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Performance tuning for the Casper JSS

April 17, 2016 [rtrouton](#) [Leave a comment](#) [Go to comments](#)

One of the challenges Casper admins can run into is performance tuning, which can require going into parts of the JSS that you normally go into only when JAMF Support asks you to do so. To help with this process, there are formulas which you can use to calculate if your JSS's Tomcat and MySQL services are configured for best performance.

Before proceeding further, I want to emphasize that a) check with JAMF Support first and b) you should always, always, **always** make backups of your JSS before changing settings. I assume no responsibility and bear no culpability if your JSS breaks as a result of anything you implement as a result of reading this post. I am also not responsible for incorrect math, ruining anyone's weekend, or that long talk you now need to have with your boss about why your JSS is now broken.

One other thing to be aware of is that I'm going to be focusing on Linux and Windows in this post since those are the platforms that I'm most familiar with for hosting a Casper 9 JSS.

For more details, see below the jump:

There are three sets of settings that can be adjusted to improve (or degrade) the performance of your JSS:

max_connections – located in MySQL's **my.cnf** config file

maxThreads – located in **/path/to/tomcat_directory/conf/server.xml**

MaxPoolSize – located in `/path/to/tomcat_directory/webapps/ROOT/WEB-INF/xml/DataBase.xml`

The formula for calculating the optimum **max_connections** setting in MySQL's **my.cnf** configuration file is shown below:

```
1 | max_connections=(n X p)+1
```

This formula sets **n** to equal the number of webapps (i.e. JSSs) you have connecting to the MySQL database and **p** equals the value of **MaxPoolSize**. The reason for the **+1** in the formula is to make sure that, no matter how many connections your JSS is making, you have at least one unused and open connection to communicate with your MySQL database.

The value of **MaxPoolSize** is set by default to **90** in the JSS, so most JSSs should be able to use this formula:

```
1 | max_connections=(n X 90)+1
```

The value of **MaxPoolSize** also affects the **maxThreads** value. The value of **maxThreads** defines the maximum number of request processing threads to be created, which therefore determines the maximum number of simultaneous requests that can be handled. The formula for calculating the optimum **maxThreads** setting in Tomcat's **server.xml** configuration file is shown below:

```
1 | maxThreads=($MaxPoolSizeNumber X 2.5)W
```

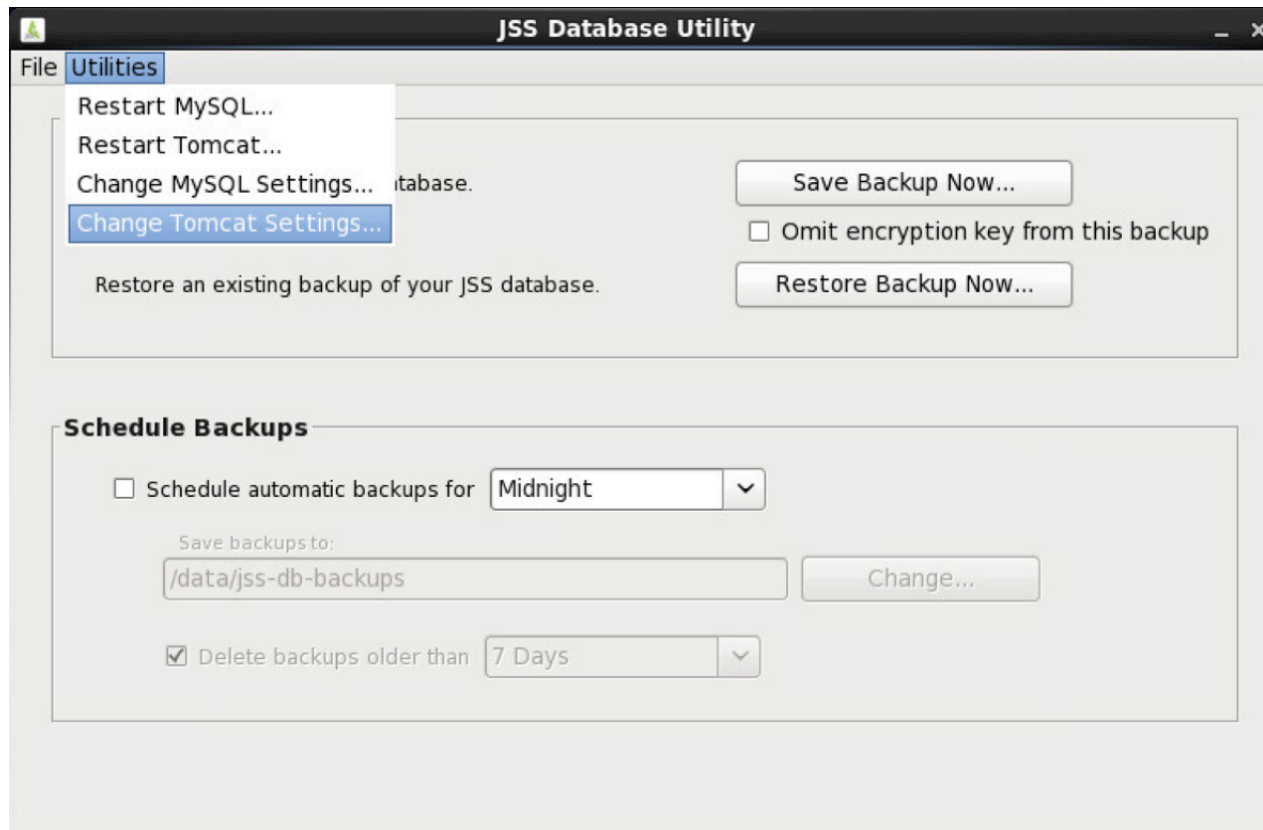
This formula sets **W** to equal the number of webapps (i.e. JSSs) you have running in Tomcat.

As mentioned previously, the value of **MaxPoolSize** is set by default to **90** in the JSS, so most JSSs should be able to use this formula:

```
1 | maxThreads=(90 X 2.5)W
```

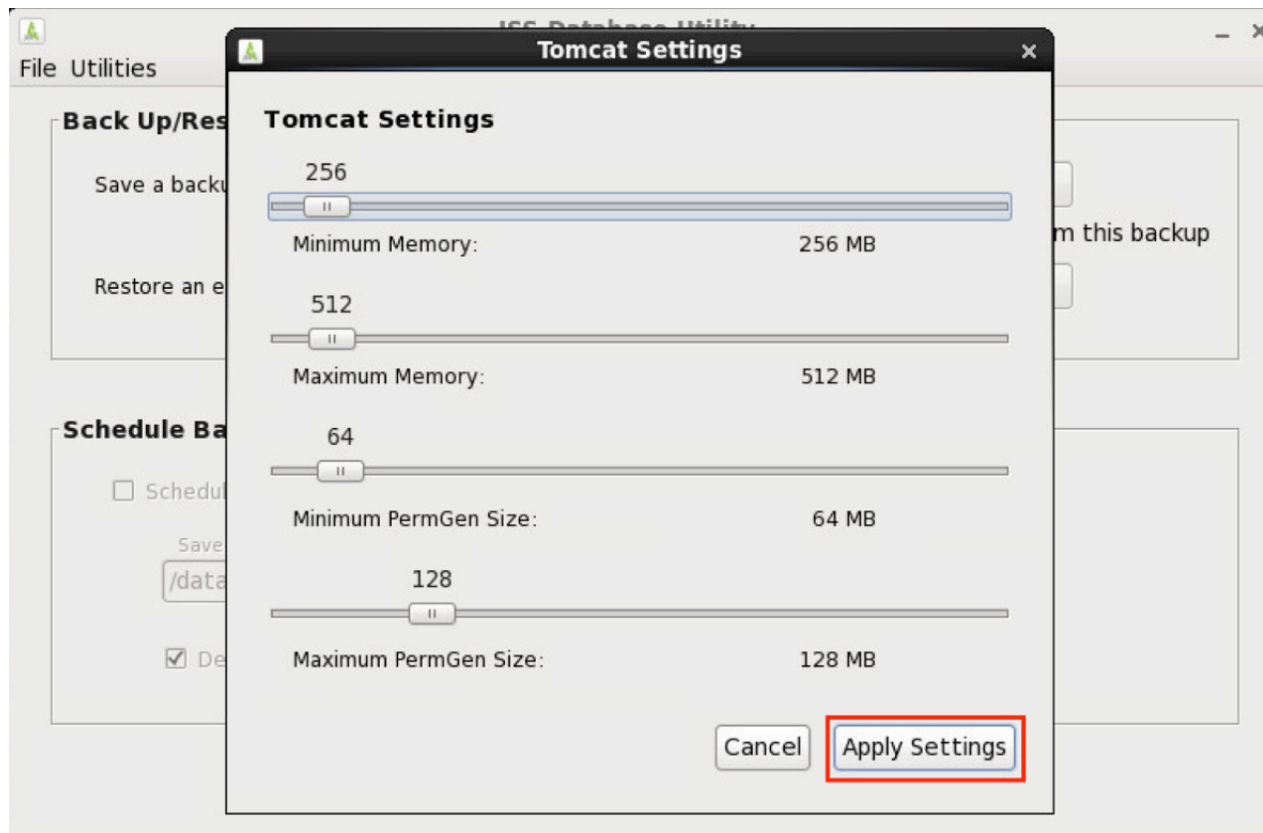
The other thing you can do to affect performance is that you can adjust how much memory is being allocated to Java, which in turn increases how much memory the JSS's Tomcat webapp is able to use (since both Tomcat and the JSS webapp are Java applications.) If you've been installing and/or updating your Casper server using JAMF's installer, I strongly recommend [using the JSS Database Utility](#) for adjusting Tomcat's memory settings. You can access those settings via the following process:

1. Launch the JSS Database Utility
2. Click on the **Utilities** menu and select **Change Tomcat Settings...**



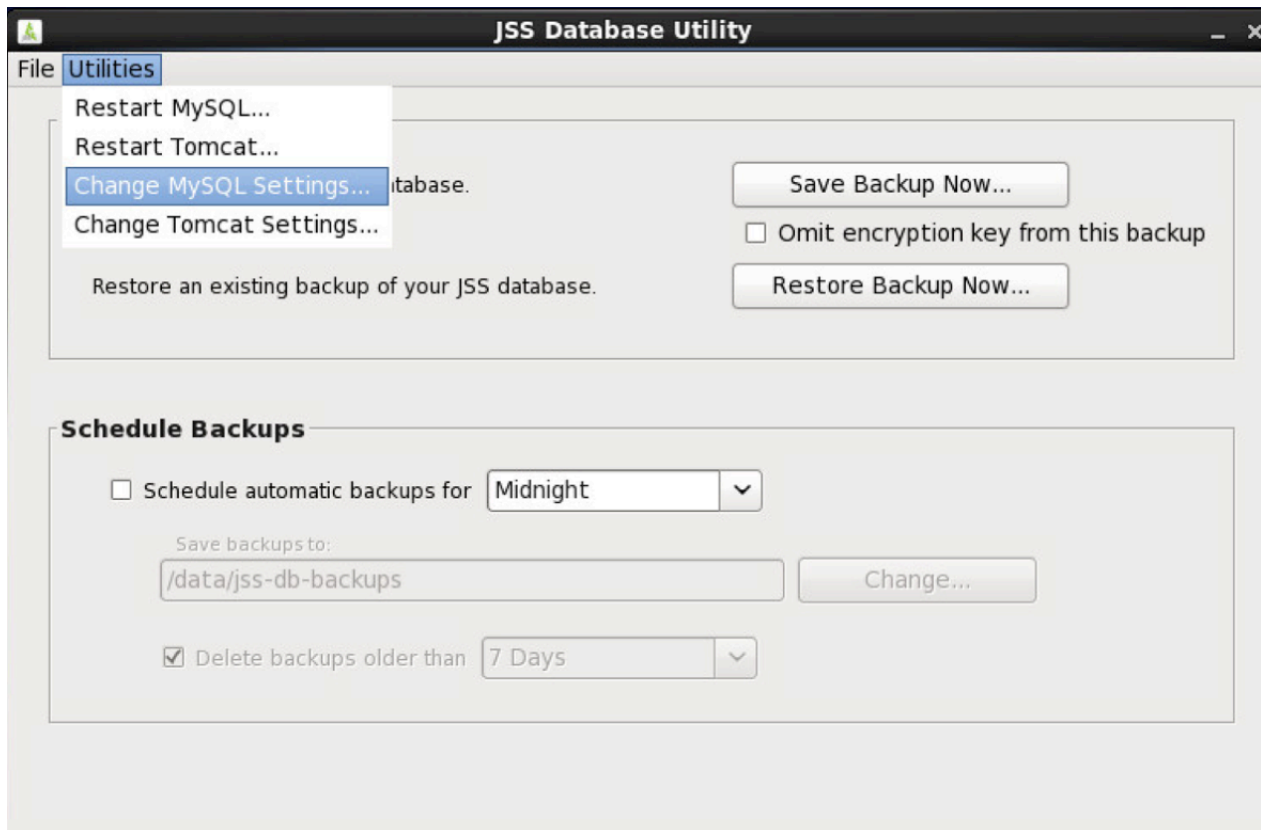
3. Adjust as needed

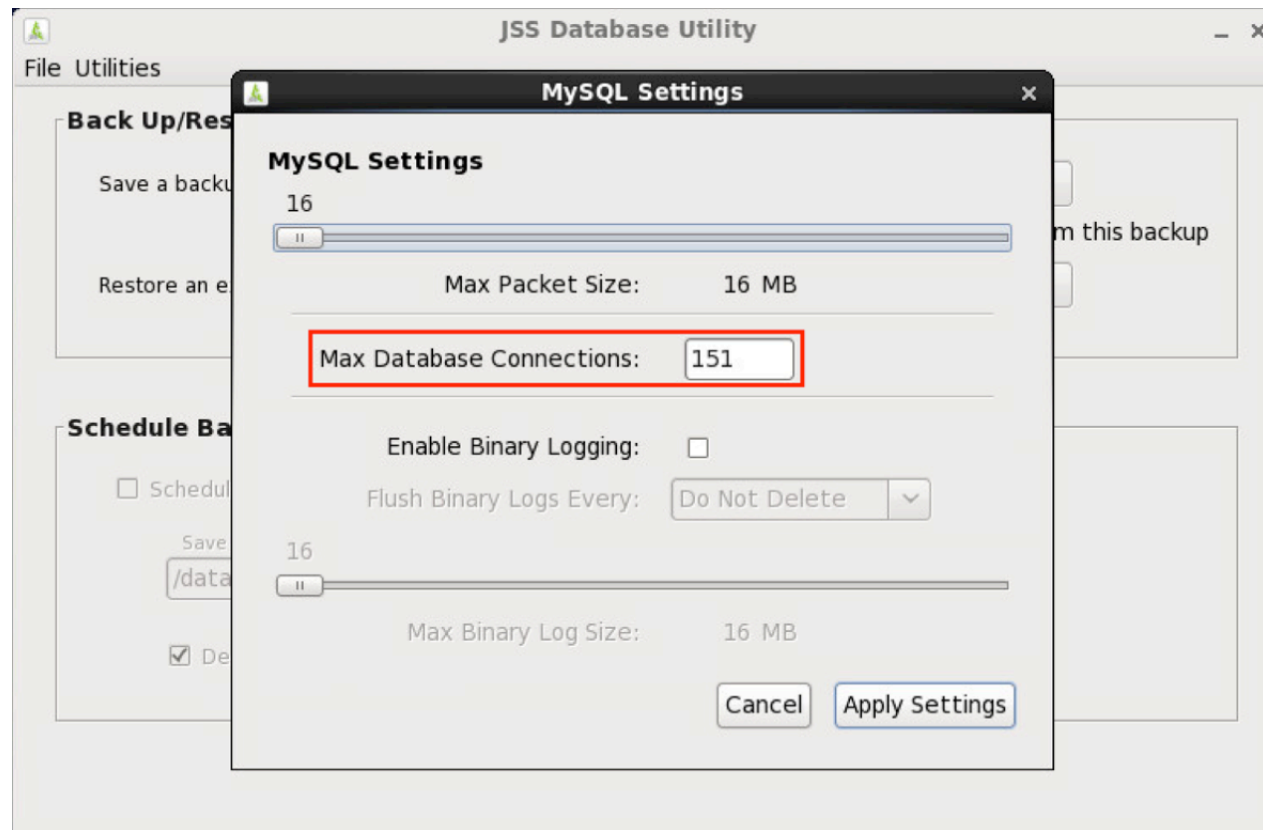
4. When finished, click the **Apply Settings** button

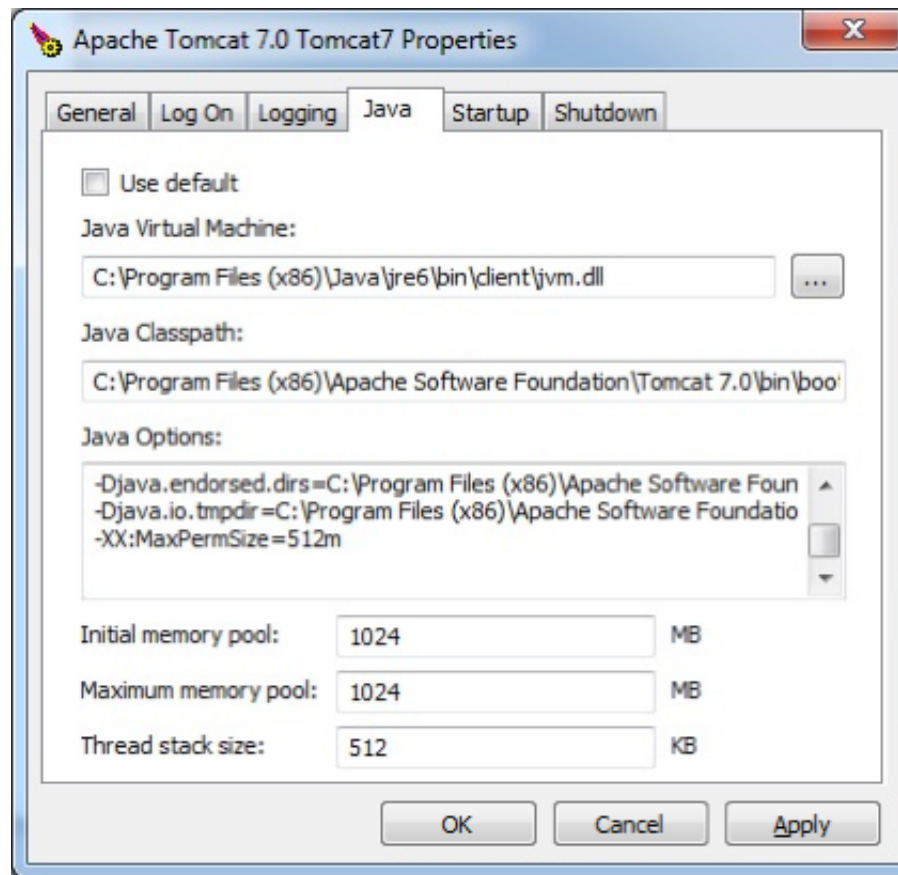


5. Restart Tomcat

Note: You can also adjust MySQL's **max_connections** settings via the JSS Database Utility by selecting **Change MySQL Settings....** and adjusting the **Max Database Connections** value.







On Linux, you set the memory options with a shell script named **setenv.sh** which is stored in **/path/to/tomcat_directory/bin**. Here's an example of what this script can look like:

```
1 | #!/bin/sh  
2 |  
3 | export CATALINA_OPTS="-Xms128m -Xmx256m -XX:MaxPermSize=128m -Djava.awt.headless=true -server"
```

As you can see from the information above, there's a lot that can go into performance tuning for a Casper JSS. JAMF has tried to set default settings that make sense for most environments, but settings that may have made sense at the initial JumpStart may now need adjustment as the number of Macs managed by your Casper server has grown.

Since different operating systems store MySQL and Tomcat in different places, please see below for a listing of where Tomcat and MySQL (along with their various configuration files) are installed.

MySQL

Here's where MySQL and its files is located for Windows, Ubuntu and Red Hat Enterprise Linux. My working assumption for these paths is that MySQL Server 5.6 is installed:

Ubuntu:

MySQL – **/var/lib/mysql**

MySQL configuration file – **/etc/mysql/my.cnf**

Red Hat Enterprise Linux:

MySQL – **/usr/bin/mysql**

MySQL configuration file – **/etc/my.cnf**

Windows:

MySQL – **C:\Program Files\MySQL\MySQL Server 5.6**

MySQL configuration file – **C:\ProgramData\MySQL\MySQL Server 5.6\my.ini**

Tomcat and the JSS webapp

If you're installing and/or updating your JSS using JAMF's installer for the JSS, here's where it puts the Apache Tomcat files and JSS webapp files for Windows and Linux (both Red Hat Enterprise Linux and Ubuntu):

Windows JSS installer:

- JSS web application – **C:\Program Files\JSS\Tomcat\webapps\ROOT**
- Apache Tomcat – **C:\Program Files\JSS**
- JSS Tomcat's **server.xml** configuration file – **C:\Program Files\JSS\Tomcat\conf\server.xml**
- JSS Tomcat's Java keystore – **C:\Program Files\JSS\Tomcat\certs\keystore**
- JSS JSS Database Utility – **C:\Program Files\JSS\bin\JSSDatabaseUtil.jar**
- JSS Database backup location – **C:\Program Files\JSS\Backups\Database**
- JSS Logs – **C:\Program Files\JSS\Logs**

Linux JSS Installer (for Red Hat Enterprise Linux and Ubuntu):

- JSS web application – **/usr/local/jss/tomcat/webapps/ROOT/**

- Apache Tomcat – **/usr/local/jss/**
- JSS Linux service startup script – **/etc/init.d/jamf.tomcat7**
- JSS Tomcat’s **server.xml** configuration file – **/usr/local/jss/tomcat/conf/server.xml**
- JSS Tomcat’s Java keystore – **/usr/local/jss/tomcat/.keystore**
- JSS JSS Database Utility – **/usr/local/jss/bin/JSSDatabaseUtil.jar**
- JSS Database backup location – **/usr/local/jss/backups/database/**
- JSS Logs – **/usr/local/jss/logs/**

If you’re installing or updating your JSS using the manual install process, Tomcat needs to be installed separately. Here’s where Tomcat is located for Windows, Ubuntu and Red Hat Enterprise Linux. My working assumption for these paths is that Tomcat 7 is installed:

Windows:

- Apache Tomcat – **C:\Program Files\Apache Software Foundation\Tomcat 7.0**
- Apache Tomcat’s **server.xml** configuration file – **C:\Program Files\Apache Software Foundation\Tomcat 7.0\conf\server.xml**
- JSS web application – **C:\Program Files\Apache Software Foundation\Tomcat 7.0\webapps\ROOT**

Red Hat Enterprise Linux:

- Apache Tomcat – **/usr/share/tomcat7**
- Apache Tomcat’s **server.xml** configuration file – **/usr/share/tomcat7/conf/server.xml**
- JSS web application – **/usr/share/tomcat7/webapps/ROOT**

Ubuntu:

- Apache Tomcat – **/var/lib/tomcat7**
- Apache Tomcat’s **server.xml** configuration file – **/var/lib/tomcat7/conf/server.xml**
- JSS web application – **/var/lib/tomcat7/webapps/ROOT**

When troubleshooting, you’ll usually need to check the logs. If you installed using the manual process and properly configured where the logs should be going, here’s where they’re stored for Windows, Ubuntu and Red Hat Enterprise Linux:

Windows:

- **C:\Program Files\Apache Software Foundation\Tomcat 7\logs\Catalina.date_goes_here.log**
- **C:\Program Files\Apache Software Foundation\Tomcat 7\logs\JAMFSoftwareServer.log**
- **C:\Program Files\Apache Software Foundation\Tomcat 7\logs\JAMFChangeManagement.log**

Red Hat Enterprise Linux and Ubuntu:

- **`/var/log/tomcat7/Catalina.date_goes_here.log`**
- **`/var/log/tomcat7/JAMFSoftwareServer.log`**
- **`/var/log/tomcat7/JAMFChangeManagement.log`**

Note: You can set the location for the **JAMFSoftwareServer.log** and **JAMFChangeManagement.log** logfiles in **`/path/to/tomcat_directory/webapps/ROOT/WEB-INF/classes/log4j.properties`**.

For the directory paths in Tomcat's **log4js.properties** file, you can use `"/` / `"` for both Windows and Unix-based systems. If you want to use Windows' `"\"` for paths, you have to use them in pairs (the first `"\"` is for escaping the slash.) Both of the following approaches shown below would work fine:

```
1 | log4j.appender.LOGFILE.File=C:/path/to/jss.log
```

```
1 | log4j.appender.LOGFILE.File=C:\\path\\to\\jss.log
```

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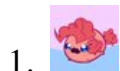
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[Sam Novak \(@snovak_uwsp\)](#)

October 31, 2016 at 1:33 pm

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Thanks for this write up Rich!

Here's some of the MySQL tuning I've done for my instance (about 300 iPads and 600 Macs)

```
# General
```

```
## Memory Usage
```

```
join_buffer_size = 256K
```

```
sort_buffer_size = 1M
```

```
## Informational
```

```
server-id = 1
```

```
# InnoDB
```

```
## Buffer Pool
```

```
### the jamfsoftware database uses myISAM for it's storage engine, so InnoDB is mostly unused
```

```
innodb_buffer_pool_instances = 8
```

```
innodb_buffer_pool_size = 256M
```

```
# Networking
```

```
## Data / Memory size
```

```
max_allowed_packet = 512M # Recommended by JAMF
```

```
## Advanced
```

```
max_connections = 301 # Recommended by JAMF
```

```
# Advanced
```

```
## Thread specific settings
```

```
thread_cache_size = 12 # 8 + (Max_connections / 100) rounded up
```

```
## Various
```

```
read_buffer_size = 64K # Possibly increase this, depending on MyISAM performance over time
```

```
read_rnd_buffer_size = 256K
```

```
tmp_table_size = 1G
```

```
# MyISAM
## Advanced settings
myisam_sort_buffer_size = 2G
```

```
## General
key_buffer_size = 4G
```

```
# Performance
## Query Cache
### Some basic testing showed the query cache can really speed up the web interface, since it'll return the same data most of the time
query_cache_size = 30M
query_cace_type = 1
```

1. No trackbacks yet.

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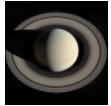


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