duration. The *Packager* publishes a URL to access the video content that will remain valid until after the packaging session is stopped, for as long as the material is available.

### Configuring Packager for MPEG DASH

The basic steps for configuring *Packager* for MPEG DASH are:

- **1.** Define the input source:
  - Create an input stream group (configuration >> input >> group >> add) and add streams to it (configuration >> input >> group >> stream >> add). See "Defining Input Streams" on page 130.
  - Create an input directory (configuration >> input >> directory >> add. See "Defining Input Directories" on page 126.
- Create an output directory to which MPEG DASH client fragments will be copied (configuration >> output >> directory >> add). See "Defining Output Directories" on page 135.
- **3.** Create a package of type *MPEG DASH* with a file output directory, either on a local drive or remote mount. See "Configuring a Package" on page 142.
- 4. Start the package (configuration >> package >> start). See "Starting a Package" on page 156.

**Note:** A player does not apply to MPEG DASH as this content can only be ingested by the JITP server.

# **Configuring HTTP Apache Web Server for Webdav-Light**

To use Webdav-Light with an Apache web server, WebDav must be enabled. The following directive should be placed in the Apache configuration:

```
<Directory "<path/to/uploaded/content>">
DAV On
</Directory>
```

For performance, RGB recommends the following, showing examples of how this is done on a typical Linux distribution:

#### Increase the number of sockets

sysctl -w net.ipv4.ip\_local\_port\_range="1024 14000"

You can also set this in **sysctl.conf**, which is good for persistence on server reboot.

#### Switch the Apache mode from *fork* to *worker*

Uncomment the following line in /etc/sysconfig/httpd/:

```
HTTPD=/usr/sbin/httpd.worker
```



Use the following values for the Apache threading directives in the **httpd.conf** file:

<IfModule worker.c>

StartServers	10
MaxClients	150
MinSpareThreads	25
MaxSpareThreads	75
ThreadsPerChild	25
MaxRequestsPerChild	0

</IfModule>

# **Options for Mounts**

Using output directories as the destination of packages can be demanding on the file systems that host the output directories. Not only must the destination storage have sufficient capacity, but it has to be able to sustain a traffic load that ensures generation and retrieval of content in real-time.

For example, if 100 streams are packaged at an average of 2 Mbps per stream in *live* mode with a *segment life span* of 30 seconds, approximately 1.5G of storage is required (100 \* 2Mbps/8 \* 30 sec \* 2). A constant average of 25 MB must be sustained to support read/write operations from end user media players. Most likely, this scenerio requires splitting the load over multiple local disks, or multiple remote file servers.

Packager offers several options for using mounts to store file output from packaging operations:

- Local directory mounts—Useful for live content and easier to deploy, local directory mounts are good for smaller deployments.
- <u>Remote NFS v1-v3</u>, <u>NFS v4</u>, <u>GPFS</u>, and <u>CIFS Server mounts</u>—Allows for greater scalability and flexibility. However, it is important to consider network conditions and equipment performance given the high disk I/O involved.<sup>4</sup>
- <u>Hard and Soft mounts</u>—*Packager* provides the option of configuring an NFS server with soft mounts (default setting) or hard mounts (required when producing live content).



**Caution:** When using NFS mounts for live content playback, RGB highly recommends **hard** mounts.

• <u>Webdav web shares</u>—Webdav is a defacto standard for pushing content over HTTP. It requires a user name and password to be able to push content to the Webdav Server.

### **Using Local Directory Mounts**

You can use a local mount for the inbound or outbound media by creating a directory. Local mounts are created differently depending on whether the underlying operating system has an **/opt/localmnt** partition. If the underlying operating system has this partition, the directory is created using a partition. If the partition is not present, the directory is created using a virtual file system (VFS).



<sup>4.</sup> For deployment scenarios, RGB recommends NFS or GPFS protocol for all external storage mounts. Common Internet File Services (CIFS) can be used but is not recommended due to decreased performance (refer to the Release Notes for this version of software for test data). If used, CIFS should be limited to non-deployment situations.

The local server implementation leverages a SQLite database which uses reader/writer locks to control access to the database. If the SQLite database file is stored on an NFS file system, you must enable file locking on the NFS Server to prevent issues from multiple processes trying to access the database file at the same time. To enable file locking, install **nfs-utils**; refer to **http://** 

masterneophyte.blogspot.com/2006/09/sqlite-databases-on-nfs-mounts.html for details.

#### Local Directory Mounts Using a Partition

If the **/opt/localmnt** partition is present, you do not need to define mount size and loop device when configuring the directory. In this case, a local mount is created with the name provided in the **Directory Name** field, and a *symlink* is created to link the local mount partition to the corresponding mount point directory under **/opt/ripcode/mnt**.

When a partition is used for a local mount, the **Host** field contains the partition directory path (always **/opt/localmnt**) and the **Share Name** field contains the directory name and mount size in the form <*directory\_name>:-1*.

### Local Directory Mounts Using a Virtual File System

If the **/opt/localmnt** partition is not present, the local mount is created using a virtual file system (VFS) file and mounted using a loop device. When mounted, the file appears as a regular ext3 filesystem, and normal filesystem operations can be performed. The size of the filesystem is restricted to the size of the physical file on disk. To remove the file system, simply unmount it and delete the file.

You will need to provide the local mount size which is the size (in megabytes) to allocate for the local mount; this value must be less than the available disk space since it is an actual file on the physical disk. You must also provide the Linux loop device to use for this local mount; there are up to 8 loop devices available in a standard Linux environment (loop0 – loop7).

**Note:** To add loop devices to the local mount, simply add the max\_loop=<1-255> definition to the kernel argument list (found in the **/boot/grub/grub.conf** file) and restart the system.

When a virtual file system is used for a local mount, the **Host** field contains the loop device used for that local mount, and the **Share Name** field contains the directory name and mount size in the form <*directory\_name*>:<*size*>.

1

**Note:** It could take several minutes to add the mount since a physical file must be created and formatted on disk. The **directory** >> **add** command will return after validating the parameters and starting the mount creation step as a background process. Until the creation step is complete, the mount will remain in an unknown state, and may not appear in the Packager Console.

# **Note:** On a standalone system, the Packager should be the only application using the loop devices. However, on a software-only system, you may be using some loop devices for other mounts. The **directory** >> **add** command will check for currently mounted loop devices, but you must ensure the selected loop device has not been assigned to another application.

### Note:

The virtual file system is created on the physical disk. The creation process does not check to see that the disk has sufficient space to create a file system of the requested size, nor does it attempt to estimate how much free space should be left over after creation to ensure normal operation of the system. Since it is not possible to check for all possible conditions, you must size the disk accordingly to ensure proper operation on the system.



### **Using Webdav Web Shares**

You can use a Webdav (Web-based Distributed Authoring and Versioning) web share for the inbound or outbound media by creating a directory. Prior to configuring a directory using Webdav, you must have a Webdav server configured and running.

To create a Webdav mount, use the **directory** >> **add** command with fields configured as follows:

- **Host**—The IP address or fully qualified domain name (FQDN) of the Webdav server, currently restricted to 23 characters.
- Remote Share Name—The directory on the Webdav server that is to be mounted.
- Remote Username—The username to use to connect to the Webdav server.
- **Remote Password**—The corresponding password.

 $(\mathbf{i})$ 

**Note:** By nature of the HTTP protocol, you must note the following when using Webdav mounts:

- Symlinks are not supported (hard or soft links). Webdav mounts can only create directories and files.
- Writes are not blocking on the remote server. The local Webdav driver caches writes locally and sends them to the remote server periodically. When the directory is unmounted, the driver attempts to flush any remaining data to the remote server. This operation may take several seconds. While data written to the mount may be immediately available on the local host, the data may not show up on the remote server for several seconds.
- Note:

: The mount operation does not directly support https. The url generated by Packager is http://<Host>/<Remote Share Name> rather than https://. However, support for accessing secure urls should work when explicitly specifiying a port as part of the hostname.



e: To connect to a specific port, include the port number as part of the host name. For example, to connect to port 443 on 10.10.88.194, the **Host** field would be 10.10.88.194:443.

(**i**)

**Note:** Webdav output directories are only supported for HLS.

# **GPFS Storage Details and Setup**

General Parallel File System (GPFS) is a scalable, high performance, clustered file system that can be used in addition to or in place of NFS. From the *Packager*'s perspective, a GPFS mount appears as a typical file system mount<sup>5</sup>. Various parameters must be set up before configuring an input or output directory to use GPFS on the *Packager*. These requirements (for the *Packager*) and their steps are described in this section.



If you do not follow these prerequisite steps, selecting a GPFS mount from the Storage Mounts container in the Packager will only create a local mount in the /mnt/RGBGPFS directory by default; this is not the desired result when setting up GPFS.



<sup>5.</sup> If using GPFS as a storage mount for nDVR, it must be set up on both the *Recording Manager* and the *Packager*(s), both of which are considered clients. For instructions on setting up GPFS on the *Recording Manager*, refer to the *nDVR User Guide, Release 1.1.* 

#### **Prerequisite Overview**

Any GPFS deployment requires configuration of the GPFS cluster in order to communicate with client nodes. This involves setting up the client software, kernel module, and ssh private/public key pairs.

These steps are not done by default; they require manual configuration depending on the deployment. The *RM* and *Recorder* provide a set of base RPMs and updates. There are also a few RPMs that contain kernel modules, but you must verify these modules match the current kernel version on each client (*RM* and/or *Recorder*). If the kernel version of a *Recorder* or *RM* does not match one of the kernel RPMs provided, then a new version must be compiled for the target kernel version. In this case, refer to "Building the Kernal Driver" on page 225.

#### Prerequisite Steps

Below are the steps required for set up. Note that the hostnames have been identified as gpfs-client and gpfs-server. GPFS clients include the *Packager* and, for nDVR, *Recording Manager*.

1. Install RPMs as shown in the code block below:

```
[root@gpfs-client ~] # yum -y install ksh
[root@gpfs-client ~] # rpm -ivh /opt/gpfs/gpfs.*.rpm
                Preparing...
 1:gpfs.base
                2:gpfs.gpl
                3:gpfs.msg.en US
                4:gpfs.docs
                [root@gpfs-client ~] # rpm -Uvh /opt/gpfs/updates/gpfs.*.rpm
Preparing...
                1:gpfs.base
 2:gpfs.gpl
                3:gpfs.msg.en US
                4:gpfs.docs
                [root@gpfs-client ~] # uname -a
Linux gpfs-cient.lab.ripcode.com 2.6.32-431.11.2.el6.x86 64 #1 SMP Tue Mar 25
19:59:55 UTC 2014 x86 64 x86 64 x86 64 GNU/Linux
[root@gpfs-client ~] # ls -l /opt/gpfs/kernel/*
-rw-r--r- 1 root root 1890738 Aug 12 20:45 /opt/gpfs/kernel/gpfs.gplbin-2.6.32-
431.11.2.el6.x86 64-3.5.0-19.x86 64.rpm
-rw-r--r-- 1 root root 1526284 Aug 12 20:45 /opt/gpfs/kernel/gpfs.gplbin-2.6.32-
431.5.1.el6.x86_64-3.5.0-19.x86_64.rpm
[root@gpfs-client ~] # rpm -ivh /opt/gpfs/kernel/gpfs.gplbin-2.6.32-
431.11.2.el6.x86_64-3.5.0-19.x86_64.rpm
Preparing...
                [root@gpfs-client ~] # modprobe -1 | grep mmfslinux
extra/mmfslinux.ko
```



2. Setup ssh keys on all nodes. An example is shown below:

```
kaluza|~$ ssh root@gpfs-server
root@gpfs-server's password:
Last login: Mon Aug 11 06:50:31 2014 from 10.10.100.43
[root@gpfs-server ~]# cat .ssh/authorized_keys | ssh root@gpfs-client "cat >> ~/
.ssh/authorized_keys"
The authenticity of host '10.10.83.54 (10.10.83.54)' can't be established.
RSA key fingerprint is c9:22:9a:cc:a2:cd:b3:5a:33:11:1c:3e:43:c9:74:4a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.10.83.54' (RSA) to the list of known hosts.
root@10.10.83.54's password:
```

3. Add the client node from the server. For example, login to gs1 and run the following:

```
[root@gpfs-server ~] # mmaddnode gpfs-client
Tue Aug 12 20:16:12 PDT 2014: mmaddnode: Processing node gpfs-client.lab.rip-
code.com
The authenticity of host 'gpfs-client.lab.ripcode.com (10.10.83.54)' can't be
established.
RSA key fingerprint is c9:22:9a:cc:a2:cd:b3:5a:33:11:1c:3e:43:c9:74:4a.
Are you sure you want to continue connecting (yes/no)? yes
mmaddnode: Command successfully completed
mmaddnode: Warning: Not all nodes have proper GPFS license designations.
   Use the mmchlicense command to designate licenses as needed.
mmaddnode: Propagating the cluster configuration data to all
 affected nodes. This is an asynchronous process.
[root@gpfs-server ~] # mmchlicense client --accept -N gpfs-client
The following nodes will be designated as possessing GPFS client licenses:
    gpfs-client.lab.ripcode.com
mmchlicense: Command successfully completed
mmchlicense: Propagating the cluster configuration data to all
 affected nodes. This is an asynchronous process.
[root@gpfs-server ~] # mmstartup -N gpfs-client
Tue Aug 12 20:17:07 PDT 2014: mmstartup: Starting GPFS ...
[root@gpfs-server ~] # mmstatus -a
-bash: mmstatus: command not found
[root@gs1 ~] # /usr/lpp/mmfs/bin/mmgetstate -a
 Node number Node name
                              GPFS state
   _____
             gpfs-client
      1
                                 active
      2
             gpfs-client2
                                active
      3
             gpfs-client3
                                 active
      4
              gpfs-client4
                                 active
```

#### Changing the GPFS Mount Path for RM

By default, the GPFS mount is mounted at **/mnt/RGBGPFS**. If the GPFS mount path is different, you will have to change the location on the *Packager* as follows:

From the Linux CLI, modify the file /etc/ripcode/ripcode.conf changing the value of "GPFSMountDir" from "/mnt/RGBGPFS" to the desired path.

### Limiting Memory Usage by GPFS kernel module

The mmfsd will use a fixed amount of memory on each node; by default this is 4GB. This memory usage is based on the tunable "pagepool." Running the GPFS command mmlsconfig will display the page pool size. Additionally, you can change the size of the page pool by running "mmchconfig pagepool=1GB" if, for example, you wish to set the page pool on all nodes to 1GB in size. After this change is made, clients will have to be shutdown (mmshutdown) and started back up (mmstartup) in order to execute the change. Also, you can limit what nodes on which to apply these page pool changes to by providing the -N flag and listing a series of target nodes.

#### Notes about using GPFS

- There is support for only one GPFS mount from a file system point of view. From the Packager point-of-view, you can add multiple mounts, but they will all point to the same location (/opt/RGBGPFS by default).
- There are currently no status checks on GPFS from *Packager*.
- GPFS clients require manual configuration intervention before it can be used. This may be unavoidable and even required by your operations team if GPFS is part of your deployment.

### **Building the Kernal Driver**

Building a client-side kernel driver is required if your kernel version is not 2.6.32-431.5.1 or 2.6.32-431.11.2. Building the kernel driver should be done from the *Packager*. Depending on the CentOS DVD version install, gcc-c++ may also need to be installed.

The commands below assume that all required libraries are already installed::

```
cd /usr/lpp/mmfs/src
make LINUX_DISTRIBUTION=REDHAT_AS_LINUX Autoconfig
make World
make InstallImages
```

### **GPFS Ports / Firewalls**

When configuring a GPFS storage mount, additional information as described below may be required when setting up a firewall.

#### **Daemon Communication**

Daemon communication occurs over port 1191 by default. In general, the default value is used in many GPFS production clusters.



#### Administrative Communication

GPFS administrative commands may use one or more TCP/IP ports to complete the command. For example, when using standard ssh, port 22 used. Additionally, other ephemeral ports (short-lived transport port) are opened for socket connections used to pass data to and from the GPFS daemons.

In some environments you may wish to limit the range of ports that the GPFS administration commands use. This is done by using this GPFS configuration command parameter: tscCmdPortRange.

When using the **tscCmdPortRange** command, ensure you configure enough ports to support all of the concurrent commands to or from a node, which will equate to about 20 or more ports.

### **Additional Information**

Additional firewall configuration for GPFS may be found on the IBM developer wiki for GPFS.



#### **CHAPTER 10**

# Reporting

This chapter describes all the reports and statistics you can view using the **Reports** tab in the *Packager* Management Console.

# In This Chapter:

- "Overview," next.
- "Viewing and Clearing Contents of the System Log" on page 227.
- "Viewing JITP Status" on page 230.
- "Viewing System Status" on page 231.

# **Overview**

Using the **Reports** tab of the Management Console you can:

- View the contents of the system log.
- View events generated by the Packager.
- View statistics for accepted, rejected, or processed transcoding operations.

# Viewing and Clearing Contents of the System Log

You can view or clear events or informational messages that have been stored in the system event and info log. The *Packager* stores all Warning, Major, Critical, events in the system log (/var/log/ripcode/ events) and Informational messages in the info log (/var/log/ripcode/info).

### Viewing an Event Summary

To view a summary of events, click the **Reports** tab and select **reports** >> **event** >> **summary** >> **show**. Click **Submit**. Results appear similar to the following.

	Packager				Current system time: Apr 22 15:09:56 Welcome admin   Connected to 10.10 Logout
Dashboard Configuration	Reports System				
System Status	Packaging Hardware	Input/Output	Events		S Connecti
event	reports >> event > This method returns the counts of	> summary >> f events for each severity.	show		
i summary Show ⊕ log ⊕ systemstatus	Submit				
	critical			58	
	major			7483	
	warning			24003	
	info			1851	

### **Viewing Events**

To view events, click the **Reports** tab and select **reports** >> **event** >> **show**.

Dashboard	Configuration Reports	Syste	m								
💀 💀 System Status							Input/O		s 🛛 🎯 Conne	ection	
event	reports This method	reports >> event >> show     It is method returns the list of requested event records.									
±∵summary		View System Messages Log (/var/log/ripcode/events)									
tt log	REPORT QU	REPORT OUERY OPTIONS									
t packages	Sort Order	: by Timestam	p 🔘 Asce	nding 🍳	Descending						
i systemstatus	Filters: Ret	urn only recor	ds matching	the filter	values. Wildo	ards (*) a	allowed, special	characters (+?.^\$()[]	) not allowed.		
	Severity	Date	/Time	Sour	ce	Acknow	ledged /	Acknowledger	Detail		
	Apply Option	Apply Options									
		Previous   Next								=	
	Severity	Date/Time	Seq.No.	Source	Acknowled	lged Ac	cknowledger	Detail			
	MAJOR	Nov 8 14:54:00	0	SSC01	NAK	un ev	nacknowledged vent	[=294]System real-ti transcoding state the 48 seconds. (Current RtPass system fps[1 sec]:125.46 target fi fps:104.243 fps[16 sec]:119.961 target fps:104.243 fps[50 target fps:104.243]	me anged after t State: ps:104.243 arget sec]:105.85 ps:119.961		

A list of events (Major, Critical, Warning) are automatically displayed with the timestamp that the event occurred, source of the event, the status of the event (acknowledged or unacknowledged), and details about the event.

To sort the list: Choose Ascending or Descending from the Sort Order field and click the Apply Options link.



**To filter the list of events:** Enter conditions by which to filter results in the fields of the **Filters** area, and click the **Apply Options** link.

### **Viewing Informational Messages**

To view informational messages in the system log, click the **Reports** tab and select **reports** >> **log** >> **system** >> **show**. The following screen appears.

Dashboard Configuration	Report	ackager					Current system time: Apr 2 Welcome admin   Connect Logout	2 15:11:56 ed to 10.10.8		
System Status	Packaging	Hardware	Inpu	t/Output	Events		C	Connectio		
event	report This metho	<b>s &gt;&gt; log &gt;&gt;</b> od returns the list of	<ul> <li>system requested system</li> </ul>	<b>n &gt;&gt; s</b> ystem log n	how ecords.					
Disystem         View System Info Log (/var/log/ripcode/info)										
+ suchamentation	REPORT QUERY OPTIONS									
Systemstatus	Sort Order: by Timestamp O Ascending O Descending									
	Filters: Re	turn only records ma	atching the f	ilter values.	Wildcards (*) allow	ed, special charact	, special characters (+?.^\$()[] \) not allowed.			
	Date/Tim	2		Source		Detail				
	Apply Optio	ons								
					Previous   Next					
	Severity	Date/Time	Seq.No.	Source	Acknowledged	Acknowledger	Detail			
	INFO	Apr 22 13:31:25	6	TSM01	N/A	info is not ack/na	ck All tasks started successful	y		
	INFO	Apr 22 13:31:25	5	TSM01	N/A	info is not ack/na	ck The task SSC01 is running.			
	INFO	Apr 22 13:31:25	4	TSM01	N/A	info is not ack/na	ck The task IQM01 is running.			
	INFO	Apr 22 13:31:25	3	TSM01	N/A	info is not ack/na	ck The task WEB01 is running			

A list of informational messages from the system log are automatically displayed with the timestamp that the message was issued, the source that generated the message, and details about the message.

To sort the list: Choose Ascending or Descending from the Sort Order field and click the Apply Options link.

**To filter the list of messages:** Enter conditions by which to filter results in the fields of the **Filters** area, and click the **Apply Options** link.



# **Viewing JITP Status**

You can view the status of JITP packaging by clicking the **Reports** tab and selecting **reports** >> **packages** >> **jitp** >> **show**. Click **Submit** to see results.

Dashboard Configuration	Reports System				
🖶 System Status	Just-In-Time Packaging	Packaging Hardware	e Input/Output	Events   🕙 C	
ë reports ∎event ₽log	reports >> package This method returns Just-In-Time	es >> jitp >> show session counts.	I		
□ packages □ jitp □ systemstatus	Submit				
	Segment	Counter	Success	Error	
		5 second	0	0	
		1 minute	0	0	
		5 minute	0	0	
		Lifetime	0	0	
	Asset	Counter	Success	Error	
		5 second	0	0	
		1 minute	0	0	
		5 minute	0	0	
		Lifetime	0	0	

The **Segment** row displays the number of segment requests that have processed by JITP in the following historical increments: last 5 seconds, last 1 minute, last 5 minutes, and Lifetime.

The **Asset** row displays the number of new assets that have been processed by JITP in the following historical increments: last 5 seconds, last 1 minute, last 5 minutes, and Lifetime.



# **Viewing System Status**

You can view the status of various hardware components for the *Packager* from the Management Console in tabular format as described in the following sections.

You can also view system stats in graphical format by clicking the **Reports** tab and selecting **reports** >> **systemstatus** >> **graphs** >> **show**. Click **Submit** to see results.



Click the tabs along the top of the graph to view graphs for different system statistics. Use the scroll bar to the immediate right of the graphs to scroll through each graph.

The graphs are generated from plug-ins that provide system information. For each plug-in, four graphs are generated with different time-scales: day, week, month and year. These graphs are used to view system patterns and expose system problems.



### Viewing the Status of the CPU

To view the status of the CPU for the *Packager*, click the **Reports** tab and select **reports** >> **systemstatus** >> **cpu** >> **show**. Click **Submit** to see results.

	Packa	ger	Current system time: Apr 22 Welcome admin   Connected Logout					
System Status	Packaging Hard	ware Input/Output	Events		Connection			
event log	reports >> sy This method returns C	<b>/stemstatus &gt;&gt; cp</b> PU utilization data.	u >> show					
i systemstatus i cpu i show i disk i dini		Submit						
⊞ipmi	User (%)	System (%)	Nice (%)	Idle (%)	IO-Wait (%)			
• memory	0.4	1.6	0.1	97.5	0.0			

### Viewing the Disk Usage Status

To view the status of the disk for the *Packager*, click the **Reports** tab and select **reports** >> **systemstatus** >> **disk** >> **show**. Click **Submit** to see results.

	Packager	Current system time: Apr 22 15:14:5: Welcome admin   Connected to 10.10 Logout				
System Status	Packaging Hardware	Input/Outp	out	Events		S Connecti
event log	reports >> systems This method returns disk utilization	tatus >> n information fo	<b>disk &gt;</b> r all mount	> show ed file systems.		
i systemstatus i opu i disk i show i dmi	Submit					
ipmi	File System	Size	Used	Available	Used (%)	Mounted On
• memory	/dev/sda1	58G	8.1G	47G	15%	1
processes	tmpfs	12G	0	12G	0%	/dev/shm
Tresourceallocation	tmpfs	6.0G	4.0K	6.0G	1%	/var/ripcode/tmp
	tmpfs	2.0G	0	2.0G	0%	/var/log/ripcode/tmp
	//10.10.100.215/input7	373G	255G	119G	69%	/opt/ripcode/mnt/out/1
	/opt/ripcode/mnt/Internal1	4.7G	139M	4.4G	4%	/opt/ripcode/mnt/out/2



### Partitions

The operating system on which *Packager* runs has five partitions. Using these partitions allows the system to continue to run even if one of the partitions is completely filled up; however, applications attempting to write to the full partition may behave erratically.

Table 77. Partitions for Packager

Partition	Description
1	A base partition fixed at 12 GB.
/swap	A swap partition created for system swapfiles fixed at 128 MB.
/tmp	A partition for temporary files fixed at 5 GB.
/var	A partition for debugging and processing log files fixed at 25 GB.
/opt/localmnt	A partition where all 'local' directory mounts are created and share space. This partition is designed to grow to fill the remainder of disk.

### Viewing the Status of the DMI (SMBIOS) Table of Hardware Components

You can view the details of the Direct Media Interface (DMI (SMBIOS)) table of hardware components for the *Packager*. To view the details of the DMI, click the **Reports** tab and select **reports** >> **systemstatus** >> **dmi** >> **show**. Click **Submit** to see results.



### Viewing the Status of the IPMI Sensor Data Records (SDR)

You can view the status of the IPMI Sensor Data Records (SDR) for the *Packager*. To view the status of the IPMI, click the **Reports** tab and select **reports** >> **systemstatus** >> **ipmi** >> **show**. Click **Submit**.

	Pac	kager		Current system time: Apr 22 15:16:57 Welcome admin   Connected to 10.10.1 Logout
Dashboard Configuration	Reports	System		
System Status F	Packaging	Hardware Input/Out	tput Events	S Connectio
event event	reports > This method re	>> systemstatus >> sturns the IPMI Sensor Data Reco	<b>ipmi &gt;&gt; show</b> ds (SDR).	
e systemstatus e cpu e disk e dmi e iomi		Submit		
show	ipmi_id	Sensor	Value	Status
• memory	01h	Temp	-53 degrees C	ok
T processes	02h	Temp	-52 degrees C	ok
the resource allocation	05h	Temp	38 degrees C	ok

### Viewing the Memory Usage

To view the memory usage for the *Packager*, click the **Reports** tab and select **reports** >> **systemstatus** >> **memory** >> **show**. Click **Submit**.

Dashboard Configuration	Packag Reports Syste	jer m			Current system time: Apr 22 15:17 Welcome admin   Connected to 10 Logout				
🖶 System Status 🛛 🛛 🕅	ackaging Hardw	are Inp	ut/Output				🧭 Connectio		
☐ reports	reports >> sys This method returns tota	stemstatus al amount of free Submit	5 >> mem and used physica	ory >> sh	OW ory in the system.				
memory	Туре	Total (MB)	Used (MB)	Free (MB)	Shared (MB)	Buffers (MB)	Cached (MB)		
show	Memory	24097	7640	16457	0	263	6261		
+ processes	Buffers/Cache (-/+)	NA	1115	22982	NA	NA	NA		
± resourceallocation	Swap	8189	0	8189	NA	NA	NA		



### **Viewing Active Processes**

To view the active processes on the *Packager*, click the **Reports** tab and select **reports** >> **systemstatus** >> **processes** >> **show**. Click **Submit**.



### APPENDIX A

# Troubleshooting and Advanced Topics

This appendix provides troubleshooting information and advanced topics for Packager.

# In This Appendix:

- "Session State and Statistics," next.
- "Event Logging in Real Time" on page 237
- "Input Stream Events" on page 238
- "Generic Packager Events" on page 238
- "IDR Alignment" on page 240
- "Smooth Streaming Events" on page 240
- "System Level Events" on page 241
- "Generating Encryption Keys from Packager" on page 242
- "Tips For Smooth JITP Playback" on page 243
- "Contacting RGB Customer Support" on page 244

# **Session State and Statistics**

When the Packager is started, a session is created which keeps track of the number of segments generated by Packager, and the state of each stream associated with the Packager object.

During a successful packaging operation, the session state from the **configuration** >> **session** >> **show** menu will display the following:

- Step State set to InProgress.
- Step Type set to encode.
- Total Frames Transcoded counts total frames processed and should be increasing.
- Frames per second measures the frame rate and should be close to actual linear input.
- Segment Generated counts segments generated and should be increasing.
- **Current Queue Depth** shows amount of request information in the queue for processing. Typically this value will be very small or 0 when operating correctly.

In case of failure, review *Packager* configuration, network and server configuration for issues. Stopping and restarting a package could help resolve any problems.

When a stream gets out-of-sync, the retry counter (not shown in the figure) will increase. In that case, the Packager automatically tries to resynchronize the stream.

configur This method r	ation 2 eturns one	>> Sessio or more session	n >> s n informatio	how n as requeste	ed.											
		Session II	8						[numeric]	Session ID to re	strieve (0 - to	get all).				
State	Session ID	Workorder ID	Subr Time Started	nit Workflow Name	Input File Name	Input	Workorder St	ер								
inProgress(3)	2	35	Tue Nov 16 15:57:54 2010	Package 4	ToIIS_FromVMG	4	Step State	Step Type	Transcoder ID	Total Frames Transcoded	Segment generated	Total Frames	Maximum queue depth	Current queue depth	Frames per second	Transp
			2010				inProgress(3)	encode(2)	2	114099	1903	0	1656	0	30.004 / 0.000	file(1)
							inProgress(3)	encode(2)	3	114100	1903	0	1656	0	30.005 / 0.000	file(1)
							inProgress(3)	encode(2)	4	114103	1903	0	1656	0	30.004 / 0.000	file(1)

# **Event Logging in Real Time**

You can track issues as they happen by viewing events and info logs in real-time using the Packager's command line interface (CLI).

- 1. Start the Packager CLI by opening an SSH<sup>1</sup> session to the IP address of the Packager. Login using an administrative user and password.
- 2. Enter system management mode by typing: system.
- **3.** Enable logging of info messages by typing console logging enable info. You can enable logging based on the severity level (critical/major/warning/info/).

Last login: Wed Mar 9 15:54:49 2011 from 10.10.12.101

```
Ripcode CLI
 Copyright (c) 2010 RipCode, Inc. All rights Reserved. *
*
          WARNING: Authorized Access Only
                                                *
     admin@ripcode> system
Entering system management mode...
admin@ripcode(system)>
  admin@ripcode(system) > console logging
disable Disable console logging for this CLI session
       Enable console logging for this session at a specific level
enable
  admin@ripcode(system) > console logging enable
console logging enable <severity>
Enable console logging for this session at a specific level
severity
         severity level (critical/major/warning/info/debug)
```



<sup>1.</sup> A regular telnet session will not be allowed a login by Packager. You must login to the CLI using an SSH connection. SSH applications are widely accessible as freeware on the Internet.

admin@ripcode(system)> console logging enable info admin@ripcode(system)> console logging disable

# **Input Stream Events**

Table 1 lists events that might occur for input streams, along with available troubleshooting steps.

Table 1. Input stream events.

Event Message	Description	Troubleshooting Steps
3:WFT01:NAK:unacknowledged event:MAJOR:[=601]Input group 2 stream 3 program 1 has experienced (127:MPEG2TS continuity error) in the last 60 seconds	Continuity errors were detected on a stream.	<ul> <li>Monitor the number of continuity errors using configuration &gt;&gt; input &gt;&gt; group &gt;&gt; stream &gt;&gt; show</li> <li>Using an external monitoring tool, verify that the continuity errors are not from the source</li> <li>Verify the ethernet port utilization</li> <li>Verify whether packets are being dropped at the switch level</li> <li>Connect to the Packager terminal as <i>root</i> and enter this command: netstat -nus   grep errors The error counter should not increase.</li> <li>Review the graphs as described in "Viewing System Status" on page 231, which may show additional netstat and Ethernet/network errors.</li> </ul>
3:WFT01:NAK:unacknowledged event:MAJOR:[=601]Input group 2 stream 5 selected program underrun, bit rate: 270 Kb/sec	If an input stream is active and not receiving the expected traffic, it may signal an <i>underrun</i> .	None.
	An <i>underrun</i> is declared if the observed TS bitrate over a selected program falls under 25% of the advertised bit rate for longer than 9 seconds.	
0:WFT01:NAK:unacknowledged event:MAJOR:[=602]Stream operational state change: input group 2 stream 3: Out-Of-Service (Not receiving packets)	If an underrun was just declared, or if no more valid packets are being received from an input stream, the stream will be declared out of service.	Monitor the input stream stats to determine the level of traffic being sent by the stream: configuration >> input >> input >> group >> stream >> show (stats).

# **Generic Packager Events**

While a Packager session is ongoing, it will issue *info* level session logs. Following is an example of an HLS session having problems with one output. Shown is a manipulation that forces the redetection of one of the input streams, which temporarily causes an out-of-service condition.



0:WFT01:NAK:unacknowledged event:MAJOR: [=774] Packager operational state change: #5 HLS\_Live: Enabled EVENTLOG:Wed Mar 9 16:09:46 2011

0:WFT01:NAK:unacknowledged event:MAJOR:[=775]Stream operational state change: input group 2 stream 5: Out-Of-Service (Forced redetection)

EVENTLOG:Wed Mar 9 16:09:47 2011 :1:WFT01:NAK:unacknowledged event:MAJOR: [=776] Packager operational state change: #5 HLS\_Live: Degraded

EVENTLOG:Wed Mar 9 16:10:03 2011

0:WFT01:NAK:unacknowledged event:MAJOR:[=777]Stream operational state change: input group 2 stream 5: In-Service

EVENTLOG:Wed Mar 9 16:10:39 2011

0:WFT01:NAK:unacknowledged event:MAJOR:[=778]Packager operational state change: #5 HLS Live: Enabled

If you note a *degraded* state for a Packager session, then a disruption of packaging activities has occurred. A *disabled* state indicates that the entire session failed, not just one or more outputs.

0:SSM01:N/A:info is not ack/nack:INFO:Started S2F Work Order:4, Session:1, Workflow:Package 5, Input:HLS Live

EVENTLOG:Wed Mar 9 16:09:16 2011

1:SSM01:N/A:info is not ack/nack:INFO:Started S2F Step:Package 5.1, Session:1, Work Order:4, Output:HLS\_Live/VMG1\_S1.ts, Transcoder:1

EVENTLOG:Wed Mar 9 16:09:16 2011

2:SSM01:N/A:info is not ack/nack:INFO:Started S2F Step:Package 5.2, Session:1, Work Order:4, Output:HLS\_Live/VMG1\_S2.ts, Transcoder:2

EVENTLOG:Wed Mar 9 16:09:16 2011

3:SSM01:N/A:info is not ack/nack:INFO:Started S2F Step:Package 5.3, Session:1, Work Order:4, Output:HLS Live/VMG1 S3.ts, Transcoder:3

EVENTLOG:Wed Mar 9 16:09:47 2011 :1:SSM01:N/A:info is not ack/ nack:INFO:Failed S2F Step:Package 5.3, Session:1, Work Order:4, Output:HLS Live/VMG1 S3.ts, Transcoder:3 (error:Input out-of-service)

EVENTLOG:Wed Mar 9 16:10:05 2011

1:SSM01:N/A:info is not ack/nack:INFO:Started S2F Step:Package 5.3 (retry 1), Session:1, Work Order:4, Output:HLS\_Live/VMG1\_S3.ts, Transcoder:3

As shown in the above sample a Failed <S2F/S2S/F2F> Step info log marks a disruption in the packaging activity. Most of the time, individual step failures are not a cause for the entire session to be stopped. When the condition for the step failure clears, in this example, the missing input comes back in line, and the missing output is immediately restarted.

1

**Note:** If an output fails without having generated a single segment, this causes the entire packaging session to abort and restart. If this condition persists, the retries will slow down by a 3 seconds interval per retry, maxing out at 15 minutes. Such a scenario most likely would be caused by external conditions; for example, retrying too often could clog the system logs.



# **IDR Alignment**

Packager requires all input streams to be IDR aligned, and verifies this while packaging is occurring. If an input stream is defined but not in use, the system does not validate alignment. While packaging is occurring, Packager validates that every segment produced starts with an IDR frame on the exact same PTS value. If that is not the case, a step failure is declared against that output and it will be retried.

EVENTLOG:Wed Mar 9 16:09:47 2011

1:SSM01:N/A:info is not ack/nack:INFO:Failed S2F Step:Package 5.3, Session:1, Work Order:4, Output:HLS\_Live/VMG1\_S3.ts, Transcoder:3 (error:Output out-of-sync)

EVENTLOG:Wed Mar 9 16:10:05 2011

1:SSM01:N/A:info is not ack/nack:INFO:Started S2F Step:Package 5.3 (retry 1), Session:1, Work Order:4, Output:HLS\_Live/VMG1\_S3.ts, Transcoder:3

**Note:** When determining whether a stream is IDR-aligned, Packager considers that a stream may be misaligned for other reasons than the input streams being out-of-sync. For example, when a package is initially started, a stream group may not be aligned for the first few seconds since no stream had a reference point and streams may have started on different IDRs. However, if a step fails more than a minute after a package has been started, it is safe to assume that the input streams are misaligned.

Dropping non-IDR frame packets will not result in an error being declared, as the packager only looks at IDR timing. Dropping one IDR may also not cause this error, as long as the starting point of the next segment still aligns. Although we collect and report segment duration, we do not validate them, so in theory, you could miss an IDR, produce a segment that is too long, but as long as the next one starts at the same point than the others, it will still be ok.

# **Smooth Streaming Events**

Table 2 lists events that can occur with packaging operations involving Microsoft Smooth Streaming.

Event	Description	Troubleshooting Steps
Live Smooth Streaming file cache utilization high threshold crossed for output 1, stream 2, fragments duration 10 seconds	Packager cannot send POST messages to the IIS Server as fast as it should and multiple POSTs are pending transmission. The file to be sent to the IIS Server is being cached. Once the IIS Server retrieves the first file, the next file is sent. If Packager tries to send more than the IIS Server can handle or there is network issue, a message appears.	<ul> <li>Verify resource usage on IIS Server.</li> <li>Verify whether packets are being dropped at the switch level.</li> <li>Verify ethernet port utilization.</li> <li>Verify CPU utilization: reports &gt;&gt; systemstatus &gt;&gt; cpu &gt;&gt; show</li> <li>Distribute the Smooth Streaming package across multiple IIS Servers.</li> </ul>

Table 2. Events that can occur with Smooth Streaming



Table 2.	Events	that	can	occur	with	Smooth	Streaming
----------	--------	------	-----	-------	------	--------	-----------

Event	Description	Troubleshooting Steps
Live Smooth Streaming ran out of file cache for output 1, stream 2, fragments duration 30 seconds	Packager has too many POST messages pending transmission. The connection with the IIS Server is being severed when that event occurs.	Same as above.
Live Smooth Streaming connection lost for output 1, stream 2 error: Timeout was reached.	Packager's connection to the IIS Server has been lost.	Same as above. Refer to this URL for error code details: http://curl.haxx.se/libcurl/c/ libcurl-errors.html

# System Level Events

System level events are triggered based on the utilization level. The threshold can be changed using **sysconfig** >> **database** >> **threshold** >> **set**. Table 2 lists system level events that can occur.

Table 3. Sv	ystem leve	l events	that	can	occur
-------------	------------	----------	------	-----	-------

Event	Description	Troubleshooting Steps
UDP error count for the last time period exceeds threshold, count: 100, threshold:0	UDP errors are detected on the Packager. This event could happen when the system is running out of resources.	<ul> <li>Verify CPU and network usage.</li> <li>Reduce the number of active packages and see if the error goes away.</li> <li>Determine if the error is associated with an input stream/group.</li> </ul>
System memory utilization high threshold crossed, used memory exceeds 70 percent.	System memory usage exceeds a maximum level (running out of memory).	<ul> <li>Reduce the number of active packages and see if the error goes away.</li> <li>Determine if the error is associated with an input stream/group.</li> <li>Run the coroner script and send results to RGB for analysis.</li> <li>Schedule an application restart during the maintenance window. If memory utilization is still high, restart Packager.</li> </ul>
System disk utilization high threshold crossed for sda1, used space exceeds 70 percent.	Disk usage exceeds a maximum level (running out of memory).	<ul> <li>Determine which directory is using the disk space (du -ch).</li> <li>If the error is associated with a specific package, stop the package and delete its directory content.</li> <li>If the error is not associated with a specific package, perform further analysis to determine which files are using up the disk space.</li> </ul>



Table 3. System level events that can occur

Event	Description	Troubleshooting Steps
CPU utilization high threshold crossed, CPU usage exceeds 70 percent	CPU utilization exceeds a maximum level.	<ul> <li>Verify CPU and network usage.</li> <li>Reduce the number of active packages and see if the error goes away.</li> <li>Determine if the error is associated with an input stream/group.</li> <li>Run the coroner script and send results to RGB for analysis.</li> </ul>
Network utilization high threshold crossed for ETH1, bandwidth usage exceeds 70 percent.	Network utilization exceeds a maximum level.	<ul> <li>Verify all input and output streams associated with that Ethernet interface and make sure that the aggregate bandwidth is below the maximum level.</li> </ul>

# **Generating Encryption Keys from Packager**

Encryption keys can be generated from Packager for use in encrypting packages for Adobe Media Access or HLS. This section describes the configuration for the key server. Key server URLs and Packager credentials must also be provisioned.

### **Flash Access**

To provision an internal key server for Adobe Flash Access so that encryption keys can be generated by Packager for encrypting Adobe Flash Access packages, follow the steps in this section. You must also provision at least one Flash Access URL (with certificates) and the Packager credential.

#### To provision an internal key server for Flash Access:

- 1. Select sysconfig >> keyserver >> add.
- 2. In the Key Server Vendor Name field, enter Internal.
- **3.** In the **Client Key Request URL** field, enter the URL to the provisioned Flash Access Server. For example: *http://10.10.95.188:8080/flashaccessserver/test*
- 4. From the Output Type field, select file.
- 5. In the Output ID field, enter 0 to signify internal.
- 6. Leave the Subdirectory Path field empty.

#### To configure JITP HDS to use Flash Access encryption via an internal key server:

- 1. Select configuration >> jitp >> config >> modify.
- 2. From the Package Type field, select Adobe HTTP Dynamic Streaming.
- 3. In the Key Server Vendor Name field, enter Internal.

### HLS

To provision an internal key server for HLS so that encryption keys can be generated by Packager for encrypting HLS packages, follow the steps in this section. The keys may be stored and served to clients



locally from the Packager, or they may be sent to a remote server via either an NFS/CIFS mount, or a Webdav/Edgeware URL. If sent to a remote server, the remote server has responsibility for serving the keys to clients.

#### To provision an internal key server for HLS:

- 1. Select sysconfig >> keyserver >> add.
- 2. In the Key Server Vendor Name field, enter Internal.
- **3.** In the **Client Key Request URL** field, enter the URL to the provisioned HLS Server and the path to the subdirectory for HLS. For example: *http://10.10.95.81/HlsKeys* or *http://ClientKeyServer/HlsKeys*

**Note:** For external client servers, the structure of the **Client Key Request URL** is highly dependent on how that server is configured.

- **4.** From the **Output Type** field, select **file** if Packager is serving keys. Select **stream** if a remote HLS Server is serving keys.
- **5.** In the **Output ID** field, enter 0 if Packager is serving keys; otherwise pick the desired output directory. For example, *1 U OutDir*.

**6.** In the **Subdirectory Path** field, enter the path to the subdirectory for HLS. For example, *HlsKeys*. [edit] JITP Configuration

#### To configure JITP HLS to use HLS encryption via an internal key server:

- 1. Select configuration >> jitp >> config >> modify.
- 2. From the Package Type field, select Adobe HTTP Live Streaming.
- 3. In the Key Server Vendor Name field, enter Internal.

### **Tips For Smooth JITP Playback**

Following are some guidelines in order to ensure smooth playback for JITP.

- 1. Ensure that your storage system average transfer time is set to below 500 milliseconds. If the TS file chunk transfer time is too long, internal and client timeout can occur.
- 2. Monitor the IO stats on the storage system.
- **3.** Ensure that your network infrastructure can meet the traffic demands of content requests.
- 4. Ensure that correct permissions are set on the source server (file mount, C2, or web server).
- **5.** Request for a given asset should be sent to the same JIT Packager. If multiple JIT Packagers are in use, consider using a load balancer with an affinity layer.
- 6. Always monitor events closely.



# **Contacting RGB Customer Support**

RGB Customer Support is available 24x7. If after reviewing this section you still require assistance, please contact RGB Customer Support via any of the following methods:

Table 4. Contacting RGB Customer Support

Method	Contact Information
E-mail	support@rgbnetworks.com
Internet	http://www.rgbnetworks.com/support/rgb-customer-portal.php
Inside North America	1.877.RGB.NETW // (1.877.742.6389)
Outside the North America	+1.408.701.2800

### Information Required for Troubleshooting

RGB requires the following information for troubleshooting. You can find this information by clicking the **System** tab and selecting **debug** >> **info** >> **execute** and clicking **Submit**.



Wait for about a minute, and select **debug** >> **info** >> **retrieve** and click **Submit**. At the bottom of the results is a link you can click to obtain the information.<sup>2</sup>

□ sysconing □ config □ database	sysconfig >> debug >> info >> retrieve This method collects system debug information. This command should only be executed under direction of Customer Support.	
debug     info     execute     retrieve	Submit	
trace	Collecting System Debug Information in /tmp/rcdebug/sysDebugInfo Get System Information Get Process List Get Interface Configuration Get Route Entries Get Network Config Get Network Stats Get Process List Get Network Stats Get Network Stats Get Build Information Get Sysleg Config Get Sysleg Config Get /etc/incode files Get Modprobe config	



### Contents of Debug File

- Packager version and configuration
- Packager and operating system release
- Group, input stream, output stream and Packager configuration information
- Smooth Streaming: IIS Server version and operating system (and reported error if any)
- Smooth Streaming: Silverlight player version, browser and operating system
- HLS: Directory information
- HLS: Player information and operating system
- Input and output stream statistics
- System Info Log (in /var/log/ripcode, look for the file named info)
- Files from these directories (additional files may be requested by Customer Support):
  - /etc/ripcode/\*
  - /var/log/ripcode/\*
  - /var/ripcode/\*
- Core dump file from /var/ripcode/core (if present).



<sup>2.</sup> This file is placed under the /tmp directory from the Packager CLI.

#### APPENDIX B

# Configurator

RGB *Configurator* is a tool that acts as a layer between a customer's development code and the RGB API and can be used for large scale provisioning of RGB Networks TransAct products, including this release of *Packager*.

Code that is written to interact with RGB products can write tools that call *Configurator* via the command line rather than making direct calls to the products.

# In This Appendix:

- "Overview," next.
- "Functionality" on page 246
- "Components" on page 247
- "Installation" on page 248
- "Usage" on page 248

## **Overview**

The *Configurator* provides compatibility among multiple RGB products and software versions. Prior to *Configurator*, a user was required to make API calls directly to a product, thereby risking backward compatibility when a new version of an API was released. In addition, a network with many disparate products could become difficult to maintain. This tool is designed to work with supported, released versions of TA products.

# **Functionality**

*Configurator* processes files that contain provisioning and configuration information about *Packagers*. One or more file contains the device's infrastructure data, such as IP addresses and host names; and one or more file contains provisioning data, such as packages, streams, transcoders, etc.

When *Configurator* is invoked for a given product, it determines whether to use the XML-RPC protocol or REST over HTTP protocol, and what version of an API to call. Configurator must be invoked on the command line.

*Configurator* relies on the introspection available for each API. The introspection data for an API is read to determine how to execute calls, such as the number of parameters, default values, etc. After a connection to a device is initialized, introspection determines which APIs are available. All introspection data is parsed for each API; this data is used for documentation and to execute *Configurator* layouts. Executable APIs are in *Configurator* layout files, which further translate to API calls for a given device.

# Components

Configurator is comprised of several components that fall into two categories: User-based and Internal.

### **User-based Components**

User-based components are the active tools you will use when provisioning systems.

### **Command Line Interface**

Configurator is installed with RGB's Command Line Interface; this may be used to provision a product or set of products. The command line may also be used for simple actions such as to retrieve the status of a device, reset a device, or list the supported APIS on a device.

### Layout Files

Layout files the input files that are read into Configurator. They are in a structured XML format and typically translate to a device's API calls. Most of the time these files will contain a combination of provisioning and execution API calls that can be run across multiples devices.

For example, you can have one layout file that is used to add and start packages, which can also be used across multiple *Packagers*. In general, when applying the same layout to multiple nodes there are configuration values that are unique per device. These values should be kept as separate configuration files (or they can be supplied on the command line).

### Logger

The logger provides you with the ability to log all calls executed as well as being able to create status and error logs.

### **Internal Components**

Several other components make up Configurator; as a user, you will not interact with these components, but they are nonetheless useful to know about.

### **Input Parser**

The input parser provides baseline validation for configurations, provisioning, and execution data that are stored in structured XML files. However, most of the validation is done by the node itself. For example, if an API call fails, an error will be returned from the device as well as reported in a log.

#### Introspector

The introspector reads introspection data for an API to determine how to execute calls, such as: number of parameters, default values, etc. An API's default values are at first determined by introspection, but the defaults can be overridden if otherwise specified in one of the 'default' files (refer to "Usage" on page 248 for additional information).

After a connection to a device is initialized, the introspector determines whether a RESTful or XML-RPC interface is available. After the API type is determined, all introspection data is parsed for each API. This data is used for documentation and to determine how *Configurator* will run user layouts.



### **Execution Action**

The execution action makes decisions about what version of an API to run and which protocol to use. Some API calls are created at run-time based on introspection data and others are supported statically.

### Installation

*Configurator* comes as an executable application that must be installed after the *Packager* application has been installed. To install *Configurator*, proceed as follows:

- 1. Log in via SSH to the *Packager* on which you wish to use *Configurator*.
- 2. Provide the root login and password for your system.
- 3. As root, change directory to /opt/ripcode/Configurator: cd /opt/ripcode/Configurator
- Use python to install the application: python setup.py install
- 5. After installation, you should see the rgb-config.py command tool in the /usr/bin directory.

# Usage

For complete details on how to use *Configurator*, please refer to the online help pages on your *Packager* as follows:

1. From a web browser, navigator to http://<IP address or hostname of *Packager*>/configurator. For example: http://10.32.128.55/configurator



**Note:** Use a lower case "c" for the navigation address.



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