Release Notes for Cisco NCS 6000 Series Routers, IOS XR Release 7.6.1

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The Cisco Network Convergence System (NCS) 6000 series router delivers outstanding network agility, packet optical convergence, and a system scale measured in petabits per second. It also facilitates the build-out of next-generation core to:

- support elastic capacity at the lowest total ownership cost
- deliver high-bandwidth mobile, video, and cloud services

Running the Cisco IOS XR operating system, Cisco's innovative virtualized operating environment, the Cisco NCS 6000 series router advances the concept of distributed routing and virtualization. With Cisco Virtualized IOS XR, the Cisco NCS 6000 series router brings new levels of programmability and virtualization to:

- enhance application service offerings
- increase provisioning speed
- optimize network economics

The Cisco NCS 6000 series router is engineered for environmental efficiency, with the use of adaptable power consumption. The Cisco NCS 6000 series router is powered by the Cisco nPower Network Processor Units (NPU). These technologies aid the Cisco NCS 6000 series router to achieve the lowest carbon footprint in service provider routing.

The Cisco NCS 6008 router, part of the Cisco NCS 6000 series routers, is the next-generation core routing system that provides industry-leading 8 Tbps of full-duplex network bandwidth through single chassis with eight line cards per chassis.

The Cisco NCS 6008 router runs on Cisco IOS XR software with Linux as the underlying host operating system. A Kernel-based Virtual Machine (KVM) hypervisor provides a virtualized environment to independently run system administration and routing functions on separate virtual machines. This provision makes the new system versatile and robust, and provides immense flexibility for future expansion without the need for a complete system overhaul.

A multi-slice architecture of line cards enables the system to be configured in a mixed operating mode, simultaneously supporting traffic at 10 Gbps and 100 Gbps on slice-level granularity.

For a list of software caveats that apply to this Release, see the Caveats section. The caveats are updated for every release and are described at http://www.cisco.com.

What's New in Cisco IOS XR Release 7.6.1

New in Documentation

This release introduces rich and intuitive ways for you to access information about error messages and supported MIBs.

Product	Description
Cisco IOS XR Error messages	Search by release number, error strings, or compare release numbers to view a detailed repository of error messages and descriptions.
Cisco IOS XR MIBs	Select the MIB of your choice from a drop-down to explore an extensive repository of MIB information.

Software Features Enhanced and Introduced

To learn about features introduced in other Cisco IOS XR releases, select the release from the Documentation Landing Page.

Feature	Description
MPLS	
Configure BFD and SRLG Diverse Path-Protection Under Named TE Tunnels	Instead of using number IDs, you can now use a string to name MPLS-TE tunnels while configuring Bidirectional Forwarding Detection (BFD) and Shared Risk Link Group (SRLG) diverse path protection. Unlike number IDs, tunnel names are unique across all the routers in your network. This facilitates faster troubleshooting as you use the **show mpls traffic-eng named-tunnels** command to check that the BFD and SRLG configurations meet specified performance requirements.
Routing	
BGP Flowspec on CSI Interfaces	A solution that uses BGP to advertise mitigation rules across BGP peer routers in case of a DDoS attack, BGP flowspec is now supported on Cross SDR Interconnect (CSI) Interfaces.
MPLS TE Preference for Tunnels	Limiting IS-IS to use only MPLS TE tunnels is useful for network topologies when the platforms have resource constraints that limit the number of mixed ECMP routes. You can now configure the MPLS TE traffic for equal-cost multipath (ECMP) such that it flows only through TE tunnels. This is useful in scenarios where the hardware has resource constraints that limit the number of mixed ECMP routes. In earlier releases, IS-IS installed multiple ECMPs for a route in the Routing Information Base (RIB) through TE tunnels and physical interfaces by default. This feature introduces the following command: **mpls traffic-eng tunnel preferred**
System Management	
MPLS Entropy Label Decapsulation on Egress CSI Interfaces	MPLS entropy labels improve load balancing across MPLS networks. With entopy label encapulation (on ingress router) and decapsulation (on egress router), there's no need for deep packet inspections on transit routers. Such inspections would've led to inefficient load-balancing. MPLS entropy label decapsulation is now supported over egress Cross SDR Interconnect Interfaces (CSI).
Telemetry	
gNMI Dial-Out via Tunnel Service	This feature uses the tunnel service to allow the router (tunnel client) to dial out to a collector (tunnel server). After the session is established, the server-client switch directions where a server can act as a client to request gNMI services without altering the gNMI semantics. With this feature, the management software automatically learns when a new device is introduced in the network. This feature introduces the keyword **tunnel** to the **grpc** command.

Caveats

There are no caveats in this release.

Release 7.6.1 Packages

This table lists the Cisco IOS XR Software feature set matrix (packages) and associated filenames available for the Cisco IOS XR Software Release 7.6.1 that is supported on the Cisco NCS 6008 router.

Table 1: Cisco IOS XR Software Release 7.6.1 Packages

Feature Set	Filename	Description
Composite Package		
Cisco IOS XR IP Unicast Routing Core Bundle	ncs6k-mini-x.iso-7.6.1	Contains required core packages, including OS, Admin, Base, Forwarding, Modular Services Card, Routing, SNMP Agent, FPD, and Alarm Correlation.
Optional Individual Packages (packages that are installed individually)		
Cisco IOS XR Manageability Package	ncs6k-mgbl.pkg-7.6.1	Extensible Markup Language (XML) Parser and HTTP server packages.
Cisco IOS XR MPLS Package	ncs6k-mpls.pkg-7.6.1	MPLS Traffic Engineering (MPLS-TE), Label Distribution Protocol (LDP), MPLS Forwarding, MPLS Operations, Administration, and Maintenance (OAM), Link Manager Protocol (LMP), Optical User Network Interface (OUNI), Resource Reservation Protocol (RSVP), and Layer-3 VPN.
Cisco IOS XR Multicast Package	ncs6k-mcast.pkg-7.6.1	Multicast Routing Protocols (PIM, Multicast Source Discovery Protocol [MSDP], Internet Group Management Protocol [IGMP], Auto-RP), Tools (SAP, MTrace), and Infrastructure [(Multicast Routing Information Base [MRIB], Multicast-Unicast RIB [MURIB], Multicast forwarding [MFWD]).
Cisco IOS XR Security Package	ncs6k-k9sec.pkg-7.6.1	Support for Encryption, Decryption, IP Security (IPSec), Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI) (Software based IPSec support—maximum of 500 tunnels)
Cisco IOS XR Lawful Intercept (LI) Package	ncs6k-li.pkg-7.6.1	Supports Lawful Intercept (LI) features.
Cisco IOS XR Documentation Package	ncs6k-doc.pkg-7.6.1	*.man* pages for Cisco IOS XR Software.

Determining Installed Active Packages

To determine active software packages installed on the router, log in to the router and enter the **show install active summary** command in EXEC mode:

```
RP/0/RP0/CPU0:router# show install active

Node B0/CB0/CPU5 [RP]
  Boot Partition: xr_lv71
  Active Packages: 7
        ncs6k-xr-7.6.1 version=7.6.1 [Boot image]
        ncs6k-li-1.0.0.0-r761
        ncs6k-mgbl-1.0.0.0-r761
        ncs6k-mcast-1.0.0.0-r761
        ncs6k-doc-1.0.0.0-r761
        ncs6k-mpls-1.0.0.0-r761
        ncs6k-k9sec-1.0.0.0-r761
```

Supported Packages and System Requirements

This section describes the system requirements for Cisco NCS 6000 Series Routers for Software Release .

Memory Requirements

The minimum memory requirements for a Cisco NCS 6008 router running Cisco IOS XR Software Release consist of the following:

- 48 GB memory on the NCS 6008 Route Processors (NCS6-RP)
- 16 GB memory on 1T line cards
- 32 GB memory on 2T line cards

In order to avoid low memory conditions during system operations, it is recommended that you have 2000MB of free memory available on the Route Processors.

Supported Hardware

The following table lists the supported hardware components on the Cisco NCS 6000 Series Router and the minimum required software release. For more information, see the *Firmware Support* section.

Table 2: Cisco NCS 6008 Router Hardware and Software Compatibility Matrix

Component	Part Number	Support from Release
Second-generation S2 fabric card for the FCC with 32 CXP2 ports for 270GE SR25 CXP2s	NCS-F-FC2	6.3.2
CXP2 - 270GE SR25 transceiver module	ONS-CXP2-SR25	6.3.2
96 ONS-CXP2-SR25 optical modules	NCS-FAB-OPT2	6.3.2

Component	Part Number	Support from Release
Cisco 100GBASE SR4 QSFP Transceiver Cisco 100GBASE LR4 QSFP Transceiver	QSFP-100G-SR4-S QSFP-100G-LR4-S	6.2.2
20-port 100Gbps Lean Core	NC6-20X100GE-L-C	6.2.2
20-port 100Gbps Multi-Service Core	NC6-20X100GE-M-C	6.2.2
Universal Fabric Card	NC6-FC2-U	6.2.1
Cisco NCS 6008 FT, version 2	NC6-FANTRAY-2	6.1.2
CPAK optical transceiver module, 100GBASE-SR4, 100m OM4	CPAK-100G-SR4	6.1.2
S13 fabric card for LCC with16 CXP ports for 100GE SR optics	NC6-FC-MC	5.2.1
S13 fabric card for LCC with16 CXP ports for 100GE SR optics Spare	NC6-FC-MC=	5.2.1
S2 fabric card for the FCC with 32 CXP ports for 100GE SR12 CXPs	NCS-F-FC	5.2.1
S2 fabric card for the FCC with 32 CXP ports for 100GE SR12 CXPs Spare	NCS-F-FC=	5.2.1
FCC shelf controllers	NCS-F-SC	5.2.1
FCC shelf controllers Spare	NCS-F-SC=	5.2.1
FCC shelf controller and switch (SC-SW) card	NCS-F-SCSW	5.2.1
FCC shelf controller and switch (SC-SW) card Spare	NCS-F-SCSW=	5.2.1
Short reach SFP 10GE transceiver module	SFP-10G-SR	5.2.1
Long reach SFP 10GE transceiver module	SFP-10G-LR	5.2.1
Short reach QSFP 40GE optical module (SC-SW card only)	QSFP-40G-SR4	5.2.1
Long reach QSFP 40GE optical module (SC-SW card only)	QSFP-40G-LR4	5.2.1
96 CXP-100G-SR12 optical module	NCS-FAB-OPT	5.2.1
2X100GE MS PAYG Card with CPAK	NC6-2-10x100G-M-K	5.2.1
2X100GE LSR PAYG Card with CPAK	NC6-2-10x100G-L-K	5.2.1
30x10GE MS PAYG Card with SFPP	NC6-30x10G-M-S	5.2.1

Component	Part Number	Support from Release
30x10GE LSR PAYG Card with SFPP	NC6-30x10G-L-S	5.2.1
Craft Panel	NCS-CRFT	5.2.1
60-port 10Gbps SFP+ Lean Core Line card	NC6-60X10GE-L-S	5.0.1
60-port 10Gbps SFP+ Multi-Service Core Line card	NC6-60X10GE-M-S	5.0.1
Cisco 10GBASE-SR SFP+ Module for MMF	SFP-10G-SR	5.0.1
Cisco 10GBASE-SR SFP+ Module for MMF, extended temperature range	SFP-10G-SR-X	5.0.1
Cisco 10GBASE-LR SFP+ Module for SMF	SFP-10G-LR	5.0.1
Cisco multirate 10GBASE-LR, 10GBASE-LW and OTU2e SFP+ Module for SMF, extended temperature range	SFP-10G-LR-X	5.0.1
Cisco 10GBASE-ER SFP+ Module for SMF	SFP-10G-ER	5.0.1
Cisco 10GBASE-ZR SFP+ Module for SMF	SFP-10G-ZR	5.0.1
NCS 6008 - 8-Slot Chassis	NCS-6008	5.0.0
NCS 6008 Fabric Card	NC6-FC	5.0.0
NCS 6008 Route Processor	NC6-RP	5.0.0
NCS 6008 Chassis Fan Tray	NC6-FANTRAY	5.0.0
NCS AC Power Tray	NCS-AC-PWRTRAY	5.0.0
NCS DC Power Tray	NCS-DC-PWRTRAY	5.0.0
NCS PDU Bracket	NCS-PDU-BRKT	5.0.0
NCS 6008 3-to-1 Phase DELTA PDU	NCS-PDU-DELTA	5.0.0
NCS 6008 3-to-1 Phase WYE PDU	NCS-PDU-WYE	5.0.0
NCS 100x10GE Patch Panel Short Reach	NCS-PP-100X10-SR	5.0.0
NCS 6000 10x100G Multi-Service CPAK	NC6-10X100G-M-K	5.0.0
NCS 6000 10x100G Multi-Service CXP	NC6-10X100G-M-P	5.0.0
NCS 6000 10x100G LSR CPAK	NC6-10X100G-L-K	5.0.0

Component	Part Number	Support from Release
NCS 6000 10x100G LSR CXP	NC6-10X100G-L-P	5.0.0
NCS Craft Panel Display Kit	NCS-CRFT	5.0.0
NCS 6008 Chassis Front Doors	NC6-DOOR-F	5.0.0
NCS 6008 Chassis Rear Doors	NC6-DOOR-R	5.0.0
NCS 6008 Chassis Drill Template	NC6-DRILLTEMP	5.0.0
NCS 6008 Chassis Front-Bottom Grille	NC6-GRILLE-FB	5.0.0
NCS 6008 Chassis Front-Top Grille	NC6-GRILLE-FT	5.0.0
NCS 6008 Chassis Rear Grille	NC6-GRILLE-R	5.0.0
NCS 6008 Power Control Module	NC6-PCM	5.0.0
NCS 6008 Chassis Trough	NC6-TROUGH	5.0.0
NCS 6008 Chassis Trough Wide	NC6-TROUGH-W	5.0.0
NCS 6008 & NCS Fabric Chassis Lift Dolly	NCS-LIFT	5.0.0
10X10G-LR Cisco CPAK module for SMF	CPAK-10X10G-LR	5.0.0
CPAK-100G-LR4 Transceiver module, 10 km SMF	CPAK-100G-LR4	5.0.0
CXP-100G-SR10 transceiver Module	CXP-100G-SR10	5.0.0

Firmware Support

To check the firmware code running on the Cisco NCS 6000 Series Router, run the **show fpd package** command in admin mode.

```
RP/0/RP0/CPU0:router(admin)#show fpd package

=============================== ====================================================
                               Field Programmable Device Package
                       ===============================================
                                                    Req     SW         Min Req    Min Req
Card Type            FPD Description              Reload  Ver        SW Ver     Board Ver
=================== ========================== ====== =======  ==========  =========
NC6-10X100G-L-K      Backup-BIOS                   YES    14.09       14.00       0.0
                     Backup-CCC-PwrOn              NO      1.39        1.31       0.0
                     Backup-EthSwitch              YES     1.33        1.32       0.0
                     BAO-DB-FPGA                   NO      1.06        1.06       0.0
                     BAO-MB-FPGA                   NO      1.06        1.06       0.0
                     CCC-Bootloader                YES     2.12        2.07       0.0
                     CCC-FPGA                      YES     2.12        2.12       0.0
                     CCC-Power-On                  NO      1.41        1.41       0.0
                     Ethernet-Switch               YES     1.33        1.33       0.0
                     PLX-8748                      YES     0.05        0.05       0.1
                     Primary-BIOS                  YES    14.09       14.09       0.0
                     S2-GN2411                     YES     5.86        5.86       2.0
```

	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-10X100G-L-P	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	1.06	1.06	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	Slice-0-GN2411	YES	5.86	5.86	2.0
	Slice-0-GN2411	YES	7.58	7.58	0.0
	Slice-1-GN2411	YES	5.86	5.86	2.0
	Slice-1-GN2411	YES	7.58	7.58	0.0
	Slice-2-GN2411	YES	5.86	5.86	2.0
	Slice-2-GN2411	YES	7.58	7.58	0.0
	Slice-3-GN2411	YES	5.86	5.86	2.0
	Slice-3-GN2411	YES	7.58	7.58	0.0
	Slice-4-GN2411	YES	5.86	5.86	2.0
	Slice-4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-10X100G-M-K	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	1.06	1.06	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-10X100G-M-P	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	1.06	1.06	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0

	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	Slice-0-GN2411	YES	5.86	5.86	2.0
	Slice-0-GN2411	YES	7.58	7.58	0.0
	Slice-1-GN2411	YES	5.86	5.86	2.0
	Slice-1-GN2411	YES	7.58	7.58	0.0
	Slice-2-GN2411	YES	5.86	5.86	2.0
	Slice-2-GN2411	YES	7.58	7.58	0.0
	Slice-3-GN2411	YES	5.86	5.86	2.0
	Slice-3-GN2411	YES	7.58	7.58	0.0
	Slice-4-GN2411	YES	5.86	5.86	2.0
	Slice-4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-2/10X100G-L-K	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	1.06	1.06	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-2/10X100G-M-K	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	1.06	1.06	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0

NC6-20X100GE-L-C	Backup-BIOS	YES	1.08	1.08	0.1
	Backup-CCC-PwrOn	NO	1.11	1.10	0.0
	Backup-EthSwitch	YES	1.00	1.00	0.0
	Backup-EthSwitch	YES	1.14	1.14	0.2
	Backup-SolDBfpga	NO	1.04	1.04	0.0
	Backup-SolMBfpga	NO	1.04	1.04	0.0
	CCC-Bootloader	YES	1.08	1.08	0.0
	CCC-FPGA	YES	1.08	1.08	0.0
	CCC-Power-On	NO	1.11	1.11	0.0
	Ethernet-Switch	YES	1.00	1.00	0.0
	Ethernet-Switch	YES	1.14	1.14	0.2
	PLX-8749	YES	0.06	0.06	0.1
	Primary-BIOS	YES	1.08	1.08	0.1
	SOL-DB-FPGA	NO	1.04	1.04	0.0
	SOL-MB-FPGA	NO	1.04	1.04	0.0
NC6-20X100GE-M-C	Backup-BIOS	YES	1.08	1.08	0.1
	Backup-CCC-PwrOn	NO	1.11	1.10	0.0
	Backup-EthSwitch	YES	1.00	1.00	0.0
	Backup-EthSwitch	YES	1.14	1.14	0.2
	Backup-SolDBfpga	NO	1.04	1.04	0.0
	Backup-SolMBfpga	NO	1.04	1.04	0.0
	CCC-Bootloader	YES	1.08	1.08	0.0
	CCC-FPGA	YES	1.08	1.08	0.0
	CCC-Power-On	NO	1.11	1.11	0.0
	Ethernet-Switch	YES	1.00	1.00	0.0
	Ethernet-Switch	YES	1.14	1.14	0.2
	PLX-8749	YES	0.06	0.06	0.1
	Primary-BIOS	YES	1.08	1.08	0.1
	SOL-DB-FPGA	NO	1.04	1.04	0.0
	SOL-MB-FPGA	NO	1.04	1.04	0.0
NC6-30/60X10G-L-S	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	0.29	0.29	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	Modena-0-PHY	YES	0.13	0.13	0.0
	Modena-1-PHY	YES	0.13	0.13	0.0
	Modena-10-PHY	YES	0.13	0.13	0.0
	Modena-11-PHY	YES	0.13	0.13	0.0
	Modena-12-PHY	YES	0.13	0.13	0.0
	Modena-13-PHY	YES	0.13	0.13	0.0
	Modena-14-PHY	YES	0.13	0.13	0.0
	Modena-15-PHY	YES	0.13	0.13	0.0
	Modena-2-PHY	YES	0.13	0.13	0.0
	Modena-3-PHY	YES	0.13	0.13	0.0
	Modena-4-PHY	YES	0.13	0.13	0.0
	Modena-5-PHY	YES	0.13	0.13	0.0
	Modena-6-PHY	YES	0.13	0.13	0.0
	Modena-7-PHY	YES	0.13	0.13	0.0
	Modena-8-PHY	YES	0.13	0.13	0.0
	Modena-9-PHY	YES	0.13	0.13	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0

	S4-GN2411	YES	7.58	7.58	0.0
	Slice-0-GN2411	YES	5.86	5.86	2.0
	Slice-0-GN2411	YES	7.58	7.58	0.0
	Slice-1-GN2411	YES	5.86	5.86	2.0
	Slice-1-GN2411	YES	7.58	7.58	0.0
	Slice-2-GN2411	YES	5.86	5.86	2.0
	Slice-2-GN2411	YES	7.58	7.58	0.0
	Slice-3-GN2411	YES	5.86	5.86	2.0
	Slice-3-GN2411	YES	7.58	7.58	0.0
	Slice-4-GN2411	YES	5.86	5.86	2.0
	Slice-4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-30/60X10G-M-S	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	0.29	0.29	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	Modena-0-PHY	YES	0.13	0.13	0.0
	Modena-1-PHY	YES	0.13	0.13	0.0
	Modena-10-PHY	YES	0.13	0.13	0.0
	Modena-11-PHY	YES	0.13	0.13	0.0
	Modena-12-PHY	YES	0.13	0.13	0.0
	Modena-13-PHY	YES	0.13	0.13	0.0
	Modena-14-PHY	YES	0.13	0.13	0.0
	Modena-15-PHY	YES	0.13	0.13	0.0
	Modena-2-PHY	YES	0.13	0.13	0.0
	Modena-3-PHY	YES	0.13	0.13	0.0
	Modena-4-PHY	YES	0.13	0.13	0.0
	Modena-5-PHY	YES	0.13	0.13	0.0
	Modena-6-PHY	YES	0.13	0.13	0.0
	Modena-7-PHY	YES	0.13	0.13	0.0
	Modena-8-PHY	YES	0.13	0.13	0.0
	Modena-9-PHY	YES	0.13	0.13	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-4-10X100G-M-K	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	1.06	1.06	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0

	S4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-6-10X100G-L-K	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	1.06	1.06	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NC6-60X10GE-L-S	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	0.29	0.29	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	Modena-0-PHY	YES	0.13	0.13	0.0
	Modena-1-PHY	YES	0.13	0.13	0.0
	Modena-10-PHY	YES	0.13	0.13	0.0
	Modena-11-PHY	YES	0.13	0.13	0.0
	Modena-12-PHY	YES	0.13	0.13	0.0
	Modena-13-PHY	YES	0.13	0.13	0.0
	Modena-14-PHY	YES	0.13	0.13	0.0
	Modena-15-PHY	YES	0.13	0.13	0.0
	Modena-2-PHY	YES	0.13	0.13	0.0
	Modena-3-PHY	YES	0.13	0.13	0.0
	Modena-4-PHY	YES	0.13	0.13	0.0
	Modena-5-PHY	YES	0.13	0.13	0.0
	Modena-6-PHY	YES	0.13	0.13	0.0
	Modena-7-PHY	YES	0.13	0.13	0.0
	Modena-8-PHY	YES	0.13	0.13	0.0
	Modena-9-PHY	YES	0.13	0.13	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	Slice-0-GN2411	YES	5.86	5.86	2.0
	Slice-0-GN2411	YES	7.58	7.58	0.0
	Slice-1-GN2411	YES	5.86	5.86	2.0
	Slice-1-GN2411	YES	7.58	7.58	0.0
	Slice-2-GN2411	YES	5.86	5.86	2.0
	Slice-2-GN2411	YES	7.58	7.58	0.0
	Slice-3-GN2411	YES	5.86	5.86	2.0

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                    Slice-3-GN2411             YES     7.58        7.58      0.0
                    Slice-4-GN2411             YES     5.86        5.86      2.0
                    Slice-4-GN2411             YES     7.58        7.58      0.0
                    SMART-iSATA                NO      7.05        7.05      0.0
                    SMART-SATA                 NO      7.05        7.05      0.0
-------------------------------------------------------------------------------
NC6-60X10GE-M-S     Backup-BIOS                YES    14.09       14.00      0.0
                    Backup-CCC-PwrOn           NO      1.39        1.31      0.0
                    Backup-EthSwitch           YES     1.33        1.32      0.0
                    BAO-DB-FPGA                NO      0.29        0.29      0.0
                    BAO-MB-FPGA                NO      0.29        0.29      0.0
                    CCC-Bootloader             YES     2.12        2.07      0.0
                    CCC-FPGA                   YES     2.12        2.12      0.0
                    CCC-Power-On               NO      1.41        1.41      0.0
                    Ethernet-Switch            YES     1.33        1.33      0.0
                    Modena-0-PHY               YES     0.13        0.13      0.0
                    Modena-1-PHY               YES     0.13        0.13      0.0
                    Modena-10-PHY              YES     0.13        0.13      0.0
                    Modena-11-PHY              YES     0.13        0.13      0.0
                    Modena-12-PHY              YES     0.13        0.13      0.0
                    Modena-13-PHY              YES     0.13        0.13      0.0
                    Modena-14-PHY              YES     0.13        0.13      0.0
                    Modena-15-PHY              YES     0.13        0.13      0.0
                    Modena-2-PHY               YES     0.13        0.13      0.0
                    Modena-3-PHY               YES     0.13        0.13      0.0
                    Modena-4-PHY               YES    0.13        0.13   0.0
                   Modena-5-PHY               YES   0.13        0.13      0.0
                   Modena-6-PHY               Y     0.13        0.13      0.0
                    Modena-7-HY                YES     0.13        0.13      0
                    Moden-8-PHY                YES     0.1        0.13      0.0
                   Modena-9-PHY              YES    0.13        13      0.0
                  Primary-BIOS              YES  14.09       14.      0.0
                 S2-GN2411                 YES     5.86        5.      2.0
                   S2-GN2411                 YES   7.58        7.5     0.0
                   S3-GN2411                 YES     5.86        5.6      2.0
                  SMART-iSATA               NO      7.05        75      0.0
C6-FANTRAY          Fantray-FPGA              NO    2.01        21      0.0  -
-------------------------------------------------------------------------M----
NC6-FANTRAY-2       Fantray-FPGA                NO      3.05      3.05      0.0
-------------------------------------------------------------------------------
NC6-FC               CC-FPGA                  YES     1.29        1.29    0.0
                     C-Power-On                NO     .39        1.39    0.0
                    PLX-8713                   YES     1.03        13      0.1
-------------------------------------------------------------------------------
NC6-FC-MC          Back-CRE-GA-MB            S     1.00       1.00      0.0
                     CCC-FPGA                  ES     1.29      1.29      0.0
                  CRE-FPGA-MB               YES   1.00        1.00      0.0
                 GN2411-BUS-0              YES   5.86        5.86      2.0
-More--K                   GN2411-BUS-              YES     7.58      7.58      0.0
                   GN2411-BUS-1               YE    7.58        7.58      0.0
                   GN2411-BUS-2               Y     5.86        5.86      2.0
-------------------------------------------------------------------------------
NC6-FC2-U            CCC-FPGA                  S     2.11        2.11      0.0
                     CCC-PoweOn                 NO      1.39       1.39      0.0
                     PLX-13                   YES     1.05        1.05     0.0
-------------------------------------------------------------------------------
NC6P                ckup-BIOS                 YES    .09       14.00      00
                     Backup-CCPwrOn                 1.42        1.32      0.0
                    Backup-Etwitch            S     1.33      1.32      0.2
                     Backup-Ethwitch                1.33       .32      0.1
                    CCC-FPGA                  YES   2.07        2.07      0.0
                     CCC-Power-On                NO      1.42        1.42      0.0
                     CPU-Complex-BOOT           YES     4.08        4.04      0.1
                     CPU-Complex-BOOT           YES     0.01        0.01      0.0
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	CPU-Complex-FPGA	YES	4.08	4.08	0.1
	CPU-Complex-FPGA	YES	0.01	0.01	0.0
	Ethernet-Switch	YES	1.33	1.33	0.2
	Ethernet-Switch	YES	1.33	1.33	0.1
	PLX-8748	YES	0.05	0.05	0.0
	Primary-BIOS	YES	14.09	14.09	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NCS-CRFT	Craft-FCC	NO	1.06	1.06	0.1
	Craft-LCC	NO	1.06	1.06	0.1
NCS-F-FANTRAY	Fantray-FPGA	NO	2.01	2.01	0.0
NCS-F-FC	Back-CRE-FPGA-DC	YES	1.00	1.00	0.0
	Back-CRE-FPGA-MB	YES	1.00	1.00	0.0
	CCC-FPGA	YES	1.29	1.29	0.0
	CCC-Power-On	NO	1.39	1.39	0.0
	CRE-FPGA-DC	YES	1.00	1.00	0.0
	CRE-FPGA-MB	YES	1.00	1.00	0.0
	GN2411-BUS-0	YES	5.86	5.86	2.0
	GN2411-BUS-0	YES	7.58	7.58	0.0
	GN2411-BUS-1	YES	5.86	5.86	2.0
	GN2411-BUS-1	YES	7.58	7.58	0.0
	GN2411-BUS-2	YES	5.86	5.86	2.0
	GN2411-BUS-2	YES	7.58	7.58	0.0
	GN2411-BUS-3	YES	5.86	5.86	2.0
	GN2411-BUS-3	YES	7.58	7.58	0.0
	GN2411-BUS-4	YES	5.86	5.86	2.0
	GN2411-BUS-4	YES	7.58	7.58	0.0
	PLX-8713	YES	1.04	1.04	0.1
NCS-F-FC2	Back-CRE2-FPGA-DC	YES	1.00	1.00	0.0
	CCC-FPGA	YES	1.10	1.10	0.0
	CCC-Power-On	NO	1.05	1.05	0.0
	CRE2-FPGA-DC	YES	1.03	1.03	0.0
	PLX-8713	YES	1.05	1.05	0.1
NCS-F-SC	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.41	1.38	0.0
	Backup-EthSwitch	YES	1.33	1.33	0.0
	CCC-Bootloader	YES	2.03	2.01	0.0
	CCC-FPGA	YES	2.03	2.03	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	CPU-Complex-BOOT	YES	4.08	4.04	0.1
	CPU-Complex-BOOT	YES	0.01	0.01	0.0
	CPU-Complex-FPGA	YES	4.08	4.08	0.1
	CPU-Complex-FPGA	YES	0.01	0.01	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8625	YES	0.02	0.02	0.0
	Primary-BIOS	YES	14.09	14.09	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NCS-F-SCSW	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.41	1.38	0.0
	Backup-EthSwitch	YES	1.33	1.33	0.0
	CCC-Bootloader	YES	2.03	2.01	0.0
	CCC-FPGA	YES	2.03	2.03	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	CPU-Complex-BOOT	YES	4.08	4.04	0.1
	CPU-Complex-BOOT	YES	0.01	0.01	0.0
	CPU-Complex-FPGA	YES	4.08	4.08	0.1
	CPU-Complex-FPGA	YES	0.01	0.01	0.0

	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8625	YES	0.02	0.02	0.0
	Primary-BIOS	YES	14.09	14.09	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
NCS-F-SCSW (SW)	CCC-FPGA	YES	1.03	1.03	0.0
	CCC-Power-On	NO	1.39	1.39	0.0
	PLX-8614	YES	0.03	0.03	0.0
P-L-20X40G-QSFP	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-DB-FPGA	NO	0.29	0.29	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	S2-GN2411	YES	5.86	5.86	2.0
	S2-GN2411	YES	7.58	7.58	0.0
	S3-GN2411	YES	5.86	5.86	2.0
	S3-GN2411	YES	7.58	7.58	0.0
	S4-GN2411	YES	5.86	5.86	2.0
	S4-GN2411	YES	7.58	7.58	0.0
	Slice-0-GN2411	YES	5.86	5.86	2.0
	Slice-0-GN2411	YES	7.58	7.58	0.0
	Slice-1-GN2411	YES	5.86	5.86	2.0
	Slice-1-GN2411	YES	7.58	7.58	0.0
	Slice-2-GN2411	YES	5.86	5.86	2.0
	Slice-2-GN2411	YES	7.58	7.58	0.0
	Slice-3-GN2411	YES	5.86	5.86	2.0
	Slice-3-GN2411	YES	7.58	7.58	0.0
	Slice-4-GN2411	YES	5.86	5.86	2.0
	Slice-4-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
PROTO-1XPAT-QSFP	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
PROTO-1XPAT-SFP	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	SMART-iSATA	NO	7.05	7.05	0.0

	SMART-SATA	NO	7.05	7.05	0.0
PROTO-2XPAT-SFP	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	Modena-0-PHY	YES	0.13	0.13	0.0
	Modena-1-PHY	YES	0.13	0.13	0.0
	Modena-2-PHY	YES	0.13	0.13	0.0
	Modena-3-PHY	YES	0.13	0.13	0.0
	Modena-4-PHY	YES	0.13	0.13	0.0
	Modena-5-PHY	YES	0.13	0.13	0.0
	Modena-6-PHY	YES	0.13	0.13	0.0
	Modena-7-PHY	YES	0.13	0.13	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
PROTO-2XPAT-SFP-L	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-MB-FPGA	NO	0.29	0.29	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
PROTO-CXP-1XPITA	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	Slice-1-GN2411	YES	5.86	5.86	2.0
	Slice-1-GN2411	YES	7.58	7.58	0.0
	SMART-iSATA	NO	7.05	7.05	0.0
	SMART-SATA	NO	7.05	7.05	0.0
PROTO-CXP-2XPITA	Backup-BIOS	YES	14.09	14.00	0.0
	Backup-CCC-PwrOn	NO	1.39	1.31	0.0
	Backup-EthSwitch	YES	1.33	1.32	0.0
	BAO-MB-FPGA	NO	1.06	1.06	0.0
	CCC-Bootloader	YES	2.12	2.07	0.0
	CCC-FPGA	YES	2.12	2.12	0.0
	CCC-Power-On	NO	1.41	1.41	0.0
	Ethernet-Switch	YES	1.33	1.33	0.0
	PLX-8748	YES	0.05	0.05	0.1
	Primary-BIOS	YES	14.09	14.09	0.0
	Slice-0-GN2411	YES	5.86	5.86	2.0
	Slice-0-GN2411	YES	7.58	7.58	0.0
	Slice-1-GN2411	YES	5.86	5.86	2.0

```
                    Slice-1-GN2411              YES      7.58        7.58       0.0
                    SMART-iSATA                 NO       7.05        7.05       0.0
                    SMART-SATA                  NO       7.05        7.05       0.0
--------------------------------------------------------------------------------
PROTO-F-SC          Backup-BIOS                 YES     14.09       14.00       0.0
                    Backup-CCC-PwrOn            NO       1.41        1.38       0.0
                    Backup-EthSwitch            YES      1.33        1.33       0.0
                    CCC-Bootloader              YES      2.03        2.01       0.0
                    CCC-FPGA                    YES      2.03        2.03       0.0
                    CCC-Power-On                NO       1.41        1.41       0.0
                    CPU-Complex-BOOT            YES      4.08        4.04       0.1
                    CPU-Complex-BOOT            YES      0.01        0.01       0.0
                    CPU-Complex-FPGA            YES      4.08        4.08       0.1
                    CPU-Complex-FPGA            YES      0.01        0.01       0.0
                    Ethernet-Switch             YES      1.33        1.33       0.0
                    PLX-8625                    YES      0.02        0.02       0.0
                    Primary-BIOS                YES     14.09       14.09       0.0
                    SMART-iSATA                 NO       7.05        7.05       0.0
                    SMART-SATA                  NO       7.05        7.05       0.0
--------------------------------------------------------------------------------
PROTO-NC6K-ATV      Backup-BIOS                 YES     14.09       14.00       0.0
                    Backup-CCC-PwrOn            NO       1.39        1.31       0.0
                    Backup-EthSwitch            YES      1.33        1.32       0.0
                    BAO-MB-FPGA                 NO       1.00        1.00       0.0
                    CCC-Bootloader              YES      2.12        2.07       0.0
                    CCC-FPGA                    YES      2.12        2.12       0.0
                    CCC-Power-On                NO       1.41        1.41       0.0
                    Ethernet-Switch             YES      1.33        1.33       0.0
                    Primary-BIOS                YES     14.09       14.09       0.0
                    Slice-1-GN2411              YES      5.86        5.86       2.0
                    Slice-1-GN2411              YES      7.58        7.58       0.0
--------------------------------------------------------------------------------
PWR-2KW-DC-V2       DT-PriMCU                   NO       6.03        6.03      0.12
                    DT-Sec54vMCU                NO       6.02        6.02      0.12
                    DT-Sec5vMCU                 NO       6.03        6.03      0.12
                    EM-PriMCU                   NO       3.12        3.12      0.21
                    EM-Sec54vMCU                NO       3.19        3.19      0.21
                    EM-Sec5vMCU                 NO       3.19        3.19      0.21
--------------------------------------------------------------------------------
PWR-3KW-AC-V2       DT-PriMCU                   NO       6.02        6.02       1.0
                    DT-Sec54vMCU                NO       6.02        6.02       1.0
                    DT-Sec5vMCU                 NO       6.04        6.04       1.0
                    EM-Sec54vMCU                NO       3.12        3.12      0.21
                    EM-Sec5vMCU                 NO       3.18        3.18      0.21
--------------------------------------------------------------------------------
```

Minimum Firmware Requirement

The following table provides the procedures and resources for minimum firmware requirements:

After completing an Return Material Authorization (RMA), upgrade the firmware as per the matrix in this link, which also links to PDF copies of the IOS XR Firmware Upgrade Guides	http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html
For the upgrade procedure, see the *Performing System Upgrade and Installing Feature Packages* chapter of the *Cisco NCS 6008 System Setup and Software Installation Guide*	http://www.cisco.com/en/US/products/ps13132/tsd_products_support_series_home.html

Other Important Information

- To uniquely identify a line card as a Cisco device, all Cisco IOS XR supported platforms are shipped with a non-tamper-able Trust Anchor Module (TAM) in the hardware. The Cisco Trust Anchor module (TAm) helps verify that Cisco hardware is authentic and provides additional security services. This feature is supported from Cisco IOS XR Release 7.1.x on Cisco NCS 6000 platform.
- From Release 6.0, the onePK toolkit is not supported.
- Country-specific laws, regulations, and licenses—In certain countries, use of these products may be prohibited and subject to laws, regulations, or licenses, including requirements applicable to the use of the products under telecommunications and other laws and regulations; customers must comply with all such applicable laws in the countries in which they intend to use the products.
- BFD limitation—If the current PPS (packets per second) is more than 7000 packets per line card (LC) then on upgrading the Cisco IOS XR software to release 5.2.5 or later the BFD sessions may shut down. You can avoid this scenario by adjusting the PPS per LC so that the load on a LC does not exceed more than 7000 PPS.

  To know the current load (PPS value), use **show bfd summary** command. Use the **bfd address-family ipv4 minimum-interval** command to configure BFD timer.
- Field replacable unit (FRU) removal—For all card removal and replacement (including fabric cards, line cards, fan controller, and RP) follow the instructions provided by Cisco to avoid impact to traffic. See the *Cisco Network Convergence System 6000 Series Routers Hardware Installation Guide* for procedures.
- Exceeding Cisco testing—If you intend to test beyond the combined maximum configuration tested and published by Cisco, contact your Cisco Technical Support representative to discuss how to engineer a large-scale configuration for your purpose.

Related Documentation

The most current Cisco NCS 6000 Series Router software documentation is located at this URL:

http://www.cisco.com/c/en/us/support/routers/network-convergence-system-6000-series-router/tsd-products-support-series-home.html

The document containing Cisco IOS XR System Error Messages (SEM) is located at this URL:

https://www.cisco.com/c/en/us/td/docs/ios_xr_sw/error/message/ios-xr-sem-guide.html

Production Software Maintenance Updates (SMUs)

A production SMU is a SMU that is formally requested, developed, tested, and released. Production SMUs are intended for use in a live network environment and are formally supported by the Cisco TAC and the relevant development teams. Software bugs identified through software recommendations or Bug Search Tools are not a basis for production SMU requests.

For information on production SMU types, refer the Production SMU Types section of the IOS XR Software Maintenance Updates (SMUs) guide.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.

- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

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