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## Juniper Network's RAID5/RAID10 Maintenance Best Practices

### Juniper platforms currently with RAID5 or RAID10 technology:

NSM3000, JA1500, STRM2500, STRM5000, STRM2500 II, STRM5000 II, STRM5000NEBS, Route Insight Manager 5001

### Background:

Various Juniper appliances ship with RAID (Redundant Array of Inexpensive Disks) technologies for storage of large amounts of application data. Maintaining the RAID volumes is critical in the event of a drive failure causing the RAID to degrade to a non-optimal state making it vulnerable to complete failure of the RAID and loss of all data stored on the RAID volume if an additional failure occurs. RAID volume consistency checks are very important to run regularly due the nature of extended drive use that will eventually encounter “media defects” or “bad sectors” which is normal on any hard disk. The consistency check is the only way to ensure that any grown defects on the RAID volume get mapped out and data redundancy is maintained for when a RAID event occurs.

### Backup of RAID data:

Follow the Juniper product documentation to regularly backup all system configuration and data to offline storage. This is the only way to recover in the event of a complete RAID volume failure.

### Monitor for RAID events and take corrective action immediately:

Juniper uses Adaptec hardware RAID adapters in our appliances. Monitoring of the RAID volume for events and replacing any drives with issues as soon as possible is the only way to ensure the system remains available. The Adaptec adapters can be monitored in various ways:

1. The Adaptec Storage Manager (ASM) software available from Adaptec or packaged with the Juniper product image. If available, the ASM can be started via the command, `/usr/StorMan/StorMan.sh`, after setting your Unix X-display. The ASM gives you options to manage multiple systems in one management screen and setup email alerts for any RAID events.
2. The Adaptec command line tool, `/usr/StorMan/arconf`, that can be run via Unix cron and email RAID events to you.
3. If the Juniper product software has RAID status monitoring make sure to configure it to notify you of any RAID events.

**Enable RAID consistency checks in one of two ways:**

1. Automatic background consistency checks

The standard is to run background checks every 30 days if turned on with the command:

```
/usr/StorMan/arcconf DATASCRUB 1 ON
```

Or set the period to run every 'X' days, via:

```
/usr/StorMan/arcconf DATASCRUB 1 PERIOD <DAYS>
```

**Note:** Running background consistency checks will impact the RAID IO performance from 10-30% for 1 to 1.5 days depending on your RAID volume size.

2. Manual scheduling of consistency checks off hours

To manually schedule (via cron) on a weekend and monitor the consistency checks, you can run the commands to start and set the priority of the checks via:

```
/usr/StorMan/arcconf task start 1 logicaldrive 0  
verify_fix
```

Then check the status of the consistency check with:

```
/usr/StorMan/arcconf getstatus 1  
Controllers found: 1  
Logical device Task:  
Logical device           : 0  
Task ID                  : 103  
Current operation        : Build/Verify  
Status                   : In Progress  
Priority                  : Low  
Percentage complete      : 62
```

**Command completed successfully.**

To lower the task/check priority, set the priority with the command like:

```
/usr/StorMan/arcconf setpriority 1 103 low
```

Where **103** is the task ID returned by the **getstatus** command above.  
Please note the lowering the task priority does lower the IO impact on the system but increases the duration to complete the check. A low priority check will take up to 1.5 days.

