BNP v2.0 Product Ordering Guide

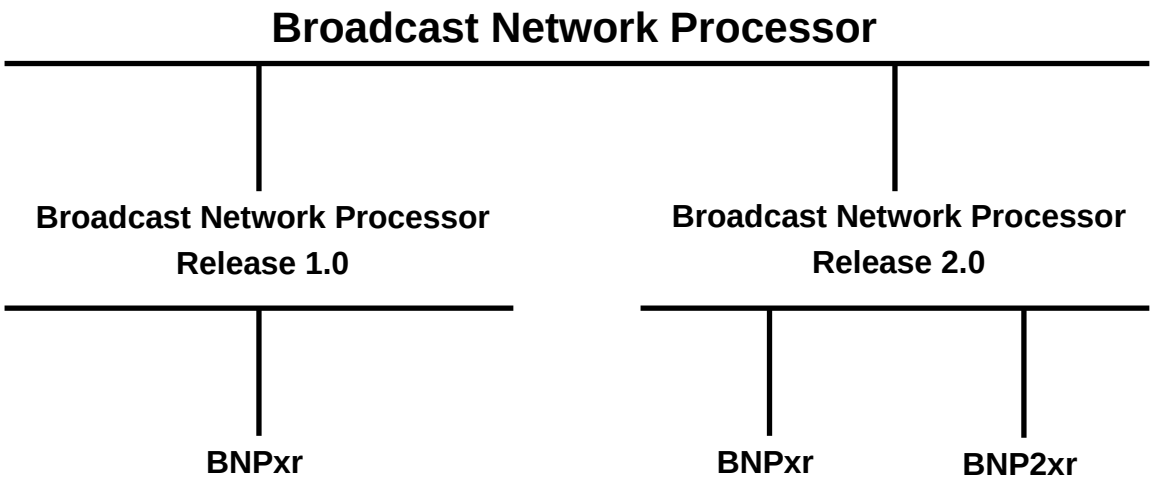
Document revision: v2.0

Document date: March, 2009

BNP Product Family Overview

With the release of BNP v2.0 software, the BNP product family has expanded to include two product system models supported by this release:
1) the original **BNPxr** based on the PROC and GBP modules, and
2) the new **BNP2xr** based on the PROC-2 and GBP-2 modules.

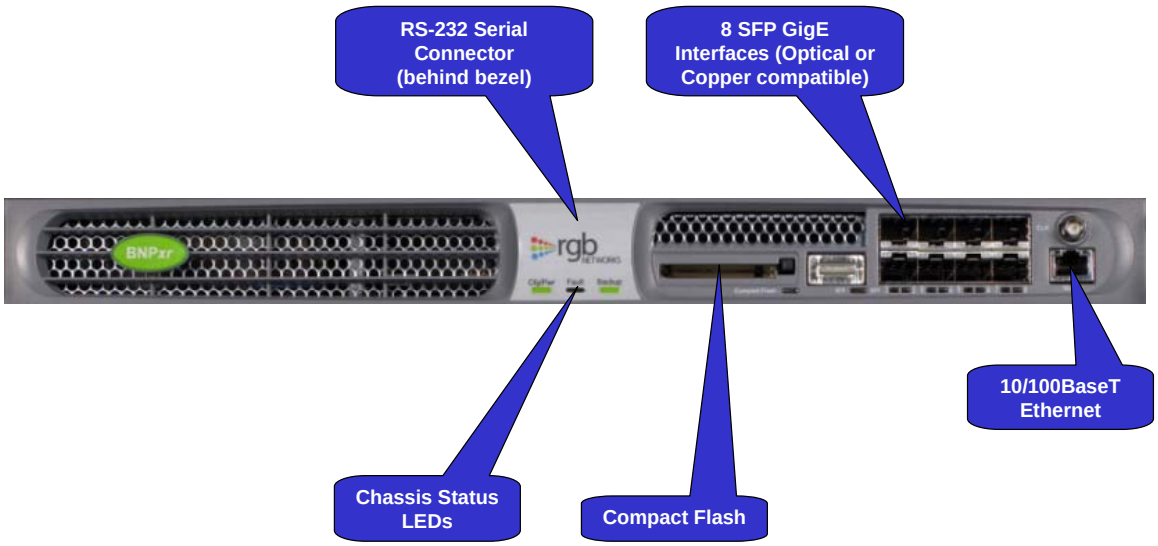
Since both BNP 1.0 and BNP 2.0 software continuing to be offered to customers for various regional requirements, the BNP product family can be illustrated in the following fashion:



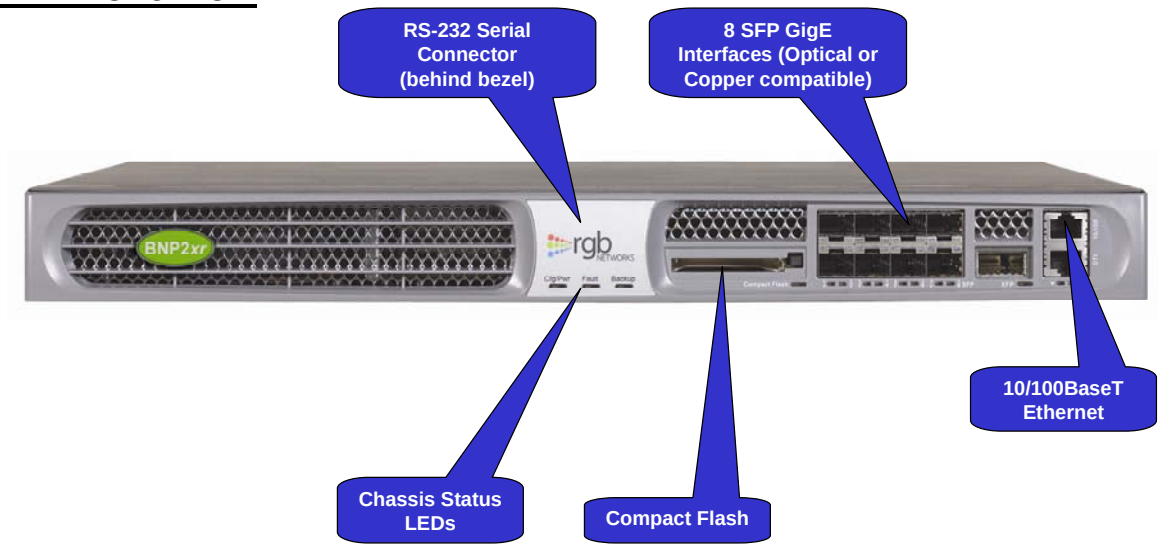
This product ordering guide is focused on the introduction of BNP v2.0 software, providing information on how to order products based on entry-level product bundles (e.g. BNP-4-AC and BNP2-2-AC) and product configuration upgrades using the associated part numbers (PNs) and product descriptions.

While one of the primary differences between the BNPxr and BNP2xr is the former being based on the GBP-1 and the later based on the GBP-2, the active functionality of the system and network interfaces are the same. This is illustrated below in the front views of the BNPxr and the BNP2xr, with the currently enabled interfaces being highlighted.

BNPxr Front View



BNP2xr Front View



A key differentiation between the BNPxr and BNP2xr is the video processing performance per processor module, as illustrated in the tables below, with BNPxr supporting up to 480Mbps bandwidth output per PROC module and BNP2xr supporting up to 640Mbps bandwidth output per PROC-2 module. Beginning with BNP v2.0, both BNPxr and BNP2xr support up to 3 processor modules allowing to effectively increase the total bandwidth supported per chassis. The following tables illustrate the capacity guidelines for BNP v2.0 using the standard 40Mbps MUX license.

BNPxr 40Mbps MUX License Capacity Guidelines for BNP 2.0 Releases

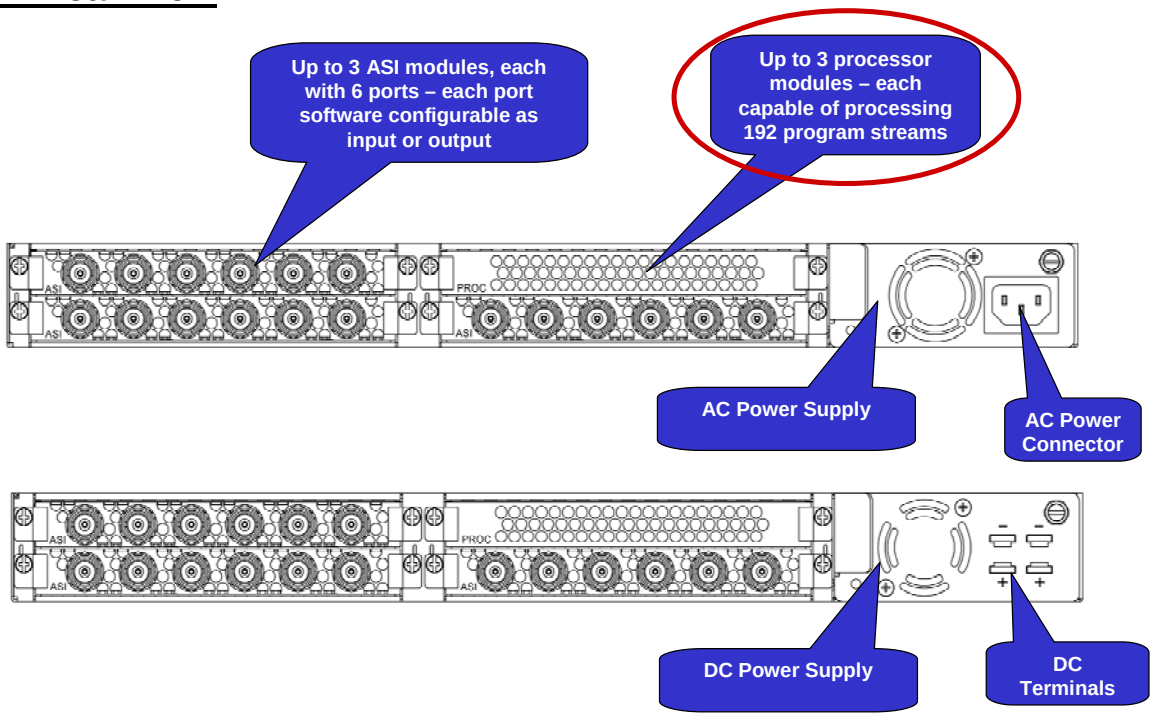
# of Modules	Max BW per TS (Mbps)	Max BW per chassis (Mbps)	MPTS Program density (2.5Mbps avg. bandwidth)	Max 40Mbps MUX Licenses
1 PROC	120	480	192	12
2 PROC	120	960	384	24
3 PROC	120	1440	576	36

BNP2xr 40Mbps MUX License Capacity Guidelines for BNP 2.0 Releases

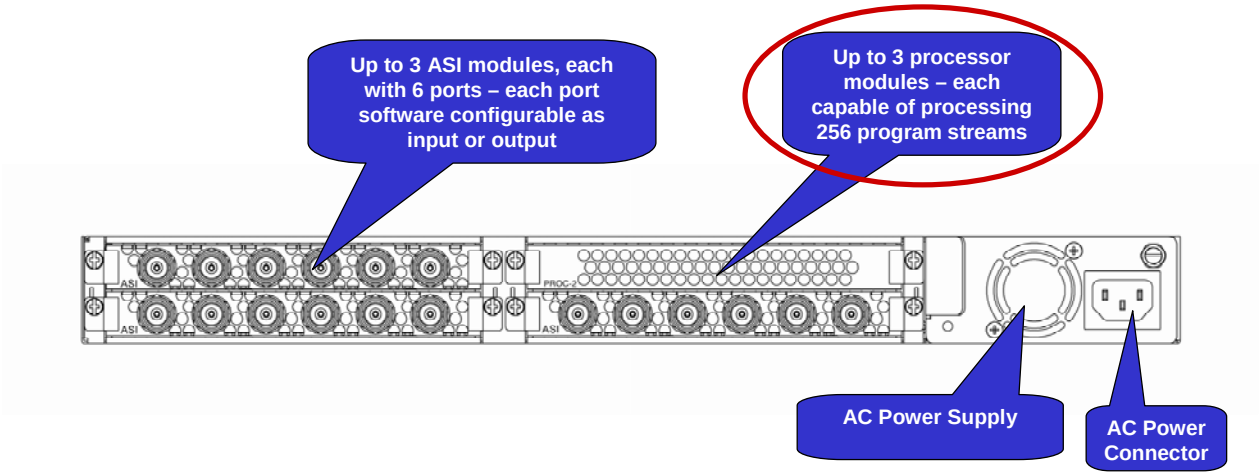
# of Modules	Max BW per TS (Mbps)	Max BW per chassis (Mbps)	MPTS Program density (2.5Mbps avg. bandwidth)	Max 40Mbps MUX Licenses
1 PROC-2	160	640	256	16
2 PROC-2	160	1280	512	32
3 PROC-2	160	1920	768	48

From an external view, with the exception of PROC modules installed for BNPxr and PROC-2 modules installed for BNP2xr enabling different performance capacities, the two product models are similar in design and configuration as illustrated below.

BNPxr Rear View



BNP2xr Rear View



BNP2xr DC power supply model available but not shown.

BNP Product Configurations

BNP is typically purchased and shipped as a **product bundle** that includes modular hardware components, operating system, application software, and associated product licenses. Details of both are described in the following sections. A standard BNP product configuration will consist of a RGB 1RU Chassis with BNP Processor Module(s) (PROC or PROC-2), Gigabit Ethernet Processor (GBP), and Power Supply (AC or DC). ASI Modules are available as an optional hardware upgrade. Product licenses are included in the product bundles and used to enable BNP software shipped on flash memory cards with the hardware units or available for purchase later as license upgrades.

BNP v2.0 Modular Hardware

The BNP models consists of 3 base chassis components and 2 modular chassis components.

Base Chassis Components

- RGB 1RU Chassis
    - Chassis housing contains the backplane and cooling fan.
    - Supports the installation of a total of four (4).chassis expansion modules (the total number of Processor (PROC / PROC-2) and ASI Modules in combination).
- Gigabit Processor Modules - BNPxr / GBP-1 and BNP2xr / GBP-2
    - Network interface module, includes 8xGigE, 10/100 Ethernet Management port, RS-232 Console Port, host processor, and flash module.
- Power Supply
    - One power supply per BNP; can be either AC or DC power.

Modular Chassis Components

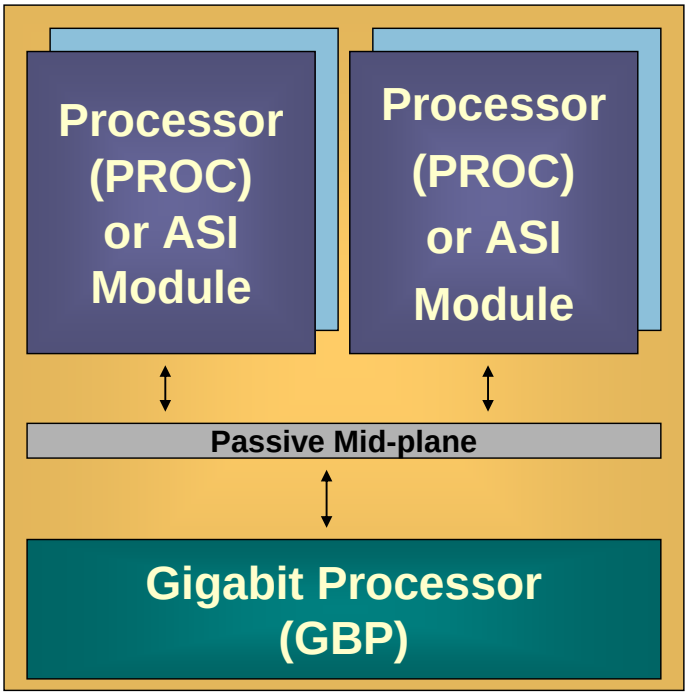
- Processor Modules - BNPxr / PROC and BNP2xr / PROC-2
    - Module required for the various video application processing supported by BNP.
    - A minimum of one (1) Processor (PROC) Module must be installed.
    - BNP v2.0 supports up to three (3) Processor Modules per chassis.
- ASI Modules - ASI and ASI-2 (are interchangeable and used in either BNPxr or BNP2xr)
    - Provides six (6) ASI-DVB interface ports per module.
    - BNP supports up to three (3) ASI Modules per chassis, for a maximum of 18 ASI ports per chassis. (3 ASI Modules x 6 ASI ports each = 18 ASI ports.)
    - There is no minimum for ASI Modules installed as ASI support is optional.
    - No functional difference between the original ASI and newer ASI-2 modules.

The following table presents a summary of possible combinations of Processor and ASI Modules in a BNPxr or BNP2xr chassis.

# of PROC Modules	# of ASI Modules	# of ASI Ports
1	0	0
1	1	6
1	2	12
1	3 (max)	18
2	0	0
2	1	6
2	2	12
3 (max)	0	0
3	1	6

Combinations of PROC or PROC2, and ASI Modules in BNP (possible configurations represented across each row)

A diagram of the BNPxr and BNP2xr, with the major components, is shown below. Four (4) configurable modules are depicted in this illustration, with the top two modules labeled.



Front of Chassis

BNP v2.0 License Options

BNP product licensing is based on the support of Multiple Program Transport Streams (MPTS) and Single Program Transport Streams (SPTS) used in MPEG program processing. Licenses are offered in units related to outbound bandwidth associated with transport stream (TS) encoding commonly deployed in the industry. Multiple licenses allow incremental TS bandwidth up to the total of all licenses applied. Licensing is based on output bandwidth, and not the number of MPTS or SPTS configured on a BNP unit.

Multiplex / MUX Licenses - support both MPTS and SPTS services

The BNP Multiplex (MUX) licenses offers support for applications requiring MPTS or SPTS services. MUX licenses are offered in 40Mbps and 56Mbps units to accommodate MUX TS bandwidth associated with operator QAM deployments. Note that while the BNP MUX licenses are typically associated with MPTSs, they also support the configuration of SPTSs. The total aggregate bandwidth of all SD and HD programs processed by a BNP unit will determine the number of 40Mbps or 56Mbps MUX license units that will be required on that unit.

- **Standard 40Mbps MUX License (BNP and BNP2 part numbers)**
  - associated with QAM 64 / Annex A QAM 128 / Annex B QAM 256 bandwidth.
  - support for grooming, statistical multiplexing, transrating and DPI applications.
- **Alternative 40Mbps MUX License (BNP-A and BNP2-A part numbers)**
  - associated with QAM 64 / Annex A QAM 128 / Annex B QAM 256 bandwidth.
  - support for grooming, statistical multiplexing, and transrating applications.
  - DPI applications supported as an optional upgrade license.
- **56Mbps MUX License (BNP2 part numbers)**
  - new bandwidth license to be supported in a future release; sold today for competitive reasons with order fulfillment using the standard 40Mbps MUX license.
  - associated with Annex A QAM 256 bandwidth, typically found in the EMEA region.
  - support for grooming, statistical multiplexing, transrating and DPI applications.

SPTS Licenses - support for SPTS services only

The BNP SPTS licenses offers support for applications requiring single program TS services, such as CBR SPTS programming in SDV and VOD solutions. SPTS licenses are offered in 40Mbps and 4Mbps units to accommodate typical STPS bandwidth associated with 3.75Mbps CBR deployments. The total aggregate bandwidth of all SD and HD programs processed by a BNP unit will determine the number of 40Mbps and 4Mbps SPTS licenses required on that unit.

- **40Mbps SPTS License**
- **4Mbps SPTS License**

Please note that in the current product release that the SPTS license is offered as an orderable product with accompanying pricing, but order fulfillment with be with the standard MUX license.

Comparison of BNPxr Capacity Guidelines for 40Mbps and 4Mbps SPTS Licenses

# of Modules	Max BW per TS (Mbps)	Max BW per chassis (Mbps)	SPTS Program density (4Mbps avg. bandwidth)	Max 40Mbps SPTS Licenses	Max 4Mbps SPTS Licenses
1 PROC-2	120	480	120	12	120
2 PROC-2	120	960	240	24	240
3 PROC-2	120	1440	360	36	360

Comparison of BNP2xr Capacity Guidelines for 40Mbps and 4Mbps SPTS Licenses

# of Modules	Max BW per TS (Mbps)	Max BW per chassis (Mbps)	SPTS Program density (4Mbps avg. bandwidth)	Max 40Mbps SPTS Licenses	Max 4Mbps SPTS Licenses
1 PROC-2	160	640	160	16	160
2 PROC-2	160	1280	320	32	320
3 PROC-2	160	1920	480	48	480

Note that STPS 40Mbps and 4Mbps licenses can be used concurrently on the same BNP unit to achieve a specific bandwidth licensing requirement. In this case, the maximum bandwidth per

number of processor modules installed in either BNPxr or BNP2xr should not be exceeded by the combined licensed bandwidth total of the activated 40Mbps and 4Mbps SPTS licenses.

BNP Product Bundles and Licenses

The BNPxr and BNP2xr MUX and SPTS licenses are offered in 1, 2 and 3 Processor Module product bundles that provide hardware, software and licenses for immediate installation and deployment. Key sales order policies and guidelines include the following.

- A minimum number of Licenses are included each BNP product bundle that must be ordered for that unit's initial installation.
- The minimum number of Licenses sold in a BNP product bundle may vary by Sales region. The policy of which BNP product bundle to offer is set by the respective, regional VP of Sales.
- License upgrades can be ordered with the product bundle or at a later time to increase the bandwidth licensed for deployment on any given unit.
- Customers can begin with any product bundle and add either MPTS or SPTS license upgrades.

BNPxr MUX License Product Bundles – Single (1x) PROC Module

BNP-2-AC and **BNP-2-DC**

BNP-A-2-AC and **BNP-A-2-DC**

- 2x 40Mbps MUX Licenses (80Mbps)
- Chassis, GBP, 1 PROC module, Power Supply, Hardware for up to 480Mbps output.

BNP-4-AC and **BNP-4-DC**

BNP-A-4-AC and **BNP-A-4-DC**

- 4x 40Mbps MUX Licenses (160Mbps)
- Chassis, GBP, 1 PROC module, Power Supply, Hardware for up to 480Mbps output.

BNPxr Single (1) PROC Module Upgrade Options

40Mbps MUX Licenses - BNPxr with 1 PROC module supports up to 12x 40Mbps MUX Licenses. Order additional 40Mbps MUX License Upgrades as required (**Part # - BNP-LIC-1**).

PROC Module Upgrade – A BNPxr initially purchased with 1 PROC Module can be upgraded by adding an additional PROC Module to support additional bandwidth output.
Step 1: Order additional PROC Module with licenses bundled. (**Part # - PROC-LIC-2**).
Step 2: Order License Upgrades as required for the second PROC module.

BNPxr MUX License Product Bundles – Dual (2x) PROC Modules

BNP-13-AC and **BNP-13-DC**

BNP-A-13-AC and **BNP-A-13-DC**

- 13 MPTS 40Mbps MUX Licenses (520Mbps) – 12 licenses for first PROC, 1 License for second PROC.
- Chassis, GBP, 2 PROC modules, Power Supply, Hardware for up to 960Mbps combined output.

BNPxr - Dual (2) PROC Module Upgrade Options

40Mbps MUX Licenses - BNPxr with 2 PROC module supports up to 24x 40Mbps MUX Licenses. Order additional 40Mbps MUX License Upgrades as required. (**Part # - BNP-LIC-1**).

PROC Module Upgrade – A BNPxr initially purchased with 2 PROC Module can be upgraded by adding an additional PROC Module to support additional bandwidth output.
Step 1: Order additional PROC Module with licenses bundled. (**Part # - PROC-LIC-2**).
Step 2: Order License Upgrades as required for the second PROC module.

BNPxr MUX License Product Bundles – 3x PROC Modules

BNP-25-AC and **BNP-25-DC**

BNP-A-25-AC and **BNP-A-25-DC**

- 25 MPTS 40Mbps MUX Licenses (520Mbps) – 12 licenses for first PROC, 12 licenses for second PROC and 1 license for the third PROC module..
- Chassis, GBP, 3 PROC modules, Power Supply, Hardware for up to 1440Mbps combined output.

BNPxr - 3x PROC Module Upgrade Options

40Mbps MUX Licenses - BNPxr with 3 PROC module supports up to 36x 40Mbps MUX Licenses. Order additional 40Mbps MUX License Upgrades as required. (**Part # - BNP-LIC-1**).

BNP2xr MUX License Product Bundles – Single (1x) PROC Module

BNP2-2-AC and **BNP2-2-DC**

BNP2-A-2-AC and **BNP2-A-2-DC**

- 2x 40Mbps MUX Licenses (80Mbps)
- Chassis, GBP, 1 PROC module, Power Supply, Hardware for up to 640Mbps output.

BNP2-4-AC and **BNP2-4-DC**

BNP2-A-4-AC and **BNP2-A-4-DC**

- 4x 40Mbps MUX Licenses (160Mbps)
- Chassis, GBP, 1 PROC module, Power Supply, Hardware for up to 640Mbps output.

BNP2-2-56-AC and **BNP2-2-56-DC** *(new bandwidth license supported in a future release)*

- 2x 56Mbps MUX Licenses (112Mbps)
- Chassis, GBP-2, 1x PROC-2 module, Power Supply, Hardware for up to 640Mbps output.

BNP2xr Single (1) PROC Module Upgrade Options

40Mbps MUX Licenses - BNP2xr with 1 PROC-2 module supports up to 16x 40Mbps MUX Licenses. Order additional 40Mbps MUX License Upgrades as required (**Part # - BNP2-LIC-1**).

PROC-2 Module Upgrade – A BNP2xr initially purchased with 1 PROC-2 Module can be upgraded by adding an additional PROC Module to support additional bandwidth output.
Step 1: Order additional PROC-2 Module with licenses bundled. (**Part # - PROC2-LIC-2**).
Step 2: Order License Upgrades as required for the second PROC-2 module.

BNP2xr MUX License Product Bundles – Dual (2x) PROC Modules

BNP2-17-AC and **BNP2-17-DC**

BNP-A-17-AC and **BNP-A-17-DC**

- 17 MPTS 40Mbps MUX Licenses (680Mbps) – 16 licenses for first PROC-2, 1 License for second PROC-2.
- Chassis, GBP-2, 2x PROC-2 modules, Power Supply, Hardware for up to 1280Mbps combined output.

BNP2xr - Dual (2) PROC Module Upgrade Options

40Mbps MUX Licenses - BNP2xr with 2 PROC-2 module supports up to 32x 40Mbps MUX Licenses. Order additional 40Mbps MUX License Upgrades as required. (**Part # - BNP2-LIC-1**).

PROC-2 Module Upgrade – A BNP2xr initially purchased with 2 PROC-2 Module can be upgraded by adding an additional PROC Module to support additional bandwidth output.

Step 1: Order additional PROC-2 Module with licenses bundled. (**Part # - PROC2-LIC-2**).

Step 2: Order License Upgrades as required for the second PROC-2 module.

BNP2xr MUX License Product Bundles – 3x PROC Modules

BNP2-33-AC and **BNP2-33-DC**

BNP2-A-33-AC and **BNP2-A-33-DC**

- 33 MPTS 40Mbps MUX Licenses (1320Mbps) – 16 licenses for first PROC-2, 16 licenses for second PROC-2 and 1 license for third PROC-2 module.
- Chassis, GBP-2, 3 PROC-2 modules, Power Supply, Hardware for up to 1920Mbps combined output.

BNP2xr - 3x PROC Module Upgrade Options

40Mbps MUX Licenses - BNP2xr with 3 PROC-2 module supports up to 48x 40Mbps MUX Licenses. Order additional 40Mbps MUX License Upgrades as required. (**Part # - BNP2-LIC-1**).

BNP v2.0 SPTS License Options

The BNP v2.0 SPTS (Single Program Transport Stream) license offers support for SPTS applications such as Switched Digital Video (SDV). SPTS licenses will be offered in 40Mbps and 4Mbps bandwidth units to accommodate the typical constant bit rate (CBR) encoding of SPTS MPEG-2 SD programs at 3.75Mbps. The total aggregate outbound bandwidth of SPTS SD and HD programs processed by a BNP unit will determine the number of SPTS bandwidth-based license units that will be required.

Similar to the BNP MUX licensing, BNP SPTS licensing is offered in single (1) Processor Module and dual (2) Processor Module product bundles, along with SPTS license upgrades. **The minimum orderable number of licenses for product bundles will be 4x 40Mbps SPTS licenses, for a total of 160Mbps SPTS bandwidth supported with the single PROC module (BNP-4-SPTS-AC and BNP-4-SPTS-DC product bundles). This same policy exists for the BNP2xr SPTS product bundles.**

Please note that the BNP can simultaneously support both MUX and SPTS licensing on the same Processor Module. Customers can begin with any product bundle and add either MUX or SPTS license upgrades, or other license options (such as for EAS support) as needed.

BNPxr SPTS License Product Bundles

BNP-4-SPTS-AC and **BNP-4-SPTS-DC**

- 4x 40Mbps SPTS Licenses (160Mbps)
- Chassis, GBP, 1 PROC, Power Supply, Hardware for up to 480Mbps output.
- BNPxr with 1 PROC module and 4x 40Mbps STPS licenses supports up to 160Mbps SPTS bandwidth.
- Order additional 40Mbps and 4Mbps SPTS Licenses Upgrades for extending the SPTS bandwidth for a 1 PROC module product configuration.
- Order a second PROC module and additional SPTS License Upgrades as required.

BNP-13-SPTS-AC and **BNP-13-SPTS-DC**

- 13x 40Mbps SPTS Licenses (520Mbps)
- Chassis, GPB, 2 PROC, Power Supply, Hardware for up to 960Mbps combined output.
- BNPxr with 2 PROC modules and 13x 40Mbps SPTS licenses supports up to 960Mbps SPTS bandwidth.
- Order additional 40Mbps and 4Mbps SPTS Licenses Upgrades for extending the SPTS bandwidth.

BNP-25-SPTS-AC and **BNP-25-SPTS-DC**

- 25x 40Mbps SPTS Licenses (1000Mbps)
- Chassis, GPB, 3 PROC, Power Supply, Hardware for up to 1340Mbps combined output.
- BNPxr with 3 PROC modules and 25x 40Mbps SPTS licenses supports up to 1000Mbps SPTS bandwidth.
- Order additional 40Mbps and 4Mbps SPTS Licenses Upgrades for extending the SPTS bandwidth.

BNPxr SPTS License Upgrade Options

For the convenience of customers, STPS license upgrades are offered in both 40Mbps and 4Mbps SPTS bandwidth increment options. Since many SPTS MPEG-2 SD programs are encoded at 3.75Mbps, the 4Mbps license option provides finer granularity of bandwidth licensing. The 40Mbps SPTS license simply allows purchasing in larger bandwidth increments.

BNP-LIC-1-SPTS-40

BNPxr SPTS License supporting 40Mbps bandwidth. Order one or multiple licenses depending on SPTS bandwidth required.

BNP-LIC-1-SPTS-4

BNPxr SPTS License supporting 4Mbps bandwidth. Order one or multiple licenses depending on SPTS bandwidth required.

BNP2xr SPTS License Product Bundles

BNP2-4-SPTS-AC and **BNP2-4-SPTS-DC**

- 4x 40Mbps SPTS Licenses (160Mbps)
- Chassis, GBP-2, 1 PROC-2, Power Supply, Hardware for up to 640Mbps output.
- BNP2xr with 1 PROC module and 4x 40Mbps SPTS licenses supports up to 160Mbps SPTS bandwidth.
- Order additional 40Mbps and 4Mbps SPTS Licenses Upgrades for extending the SPTS bandwidth for a 1 PROC module product configuration.
- Order a second PROC module and additional SPTS License Upgrades as required.

BNP2-17-SPTS-AC and **BNP2-17-SPTS-DC**

- 17x 40Mbps SPTS Licenses (680Mbps)
- Chassis, GPB-2, 2 PROC-2, Power Supply, Hardware for up to 1340Mbps combined output.
- BNP2xr with 2 PROC-2 modules and 17x 40Mbps SPTS licenses supports up to 1340Mbps SPTS bandwidth.
- Order additional 40Mbps and 4Mbps SPTS Licenses Upgrades for extending the SPTS bandwidth.

BNP2-33-SPTS-AC and **BNP2-33-SPTS-DC**

- 33x 40Mbps SPTS Licenses (1320Mbps)
- Chassis, GPB-2, 3 PROC-2, Power Supply, Hardware for up to 1920Mbps combined output.
- BNP with 3 PROC-2 modules and 33x 40Mbps licenses supports up to 1920Mbps SPTS bandwidth.
- Order additional 40Mbps and 4Mbps SPTS Licenses Upgrades for extending the SPTS bandwidth.

BNP2xr SPTS License Upgrade Options

For the convenience of customers, STPS license upgrades are offered in both 40Mbps and 4Mbps SPTS bandwidth increment options. Since many SPTS MPEG-2 SD programs are encoded at 3.75Mbps, the 4Mbps license option provides finer granularity of bandwidth licensing. The 40Mbps SPTS license simply allows purchasing in larger bandwidth increments. (BNP2xr and BNPxr have separate SPTS license PNs in order to facilitate specific pricing as needed.)

BNP2-LIC-1-SPTS-40

BNP2xr SPTS License supporting 40Mbps bandwidth. Order one or multiple licenses depending on SPTS bandwidth required.

BNP2-LIC-1-SPTS-4

BNP2xr SPTS License supporting 4Mbps bandwidth. Order one or multiple licenses depending on SPTS bandwidth required.

Guidelines for Upgrading BNPxr to BNP 2.0 Releases

The key differentiation between the BNPxr using BNP v1.0 releases and BNP v2.0 releases is the video processing performance per processor module and the number of PROC modules supported in a BNPxr configuration. These are directly based on the maximum bandwidth supported for each video processing engine, which is also reflected as the maximum bandwidth per transport stream (TS). There are 4 video processing engines on each PROC module.

- BNP 1.0 releases supports up to 2 processor modules, with BNPxr supporting up to 640Mbps bandwidth output per PROC module. This is based on 160Mbps maximum bandwidth per video processing engine (and per TS.)
- BNP 2.0 releases supports up to 3 processor modules, with BNPxr supporting up to 480Mbps bandwidth output per PROC module. This is based on 120Mbps maximum bandwidth per video processing engine (and per TS.)

The following tables summarize the bandwidth and license capacity differences for BNPxr between the BNP v1.0 and v2.0 code releases.

BNPxr Capacity Guidelines per PROC Module Configuration for BNP 1.0 Releases

# of Modules	Max BW per TS (Mbps)	Max BW per chassis (Mbps)	MPTS Program density (2.5Mbps avg. bandwidth)	Max 40Mbps MUX Licenses supporting both MPTS & SPTS configuration	Max 4Mbps SPTS streams (typically for CBR programs)
1 PROC	160	640	256	16	160
2 PROC	160	1280	512	32	320

BNPxr Capacity Guidelines per PROC Module Configuration for BNP 2.0 Releases

# of Modules	Max BW per TS (Mbps)	Max BW per chassis (Mbps)	MPTS Program density (2.5Mbps avg. bandwidth)	Max 40Mbps MUX Licenses supporting both MPTS & SPTS configuration	Max 4Mbps SPTS streams (typically for CBR programs)
1 PROC	120	480	192	12	120
2 PROC	120	960	384	24	240
3 PROC	120	1440	576	36	360

These changes in performance capacity in migrating BNPxr v1.0 customers to v2.0 releases means that the following guidelines should be used.

Current # of MUX Licenses Installed in BNPxr with v1.0	Number of PROC Modules needed for BNPxr with v2.0	Upgrade Required
2 - 12	1	None
13 - 16	2	Add a PROC
17 - 24	2	None
25 - 32	3	Add a PROC

Approved upgrades requiring additional PROC modules will be facilitated through Customer Support as a RMA process.