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

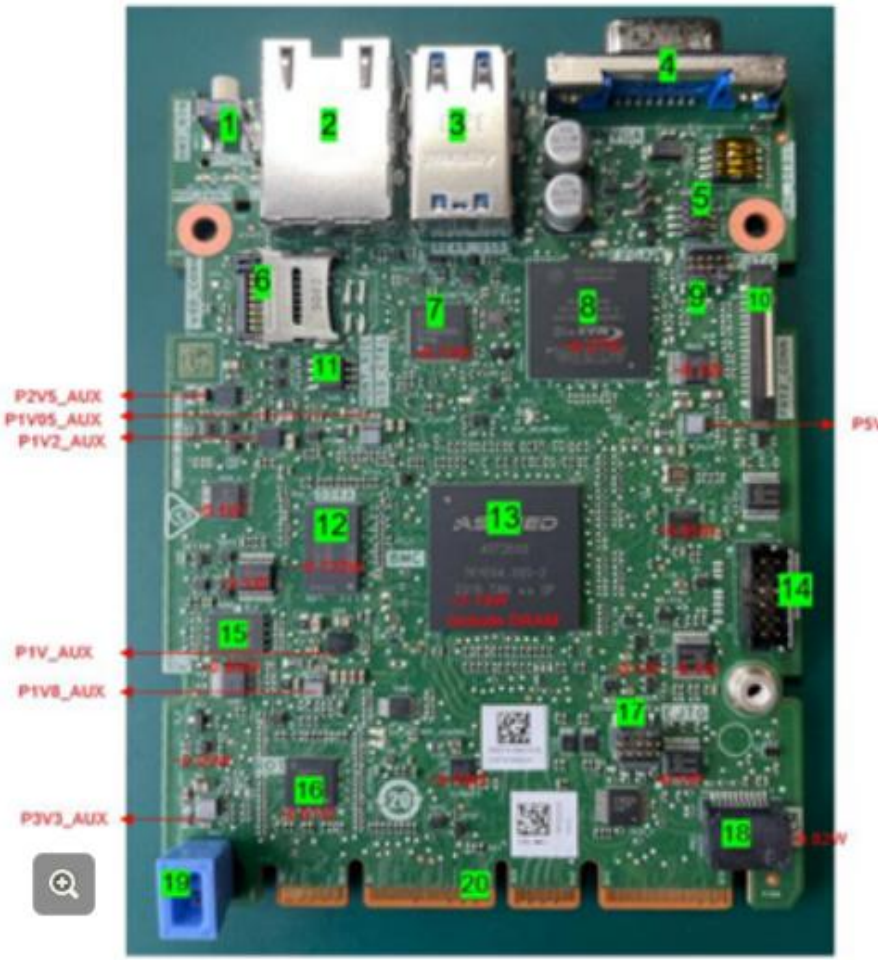
- A move to OpenBMC-based new architecture
  - Eliminates the dependency on Vertiv
  - Open source-based solution
  - In-house design with full control
  - Flexible architecture for future extensions
  - As far as possible, user interfaces are kept compatible with the previous generation

- 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.

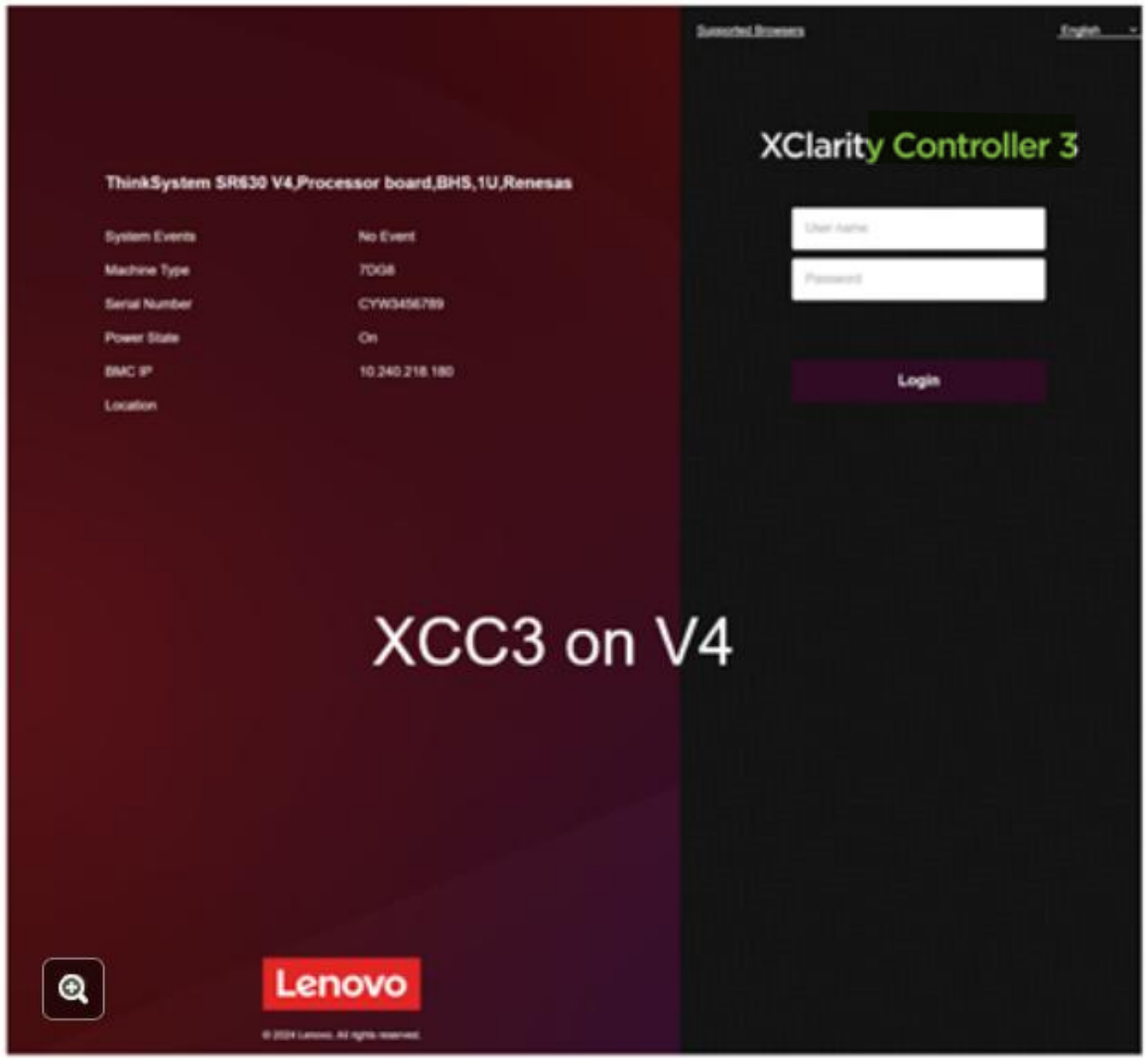
- The new BMC hardware module follows OCP spec
- The BMC chip, BMC/UEFI flash, and PFR chip are all on one board
- New power sequence management through the SCM FPGA and HPM FPGA
- Two FPGAs (SCM FPGA and HPM FPGA), which the BMC needs to authenticate and update
- As with the ThinkSystem V3 platform,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

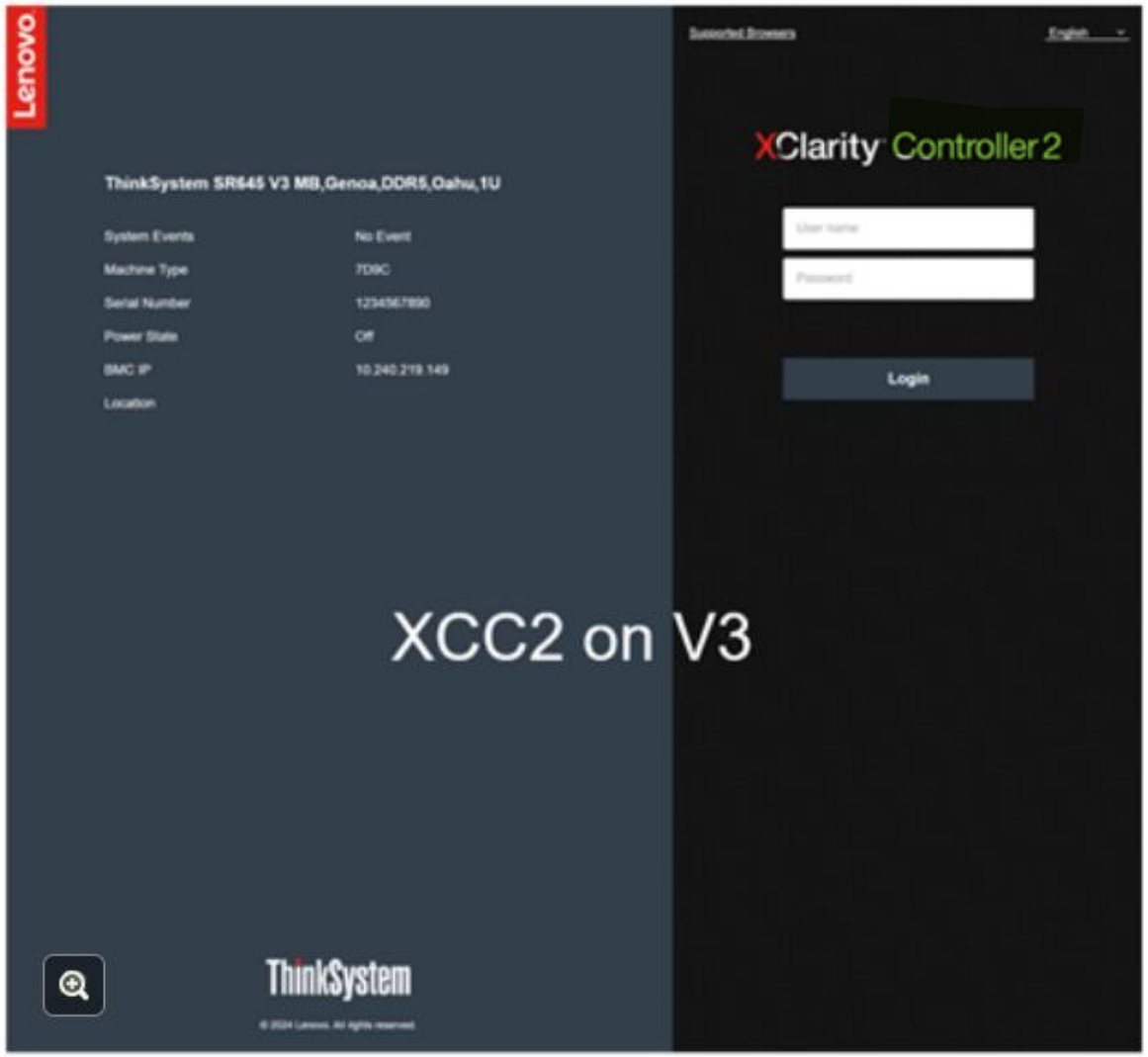


Key component list

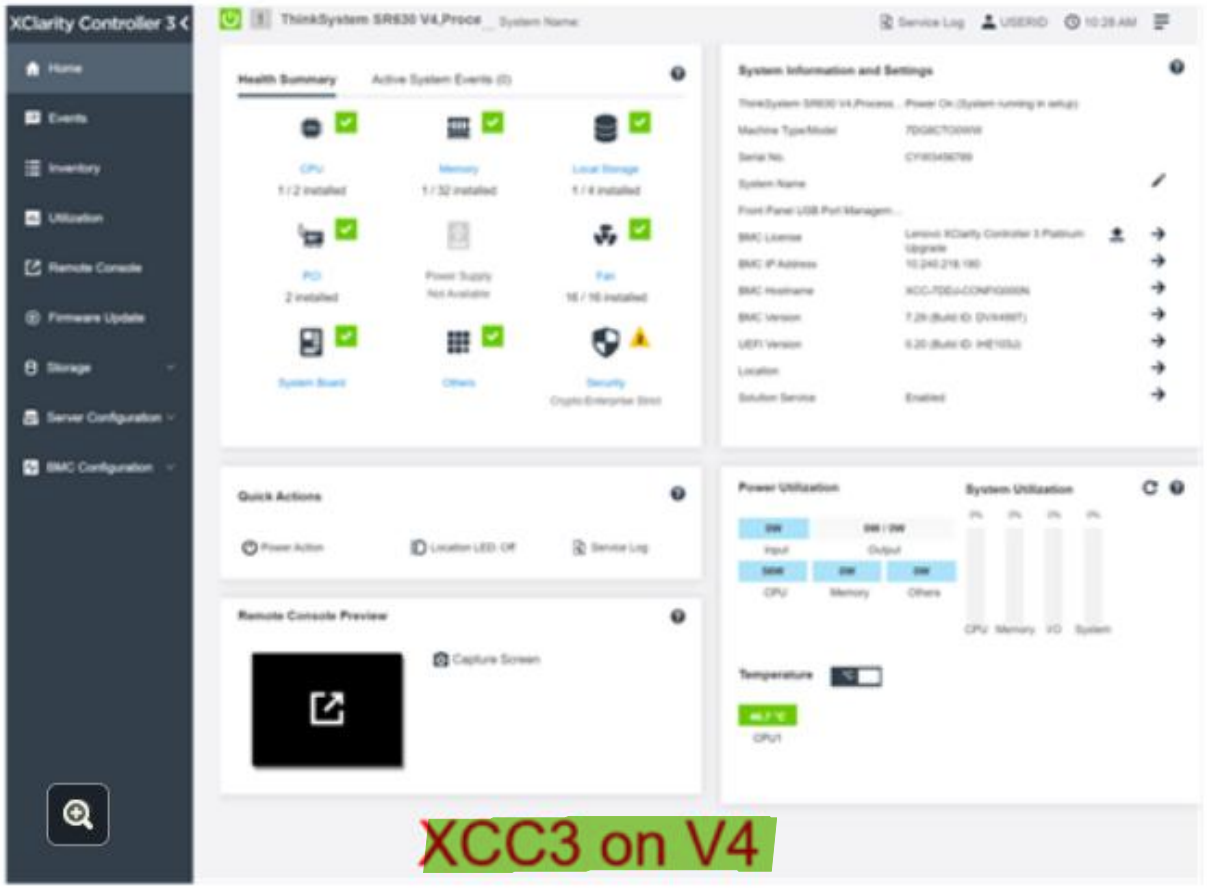
1. NMI button w/ 3xLEDs
2. RJ45 connector
3. 2xUSB 3.0 connector
4. VGA port
5. BMC/ uEFI debug header
6. Micro SD socket
7. USB Host controller
8. SCM FPGA Intel MAX10
9. FPGA JTAG Header
10. PHY2 connector
11. USB ROM
12. DDR4 512M
13. Aspeed AST2600 BMC
14. COM port/FW programming header
15. uEFI ROM(WSON8)
16. PFR Chip
17. BMC JATG Header
18. PRC TPM/BMC TPM Option card
19. Internal Handle
20. DC-SCI (168pin Gold finger)

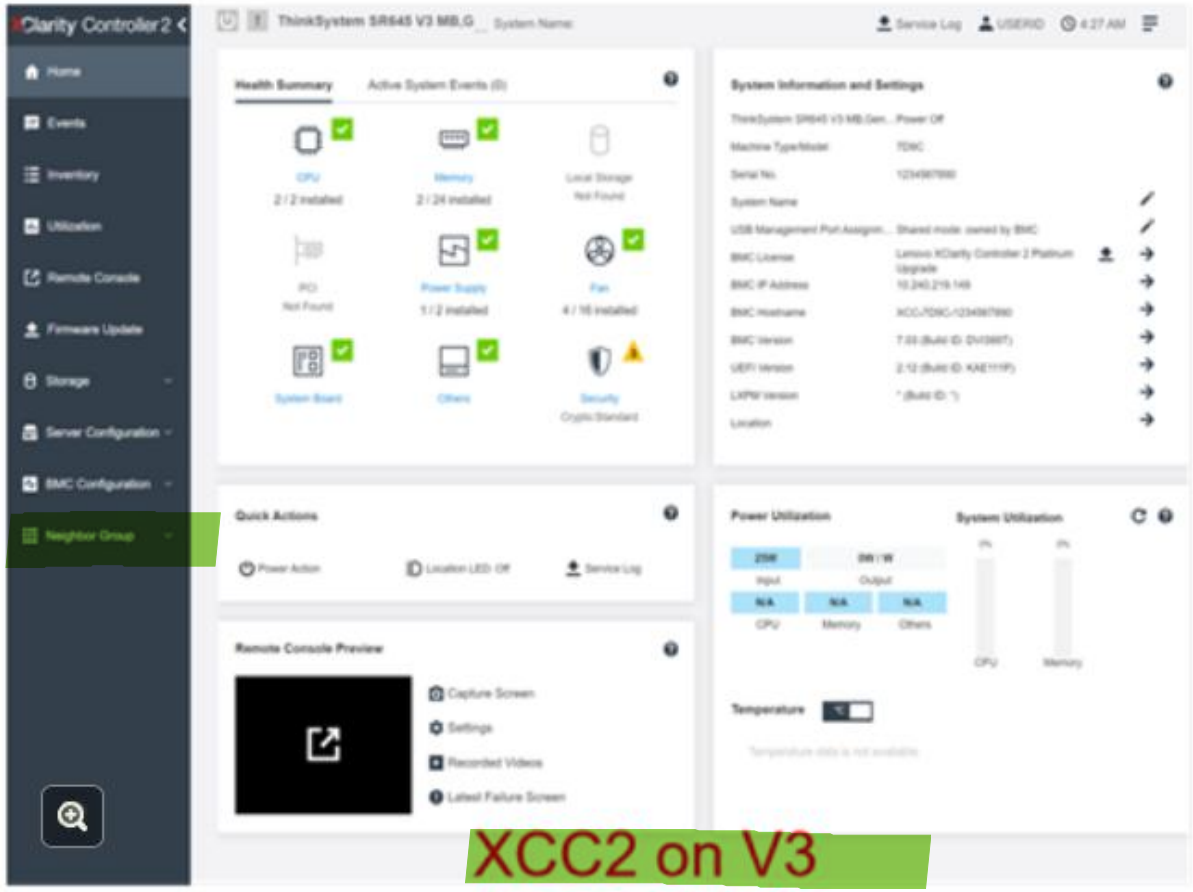
XCC3 and XCC2 login page comparison





XCC3 and XCC2 home page comparison



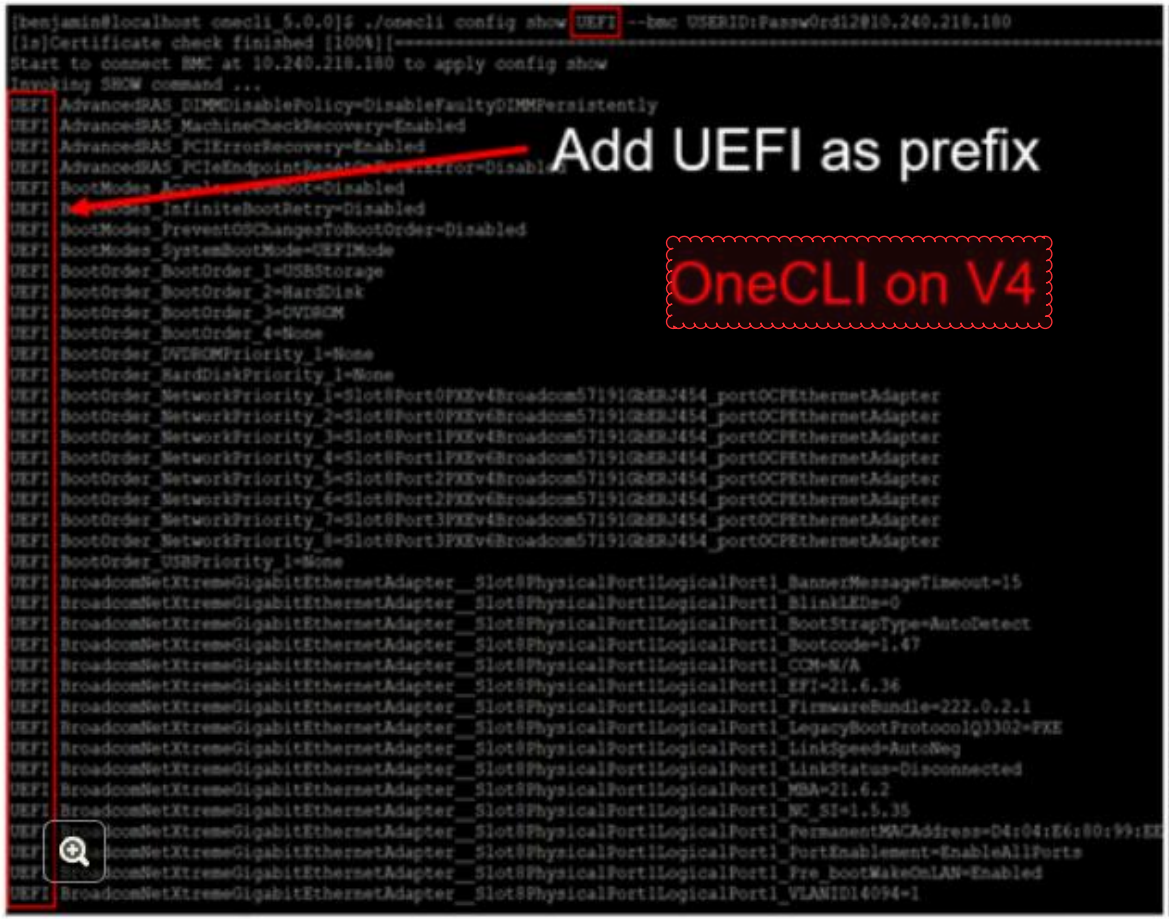


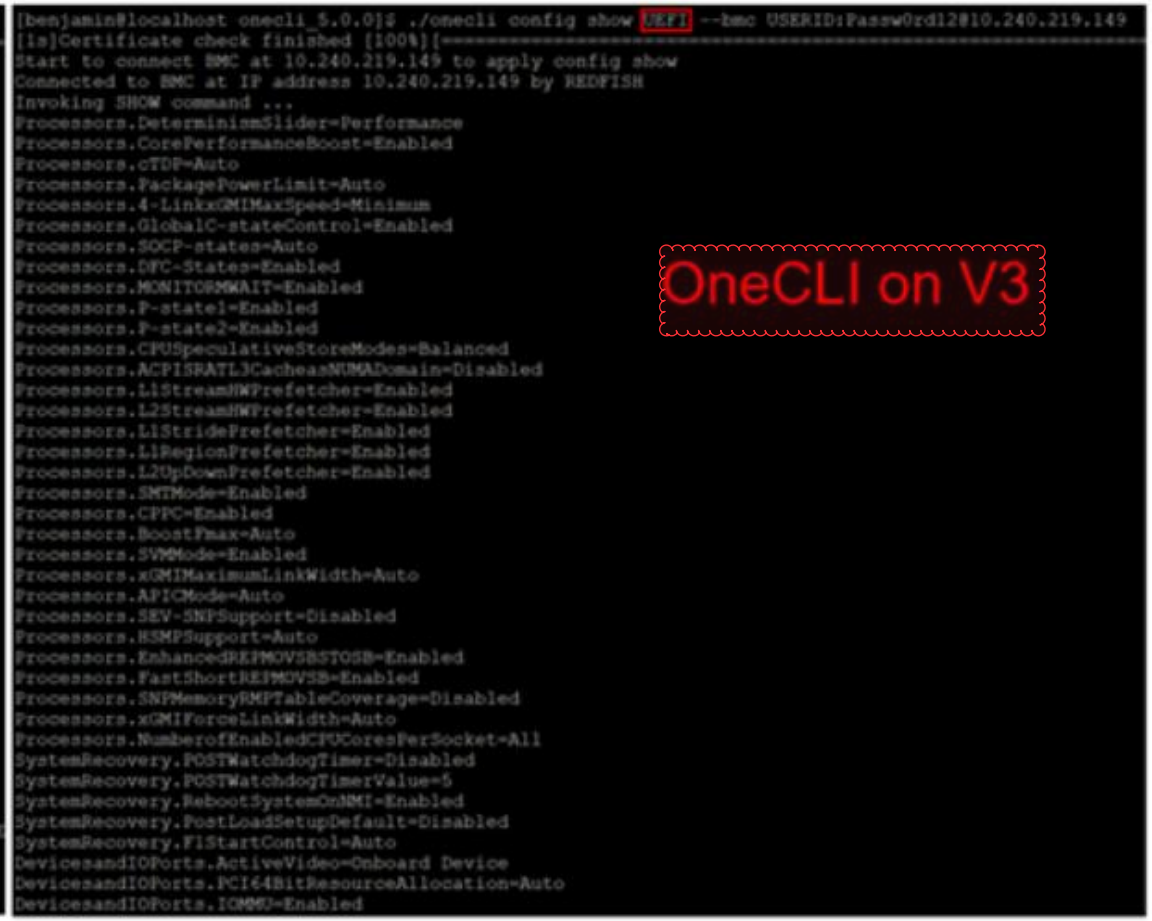
BMC configuration settings through OneCLI

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

UEFI configuration settings through OneCLI

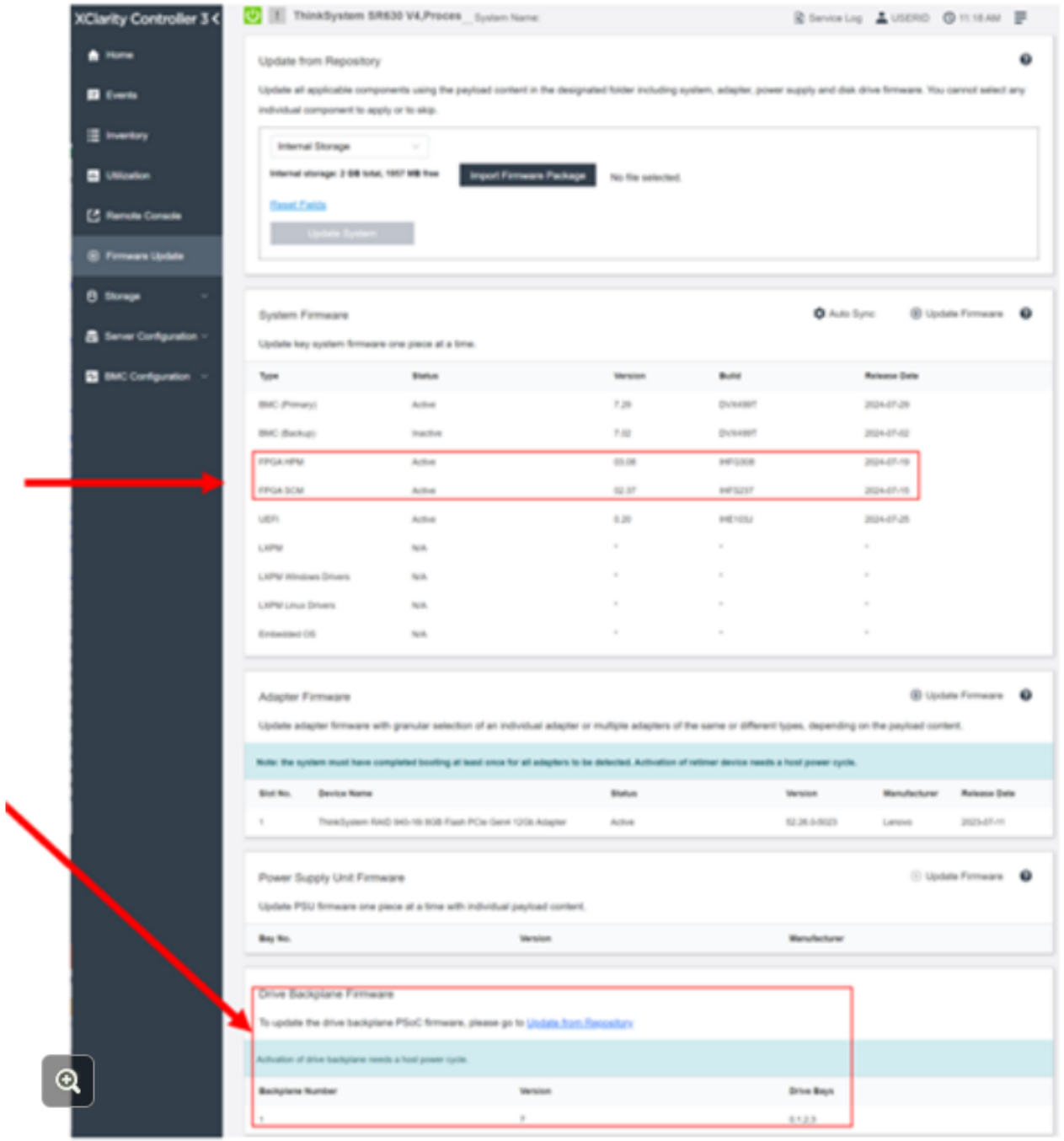
- The name of UEFI settings aligns with Redfish BIOS attribute names, and UEFI has been added as a prefix





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



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