

Cambium Wireless Manager

Performance Tuning Guide



Cambium Networks

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Accuracy

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1 Introduction

This document consolidates and captures lessons learned and tips that have been used in several customer deployments to properly configure and optimize Wireless Manager. In many cases, if slow performance is being experienced, following the steps in this guide will correct the issues. For persistent performance issues, support should be contacted to troubleshoot the issue further.

Because Wireless Manager is distributed as software in a variety of server and networking environments, there is no “one size fits all” solution. However, the guidelines in this document will serve as a solid starting point and will typically address most performance related issues.

The remainder of this document covers the specific guidelines and recommendations to optimize various aspects of the Wireless Manager server.

2 Database Configuration Recommendations

To optimize MySQL database resources perform the steps per the operating system sections below.

2.1 Linux

1. Stop WM Server.
2. Stop the service for MySQL Server.
3. In the MySQL server file system, find either the file “my.cnf” or the file “my.ini”. **Note:** “my.ini” or “my.cnf” are normally present in /etc/ folder.
4. Open the file for editing. **Note:** A simple and fast way to accomplish the next step is to initially use the contents of the file my-huge.
5. For any of the following attributes whose value is smaller than the value recommended here, increase it to the recommended value:

```
back_log=50
binlog_cache_size=1M
bulk_insert_buffer_size=128M
join_buffer_size=16M
```

```
key_buffer_size=512M
max_connections=150
max_connect_errors=10
max_allowed_packet=512M
max_heap_table_size=64M
query_cache_size=128M
query_cache_limit=4M
read_buffer_size=4M
read_rnd_buffer_size=8M
sort_buffer_size=2M
table_open_cache=512
thread_cache_size=8
thread_stack=192K
tmp_table_size=64M
```

6. Save and close the file.
7. Restart the service for MySQL Server.
8. Start the WM Server.

2.2 Windows

1. Stop WM Server.
2. Stop the service for MySQL Server.
3. In the MySQL server file system, find either the file my.cnf or the file my.ini.
Note: *my.ini or my.cnf is normally present in C:\MySql Server 5.1\ folder.*
4. Open the file for editing. **Note:** *A simple and fast way to accomplish the next step is to locate and initially use the contents of the file my-huge.*
5. For any of the following attributes whose value is smaller than the value recommended here, increase it to the recommended value. If any attribute is missing, add it in the file.

```
innodb_additional_mem_pool_size=2M
innodb_flush_log_at_trx_commit=1

innodb_log_buffer_size=4M

# Set this parameter to any value between 128M to 1024M.
# The value should be in power of 2.
innodb_buffer_pool_size=512M

# About 25%-100% of your buffer pool size.
innodb_log_file_size=10M

innodb_thread_concurrency=8
max_connections=150
max_connect_errors=10
max_allowed_packet=512M
```

```
max_heap_table_size=64M
query_cache_size=128M
query_cache_limit=4M
read_buffer_size=4M
read_rnd_buffer_size=8M
sort_buffer_size=2M
table_open_cache=512
thread_cache_size=8
thread_stack=192K
tmp_table_size=64M
```

6. Save and close the file.
7. Restart the service for MySQL Server.
8. Start the WM Server.

3 Guidelines and Optimizations for Discovery

An increase in the performance of WM can be obtained by increasing the number of threads for a particular task. For single network discovery, one thread will serve the purpose, but for more networks (say 10), it is recommended to employ more threads (say 5).

By default, WM discovery engine starts 4 discovery threads which share the work involved in discovering the specified networks. Hence, if there are a large number of networks to be discovered then the thread count can be increased.

During discovery of a network, discovery engine will send SNMP packets to all the devices asynchronously. Those devices which respond to this request will be taken up for SNMP discovery and to those devices which does not respond, ICMP queries will be sent. The performance can be improved if the processing of those requests which has responded in the first step, is handled by a separate thread. So for this purpose, Net_Disc is used in Threads.conf. This is an additional thread. As and when the packets are sent, processing of those requests which has responded to the requests will be taken care of by this thread, thereby speeding things and improving the performance.

Also, if there is SNMPv3 discovery or if there are using multiple communities/ports, it is recommended to add the following entry in the threads.conf file located at <WM_installed_directory>\server\conf\threads.conf. This will result in better overall discovery performance.

3.1 Optimizing Thread Configuration

1. Stop the WM Server.
2. Change **Net_Disc** value as per system configuration and number of devices (Ref below table).
3. Start WM Server.

RAM(GB)	Number of Devices	Net Disc	Number of Discovery threads(Default 4 threads) Max should not be greater than 10.	Threads Processing The successful SNMP response (Net Disc * Number of Discovery threads)	Total Threads (Number of threads +Threads Processing The successful SNMP response)
4	Up to 100	1	4	4	8
8	above 100	2	4	8	12

3.2 Additional Recommendations

For large networks, the following recommendations apply:

- While adding network for discovery, it is recommended to avoid too many community strings as WM will try to discover each IP with every community string.
- It is recommended to add a minimum number of networks for discovery. For example, rather than discovering 1000 devices by adding 100 subnets, user should add 10 subnets in such a way that it will discover complete network. WM takes longer time to discover sparsely populated networks.

4 Polling Configuration Recommendations

Wireless Manager has two mechanisms for synchronizing the network view – automatic rediscovery, and periodic configuration polling. Both operations can consume significant system resources and lead to performance degradation on

larger networks. Overall it is recommended to use one or the other mechanism – not both.

4.1 *Disable or Increase Configuration Polling Intervals*

If the Wireless Manager server is managing more than 1500 devices, increase the polling intervals by using the below procedure:

1. Open Wireless Manager Client.
2. Go to Tools → Polling Configuration → Configuration polling tab.
3. Increase polling duration under “Global Polling Interval” as specified in the table below. Polling can also be disabled if desired.

Number of Device In WM	Polling Interval
<1500	12 Hours (default)
1500-3000	24 Hours
3000-4500	36 Hours
4500-6000	48 Hours
6000-7500	60 Hours
7500-9000	72 Hours
9000-10000	84 Hours

4. Press OK to apply changes.

In addition to the above, additional performance gains can be achieved by using device type based configuration polling. This can be used to limit “fast polling” to key device types in the network. Other devices can be reduced or disabled.

4.2 *Disabling Auto Discovery*

Disabling auto discovery can significantly improve overall server performance.

1. Go to Tools → Discovery Configurator → General tab
2. Uncheck “AutoDiscovery” option

Use this option for enable or disable the discovery of a network, a set of nodes in a network or even a single node in a network.

3. Click "Apply" to make changes

4.3 Increasing the Rediscovery Interval

1. Open Wireless Manager Client.
2. Go to Tools → Discovery Configurator → General tab
3. Go to "Initial Parameters" and increase "Rediscovery Interval" per the table below and click Ok.
4. Go to Rediscovery → Regular Interval and update it to match the value set above.
5. Click "Apply" to make changes.

Number of Device In WM	Network Rediscovery Interval
<1500	24 Hours
1500-3000	36 Hours
3000-4500	48 Hours
4500-6000	60 Hours
6000-7500	72 Hours
7500-9000	84 Hours
9000-10000	96 Hours

4.4 Disable Rediscovery of Already Discovered Devices

During rediscovery, performance can be improved if Wireless Manager does not try to completely reprobe devices that have already been discovered. This can be accomplished by performing the following steps.

1. Open Wireless Manager Client
2. Go to Tools → Discovery Configurator → General tab
3. Uncheck "Rediscover Already Discovered" option to disable rediscovery of devices.

The *Rediscover Already Discovered* checkbox controls the whether the nodes that are already discovered need to be considered for the Rediscovery process or not. When checked, the data stored for already discovered devices would be updated from the device after rediscovery

4. Click "Apply" to make changes

5 Optimizing Memory Utilization

The steps to configure memory utilizations are as follows:

1. Stop the Wireless Manager server.
2. Go to C:\Cambium\WM\server\bin\ (\usr\local\cambium\wm\server\bin\ in case of Linux) directory.
3. Open startWM.bat (.sh) for editing.
4. Search the following text in file: set MAX_HEAP_SIZE_MB=1024.
5. Increase this value to these possible values 1280, 1536 or 1756 depending on the total memory available on the server. 2048 can be used if greater than 2 GB of memory is available. Since Wireless Manager is a 32 bit process, values above 2048 will have no effect. In general, **the value should be less than or equal to 75% of the physical memory** available on the server. Also be sure to leave "room" for the operating system and other processes on the server.
6. Start the Wireless Manager server.

6 Disabling Automatic Backups

Disabling automatic backups can be accomplished using the following steps:

1. Go to C:\Cambium\WM\server\conf
2. Open **BackUp.conf** for editing.
3. Search the following text: BACKUP className="jdbc.CustomBackupDB"
4. If DAILY attribute in the same line is set to true, Change its value to false to turn off automatic backup.
5. Changes will reflect after the server is restarted.

7 Recommendations for Scheduled Reports

Running some of the available system reports, particularly if they are to be scheduled, can be very impactful on system resources. When scheduling reports, the following table should be used to determine the minimum recommended interval.

System Report Name	Minimum Interval (For <5000 devices)	Minimum Interval (For >5000 devices)
Inventory Summary Report	12 Hours	24 Hours
Device Summary Report	18 Hours	36 Hours
Device Uptime Report	24 Hours	48 Hours
Bridge Table Summary AP/SM	18 Hours	36 Hours
Ethernet Statistics AP/SM	24 Hours	48 Hours
General Status AP/SM	24 Hours	48 Hours
QOS Summary AP/SM	24 Hours	48 Hours
Radio Statistics AP/SM	24 Hours	48 Hours
AP Session Report	30 Hours	60 Hours
Top 25 Report AP/SM	30 Hours	60 Hours
VLAN Configuration Summary AP/SM	24 Hours	48 Hours
Graphical Summary Report AP/SM	30 Hours	60 Hours

8 Software Upgrade Recommendations

The speed of software upgrades can be improved by using the "Auto Upgrade" option **only in the case of subscriber modules**. This process generally transfers the firmware image onto the parent AP and then it is the responsibility of parent to upgrade/downgrade their child. This requires less coordination on the part of Wireless Manager and will increase the number of concurrent devices that can be upgraded.

9 Physical Maps Configuration Settings

For large networks, it is recommended to enable "Icons always respect zoom level", this will ensure the device are plotted as per the visible bound.

1. Open Wireless Manager Client.
2. Select physical map option from left side Application treeview panel.
3. Go to Options and click on "*Icons always respect zoom level*" to enable or disable this option.

If this is checked, devices are filtered by the zoom level according to device type, with PTP devices being shown always, and SMs only being shown when zoomed in to the region containing the associated sector.

If this is unchecked, the map will only show a maximum of 100 devices. If less than 100 devices are under management then this setting is fine. However, if greater than 100 devices are under management, then not all devices will be displayed.

Note that the filter panel can be used to further tune the devices that will show on the physical map. For example, the panel can be used to display only devices with Critical or Major alarms.