This article describes how to troubleshoot disk, RAID, and hardware issues.

Contents

Checking the Disk Health

You can check the disk health from the Central Manager or from the command line. On a Central Manager, choose the device to check, and then choose **Monitor > Disks** to get a report on the disk status. For more details, see the Disks Report section in the *Cisco Wide Area Application Services Configuration Guide*.

From the command line, you can use the **show disks details** command as follows:

```
WAE674# show disks details

RAID Physical disk information:
  disk00: Online                J8WM2DTC    286102 MB
  disk01: Rebuilding            J8WMPV9C    286102 MB                    <-------replaced disk is r
  disk02: Online                J8WMYG6C    286102 MB

RAID Logical drive information:
  Drive 1:    RAID-5  Critical                                          <-------RAID logical drive
        Enabled   (read-cache) Enabled (write-back)

Mounted file systems:
 MOUNT POINT      TYPE       DEVICE            SIZE     INUSE      FREE USE%
 /sw              internal   /dev/sda1         991MB    892MB      99MB  90%
 /swstore         internal   /dev/sda2         991MB    733MB     258MB  73%
 /state           internal   /dev/sda3        7935MB    176MB    7759MB   2%
 /local/local1    SYSFS      /dev/sda6       22318MB    139MB   22179MB   0%
 .../local1/spool PRINTSPOOL /dev/data1/spool  991MB     32MB     959MB   3%
 /obj1            CONTENT    /dev/data1/obj  248221MB    130MB  248091MB   0%
 /dre1            CONTENT    /dev/data1/dre  248221MB    130MB  248091MB   0%
 /ackq1           internal   /dev/data1/ackq   991MB     32MB     959MB   3%
 /plz1            internal   /dev/data1/plz   2975MB     64MB    2911MB   2%

Disk encryption feature is disabled.
```

It is also useful to check the Predictive Failure Analysis (PFA) flag for RAID-5 disks by using the **show disks tech-support** command. You will find the PFA flag at the end of the output. If the PFA flag is set to Yes, it indicates a predicted drive failure and you should replace the disk. A critical alarm is also raised on the WAE.

Disk Failures

Disk failures are automatically detected by the system. Failed disks are automatically removed from service.

You can also shut down a disk for scheduled replacement by using the following commands:

For a RAID-5 system:

```
WAE674# disk disk-name disk01 replace
Controllers found: 1


Command completed successfully.
```

After you replace a disk on a RAID-5 system, the system rebuilds the logical RAID drive automatically.

For a RAID-1 system:

```
WAE7326# config
```

```
WAE7326(config)# disk disk-name disk01 shutdown
Device maybe busy while going offline ... please wait!
mdadm: set /dev/sdb1 faulty in /dev/md0
mdadm: set /dev/sdb2 faulty in /dev/md1
. . .
```

After you replace the disk on a RAID-1 system, use the following command to reenable the disk:

```
WAE7326# config
WAE7326(config)# no disk disk-name disk01 shutdown
```

RAID-5 Rebuilding and Synchronization

On a RAID-5 system, a RAID rebuild occurs when a hard disk is replaced, and a RAID synchronization occurs when WAAS is installed onto a system by CD or when you run the **disk recreate-raid** EXEC command. During a RAID rebuilding or synchronization process, which is managed by the RAID firmware, the hard disk LEDs blink constantly as the drives are set up with the RAID configuration. The RAID array rebuilding or synchronization process can take up to 6 hours to complete on a WAE-7371 with six 300-GB hard disks. Unfortunately, there is no indication of the time remaining.

CAUTION: Do not power cycle or remove a disk from the system when any of the drive LEDs are blinking because the disk can be damaged.

If you do remove a disk during the RAID build process, reinsert the disk and wait up to 6 hours for the RAID build process to complete.

There are slight differences in the RAID rebuild and synchronization, as follows:

- Rebuild: Occurs after hard disk replacement. A disk and RAID failure alarm is raised on the device. The hard disk LEDs blink rapidly and the LED on the replaced hard disk remains amber until the rebuild process is complete. The **show disks detail** command shows the RAID physical disk that was replaced in the "Rebuilding" state and the RAID-5 logical disk in the "Critical" state.
- Synchronization: Occurs after system installation from the CD or RAID recreation. A RAID failure alarm is raised on the device. The hard disk LEDs blink rapidly until the rebuild process is complete. The **show disks detail** command shows all the RAID physical disks in the "Online" state and the RAID-5 logical disk in the "Impacted" state.

Firmware Upgrade for WAE-7341/7371/674

Ensure that your WAE-7341/7371/674 appliance has the recommended RAID controller firmware, 5.2-0 (15418). You can check the RAID controller firmware with the **show disks tech-support** command as follows:

```
wae# show disks tech-support

Controllers found: 1
-----------------------------------------------------------------------
Controller information
-----------------------------------------------------------------------
   Controller Status : Okay
   Channel description : SAS/SATA
   Controller Model : IBM ServeRAID 8k
   Controller Serial Number : 40453F0
   Physical Slot : 0
   Installed memory : 256 MB
   Copyback : Disabled
```

Disk Failures   3

```
      Data scrubbing : Disabled
      Defunct disk drive count : 0
      Logical drives/Offline/Critical : 1/0/0
      ---------------------------------------------------
      Controller Version Information
      ---------------------------------------------------
      BIOS : 5.2-0 (15418)
      Firmware : 5.2-0 (15418)                              <-----Firmware version
      Driver : 1.1-5 (2449)
      Boot Flash : 5.1-0 (15418)
      ---------------------------------------------------
. . .
```

If your RAID controller firmware needs to be updated, obtain the recommended version from the Cisco software download website (registered customers only) and upgrade the firmware as described in the documentation that accompanies the firmware.

Boot Sequence Issue on WAE-7341/7371/674

WAE-7341/7371/674 appliances are designed to boot from the internal compact flash storage device, not the hard disk. If the WAE BIOS is inadvertently changed to boot from the hard disk, the WAE will fail to boot.

If you encounter this situation, change the BIOS back to boot from the compact flash to allow proper booting. For details on how to change the startup sequence, see the chapter Using the Configuration/Setup Utility Program in the *Cisco Wide Area Application Engine 7341, 7371, and 674 Hardware Installation Guide*. You can choose the option **Load Default Settings** to restore the correct default settings, which include booting from the internal compact flash storage device.

Serial Port Disabled Issue on WAE-7341/7371/674

Sometimes after multiple power cycles during the device boot, the serial port becomes disabled.

If you encounter this situation, you should reenable the serial port. For details, see the chapter Using the Configuration/Setup Utility Programin the *Cisco Wide Area Application Engine 7341, 7371, and 674 Hardware Installation Guide*. You can choose the option **Load Default Settings** to restore the correct default settings, which include enabling the serial port.

Boot Status Display

To monitor the boot process on Cisco WAE and WAVE appliances, connect to the serial console port on the appliance as directed in the Hardware Installation Guide.

Cisco WAE and WAVE appliances have video connectors that should not be used in normal operation. The video output is for troubleshooting purposes only during the BIOS boot and stops displaying output as soon as the serial port becomes active.

If you are monitoring the video output, it may appear that the device has stopped booting when the output stops, but it is normal for the video output to stop while the device continues booting.

Replacing Disks on the WAE-612 with WAAS Versions 4.0.11 and Earlier Releases

If you are running WAAS version 4.0.11 or an earlier release on a WAE-612 device and a disk fails, the replacement procedure varies, depending on the failure symptoms and the WAAS version that is in use. See the following sections, depending on the failure symptoms:

- Disk01 Fails
- Disk00 Fails and Disk01 has Problematic Status and is Marked Bad
- Disk00 Fails and Disk01 is Not Marked Bad

If you are running WAAS version 4.0.13 or a later release, see the Performing Disk Maintenance for RAID-1 Systems section in the *Cisco Wide Area Application Services Configuration Guide* for the hot-swap disk replacement procedure.

NOTE: On a WAE-612 that is running any WAAS version from 4.0.13 through 4.0.19, which supports the hot-swap replacement of drives, a problem may occur while replacing the drives while the unit is running. Occasionally, after a drive hot-swap procedure, the WAE-612 may stop operating and require a reboot. To avoid this problem, upgrade your WAAS software to version 4.0.19 or a later release.

Disk01 Fails

If the disk only in slot 01 (right slot) fails and disk00 is good, use the following procedures to replace the disk, depending on the WAAS version on the device.

WAAS version 4.0.5 and earlier releases

1. Mark disk01 as bad.
2. Upgrade the WAAS software to WAAS 4.0.7.
3. Shut down the WAE and replace disk01.
4. Start up the WAE.
5. Mark disk01 as good and reload the WAE.

WAAS versions 4.0.7 through 4.0.11

1. Mark disk01 as bad.
2. Shut down the WAE and replace disk01.
3. Start up the WAE.
4. Mark disk01 as good and reload the WAE.

Disk00 Fails and Disk01 has Problematic Status and is Marked Bad

If disk00 fails and disk01 shows a status of Problematic, with an asterisk (*) next to the status (the asterisk means the disk is marked bad), it means that disk00 has failed but disk01 is misclassified as bad and its partition table has been removed. In this situation, all data will be lost after the disk replacement.

Use the following procedures to replace the disk, depending on the WAAS version on the device.

WAAS version 4.0.5 and earlier releases

1. Mark disk00 as bad (if it is not already done).
2. Shut down the WAE and replace disk00.
3. Start up the WAE.
4. Mark disk00 as good (disk01 should still show as bad) and reload the WAE.
5. Reinstall a later version of the WAAS software (for example, by using the **copy ftp install** command or other method).

6. Mark disk01 as good and reload the WAE.

You should see RAID rebuilds from disk00 to disk01.

WAAS versions 4.0.7 through 4.0.11

1. Mark disk00 as bad (if it is not already done).
2. Shut down the WAE and replace disk00.
3. Start up the WAE.
4. Mark both disk00 and disk01 as good and reload the WAE.
5. Reinstall a later version of the WAAS software (for example, by using the **copy ftp install** command or other method).

Disk00 Fails and Disk01 is Not Marked Bad

If disk00 fails and there is no asterisk (*) next to the status of disk01 (an asterisk means that the disk is marked bad), it means that disk00 has failed and the partition table of disk01 is intact. The status of disk01 may show as Problematic or as something else. In this situation, data will not be lost after disk replacement.

Use the following procedures to replace the disk, depending on the WAAS version on the device.

WAAS version 4.0.5 and earlier releases

1. Upgrade the WAAS software to WAAS 4.0.7 or a later release.
2. Mark disk00 as good.
3. Shut down the WAE and remove disk00.
4. Move disk01 (right disk) to the disk00 position on the left side.
5. Insert a replacement disk into the disk01 slot.
6. Start up the WAE.

You should see RAID rebuilds from disk00 to disk01.

WAAS versions 4.0.7 through 4.0.11

1. Mark disk00 as good.
2. Shut down the WAE and remove disk00.
3. Move disk01 (right disk) to the disk00 position on the left side.
4. Insert a replacement disk into the disk01 slot.
5. Start up the WAE.

You should see RAID rebuilds from disk00 to disk01.