

XCC3 on ThinkSystem V4 servers

New features and enhancements

Lenovo

Overview

XCC3 features the following hardware and design changes:

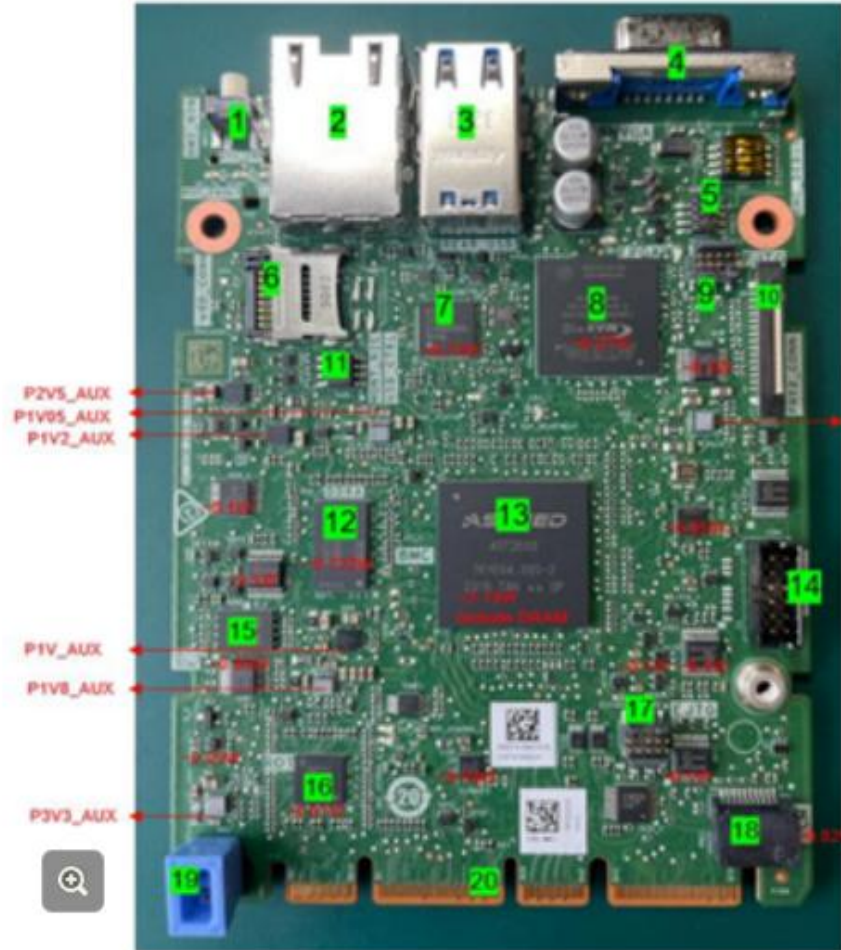
- XCC3 uses DC-SCM as the BMC hardware module
 - The SD520 V4 has an onboard BMC chip and uses an RoT card instead of a DC-SCM. BMC/UEFI flash chips and the PFR chip are on the RoT card
- A move to OpenBMC-based new architecture
 - Eliminates the dependency on Vertiv
 - Open source-based solution
 - In-house design with full control
 - Flexible architecture for future extensions
 - As far as possible, user interfaces are kept compatible with the previous generation
- A phased approach to deliver a full-function stack
 - Almost every single function is re-designed and re-coded
 - Schedule/resource constraints



DC-SCM card

The BMC chip was stored on the RoT module in V3 servers. Except with the SD520 V4, the BMC chip has been moved to the DC-SCM card in V4 servers.

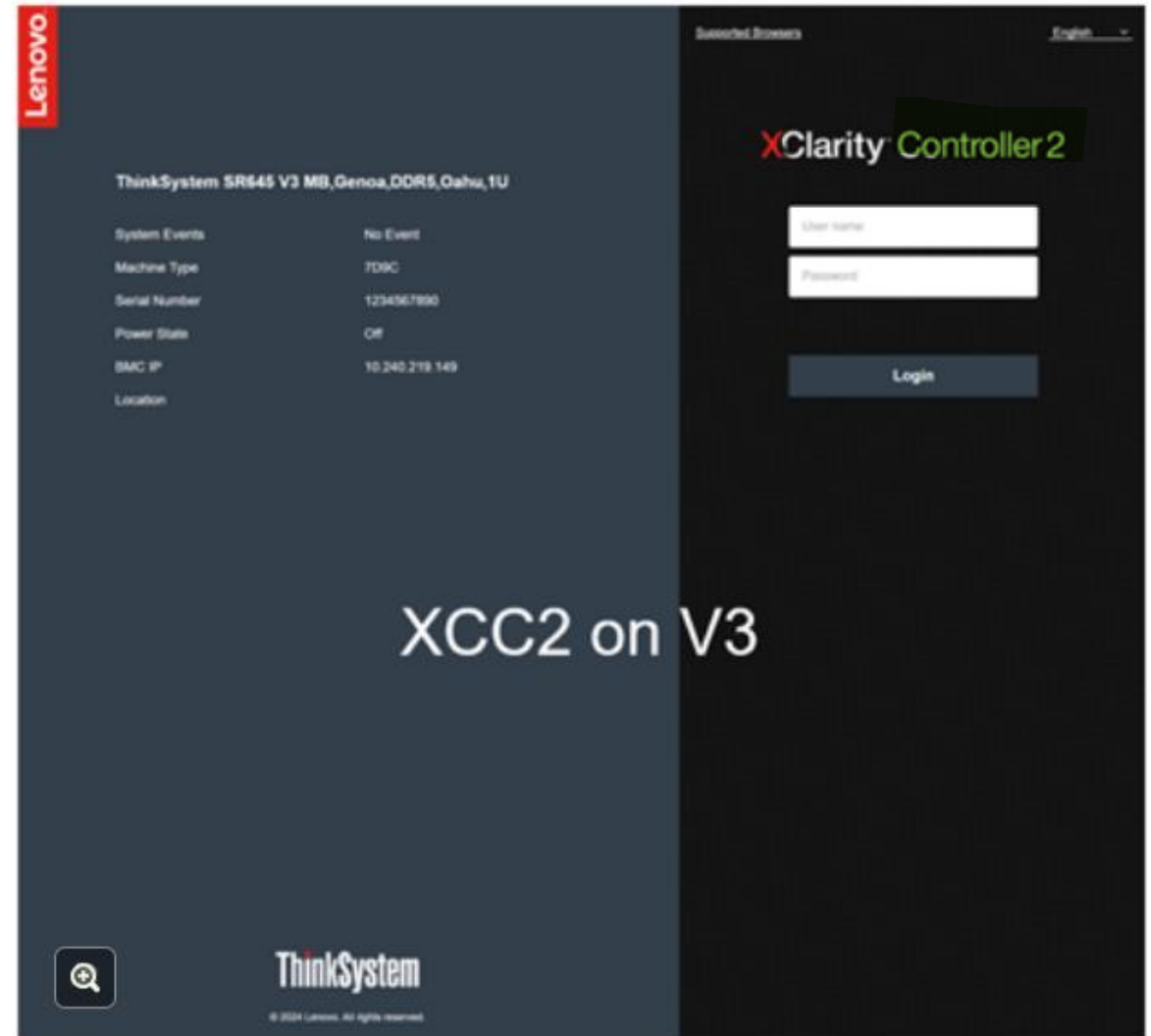
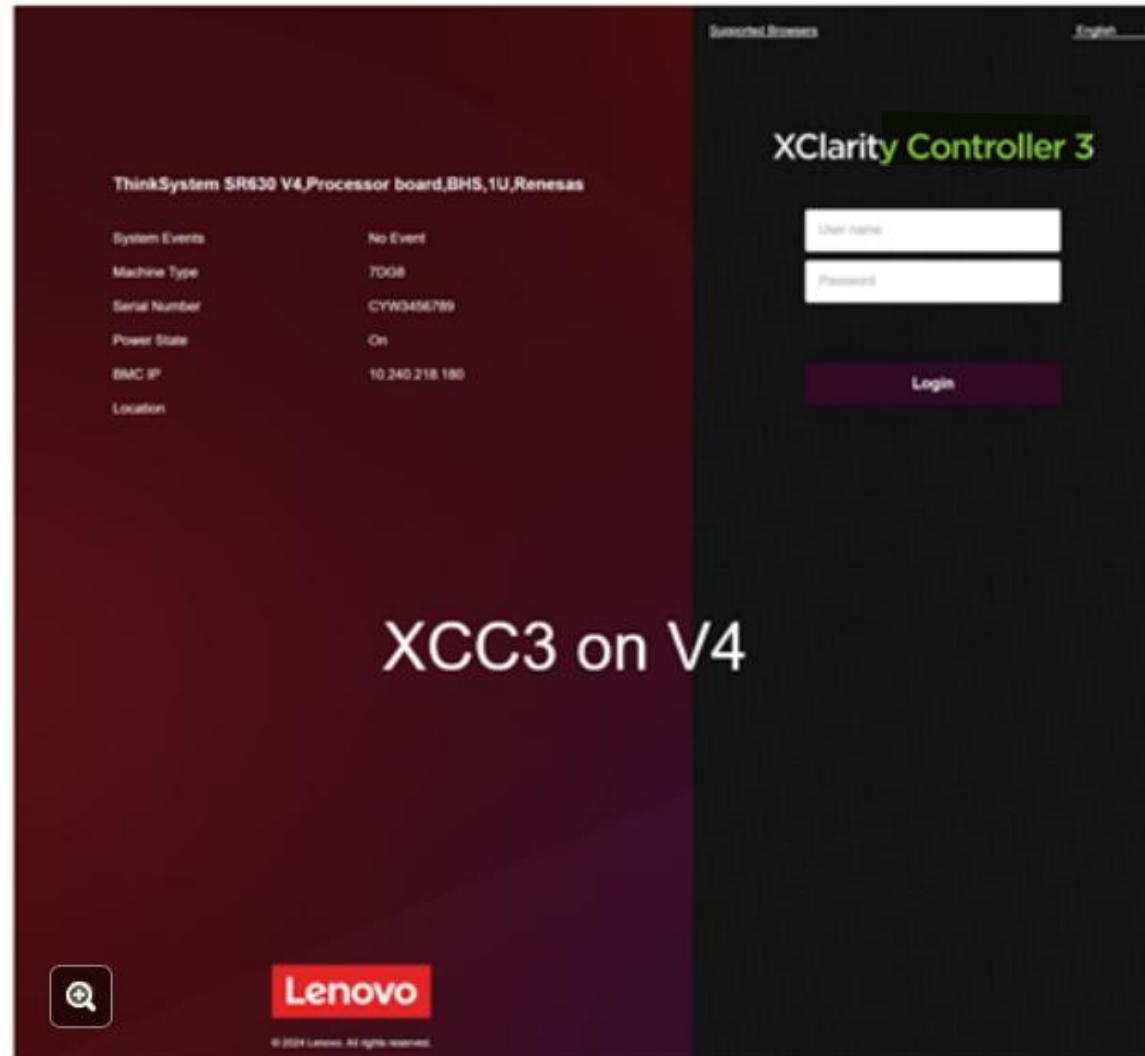
- The new BMC hardware module follows OCP spec
- The BMC chip, BMC/UEFI flash, and PFR chip are all on one board
- New power sequence management through the SCM FPGA and HPM FPGA
- Two FPGAs (SCM FPGA and HPM FPGA), which the BMC needs to authenticate and update
- As with the ThinkSystem V3 platform, the AST2600 is used as the BMC chip
- New UEFI SPI flash is 64 MB (V3 is 32 MB)
 - Longer UEFI firmware update time



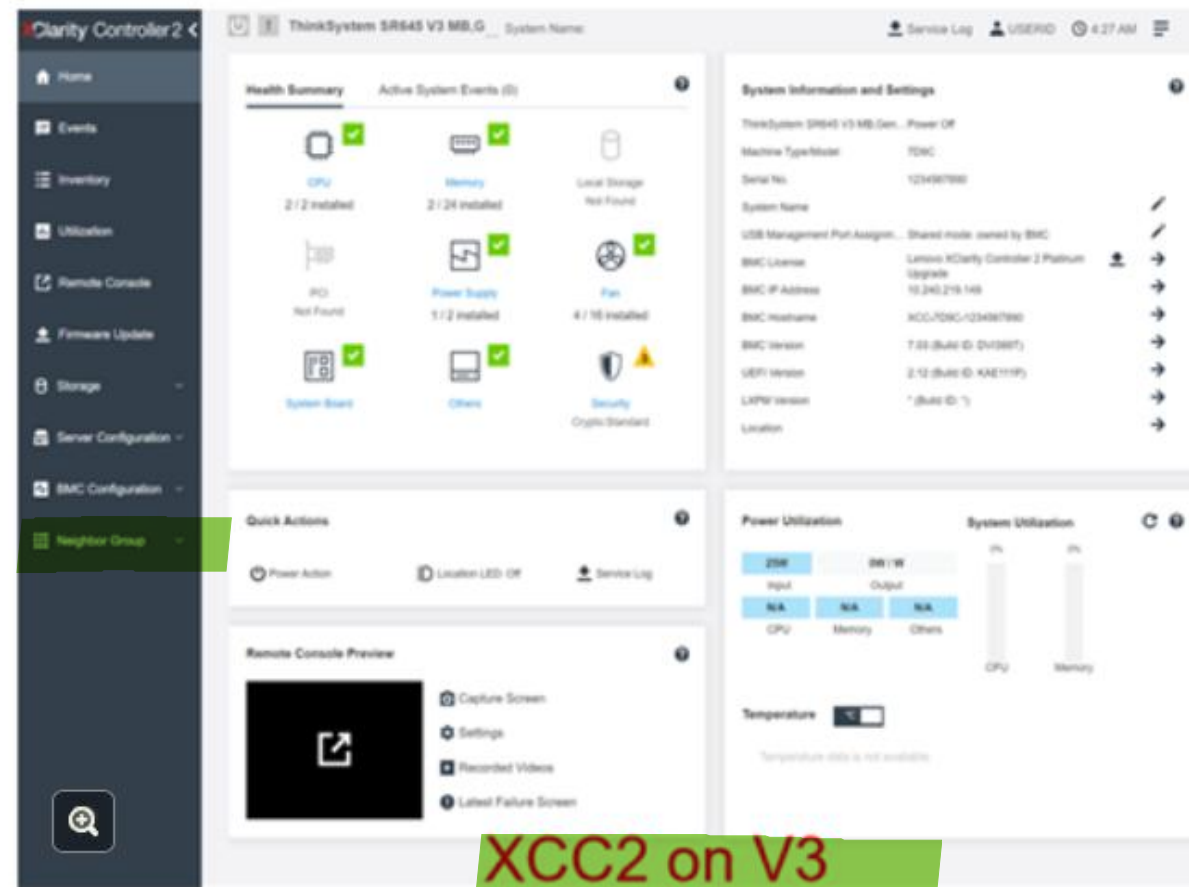
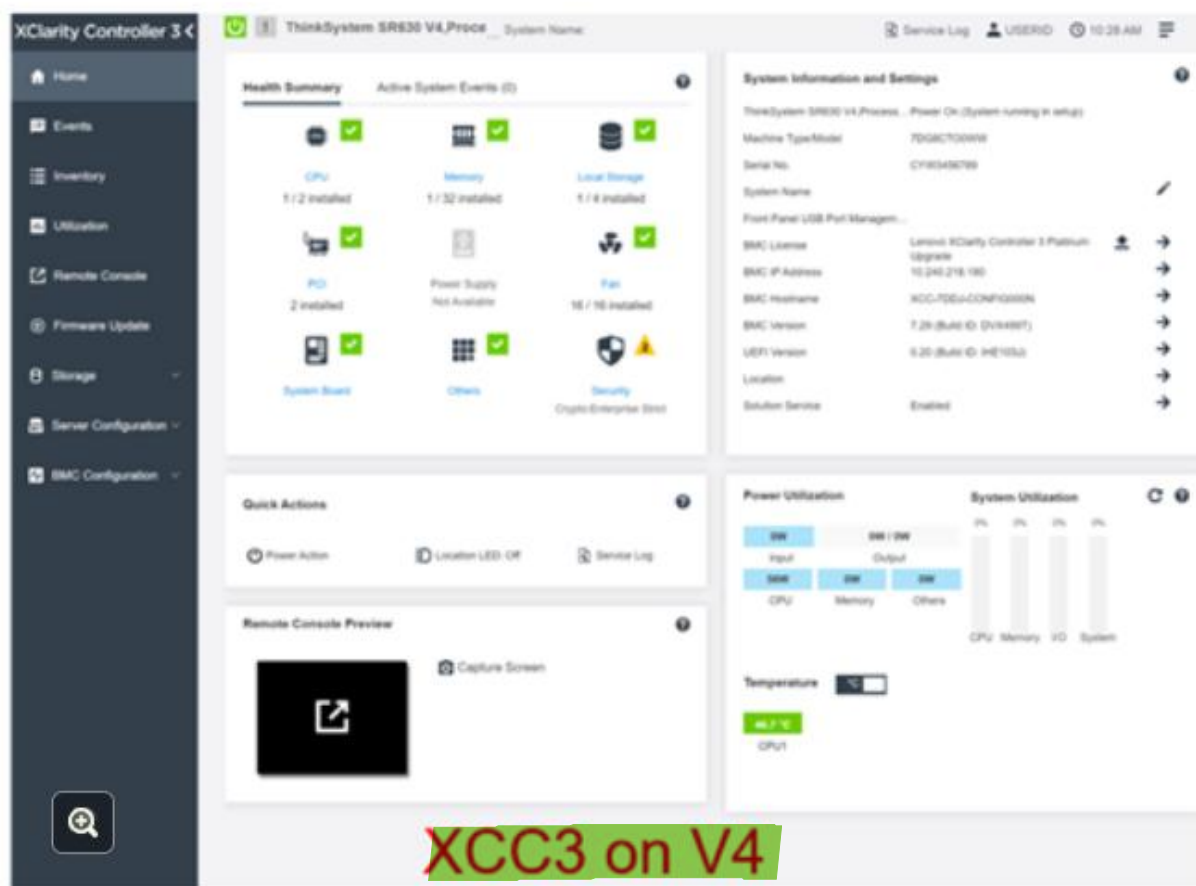
Key component list

1. NMI button w/ 3xLEDs
2. RJ45 connector
3. 2xUSB 3.0 connector
4. VGA port
5. BMC/ uEFI debug reader
6. Micro SD socket
7. USB Host controller
8. SCM FPGA Intel MAX10
9. FPGA JTAG Header
10. PHY2 connector
11. USB ROM
12. DDR4 512M
13. Aspeed AST2600 BMC
14. COM port/FW programming header
15. uEFI ROM(WSN8)
16. PFR Chip
17. BMC JATG Header
18. PRC TPM/BMC TPM Option card
19. Internal Handle
20. DC-SCI (168pin Gold finger)

XCC3 and XCC2 login page comparison



XCC3 and XCC2 home page comparison



BMC configuration settings through OneCLI

- BMC and UEFI settings both leverage the Redfish standard
- The BMC settings prefix and name have been changed along with the new architecture

```
[benjamin@localhost onecli 5.0.0]$ ./onecli config show BMC --bmc USERID:Passw0rd12@10.240.219.149
[!s]Certificate check finished [100%][=====]
Start to connect BMC at 10.240.219.149 to apply config show
Invoking SHOW command ...
BMC.AccessibleInterfaces.1-redfish|ssh|web
BMC.AccessibleInterfaces.10=
BMC.AccessibleInterfaces.11=
BMC.AccessibleInterfaces.12=
BMC.AccessibleInterfaces.13=
BMC.AccessibleInterfaces.14=
BMC.AccessibleInterfaces.2-redfish|ssh|web
BMC.AccessibleInterfaces.3=
BMC.AccessibleInterfaces.4=
BMC.AccessibleInterfaces.5=
BMC.AccessibleInterfaces.6=
BMC.AccessibleInterfaces.7=
BMC.AccessibleInterfaces.8=
BMC.AccessibleInterfaces.9=
BMC.AccountUnlockTimeout=1800
BMC.AuthorityLevel.1=Administrator
BMC.AuthorityLevel.10=
BMC.AuthorityLevel.11=
BMC.AuthorityLevel.12=
BMC.AuthorityLevel.13=
BMC.AuthorityLevel.14=
BMC.AuthorityLevel.2=testRole
BMC.AuthorityLevel.3=
BMC.AuthorityLevel.4=
BMC.AuthorityLevel.5=
BMC.AuthorityLevel.6=
BMC.AuthorityLevel.7=
BMC.AuthorityLevel.8=
BMC.AuthorityLevel.9=
BMC.AutoROMPromotion=Enabled
BMC.AutoReboot=True
BMC.BackupAutoPromote=Disabled
BMC.BlockListDaily=
BMC.BlockListIPv4=
BMC.BlockListIPv6=
BMC.BootListMac=
BMC.BootListOneTime=
BMC.BootMode=None
BMC.BootRecordingEnabled=False
```

Change from IMM to BMC

OneCLI on V4

```
[benjamin@localhost onecli 5.0.0]$ ./onecli config show IMM --bmc USERID:Passw0rd12@10.240.219.149
[!s]Certificate check finished [100%][=====]
Start to connect BMC at 10.240.219.149 to apply config show
Connected to BMC at IP address 10.240.219.149 by REDFISH
Invoking SHOW command ...
IMM.Cert_CSR_Export_Format=FEM
IMM.Cert_Key_Algo=ECDH-P256
IMM.SSH_SERVER_KEY=Installed
IMM.SSL_HTTPS_SERVER_CERT=Private Key and CA-signed cert installed. Expiration: August 18, 2024
IMM.SSL_HTTPS_SERVER_CSR=Private Key and CA-signed cert installed. Expiration: August 18, 2024
IMM.SSL_LDAP_CLIENT_CERT=Private Key and CA-signed cert installed. Expiration: August 18, 2024
IMM.SSL_LDAP_CLIENT_CSR=Private Key and CA-signed cert installed. Expiration: August 18, 2024
IMM.SSL_SMR_CLIENT_CERT=Private Key and Cert/CSR not available.
IMM.SSL_SMR_CLIENT_CSR=Private Key and Cert/CSR not available.
IMM.SSL_CLIENT_TRUSTED_CERT_SMR=Not-Installed
IMM.SSL_CLIENT_TRUSTED_CERT1=Not-Installed
IMM.SSL_CLIENT_TRUSTED_CERT2=Not-Installed
IMM.SSL_CLIENT_TRUSTED_CERT3=Not-Installed
IMM.SSL_CLIENT_TRUSTED_CERT4=Not-Installed
IMM.BackupAutoPromote=Disabled
IMM.LLDPCControl=Open
IMM.FanSpeedPolicies=Disabled
IMM.SSEWearThreshold=8
IMM.PowerRestorePolicy=Restore
IMM.FrontButton_FWR_Ferm=Enabled
IMM.ZeroOutput=Disabled
IMM.ForceBootToUefi=Disabled
IMM.AutoROMPromotion=Enabled
IMM.PowerOnAtSpecifiedTime=0:0:0:0:0
IMM.ShutdownAndPowerOff-WD:HH:MM
IMM.PowerOnServer-WD:HH:MM
IMM.ShutdownAndRestart-WD:HH:MM
IMM.PXE_NextBootEnabled=Disabled
IMM.SystemNextBootMode=Legacy
IMM.LXCAINSDiscovery=Enabled
IMM.TimeZone=UTC+2:00
IMM.DST=Off
IMM.IMMInfo_Name=
IMM.IMMInfo_Contact=
IMM.IMMInfo_Location=
IMM.IMMInfo_RoomId=
IMM.IMMInfo_RackId=
```

OneCLI on V3

UEFI configuration settings through OneCLI

- The name of UEFI settings aligns with Redfish BIOS attribute names, and UEFI has been added as a prefix

```
[benjamin@localhost onecli 5.0.0]$ ./onecli config show UEFI --bmc USERID:Passw0rd12@10.240.218.180
[is]Certificate check finished [100%][=====]
Start to connect BMC at 10.240.218.180 to apply config show
Invoking SHOW command ...
UEFI AdvancedRAS_DIMMDisablePolicy=DisableFaultyDIMMPersistently
UEFI AdvancedRAS_MachineCheckRecovery=Enabled
UEFI AdvancedRAS_PCIErrorsRecovery=Enabled
UEFI AdvancedRAS_PCIEndpointResetsAfterError=Disabled
UEFI BootModes_AcceleratedBoot=Disabled
UEFI BootModes_InfiniteBootRetry=Disabled
UEFI BootModes_PreventOSChangesToBootOrder=Disabled
UEFI BootModes_SystemBootMode=UEFI Mode
UEFI BootOrder_BootOrder_1=USBStorage
UEFI BootOrder_BootOrder_2=HardDisk
UEFI BootOrder_BootOrder_3=CDROM
UEFI BootOrder_BootOrder_4=None
UEFI BootOrder_DVDROMPriority_1=None
UEFI BootOrder_HardDiskPriority_1=None
UEFI BootOrder_NetworkPriority_1=Slot8Port0PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_NetworkPriority_2=Slot8Port0PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_NetworkPriority_3=Slot8Port1PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_NetworkPriority_4=Slot8Port1PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_NetworkPriority_5=Slot8Port2PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_NetworkPriority_6=Slot8Port2PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_NetworkPriority_7=Slot8Port3PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_NetworkPriority_8=Slot8Port3PXEv4Broadcom57191GbEJ454_portOCPEthernetAdapter
UEFI BootOrder_USBPriority_1=None
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_BannerMessageTimeout=15
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_BlinkLED=0
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_BootStrapType=AutoDetect
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_Bootcode=1.47
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_CCM=N/A
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_EFI=21.6.36
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_FirmwareBundle=222.0.2.1
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_LegacyBootProtocolQ3302=FXE
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_LinkSpeed=AutoNeg
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_LinkStatus=Disconnected
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_MBA=21.6.2
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_NC_SI=1.5.35
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_PermanentMACAddress=04:04:E6:80:99:EE
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_PortEnablement=EnableAllPorts
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_Pre_bootWakeOnLAN=Enabled
UEFI BroadcomNetXtremeGigabitEthernetAdapter_Slot8PhysicalPort1LogicalPort1_VLANID14094=1
```

Add UEFI as prefix

OneCLI on V4

```
[benjamin@localhost onecli 5.0.0]$ ./onecli config show UEFI --bmc USERID:Passw0rd12@10.240.219.149
[is]Certificate check finished [100%][=====]
Start to connect BMC at 10.240.219.149 to apply config show
Connected to BMC at IP address 10.240.219.149 by REDFISH
Invoking SHOW command ...
Processors.DeterminismSlider=Performance
Processors.CorePerformanceBoost=Enabled
Processors.cTDP=Auto
Processors.PackagePowerLimit=Auto
Processors.4-LinkxGMMMaxSpeed=Minimum
Processors.GlobalC-stateControl=Enabled
Processors.SOCP-states=Auto
Processors.SVC-states=Enabled
Processors.MONITORWAIT=Enabled
Processors.P-state1=Enabled
Processors.P-state2=Enabled
Processors.CPUSpeculativeStoreModes=Balanced
Processors.ACPISTRATL3CacheasNUMADomain=Disabled
Processors.L1StreamWMPrefetcher=Enabled
Processors.L2StreamWMPrefetcher=Enabled
Processors.L1StridePrefetcher=Enabled
Processors.L1RegionPrefetcher=Enabled
Processors.L2UpDownPrefetcher=Enabled
Processors.SMTMode=Enabled
Processors.CPPC=Enabled
Processors.BoostFmax=Auto
Processors.SVMMode=Enabled
Processors.xGMMMaximumLinkWidth=Auto
Processors.APICMode=Auto
Processors.SEV-SNPSupport=Disabled
Processors.HSMPSupport=Auto
Processors.EnhancedREPMOVESBTOSS=Enabled
Processors.FastShortREPMOVESB=Enabled
Processors.SNPMemoryRMFTableCoverage=Disabled
Processors.xGMIForceLinkWidth=Auto
Processors.NumberOfEnabledCPUCoresPerSocket=All
SystemRecovery.POSTWatchdogTimer=Disabled
SystemRecovery.POSTWatchdogTimerValue=5
SystemRecovery.RebootSystemOnNMI=Enabled
SystemRecovery.PostLoadSetupDefault=Disabled
SystemRecovery.FiStartControl=Auto
DevicesandIOPorts.ActiveVideo=Onboard Device
DevicesandIOPorts.PCI64BitResourceAllocation=Auto
DevicesandIOPorts.IOMMU=Enabled
```

OneCLI on V3

Firmware updates

- The **FPGA firmware** and **backplane PSoC firmware** are **separated** from the **XCC3 package**
 - In previous generations, they were packaged together
- The **SCM FPGA** and **HPM FPGA** have **individual firmware inventory entries**, but they can be updated together
 - If **FPGA firmware** is updated when **system power is on**, a **BMC reset** and **system reboot is needed**
- The drive **backplane PSoC** firmware has a **separate firmware inventory entry** – there will be a **bundle** which includes all the **drive backplane firmware**
 - If drive backplane firmware is **updated** when **system power is on**, a **system reboot is needed**

Update from Repository

Update all applicable components using the payload content in the designated folder including system, adapter, power supply and disk drive firmware. You cannot select any individual component to apply or to skip.

Internal Storage: 2.08 GB total, 1937 MB free. [Import Firmware Package](#) No file selected.

[Download](#) [Update System](#)

System Firmware [Auto Sync](#) [Update Firmware](#)

Update key system firmware one piece at a time.

Type	Status	Version	Build	Release Date
BMC (Primary)	Active	7.25	21c44807	2024-07-26
BMC (Backup)	Inactive	7.02	21c44807	2024-07-02
FPGA HPM	Active	02.08	HPFS008	2024-07-15
FPGA SCM	Active	02.37	HPFS037	2024-07-15
UEFI	Active	0.20	HE1052	2024-07-25
LAMP	N/A	-	-	-
LAMP Windows Drivers	N/A	-	-	-
LAMP Linux Drivers	N/A	-	-	-
Embedded OS	N/A	-	-	-

Adapter Firmware [Update Firmware](#)

Update adapter firmware with granular selection of an individual adapter or multiple adapters of the same or different types, depending on the payload content.

Note: the system must have completed booting at least once for all adapters to be detected. Activation of network device needs a host power cycle.

Slot No.	Device Name	Status	Version	Manufacturer	Release Date
1	ThinkSystem RAID 940-16 8GB Flash PCIe Gen5 12Gb Adapter	Active	02.26.0-0023	Lenevo	2023-07-11

Power Supply Unit Firmware [Update Firmware](#)

Update PSU firmware one piece at a time with individual payload content.

Bay No.	Version	Manufacturer
1	0.1.0.0	3M

Drive Backplane Firmware

To update the drive backplane PSoC firmware, please go to [Update from Repository](#).

Activation of drive backplane needs a host power cycle.

Backplane Number	Version	Drive Bay
1	0	0.1.0.0

Security

- There are plans to acquire FIPS 140-3 validation and certification for XCC3
- PFR (Platform Firmware Resilience) is supported in the same way as with the ThinkSystem V3 platform
- Security mode design is the same as with the ThinkSystem V3 platform
 - Three modes are supported: Enterprise Strict, Standard, and Compatibility
- Secure out of box
 - Similar to the ThinkSystem V3 platform, non-secure protocol/functions – for example, IPMI over LAN – are disabled by default

Miscellaneous new functions

- In-band (IB) IPMI access is supported through KCS (Keyboard Controller Style) but not USB LAN
Out-of-band (OOB) IPMI access is supported through Ethernet interfaces
- The default IB USB LAN IPv4 address has changed from 169.254.95.118 to 172.20.95.118
- Minor changes to user interfaces will be documented in the XCC3 user guide
- Generic NIC support will be available in wave 3
- CXL memory OOB management will be supported in wave 3