

Bison SSD Upgrade Procedure

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Abstract

This procedure outlines the step-by-step process for upgrading the Ubuntu 20.04 Bison Server from a pair of mirrored 256GB SSDs to a pair of mirrored 1TB SSDs. The upgrade has been determined as essential for accommodating growing data demands, enabling ZFS snapshots, future-proofing, and ensuring optimal system performance. The steps outlined cover essential pre-upgrade considerations, backup strategies, and detailed instructions for a seamless transition of SSDs. Also included are considerations of possible complications that could arise. A Virtual Machine test of the methods outlined in this procedure is documented in this paper.

1 Pre-Upgrade Considerations

1.1 Inspect Integrity of File Systems

It is important to ensure that the file system is in a working condition before migrating to a new SSD configuration. To do this, several commands will be run. First, a list of the ZFS pools will be generated:

```
sudo zpool list
```

Next, the integrity of the ZFS pools will be checked:

```
sudo zpool status
```

If there are any degraded or faulted file systems, they must be repaired using

```
sudo zpool clear <erroneous pool>
```

1.2 Creating a New ZFS Snapshot

Once the integrity of the ZFS is ensured, the next step is to create an up-to-date snapshot of the system. Because of the low storage capacity of the current hard drives, it will be necessary to free up space by removing older snapshots of the system that contain outdated data and aren't likely to be useful in a rollback situation. First, a list of ZFS snapshots will be generated:

```
sudo zfs list -t snapshot -o name
```

Next, all snapshots older than a week will be pruned, using a bash script available under the MIT License and reviewed by H. Ryott Glayzer to ensure its usage is safe for Bison:

```
sudo zfs-prune-snapshots 1w
```

Now, there should be space to create a new snapshot. To create a new snapshot of the entire system, a BASH script created by H. Ryott Glayzer under the GPLv3 license will be used. First, ensure that `/usr/bin` is in the system's PATH:

```
echo $PATH
```

Then run the `system-snapshot` utility

```
sudo system-snapshot
```

This will have created a ZFS snapshot for the entire system.

1.3 Scrub the Root and Boot Pools

Next, scrub the pools that will be migrated to doubly ensure that the data is in good health

```
sudo zpool scrub bpool; sudo zpool scrub rpool
```

2 Migrating SSD

2.1 Removing an old Disk

Shut Down Bison and remove the disk attached at SATA3_2. Then, boot Bison.

2.2 Manually Partition New Disk

The new disk will be connected to Bison and manually partitioned via the `cdisk` utility to contain:

- 512M EFI System
- 8G Linux Swap
- 2G Solaris Boot
- 900G Solaris Root

2.3 Format Partitions

Next, the partitions must be formatted. Let's assume that the disk is `/dev/sdh`.

```
$ sudo fdisk -l /dev/sdh
...
Device      ...  Size Type
/dev/sdh1   ...  512M EFI System
/dev/sdh2   ...    8G Linux swap
/dev/sdh3   ...    2G Solaris boot
/dev/sdh4   ...  900G Solaris root
```

```
$ sudo mkfs.fat -F 32 /dev/sdh1
```

```
$ sudo mkswap /dev/sdh2
```

```
$ sudo swapon /dev/sdh2
```

2.4 Copying the EFI Bootloader to the New Drive

Next, the `dd` utility will be used to copy `/dev/sda1` to the EFI partition of the new disk.

```
sudo dd if=/dev/sda1 of=/dev/sdh1 status=progress
```

2.5 Copying the Boot and Root Pools to the First Drive

```
zpool status -L
sudo zpool attach bpool /dev/sdb3 /dev/sdh3
sudo zpool attach rpool /dev/sdb4 /dev/sdh4
zpool status -L
```

wait until disks are done resilvering.

```
zpool status -L
sudo zpool detach bpool /dev/sdb3
sudo zpool detach rpool /dev/sdb4
sudo zpool set autoexpand=on rpool
```

2.6 Setting up the next Drive

- Shut down Bison and remove the next 256G drive.
- Boot Bison and configure it to boot from the 1TB drive.
- Repeat Steps 2.1 to 2.4 to complete.

3 Troubleshooting

During this process, the data on the 256G disks will be unchanged. If anything goes wrong, simply add the 256G disk back into Bison and restart.