The text "Data Center Support" is centered in white on a blue background that features a perspective view of a server aisle in a data center.

Data Center Support

Using LSI Storage Authority to perform RAID volume expansion

December 2017

Abstract

The article describes how to expand the RAID volume in ThinkSystem servers online.

Revisions

Date	December 2017
Description	Initial release

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Introduction

This article provides an introduction about how users can increase RAID volume in ThinkSystem servers by adding hard drives online.

Limitation

Expanding RAID volume by adding hard drives is only available for RAID 0, 5, and 6 configurations.

This method of RAID volume expansion will not work for other RAID configurations such as RAID 10, 50, and 60.

Users can only use LSI Storage Authority (LSA) to perform the RAID Expansion online.

RAID Volume Expansion in Practice

Preconfiguration:

- System: Lenovo ThinkSystem SR550 (MT: 7X03)
- CPU: Intel® Xeon® Silver 4114 CPU @ 2.20 GHz x 2
- Memory: Samsung DDR4 8 GB x 12
- RAID card: Lenovo ThinkSystem RAID 930-8i 2 GB Flash
 - DG0 (Disk Group 0) with three physical drives
- Hard Drive: Eight 300-GB 10K rpm SAS 12 Gbps
 1. Three drives are in DG0 group
 2. Five drives are in Unconfigured good
- OS: Windows 2016
- Application: LSI Storage Authority (LSA)

Objective:

Describe how to add one Unconfigured Good hard drive into the DG0

Firmware and Driver:

If the RAID adapter has down-level firmware, update to latest is the best practice

Procedure:

To add the Unconfigured Good hard drive to the DG0:

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Using LSI Storage Authority to perform RAID volume expansion

1. Log in to LSA and with the RAID controller RAID 930-8i selected, and click the **Drive Groups** tab to view all existing Drive groups.

Note: In our system, there is only one drive group and that is DG0. There are three physical drives in DG0 as RAID 5.

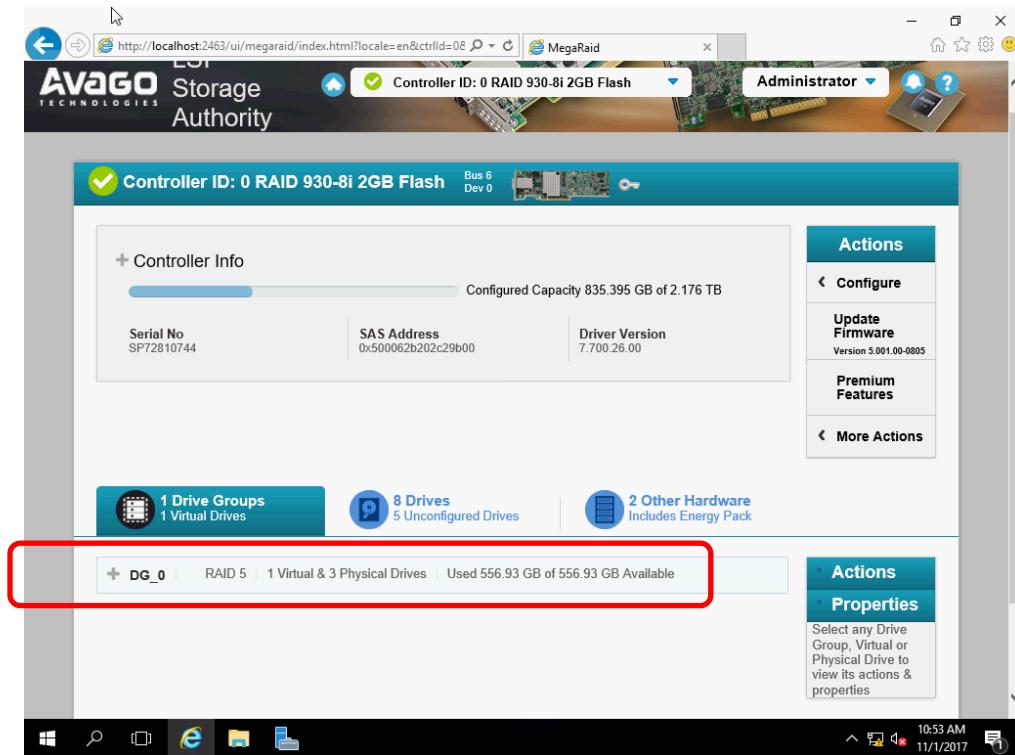


Figure 1. RAID 930-8i with one DG

2. Select the Drives Tab to view the drive states of all of the drives that are attached to the RAID controller. In the following example, there are five Unconfigured Drives. The unconfigured drives can be added to drive groups.

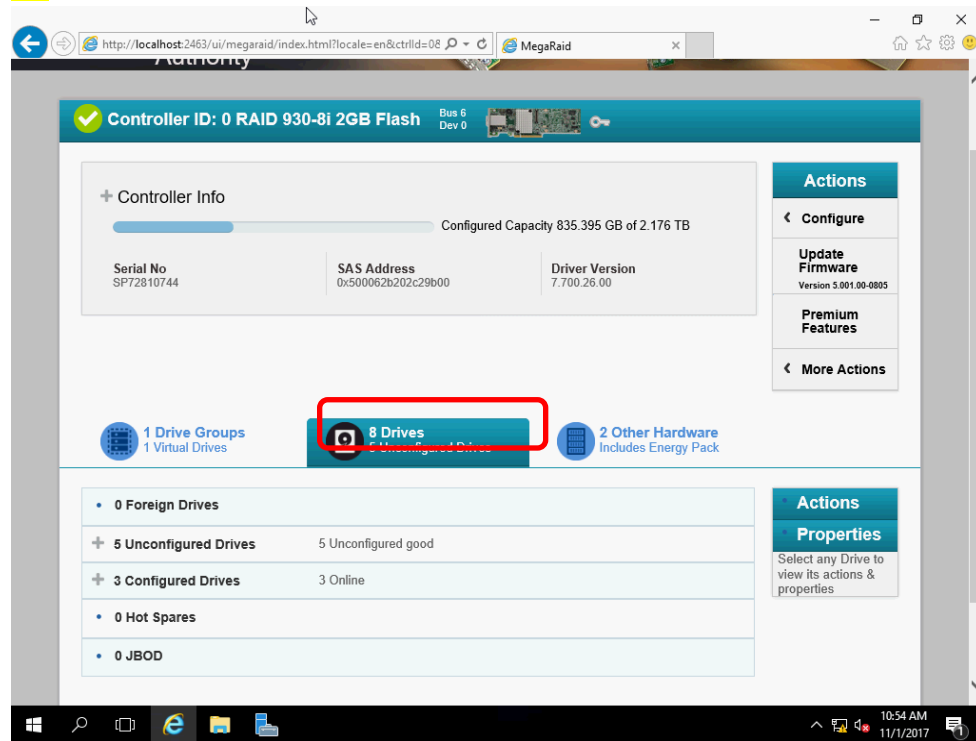


Figure 2. Five Unconfigured Drives in RAID 930-8i

3. Click the **Drive Groups** Tab again to return to drive groups and Select **RAID DG0** to select that drive group. Choose **Modify Drive Group** below **Actions**.

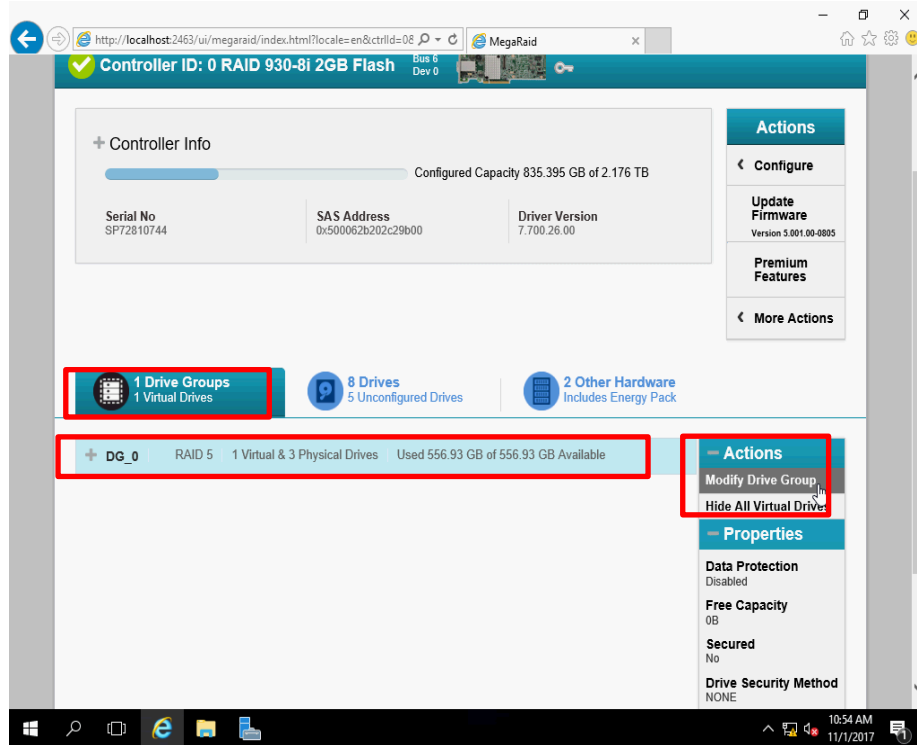


Figure 3. Modify Drive Group

4. Select **RAID 5** from the RAID Level Setting pull-down menu on the Modify Drive Group screen. Select the check box “It is advisable to backup data before you proceed. Are you sure you want to continue?”

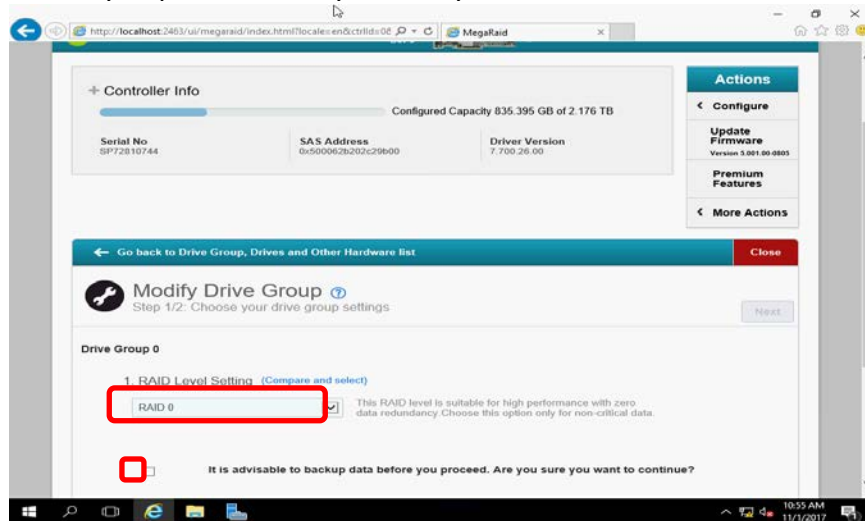


Figure 4. Select RAID 5 from the RAID Level Setting

Note: This check box ensures that the user read the notice and is aware that data could be lost. The Next button highlights when changes are made on the page.

5. Click **Next** to proceed.

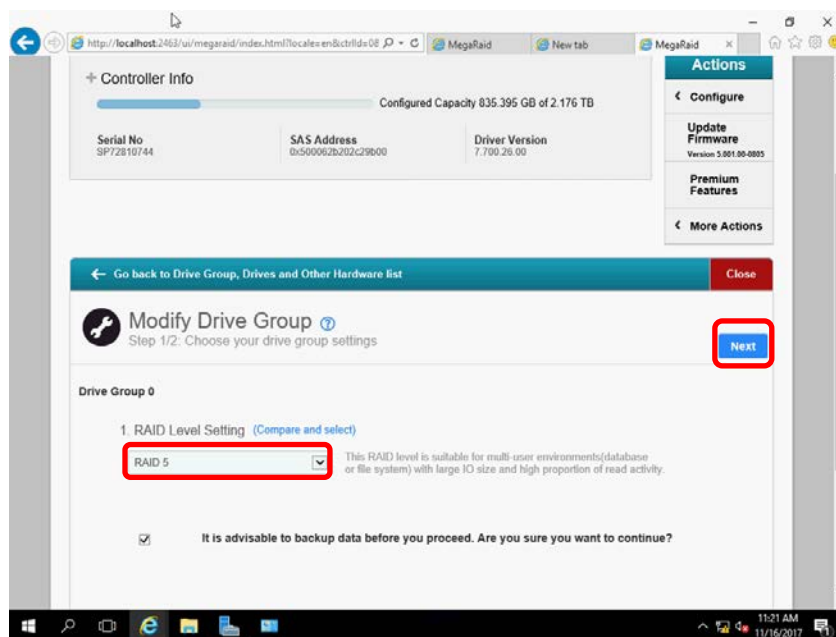


Figure 5. RAID Level at RAID 5 and click **Next**

6. The Unconfigured Drive Window is available after step 5. Pick the drive in the new disk group.
 - a. Check the drive in slot 11, and then click **Add physical Drives**.

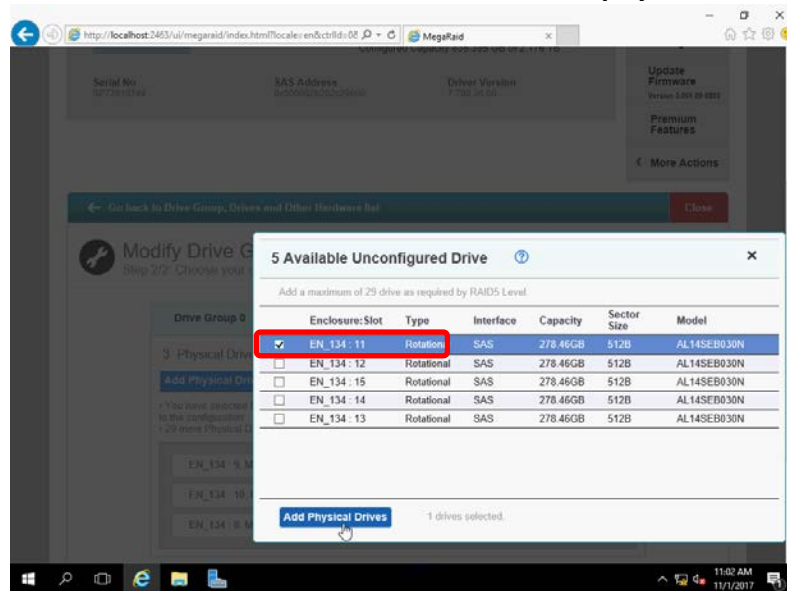


Figure 6. Check the drive in slot 11

- b. The Unconfigured drive Window disappeared. Slot 11 is in the drive group 0. Click **Finish**.

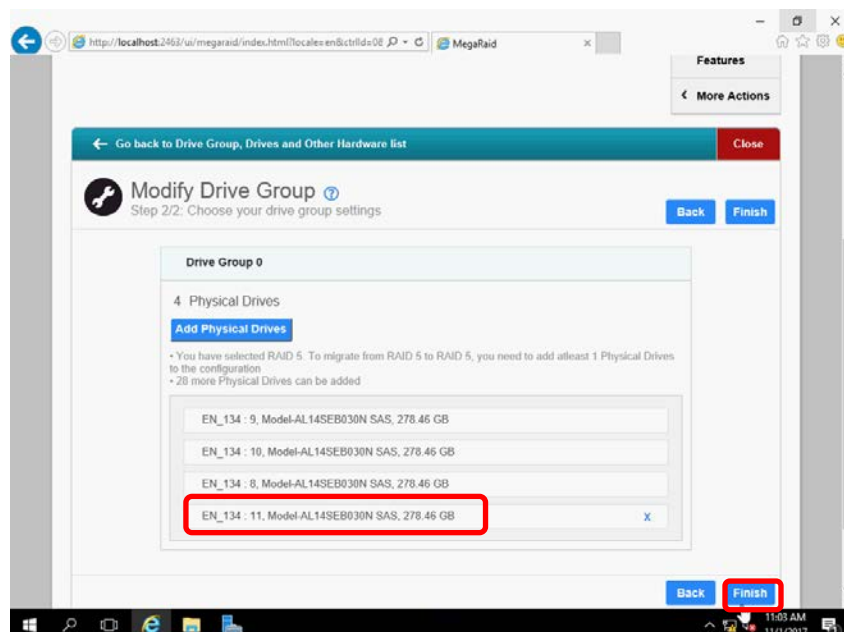


Figure 7. The drive in slot 11 has been added into the drive group

c. The background process is in progress.

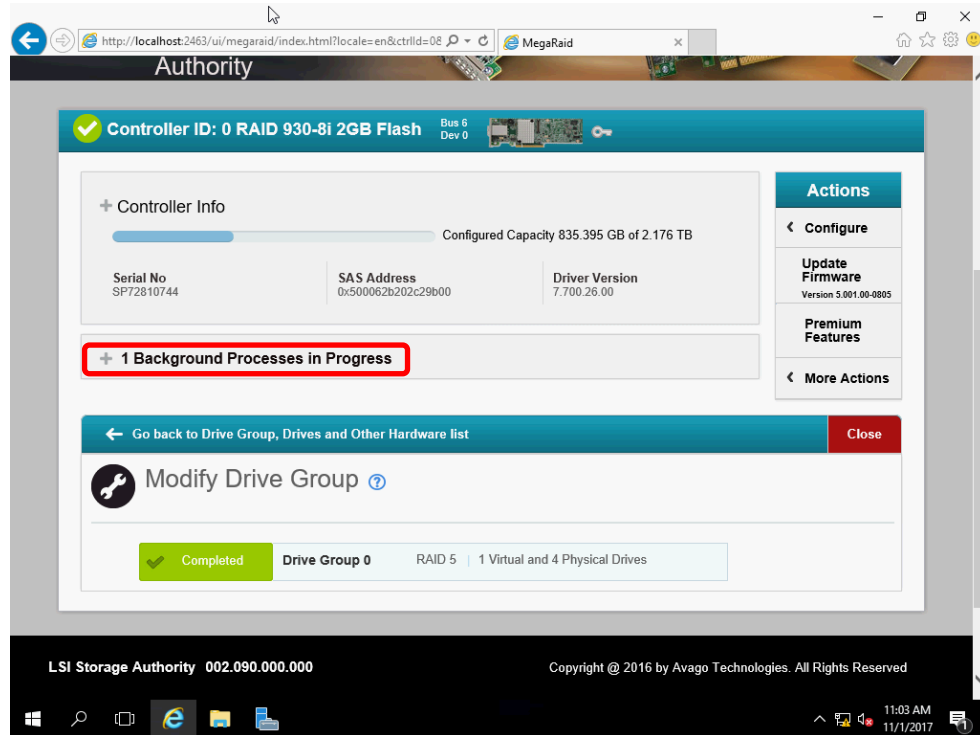


Figure 8. Background Processes in Progress screen

The process takes a couple of hours to complete. Once the process completes, the additional disk space can be seen in storage management in Windows.

Note: The time required for the entire process depends on the card model, HDD type, HDD size, and system loading. The following sample results are based on two different sets of configurations:

Configuration 1:

System: Lenovo ThinkSystem SR550 (MT: 7X03)
 CPU: Intel® Xeon® Silver 4114 CPU @ 2.20 GHz x 2
 Memory: Samsung DDR4 8 GB x 12
 Hard Drive: 300 GB 10K rpm SAS 12 Gbps
 OS: Windows 2016
 Application: LSI Storage Authority (LSA)
 Loading: No running applications

Card Type	RAID 5 with three disks Expands to RAID 5 with four disks	RAID 5 with three disks Expands to RAID 5 with five disks
RAID 530-8i	10 hours	16 hours
RAID 930-8i 2 MB cache	3.5 hours	4.5 hours

Configuration 2:

System: Lenovo ThinkSystem SR550 (MT: 7X03)
 CPU: Intel® Xeon® Silver 4114 CPU @ 2.20 GHz x 2
 Memory: Samsung DDR4 8 GB x 12
 Hard Drive: 7.68 TB SSD model: MZILS7T6HMLSV3
 OS: Windows 2016
 Application: LSI Storage Authority (LSA)
 Loading: No running applications

Card type	RAID 5 with three disks Expands to RAID 5 with four disks
RAID 530-8i	176 hours
RAID 930-8i 2 MB cache	32 hours