

Documentation Writing Sample Cover Sheet

TITLE	Harmonic NMX 9.0 Release Notes
AUTHOR	Tom Witherspoon
DATE OF PUBLICATION	April 27, 2021
PERCENTAGE OF CONTENT AUTHORED	85%
IS THIS ORIGINAL WORK, OR BASED ON EXISTING MATERIAL?	Most of the material for these release notes is derived from our bug tracking system, JIRA. The project managers are responsible for determine the what content goes into the release notes. I am responsible for making sure the content is clear and concise.
WHERE DID YOU ACQUIRE THE INFORMATION FOR THIS DOCUMENT?	From project managers and engineers. Sometimes marketing offers input on wording.
WAS THE DOCUMENT EDITED BY OTHERS?	No
HOW DID YOU OBTAIN CODE SAMPLES FOR THIS DOCUMENT?	N/A
WAS A COMPANY STYLE GUIDE USED IN CREATING THIS DOCUMENT?	Yes
ADDITIONAL CONTEXT FOR THIS DOCUMENT:	This is probably the most important document I produce for every release. The operation of the product does not change that much from release to release, but issues that have been resolved and others newly discovered are included and edited for brevity.
WAS THIS DOCUMENT PART OF A LARGER SET OF DOCUMENTATION?	Yes

Harmonic NMX Release Notes

Release: 9.0.0

Date: 27 April 2021

Notice:

Copyright 2021 Harmonic Inc. All rights reserved. Harmonic, the Harmonic logo, [all other Harmonic products mentioned] are trademarks, registered trademarks or service marks of Harmonic Inc. in the United States and other countries. All other trademarks are the property of their respective owners. All product and application features and specifications are subject to change at Harmonic's sole discretion at any time and without notice.

Disclaimer:

Harmonic reserves the right to alter the product specifications and descriptions in this publication without prior notice. No part of this publication shall be deemed to be part of any contract or warranty unless specifically incorporated by reference into such contract or warranty. The information contained herein is merely descriptive in nature, and does not constitute a binding offer for sale of the product described herein. Harmonic assumes no responsibility or liability arising from the use of the products described herein, except as expressly agreed to in writing by Harmonic. The use and purchase of this product does not convey a license under any patent rights, copyrights, trademark rights, or any intellectual property rights of Harmonic. Nothing hereunder constitutes a representation or warranty that using any product in the manner described herein will not infringe any patents of third parties.

Third-Party Product Trademarks:

Adobe® After Effects®, Photoshop®, Flash® Professional, Premiere® Avid® Media Composer® Jünger Audio™ Apple® QuickTime® Microsoft® Mediaroom® Microsoft® PlayReady® DOCSIS® 3.0 Start Over® TV Dolby is a registered trademark of Dolby Laboratories. Dolby Digital, Dolby Digital Plus, Dolby Plus, aacPlus, AC-3, and Dolby® E are trademarks of Dolby Laboratories. Level Magic and Jünger are trademarks of Jünger Audio Studioteknik GmbH. MPEG Audio technology licensed from Fraunhofer IIS <http://www.iis.fraunhofer.de/amm/> PitchBlue® is a registered trademark of Vigor Systems. QuickTime and the QuickTime logo are trademarks or registered trademarks of Apple Computer, Inc., used under license therefrom.

Third-Party Copyright Notes:

Harmonic software uses version 3.15.4 of the FreeImage open source image library under FreeImage Public License (FIPL). See <http://freeimage.sourceforge.net> for details. The product may include implementations of AAC and HE-AAC by Fraunhofer IIS; and MPEG Audio technology licensed from Fraunhofer IIS. The software described in this publication may use version 2.8 of FFmpeg open source package under Lesser General Public License (LGPL).

Table of Contents

1	What's New in this NMX System Release.....	6
1.1	What are the New Features for the NMX 9.0 system release	6
1.2	What issues have been resolved for the NMX 9.0 system release	7
1.3	What issues are known for the NMX 9.0 system release.....	7
2	NMX Release Details.....	8
2.1	NMX Introduction	8
2.2	NMX Package Contents	9
2.3	Information About Non-Embedded Software	9
2.4	NMX Documentation	9
3	New Features	12
3.1	NMX New Features	12
3.1.1	Highlighted Features	12
3.2	Electra X New Features	17
3.2.1	Platform Information	17
3.2.2	Highlighted Features	18
3.3	XOS Appliance New Features	20
3.3.1	XOS Appliance Components.....	20
3.3.2	XOS Platforms New Features	22
3.3.3	XOS Receiving and Descrambling New Features	27
3.3.4	XOS Transcoding New Features.....	28
3.3.5	XOS Multiplexing and Scrambling New Features.....	30
3.3.6	XOS Packaging New Features.....	31
3.4	ProStream X New Features.....	32
3.4.1	Highlighted Features	34
3.4.2	Compatibility Information for CableOS.....	35
3.5	Electra X2S New Features	36
3.5.1	Highlighted Features	36
3.6	Ellipse 3000 New Features.....	37
3.6.1	Highlighted Features	37
3.7	ProStream 9100 New Features	38
3.7.1	Highlighted Features	38
3.8	ProView 7100 New Features.....	39

3.8.1	Highlighted Features	39
3.9	ProView 8100 New Features.....	40
3.9.1	Highlighted Features	40
4	Resolved Issues	41
4.1	NMX Resolved Issues.....	41
4.2	Electra X Resolved Issues	43
4.3	XOS Appliance Resolved Issues.....	44
4.3.1	XOS Platforms Resolved Issues	44
4.3.2	XOS Receiving and Descrambling Resolved Issues.....	44
4.3.3	XOS Transcoding Resolved Issues	45
4.3.4	XOS Multiplexing and Scrambling Resolved Issues	45
4.3.5	XOS Packaging Resolved Issues	46
4.4	ProStream X Resolved Issues	47
4.5	Ellipse 3000 Resolved Issues	48
4.6	ProStream 9100 Resolved Issues.....	49
4.7	ProView 7100 Resolved Issues	51
4.8	ProView 8100 Resolved Issues	54
5	Known Issues.....	56
5.1	NMX Known Issues	56
5.2	Electra X Known Issues.....	57
5.3	XOS Appliance Known Issues	58
5.3.1	XOS Platforms Known Issues	58
5.3.2	XOS Receiving and Descrambling Known Issues	59
5.3.3	XOS Transcoding Known Issues	60
5.3.4	XOS Multiplexing and Scrambling Known Issues.....	63
5.3.5	XOS Packaging Known Issues	63
5.4	ProStream X Known Issues.....	64
5.5	Ellipse 3000 Known Issues	67
5.6	ProStream 9100 Known Issues	68
5.6.1	Device Limitations for this Release.....	69
5.7	ProView 7100 Known Issues.....	71
5.8	ProView 8100 Known Issues.....	73
6	Resolved Security Issues	75
6.1	NMX Resolved Security Issues.....	75
6.1.1	Security Changes to the NMX Recovery Image	75

6.2	Electra X/X2/XVM Resolved Security Issues	78
6.3	XOS Appliance Resolved Security Issues.....	78
6.4	ProStream X Resolved Security Issues	78
7	H/W and F/W Compatibility	79
7.1	Supported Devices.....	79
7.1.1	Supported Harmonic Devices	79
7.1.2	Supported Third-Party Devices	82
7.2	Unsupported Devices.....	89
7.2.1	Unsupported Harmonic Devices.....	89
7.2.2	Unsupported Third-Party Devices	90
7.3	NMX Recovery Image Versions and Compatibility.....	91
7.3.1	Notes on Updating the NMX Recovery Image.....	91
7.3.2	NMX Recovery Images.....	91
8	Hardware Platforms	98
8.1	Supported Hardware Platforms.....	98
8.2	Unsupported Hardware Platforms.....	100
9	NMX Sizing and Scalability	102
9.1	Recommendations.....	102
9.1.1	Maximum Recommended Figures.....	102
9.1.2	Sizing Related to ProStream X Management.....	103
10	NMX Licenses	104
10.1	NMX Licenses	104
10.1.1	License for Device Management.....	106
10.1.2	Legacy Licenses for Device Management.....	107
10.2	Electra X Firmware Licenses	108
10.2.1	Simplified Licenses	118
10.3	Electra XOS Firmware Licenses	129
10.4	ProStream X/XVM Licenses.....	132
10.4.1	ProStream X Licenses.....	132
10.4.2	ProStream XVM Licenses	135
10.4.3	Simplified Licenses	138

1 What's New in this NMX System Release

These release notes contain only information specific to new features and open/resolved issues for this NMX system release.

NMX Release	Electra X/X2/XVM Release	XOS Appliance Release	ProStream X Release
9.0.0.0.22	1.17.0.0.40	1.15.0.0.023 (ISO,BIN) 1.15.0.0.10 (RPM) 1.15.0.0.74 (vos_bundle)	2.9.9.0.539

WARNING

As of the release of NMX 9.0.0, **Electra 9200** is no longer supported by Harmonic. Also, the **SAPI** interface has been removed from NMX, as well as **EIS-Muxconfig** and **Simcomp-Muxconfig** legacy services.

1.1 What are the New Features for the NMX 9.0 system release

All the new features documented in these sections of this document are included in NMX 9.0:

- [NMX New Features](#)
- [Electra X/X2/XVM New Features](#)
- [ProStream X New Features](#)
- [XOS Appliance New Features](#)

WARNING

The new Electra X G3 chassis with Cascade Lake CPUs supports up to 3 SDI cards, or up to 24 SDI inputs. Customers who intend to deploy dense SDI encoding configurations must determine the maximum number of services that can be supported for their configuration through the Sales Benchmarking System. This is to prevent the configuration from overloading the CPU.

Currently, the server could overload in demanding configurations with no explicit alarm. Some symptoms of overload include corrupted transport output and unresponsive server.

1.2 What issues have been resolved for the NMX 9.0 system release

All the issues documented in these sections of this document have been resolved for NMX 9.0:

- [NMX Resolved Issues](#)
- [Electra X/X2/X2S Resolved Issues](#)
- [ProStream X Resolved Issues](#)
- [XOS Appliance Resolved Issues](#)
- [Resolved Security Issues](#)
 - A new section, [Security Changes to the NMX Recovery Image](#), has been added.

1.3 What issues are known for the NMX 9.0 system release

All the issues documented in these sections of this document have been resolved for NMX 9.0:

- [NMX Known Issues](#)
- [Electra X/X2/X2S Known Issues](#)
- [ProStream X Known Issues](#)
- [XOS Appliance Known Issues](#)

2 NMX Release Details

2.1 NMX Introduction

NMX is a suite of software applications that provide configuration, control, monitoring, and fault management in Harmonic open digital compression systems. NMX supports geographically diverse broadcast sites through client/server architecture and is highly scalable, able to support small networks with only a few devices, as well as larger networks with a greater number of managed devices.

A complete description of the NMX architectural components and functionality can be found in the various documents provided with your purchase of NMX. These documents are installed to C:\Program Files\Harmonic\Documents during NMX installation.

Important!

The following product has reached the End of Service (EOS) date and is no longer supported with the upgrade to NMX 9.0.0 and later releases:

- **Electra 9200**

Important!

The following products have reached the End of Service (EOS) date and are no longer supported with the upgrade to NMX 8.5.0 and later releases:

- **Electra 8100/8200/8300**
- **ProMedia X Origin**
- **Iris**

Remove or replace these devices from the original catalogs and maps **before** upgrading to the current NMX release.

NOTES:

- The Iris feature needs to be disabled prior to the upgrade to avoid any potential service disruption.
- GRID is not packaged with NMX. To obtain the latest version, please contact Harmonic Customer Support.
- **Warning on upgrading NMX to 8.5 or later for XOS products:** The output services may be interrupted for 20 seconds each time the new version of NMX server is started until the XOS is upgraded to the version included with the NMX upgrade.

2.2 NMX Package Contents

This NMX release contains the following software items:

- NMX application
- Adobe Reader (a third-party application)

Note:

Beginning with NMX 8.2.0, software for other devices has been removed from the NMX package. Contact Harmonic Support for information about downloading other device software.

Note:

Third-party software included in the NMX server package provided by Harmonic, or as part of the recovery image and described in this section, may include technical problems, and/or be out-of-date. Harmonic makes no commitment to provide up-to-date software, support, or to assume responsibility for issues with third-party software or documentation. Installing and/or running any other third-party software not listed above may impact NMX functionality or disrupt service and should be avoided.

2.3 Information About Non-Embedded Software

Important!

Contact your Harmonic representative if you are interested in Harmonic's non-embedded device software (e.g., Electra X, Electra X2S, ProStream XVM. etc.). Non-embedded software must be downloaded and installed separately from NMX.

Important! If you have an existing Electra X2S installation and want to upgrade to this NMX version, please contact Harmonic Technical Support.

2.4 NMX Documentation

NMX documentation is installed to your NMX Server PC with your NMX release.

Document	Where to find it
Release notes for the current NMX release	C:\Program Files\Harmonic\Release_Notes
Release notes for past NMX releases	C:\Program Files\Harmonic\Documents\Archive_Release_Notes
NMX context-sensitive help	From the NMX GUI, click the Help button (device properties) or the Help icon (service properties) on GUI pages
REST API Document	C:\Program Files\Harmonic\Documents\NMX\REST_API
NMX Installation Guide NMX User Guide	C:\Program Files\Harmonic\Documents\NMX\Product_Guides
NMX AFA SNMP Interface Development Guide	C:\Program Files\Harmonic\Documents\NMX\AFA_SNMP_Agent
NMX supported devices guides: • Electra X2 Component Replacement Guide • Electra X2 Installation Guide • Electra X2S Getting Started Guide • Electra X2S Getting Started Guide for HPE ProLiant DL360 Gen10 • Electra XVM Installation Guide • Electra X Template User Guide • Ellipse 3000 Encoder Hardware Guide • Ellipse 3000 Encoder Quick Start Guide • Ellipse 3000 Encoder User Guide • ProStream 9000 Hardware Guide • ProStream 9000 Software Guide • ProStream 9000 to ProStream X Conversion Guide • ProStream XVM Installation Guide • ProStream X Installation Guide • ProStream X/XVM User Guide • ProView 8000 Installation Guide • ProView 8000 User Guide • ProView 7000 Hardware Installation Guide • ProView 7000 User Guide	C:\Program Files\Harmonic\Documents\Device_Guides

Document	Where to find it
NMX Technical Notes • Configuring ACE Services in Service Plan Editor • Configuring BMW Services on Electra_X • Configuring Electra VBR-CBR Services • Configuring Electra X / ProStream X Docker • Configuring NMX Server Redundancy • Configuring Platinum VX Switch • Configuring ProStream Audio Leveling • Configuring ProStream CAS Services • Configuring Slate Insertion for ProStream Output • DVB T2-MI Gateway Configuration Guide • Electra Series Port Socket Service _Redundancy • Getting Started with W&T 57730 • Installing and Configuring XXCentOS for use with Electra X and ProStream X Dockers • Installing HIM and Deploying Electra X and ProStream X Docker • Integrating Cisco Switch with NMX • Managing Electra X CA Certificates • ProStream 1000/9000 Port/Socket/Service Redundancy • ProStream 9000 Splicing • Switch Configuration and Management • Using IPSec for RDP Connections	C:\Program Files\Harmonic\Documents\NMX\Technical_Notes

3 New Features

3.1 NMX New Features

The NMX software suite provides configuration, control, monitoring, and fault management for Harmonic open digital compression systems. NMX supports geographically diverse broadcast sites through client/server architecture and is highly scalable in its ability to support small networks with only a few devices, as well as larger networks with a greater number of managed devices.

NMX Release

9.0.0.0.22

3.1.1 Highlighted Features

The following features are highlighted in this release:

Roadmap Feature Category	Roadmap Feature Name	Release Note Information	Key
3rd Parties	MIT-Xpert iSIMS and iMUX v2021.1.0	NMX now supports the management of version 2021.1.0 of the MIT-Xpert iSIMS and iMUX servers.	NMXNG-6344
3rd Parties	Nevion TNS-544 2:1 switch management	NMX is now able to manage the Nevion TNS-544 2:1 smart switch, the same way the Harmonic ProSwitch is managed. A warning alarm is raised when switchover is manually performed from the TNS SAG. Another warning alarm is raised for all switches when the switch is set in "Manual override" mode from NMX.	NMXNG-5640

RESTAPI	SAPI support removal	SAPI, the legacy NMX northbound interface, has reached its End of Service (EOS) date and is no longer supported in NMX 9.0.0 and future releases. From 9.0.0 on, any integration to an external management system will only rely on the NMX RESTAPI or the SNMP interface. Note that old EIS-Muxconfig and Simcomp-Muxconfig services of NMX are also removed since they rely on SAPI.	NMXNG-5889
RESTAPI	Throttling limit extension	Some default API limits in rate throttling mechanism have been increased (max number of calls per minutes/hour/day). Please refer to the "NMX RESTAPI Getting Started Guide" for details. Note that recommendations provided in this document should still be followed to prevent throttling issues.	NMXNG-5887
Redundancy	Dual Streaming on XOS w/h statmux and seamless switch on ProStream X (Alpha)	In a broadcast architecture with statmux, it is now possible with ProStream X and XOS to use the dual GbE port mode on XOS outputs and ProStream X inputs, with dual streaming and 2022-7 seamless switch. This removes the need of a trunk between the 1+1 IP switches and ensures 100% seamless switch on any failure occurring on one GbE port or on one IP switch. (Alpha in NMX 9.0.0)	NMXNG-5017
Redundancy	Input TS redundancy usability for ProStream X (Alpha)	Usage of Enhanced TS input redundancy of ProStream X is now easier: the Active status is directly visible on the input transport in Inputs view, and a command has been added in the popup menu to switch the transport manually. Manual switching is now possible even when the redundancy mode is in automatic. (Alpha in NMX 9.0.0)	NMXNG-4730

Redundancy	Port redundancy with XOS SW only	Port redundancy modes, including Dual Mode, are now supported with XOS SW only deployments in addition to Appliance deployments. These modes are configurable from NMX GUI (excluding Port Teaming).	NMXNG-6076
Redundancy	Socket and service redundancy state out of Site Sync	The Site Synchronization feature is a powerful tool used to replicate the service plan from one site to another one managed by different NMX servers. It has been improved to exclude from the socket and service redundancy status (active and desired source properties) from this replication, which can be independent between the sites.	NMXNG-4808
Redundancy	XOS alternate source with dual port mode	NMX now supports the configuration of XOS source redundancy with the alternate source on 2nd port in Dual port mode. Dual mode on input GbE ports is useful to trigger encoder device redundancy when both ports fail. (Alpha in NMX 8.9.0, GA in 9.0.0)	NMXNG-6136
Security	Miscellaneous improvements and vulnerability fixes	The NMX server security has been improved in accordance to Harmonic security policy: - Up to date Windows Server 2019 patches have been applied in the NMX recovery image. - Windows security settings of the NMX recovery image have been reinforced to comply with additional items of CIS benchmarking (in particular SQL related items). Note that idle RDP connections will now disconnect in 15 minutes. - The "sa" user of SQL server has been disabled and replaced by a new user name; refer to the "NMX Install Guide". - Other vulnerabilities have been fixed; refer to the Resolved Security Issues section of these Release Notes. - NMX software has been tested with the latest Symantec and McAfee anti-virus software.	NMXNG-5888

Security	TFTP server disabled	The TFTP server protocol is only used by NMX for the ProStream 9000 software download. For security reasons, it is now disabled by default. It can be enabled when needed through a preference in NMX Global Options.	NMXNG-6143
System	Electra X / ProStream X / XOS follow-up	NMX supports all the new features introduced in: - Electra X v1.17 - ProStream X v2.9.9 (except the features indicated as "SAG only") - XOS Appliance v1.15.0 These new features are described in the chapter related to each of these products in the Release Notes.	NMXNG-5884
System	VMWare ESXi v7.0 support	The NMX VM has been verified with v7.0 of ESXi.	NMXNG-5610
System	XOS Small platform support (Alpha)	NMX now supports the XOS Small platform (HWR-XOS-CHS-MODEL-S). (Alpha in NMX 9.0.0)	NMXNG-5141
Usability	CAS Vendor in EMM stream name	The CAS Vendor Name property has been added to EMM stream properties, and is used in the EMM stream name for easier identification.	NMXNG-5946
Usability	Different Pandora server per ProStream X (Alpha)	You can declare a different Pandora encryption server per ProStream X, in the device properties panel, instead of a single one in NMX Global Options. (Alpha in NMX 9.0.0)	NMXNG-6372
Usability	Encapsulation Mode and Output Mode properties always loaded with M/W templates	When loading a M/W template, the Encapsulation Mode and Output Mode properties are now always loaded in the template. This supersedes the current preference indicated in "Exclude IP Properties for Mobile/Web Services".	NMXNG-5535

Usability	Highlight changes in Service Spreadsheet views	Any properties changed in spreadsheet views of the Service Plan are now highlighted, similar to the behavior of the Properties panel of the Service Plan configuration.	NMXNG-6209
Usability	Manual crosspoint changes in Audit Log	Any change of a Crosspoint in an SDI/ASI router or a 2:1 switch done from NMX is now subject to a record in the Audit Log (not only the ones recorded for automatic failover).	NMXNG-5230
Usability	Miscellaneous improvements in XOS OTT Profile configuration	For XOS OTT Profile configuration, it is now possible to rename a profile in the main Profile Properties panel, and to define the logo groups in the Logo spreadsheet view.	NMXNG-5956
Usability	NMX Stress Alert	NMX Server Resource Monitoring: The NMX Validator service now monitors the system resource usage (CPU, RAM, handle count) and raises errors when editable thresholds are crossed. A useful tool when you suspect some slowness in your NMX.	NMXNG-6280

[21 issues](#)

3.2 Electra X New Features

The Harmonic Electra™ X advanced media processor is the industry's first fully converged platform for broadcast and multi-screen content delivery, leveraging the PURE Compression Engine for cutting edge video quality.

Electra X/X2/XVM Release

1.17.0.0.40

3.2.1 Platform Information

Electra X	A fully qualified, tested and certified platform for running the Electra X software. Electra X is fully data center ready with dual power supplies and front to back air flow.
Electra XVM	The virtualized, software-based nature of Electra XVM takes enterprise-class media processing out of the broadcast machine room and moves it to the data center. Hosted on the Harmonic VOS ecosystem, which runs in the VMware® vSphere virtual machine environment on an industry-standard blade server, Electra XVM provides hardware transparency and maximum operational flexibility. Please contact Harmonic for recommendations on processing hardware. Note Please contact Professional Services for Electra XVM BIOS requirements outlined in the <i>Mandatory_Configurations_of_BIOS_VM_for_XVM_v09</i> document. Note The density of XVM/VBR systems varies based on incoming rates and Mux rates. Please contact Harmonic Product Marketing for information.

3.2.2 Highlighted Features

The following features are highlighted in this release:

Roadmap Feature Category	Roadmap Feature Name	Release Note Information	Key
DPI	DTMF input support for OTT output	DTMF decode from an incoming PID in the TS, converting it to SCTE-35, and inserting it into the MBR output of the ELC X2 or XVM. All profiles have the SCTE35.	DVREQ-8603
System	Encoder stress alarm	An alarm is now reported when a service is affected by a lack of CPU resources. This alarm can appear when the number of encoded services exceeds the recommended value, or if encoding conditions (encoder settings and/or source specifications) are no longer compatible with the values used for bench-marking.	DVREQ-8566
Video	RFD support for HEVC on progressive output	Repeat Field detection is now available for HEVC. Available for SD and HD, for interlaced or progressive input, and progressive output.	DVREQ-8608
Video	HEVC VQ improvement on transparent logos	A new algorithm improves the VQ of semi-transparent logos.	DVREQ-8625

[4 issues](#)

⚠ Important

GOP Configuration Restrictions for AVC OTT and HEVC OTT Encoding on Electra X

When Electra X is used for AVC OTT and HEVC OTT encoding, Electra X and NMX allow a larger range of GOP configurations than Harmonic recommends for actual use. For best quality and performance, Harmonic recommends the following GOP configurations.

IDR Interval: Harmonic recommends an IDR Interval between 2 and 10 seconds.

GOP Structure (Mini-GOP Size - M):

If the output frame rate is	...and the output Video Format is	Recommended M values
between 20 and 60 frames/second	Progressive HD or SD *Interlaced HD or SD	Auto, 4, 8 Auto, 4
between 8 and 15 frames/second	Progressive HD or SD	Auto, 4
lower than 8 frames/second	Progressive HD or SD	Auto, 1

*When the output video is interlaced, it is expected that video frame rate is set to be the same as the frame rate of the input video.

In future releases, Harmonic may modify NMX and Electra X to enforce some of these recommendations, which may prevent some legacy configurations to be provisioned. Harmonic recommends that customers using configurations that do not comply with these recommendations consider modifying them.

3.3 XOS Appliance New Features

Release Information

XOS Appliance Release	NMX Release
1.15.0.0.023 (ISO,BIN)	9.0.0.0.22
1.15.0.0.10 (RPM)	
1.15.0.0.74 (vos_bundle)	



NOTE:

Limited Availability (LA) of a New Feature is considered **GA-level quality** for a customer/ customer segment and acceptable for on-air use.

3.3.1 XOS Appliance Components

The XOS Appliance is a software product that includes several components that are used depending on the required processing.

The XOS Appliance can be deployed as follows:

1. On appliances
2. As software on a compatible Linux server.

Available features depend upon the selected deployment and selected management (NMX, Standalone, API).

The XOS Appliance contents of this release note are organized by XOS component type.

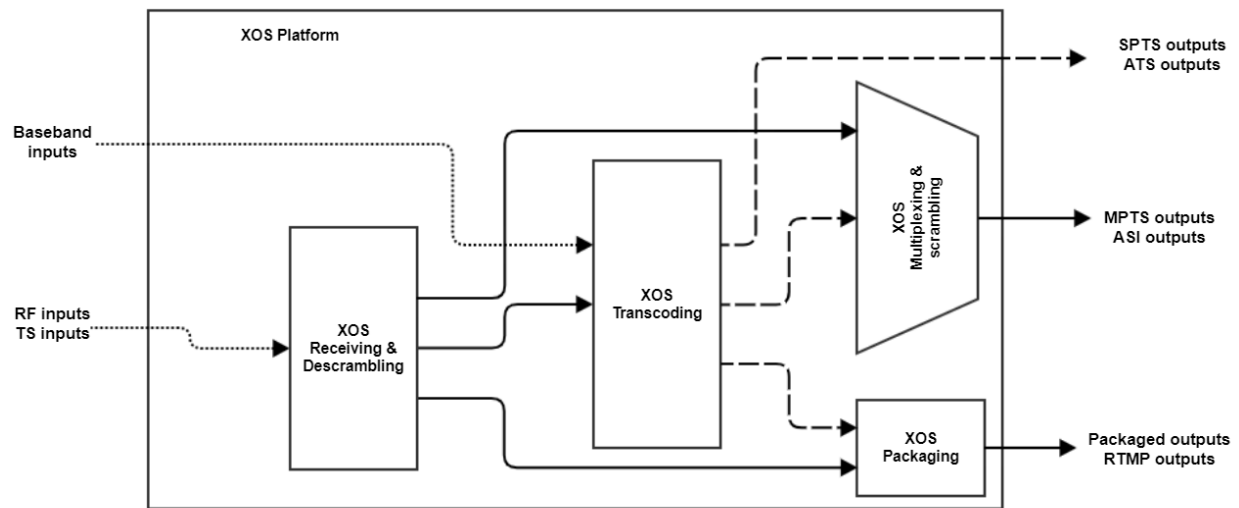


Figure 1. XOS Appliance Diagram

XOS Platforms

The XOS Platform refers to XOS components which are global to the product. This includes common software and for XOS appliances hardware components.

XOS Receiving & Descrambling

This component gathers features related to stream reception & descrambling.

XOS Transcoding

The XOS Transcoding components perform encoding from one or multiple channels sharing the same source. They also deliver SPTS and ATS outputs from broadcast and streaming applications.

XOS Multiplexing & Scrambling

The XOS Multiplexing components manage statmux and generate one or multiple MPTS from the outputs of XOS transcoding components and from external sources. These components are only supported through the XOS Standalone GUI and API in this release, not through NMX.

XOS Packaging

XOS Packaging is a carrier-grade system for preparing scaleable, secure, live video streams for delivery over multi-screen OTT networks.

3.3.2 XOS Platforms New Features

Highlighted Features

The following features are highlighted in this release:

Roadmap Feature Category	Roadmap Feature Name	Release Note Information	Key
Platform	ASI outputs (SAG)	XOS now supports the ASI output card with 4 x ASI output.	NG-33789
Platform	XOS Small server	The XOS Model Small (XOS 1000) platform is added to the portfolio. This model targets low density encoding/transcoding use cases.	NG-38423

[2 issues](#)

NOTE:

Please contact Harmonic for recommendations on processing hardware.

Supported Appliances

Appliances are standard servers selected and configured by Harmonic. The XOS servers are fully data center-ready with dual power supplies and front to back air flow.

The following appliances are supported in this release:

Part	Description	Applications
XOS Platforms		
HWR-XOS-CHS-MODEL-L	XOS: 1RU HPE, 2 AC, 8 GBE, FRONT PANEL, SD/HD/UHD, LARGE MODEL	- SD/HD/UHD encoding & transcoding - Additional UHD transcoding with UHD card
HWR-XOS-CHS-MODEL-M	XOS: 1RU HPE, 2 AC, 8 GBE, FRONT PANEL, SD/HD, MEDIUM MODEL	- SD/HD encoding & transcoding - OTT packaging
HWR-XOS-CHS-MODEL-S	XOS: 1RU, 2 AC, 6 GBE, FRONT PANEL, SD/HD, SMALL MODEL	SD/HD encoding & transcoding
HWR-XOS-CHS-7000	XOS: 1RU HPE, 2 AC, 8 GBE, CLASS 7000, SD/HD/UHD	SD/HD/UHD encoding & transcoding
HWR-XOS-CHS-4000 HWR-ELCXOS-CHS-1RU-2AC-C1	XOS: 1RU HPE, 2 AC, 8 GBE, CLASS 4000, SD/HD	- SD/HD/UHD encoding & transcoding - Additional UHD transcoding with UHD card
HWR-PKGX-CHS-1RU-2AC-G1		OTT Packaging

Appliance Options

The following options are available to add to your XOS Platform:

Label	Description	Harmonic Sales Ref
10G	Dual port 10GbE SFP+ 10G SFP+ modules ordered separately	HWR-OPT-DUAL-10GBE-NO-SFP

Label	Description	Harmonic Sales Ref
25G	Dual port 25GbE SFP+ • 10G or 25G • SFP+/SFP28 modules ordered separately	HWR-OPT-DUAL-10GBE-NO-SFP
UHD	UHD Accelerator card • 1 HEVC UHD CBR encoding	HWR-XOS-OPT-1UHD
SDI#1	SDI input card • 8x SD/HD-SDI or 4x 3G SDI • UHD as 4x3G-SDI (Quadrant mode) • Mini DIN connectors • Break out cables to order separately	HWR-XOS-OPT-SDI-8IN
SDI#2	SDI input card • 8x SD/HD/3G-SDI, • UHD as 4x 3G-SDI (Quadrant or 2SI)) • Mini DIN connectors • Break out cables to order separately	HWR-XOS-OPT-SDI-8X3G
ASI	ASI output card • 4x ASI output ports • Mini BNC connectors • Break out cables to order separately	HWR-XOS-OPT-SDI-ASI-4
S2X	DVB-S2X input card • 4x RF ports • 8x Demodulators	HWR-XOS-OPT-DVBS2X

Supported Appliance Configurations

Servers can have free PCI slots for optional cards.

NOTE:

All these configurations include NMX as a Management Interface.

Slot numbering as shown in NMX.

In all the SDI configurations, the SDI card number is 1 to x (contiguous values), left to right.

Examples:

- SDI boards in left and right : left is card #1, right is card #2.
- SDI boards in middle and right: middle is card #1, right is card #2.
- SDI boards in left, middle and right: left is card #1, middle is card #2, right is card #3. This configuration is not supported today.

Transcoding Applications

XOS Small with option cards

	SLOT1 (Top)	SLOT2 (Bottom)
1	empty	empty
2	SDI#1	empty

XOS Medium/Large server with SDI and NIC cards only

	SLOT1 (Left)	SLOT2 (Middle)	SLOT3 (Right)
1	empty	empty	empty
2	SDI#1	empty	empty
3	SDI#1	empty	SDI#1
4	SDI#2	empty	empty
5	SDI#2	empty	SDI#2
6	10G	empty	empty

	SLOT1 (Left)	SLOT2 (Middle)	SLOT3 (Right)
7	25G	empty	empty
8	10G	empty	SDI#1
9	25G	empty	SDI#1
10	10G	SDI#1	SDI#1
11	25G	SDI#1	SDI#1

XOS Large server with UHD cards

	SLOT1 (Left)	SLOT2 (Middle)	SLOT3 (Right)
1	empty	UHD	empty
2	empty	UHD	UHD
3	SDI#1	UHD	empty
4	SDI#1	UHD	UHD
5	SDI#2	UHD	empty
6	SDI#2	UHD	UHD
7	25G	UHD	empty
8	25G	UHD	UHD

XOS Medium/Large server with ASI/DVB-S2X cards

	SLOT1 (Left)	SLOT2 (Middle)	SLOT3 (Right)
1	S2X	empty	ASI

Packaging Only Applications

XOS Medium with NIC cards only

	SLOT1 (Left)	SLOT2 (Middle)	SLOT3 (Right)
1	empty	empty	empty
2	10G	empty	empty

Software Deployments

As a Linux application

The XOS Appliance can be deployed as a Linux application (RPM package) on standard Linux servers with minimal specs.

These servers can be provided by Harmonic (reference platforms) or directly by the customer (custom hardware).

Available features may differ from appliances:

- PCI cards such as SDI input cards or UHD HW acceleration cards are not supported,
- Hardware monitoring is limited to some HW alarms. Complete monitoring is performed using tools provided by the hardware manufacturer (iLO and HP One View for HP servers),
- Software deployment and updates are performed by third party mechanisms or by HIM (Harmonic Infrastructure Manager),
- Network set-up is part of Operating System set-up and is not available in NMX or in Stand Alone user interface.

3.3.3 XOS Receiving and Descrambling New Features

Highlighted Features

In this NMX release, there are no new XOS Receiving and Descrambling new features.

3.3.4 XOS Transcoding New Features

Highlighted Features

The following features are highlighted in this release:

Roadmap Feature Category	Roadmap Feature Name	Release Note Information	Key
Audio	5.1 to 5.1.4 (SAG)	XOS now supports 5.1 up mix to DD+/JOC 5.1.4 for ATMOS encoding.	NG-44412
Audio	AC-4 5.1.4 pass through	AC-4 pass through is extended to 5.1.4 audio (ATMOS).	NG-45197
Audio	AC-4 5.1.4 to DD+/JOC	Transcoding of ATMOS AC-4 5.1.4 into DD+/JOC 5.1.4 is now supported.	NG-44873
Audio	ADTS/LATM (SAG)	XOS now supports the configuration of the AAC stream type via the stand-alone GUI (SAG). You can now select the AAC stream type ADTS or LATM from the SAG.	NG-45987
Data	CC descriptor support (SAG)	Closed Captions are now automatically generated to ensure proper decoding, or to provide correct OTT packaging.	NG-41702
Data	DVB-TTML pass through (SAG) (Alpha)	DVB-TTML can be pass through with OTT transcoding. This feature is only available with SAG. (Alpha in XOS 1.15/NMX 9.0.0)	NG-51452
Data	Disable conditioning on segment descriptor 0x02	Stream conditioning is now disabled on SCTE-35 time_signal messages which only contain descriptors with "segmentation_type_id 0x02" (ad server call).	NG-41788
Data	ESAM for OOB cue-tones only	ESAM interface can now be restricted to sending unsolicited cue tones. Incoming cue-tones can be passed through and not managed through ESAM interface.	NG-46144
Data	HD VANC pass through	VANC data can now be passed through transparently in MPEG-2 TS according to SMPTE ST 2038 for HD sources.	NG-47945

Data	Teletext to DVB TTML	Incoming DVB Teletext (TS) can be converted to DVB TTML for multiscreen encoding applications with ATS output.	NG-43412
Data	Teletext to DVB subtitles (NMX) (Alpha)	Teletext subtitles can be transcoded to DVB subtitles when received from SDI and TS inputs. (Alpha in XOS 1.15/NMX 9.0.0)	NG-47602
Inputs	Delay compensation with redundancy (SAG)	Alternate source switching between 2 services can be controlled through SCTE-35 messages with delay compensation to align content. This is a customer specific feature.	NG-44082
Inputs	Hybrid redundancy 2110 & TS (SAG)	Source redundancy now works with one 2110 source and one MPEG TS source. The feature can only be configured from the Web interface.	NG-44081
Inputs	Trigger redundancy upon Non-decodable video	Non-decodable video can now trigger source redundancy. This trigger can be configured.	NG-38484
Inputs/ Outputs	SRT support (SAG) (Alpha)	SRT for inputs and for broadcast outputs is supported with configurable latency. This feature is only available through SAG. (Alpha in XOS 1.15/NMX 9.0.0)	NG-51448
OTT	Default HLS audio (SAG) (Alpha)	When grooming a baseband source, audio can be declared as default to correctly populate the HLS manifest. This feature is only available through the SAG. (Alpha in XOS 1.15/NMX 9.0.0)	NG-51453
System	Encoder stress report (SAG)	Encoder stress dashboard is available through XOS SAG under DevOps Portal->Kibana->Encoder stress dashboard.	NG-46841
System	Shorter Disturbance	When editing non-seamless parameters which are not linked to the source, the disturbance on an outgoing signal is significantly reduced (~6s).	NG-45881
Video	Align IDR on audio frames	The IDR period for multiscreen encoding can be defined in milliseconds. This change enables you to align the length of audio and video segments in some use cases (i.e. 1.92s in 50Hz). With DASH, this helps ensure segment templates are kept small through use of the repeat ('r') attribute.	NG-40623

Video	Improved HEVC progressive encoding	VQ is improved for HEVC progressive encoding.	NG-43928
Video	Improved VQ stability	PURE codec is now tuned to improve VQ stability.	NG-47809
Video	Reduced AVC broadcast latency	Latency of AVC broadcast encoding (CBR & VBR) can now be reduced with a dedicated mode. Depending on the use case, latencies down to 2.5s can be reached.	NG-35391
Video	SDR to Dolby Vision 8.1	Conversion from SDR to Dolby Vision 8.1 is now supported.	NG-47832
Video	Update HDR conversions (BT.2408 & Full)	SDR to HDR conversions have been improved for a more accurate rendering. The two existing modes (Pro/Consumer) are replaced by two new modes: "BT.2408" and "Full". The BT.2408 mode provides tone expansion with a peak brightness at 203 nits, while the Full mode pushes Peak Brightness up to 1000 nits.	NG-44556
Video	VQ Multiscreen HEVC improvements	Improved VQ of HEVC multiscreen encoding.	NG-45129

[25 issues](#)

3.3.5 XOS Multiplexing and Scrambling New Features

Highlighted Features

In this NMX release, there are no new Multiplexing and Scrambling features.

3.3.6 XOS Packaging New Features

Highlighted Features

The following features are highlighted in this release:

Roadmap Feature Category	Roadmap Feature Name	Release Note Information	Key
OTT	Custom DASH audio track names (SAG) (Alpha)	DASH - The capability to set a custom name for an audio track at the source grooming stage and have it included as Label in the DASH manifest, so that the players can display it to end-users, has been added. (Alpha in XOS 1.15/NMX 9.0.0)	NG-51450
OTT	DVB-TTML to OTT subtitles (SAG) (Alpha)	Convert Live only DVB-TTML to OTT subtitles (DASH-SMPTE TT, HLS-WebVTT). This feature is only available with SAG. (Alpha in XOS1.15/NMX 9.0.0)	NG-51447
System	Support of CMAF packaging on XOS	XOS now supports CMAF packaging (unified HLS-DASH packaging) with the full set of configuration parameters. (Alpha in NMX 8.9.0 and GA in NMX 9.0.0)	NMXNG-6138

[3 issues](#)

3.4 ProStream X New Features

ProStream® X is a new family of high-throughput and high-performance software-based stream processors enabling multiplexing, scrambling, and splicing.

ProStream X is leveraging a software-based implementation and, as such, can be deployed throughout two types of infrastructure deployment environment: virtualized (XVM) or appliance (X).

The Harmonic ProStream X video stream processor and gateway leverages advances in IT infrastructure to provide best-in-class, high-performance stream processing for mission-critical broadcast, cable, satellite, IPTV, and OTT delivery applications. As the successor to the market-leading ProStream 9100 stream processor, the software-based ProStream X system allows users to leverage the versatility and agility of software-based infrastructure. The platform integrates 10 Gbps throughput with a variety of advanced video processing applications, including multiplexing, splicing, blackout switching, and DVB CSA3 encryption. ProStream X also serves as a high-throughput IP gateway featuring socket address flipping.

ProStream X runs on a 1-RU COTS HPE® server and pairs with the Harmonic Electra™ X2 advanced media processor to deliver a compact solution for encoding and distributing superior-quality IP video streams. This high-density architecture reduces the amount of rack space required to meet fluctuating stream processing requirements, helping operators reduce CAPEX and OPEX. High reliability and simplified serviceability result in an all-in-one-box experience for high-throughput stream processing at low TCO.

SD, HD, and UHD formats, and MPEG-2, MPEG-4 AVC, and HEVC codecs are all supported on ProStream X.

ProStream® XVM is a stream processor software application targeted at virtualized environments, enabling deployment over generic IT infrastructure (typically blade servers). Processing density depends on blade CPU performance. This type of environment is compliant with the Electra XVM for a complete virtualized statistical multiplexing solution.

The Harmonic ProStream XVM virtualized stream processor leverages advances in IT infrastructure to provide a software-based solution for scrambling, multiplexing and statistical multiplexing of SD and HD MPEG video.

ProStream XVM is designed to run on common hardware platforms in IT data center environments. The system pairs with the Harmonic Electra™ XVM virtualized media processor to deliver a completely software-based, broadcast-ready solution for scrambling, multiplexing, re-multiplexing, and statistical multiplexing.

ProStream X and ProStream XVM Release 2.9.x are supported under SAG and under the NMX management system. It is associated with the NMX 9.0 release.

Note

Contact Harmonic for recommendations on processing hardware, and Professional Services for ProStream X BIOS requirements.

Special upgrade procedure for devices setup with NMX Device Redundancy (Hot:Warm - automatic switching)

Note

This procedure is only relevant when upgrading the firmware version from lower than 2.9.1 to 2.9.1 or higher!

1. Make sure that the devices are in the following initial state: <Device 1, Active>, <Device 2, Inactive>.
2. Change the Device Redundancy in NMX from Automatic mode to Manual Mode.
3. Upgrade Device 2 and wait till it is back up with the new build.
4. Perform a manual switch-over to Device 2 (with the new build).
5. Make sure that the devices are now in the following state: <Device 1, Inactive>, <Device 2, Active>.
6. Upgrade Device 1 and wait till it is back up with the new build.
7. Change the Device Redundancy in NMX from Manual mode to Automatic Mode.

Note

A downgrade from firmware version 2.9.1 or higher to older versions is seamless.
An upgrade from firmware version 2.9.1 to higher version is also seamless.

ProStream X Release

2.9.9.0.539

Platform Information

ProStream X	ProStream X is a SW based appliance. It is an HPE OEM DL360 Gen10 8-SFF CTO Server-SKU (869121-B21). Dual sockets CPU 4210R, 64-GB RAM , SSD, 1 RU.
ProStream XVM	The Harmonic ProStream® XVM virtualized stream processor leverages advances in IT infrastructure to provide a software-based solution for statistical multiplexing of SD and HD MPEG video. The statmux controller is part of the ProStream XVM environment and can control ProStream XVM statmux pools managed by the NMX system, in a fully virtualized environment.

3.4.1 Highlighted Features

The following features are highlighted in this release:

Roadmap Feature Category	Roadmap Feature Name	Release Note Information	Key
Configuration	Control over sensitivity of CC errors	Added control over the sensitivity of CC Errors alarm.	DVREQ-8651
Configuration	Edit descriptors to override all output TS TOT	Added the ability to use a global setting option for "Time offset Descriptor" in TOT.	DVREQ-8655
Configuration	Global Defaults customization for CableOS	Added the ability to customize the default parameters for all new Input and Output TSs.	DVREQ-8649
GUI	Ability to read the current ProStream X temperature.	Added the functionality to read the ProStream X temperature and present it in the following locations: * RESTAPI * Support page * Dashboard	DVREQ-8633
GUI	ProStream X improvement	ProStream X shows the full input bitrate on each port.	DVREQ-8662
Networking	Output identical TS Mirror between ports types	Added the ability to output the exact identical TS output, same packet order, nulls, bitrate, etc.	DVREQ-8640
Platform	ProStream X Encryption Hacking Prevention Scrambling license addition	Added ProStream X Encryption Hacking Prevention Scrambling Firmware License (FW-PRM-X-SELC-EHP).	DVREQ-398
Redundancy	Mixed platform system redundancy	Added support for mixed platform system redundancy using the Intel and HPE appliances.	DVREQ-8555
Redundancy	New Service Redundancy trigger	Added a new Service Redundancy trigger for "Invalid Video".	DVREQ-8646
Table Manipulation	SDT Re-Generation	Added support for SDT Re-Generation.	DVREQ-8650

Terrestrial	DTMB SFN transmission (SIP Table) China SFN Standard	Added support for DTMB SFN transmission (SIP Table). This feature requires license FW-PRM-X-DTMB-TS, per DTMB TS output.	DVREQ-8572
-------------	--	--	----------------------------

[11 issues](#)

3.4.2 Compatibility Information for CableOS

Deployment of this ProStream X release must be done in accordance with the following compatibility constraints:

- CableOS Pebble (RPD): version 1.8.3 or higher
- CableOS Core: version 1.8.3 or higher

 In this version IPv6 is not supported for HHP.

 When upgrading from ProStream X Release 2.5.x to Release 2.6.x, existing IPv6 parameters need to be reconfigured.

 In a 1+1 cluster, the user can define an independent pair of GM clocks per ProStream X device.

3.5 Electra X2S New Features

The Harmonic Electra™ X advanced media processor is the industry's first fully converged platform for broadcast and multi-screen content delivery, leveraging the PURE Compression Engine for cutting edge video quality.

Electra X2S Release	ProStream XVM Release	NMX VM Release
1.17.0.0.40	2.9.9.0.539	9.0.0.0.22

Platform Information

Electra X2S	The Electra X2S is a system in a 1RU server box, combining the performance of Electra X, ProStream X and controlled by the rich functionality of NMX.
--------------------	---

3.5.1 Highlighted Features

In this NMX release, there are no new Electra X2S features.

3.6 Ellipse 3000 New Features

The Ellipse 3000 family of encoders presents an advanced concept in contribution applications, providing broadcasters with multiple simultaneous MPEG-2 or MPEG-4/AVC (H.264) video encoding and DSNG modulation .

Ellipse 3000 encoder supports all SD and HD MPEG-2 and MPEG-4 AVC codecs at 4:2:0 or 4:2:2 chroma subsampling with 8 or 10 bits. Fully firmware upgradeable, the encoders offer a smooth and cost-effective migration path from MPEG-2 SD 4:2:0 8-bit to AVC HD 4:2:2 10-bit compression schemes, making them among the most versatile contribution encoders available. Options for re-multiplexing and cascading allow the devices to operate on a stand-alone basis with no need for external multiplexers or PSI generators.

Ellipse 3000 Release

3.3.5.0.76

3.6.1 Highlighted Features

In this NMX release, there are no new Ellipse 3000 encoder features.

3.7 ProStream 9100 New Features

The latest evolution of Harmonic's market-leading ProStream platform, the 1-RU ProStream 9100 with ACE delivers superior video quality and the flexibility to support multiple complex digital processing applications, such as digital turnaround, any-to-any audio and video transcoding, and live adaptive streaming. It addresses current broadcast and multi-screen I/O formats, and scales easily to accommodate future formats.

ProStream 9100 with ACE features an ultrahigh-density architecture that dramatically reduces the amount of rack space required to meet growing processing and transcoding requirements. System flexibility and workflow versatility are achieved with modular audio/video processing modules and next-generation, high capacity IP processing cards. Low power consumption, high reliability and simplified serviceability result in a best-in-class, multi-format platform that offers superior video quality and OPEX.

ProStream 9100 Release

17.7.8.0.284

3.7.1 Highlighted Features

In this NMX release, there are no new ProStream 9100 features.

3.8 ProView 7100 New Features

The Harmonic ProView™ 7100 is a single rack unit (1RU) scalable receiver, DVB descrambler, multi-format video decoder, video transcoder, and MPEG stream processor. The modular ProView 7100 addresses the full spectrum of content reception applications from single channel decoding to descrambling and re-multiplexing of multiple transport streams.

ProView 7100 Release

4.3.5.0.88

Note

To upgrade from release 4.0.0.0.26, reboot the device and then start the upgrade.

3.8.1 Highlighted Features

In this NMX release, there are no new ProView 7100 features.

3.9 ProView 8100 New Features

ProView™ 8100 is an advanced Integrated Receiver Decoder (IRD) platform that optimizes primary distribution of video content over satellite, ASI or IP delivery networks. With an advanced feature set and compact design, the ProView 8000 IRD family increases workflow efficiencies, cost savings, and reliability for global broadcasters and service providers, simplifying the migration to an IP infrastructure and launch of value-added services.

The ProView 8100 is ideal for use in a wide range of applications, from basic monitoring to end-point delivery from the distribution network. The IRD can act as a stand-alone unit or as part of a widely dispersed primary distribution network under the control of Harmonic's DMS™ video Distribution Management System. DMS provides broadcasters and service providers with powerful control tools for remotely managing large device populations, enabling secure broadcast of video content over satellite or IP delivery.

ProView 8100 Release

1.5.3.0.55

3.9.1 Highlighted Features

In this NMX release, there are no new ProView 8100 features.

4 Resolved Issues

4.1 NMX Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Resolved
NMX-69877	PSX-11508	The ECMG configuration page did not show the External CW tab.
NMX-69901	NMX-69572	Electra XOS produced no output with a bitrate over the minimum recommended by NMX.
NMX-70043	NMX-70041	The PSU Alarm of NMX HPE server was sometimes not shown in NMX Operator.
NMX-70091	NMX-70089	After upgrading the catalog, the default password "harmonic" was applied to all of the user accounts, and all previous passwords were deleted.
NMX-70093	ACP-15590	For newly created services using 2110 input, the RTP Payload value was incorrect and triggered a "service initialization" failure.
NMX-70104	NMX-70102	The static audio gain for XOS was not applied for some OTT services.
NMX-70113	NMX-69818	NMX failed to establish websocket connections with some XOS devices; an "DeviceTimeout" alarm was raised on those devices.
NMX-70127	NMX-70125	User was not allowed to add an Ellipse 3102 device under NMX.
NMX-70133	NMX-70131	Performing the "Clear Configuration" command from NMX directed to ProStream X produced the following incorrect message: "This action will restart the device, re-download the software, and is service effecting."
NMX-70141	NMX-70139	A Provision Error was observed for all transports after upgrading NMX to 8.8.1.
NMX-70164	NMX-70162	Customer observed the "PSI Input Source Transport Is Missing" alarm on several services, but there was no effect on any of the devices.
NMX-70190	NMX-70189	Customer observed that some TS are scrambled at output and the scrambledKey appeared and disappeared randomly.

NMX-70224	NMX-70223	The Packager XOS input discovery failed from the GbE9 port when the port was set to Teaming mode.
NMX-70236	NMX-70235	ProStream X went offline when the external PCR was passed to output.
NMX-70247	NMX-70220	The HLAutomationProcess memory expanded up to 50GB due to a SecurityScan attack.
NMX-70272	NMX-70271	NMX did not manage "enableWebVttSourcePositioning" under the HLS package profile.
NMX-70282	NMX-70217	NMX experienced a redundancy failure after a network outage.
NMX-70305	NMX-70304	During an STB scan, incorrect descriptor values were sent to ProStream X.
NMX-70360	NMX-70338	Customer was unable to generate NMX reports in the Timeline GUI of NMX Operator.
NMX-70366	NMX-70143	During an NMX automation server crash, there was an unexpected switchover to the backup NMX server.
NMX-70443	NMX-70442	Unexpected 2110 configuration alarms were raised with wrong objects.
NMX-70466	NMX-70412	The Object Repository Server (ORS) suffered a crash after completing a Designer modification for the SDI router.
NMX-70486	NMX-70484	The PMT PID could not be changed in the NMX Designer/Spreadsheet for an XOS service.
NMX-70496	NMX-70495	The NMX Gateway did not start after a server reboot.
NMX-70502	NMX-70424	NMX experienced an unexpected switchover, which resulted in a crash of the Object Repository Server (ORS).
NMX-70584	NMX-70580	During a GbE port switch on XOS, the NMX Operator switched the intended main port to backup status.
NMX-70606	NMX-70493	The Slate picture for X2 MW output change was not taken into account in the NMX Designer.
NMX-70627	PSX-12502	The Initialization Vector field was removed from the GUI, but was still needed to configure AES scrambling. It has been restored to the GUI.

28 issues

4.2 Electra X Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Resolved
ACP-15480	ACP-15446	Customer reported unexpected service restarts.
ACP-15481	ACP-15426	The subtitle burn-in for Electra X2 did not work due to an improper default pageID.
ACP-15498	ACP-15487	The Electra XVM could not output the ARIB-CC data PID.
ACP-15559	ACP-15165	The NMX and Electra X encoder were not synced to the same time server, which produced a "Service Delay Mismatch" alarm on the audio.
ACP-15577	ACP-15463	After upgrading NMX from 8.3 to 8.8 (Electra X2 from 1.10.0 to 1.15.0), the Electra X2 device with EyeQ experienced a reduced efficiency in Reduce Latency mode.
ACP-15601	ACP-15469	A newer model of the Electra X2 (EL-X2-G3-AC-HH) failed to show a "Power Supply Failure" alarms in neither the NMX Operator or in the web GUI.
ACP-15606	ACP-15598	Customer reported a frequent output freeze while the Electra X2 device was transcoding an AVS+/MPEG2 signal to H.264.

[7 issues](#)

4.3 XOS Appliance Resolved Issues

This section contains the resolved issues for the XOS Appliance. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

4.3.1 XOS Platforms Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Resolved
NG-40693	The default XOS SAG Gateway configuration was not being used for egress interface for a single gateway.
NG-48350	When the customer added or removed an Alternate Source on XOS RPM (on a Dell server), a long outage was experienced (~45 seconds).
NG-49135	Alarms were not cleared from SAG/NMX when the SDI source issue was cleared.
NG-51687	The Nielsen parameters were not displayed at service creation.
NGDE-4298	When PTP is de-synchronized on one port, alarms appeared on both ports.

5 issues

4.3.2 XOS Receiving and Descrambling Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Resolved
NG-49803	Very short splice durations were making MPEG-2 VBR encoding difficult.

1 issue

4.3.3 XOS Transcoding Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Resolved
NG-48186	Customer experienced poor video quality.
NG-48382	The Repeat Field Detection (3:2 pull down mode) produced an incorrect performance.
NG-49249	The RmpWorker process was killed due to device running out of memory.
NG-49701	Electra XOS did not detect an issue on the packetized elementary stream (PES) head on the input source.
NG-49803	Very short splice durations were making MPEG-2 VBR encoding difficult.
NG-50127	Customer experienced a TS output underflow for 192kbps AC3 passthrough after the XOS device was running for 3 hours.
NG-50706	The AC4 OTT service, the number of channels was not filled correctly in mediainfo.
NG-51334	[DPI] When handling very short splice durations for MPEG-2 VBR, sometimes the splice point was lost.
NG-51674	Customer using an older version of SCTE104 experienced the insertion of invalid sub_segment_info.

[9 issues](#)

4.3.4 XOS Multiplexing and Scrambling Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Resolved
NG-40693	The default XOS SAG Gateway configuration was not being used for egress interface for a single gateway.

[1 issue](#)

4.3.5 XOS Packaging Resolved Issues

In this NMX release, there are no Resolved Issues for XOS Packaging features.

For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

4.4 ProStream X Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Resolved
PSX-11686	PSX-10841	ProStream X restarted due to a crash and generated a core dump file.
PSX-11694	PSX-11691	Customer experienced unexpected service redundancy switching events.
PSX-11700	PSX-10327	CC and TEI errors occurred on Injected EMM PIDs at all outputs.
PSX-11718	PSX-11715	Sometimes the user could not login into the ProStream GUI.
PSX-11807	ACP-15582	DataTrack enabled with DiviTrack was causing PCR accuracy errors.
PSX-11835	PSX-11833	An API request to "list output services" resulted in an empty list.
PSX-11842	PSX-11840	PCR accuracy errors on the ProStream X output increased.
PSX-11856	PSX-11851	Customer experienced an audio error for 30 seconds on the main service immediately following an ad splice event, as well as CC errors.
PSX-11920	PSX-11918	After refreshing the GUI, the backup source for an input TS disappeared.
PSX-11965	PSX-11606	Port redundancy was not functional after issuing a Clear Config command from NMX.
PSX-12214		An incorrect GUI validation enabled the creation of non-identical mirrors.
PSX-12268	PSX-12266	The "Backup Source 1, CC Error Detected" alarm was raised even though the "Event Setting" CC error was changed.
PSX-12305	PSX-12303	After PSX upgrade, the device redundancy time increased under NMX control.
PSX-12387	PSX-12385	PSX suffered crash events every 2-3 minutes due to the corrupted variables "payloadStart" and "payloadLength".
PSX-12504	PSX-12502	The Initialization Vector field was removed from the GUI, but was still needed to configure AES scrambling. It has been restored to the GUI.
PSX-12505	PSX-5106	When performing a switchover from main to backup, CC Error alarms were displayed.
PSX-12546	PSX-12544	The ECM PID was routed to the Null PID 0x1FFF on the RSS VOD Service.

17 issues

4.5 Ellipse 3000 Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Resolved
ELLIPSE-2766	BISS was not working on the source service when it was cascaded to another service with BISS.
1 issue	

4.6 ProStream 9100 Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Resolved
AFR-42721	AFR-42552	The time-shift function did not work on scrambled HDR-HEVC content.
AFR-43346	AFR-43327	PSIG had an incorrect activation time.
AFR-43596	AFR-43593	After device reboot, non-updated PSIG data was deleted.
AFR-43650	AFR-43613	When PSIG persistence was enabled and a configuration change happened (change AND/OR delete NetworkID AND/OR TSID), a timeout could occur after a device reset.
AFR-43660		STB failed to decrypt the service due to input TS redundancy, until a CP change occurred.
AFR-43661		The RAI bit was disabled when the Alternate PES mode was configured.
AFR-43667	AFR-43666	When the Polaris pacer chip was not functioning a GbE card hardware failure alarm was not asserted. As a result, channel streaming was not switched to the redundant ProStream 9100.
AFR-43671	AFR-43670	After rebooting, ProStream 9100 configured for IGMPv2 requested that traffic be sent as IGMPv3.
AFR-43681	QEAT-4405	A closed caption error occurred after switching SPS service to the alternative service if that service was Input StatMux Aligned.
AFR-43687	PSX-6677	There were missing PSI tables after enabling device redundancy.
AFR-43705	AFR-43609	ProStream 9K stopped splicing a channel without displaying any errors in the GUI.
AFR-43707		ProStream 9K experienced CC errors and statmux instability after SPS switches.
AFR-43710	AFR-43709	ProStream 9K experienced a crash event due to a failed LowP2 task.
AFR-43726	AFR-43724	Customer experienced a crash event during table parsing of their input.
AFR-43747		Both main and backup ProStream 9000 devices sent CW provision with CW sync enabled to ECMG.
AFR-43749		Event information was missing from the EIT of the ProStream 9000 output service.

AFR-43752	AFR-43751	After setting DVB subtitles as on-screen display (OSD) subtitles, a "DVB Subtitle Bitstream Error" alarm was raised.
AFR-43756		ASI card hardware failure occurred after sending tables via the PSIG interface after resetting the device.
AFR-43764		Splicing a service on PS9K resulted in distorted subtitles.
AFR-43766		Network security vulnerability existed on ProStream 9000 on port 8888 on Gbe ports on Polaris card.
AFR-43768		Timeout alarm triggered from the BOSS clients when scheduling regional switches or manually switching tables via the BOSS client.
AFR-43774		The Juno software was not upgraded when a new version of ProStream 9K was installed.
AFR-43775		After setting the PMT Repetition Rate to 100ms on ACE OTT/Multiscreen output, NMX provisioned the spool bitrate at 0ms for MW.
AFR-43779		Services enabled for splicing failed at output with no bitrate on PIDs.
AFR-43780	AFR-43659	With ProStream 9000 RF Meteor card, the video or audio PID from the Harris APEX exciter occasionally intermittently dropped approximately every 30 seconds.
AFR-43784		Customer could not add a new PID to an output TS.
AFR-43793	PSX-7418	STT generated by Prostream was sending UTC time instead of GPS time.
AFR-43797	AFR-43564	When using the Web GUI, HHP messages were missing in redundancy.

28 issues

4.7 ProView 7100 Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Resolved
IRP-11668	ZDC-3214	On some streams, OSD DVB Subtitles did not clear until the next subtitle appeared.
IRP-11642	IRP-11621	Audio was missing on SDI when decoding 1080p (AVC/HEVC).
IRP-11633	ZDC-3457	Manual time changes in SAG were overwritten by auto refresh before they were applied.
IRP-11631		MPE output was not recognized by some equipment.
IRP-11628		Dolby-E was not properly passed to SDI out when decoding some streams.
IRP-11627	IRP-11624	SCTE-35 to SCTE-104 conversion did not work with duration above 6553 seconds.
IRP-11623		SAG did not present language descriptor for ZHO (Chinese) and MSA (Malay) DVB Subtitles.
IRP-11622		OSD DVB subtitles were presented briefly when subtitles field page_time_out == 0.
IRP-11620	IRP-11567	The SAG did not load when the inserted CAM name contained special characters.
IRP-11618		Was unable to change some RF port parameters, that are not DMS configurable, while controlled by DMS.
IRP-11611	ZDC-3468	False "CAM Authentication Failure" alarm was raised when working with old SMiT Conax CAMs.
IRP-11607		Some ports on the DVB-S/S2/S2X card did not recover after an RF signal loss caused by bad weather.
IRP-11583		Closed Captions did not work with some content when AFD was enabled.
IRP-11578	IRP-11569	Filtering according to CA descriptors was not performed on some CAMs.
IRP-11553	IRP-11519	The recovery time of de-jittering mechanism when working with multiple input IP sockets was improved.

IRP-11543		SAG didn't load when there was an invalid language descriptor at the program PMT.
IRP-11532	ZDC-3321	Black background appeared on DVB subtitles when the CLUT background value was missing.
IRP-11509		When upgrading from 3.X to 4.X, failure to upgrade DB caused the unit to lose the management IP address.
IRP-11502	IRP-11497	In a certain scenario, devices, under DMS control, that were downgraded from 4.X to 3.X and then upgraded back, were missing some programs in the output.
IRP-11498	IRP-11494	Configuration is restored to defaults when upgrading transcoders from 3.X to 4.X.
IRP-11487		On a device with DVB-S/S2/S2X, a bitrate higher than 79Mbps was not supported.
IRP-11466		When experiencing severe RF noise, a transcoded program sometimes got stuck and didn't recover.
IRP-11462		Online help did not work properly in the Chrome browser.
IRP-11450	IRP-11443	When under DMS control, the NIT, EIT, and TDT were forced to be passed.
IRP-11415		Descrambling failed when using SmartDTV NAGRA CAM.
IRP-11406		A decoding failure alarm occurred when manually selecting codec Dolby-E.
IRP-11401		When removing a program that has a PID in common with another program and both use VMX descrambling, the descrambling failed for one crypto-period.
IRP-11386		The GI stream (0x80) wasn't automatically decoded and a decoding failure alarm was shown.
IRP-11368		FIC: Audio dropped on Musicam and Dolby-E passthrough on a customer specific stream.
IRP-11349	IRP-11343	ProView 7100 video decoding of low-delay (P only) MPEG-2 sometimes stopped working after input loss.
IRP-11330	IRP-11322	DMS: Back-to-back blackout events did not perform according to expectations.
IRP-11317	AFR-41502	Closed Captions were not clear when transcoding MPEG to H264.
IRP-11315	IRP-11314	The transcoder did not support large MVs generated by Electra.

IRP-11301	IRP-11295	Occasionally ProView would crash after the DMS was configured to work in standalone mode.
IRP-11291	IRP-11290	DMS: DCT deactivation time was extended from 5 minutes to 24 hours.
IRP-11239	IRP-11238	When decoding 1080p, some subtitles were missing on the VANC output with SMPTE-2038 VBI PID.
IRP-10747		There was no support for 4:2:2 decoding of AVC / MPEG-2 and for AVC-I in this release. 4:2:0 works for all codecs and resolutions.
IRP-10744		When working in HEVC mode, there were no alarms for unsupported content (such as unsupported frame rates or sub-resolutions).

38 issues

4.8 ProView 8100 Resolved Issues

The following issues have been resolved. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Resolved
ZDC-3499	IRP-11623	SAG did not present language descriptor for ZHO (Chinese) and MSA (Malay) DVB Subtitles.
ZDC-3498	IRP-11622	OSD DVB Subtitles were presented briefly when subtitles field page_time_out == 0
ZDC-3494	ZDC-3492	Audio decoding did not always recover after a huge number of CC errors at the input.
ZDC-3477	IRP-11583	The Closed Captions did not work with some content when AFD was enabled.
ZDC-3471	IRP-11569	Filtering according to CA descriptors was not performed on some CAMs.
ZDC-3468		False "CAM Authentication Failure" alarm was raised when working with old SMI Conax CAMs.
ZDC-3378	IRP-11567	The SAG did not load when the inserted CAM name contained special characters.
ZDC-3375		Decoding program configuration, that was set to "local override" by DMS, was lost after a reboot or input loss.
ZDC-3324	IRP-11543	SAG did not load when there was an invalid language descriptor at the program PMT.
ZDC-3287	IRP-11443	When under DMS control, the NIT, EIT, and TDT were forced to be passed.
ZDC-3275	IRP-11401	When removing a program that has a PID in common with another program and both use VMX descrambling, the descrambling failed for one crypto-period.
ZDC-3260	ZDC-2736	CC errors occurred at the input, while there were no unrecovered Zixi packets.
ZDC-3232	IRP-11386	The GI stream (0x80) wasn't automatically decoded and a decoding failure alarm was shown.
ZDC-3214		On some streams, OSD DVB subtitles did not clear until the next subtitle appeared.

ZDC-3200	IRP-11295	Occasionally ProView would crash after the DMS was configured to work in standalone mode.
ZDC-3199	IRP-11290	DMS: DCT deactivation time was extended from 5 minutes to 24 hours.
ZDC-3190	IRP-11263	OSD TTX Subtitles did not work when manually selecting some pages.
ZDC-3082	NMX-55002	There was a software mismatch alarm in NMX during a ProView upgrade.
ZDC-3053		After switching to blanking mode Mute there was a sync before it went to Mute again.
ZDC-2996		The label of the RF status on the idle screen always showed "RF-1".
ZDC-2972	IRP-10631	After a Rollback command, the device was restored to its default settings.
ZDC-2971		The Internet DRP port was not reconnected after the Internet DRP Backup port was removed.
ZDC-2790		The default PID was not the same as the PMT of the input program.
ZDC-2786		If one of the audios was set to None, after a device reboot both audios did not work on the SDI output.
ZDC-2748		Front Panel bug: A PID selection remained set to its configured mode when the program was switched via the front panel to Program mode.
ZDC-2697		When input redundancy was configured to Hot-Standby mode, the 'de-jittering failure' alarm was raised for the Primary port.
ZDC-1874		After disabling output TS in TSXC, unreferenced PIDs were shown in the GUI.
27 issues		

5 Known Issues

5.1 NMX Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Known	Release Note Information
NMX-70038	NMX-70037	When discovering the IP source with DolbyE audio, the default Processing Mode is blank, resulting in a provision error.	Workaround: After discovering the source with DolbyE audio, go to the Dolby E audio stream properties in the NMX Designer and change the Processing Mode to Compression.
NMX-70196		The XOS SW download takes up the entire network bandwidth for a few minutes with 100Mbps switch ports, freezing NMX in the process.	When the NMX management port is connected to a 100M switch (instead of a 1G switch), the XOS upgrade takes all the network bandwidth and then during XOS upgrade: 1. The NMX server cannot be used. 2. All devices go to timeout because of ping failure. 3. The remote desktop connection is lost.
NMX-70450		NMX redundancy is broken after reboot if the redundancy is switched too quickly. This is a known system limitation.	Workaround: After rebooting, wait for 10-15 minutes between each switch.
NMX-70602		When PTP communication is lost with the Grandmaster clock, a PTP clock failure is observed. The alarm is incorrectly set to "trigger redundancy".	Workaround: Disable "Trigger Redundancy" from the Global Alarm Configuration for the "PTP Clock failure" alarm.

[4 issues](#)

5.2 Electra X Known Issues

In this NMX release, there are no Known Issues for Electra X/X2/X2S features.

For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

5.3 XOS Appliance Known Issues

This section contains the known issues for the XOS Appliance. For specific resolved issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Warning!

We do not recommend downgrading the XOS Appliance to any previous version. This may cause instability in UHD encoding.

5.3.1 XOS Platforms Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Known	Release Note Information
NG-41382	NMX triggering redundancy with HHP enabled takes ~7s longer when compared to HHP disabled.	
NG-48536	The console becomes black when the user is logged into iLO for some time and there is no keyboard response.	Workaround: Reboot the device to recover the iLO console. The host can still be reached via SSH and HTTP.

2 issues

5.3.2 XOS Receiving and Descrambling Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Known
NG-47718	Out of the Box profiles lose signal after disabling/enabling the tuner when upgrading to trunk build.
NG-48867	When adding pass-through radios, sometimes some of them are not demuxed.
2 issues	

5.3.3 XOS Transcoding Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Known	Release Note Information
NG-23243		The Output TS Bitrate alarm takes a long time to be asserted and remitted.	Workaround: Configure the input bitrate below the configured passthrough bitrate. When the input audio bitrate exceeds the configured passthrough audio bitrate, the alarm is not asserted, and it is not remitted after the input audio bitrate drops below the configured passthrough bitrate.
NG-24799		When the audio passthrough bitrate is set lower than the source audio bitrate, an Insufficient TS Bitrate alarm is raised from XOS.	Workaround: Increase the audio bitrate.
NG-25573		Silence is experienced instead of expected nulls for missing audio when starting with a bad source.	
NG-27187		There is no video standard mismatch alarm for video input.	There is no video mismatch alarm in cases of service provisioned as SD with real input in HD .
NG-27580	PSX-5591	The video bitrate exceeds the pool bitrate for a short period of time.	This occurs when ProStream X device redundancy is triggered.
NG-35314		XOS is missing a picture in picture (PIP) service with an alternate source if the PIP audio is not shared with the main.	Workaround : Share the audio between PIP and main.

NG-35355	The "Time zone" modification is not considered in the Nielsen configuration.	Workaround : Deactivate then activate the Service Plan.
NG-36121	XOS produces a PES length error at the AC-4 audio PID.	
NG-38110	If the Provider name is longer than 256 characters, then the output contains no PSI table.	The output only contains audio, video, and NULL packets.
NG-46249	After forcing an alternate source backup on the XOS HITS device, and then disabling and enabling the Service Plan, the Main source is unavailable and the Backup cannot be engaged.	
NG-46579	The geo-redundancy synchro PTS and IDR settings used to synchronize two different XOS HITS units failed.	Workaround: Perform a service restart, then synchronize.
NG-50019	When the encoder is configured for AC4 passthrough audio, but the actual input is PCM, the output is lost and there is no alarm.	Workaround: Change the input source audio to AC4 and the output automatically recovers.
NG-50034	Source redundancy takes up to 5 minutes to trigger when source video underflows.	
NG-50630	UHD Transcoding (IPTV or OTT) with HDR Tone Conversion "Full" mode does not run in a stable fashion on XOS-4000 servers with Broadwell CPUs.	Workaround: Use the HDR Tone Conversion "BT.2408" mode as an alternative. The HDR Tone Conversion "Full" mode is not supported on XOS-4000 servers with Broadwell CPUs and UHD transcoding (IPTV or OTT).
NG-51259	The Automatic Alternate Source switching process takes up to 15s when 2022-6 contains OP47.	

NG-51778	PSX-12388	The "Divitrack not receiving STC Pool" alarm is asserted after changing the STC pool multicast with services running.	Workaround: Disable and enable the services to clear the alarm and return services to VBR. Output is still fine but services are in CBR.
----------	-----------	---	--

16 issues

5.3.4 XOS Multiplexing and Scrambling Known Issues

In this NMX release, there are no Known Issues for XOS Multiplexing and Scrambling features.

For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

5.3.5 XOS Packaging Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Rn Summary - Known	Release Note Information
NG-17809	Source redundancy may not work during the first few minutes after a service/ source/destination update.	The active input resets to the first source even if manually switched to the second during that period. After this period the socket switch request can be successfully reiterated.
NG-30305	After changing the Input Video bitrate in NMX the HLS manifest does not change as expected.	Workaround: Disable and then enable the channel when you change an HLS parameter (or any package parameter). This provokes a stop of all the packages belonging to the channel.
NG-51194	Redundancy Mode Active_Active is not working for OTT push-packaging from the SAG	
3 issues		

5.4 ProStream X Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Known	Release Note Information
PSX-11579	PSX-8785	Configuring the Device Redundancy to "Manual-Primary" results in the triggering of all services, and then those services move to the Backup source.	Workaround: Configure the device redundancy and then configure the VIPA.
PSX-11696	PSX-11399	A TS on ProStream XVM causes Overflow alerts on the NSG output.	
PSX-11699	PSX-10465	A PCR accuracy error occurs at the ProStream X output.	
PSX-11719	PSX-11114	The ProStream X device is failing after running for a few days.	Workaround: Add a 5 second delay between the RESTAPI commands. No alarms were displayed and the RESYNC function does not solve the problem.
PSX-11723	NMX-69433	Following an upgrade to NMX 8.7 and a NMX redundancy test, customer experiences missing descriptors on audio 2 services and those services are muted.	Workaround: Disabling and re-enabling the service via the Operator recovers the audio.
PSX-11727	PSX-9379	When ptpd is used with the IPv6 protocol, a validation error appears on each Apply that the configuration is not supported.	
PSX-11728	PSX-8927	When using an incorrect password for the TACACs Centralized mode, local and TACACs credentials are not accepted by the SAG.	Workaround: Stop the TACACs service to switch back to the local mode and correct the password.

PSX-11734	PSX-8912	With VoD sockets present, a redundant warning message about PCR is displayed when changes are saved.	
PSX-11751	PSX-5596	The ECMG values change to incorrect values after the SwitchOver automation is executed overnight.	Workaround: Delete the ECMG and re-configure it.
PSX-11754	PSX-11390	Customer cannot switch the Source of the Mirror from TS to PLP on IP and ASI.	Workarounds: For ASI: 1. Set Source TS to None (no need for Apply). 2. Drag the Master TS to the output Port. 3. Apply. For IP: 1. Delete output mirror socket. 2. Create new socket. 3. Drag the output TS to the new socket. 4. Apply.
PSX-11772	PSX-9640	After moving a service from one SCG to another, the CA descriptor is lost.	This issue only happens when the following conditions are met: * The CA descriptor location is PID * The PIDs are in different SCGs * Moving PID from one SCG to another in a single command.
PSX-11777	PSX-8578	ProStream X SAG device redundancy fails to boot due to missing HHP messages.	Recommendations: 1. Limit the load. Up to 7-7.5 G per input, same for output, per system. 2. HHPv1/2 (NMX and SA) DR must be configured on at least two interfaces without VIPA to be stable. The alarm "Redundancy missing msgs" is expected when VIPA + HHP are configured on the same interface. It is harmless if HHP has interfaces without VIPA.

PSX-11787	PSX-9887	The Unicast TS on backup port does not reach its destination when the TS is under VLAN, after switching the device to primary.	
PSX-11992	PSX-11990	[SA DR] Sometimes, on a reboot, the new Primary device doesn't output and for 2-3 minutes the old Primary device is active.	
PSX-12054		After downgrading to 2.9.8.0.407 and enabling the "Invalid Video ES Type" trigger, the "Bitrate (PID) Underflow" trigger becomes enabled.	
PSX-12196		The Mixed Platform feature is not working when HP is the Primary device and an Intel device is added as a Backup.	
PSX-12209		After disabling the standalone Device Redundancy on the Backup, and selecting the option of Clear Config, the ports and TSs are removed.	Workaround: Clear the configuration on the backup device. This error occurs when an ASI card is installed on PSX.
PSX-12292	PSX-12290	ProStream X gets a SID of -1 on the SCTE message.	
PSX-12312	PSX-12306	Customer reports that the T2MI stream is blocked by the transmitter due to the SFN delay that is too high.	

19 issues

5.5 Ellipse 3000 Known Issues

In this NMX release, there are no Known Issues for Ellipse 3000 features.

For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

5.6 ProStream 9100 Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Known	Release Note Information
AFR-43674	PSX-1652	The Scrambled service goes to Clear for a few seconds when jumping between input TS redundancy.	
AFR-43698		The ASI mirror does not show the correct reference to payload.	
AFR-43744	PSX-7259	The scrambling control group (SCG) from the external EIS is deleted after the SCG from NMX is provisioned.	Workaround: Configure first the internal EIS and then configure the external EIS.
AFR-43755		After upgrading from 17.7.6.0.124 to 17.7.8.0.200, the virtual IP address of the management port (MNG) is unresponsive.	After ProStream upgrade or reset the Virtual IP is not available until all of the cards have started and ProStream finishes loading. This can take ~5 minutes after the Physical IP is already up and running.
AFR-43757		ProStream 9K experiences an "ACE PID Xcoding Failure" alarm despite no error detected.	
AFR-43767		ProStream fails to process the TCP sequence correctly, resulting in an ECMG disconnection.	
AFR-43792		The PS9K device is detecting an incorrect configuration for the Juno card.	This is a system limitation; it cannot be fixed.
AFR-43794		Customer observes strange video effects after transcoding is enabled.	
8 issues			

5.6.1 Device Limitations for this Release

The following operation limitations are known for the ProStream 9100 device for this NMX release.

For complete information regarding device capabilities and limitations, please refer to product data sheets.

1. Splicing under NMX system:
 - a. Electra encoders and ProStream 9100 with Quad GbE cards for splicing applications are not supported on the same NMX map. Electra encoders and ProStream 9100 splicers should be configured in 2 different NMX maps.
2. Multiplexing capacity limitations:
 - a. Up to 400 output Transport Streams (any mixture of SPTS and MPTS) per device.
 - b. Up to 500 input services per GbE port.
 - c. Up to 20 ECMs per scrambled output service.
3. GbE IOM card:
 - a. Multicast of PIDs to GbE ports: ProStream 9100 can stream multiple instances of incoming PIDs to multiple output TSs, with different scrambling control parameters. When applying configurations of PID multicast over GbE output cards, the following must be enforced:
 - i. When (at least) one multicast PID exceeds 16 instances (duplications in one GbE output card) the total multicast bitrate is limited to 50Mbps. Otherwise there is no bit rate limitation.
 - ii. When using Fiber SFP modules, the GbE IOM does not stream output through its Tx connector until the Rx connector has a valid input link. To bypass this limitation, configure the relevant port to use the "Force Tx" mode. For further information, see NMX Online Help. This does not affect work with Copper SFP.
4. DiviTrack-over-IP-related limitations:
 - a. There is no limit regarding the number of GbE cards in the platform but DTolP function works only from Slot 1. All encoders must be connected to this card.
 - b. Up to 120 services may be supported per platform.
 - c. Up to 64 services may be included in a single DTolP pool.
 - d. Up to 3 pools may be provisioned in a single TS
 - e. Up to 14 DTolP pools may be provisioned on a single device.
 - f. A given service may be included in only one DTolP pool at any given time.
5. Encoders and ProStream 9100 with Quad GbE cards cannot be configured in the same map.
6. Scrambling-related limitations:
 - a. ProStream cannot detect the connection status with any EIS machine that is used for provisioning scrambling commands. Therefore, ProStream does not issue any alarm in case the connection between the device and the EIS is lost.
 - b. "Fast Crypto Period change" feature: the feature requires a short Delay start (less than 1 second).
 - c. When scrambling virtual channels (VCs), the following limitations apply:
 - i. All VCs that include a given shared elementary stream must be either scrambled or clear.
 - ii. A single SCG must be used for issuing the scrambling commands for all VCs that include a given shared elementary stream.

- d. When scrambling services with a common PMT PID, the option "CA Descriptor Managed by Scrambler" (in NMX preferences) may not be used.
 - e. Maintain consistency between the modes in which SCGs are provisioned (program level / PID level) and the configured location of CA descriptor. Mixing modes (e.g. SCG in PID level, CA descriptor in program level) may cause problems in the generation of the CA descriptor.
 - f. The extended SCS/ECMG protocol, which includes special messages related to SCS redundancy, may be operated only in the case of 1:1 hot SCS redundancy. It will not operate correctly in N:1 redundancy scenarios.
7. FEC-related limitations:
- a. For every FEC-enabled socket transmitted by the ProStream 9100 on UDP port X (where X is any valid UDP port number), two additional sockets are automatically transmitted, on UDP ports X+2 and X+4. This must be accounted-for when allocating UDP ports to streamed content.
8. VBR passthrough-related limitations:
- a. VBR passthrough when input PCR is not on ES is not supported.

5.7 ProView 7100 Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Known	Release Note Information
IRP-11481	IRP-11207	Firmware activation fails in IE, during an upgrade or a downgrade.	
IRP-11465	ZDC-3208	DMS: The system sometimes reboots after a DMS redundancy break.	
IRP-11240		A "Critical SW failure" alarm is raised while decoding a program with the wrong BISS key.	
IRP-11199		After upgrading with a decoder board, there may be false critical SW failure alarms.	Workaround: Reboot the device again and the alarm will be remitted.
IRP-11033	ZDC-3070	Re-insertion from VBI ES is supported only if the VBI PID is according to SMPTE-2038.	
IRP-10669		Decoder: HEVC does not recover after 60 hours of RF noise long-run.	
IRP-10444		After the upgrade from software version 3.x to 4.0, the user's customized passwords cannot be used.	
IRP-10410		Upgrading from ProView version 3.6/7 to 4.x while ProView devices are in N:1 redundancy (under NMX) might be service affecting for 2 minutes.	Workaround: Stop the redundancy and only then perform the upgrade. Once all devices are in version 4.x, restore the redundancy.
IRP-10343		Upgrade to software version 4.0 or higher can only be performed from software version 3.6 or higher.	

IRP-10321		NMX: Device redundancy does not work when one device runs on software version 4.x and another on version 3.x.	
IRP-10305		Preset files from software version 3.x cannot be downloaded to software version 4.0.	All presets in software version 4.0 are XML-based.
IRP-10108		When using more than 1 program with a common PMT on the TS output (Multiplex mode), a PMT PID conflict occurs.	
IRP-9787		SCTE-104 is not inserted on lines 22 and 23.	
IRP-9621	ZDC-1261	Web GUI: There is no indication that TDT/TOT is present in the stream on the output multiplexer.	
IRP-9574	ZDC-2105	It is not possible to set the language on the BISS Aston Pro CAM through the web GUI.	
IRP-9436		Seamless switching does not work when IP IN is configured without de-jittering.	
IRP-7631		The decoder blanking mode "Bar" is not displayed on HDMI output.	
IRP-7315		The SDI audio groups work with an audio sample rate of 48 kHz only.	
18 issues			

5.8 ProView 8100 Known Issues

The following known issues remain in this release. For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

Key	Multi Branch Parent	Rn Summary - Known	Release Note Information
ZDC-3527		Failure to upgrade to versions with new Zixi lib from versions below 1.5.0.	Workaround: Before upgrading to 1.5.4 or 1.6, upgrade to any 1.5.X version first.
ZDC-3506		Configuration changes on any RF port affect the LNB configuration, regardless of the LNB selected port.	
ZDC-3502	IRP-11624	SCTE-35 to SCTE-104 conversion does not work with duration above 6553 seconds.	
ZDC-3355		Upgrade from version lower than 1.3.5 to version 1.5 via DMS fails.	Workaround: Reboot the device before upgrading.
ZDC-3193	IRP-11270	The decoder does not support H. 264 with picture structure MBAFF.	
ZDC-2110		The MMI session does not close when the MMI dialog box is closed, during its session initialization.	Workaround: The CAM should be reset to close the MMI session.
ZDC-1967		ProView 8100, model 8110: Although this model only supports analog audio processing type formats, the GUI also shows digital audio processing types.	
ZDC-1794		Web GUI: A few parameters, such as PAT, CAT, PMT, and SDT tables, are not displayed in the Logical output after changing the display mode to Table View.	

ZDC-1407 A "Program Descrambling Failure" alarm is raised on the decoder configured to 'Automatic' and 'CA Device=None' when the same program is also configured to the output as multiplex.

ZDC-1142 Web GUI: The error message "PID Conflict may occur in the output" does not appear.

ZDC-792 The decoder cannot decode HD AVC video with a bitrate higher than 40 Mbps.

ZDC-40 The Carrier Frequency label isn't updated according to the selected LNB frequency band.

12 issues

6 Resolved Security Issues

The following section contains resolved security issues that were made for this NMX release. The security issues are listed per product.

6.1 NMX Resolved Security Issues

The following resolved security issues are included in this release of NMX.

Key	Rn Summary - Resolved
NMX-69847	A vulnerable cipher (TLS_RSA_WITH_AES_128_CBC_SHA) was still enabled in latest recovery images (1.5).
NMX-70247	The HLAutomationProcess memory expanded up to 50GB due to a SecurityScan attack.
2 issues	

6.1.1 Security Changes to the NMX Recovery Image

The security changes to the NMX Recovery Image are included here for reference.

Version 1.6

Security Vulnerability	Comments
Ensure the sa Login Account is set to 'Disabled'	A new administrative user sqlroot is created with same password as original sa user. Going forward this user should be used for all SQL administrative activities including those originating from NMX (eg: catalog management).
Ensure the sa Login Account has been renamed	
Ensure no login exists with the name sa	
Ensure 'Interactive logon: Number of previous logons to cache (in case domain controller is not available)' is set to '4 or fewer logon(s)' (MS only)	

Security Vulnerability	Comments
Ensure 'Audit Account Lockout' is set to include 'Failure'	
Ensure 'Audit Group Membership' is set to include 'Success'	
Ensure 'Audit Other Logon/Logoff Events' is set to 'Success and Failure'	
Ensure 'Audit Special Logon' is set to include 'Success'	
Ensure 'Audit Detailed File Share' is set to include 'Failure'	
Ensure 'Audit File Share' is set to 'Success and Failure'	
Ensure 'Audit Other Object Access Events' is set to 'Success and Failure'	
Ensure 'Audit Removable Storage' is set to 'Success and Failure'	
Ensure 'Audit Authorization Policy Change' is set to include 'Success'	
Ensure 'Audit MPSSVC Rule-Level Policy Change' is set to 'Success and Failure'	
Ensure 'Audit Other Policy Change Events' is set to include 'Failure'	
Ensure 'Turn off Microsoft Peer-to-Peer Networking Services' is set to 'Enabled'	
Ensure 'Require user authentication for remote connections by using Network Level Authentication' is set to 'Enabled'	

Security Vulnerability	Comments
Ensure 'Set time limit for active but idle Remote Desktop Services sessions' is set to 'Enabled: 15 minutes or less'	Any RDP session which is idle for over 15 minutes will be disconnected. If required, user can change this using gpedit.msc and going to: <i>Local Computer Policy->Computer Configuration->Administrative Templates->Windows Components->Remote Desktop Services->Remote Desktop Session Host->Session Time Limits</i>
Ensure 'Set time limit for disconnected sessions' is set to 'Enabled: 1 minute'	Any disconnected session is closed after 1 minute. When a session is closed, all applications open on the session are also closed. If required, user can change this using gpedit.msc and going to: <i>Local Computer Policy->Computer Configuration->Administrative Templates->Windows Components->Remote Desktop Services->Remote Desktop Session Host->Session Time Limits</i>
Ensure 'Manage preview builds' is set to 'Enabled: Disable preview builds'	
Ensure 'Select when Preview Builds and Feature Updates are received' is set to 'Enabled: Semi-Annual Channel, 180 or more days'	
Ensure 'Turn off Help Experience Improvement Program' is set to 'Enabled'	

6.2 Electra X/X2/XVM Resolved Security Issues

The following resolved security issues are included in this release of NMX.

Key	Rn Summary - Resolved
ACP-15551	A vulnerability was discovered when a home directory had a permission mode above 750.
ACP-15536	"HTTP reply code" vulnerability discovered and fixed.
ACP-15522	"SSH protocol (public key too small)" vulnerability discovered and fixed.
ACP-15521	"Deprecated Public Key length" vulnerability discovered and fixed.
ACP-15518	Session Cookie Does Not Contain the 'Secure' Attribute vulnerability discovered and fixed.
ACP-15504	Security vulnerabilities resulting from no support for Nginx 1.16.x have been solved by updating to the latest Nginx version.

6 issues

6.3 XOS Appliance Resolved Security Issues

In this NMX release, there are no Resolved Security Issues for XOS Appliance features.

For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

6.4 ProStream X Resolved Security Issues

In this NMX release, there are no Resolved Security Issues for ProStream X features.

For specific known issues in earlier releases, refer to the archived release notes at: C:\Program Files\Harmonic\Documents\Archive_Release_Notes.

7 H/W and F/W Compatibility

7.1 Supported Devices

7.1.1 Supported Harmonic Devices

For a complete list of devices and software releases managed by your NMX installation, refer to the C:\Program Files\Harmonic\Release_Notes\manifest.txt file installed with your NMX release package.

⚠ Important!

Whenever you upgrade your device hardware, you will need to re-create the devices in your NMX network map and service maps. Delete old devices and services from your network and service maps and re-create them with the correct device type.

⚠ Important!

Important! If you have an existing Electra X2S installation and want to upgrade to this NMX version, please contact Harmonic Technical Support.

⚠ Important!

GRID is not packaged with NMX 8.5.0. To obtain the latest version, please contact Harmonic Customer Support.

Device	Type	Version
NMX	Network Management System	9.0.0.0.22
Electra X2S	Statmux in a box	9.0.0.0.22 1.17.0.0.40 2.9.9.0.539
Electra X	Encoder	1.17.0.0.40

Device	Type	Version
Electra XVM	Virtual Encoder	1.17.0.0.40
Ellipse 3000	Encoder	3.3.5.0.76
ProStream 9100	Stream Processor	17.7.8.0.284
ProStream X/XVM/Docker	Stream Processor	2.9.9.0.539
ProView 7100	Integrated Receiver-Decoder	4.3.5.0.88
ProView 8100	Integrated Receiver-Decoder	1.5.3.0.55
SMD 9200	Modulator	3.0.0 3.2.1
SMD 9300	Modulator	M6100_1.4.2.38683 M6100_1.4.11.47223
ProStream 3600	Modulator	v2.30 Nov 9 2009 10:41:37 v8.41 May 25 2012 12:53:38
XOS Appliance	Receiver/Processor	1.15.0.0.023 (ISO,BIN) 1.15.0.0.10 (RPM) 1.15.0.0.74 (vos_bundle)

Other Supported Harmonic Devices

Tested vs. Supported Versions

NMX supports all the subsequent patches for versions listed under "Supported Versions," but QA tests only the specific versions listed under "Tested Versions."

Device	Type	Tested Versions	Supported Patch Versions
Amethyst III	ASI or IP Smart Switch	02.00.01 02.22.02 02.22.03 02.22.05 02.22.06	02.00.xx 02.22.xx
ProSwitch	ASI or IP Smart Switch	01.00.00 01.10.00 01.20.00 01.30.00 02.00.00	01.00.xx 01.10.xx 01.20.xx 01.30.xx 02.00.xx
NetProcessor 9030/9040	T2-gateway function	05.00.03 05.11.00	05.00.xx 05.11.xx
Electra VS	Encoder / Transcoder	05.00.01 05.10.04 05.11.04 05.12.00 05.14.00	05.00.xx 05.10.xx 05.11.xx 05.12.xx 05.14.xx
Electra XT	Dense Transcoder	02.00.01 02.50.00 02.60.01 02.61.00 02.62.00 02.64.00 02.70.03 02.71.00 02.80.00 02.90.00	02.00.xx 02.50.xx 02.60.xx 02.61.xx 02.62.xx 02.64.xx 02.70.xx 02.71.xx 02.80.xx
ViBE CP9000	Contribution encoder	02.00.00 02.10.00	NA
RD9000	Contribution decoder	01.5.0 01.7.0 01.8.0 01.9.0 01.10.0	NA

Device	Type	Tested Versions	Supported Patch Versions
Spectrum XE	Compressed Layout	02.10.00 2.50.02.006 3.00.01.020 03.10 03.20 03.40 03.50 03.60 03.70 03.80	02.10.xx 02.50.xx 03.00.xx 03.10.xx 03.20.xx 03.40.xx 03.50.xx 03.60.xx 03.70.xx 03.80.xx

7.1.2 Supported Third-Party Devices

The following third-party products are **supported** in this NMX release:

Device Type	Vendor / Family in NMX	Model	Supported Firmware
Ad Insertion	Vigor	Advertio	
Baseband Router	(GV) Snell (Probel SWP-02 protocol)	Sirius 800	
Baseband Router	(GV) Snell (Probel SWP-02 protocol)	Sirius 600	
Baseband Router	(GV) Snell (Probel SWP-02 protocol)	Pyxis	SDC Na-00743 SW-P-02 over IP
Baseband Router	(GV) Snell (Probel SWP-02 protocol)	Halo	SC12 V1.10 LARGE
Baseband Router	(GV) Snell (Probel SWP-02 protocol)	Cygnus	
Baseband Router	(GV) Snell (Probel SWP-02 protocol)	Freeway	SC12 V1.10 LARGE
Baseband Router	UTAH (Probel SWP-02 protocol)	100/UDS	v 02.03

Device Type	Vendor / Family in NMX	Model	Supported Firmware
Baseband Router	(GV) Snell (Probel SWP-02 protocol)	Vega (100 series)	Controller v3.17.1.6093 Vega Routing v3.17b.31
Baseband Router	(GV) Miranda (NV9000 controller with NP0017 protocol)	NVision 8576	v 4.4.0, v 4.6.2
Baseband Router	(GV) Miranda (NV9000 controller with NP0017 protocol)	NVision 8256	v 4.4.0, v 4.6.2
Baseband Router	(GV) Miranda (NV9000 controller with NP0017 protocol)	NVision 5128	v 4.4.0, v 4.6.2
Baseband Router	Nevion (MRP protocol)	Vikinx Sublime (Video only)	v2.7.2
Baseband Router	Nevion (MRP protocol)	VikinX Sublime X2	v6.1.1
Baseband Router	Harris/Imagine (Leitch Pass Thru protocol)	Panacea	v 1.46
Baseband Router	Harris/Imagine (Leitch Pass Thru protocol)	Platinum	v 4.x
Baseband Switch	Harris/Imagine (Leitch Pass Thru protocol)	Platinum VX	v1.3.8
Baseband Router	Harris/Imagine (Leitch Pass Thru protocol)	Integrator	v 4.46
Baseband Router	Harris/Imagine (Leitch Pass Thru protocol)	Leitch Xplus	
Baseband Router	Harris/Imagine (Leitch Pass Thru protocol)	Leitch HD	
Baseband Switch	DEV	DEV 1951	32-0037 S.01
Baseband Router	Evertz (Quartz protocol)	EQX family (10 and 26 at least)	1 0 88

Device Type	Vendor / Family in NMX	Model	Supported Firmware
HIM (Harmonic Infrastructure Manager)	Red Hat Ansible Tower	Ansible AWX	1.10.0.0.3
IP Switch	Cisco switches are listed in the next section.		
Modulator	Radyne	DM240XR-100S-A	F 05377-Y
Modulator	Radyne	DM240XR-100S-LBAND	
Modulator	Radyne	DM240XR-200S	
Modulator	Radyne	DM240XR-200S-A	
Modulator	Radyne	DM240XR-200S-LBAND	
Modulator	Radyne	DM240XR-300S	
Modulator	Radyne	DM240XR-300S-A	
Modulator	Radyne	DM240XR-300S-LBAND	
Modulator	Sencore	ASM988A	
Modulator	Newtec	MCX7000	v2.5.1
Modulator	Newtec	M6100	v2.11.6
Other	Keepixo	AL2000	3.3.r62572
Other	Asentria/Omnitronix GPI box	S410	HAR312G
Other	Asentria/Omnitronix GPI box	SL 10	HAR312G
Other	W&T GPI box	57730	v1.44

Device Type	Vendor / Family in NMX	Model	Supported Firmware
Other	Nevion/TVIPS	CP 541/TNS 541/TNS 544	1.0.21 2.4.0 2.8.0
Other	Nevion/TVIPS	CP 515/TNS 515	4.0.38
Other	Enensys	NN6 – T2 Gateway	v 2.7.7
Other	Enensys	NN6 – T2 Gateway - IP	3.6.3
Other	Enensys	HDm Smart Gate T2 Gateway	v3.10.1
Other	Enensys	NN6- MIP inserter	v 3.4.7
Other	Enensys	HDm Smart Gate T (MIP inserter)	v4.1.6
Other	Enensys	ASI Guard	v 2.1.1
Other	Enensys	IPGuardE2	1.3.1
Other	Enensys	IPGuard v2	2.7.3
Other	Grass Valley A/B Switch	8972PX	
Other	MIT-xperts	iSIMS	2021.1.0
Other	MIT-xperts	iMUX	2021.1.0
Other	QBit radio encoder	QBit 561	v2.250
Receiver	Motorola	DSR 4410	0000c8:007924:00019E
Receiver	Cisco/SA	D9650	v 2.33
Receiver	Cisco/SA	D9850	v 2.33
Receiver	Sencore	MRD 3187A – 1Ch	v 6.1.0-v 6.2.1

Device Type	Vendor / Family in NMX	Model	Supported Firmware
Receiver	Sencore	MRD 3187B – 1 Ch	v 7.3.1
Receiver	Sencore	MRD 3187A – 2 Ch	v 6.1.0-v 6.2.1
Receiver	Sencore	MRD 3187B – 2 Ch	v 7.3.1
RF Switch	Newtec	USS0202 / USS0212	v2.4.8 v3.4.8
RF Switch	Quintech	SRM 2150	v 2.75
RF Switch	Quintech	SRM 200	v 2.75
RF Switch	Quintech	SRR 070	v 1.58
RF Switch	Quintech	QRM 2500	Fv4.49
RF Switch	Universal	10943B-D485 (L-band)	v 1.01
RF Switch	Universal	10942B-D485 (IF-band)	v 1.01
RF Switch	Universal	10943B-SE10-4 (L-band)	2.01 2.02
RF Switch	Universal	10942B-S3E10 (IF-band)	2.01 2.02
Time Server	NTP Time Server Monitor	Meinberg	v 1.04

Cisco Switches Support

For monitoring purposes, NMX supports the following Cisco Catalyst and Nexus switches family generically, i.e., in the following model/option combinations and OS versions:

- Cisco Catalyst 2960, 3560, 3650, 3750 and 3850
- Cisco Catalyst 4948, 4500 and 6500 series
- Cisco Catalyst 9200, 9300 and 9500 series
- Cisco Nexus 9000 series: only models 9372PX-E, 9372TX-E, 93180YC-EX and 9372PX

All new deployments requiring the use of the Cisco switches listed here should be declared in NMX as Cisco Catalyst 1RU, Cisco Catalyst modular or Cisco Nexus.

Due to the many Cisco models with respective port/uplink options and different versions of the Cisco OS, be advised that all combinations have not been tested, but are supported for generic implementations. Report any deployment difficulties to Harmonic Tech Support. Note that NMX does not support upgrading firmware for generic or legacy Cisco switches.

If your deployment requires NMX to monitor port-level alarms on the switches, install one of the following legacy Cisco switch models (declared as Cisco Legacy), which have the appropriate firmware:

Device Type	Vendor	Model	Supported Firmware
IP Router	Cisco	Catalyst 3750_24TS 24 ports Catalyst 3750G-24TS 24 port+ 4 uplinks Catalyst 3750-48TS 24 ports	v 12.2(35)
IP Router	Cisco	Catalyst 4948 48 ports Catalyst 4948 48 ports + 4x1G uplinks	v 12.2(25)EWA v 12.2(53)SG8
IP Router	Cisco	Catalyst 6500 Series	v 12.2(18)SXF17a
IP Router	Cisco	Catalyst 3750x 24 ports Catalyst 3750x 24 ports + 4x 1G uplinks Catalyst 3750x 24 ports + 4x 1G & 2x10G uplinks Catalyst 3750x 48 ports Catalyst 3750x 48 ports + 4x 1G uplinks Catalyst 3750x 48 ports + 4x 1G & 2x10G uplinks	v 12.2(55)SE3(UNIVERSALK9)
IP Router	Cisco	Catalyst 3560x 24 ports Catalyst 3560x 24 ports +4x 1G uplinks Catalyst 3560x 24 ports + 4x 1G & 2x10G uplinks Catalyst 3560x 48 ports Catalyst 3560x 48 ports +4x 1G uplinks Catalyst 3560x 48 ports + 4x 1G & 2x10G uplinks	v 12.2(55)SE5(UNIVERSALK9)

Device Type	Vendor	Model	Supported Firmware
IP Router	Cisco	Catalyst 3850_48T 48 ports Catalyst 3850_48T 48 ports + 4x 1G uplinks Catalyst 3850_48T 48 ports + 4x 10G uplinks Catalyst 3850_48T 48 ports + 2x 1G & 2x 10G uplinks	03.02.03.SE
IP Router	Cisco	Catalyst 3650_24TS	03.07.02E

You must always use the Cisco switch CLI, GUI or equivalent tools to configure the switch before installing it in the NMX network.

7.2 Unsupported Devices

7.2.1 Unsupported Harmonic Devices

The following table lists the Harmonic devices that have reached their End of Service (EOS) with their corresponding NMX release.

NMX Release	Devices No Longer Supported
9.0.x	Electra 9200
8.5.x	- Electra 8100/8200/8300 - ProMedia X Origin - Iris
8.2.x	- ProMedia Live - ProMedia Package - ProMedia Origin 1.x - ProStar
8.0.x	- ProStream 1000 - Ion Encoder - Audio Encoder - Ion AVC HD - Ion AVC SD - Electra 1000 - Electra 5000 - Electra 5400 - Electra 7000 - ProView 2900
7.8.x	- Ion AVC SD - Ion AVC HD - Electra 1000
7.6.x	bNSG
7.3.x	- Ellipse 1000 - Ellipse 2000

NMX Release	Devices No Longer Supported
6.x	• ProStream 1000 Mentor • ProStream 1000 256M Platform • ASI-RMX card (unsupported beginning with NMX 7.0) • ProStream 2000 Digital Splicer • ProStream 4000 Multiscreen Transcoder • ProStream 8000 IP Digital Mosaic System • NSG (8108, 9116, 9000-3G/6G/40G) Universal EdgeQAM • MV encoders • MN 20 • BNG Multiplexers and EdgeQAMs • Optical Transport Devices • DDM • Terayon CherryPicker

Note:

NMX 7.0 no longer supports ProStream 1000 devices with ASI-RMX cards; replace your ASI-RMX cards with ASI-SCR cards before upgrading to NMX 7.0.

NMX will not upgrade catalogs with ProStream 1000 devices with ASI-RMX cards. To upgrade to NMX 7.0 from earlier releases, see the [NMX_InstallGuide.pdf](#).

Note:

The Electra 8310 series with multi-screen services only is not supported; it can only be used in conjunction with a 60 Hz Broadcast service.

7.2.2 Unsupported Third-Party Devices

No third-party device support was dropped from this NMX release.

7.3 NMX Recovery Image Versions and Compatibility

The purpose of NMX Recovery Image updates is to deliver NMX servers and OVA with the up to date Windows patches and other security hardening. These images are available to customers for already deployed systems to take advantage of this hardening, without obligation to upgrade to the latest NMX software. The version number of the recovery image is available in the file c:\Utilities\Version.txt of the NMX server (latest version of the history).

Note:

The NMX recovery images do not apply on custom hardware (i.e., a server provided by the customer). A specific setup procedure provided in the NMX Installation Guide must be performed instead.

7.3.1 Notes on Updating the NMX Recovery Image

Customers can also update the Windows Server 2019 image on their deployed NMX servers without applying the new recovery image. A section has been added in the NMX Install Guide that details the procedure to update your existing image (starting with NMX v8.9 / image v1.5) to same level as the latest recovery image.

The Windows updates validated with NMX can be installed directly on NMX server (or through a WSUS server), but **we strongly recommend using the latest NMX Recovery Image**.

Beginning with NMX 8.9, the Python version included with NMX has been upgraded from v2.7 to v3.9. Python scripts created and used in previous NMX releases may not run in 8.9 and should be converted.

Every NMX recovery image since WS2012 image v2.6 comes with the User Account Control (UAC) enabled by default for increased security. Since NMX client applications, like NMX Operator, require Windows Administrator privileges, this can cause the appearance of warning messages each time you launch these applications on the NMX server. To prevent these messages from being generated, you must change the Windows UAC setting. Consult the Windows Server documentation for details.

7.3.2 NMX Recovery Images

ISO images can be found in the "NMX Recovery Image" page of Harmonic Software Download Portal. This section contains lists of the supported image versions, and their compatibility with NMX software and hardware platforms provided by Harmonic.

Windows Server 2019

NMX 8.5 and later releases require Windows Server 2019 (WS2019). The upgrade procedure from WS2012 to WS2019 recovery image is provided in NMX 8.5 Installation Guide.

Please note that the high security policy is enforced by default in this image (you can change it after the first time you log in), with the following rules:

- On first Windows login, user is forced to change the default password
- Complex password rule is enforced
- Password expiration is set to 90 days
- When changing a password, the 12 previous passwords are forbidden

Please also note that NMX 8.4 and earlier releases are not supported on WS2019.

 Note:

From recovery version 1.5 onward, the **Allow Remote Shell Access local computer policy** will remain **Disabled** to follow **CIS Security Benchmark Compliance**. If you need to install an active directory, or any other server role that requires this policy to be enabled, then you must enable it manually.

Version	Date	Changes	NMX Version Information
1.6	03/31/2021	• Installed Windows security updates till date • Installed updates for other Microsoft products till date • Windows security settings reinforced to comply to additional items of CIS benchmarking. As part of them, idle RDP connections will now disconnect in 15 minutes. • The sa user of SQL server has been disabled and replaced by a new user name (see NMX Install Guide).	Released with 9.0.0.0 GA Min NMX version: 8.5.0

Version	Date	Changes	NMX Version Information
1.5	12/15/2020	• Installed Windows security updates till date • Installed updates for other Microsoft products till date • Windows security settings reinforced to comply to most items of CIS benchmarking. In particular, Remote Shell Access is disabled by default (must be enabled if Active Directory is required) • Some vulnerability fixes (see § Resolved Security Issues)	Released with 8.9.0.0 GA Min NMX version: 8.5.0
1.4	08/18/2020	• Installed Windows security updates till date 8/18 • Installed updates for other Microsoft products till date 8/18 • Installed .Net 4.8 framework • Added Adobe Acrobat Reader DC tool in NMX OVA	Released with 8.8.0.0 GA Min NMX version: 8.5.0
1.3	05/27/2020	• Installed Windows security updates until May 2020 • Installed updates for other Microsoft products until May 2020 • Disabled static key ciphers which are potentially vulnerable to security risks	Released with 8.7.0 GA Min NMX version: 8.5.0
1.2	03/12/2020	• Installed Windows security updates until March 2020 • Installed updates for other Microsoft products until March 2020 • Installed the required drivers/software from the Gen10 Service Pack for ProLiant (SPP) applicable for the HPE servers	Released with 8.6.0 GA Min NMX version: 8.5.0

Version	Date	Changes	NMX Version Information
1.1	12/06/2019	• Support for Windows Server 2019 and SQL Server 2017 • Installed Windows security updates until November 2019 • Installed updates for other Microsoft products until November 2019 • Changes related to the Windows security policy	Released with 8.5.0 LA and GA Min NMX version: 8.5.0

Windows Server 2012 R2 (Only supports NMX 8.4 and earlier releases.)

From NMX 8.4.x onward, TLS 1.0 has been disabled for security reasons. If a downgrade to an earlier release of NMX is required, TLS 1.0 must be manually enabled before the downgrade for NMX to work correctly. Please contact Harmonic Customer Support for this specific operation.

Version	Date	Changes	NMX Version Information
3.2	10/14/2020	• Installed Windows security updates till date (10/14/2020) • Installed updates for other Microsoft products till date (10/14/2020)	Released - Standalone Min NMX version: 7.8.2.0 NOTE: Only OVAs are created.
3.1	03/04/2020	• Installed Windows security updates till date (03/04) • Installed updates for other Microsoft products till date (03/04)	Released without NMX version Min NMX version: 7.8.2.0
3.0	11/22/2019	• Installed Windows security updates till date (11/22) • Installed updates for other Microsoft products till date (11/22) • Fixed the issue related to the Dell R230 server support (NMX-66334)	Released with 8.4.2 Min NMX version: 7.8.2.0

Version	Date	Changes	NMX Version Information
2.9	08/21/2019	- Added support for HPE DL360 Gen10 platform (excluding HW alarm monitoring) - Installed Windows security updates till date (8/21) - Installed updates for other Microsoft products till date (8/21), in particular SP3 of SQL server 2014 which is required for NMX 8.4	Released with 8.4.0 (see the note above) Min NMX version: 7.8.2.0
2.7	07/09/19	- Installed Windows security updates till date (05/20) - Installed updates for other Microsoft products till date (05/20) - Changes to pre-configure the server for Ansible	Released with 8.3.0 Min NMX version: 7.8.2
2.6	03/26/19	- Installed Windows security updates till date - Installed updates for other Microsoft products till date Enabled Windows Firewall	Released with 8.2.0 Min NMX version: 7.8.2
2.5	01/02/19	- Installed Windows security updates till date - Installed updates for other Microsoft products till date - Disabled Elasticsearch service by default	Released with 8.1.0 Min NMX version: 7.8.2

Version	Date	Changes	NMX Version Information
2.4	11/20/18	• Installed Windows security updates till date • Installed updates for other Microsoft products till date • NMX-62897: Microsoft Internet Explorer Security Update for September 2017 • NMX-62893: Microsoft Visual Studio Security Update for July 2018 – KB4336919 • NMX-62891: Microsoft Security Update for SQL Server (ADV180002) (Spectre/ Meltdown) – KB4056898 • NMX-62887: Microsoft Internet Explorer Cumulative Security Update (MS15-124) – KB3104002 • NMX server hardening requirements to comply to CIS benchmarks standard. • Installed Elastic Search and Kibana	Released with 8.1.0 Min NMX version: 7.8.2
2.2	09/13/18	• Installed Windows security updates till date • Installed updates for other Microsoft products till date • Fixed vulnerabilities detected by Qualys scan	Released with 8.0.1.0 Min NMX version: 7.5.0
2.1	07/30/18	• Installed Windows security updates till date • Changes to reduce the size of the recovery image	Released with 8.0.0 Min NMX version: 7.5.0
2.0	06/22/18	• Installed Windows security updates till date	Released with 8.0.0 Min NMX version: 7.5.0

Version	Date	Changes	NMX Version Information
1.9	03/16/18	Installed Windows security updates till date	Released with 7.8.2.0 Min NMX version: 7.5.0
1.8	12/01/17	Installed Windows security updates till date	Released with 7.8.0.1 Min NMX version: 7.5.0
1.7	08/30/17	- NMX-59662 Added Intel video driver - NMX-59696 Cleared default windows product key to prevent licensing issues	Released with 7.8.0.0 Min NMX version: 7.5.0
1.6	07/27/17	- Added support for Dell R230 XL Server - Installed Windows security updates till date	Released with 7.7.2.0 Min NMX version: 7.5.0
1.5	06/05/17	- Installed Windows security updates till date - Installed Windows security patch for WannaCry Ransomware	Released with 7.6.3.0 Min NMX version: 7.5.0
1.4	10/13/16	- Updated DTC settings for GRID server - Installed driver for NMX server front panel - Installed Windows security updates till date	Released with 7.5.4.0 Min NMX version: 7.5.0
1.3	02/19/16	- Applicable to Intel Wildcat, Dell R620 and Dell R230 servers. - Fixed the issue of duplicate device SN ID.	Released with 7.5.0.0 Min NMX version: 7.5.0

8 Hardware Platforms

8.1 Supported Hardware Platforms

This NMX release is supported on the following hardware server platforms provided by Harmonic:

Harmonic Part Number	Configuration
NMX-HWP-3G-A	• HPE DL360 Gen10 • 2 x Xeon Silver 4208 (2.1GHz) • 64GB RAM • 2 x 480GB SSD drive in RAID1 • 4 x 1GbE ports • Dual power supply, Hot swappable • WS2019 / SQL Server 2017 • Downgrade to WS2012 / SQL Server 2014 required for NMX < 8.5. • Win2019-Recovery-Image_v1.1 or higher • Win2012-Recovery-Image_v2.9 or higher (NMX < 8.5).
NMX-HWP-3F-A NMX-HWP-3F-B	• INTEL Wildcat Pass R1304WT2 • 2 x 2.4GHz Intel Xeon E5-2620v3, 6 cores, 15M Cache • 16GB RAM (NMX-HWP-3F-A) or 32 GB (NMX-HWP-3F-B) • 480 GB SSD • 4 x 1GbE Ports • Dual power supply, Hot swappable • Upgrade to WS2019 / SQL Server 2017 required for NMX 8.5. • Upgrade of NMX-HWP-3F-A to 32GB required for NMX 8.5. • Win2019-Recovery-Image_v1.1 or higher. • Win2012-Recovery-Image_v1.3 or higher (NMX < 8.5).

Harmonic Part Number	Configuration
NMX-HWP-2F-A	DELL R230 XL • 1X 3.0 GHz Intel Xeon E3-1220v5, 4 cores, 8M Cache • 8GB RAM - 16GB RAM starting with Rev B (2/2019) • 2 x 500 GB 7200 rpm RAID1 HDD (Mirror) - 2 x 1 TB RAID1 HDD starting with Rev A (3/2018) • 2 x 1GbE Ports • Single power supply • Upgrade to WS2019 / SQL Server 2017 required for NMX 8.5. • Upgrade to 32GB required for NMX 8.5. • Win2019-Recovery-Image_v1.1 or higher. • Win2012-Recovery-Image_1.6 or higher (NMX < 8.5)
NMX-HWP-3F1-A	Same as NMX-HWP-3F-A (but delivered with WS2008). • Upgrade to WS2019 / SQL Server 2017 required for NMX 8.5. • Upgrade to 32GB required for NMX 8.5. • Win2019-Recovery-Image_v1.1 or higher. • Win2012-Recovery-Image_1.6 or higher (NMX < 8.5)

Note: the server can also be a custom hardware platform provided by customer. In such case, the platform and OS must comply to minimum requirements described in the NMX Installation Guide. The NMX recovery images don't apply on custom hardware, a specific setup procedure provided in the NMX Installation Guide must be performed,

8.2 Unsupported Hardware Platforms

This NMX release is not supported on the following server platforms:

Part Number	Configuration
DELL11P4-PRO	Dell 860, 1GB RAM, Win 2000 Pro, SQL
DELL11P4-SQL-S	Dell 860, 1GB RAM, Win Svr 2000, SQL 2000
R-DELL11P4-SQL-S	Dell 860, 1GB RAM, Win Svr 2000, SQL 2000
DELL11P4-SQL-S-4	Dell 860, 1GB RAM, Win Svr 2003, SQL 2008
DELL12PX-SQL-S-01	Dell 1950-III, 4GB RAM, Win Svr 2003, SQL 2000
DELL12PX-SQL-S-2K	Dell 1950-III, 4GB RAM, Win Svr 2000, SQL 2000
DELL12PX-SQL-S-3-01	Dell 1950-III, 4GB RAM, Win Svr 2000, SQL 2000
R-DELL12PX-SQL-S	Dell 1950, 2GB RAM, Win Svr 2000, SQL 2000
NMX-HWP-2D-A	Dell R200, 2GB RAM, Win 2003, SQL 2000
NMX-HWP-2D-B	Dell R200, 2GB RAM, Win 2003, SQL 2000
NMX-HWP-3D-B	Dell R610, 4GB RAM, Win Svr 2003, SQL 2000
NMX-HWP-3D-D	Dell R610, 4GB RAM, Win Svr 2003, SQL 2000
DELL11P4-SQL-S-2K	Dell 2950, 2GB RAM, Win Svr 2000, SQL 2000
HWP-DELL-2D-NMX-A	Dell R210, 4GB RAM, Win Svr 2003, SQL 2008
HWP-DELL-2D-NMX-D	Dell R210, 4GB RAM, Win Svr 2003, SQL 2008
NMX-HWP-2D-A-01	Dell R210, 4GB RAM, Win Svr 2003, SQL 2008

Part Number	Configuration
NMX-HWP-2D-D	Dell R210, 4GB RAM, Win Svr 2003, SQL 2008
NMX-HWP-2D-E	Dell R210, 4GB RAM, Win Svr 2003, SQL 2008
DMS-HWP-3D-A	Dell R610, 4GB RAM, Win Svr 2003, SQL 2008
HWP-DELL-3D-NMX-A	Dell R610, 4GB RAM, Win Svr 2003, SQL 2008
HWP-DELL-3D-NMX-D	Dell R610, 4GB RAM, Win Svr 2003, SQL 2008
NMX-HWP-3D-A	Dell R610, 4GB RAM, Win Svr 2003, SQL 2008
NMX-HWP-3D-A-02	Dell R610, 16GB RAM, Win Svr 2003, SQL 2008
NMX-HWP-3D-D	Dell R610, 16GB RAM, Win Svr 2003, SQL 2008
HWP-DELL-2E-NMX-A	DELL R210-II , 8GB RAM, Win Svr 2008, SQL 2008
HWP-DELL-2E-NMX-C	DELL R210-II , 8GB RAM, Win Svr 2008, SQL 2008
HWP-DELL-3E-NMX-A	DELL R620 , 16GB RAM, Win Svr 2008, SQL 2008
HWP-DELL-3E-NMX-C	DELL R620 , 16GB RAM, Win Svr 2008, SQL 2008

9 NMX Sizing and Scalability

9.1 Recommendations

This section provides information on sizing limits and scalability of NMX software, running on the high-end hardware platform (NMX-HWP-3F-A). It does not cover the sizing and performance of devices managed by NMX.

9.1.1 Maximum Recommended Figures

NMX does not artificially limit the number of devices, streams, clients, GUIs, etc., that can be operational at any given time; the limits in NMX scalability are related to the resulting performances. This allows NMX to support as many of these components as possible given the customers network, network bandwidth, server performance, etc. These limits can also depend on what the customer considers acceptable for their environment. For example, one criterion is the NMX Domain Manager startup time; the startup time must be less than 5 minutes in Harmonic performance tests.

The primary factor in system scale is the number of provisioned streams in the server. But there are many combinations of factors (device types, architecture, service number) and usability criteria, so it can be very difficult to provide accurate summary tables of limits.

Here are some recommended maximum limits for some typical system configurations:

System Configuration	Max Recommended Elementary Streams per NMX
MPTS VBR, with 6 NG's of (10:2 Electra X + 1:1 ProStream 9K or X) – 84 devices	2640 ES
IPTV, with 10 NG's of 10:2 Electra X – 120 devices	9600 ES
OTT, with 4 NG's of xx Electra X	4400 ES (one video profile considered as one ES), 400 inputs SPTS, 13200 descriptors

NG = Network Group in NMX

Note

The maximum recommended number of devices managed under one NMX server is 200 (this excludes logical devices like inputs and outputs of the system).

Note

The management of a very large system can be split into several NMX servers that can be declared as proxy-sites in a central NMX for a centralized view of the entire system.

9.1.2 Sizing Related to ProStream X Management

With NMX 8.2 and later versions, a dedicated type of service plan, named "Service Plan X" is proposed in NMX in addition to the standard service plan. Service Plan X enables higher maximum sizing for ProStream X management. It is only applicable to ProStream X output transports with or without Electra X/XOS encoders, with or without DiviTrack. This feature is in Limited Availability in 8.2; please contact Harmonic support before using it. The maximum recommended sizing manageable by NMX is the following:

Sizing Item	Unit	Standard Service Plan	Service Plan X
Total TS	TS	500	1,000
FEC TS	TS	500	1,000
Total Services	Services	500	1,000
Scrambled Services	Services	500	1,000
PIDs (all service components and tables)	PIDs	3,000	6,000
ECMs	ECMs	500	1,000
EMMs	EMMs	500	1,000
Statmux Pools (internal PS-X limitation)	Pools	35	35
Statmux Services (internal PS-X limitation)	Services	128	128

10 NMX Licenses

Licenses are required for some device features that NMX supports, and you cannot enable those features without the appropriate license. You can add or renew licenses to your system using the Harmonic License Manager. Most licenses are permanent; once enabled, the feature will continue to function without raising license-related alarms.

- To add or renew device licenses, you need to download the Harmonic License Manager. Contact Harmonic Technical Support if you need access to the Harmonic License Manager and a user account. For more information, refer to the NMX Licensing Support section in the *NMX User Guide* or *NMX Installation Guide* at: C:\Program Files\Harmonic\Documents\NMX\Product_Guides.
- To review device license types and descriptions in the NMX Release Notes, go to the device's New Features section whose licenses you want to review. For example: NMX Release Notes > NMX and Device Licenses > Electra X Firmware Licenses.

Alert

Temporary licenses included with NMX or supported devices are provided for Demo purposes and are not intended for production systems. Contact Harmonic Technical Support if you want to remove temporary licenses.

Note

XOS licenses are not managed through the Harmonic License Manager.

10.1 NMX Licenses

Licensing enables specific NMX features; contact Harmonic Technical Support to purchase licenses or review the *NMX_InstallGuide.pdf*, section "Licensing Information."

The following NMX features can be licensed:

Name	Description	Release
LIC-NMX-BASE	NMX base permanent simplified license . Includes all monitoring-only devices, DPI provisioning and Consolidated Alarms client. It embeds SW-NMX-BASE-7-E, SW-NMX-DPI-E and SW-NMX-CAO-E licenses in the server.	NMX 8.2.0
LIC-NMX-BASE-BCK	NMX base permanent simplified license for backup server. Includes all monitoring-only devices, DPI provisioning and Consolidated Alarms client. It embeds SW-NMX-BACKUP-7-E, SW-NMX-DPI-E and SW-NMX-CAO-E licenses in the server.	NMX 8.2.0
LIC-NMX-BASE-VM	VM NMX base permanent simplified license . Includes all monitoring-only devices, DPI provisioning and Consolidated Alarms client. It embeds SW-NMX-BASE-7-VM-E, SW-NMX-DPI-E and SW-NMX-CAO-E licenses in the server.	NMX 8.2.0
LIC-NMX-BASE-BCK-VM	VM NMX base permanent simplified license for backup server. Includes all monitoring-only devices, DPI provisioning and Consolidated Alarms client. It embeds SW-NMX-BACKUP-7-VM-E, SW-NMX-DPI-E and SW-NMX-CAO-E licenses in the server.	NMX 8.2.0
SW-NMX-REST-API-E	Software license for Managing and Monitoring devices and services using NMX Restful API. Per NMX server (Back up NMX server also requires a license).	NMX 7.6.1
SW-NMX-BASE-7-VM-E	VM Permanent classic license with full access to NMX (excluding DPI, EIS and RESTAPI features).	NMX 7.3
SW-NMX-BACKUP-7-VM-E	Backup VM classic Permanent license with full access to NMX (excluding DPI, EIS and RESTAPI features).	NMX 7.3
SW-NMX-BASE-7-E	Permanent classic license with full access to NMX (excluding DPI, EIS and RESTAPI features).	NMX 7.0
SW-NMX-BACKUP-7-E	Permanent classic license with full access to NMX (excluding DPI, EIS and RESTAPI features).	NMX 7.0
SW-NMX-EIS-E	Software license to enable NMX Internal EIS (Event Information Scheduler) – ProStream CAS. Per NMX server (Back up NMX server also requires license).	NMX 7.0

Name	Description	Release
SW-NMX-DPI-E	Software license to enable provisioning DPI PIDs and/or sending SCTE104 commands to the encoders in NMX. Per NMX server (Back up NMX server also requires license).	NMX 7.0
SW-NMX-DEMO-E	NMX Demo license – Temporary enables all software option - 90 Days. Per NMX server. SW-NMX-BASE-xx license must first be removed before installing SW-NMX-DEMO-E license.	NMX 7.0
SW-NMX-DCO-E	NMX Client License (Designer, Operator) – one provided with Server. One license per additional client to be connected at the same time.	NMX 7.0
SW-NMX-SEO-E	NMX Software Stream Editor License. Stream editor client – one provided with Server. One license per additional client to be connected at the same time.	NMX 7.0
SW-NMX-CAO-E	NMX Software Consolidated Alarm License. Consolidated Alarms client.	NMX 7.0

 Note:

EIS, DPI and RESTAPI licenses are required for each of the servers that are using the interface. For example, a main and spare NMX will require 2 licenses in total.

10.1.1 License for Device Management

The following NMX license is required per device whose configuration is managed by NMX, when LIC-NMX-BASE or LIC-NMX-BASE-VM has been ordered:

Name	Description
LIC-NMX-DEVICE-CONF	Software license for Management of device whose configuration is under NMX control (Electra X/XOS, ProStream X, SDI routers and 2:1 switches, etc.). Per device. Monitoring-only devices does not require any license. Backup NMX does not require this license.

10.1.2 Legacy Licenses for Device Management

The following legacy NMX licenses are required per managed device or channel, only when LIC-NMX-BASE or LIC-NMX-BASE-VM has not been ordered:

Name	Description
SW-LIC-10	Software license for Monitoring Only devices. For Electra VS, Electra XT, Spectrum XE, NetProcessor 9030/40, ProView 7100, ProView 8100, 3rd party monitoring (like Cisco switch, Newtec M6100 and MCX7000, ...). Per device.
SW-LIC-20	Software license for Management and Monitoring class 20 devices. For Amethyst III, ProSwitch, Electra 9k or other legacy encoders (CBR, internal statmux), third party monitoring + control (Newtec USS or Quintech switch, ...), Router <32x32, and GPI contact closure monitored device. Per device.
SW-LIC-30	Software license for Managing and Monitoring class 30 devices. For Electra 9k or other legacy encoders (statmux). Per channel.
SW-LIC-40	Software license for Managing and Monitoring class 40 devices. For ProStream 9k (remux only excl. scrambling), ProStream X/XVM (remux only excl. scrambling), ProMedia Live. Per device.
SW-LIC-50	Software license for Managing and Monitoring class 50 devices. For ElectraX/XVM/XOS, ProStream 9k (all features included), ProStar, ProStream X/XVM (all features included), ProMedia Live/Package or Packager, ProMedia X Origin, Packager XOS. Per device/node.
SW-LIC-60	Software license for Managing and Monitoring class 60 devices. For NxM routers larger than 32x32. Per router.
SW-LIC-100	Software license for Management and Monitoring class 100 device - 3rd party umbrella management connections. Per 3rd party application connection.

10.2 Electra X Firmware Licenses

Licensing enables specific Electra firmware features; contact Harmonic Technical Support to purchase licenses.

Warning

If a licensed service on Electra X expires while a channel is running, all services could be affected.

Note:

Where "*" is used, the * is a wildcard that can be replaced by "VM" or "2", meaning that "X*" can be either "X2" or "XVM". The simplified licenses are addressed after these tables.

The following firmware features can be licensed on Electra platforms, and are supported in the corresponding initial NMX release.

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-LAB	Firmware option for Electra X platforms. Lab License. This enables all firmware options for lab verification and interoperability testing. For non-commercial use only, license is not valid for customer facing and / or revenue bearing services.	1.0.0.0	7.0.0.7
FW-ELC-X*-DEMO	Firmware option for Electra X platforms, enabling all video & audio encoding and all video & audio decoding supported and licensed functions. For use for support purposes only (non-commercial); this is a temporary license and will expire after 45 days.	1.0.0.0	7.0.0.7
Electra X Platform Licenses			

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-BASE-1	Firmware option for Electra X platforms. Base License.	1.0.0.0	7.0.0.7
Video Input Options			
FW-ELC-X2-SDI-IN-SD	Firmware option for Electra X platforms enabling one SDI input in SD 576i or 480i 4:2:2 format.	1.1.0.0	7.3.0.0
FW-ELC-X2-SDI-IN-HD	Firmware option for Electra X platforms enabling one SDI input in HD 1080i, 1080psf or 720p 4:2:2 format.	1.1.0.0	7.3.0.0
FW-ELC-X*-IP-IN-SD	Firmware option for Electra X platforms enabling one IP input service in SD 576i or 480i 4:2:2 format.	1.1.0.0	7.3.0.0
FW-ELC-X*-IP-IN-HD	Firmware option for Electra X platforms enabling one IP input service in HD 1080i, 1080psf or 720p 4:2:2 format.	1.1.0.0	7.3.0.0
FW-ELC-X*-IP-IN-HD-2022-6	Firmware option for Electra X platforms enabling one IP SMPTE 2022-6 input service in HD 1080i, 1080psf or 720p 4:2:2 format.	1.3.0.0	7.5.0.0
FW-ELC-X*-IP-IN-SD-2022-6	Firmware option for Electra X platforms enabling one IP SMPTE 2022-6 input service in SD 576i or 480i 4:2:2 format.	1.3.0.0	7.5.0.0
Broadcast Video Encode Options			
FW-ELC-X*-ENC-HD-MP2	Firmware option for Electra X platforms to enable HD MPEG-2 video encoding. One per video stream required.	1.0.0.0	7.0.0.7

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-ENC-EYEQ-HD	Firmware license for Electra X enabling EyeQ for AVC IPTV broadcast encoding up to 1080p60. One per output stream required. This license is permanent and will appear as FW-ELC-*-ENC-EYEQ-HD on the encoder. AVC* licenses are required in addition to this license. The number of profiles supported per chassis depends on profile resolutions and frame rates.	1.6.0.0	7.8.0.0
FW-ELC-X*-ENC-SD-MP2	Firmware option for Electra X platforms to enable SD MPEG-2 video encoding. One per video stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-ENC-HD-AVC	Firmware option for Electra X platforms to enable HD AVC video encoding. One per video stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-ENC-SD-AVC	Firmware option for Electra X platforms to enable SD AVC video encoding. One per video stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-ENC-PIP-AVC	Firmware option for Electra X platforms, enabling output of one Low Resolution Channel (96x96, 128x96 or 192x192) AVC main or baseline profile. One per video stream required.	1.1.0.0	7.3.0.0
FW-ELC-X*-ENC-HD-HEVC	Firmware option for Electra X platforms to enable HD HEVC video encoding. One per video stream required.	1.3.0.0	7.5.0.0
FW-ELC-X*-ENC-SD-HEVC	Firmware option for Electra X platforms to enable SD HEVC video encoding. One per video stream required.	1.3.0.0	7.5.0.0
FW-ELC-X*-ENC-SD-ALL	Firmware option for Electra X platforms, enabling encoding of one channel in any codec SD 576i or 480i. Supports audio pass-through. One per video stream required.	1.1.0.0	7.3.0.0

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-ENC-HD-ALL	Firmware option for Electra X platforms, enabling encoding of one channel in any codec HD 1080p or 720p, or any codec SD 576i or 480i. One per video stream required.	1.1.0.0	7.3.0.0
FW-ELC-X*-ENC-HD-AVC-DNSE-8CH-B	Firmware option for Electra X platform, enabling encoding of eight channels in High Density mode for AVC HD 1080p, 1080i or 720p, 4:2:0 mode. This option does not enable encoding in High VQ mode.	1.2.2.0	7.4.2.0
MultiScreen Video Encode Options			
FW-ELC-X*-ENC-MW-AVC-SBR-HHD	Firmware option for Electra X platforms, enabling output of one Mobile/Web Bit Rate video stream AVC Main or Baseline Profile, up to 30/25 fps and up to 1080Px1920 with MPEG2 Transport Stream output.	1.0.0.0	7.0.0.7
FW-ELC-X*-ENC-MW-AVC-SBR-HD	Firmware option for Electra X platforms to enable the output of one Mobile/Web Bit Rate video stream AVC Main or Baseline Profile, up to 30/25 fps and up to 720px1280 with MPEG2 Transport Stream output.	1.0.0.0	7.0.0.7
FW-ELC-X*-ENC-MW-AVC-SBR-SD	Firmware option for Electra X platforms to enable the output of one Mobile/Web Bit Rate video stream AVC Main or Baseline Profile, up to 30/25 fps and up to 480X260 with MPEG2 Transport Stream output.	1.0.0.0	7.0.0.7
FW-ELC-X*-ENC-MW-HEVC-SBR-SD	Firmware option for Electra X platforms, enabling output of one Mobile/Web Bit Rate video stream HEVC Main or Baseline Profile, up to 30/25 fps and up to 480x360 with MPEG2 Transport Stream output.	1.2.0.0	7.4.0.0

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-ENC-MW-HEVC-SBR-HD	Firmware option for Electra X platforms, enabling output of one Mobile/Web Bit Rate video stream HEVC Main or Baseline Profile, up to 30/25 fps and up to 720px1280 with MPEG2 Transport Stream output.	1.2.0.0	7.4.0.0
FW-ELC-X*-ENC-MW-HEVC-SBR-HHD	Firmware option for Electra X platforms, enabling output of one Mobile/Web Bit Rate video stream HEVC Main or Baseline Profile; 30/25 fps 1080px1920, 60/50 fps 720px1280, and up to 30/25 fps and up to 720px1280 with MPEG2 Transport Stream output.	1.2.0.0	7.4.0.0
FW-ELC-X*-ENC-OTT-AVC-SD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are AVC progressive only, up to 30/25 fps, and up to 720x576 with MPEG2 Transport Stream output.	1.1.1.0	7.3.1.0
FW-ELC-X*-ENC-OTT-AVC-BSD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are AVC, progressive or interlaced, up to 60/50 fps, and up to 720x576 with MPEG2 Transport Stream output.	1.1.1.0	7.3.1.0
FW-ELC-X*-ENC-OTT-AVC-HD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are AVC, progressive only, up to 30/25 fps, and up to 1920x1080 with MPEG2 Transport Stream output.	1.1.1.0	7.3.1.0
FW-ELC-X*-ENC-OTT-AVC-BHD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are AVC, progressive or interlaced, up to 60/50 fps, and up to 1920x1080 with MPEG2 Transport Stream output.	1.1.1.0	7.3.1.0

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-ENC-OTT-HEVC-SD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are HEVC Main Profile, AVC Main or Baseline Profile, progressive only, up to 30/25 fps, and up to 720x576 with MPEG2 Transport Stream output.	1.2.0.0	7.4.0.0
FW-ELC-X*-ENC-OTT-HEVC-HD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are HEVC Main Profile, AVC Main or Baseline Profile, progressive only, up to 30/25 fps, and up to 1920x1080 with MPEG2 Transport Stream output.	1.2.0.0	7.4.0.0
FW-ELC-X*-ENC-OTT-HEVC-BSD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are HEVC Main Profile, AVC Main or Baseline Profile, progressive or interlaced, up to 60/50 fps, and up to 720x576 with MPEG2 Transport Stream output.	1.2.0.0	7.4.0.0
FW-ELC-X*-ENC-OTT-HEVC-BHD	Firmware option for Electra X platforms, enabling output of one full OTT profile set of video streams. Supported formats are HEVC Main Profile, AVC Main or Baseline Profile, progressive or interlaced, up to 60/50 fps, and up to 1920x1080 with MPEG2 Transport Stream output.	1.2.0.0	7.4.0.0
FW-ELC-X*-ENC-OTT-EYEQ-BHD	Firmware option for Electra X platforms, allowing EyeQ rate control for one OTT output profile set. *-ENC-OTT-AVC* licenses are required in addition to this license to encode a profile set. Supported formats are AVC progressive or interlaced, up to 60/50 fps	1.4.0.0	7.6.0.0
Audio Encoding and Processing Options			

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-AUD-ENC-DD-MC	Firmware option for Electra X platforms to enable AC-3 multichannel audio encoding. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-ENC-DD-ST	Firmware option for Electra X platforms to enable AC-3 stereo audio encoding. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-ENC-DDP-MC	Firmware option for Electra X platforms to enable E-AC-3 multichannel audio encoding. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-ENC-DDP-ST	Firmware option for Electra X platforms to enable E-AC-3 stereo audio encoding. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-ENC-AC4-MC	Firmware option for Electra X platforms to enable AC-4 multichannel audio encoding. One per audio stream required.	1.7.1.0	8.0.1.0
FW-ELC-X*-AUD-ENC-AC4-ST	Firmware option for Electra X platforms to enable AC-4 stereo audio encoding. One per audio stream required.	1.7.1.0	8.0.1.0
FW-ELC-X*-AUD-ENC-AAC-MC	Firmware option for Electra X platforms to enable AAC/HE AAC multichannel audio encoding. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-ENC-AAC-ST	Firmware option for Electra X platforms to enable AAC/HE AAC stereo audio encoding. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-ENC-MP2-ST	Firmware option for Electra X platforms to enable MPEG 1 Layer 2 stereo audio encoding. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-LVL-MC	Firmware option for Electra X platforms to enable multichannel audio leveling. One per audio stream required.	1.0.0.0	7.0.0.7

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-AUD-LVL-ST	Firmware option for Electra X platforms to enable stereo audio leveling. One per audio stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-AUD-HALC-MC	Firmware option enabling Harmonic algorithm Automatic loudness control of one multi-channel 5.1 or 2.0 embedded audio stream. This license is permanent, enforced and has a count of 1. One per audio stream required.	1.8.0.0	8.1.0.0
FW-ELC-X*-AUD-HALC-ST	Firmware option enabling Harmonic algorithm Automatic loudness control of one embedded 2.0 audio stream. This license is permanent, enforced and has a count of 1. One per audio stream required.	1.8.0.0	8.1.0.0
FW-ELC-X*-AUD-NEILSEN-MC	Firmware option for Electra X platform to enable Nielsen watermarking insertion on one 5.1 or 2.0 audio stream. One per audio stream required.	1.3.0.0	7.5.0.0
FW-ELC-X*-AUD-NEILSEN-ST	Firmware option for Electra X platform to enable Nielsen watermarking insertion on one 5.1 or 2.0 audio stream. One per audio stream required.	1.3.0.0	7.5.0.0
FW-ELC-X*-AUD-NIELSEN-DEC	FW option for Electra X2 platform for decoding Nielsen watermarking with logs, for the left channel. used for RTVOD. This license is permanent, enforced and has a count of 1. Complement to Nielsen watermarking license. FW-ELC-X*-AUD-NEILSEN-MC or FW-ELC-X*-AUD-NEILSEN-ST is mandatory.	1.8.0.0	8.1.0.0
Ancillary Options			
FW-ELC-X*-DPI	Firmware option for Electra X platforms to enable DPI and SCTE 35 support. One per DPI stream required.	1.0.0.0	7.0.0.7

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-DPI-ESAM-XCODE	Firmware option for Electra X platforms to enable Support ESAM interfaces	1.0.0.0	7.0.0.7
FW-ELC-X*-DT-LAN	Firmware option for Electra X platforms to enable DiviTrack over IP LAN functionality	1.0.0.0	7.0.0.7
FW-ELC-X*-DT-WAN	Firmware option for Electra X platforms to enable DiviTrack over IP WAN functionality	1.0.0.0	7.0.0.7
FW-ELC-X*-FEC	Firmware option for Electra X platforms to enable FEC on IP output. One per chassis required.	1.0.0.0	7.0.0.7
FW-ELC-X*-PSIP-REGEN	Firmware option for Electra X platforms to enable PSIP table regeneration. One per chassis required.	1.0.0.0	7.0.0.7
FW-ELC-X*-ENC-UPCONV	Firmware option for Electra X platforms to enable broadcast quality up conversion or cross conversion of the SD or HD input video	1.0.0.0	7.0.0.7
FW-ELC-X*-PIC-VPP-BASIC	Firmware option for Electra X platforms to enable video pre-processing features like MCTF. This is the basic option.	1.0.0.0	7.0.0.7
FW-ELC-X*-608TO708-CC-XCODE	Firmware option for Electra X platforms to enable 608/708 closed caption conversion. One per video stream required.	1.0.0.0	7.0.0.7
FW-ELC-X*-DPI-ADSMART	Firmware option for Electra X platform for DPI ADSMART support. One license per output service required.	1.3.0.0	7.5.0.0
FW-ELC-X*-TTEXT-DVBSUB-BURN	Firmware option for Electra X platform, enabling burning Teletext or DVB subtitle information onto the video. One license per video input required.	1.3.0.0	7.5.0.0

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-TTXT-TO-DVB SUB-XCOD	Firmware option for Electra X platform enabling Teletext to DVB subtitle transcoding. One license per output data stream required.	1.5.0.0	7.7.0.0
Graphics and Payout Options			
FW-ELC-X*-LOGO-BASIC	Firmware option for Electra X platforms to enable basic static Logo 500x500 pixels maximum size	1.0.0.0	7.0.0.7
FW-ELC-X*-SLATE-BASIC	Firmware option for Electra X platforms to enable full screen slate replacement. The slate is a still image with no associated audio	1.0.0.0	7.0.0.7
FW-ELC-X*-DPI-AUTOMATION	Firmware option for Electra X platforms for DPI based automation server communication. This is used for controlling graphics and payout.	1.2.0.0	7.4.0.0
FW-ELC-X*-PLAY-FILE-BASIC	Firmware option for Electra X platforms to enable playback of local files. One per subtitle stream. This license is permanent, enforced and has a count of 1.	1.2.0.0	7.4.0.0
FW-ELC-X*-STREAM-SWITCH-BASIC	Firmware option for Electra X for seamless switching between live input sockets.	1.2.0.0	7.4.0.0
FW-ELC-X*-GFX-1-SD	Firmware option for Electra X platforms enabling SD Graphics insertion allowing 1 layer of graphics, PNG, WAV and SWF support.	1.2.0.0	7.4.0.0
FW-ELC-X*-GFX-1-HD	Firmware option for Electra X platforms enabling HD Graphics insertion allowing 1 layer of graphics, PNG, WAV and SWF support.	1.2.0.0	7.4.0.0
FW-ELC-X*-GFX-4-SD	Firmware option for Electra X platforms enabling SD Graphics insertion allowing 4 independent layers of graphics, PNG, WAV and SWF support.	1.2.0.0	7.4.0.0

License Name	Description	Electra X Release	NMX Release
FW-ELC-X*-GFX-4-HD	Firmware option for Electra X platforms enabling HD Graphics insertion allowing 4 layers of graphics, PNG, WAV and SWF support.	1.2.0.0	7.4.0.0
FW-ELC-X*-GFX-8-SD	Firmware option for Electra X platforms enabling SD Graphics insertion allowing 8 independent layers of graphics, PNG, WAV and SWF support.	1.2.0.0	7.4.0.0
FW-ELC-X*-GFX-8-HD	Firmware option for Electra X platforms enabling HD Graphics insertion allowing 8 layers of graphics, PNG, WAV and SWF support.	1.2.0.0	7.4.0.0

10.2.1 Simplified Licenses

The simplified licenses provide easy ordering of Electra X by gathering the features of several part numbers under a single part number. The following table gives the correspondence between the simplified licenses and the detail licenses.

Electra X2

New License	Description	Included Detail Licenses	
LIC-ELC-X2-ENC-HD-PLUS	SW LICENSE HD PLUS ENCODING (1080P60/1080I) ONE CHANNEL	Part Number	QTY
		FW-ELC-X2-SDI-IN-HD	1
		FW-ELC-X2-IP-IN-HD	1
		FW-ELC-X2-ENC-UPCONV	1
		FW-ELC-X2-PIC-VPP-BASIC	1
		FW-ELC-X2-LOGO-BASIC	1
		FW-ELC-X2-SLATE-BASIC	1
		FW-ELC-X2-ENC-HD-HEVC	1
		FW-ELC-X2-ENC-OTT-HEVC-BHD	1
		FW-ELC-X2-DT-WAN	1
		FW-ELC-X2-ENC-PIP-AVC	1
		FW-ELC-X2-ENC-1SEG-AVC	1
		FW-ELC-X2-AUD-ENC-AAC-MC	12
		FW-ELC-X2-AUD-ENC-MP2-ST	12
		FW-ELC-X2-DPI	1
		FW-ELC-X2-FEC	1
		FW-ELC-X2-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses	
LIC-ELC-X2-ENC-HD	SW LICENSE HD OTT ENCODING (720P60/1080P30) ONE CHANNEL	Part Number	QTY
		FW-ELC-X2-SDI-IN-HD	1
		FW-ELC-X2-IP-IN-HD	1
		FW-ELC-X2-ENC-UPCONV	1
		FW-ELC-X2-PIC-VPP-BASIC	1
		FW-ELC-X2-LOGO-BASIC	1
		FW-ELC-X2-SLATE-BASIC	1
		FW-ELC-X2-ENC-OTT-HEVC-HD	1
		FW-ELC-X2-ENC-SD-HEVC	1
		FW-ELC-X2-ENC-OTT-HEVC-BSD	1
		FW-ELC-X2-ENC-PIP-AVC	1
		FW-ELC-X2-ENC-1SEG-AVC	1
		FW-ELC-X2-AUD-ENC-AAC-MC	12
		FW-ELC-X2-AUD-ENC-MP2-ST	12
		FW-ELC-X2-DPI	1
		FW-ELC-X2-FEC	1
		FW-ELC-X2-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses	
LIC-ELC-X2-ENC-SD-PLUS	SW LICENSE SD PLUS ENCODING (560P60/480I/576I) ONE CHANNEL	Part Number	QTY
		FW-ELC-X2-SDI-IN-HD	1
		FW-ELC-X2-IP-IN-HD	1
		FW-ELC-X2-PIC-VPP-BASIC	1
		FW-ELC-X2-LOGO-BASIC	1
		FW-ELC-X2-SLATE-BASIC	1
		FW-ELC-X2-ENC-SD-HEVC	1
		FW-ELC-X2-ENC-OTT-HEVC-BSD	1
		FW-ELC-X2-DT-WAN	1
		FW-ELC-X2-ENC-PIP-AVC	1
		FW-ELC-X2-ENC-1SEG-AVC	1
		FW-ELC-X2-AUD-ENC-AAC-MC	12
		FW-ELC-X2-AUD-ENC-MP2-ST	12
		FW-ELC-X2-DPI	1
		FW-ELC-X2-FEC	1
		FW-ELC-X2-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses	
LIC-ELC-X2-ENC-SD	SW LICENSE SD OTT ENCODING (480P30/576P25) ONE CHANNEL	Part Number	QTY
		FW-ELC-X2-SDI-IN-HD	1
		FW-ELC-X2-IP-IN-HD	1
		FW-ELC-X2-PIC-VPP-BASIC	1
		FW-ELC-X2-LOGO-BASIC	1
		FW-ELC-X2-SLATE-BASIC	1
		FW-ELC-X2-ENC-OTT-HEVC-BSD	1
		FW-ELC-X2-ENC-PIP-AVC	1
		FW-ELC-X2-ENC-1SEG-AVC	1
		FW-ELC-X2-AUD-ENC-AAC-MC	12
		FW-ELC-X2-AUD-ENC-MP2-ST	12
		FW-ELC-X2-DPI	1
		FW-ELC-X2-FEC	1
		FW-ELC-X2-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses							
LIC-ELC-X2-GFX-8-HD-SD	SW LICENSE FOR HD OR SD GRAPHICS INSERTION UP TO 8 GFX LAYERS	<table><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-ELC-X2-GFX-8-HD</td><td>1</td></tr><tr><td>FW-ELC-X2-GFX-8-SD</td><td>1</td></tr></table>	Part Number	QTY	FW-ELC-X2-GFX-8-HD	1	FW-ELC-X2-GFX-8-SD	1	
Part Number	QTY								
FW-ELC-X2-GFX-8-HD	1								
FW-ELC-X2-GFX-8-SD	1								

New License	Description	Included Detail Licenses							
LIC-ELC-X2-BBOIP	SW LICENSE TO ENABLE A HD/SD INPUT SERVICE DELIVERED OVER S2110 OR S2022-6	<table><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-ELC-X2-IP-IN-SD-2022-6</td><td>1</td></tr><tr><td>FW-ELC-X2-IP-IN-SD-2110</td><td>1</td></tr></table>	Part Number	QTY	FW-ELC-X2-IP-IN-SD-2022-6	1	FW-ELC-X2-IP-IN-SD-2110	1	
Part Number	QTY								
FW-ELC-X2-IP-IN-SD-2022-6	1								
FW-ELC-X2-IP-IN-SD-2110	1								

Electra XVM

New License	Description	Included Detail Licenses	
LIC-ELC-XVM-ENC-HD-PLUS	SW LICENSE HD PLUS ENCODING (1080P60/1080I) ONE CHANNEL	Part Number	QTY
		FW-ELC-XVM-IP-IN-HD	1
		FW-ELC-XVM-ENC-UPCONV	1
		FW-ELC-XVM-PIC-VPP-BASIC	1
		FW-ELC-XVM-LOGO-BASIC	1
		FW-ELC-XVM-SLATE-BASIC	1
		FW-ELC-XVM-ENC-HD-HEVC	1
		FW-ELC-XVM-ENC-OTT-HEVC-BHD	1
		FW-ELC-XVM-DT-WAN	1
		FW-ELC-XVM-ENC-PIP-AVC	1
		FW-ELC-XVM-ENC-1SEG-AVC	1
		FW-ELC-XVM-AUD-ENC-AAC-MC	12
		FW-ELC-XVM-AUD-ENC-MP2-ST	12
		FW-ELC-XVM-DPI	1
		FW-ELC-XVM-FEC	1
		FW-ELC-XVM-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses	
LIC-ELC-XVM-ENC-HD	SW LICENSE HD OTT ENCODING (720P60/1080P30) ONE CHANNEL	Part Number	QTY
		FW-ELC-XVM-IP-IN-HD	1
		FW-ELC-XVM-ENC-UPCONV	1
		FW-ELC-XVM-PIC-VPP-BASIC	1
		FW-ELC-XVM-LOGO-BASIC	1
		FW-ELC-XVM-SLATE-BASIC	1
		FW-ELC-XVM-ENC-OTT-HEVC-HD	1
		FW-ELC-XVM-ENC-SD-HEVC	1
		FW-ELC-XVM-ENC-OTT-HEVC-BSD	1
		FW-ELC-XVM-ENC-PIP-AVC	1
		FW-ELC-XVM-ENC-1SEG-AVC	1
		FW-ELC-XVM-AUD-ENC-AAC-MC	12
		FW-ELC-XVM-AUD-ENC-MP2-ST	12
		FW-ELC-XVM-DPI	1
		FW-ELC-XVM-FEC	1
		FW-ELC-XVM-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses	
LIC-ELC-XVM-ENC-SD-PLUS	SW LICENSE SD PLUS ENCODING (560P60/480I/576I) ONE CHANNEL	Part Number	QTY
		FW-ELC-XVM-IP-IN-HD	1
		FW-ELC-XVM-PIC-VPP-BASIC	1
		FW-ELC-XVM-LOGO-BASIC	1
		FW-ELC-XVM-SLATE-BASIC	1
		FW-ELC-XVM-ENC-SD-HEVC	1
		FW-ELC-XVM-ENC-OTT-HEVC-BSD	1
		FW-ELC-XVM-DT-WAN	1
		FW-ELC-XVM-ENC-PIP-AVC	1
		FW-ELC-XVM-ENC-1SEG-AVC	1
		FW-ELC-XVM-AUD-ENC-AAC-MC	12
		FW-ELC-XVM-AUD-ENC-MP2-ST	12
		FW-ELC-XVM-DPI	1
		FW-ELC-XVM-FEC	1
		FW-ELC-XVM-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses	
LIC-ELC-XVM-ENC-SD	SW LICENSE SD OTT ENCODING (480P30/576P25) ONE CHANNEL	Part Number	QTY
		FW-ELC-XVM-IP-IN-HD	1
		FW-ELC-XVM-PIC-VPP-BASIC	1
		FW-ELC-XVM-LOGO-BASIC	1
		FW-ELC-XVM-SLATE-BASIC	1
		FW-ELC-XVM-ENC-OTT-HEVC-BSD	1
		FW-ELC-XVM-ENC-PIP-AVC	1
		FW-ELC-XVM-ENC-1SEG-AVC	1
		FW-ELC-XVM-AUD-ENC-AAC-MC	12
		FW-ELC-XVM-AUD-ENC-MP2-ST	12
		FW-ELC-XVM-DPI	1
		FW-ELC-XVM-FEC	1
		FW-ELC-XVM-608TO708-CC-XCODE	1

New License	Description	Included Detail Licenses	
LIC-ELC-XVM-GFX-8-HD-SD	SW LICENSE FOR HD OR SD GRAPHICS INSERTION UP TO 8 GFX LAYERS	Part Number	QTY
		FW-ELC-XVM-GFX-8-HD	1
		FW-ELC-XVM-GFX-8-SD	1

New License	Description	Included Detail Licenses							
LIC-ELC-XVM-BBOIP	SW LICENSE TO ENABLE A HD/SD INPUT SERVICE DELIVERED OVER S2110 OR S2022-6	<table><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-ELC-XVM-IP-IN-SD-2022-6</td><td>1</td></tr><tr><td>FW-ELC-XVM-IP-IN-SD-2110</td><td>1</td></tr></table>	Part Number	QTY	FW-ELC-XVM-IP-IN-SD-2022-6	1	FW-ELC-XVM-IP-IN-SD-2110	1	
Part Number	QTY								
FW-ELC-XVM-IP-IN-SD-2022-6	1								
FW-ELC-XVM-IP-IN-SD-2110	1								

10.3 Electra XOS Firmware Licenses

Licensing enables specific Electra firmware features; contact Harmonic Technical Support to purchase licenses.

Name	Description	Electra XOS Release	NMX Release
Electra XOS Platform Licenses			
SWR-ELCXOS-BASE-APPLIANCE SWR-XOS-BASE-APPLIANCE	Base software for running Electra XOS on an appliance	1.6	8.0
SWR-ELCXOS-BASE-BAREMETAL SWR-XOS-BASE-SOFTONLY	Base software for running Electra XOS on a reference platform	1.6	8.0
Electra XOS Service Licenses			
LIC-ELCXOS-ENC-UHD-PLUS LIC-XOS-ENC-UHD-PLUS	Encoding of one broadcast service or one OTT service with one maximum resolution at 2160p60. Includes video decoding, logo insertion, MPEG1Layer II & AAC audio codecs, audio pass through.	1.6	8.0
LIC-ELCXOS-ENC-UHD LIC-XOS-ENC-UHD	Encoding of one broadcast service or one OTT service with one maximum resolution at 1440p60 or 2160p30. Includes video decoding, logo insertion, MPEG1Layer II & AAC audio codecs, audio pass through.	1.6	8.0
LIC-ELCXOS-ENC-HD-PLUS LIC-XOS-ENC-HD-PLUS	Encoding of one broadcast service or one OTT service with one maximum resolution at 1080i30 or 1080p60. Includes video decoding, logo insertion, MPEG1Layer II & AAC audio codecs, audio pass through.	1.6	8.0

Name	Description	Electra XOS Release	NMX Release
LIC-ELCXOS-ENC-HD LIC-XOS-ENC-HD	Encoding of one broadcast service or one OTT service with one maximum resolution at 1080p30. Includes video decoding, logo insertion, MPEG1Layer II & AAC audio codecs, audio pass through.	1.6	8.0
LIC-ELCXOS-ENC-SD-PLUS LIC-XOS-ENC-SD-PLUS	Encoding of one broadcast service or one OTT service with one maximum resolution at 525i25/480i30 or 540p60. Includes video decoding, logo insertion, MPEG1Layer II & AAC audio codecs, audio pass through.	1.6	8.0
LIC-ELCXOS-ENC-SD LIC-XOS-ENC-SD	Encoding of one broadcast service or one OTT service with one maximum resolution at 540p30. Includes video decoding, logo insertion, MPEG1Layer II & AAC audio codecs, audio pass through.	1.6	8.0
Electra XOS Additional Service Licenses			
LIC-ELCXOS-HDR LIC-XOS-HDR	HDR cross conversion and tone mapping	1.6	8.0
LIC-XOS-HDR-BCOM	HDR cross conversion and tone mapping + Tone Expansion	1.6	8.2
LIC-ELCXOS-AUD-DOLBY LIC-XOS-AUD-DOLBY	Dolby audio codecs (Dolby Digital, Digital+, Dolby AC-3, Dolby AC-4, Dolby E)	1.6	8.0
LIC-XOS-ALC	Harmonic Automatic Loudness Control	1.6	8.0
LIC-XOS-ENC-EYEQ	EyeQ encoding	1.6	8.0
LIC-XOS-MEZZA-NMI	Lightly compressed source with Sony NMI	1.8	8.0
LIC-XOS-UNCOMP	Uncompressed baseband 2022-6 source	1.8	8.0
Electra XOS OTT Packaging Licenses			

Name	Description	Electra XOS Release	NMX Release
LIC-ELCXOS-OTT-EGRESS-S LIC-XOS-OTT-EGRESS-S	RTMP & OTT packaging for 3 Mbps	1.6	8.0
LIC-ELCXOS-OTT-EGRESS-M LIC-XOS-OTT-EGRESS-M	RTMP & OTT packaging for 100 Mbps	1.6	8.0
LIC-ELCXOS-OTT-EGRESS-L LIC-XOS-OTT-EGRESS-L	RTMP & OTT packaging for 1 Gbps	1.6	8.0

10.4 ProStream X/XVM Licenses

Licensing enables specific ProStream firmware features; contact Harmonic Technical Support to purchase licenses.

The following feature(s) can be licensed on the ProStream platform, and are supported in the corresponding initial NMX release.

10.4.1 ProStream X Licenses

Name	Description	ProStream X Release	NMX Release
FW-PRM-X-DTMB-TS	ProStream X SFN DTMB Adaptation of one TS.	2.9.9.0	9.0
FW-PRM-X-SELC-EHP	ProStream X Encryption Hacking Prevention Scrambling Firmware License.	2.9.9.0	9.0
FW-PRM-X-DVB-VOD-CHS	ProStream X real-time DVB encryption of VoD programming (Tier-based or Session-based encryption). One per device (or docker instance).	2.9.7.0	8.8.0
FW-PRM-X-SFN	ProStream X MIP Insertion (SFN) DVB-T support. This option allows the SFN Adaptation of 1 first or additional TS.	2.9.0.0	8.5.0
FW-PRM-X-AD-INSERTION	ProStream X Ad insertion (DPI splicing) support. One per service required.	2.8.0.0	8.4.0
FW-PRM-X-T2MI-GTW	ProStream X generation of one DVB T2-MI stream over ASI or IP. One license per T2-MI stream required.	2.8.0.0	8.4.0
FW-PRM-X-SELC-SCR	ProStream X Selective Encryption firmware license. One per service required.	2.4.5.0	8.1
FW-PRM-X-SCR-PANDORA-SRV	ProStream X Pandora scrambling support. One per service required.	2.4.7.0	8.1.2
FW-PRM-X-TS-PLAYER	ProStream X internal file player support firmware license per TS.	2.4.0.0	8.0

Name	Description	ProStream X Release	NMX Release
FW-PRM-X-TBL-SPOOLING	ProStream X firmware license enabling (P)SI/PSIP table carousel delivered from a specific table generator. One per transport stream required.	2.1.1.0	7.8
FW-PRM-X-DT-TARGET-BTR-SRV	ProStream X Target Average bitrate per service within the statmux pool and with minimum degradation of the video quality. One per service is required.	2.2.0.0	7.8
FW-PRM-X-DATATRACK	ProStream X DataTrack license that enables adding external data/ Audio PIDs to the statmux pool. One per TS(MUX) is required.	2.2.0.0	7.8
FW-PRM-X-EAS-SCTE18-SRV	ProStream X EAS with SCTE18 Trigger license.	2.3.1.0	7.8.2
FW-PRM-X-RESTAPI-L2L-SRV	ProStream X Live to live signaling license per service with RESTAPI.	2.3.1.0	7.8.2
FW-PRM-X-RESTAPI-SCTE35-SRV	ProStream X SCTE35 generation firmware license per service with RESTAPI.	2.3.1.0	7.8.2
FW-PRM-X-SCTE35-SRV	ProStream X SCTE35 insertion firmware license. One per service required.	2.3.1.0	7.8.2
FW-PRM-X-DES-FIX-SRV	ProStream X AES Fixed key De-scrambling firmware license. One per service required.	2.3.1.0	7.8.2
FW-PRM-X-DT-REGIONAL-SRV	ProStream X license for sharing common services between regional statmux pools. The license is per one duplicate of the common services.	2.1.0.0	7.7
FW-PRM-X-RESTAPI	ProStream X RESTAPI firmware license.	2.1.0.0	7.7
FW-PRM-X-2G-GATEWAY	ProStream X 2 Gbps throughput license.	2.0.0.0	7.6.2
FW-PRM-X-BASE	ProStream X Base license.	2.0.0.0	7.6.2

Name	Description	ProStream X Release	NMX Release
FW-PRM-X-DEMO	ProStream X firmware license for all functions for 90-day demo usage. For non-commercial use only.	2.0.0.0	7.6.2
FW-PRM-X-LAB	ProStream X firmware license for Lab use only.	2.0.0.0	7.6.2
FW-PRM-X-SPARE	ProStream X COLD SPARE firmware license for all ProStream functions for 30 days. One per chassis required.	2.0.0.0	7.6.2
FW-PRM-X-DEVICE-REDUNDANCY	ProStream X Stand Alone Device Redundancy firmware license. One per chassis required.	2.0.0.0	7.6.2
FW-PRM-X-SLATE-SRV	ProStream X firmware license for Slate Insertion. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-EAS-SRV	ProStream X firmware license for Emergency Alert System. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-FEC-TS	ProStream X FEC firmware license. One per Transport Stream required.	2.0.0.0	7.6.2
FW-PRM-X-DT-POOL	ProStream X firmware license for statmux controller. One DivitrackIP license per pool required.	2.0.0.0	7.6.2
FW-PRM-X-DVB-CW	ProStream X DVB SCR firmware license. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-DVB-CSAV3-CW	ProStream X DVB CSA V3 scrambling firmware license. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-AES-CW	ProStream X AES SCR firmware license. One per service is required.	2.0.0.0	7.6.2
FW-PRM-X-BISS-FIX-SRV	ProStream X BISS Fixed key firmware license. One per service required.	2.0.0.0	7.6.2

Name	Description	ProStream X Release	NMX Release
FW-PRM-X-SCR-FIX-SRV	ProStream X Fixed Key firmware license. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-SELC-EHP	ProStream X Encryption Hacking Prevention Scrambling firmware license. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-SRV-SUB	ProStream X Splicing Service Substitution firmware license. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-ESAM	ProStream X ESAM interface Firmware License. One per service required.	2.0.0.0	7.6.2
FW-PRM-X-BLCKOUT-VIRD	ProStream X ESAM for Blackout solution Firmware License. One per VIRD/channel required.	2.0.0.0	7.6.2
FW-PRM-X-BDS-SRV	ProStream X FW option for connection to BDS for Invidi support. One per service required.	2.0.0.0	7.6.2

10.4.2 ProStream XVM Licenses

Name	Brief Description	ProStream XVM Release	NMX Release
FW-PRM-XVM-AD-INSERTION	ProStream XVM Ad insertion (DPI splicing) support. One per service required	2.8.0.0	8.4.0
FW-PRM-XVM-SELC-SCR	ProStream XVM Selective Encryption firmware license. One per service required.	2.4.5.0	8.1
FW-PRM-XVM-SCR-PANDORA-SRV	ProStream XVM Pandora scrambling support. One per service required.	2.4.7.0	8.1.2
FW-PRM-XVM-TS-PLAYER	ProStream XVM internal file player support firmware license per TS.	2.4.0.0	8.0

Name	Brief Description	ProStream XVM Release	NMX Release
FW-PRM-XVM-DATATRACK	ProStream XVM DataTrack license that enables adding external data/ Audio PIDs to the statmux pool. One per TS(MUX) is required.	2.2.0.0	7.8
FW-PRM-XVM-EAS-SCTE18-SRV	ProStream XVM EAS with SCTE18 Trigger license.	2.3.1.0	7.8.2
FW-PRM-XVM-RESTAPI-L2L-SRV	ProStream XVM Live to live signaling license per service with RESTAPI.	2.3.1.0	7.8.2
FW-PRM-XVM-RESTAPI-SCTE35-SRV	ProStream XVM SCTE35 generation firmware license per service with RESTAPI.	2.3.1.0	7.8.2
FW-PRM-XVM-SCTE35-SRV	ProStream XVM SCTE35 insertion firmware license. One per service required.	2.3.1.0	7.8.2
FW-PRM-XVM-DES-FIX-SRV	ProStream XVM AES Fixed key De-scrambling firmware license. One per service required.	2.3.1.0	7.8.2
FW-PRM-XVM-DT-REGIONAL-SRV	ProStream XVM license for sharing common services between regional statmux pools. The license is per one duplicate of the common services.	2.1.0.0	7.7
FW-PRM-XVM-RESTAPI	ProStream XVM RESTAPI firmware license.	2.1.0.0	7.7
FW-PRM-XVM-TBL-SPOOLING	ProStream XVM firmware license enabling (P)SI/ PSIP table carousel delivered from a specific table generator. One per transport stream required.	2.1.1.0	7.7.2
FW-PRM-XVM-DT-TARGET-BTR-SRV	ProStream XVM Target Average bitrate per service within the statmux pool and with minimum degradation of the video quality. One per service is required.	2.1.1.0	7.7.2
FW-PRM-XVM-DVB-CW	ProStream XVM DVB SCR firmware license. One per service required.	1.5	7.6

Name	Brief Description	ProStream XVM Release	NMX Release
FW-PRM-XVM-AES-CW	ProStream XVM AES SCR firmware license. One per service is required.	1.5	7.6
FW-PRM-XVM-BISS-FIX-SRV	ProStream XVM BISS Fixed key firmware license. One per service required.	1.5	7.6
FW-PRM-XVM-SCR-FIX-SRV	ProStream XVM Fixed Key firmware license. One per service required.	1.5	7.6
FW-PRM-XVM-BDS-SRV	ProStream XVM FW option for connection to BDS for Invidi support. One per service required.	1.5	7.6
FW-PRM-XVM-SELC-EHP	ProStream XVM Encryption Hacking Prevention Scrambling firmware license. One per service required.	2.0.0.0	7.6.2
FW-PRM-XVM-SRV-SUB	ProStream XVM Splicing Service Substitution firmware license. One per service required.	2.0.0.0	7.6.2
FW-PRM-XVM-ESAM	ProStream XVM ESAM interface Firmware License. One per service required.	2.0.0.0	7.6.2
FW-PRM-XVM-BLCKOUT-VIRD	ProStream XVM ESAM for Blackout solution Firmware License. One per VIRD/channel required.	2.0.0.0	7.6.2
FW-PRM-XVM-BASE	ProStream XVM Base license.	1.3	7.5
FW-PRM-XVM-DEMO	ProStream XVM firmware license for all functions for 90-day demo usage. For non-commercial use only.	1.3	7.5
FW-PRM-XVM-LAB	ProStream XVM firmware license for Lab use only.	1.3	7.5
FW-PRM-XVM-SPARE	ProStream XVM COLD SPARE firmware license for all ProStream functions. For 30 days. One per chassis.	1.3	7.5

Name	Brief Description	ProStream XVM Release	NMX Release
FW-PRM-XVM-REDUNDANCY	ProStream XVM Stand Alone Device Redundancy firmware license. One per chassis required.	1.3	7.5
FW-PRM-XVM-SLATE-SRV	ProStream XVM firmware license for Slate Insertion. One per service required.	1.3	7.5
FW-PRM-XVM-EAS-SRV	ProStream XVM firmware license for Emergency Alert System. One per service required.	1.3	7.5
FW-PRM-XVM-FEC-TS	ProStream XVM FEC firmware license. One per Transport Stream required.	1.3	7.5
FW-PRM-XVM-DT-POOL	ProStream XVM firmware license for statmux controller. One DiviTrackIP license per pool.	1.3	7.5

10.4.3 Simplified Licenses

The simplified licenses provide easy ordering of ProStream X by combining the features of several different parts under one part number. The following tables show the correspondence between the simplified licenses and the details licenses

ProStream X

New license	Description	Included detail licenses								
LIC-PRM-X-BASE	ProStream X base license enabling basic multiplexer function including RestAPI. One license per ProStream X appliance is required.	<table><tr><th colspan="2">LIC-PRM-X-BASE</th></tr><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-PRM-X-BASE</td><td>1</td></tr><tr><td>FW-PRM-X-RESTAPI</td><td>1</td></tr></table>	LIC-PRM-X-BASE		Part Number	QTY	FW-PRM-X-BASE	1	FW-PRM-X-RESTAPI	1
LIC-PRM-X-BASE										
Part Number	QTY									
FW-PRM-X-BASE	1									
FW-PRM-X-RESTAPI	1									

New license	Description	Included detail licenses																				
LIC-PRM-X-SCRAMBLING	Scrambling license for single (one) channel for the following scrambling options: DVB CSAv2, AES, BISS-1, Fixed Key scrambling, Fixed key descrambling, selective encryption, Enhanced Hacking Protection (EHP) and Pandora encryption.	<table><tr><th colspan="2">LIC-PRM-X-SCRAMBLING</th></tr><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-PRM-X-AES-CW</td><td>1</td></tr><tr><td>FW-PRM-X-DVB-CW</td><td>1</td></tr><tr><td>FW-PRM-X-BISS-FIX-SRV</td><td>1</td></tr><tr><td>FW-PRM-X-DES-FIX-SRV</td><td>1</td></tr><tr><td>FW-PRM-X-SCR-FIX-SRV</td><td>1</td></tr><tr><td>FW-PRM-X-SCR-PANDORA-SRV</td><td>1</td></tr><tr><td>FW-PRM-X-SELC-EHP</td><td>1</td></tr><tr><td>FW-PRM-X-SELC-SCR</td><td>1</td></tr></table>	LIC-PRM-X-SCRAMBLING		Part Number	QTY	FW-PRM-X-AES-CW	1	FW-PRM-X-DVB-CW	1	FW-PRM-X-BISS-FIX-SRV	1	FW-PRM-X-DES-FIX-SRV	1	FW-PRM-X-SCR-FIX-SRV	1	FW-PRM-X-SCR-PANDORA-SRV	1	FW-PRM-X-SELC-EHP	1	FW-PRM-X-SELC-SCR	1
LIC-PRM-X-SCRAMBLING																						
Part Number	QTY																					
FW-PRM-X-AES-CW	1																					
FW-PRM-X-DVB-CW	1																					
FW-PRM-X-BISS-FIX-SRV	1																					
FW-PRM-X-DES-FIX-SRV	1																					
FW-PRM-X-SCR-FIX-SRV	1																					
FW-PRM-X-SCR-PANDORA-SRV	1																					
FW-PRM-X-SELC-EHP	1																					
FW-PRM-X-SELC-SCR	1																					
LIC-PRM-X-SWITCHING	Switching license for single (one) channel for the following switching options: EAS, EAS SCTE-18 Triggering, Live-to-live switching (Seamless Program Substitution), external slate insertion switching , BDS connection for Invidi support , blackout switching and ESAM interface support.	<table><tr><th colspan="2">LIC-PRM-X-SWITCHING</th></tr><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-PRM-X-BDS-SRV</td><td>1</td></tr><tr><td>FW-PRM-X-BLCKOUT-VIRD</td><td>1</td></tr><tr><td>FW-PRM-X-EAS-SCTE18-SRV</td><td>1</td></tr><tr><td>FW-PRM-X-EAS-SRV</td><td>1</td></tr><tr><td>FW-PRM-X-ESAM</td><td>1</td></tr><tr><td>FW-PRM-X-SLATE-SRV</td><td>1</td></tr></table>	LIC-PRM-X-SWITCHING		Part Number	QTY	FW-PRM-X-BDS-SRV	1	FW-PRM-X-BLCKOUT-VIRD	1	FW-PRM-X-EAS-SCTE18-SRV	1	FW-PRM-X-EAS-SRV	1	FW-PRM-X-ESAM	1	FW-PRM-X-SLATE-SRV	1				
LIC-PRM-X-SWITCHING																						
Part Number	QTY																					
FW-PRM-X-BDS-SRV	1																					
FW-PRM-X-BLCKOUT-VIRD	1																					
FW-PRM-X-EAS-SCTE18-SRV	1																					
FW-PRM-X-EAS-SRV	1																					
FW-PRM-X-ESAM	1																					
FW-PRM-X-SLATE-SRV	1																					

New license	Description	Included detail licenses								
LIC-PRM-X-ADVANCED-SM	Advanced Statmux tool for up to 6 video channels with Target Average Bitrate and one DataTrack (1 TS) . For enabling DiviTrack Statmux (per pool), a separate license should be quoted.	<table><tr><th colspan="2">LIC-PRM-X-SWITCHING</th></tr><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-PRM-X-DT-TARGET-BTR-SRV</td><td>6</td></tr><tr><td>FW-PRM-X-DATATRACK</td><td>1</td></tr></table>	LIC-PRM-X-SWITCHING		Part Number	QTY	FW-PRM-X-DT-TARGET-BTR-SRV	6	FW-PRM-X-DATATRACK	1
LIC-PRM-X-SWITCHING										
Part Number	QTY									
FW-PRM-X-DT-TARGET-BTR-SRV	6									
FW-PRM-X-DATATRACK	1									

ProStream XVM

New license	Description	Included detail licenses								
LIC-PRM-XVM-BASE	ProStream XVM base license enabling basic multiplexer function including RestAPI. One license per ProStream X appliance is required.	<table><tr><th colspan="2">LIC-PRM-XVM-BASE</th></tr><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-PRM-XVM-BASE</td><td>1</td></tr><tr><td>FW-PRM-XVM-RESTAPI</td><td>1</td></tr></table>	LIC-PRM-XVM-BASE		Part Number	QTY	FW-PRM-XVM-BASE	1	FW-PRM-XVM-RESTAPI	1
LIC-PRM-XVM-BASE										
Part Number	QTY									
FW-PRM-XVM-BASE	1									
FW-PRM-XVM-RESTAPI	1									

New license	Description	Included detail licenses																				
LIC-PRM-XVM-SCRAMBLING	Scrambling license for single (one) channel for the following scrambling options: DVB CSAv2, AES, BISS-1, Fixed Key scrambling, Fixed key descrambling, selective encryption, Enhanced Hacking Protection (EHP) and Pandora encryption.	<table><tr><th colspan="2">LIC-PRM-XVM-SCRAMBLING</th></tr><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-PRM-XVM-AES-CW</td><td>1</td></tr><tr><td>FW-PRM-XVM-DVB-CW</td><td>1</td></tr><tr><td>FW-PRM-XVM-BISS-FIX-SRV</td><td>1</td></tr><tr><td>FW-PRM-XVM-DES-FIX-SRV</td><td>1</td></tr><tr><td>FW-PRM-XVM-SCR-FIX-SRV</td><td>1</td></tr><tr><td>FW-PRM-XVM-SCR-PANDORA-SRV</td><td>1</td></tr><tr><td>FW-PRM-XVM-SELC-EHP</td><td>1</td></tr><tr><td>FW-PRM-XVM-SELC-SCR</td><td>1</td></tr></table>	LIC-PRM-XVM-SCRAMBLING		Part Number	QTY	FW-PRM-XVM-AES-CW	1	FW-PRM-XVM-DVB-CW	1	FW-PRM-XVM-BISS-FIX-SRV	1	FW-PRM-XVM-DES-FIX-SRV	1	FW-PRM-XVM-SCR-FIX-SRV	1	FW-PRM-XVM-SCR-PANDORA-SRV	1	FW-PRM-XVM-SELC-EHP	1	FW-PRM-XVM-SELC-SCR	1
LIC-PRM-XVM-SCRAMBLING																						
Part Number	QTY																					
FW-PRM-XVM-AES-CW	1																					
FW-PRM-XVM-DVB-CW	1																					
FW-PRM-XVM-BISS-FIX-SRV	1																					
FW-PRM-XVM-DES-FIX-SRV	1																					
FW-PRM-XVM-SCR-FIX-SRV	1																					
FW-PRM-XVM-SCR-PANDORA-SRV	1																					
FW-PRM-XVM-SELC-EHP	1																					
FW-PRM-XVM-SELC-SCR	1																					
LIC-PRM-XVM-SWITCHING	Switching license for single (one) channel for the following switching options: EAS, EAS SCTE-18 Triggering, Live-to-live switching (Seamless Program Substitution), external slate insertion switching , BDS connection for Invidi support , blackout switching and ESAM interface support.	<table><tr><th colspan="2">LIC-PRM-X-SWITCHING</th></tr><tr><th>Part Number</th><th>QTY</th></tr><tr><td>FW-PRM-XVM-BDS-SRV</td><td>1</td></tr><tr><td>FW-PRM-XVM-BLCKOUT-VIRD</td><td>1</td></tr><tr><td>FW-PRM-XVM-EAS-SCTE18-SRV</td><td>1</td></tr><tr><td>FW-PRM-XVM-EAS-SRV</td><td>1</td></tr><tr><td>FW-PRM-XVM-ESAM</td><td>1</td></tr><tr><td>FW-PRM-XVM-SLATE-SRV</td><td>1</td></tr></table>	LIC-PRM-X-SWITCHING		Part Number	QTY	FW-PRM-XVM-BDS-SRV	1	FW-PRM-XVM-BLCKOUT-VIRD	1	FW-PRM-XVM-EAS-SCTE18-SRV	1	FW-PRM-XVM-EAS-SRV	1	FW-PRM-XVM-ESAM	1	FW-PRM-XVM-SLATE-SRV	1				
LIC-PRM-X-SWITCHING																						
Part Number	QTY																					
FW-PRM-XVM-BDS-SRV	1																					
FW-PRM-XVM-BLCKOUT-VIRD	1																					
FW-PRM-XVM-EAS-SCTE18-SRV	1																					
FW-PRM-XVM-EAS-SRV	1																					
FW-PRM-XVM-ESAM	1																					
FW-PRM-XVM-SLATE-SRV	1																					

New license	Description	Included detail licenses	
LIC-PRM-XVM-ADVANCED-SM	Advanced Statmux tool for up to 6 video channels with Target Average Bitrate and one DataTrack (1 TS) . For enabling DiviTrack Statmux (per pool), a separate license should be quoted.	LIC-PRM-XVM-SWITCHING	
		Part Number	QTY
		FW-PRM-XVM-DT-TARGET-BTR-SRV	6
		FW-PRM-XVM-DATATRACK	1