

Recommended BIOS and OS tuning guide for SQream DB

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This document describes the best practices for properly tuning and configuring a SQream DB installation, to support data warehouse workloads.



Ignore settings where not applicable

1. BIOS/RAID

- (For Dell PowerEdge servers) Enable Memory Map I/O Over 4GB
- Set power profile to maximum performance
- Set power regulator to high performance mode
- Enable Intel Turbo Boost and Hyperthreading
- Disable Intel Virtualization Technology
- Disable Intel VT-d
- Disable processor C-States (Minimum processor idle power core state)
- Set Energy/Performance bias to maximum performance
- Disable dynamic power capping
- Set DIMM voltage to Optimized for Performance
- Set memory power savings mode to Maximum performance
- Enable ACPI SLIT
- Set QPI Snoop configuration to Home-Snoop or Early-Snoop

2. OS settings

- Set number of open files to 500,000:

```
echo -e "*          soft  nproc      500000\n*          hard  nproc      500000\nsoft  nofile  500000\n*          hard  nofile    500000" >> /etc/security/limits.conf
```

- Tune kernel by adding lines to `/etc/sysctl.conf`:

```
echo -e " fs.file-max=2097152\n vm.dirty_background_ratio = 5 \n vm.dirty_ratio = 10\n \n vm.swappiness = 10 \n vm.zone_reclaim_mode = 7 \n vm.vfs_cache_pressure = 200 \n" >> /etc/sysctl.conf
```

- Disable transparent hugepages

```
echo 'never' > /sys/kernel/mm/transparent_hugepage/enabled
```

- Tune NVIDIA Tesla series cards by placing the following lines in `/etc/rc.local`:

```
nvidia-persistenced
nvidia-smi -pm 1
nvidia-smi -acp 0
nvidia-smi --auto-boost-permission=0
nvidia-smi --auto-boost-default=0
# Assuming all GPUs are of the same type
nvidia-smi -ac $(SC=`nvidia-smi --query-supported-clocks=mem,gr --format=csv,noheader | head -n1`; echo $SC | awk 'BEGIN { FS=" " } ; { print $1 "," $3 }')
```