Recommended BIOS and OS tuning guide for SQream DB

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This document describes the best practices for properly tuning and configurig 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\n*
soft    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 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 }')
```