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[APPLICATIONS MANAGER BEST PRACTICES]

THIS DOCUMENT ILLUSTRATES THE BEST PRACTICES INVOLVED IN MANAGEENGINE™ APPLICATIONS MANAGER.

Applications Manager – Best Practices Document

This document will list the AdventNet ManageEngine™ Applications Manager best practices

1. Hardware and Software requirements
2. Configuring Applications Manager
3. Securing Applications Manager
4. Fault Management
5. Log file Management
6. Application Manager Database Management
7. Crash & Recovery

1. Hardware and Software requirements

Performance of Applications Manager depends considerably on the CPU and memory of the system. The following table describes the configuration of the system required for various deployments. We strongly recommend having a dedicated server for Applications Manager when going into production. Each deployment of Applications Manager can have 250 monitors.

The hardware configuration for Stand Alone and Enterprise Edition setup is mentioned below.

Up to 50 monitors

<i>Operating Platform</i>	<i>Processor Speed</i>	<i>Memory*</i>	<i>Hard Disk Space Required</i>
Windows/Linux	1.4 GHz	1 GB RAM	20 GB

50 - 250 monitors

<i>Operating Platform</i>	<i>Processor Speed</i>	<i>Memory*</i>	<i>Hard Disk Space Required</i>
Windows/Linux	1.4 GHz	2 GB RAM	20 GB

250 -1000 monitors -Enterprise Edition Setup (250 monitors /Managed Server)

Operating Platform	Processor Speed	Memory*	Hard Disk Space Required
Windows/Linux	1.8 GHz	2 GB RAM – Managed Server	40 GB

1000 monitors and above Enterprise Edition Setup (250 monitors/Managed Server)

Operating Platform	Processor Speed	Memory*	Hard Disk Space Required
Windows/Linux	Dual Processor 1.8 *2 GHz	2 GB RAM – Managed Server	100 GB or higher based on monitors

* The above mentioned memory does not include memory used by OS which should account for another 2GB.

* If the numbers of Managed Servers are high, 4GB for the Admin Server is recommended.

* The above mentioned number also depends on the load of monitored servers, when the load of monitored servers is high then higher configuration may be needed.

Performance of Applications Manager is also influenced by the other factors such as type of monitors configured, polling interval set and network speed. When you are going for large deployments we recommend adding the monitors in the range of 25 – 50 at a time and determine the performance before adding more monitors. So that when the threshold is reached and when you find that Applications Manager system is slow to handle request, then you may need to add the remaining monitors to another Managed Server.

Supporting Operating System

Applications Manager has been tested on the following operating systems and versions:

- Windows 2000 Server / XP / 2003 / 2008
- Enterprise Linux 2.1 and above / Debian / SuSe / Ubuntu

Supported Browsers

The supported browsers are:

- Internet Explorer 6.0 and above
- Firefox 2.0 and above

2. Configuring Applications Manager

Performance of Applications Manager can be improved by configuring the following attributes.

- **Enterprise Edition Setup**

Each installation of Applications Manager can normally support monitoring 250 monitors (servers and applications on a 1 CPU, 1.8 GHz, 2 GB RAM, RH Linux). This could go higher based on the hardware configuration of the server on which Applications Manager is deployed and based on the load of the monitored server.

When you need to monitor more number of monitors than 250, for the above given system configuration, then it is recommended to move to distributed setup supported through Application Manager Enterprise Edition setup. It works by supporting an Admin Server and Managed Server environment.

Refer the following links for more information on Enterprise Edition:

1. http://manageengine.adventnet.com/applications_manager/enterprise-edition.html
2. http://manageengine.adventnet.com/applications_manager/applications-management-productfaq.html#e1

Table gives the number of Managed Servers required for given number of monitors.

<i>Total No. of Monitors</i>	<i>Managed Servers</i>
500	2
750	3
1000	4
2000	8

**Better numbers are possible with better hardware supporting over 500 monitors per server.*

- **Increase data collection threads**

Applications Manager use a separate thread for every data collection of monitor, the default number of threads used is controlled by the respective schedulers specified in the

<AppManager_Home>/working/conf/threads.conf

The default number of threads used for URL Sequence Monitoring is 5 and other monitors are 12.

When the number of monitors is greater than 100, you can increase the data collection threads (default is 10) by editing the '*Data Collection*' attribute in the file

<AppManager_Home>/working/conf/threads.conf

The '*Data Collection*' thread value can be increased to a value ranging between 20 and 25.

Similarly, when the number of URL Sequence monitors is large in the range of 100, you can increase the URL monitoring thread count by editing the '*URL Monitor*' attribute to 20 – 25. However, the total number of threads including both URL monitor and other data collection threads must not exceed 40.

Note: Increase in the '*Data Collection*' thread will lead to slight increase in CPU usage.

- **Increase number of connections in database connection pool**

When the number of monitors is greater than 100, connection pool can be increased by editing the **NON_TRANS_CONNECTIONS** field in

<AppManager_Home>/working/conf/database_params.conf

The default value of 6 can be set to 90 percent of the number of data collection threads.

Note: Increase in the '*Connection Pool*' will lead to slight increase in CPU usage.

- **Downtime Scheduler**

When you do not need monitoring to happen during specific time period for some monitors, you can achieve this using the option '**Downtime Scheduler**' available under '**Admin**' tab.

Monitors configured for '**Downtime Scheduler**' does not use the data collection thread during the specified period and allows other monitors to utilize the data collection threads and hence improves Applications Manager performance.

- **Poll Intervals**

When performance polling is set only the availability and health check will happen at every polling event while other performance data will be collected only at the end of scheduled number of polls. This will reduce the load on the system when you want to monitor only health and availability.

This option is available under '**Admin**' -> '**Performance Polling**' where you can set the number of polls before collecting performance data for server monitors. We recommend having a Poll Interval of 10 minutes for every monitor and a performance poll value of 3.

- **MySQL Database tuning**

Application Manager use MySQL database to store the information, Performance of MySQL database server can be improved by editing the variables in MySQL configuration file '**my.ini**' located at

<AppManager_Home>/working/mysql

You can set all of the memory, table, and connection limits to suit your need. Some of the status variables to look at are:

1. Thread cache variables. (thread_cache_size)
2. Query cache variables. (query_cache_size, query_cache_limit)
3. Key buffer (key_buffer)
4. Connection values (max_connections)

For larger deployments in the range of 1000 monitors or more, we recommend a dedicated server for **MySQL database**.

- **Increase AM JVM heap size**

Application Manager JVM heap size can be increased according to your environment by editing the **-Xms** and **-Xmx** parameters in the file

<ApplicationManager_Home>/startApplicationsManager.sh for Linux

<ApplicationManager_Home>/startApplicationsManager.bat for Windows

Applications Manager installed as Windows service

On such cases memory tuning can be achieved by editing the following parameters in **wrapper.conf** file available under the directory

<ApplicationManager_Home>/working/conf

wrapper.java.initmemory – Initial Java Heap Size

wrapper.java.maxmemory – Maximum Java Heap size

Recommended setting for JVM Heap size and MySQL status values for various RAM sizes and assuming Applications Manager is running on a dedicated server.

RAM size	JVM Heap Size	thread_cache_size	query_cache_size	query_cache_limit	key_buffer	table_cache
1 GB	200M	32M	128M	2M	128M	64
2 GB	512M	32M	256M	2M	512M	128M
4 GB and above	1024M	32M	256M	2M	1024M	128M

- **Using Monitor Groups**

Monitor Groups are a logical group of one or more monitors that provides a holistic view of your business environment. Monitor Groups can be used to group resources belonging to particular Business Application or to group resources by location- as Services Group.

Refer the following link for more information on Monitor Groups:

http://manageengine.adventnet.com/applications_manager/help/managing-business-applications/working-business-applications.html

3. Securing Applications Manager

When moving Applications Manager to Production environment, some of the configuration details have to be taken care.

- **Installation configuration**

Have a dedicated OS User (System) account for installing Applications Manager. This OS user account needs full permissions on all folders and sub-folders in the installation root of Applications Manager only. Also make sure this OS User account is fully secure. It is NOT necessary to install Applications Manager in a root (in Linux) or administrator (windows) OS User account. But make sure the whole installation is done using the same OS user account. Do not install using root and try to run using an OS user account. That will fail.

- **User configuration**

1. Make sure you change the password for the default **'admin'** Web Client User within Applications Manager.
2. If you want to give full **'Read-Only'** privileges to certain Web Client Users in your organization, and then make sure you create a client login with **'USER'** role.
3. If you want to give restricted **'Read-Only'** privileges to certain Web Client Users in your organization, and then make sure you create a client login with **'Operator'** role. **'Operator'** can view only servers that they own.

- **MySQL database configuration**

It is recommended to change the default password.

To change MySQL Database password, follow the below given steps:

1. Connect to Applications Manager's MySQL. Go to **<AppManager7/working/MySQL>** execute the following command

```
./bin/mysql -u root -h localhost --port=13326 -D AMDB -pappmanager
```

2. Execute the following queries in the database

```
USE mysql;  
update user set password=password ('New Password') where user = 'root';  
FLUSH PRIVILEGES;
```

3. Then stop Applications Manager.

4. Go to **<AppManager7/working/conf>** folder, edit **<databaseparams.conf>** and change the password to the 'New' password. Restart Applications Manager.

- **File upload configuration**

By default, uploading binaries, MIBs, scripts are allowed in Applications Manager. This may be required in the initial stages while using Applications Manager for uploading MIBs, action scripts etc. However while going in to production, it is strongly recommended to disable this.

This option can be disabled by setting **am.upload.enabled=false** in **<Appmanager_Home>/conf/AMServer.properties** file.

4. Fault Management

These sections list the steps to prevent false alarms that are generated in Applications Manager due to overloaded network.

- **Socket Timeout**

Increasing the socket timeout values **<AppManager_Home>/conf/AMServer.properties** by changing the **'am.sockettest.timeout'** value from 5 to 10 will help to eradicate false alerts generated.

- **Network Availability check**

When the Applications Manager is out of the network or is not connected to the network, the status of all the Monitors that are currently been monitored will be shown as **'Down'**. You can avoid this by enabling the **'Check for Network Availability'** option.

When this option is enabled, Applications Manager will generate alerts for the unavailability of resources only if the specified host is reachable in the network. For example, let us assume that the system/host which runs the Applications Manager has been isolated from the network. Enable this option and specify a hostname in the network (preferably not the hostname where Applications Manager runs). Now,

Applications Manager tries to ping that machine for its availability in the network. If not available, alerts are not generated and resources are not shown as down.

You can also specify the IP of your routers, gateways, etc., to check the system/host which runs the Applications Manager is present in the network.

- **URL Availability check**

When the Applications Manager is out of the network or if external proxy settings are not configured, the status of all the URLs that are currently been monitored will be shown as '*Down*'. You can avoid this by enabling the '*Check URL Availability*' option.

When this option is enabled, Applications Manager will generate alerts for the unavailability of URL only if the other specified URL is down. For example, let us assume that the system/host which runs the Applications Manager has been isolated from the network. Enable this option and specify another URL which is expected to be up always. Now, Applications Manager tries to monitor URL for its availability. If not available, alerts are not generated and URL is not shown as down. Further a mail is sent to the configured mail address intimating the same.

- **Consecutive polls check**

You can use this option to determine the number of consecutive polls the error exists before reporting the error to system. Consecutive polls count in '*Admin*' -> *Action / Alert Settings* can be increased from default value of 1 to 2. So that alerts will be generated after two consecutive polls which would eradicate false alarms.

5. Log File Management

Applications Manager logs the data collection details, error traces under the

<AppManager_Home>/logs

Default size and number for log file rotation can be changed in the file

<AppManager_Home>/working/conf/logging_parameters.conf

Log folder available under *<AppManager_Home>* can be moved/deleted to different location every fortnight.

6. Applications Manager Database Management

- **Data backup**

It is very important to backup the Application Manager data in database every fortnight, so that data is not lost in case of any disaster. Refer the following link on how to backup the data:

http://manageengine.adventnet.com/applications_manager/help/appendix/data-backup.html

7. Crash & Recovery

Under '**Admin**'->'**Global Settings**', '*Restart the product in case of serious server error*' checkbox is provided to automatically restart Application Manager in case of any serious errors. Make sure that the option is checked so that Application Manager can recover automatically on error.

Other General Guidelines

- Refer the Security/Firewall Requirements documents given in below link to understand what changes are required in the firewall.

http://manageengine.adventnet.com/applications_manager/help/appendix/security-configuration.html

- You can install Applications Manager as a Windows Service or configure a cron job on Linux to start on server start up. Refer the below link for more information:

http://manageengine.adventnet.com/applications_manager/help/installation/starting-applications-manager.html#windows_service

- If you are planning to use the Enterprise Edition, fully understand the EE architecture

http://manageengine.adventnet.com/applications_manager/help/enterprise-edition.html

- To change the default HTTP port used by Applications Manager, refer the Server Settings document given in the below link. You can refer to this document on other settings that you can modify. For e.g., whenever Applications Manager starts, if you do not want the browser to open automatically, you need to modify the entry

<am.browser.startup=false>

http://manageengine.adventnet.com/applications_manager/help/administrative-operation/server-settings.html

- It is recommended to restart Application Manager every *fortnight*.
- It is recommended to use **SNMP** or **WMI** mode for monitoring Windows machine and **SSH** or **Telnet** for monitoring **UNIX** machines.
- When monitoring Windows Server 2003 using WMI mode, memory usage report may show incorrect values due to issue in Windows 2003 + Service pack1 version. Ensure that the latest service pack is applied to the Windows server. Please refer the link for more details - <http://support.microsoft.com/kb/906868/>

Addendum

<ApplicationManager_Home> refers to the directory in which you have installed the Applications Manager product. This directory location is specified by you when you install the product.

For example, let us assume that you have installed Applications Manager under the default **<Program Files>** directory of **C** drive in your system. In this case,

<ApplicationManager_Home> denotes

C:\Program Files\AdventNet\ME\AppManager

In Linux, if Applications Manager is installed under home directory, then

<ApplicationManager_Home> denotes ~/AdventNet/ME/AppManager8