Problem determination and troubleshooting

Known issues

Before you begin

Before starting any troubleshooting procedures on the new Lenovo RAID/HBA adapters, work through the following steps:

- Check the event that occurred before the suspected system problem. If possible, return the system to the previous state.
- Confirm the supported firmware levels on the current system.
- Record the symptoms, including poor performance and error messages.
- Determine whether the problem is repeatable.

The problem determination and troubleshooting procedures for the new Lenovo RAID/HBA adapters are almost the same as those for the ThinkSystem 430-530-730-930 Series adapters, but the terminology, displays, and syntax might vary. Refer to course ES41759B – ThinkSystem problem determination for more information.

Known launch issues

The following items are harmless known issues that have arisen during the first launch of the new Lenovo HBA/RAID adapters. Most of these issues are actually just the adapters working as they are designed, and they will be resolved in future XCC version releases.

- XCC displays incorrect drive temperatures for most drives attached to the new Lenovo HBA/RAID adapters.
  - There is no thermal impact or concern, because the temperature being reported is the temperature of the hottest drive attached
  - Thermal logic will control fans correctly, but if a user attempts to read a specific drive's temperature through XCC, they will see the temperature of the hottest drive instead
  - Workaround: Use in-band methods for temperature data using arcconf or MaxView Storage Manager
  - Future versions will have XCC hardcode to show **N/A** for drive temperature data when they are attached to these controllers
- XCC may report a **REBUILD** status when using the new Lenovo HBA/RAID adapter's Secure Erase function
  - Future versions of XCC will indicate that this is a Secure Erase.

Note: The OS CLI utility arcconf can be downloaded from the Lenovo Support Web site. The file name is lnvgy_utl_storehba_smartpqi.arcconf-XX.XX.XX.XX-.

Known launch issues - continued

- VMware vCenter cannot turn on a drive's amber Locate LED when it is attached to the new Lenovo HBA/RAID adapters.
  - This is a VMware plugin issue that should be resolved with future releases of VMware and/or the Lenovo VMware Customized Image (CI)
- After creating or deleting RAID volumes in UEFI HII, users will need to reboot the system to let UEFI discover any of the drives and virtual drives on the controller because all the UEFI handles will have become invalid.
  - This is corrected automatically on each boot, so rebooting the system resolves the issue
- Collecting a Support Archive is required for further escalation and can be collected from a few different interfaces.
  - From the arcconf command-line utility inside an OS, use the following command to generate a human-readable archive with logs from all the new Lenovo HBA/RAID adapters in the system: `arcconf savesupportarchive`

Limitation tips

The following table introduces information about the limitations that have been experienced following the first launch. Temporary limitations will be fixed in 22A or 22B.

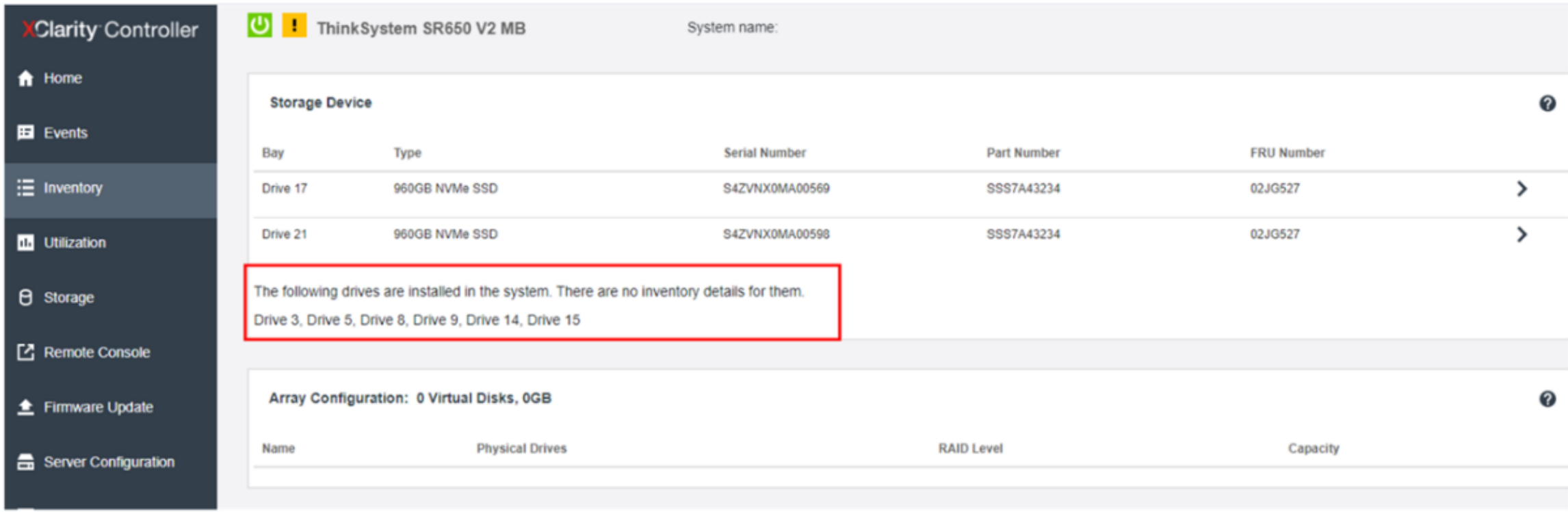
Tip link in Lenovo Knoweledge Base and Guides	Type	Description
https://datacentersupport.lenovo.com/us/en/solutions/HT512742	Temporary	The drive temperature reported by XCC is incorrect for drives connected to ThinkSystem 4350-5350-9350 Series adapters
https://datacentersupport.lenovo.com/us/en/solutions/HT512743	Permanent	Linux installation hangs when using a driver update disk on ThinkSystem 4350-5350-9350 Series adapters
https://datacentersupport.lenovo.com/us/en/solutions/HT512744	Permanent	Physical drives reused with ThinkSystem 4350-5350-9350 Series adapters need to be uninitialized
https://datacentersupport.lenovo.com/us/en/solutions/HT512745	Temporary	RAID arrays created with OneCLI or ARCCONF on ThinkSystem 5350-9350 Series adapters are not visible in XCC
https://datacentersupport.lenovo.com/us/en/solutions/HT512746	Temporary	Hot spares are not created when configuring RAID arrays in LXPM with ThinkSystem 5350-9350 Series adapters
https://datacentersupport.lenovo.com/us/en/solutions/HT512747	Temporary	ESXi 7.0u3 is not supported with ThinkSystem 4350-5350-9350 Series adapters

Symptom: Drives/arrays not seen by the OS

- Is the correct device driver loaded?
  - VMware ESXi and Microsoft Windows do not have inbox drivers which can identify the new Lenovo HBA/RAID adapters, so it's necessary to use the Lenovo VMware Customized Image (CI) or provide the driver during the Windows installation.
  - Supported versions of Linux have an inbox driver which is good enough for OS installations but should be updated to Lenovo certified driver as soon as possible.
- Are the drives seen by the controller? You can check for drives in:
  - The HII page (**F1 Setup -> System Settings -> Storage ->** [Controller name] **->** Disk Utilities)
  - LXPM (**F1 setup ➔ Graphical menu ➔ RAID Setup area**)
  - In the XCC Web interface, select **Inventory ➔ Storage Devices** section, or the **Storage ➔ RAID Setup** area
    - If you see a message like `The following drives are installed in the system. There are no inventory details for them` Screen capture, it indicates that a drive is installed, but the controller is not reporting the drive to XCC. This will not influence the RAID setup in LXPM.
    - XCC can detect the presence of a drive directly from a backplane using I2C reads of the backplane's Storage Enclosure Processor (SEP) registers, regardless of whether the controller can see the drive itself.

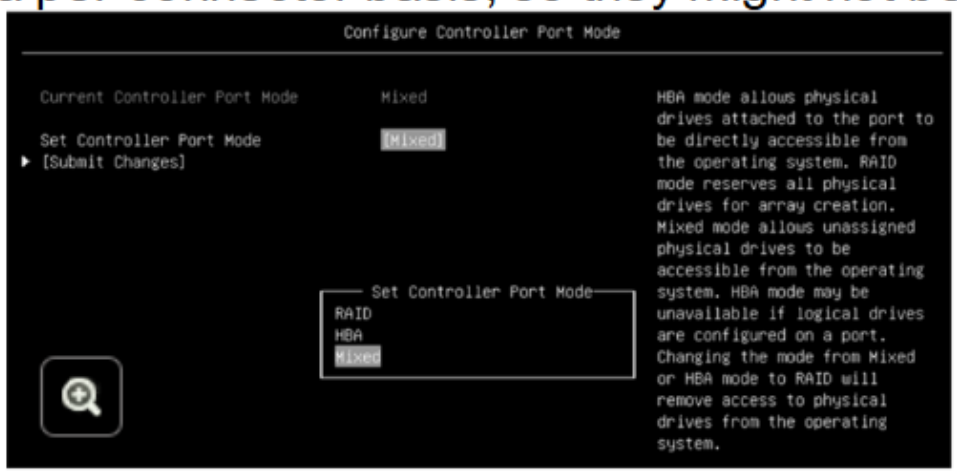
Symptom: Drives/arrays not seen by the OS

XCC storage inventory



Symptom: Drives/arrays not seen by OS - continued

- If the drives are not seen by the controller, check SAS cable connections, backplane power cable connections, and so on.
- If the drives are seen by the controller, check whether the user changed the mode that the controller or connectors are in.
  - Mixed Mode vs HBA Mode vs RAID mode
  - The new Lenovo HBA/RAID adapters Controller Port Mode default to Mixed Mode, meaning that users can use drives both inside or outside of RAID volumes / virtual drives
  - RAID Mode does not support drives outside of a RAID volume (HBA drives)
  - HBA Mode does not support RAID
  - Modes can be set on a per-connector basis, so they might not be the same for all drives



Symptom: Drive slot numbers are incorrect

If there are slot numbering issues, this might be an XCC, UEFI, or backplane firmware issue.

The reasons for these issues are as follows:

- Drive slot numbering is set by XCC regardless of whether ThinkSystem storage adapters or new RAID/HBA adapters are installed in the system.
  - When the system boots, XCC detects all the backplanes and the number of slots the system has along with their locations. It then programs the slot numbering to each backplane.
- When the controller boots, it reads the backplane's slot information based on the Universal Backplane Management (UBM) standard and uses this information to override internal default slot numbering. So, the incorrect slot numbering showing in the controller is very rarely a controller issue.
- If the controller boots before XCC has updated the backplane slot information, the controller might see stale or incorrect data, or slot number 255 will be reported for all the slots in the event log.
  - This has been prevented by having the system UEFI wait for a green light from XCC before booting past a certain point.

Note: Backplane firmware updates are integrated into XCC updates.

Collecting FFDC and the Support Archive for further escalation

The following symptoms have many possible causes and FFDC and the Support Archive should be collected for further escalation.

- Adapter not seen in XCC
- Adapter firmware update fails through XCC
- Adapter firmware update fails through OS flash
  - Check to make sure that a supported driver (`smartpqi`) is loaded for the adapter
  - The system may need to be rebooted after the driver installation before the SUPs (firmware executable) package can detect the adapter
  - Any other kind of flash failure will need the Support Archive to be collected, as well as the specific output from the SUPs
  - If the flash failure is from within another tool such as OneCLI or LXCA, it is recommend that the SUPs executable be run as "standalone", either in band or through XCC, to rule out XML or tool issues
- RAID setup issues in LXPM

Summary

This course enabled you to:

- Describe the features of the new Lenovo RAID/HBA adapters
- Identify the differences between the RAID/HBA adapters
- Describe how to configure RAID adapters with different tools
- Describe the problem determination steps and explain how to troubleshoot issues with the new Lenovo RAID/HBA adapters