AdventNet Web NMS 4.7
Standard and Professional Editions

Performance and Sizing Guide

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1. Introduction

This document contains performance characterization and sizing information for AdventNet Web NMS 4.7. The primary intent of this document is to provide a quick insight into the high performance capabilities and the scalability aspects of AdventNet Web NMS platform. The information in this guide will assist you in sizing systems for AdventNet Web NMS applications in your environment.

1.1 About this guide

This guide requires basic knowledge of the AdventNet Web NMS server architecture and the basic management functionalities of it. The target audience for this guide is technical team members working on AdventNet Web NMS development and deployment as well as technical consultants for AdventNet Web NMS.

2. Scope

This document presents the performance test results of AdventNet Web NMS 4.7 under various load conditions. The following interpretation about AdventNet Web NMS system performance could be relevant from this document:

1. Performance metrics of the following AdventNet Web NMS parameters for Oracle and MySQL in Windows, Linux, and Solaris platforms.
    - Status Polling Rate
    - Data Collection Rate
    - SNMP Trap Processing Rate
    - Discovery Rate
    - Resource Metrics
    - Throughput Metrics
2. Performance metrics of the above parameters for the following system setup and load conditions:
    - 10,000 Managed Objects with server and database in same machine
    - 10,000 Managed Objects with server and database in different machines (distributed setup).
    - 100,000 Managed Objects in distributed setup.
    - 500,000 Managed Objects in distributed setup.
    - 1,000,000 Managed Objects in distributed setup.

3. Metrics Definitions

Following are the definitions of the performance and resource metrics that are calculated in the performance tests:

3.1 Status polling rate

The status-polling rate is the rate at which managed objects are polled for their current status. The type of the managed object that is polled for status is SnmpNode.

3.2 Data collection rate

The data collection rate is the rate at which SNMP data collection is carried out for all the objects with a data poll interval of 10 seconds.

3.3 Trap processing rate

Trap processing rate is defined as the number of traps that are processed by the AdventNet Web NMS system and are converted into alarms after correlation. This includes status propagation to the corresponding managed objects. The type of the managed object chosen for status propagation is SnmpNode.

3.4 Discovery rate

The rate at which the nodes in the network are discovered in the SNMP and ICMP discovery modes.

3.5 BE and DB server CPU utilization

The average percentage values of CPU utilization of the back-end server and database server under consideration.

3.6 BE and DB server memory consumption

The average memory consumption of back-end and database server under consideration.

Note: Performance and sizing tests were conducted on Windows/Linux systems with Pentium processors.

4. Performance Tables

The performance tests for the parameters mentioned above have been carried out in isolation ensuring no activity other than the one that is tested. For example, when testing for data collection, functions like discovery, status polling etc. would be turned off. Also, the performance tests have been carried out for various system loads and the best results under those load conditions have been documented here.

The following tables present the performance data under various load conditions.

4.1 Oracle-Windows Test Results

Database: Oracle 8.1.7
OS: Windows 2000

Load configuration		10,000 MOs	10,000 MOs	100,000 MOs	500,000 MOs	1,000,000 MOs
System Setup						
DB setup mode[1]		Combined	Distributed	Distributed	Distributed	Distributed
BE System Configuration		2*1130MHz 2GB RAM	1500MHz 512MB	1800MHz 512MB	2*1130MHz 2GB	2*1130MHz 2GB
DB System Configuration			1700MHz 512MB	2*1130MHz 2GB	2*2400MHz 2GB	2*2400MHz 2GB
Performance Metrics						
Status Polling Rate (Polls/sec)		100	86	108	136	125
Data Collection Rate (Polls/sec)		500	510	510	800	820
SNMP Trap Processing Rate (alarms per second)		394	418	610	450	350
Discovery Rate (per minute)	SNMP	82	78	79	82	80
	ICMP	960	965	950	950	960
Resource Metrics						
BE server CPU utilization[2]		25-45%	55-60%	60-75%	50-65%	30-90%
BE server memory consumption		15-35 MB	15-50 MB	30-80 MB	30-140 MB	40-230 MB
DB CPU utilization[3]		30-75%	20-60%	50-65%	45-55%	35-60%
DB memory consumption		1200-1300 MB	250-320 MB	1200-1300 MB	1200-1300 MB	1200-1300 MB

Note: In the system configuration values, 2*xxxxMHz means dual processor while only xxxxMhz means single processor

[1] The DB server could either be distributed in a separate machine or run in the same machine as the Backend server.

[2] The CPU utilization for BE server during discovery rate test was stable at 10% for all conditions.

[3] The CPU utilization for DB server during discovery rate test was stable at 20% for all conditions.

4.2 Oracle-Linux Test Results

Database: Oracle 8.1.7
OS: Linux 7.2

Load configuration		10,000 MOs	10,000 MOs	100,000 MOs	500,000 MOs	1,000,000 MOs
System Setup						
DB setup mode[1]		Combined	Distributed	Distributed	Distributed	Distributed
BE System Configuration		2*1130MHz 2GB RAM	1800 MHz 512MB	1800 MHz 512MB	2*1130MHz 2GB	2*1130MHz 2GB
DB System Configuration			1800 MHz 512MB	2*1130MHz 2GB	2*2400MHz 2GB	2*2400MHz 2GB
Performance Metrics						
Status Polling Rate (Polls/sec)		110	119	102	137	132
Data Collection Rate (Polls/sec)		550	547	554	810	815
SNMP Trap Processing Rate (alarms per second)		467	407	454	461	253
Discovery Rate (per minute)	SNMP	68	72	72	71	75
	ICMP	720	717	715	725	715
Resource Metrics						
BE server CPU utilization[2]		30-55%	25-40%	25-35%	55-65%	25-60%
BE server memory consumption		15-35 MB	15-40 MB	25-30 MB	30-130 MB	45-240 MB
DB CPU utilization[3]		40-80%	45-55%	40-80%	55-90%	35-55%
DB memory consumption		1200-1300 MB	250-300 MB	600-700 MB	1200-1300 MB	1200-1300 MB

Note: In the system configuration values, 2*xxxxMHz means dual processor while only xxxxMHz means single processor

1 The DB server could either be distributed in a separate machine or run in the same machine as the Backend server.
2 The CPU utilization for BE server during discovery rate test was stable at around 15% for all conditions.
3 The CPU utilization for DB server during discovery rate test was stable at around 20% for all conditions.

4.3 Oracle-Solaris Test Results

Database: Oracle 8.1.7
OS: Solaris

Load configuration		10,000 MOs	10,000 MOs	100,000 MOs	500,000 MOs	1,000,000 MOs
System Setup						
DB setup mode[1]		Combined	Distributed	Distributed	Distributed	Distributed
BE System Configuration		1200 MHz 8GB RAM	1500 MHz 512 MB	1200 MHz 8 GB	1200 MHz 8 GB	1200 MHz 8 GB
DB System Configuration			1200 MHz 8 GB	1200 MHz 8 GB	1200 MHz 8 GB	1200 MHz 8 GB
Performance Metrics						
Status Polling Rate (Polls/sec)		125	98	127	125	120
Data Collection Rate (Polls/sec)		455	450	460	710	715
SNMP Trap Processing Rate (alarms per second)		300	140	385	240	200
Discovery Rate (per minute)	SNMP	60	60	60	60	60
	ICMP	614	620	610	616	614
Resource Metrics						
BE server CPU utilization[2]		16-32.5%	50-62%	2-35%	10-45%	7.5-25%
BE server memory consumption		89-118 MB	80-81 MB	74-117 MB	100-151 MB	108-152 MB
DB CPU utilization[3]		13-14%	13-14%	9-13%	17-30%	20-40%
DB memory consumption		1.9 GB	1.9 GB	1.9 GB	1.9 GB	1.9 GB

[1] The DB server could either be distributed in a separate machine or run in the same machine as the Backend server.
[2] The CPU utilization for BE server during discovery rate test was stable at around 10% for all conditions.
[3] The CPU utilization for DB server during discovery rate test was stable at around 20% for all conditions.

4.4 MySQL-Windows Test Results

Database: MySQL 3.23.36
OS: Windows 2000

Load Configuration		10,000 MOs	10,000 MOs
System setup			
DB setup mode[1]		Combined	Distributed
BE System Configuration		2*1130 MHz (Dual Processor) 2GB RAM	1500 MHz 512 MB RAM
DB System Configuration			1700 MHz 512 MB RAM
Performance metrics			
Status Polling Rate (Polls/sec)		13	10
Data Collection Rate (Polls/sec)		435	443
SNMP Trap Processing Rate (alarms per second)		121	72
Discovery Rate (per minute)	SNMP	83	86
	ICMP	980	982
Resource Metrics			
BE server CPU utilization[2]		20-70%	20-75%
BE server memory consumption		15-45 MB	25-50 MB
DB CPU utilization[3] (in percentage of one CPU capacity)		95-110%	85-95%
DB memory consumption		265-275 MB	250-275 MB

[1] The DB server could either be distributed in a separate machine or run in the same machine as the Backend server.
[2] The CPU utilization for BE server during discovery rate test was stable at around 10% for all conditions.
[3] The CPU utilization for DB server during discovery rate test was stable at around 20% for all conditions.

4.5 MySQL-Linux Test Results

Database: MySQL 3.23.36
OS: Linux 7.2

Load Configuration		10,000 MOs	10,000 MOs
System setup			
DB setup mode[1]		Combined	Distributed
BE System Configuration		2*1130 MHz (Dual Processor) 2GB RAM	1800 MHz 512 MB RAM
DB System Configuration			1800 MHz 512 MB RAM
Performance metrics			
Status Polling Rate (Polls/sec)		20	90
Data Collection Rate (Polls/sec)		440	447
SNMP Trap Processing Rate (alarms per second)		371	100
Discovery Rate (per minute)	SNMP	76	69
	ICMP	816	808
Resource Metrics			
BE server CPU utilization[2]		30-75%	25-35%
BE server memory consumption		20-50 MB	20-60 MB
DB CPU utilization[3] (in percentage of one CPU capacity)		45-85%	45-75%
DB memory consumption		260-275 MB	250-260 MB

[1] The DB server could either be distributed in a separate machine or run in the same machine as the Backend server.
[2] The CPU utilization for BE server during discovery rate test was stable at around 15% for all conditions.
[3] The CPU utilization for DB server during discovery rate test was stable at around 20% for all conditions.

4.6 MySQL-Solaris Test Results

Database: MySQL 3.23.58
OS: Solaris (sunfire)

Load Configuration		10,000 MOs
System setup		
DB setup mode[1]		Combined
BE System Configuration		1200 MHz 8 GB RAM
DB System Configuration		
Performance metrics		
Status Polling Rate (Polls/sec)		75
Data Collection Rate (Polls/sec)		420
SNMP Trap Processing Rate (alarms per second)		450
Discovery Rate (per minute)	SNMP	60
	ICMP	718
Resource Metrics		
BE server CPU utilization[2]		15-35%
BE server memory consumption		75-100 MB
DB CPU utilization[3] (in percentage of one CPU capacity)		21-79%
DB memory consumption		9-80 MB

[1] The DB server could either be distributed in a separate machine or run in the same machine as the Backend server.
[2] The CPU utilization for BE server during discovery rate test was stable at around 10% for all conditions.
[3] The CPU utilization for DB server during discovery rate test was stable at around 20% for all conditions.

5. Sizing Tables

5.1 Oracle 8.1.7 - Windows 2000/Linux 7.2

The sizing parameters for a Windows/Linux machine with Oracle database in distributed and combined environments are listed below. Based on the load in the network, the system configurations for back-end server, front-end server, and the database server are determined.

5.1.1 Distributed Environment

The BE, FE, and Oracle database servers are installed in separate machines. The minimum required configurations for the 3 systems are listed below.

MOs	0-10k	10-25k	25-50k	50-75k	75-100k	100-250k	250-500k	500-750k	750-1M
Back End Server Configuration									
Processor (GHz)	1.4	1.5	1.6	1.7	1.8	2*1.4	2*1.6	2*1.8	2*2.0
RAM	512MB	512MB	512MB	512MB	512MB	1GB	1GB	1GB	2GB
Database Server Configuration									
Processor (GHz)	1.7	1.8	1.9	2.0	2*1.5	2*1.6	2*1.8	2*2.2	2*2.4
RAM	512MB	512MB	512MB	512MB	1GB	2GB	2GB	2GB	2GB
Front End Server Configuration									
Processor (GHz)	1.4	1.4	1.5	1.5	1.7	1.7	1.8	1.8	1.8
RAM	512MB	512MB	512MB	512MB	512MB	512MB	512MB	512MB	512MB
Client Related Information									
No. of Application Clients	5		15			30		45	

Note: In the system configuration values, 2*x.x GHz means dual processor while only x.x GHz means single processor.

5.1.2 Combined Environment

The BE, FE, and Oracle database servers are installed in a single machine. The minimum required configuration of the system is listed below.

MOs	0-10 k
Server Configuration	
Processor	2*1500 MHz (Dual processor)
RAM	2 GB
Client Related Information	
No. of Application Clients	15

5.2 MySQL 3.23.36 – Windows 2000/Linux 7.2

The sizing parameters for a Windows/Linux machine with MySQL database in combined and distributed environments are listed below. MySQL can only be used to manage upto 10,000 MOs.

5.2.1 Distributed Environment

The BE, FE, and MySQL database servers are installed in separate machines. The minimum required configurations of the 3 systems are listed below.

MOs	0-10 k
Back End Server Configuration	
Processor	1400 MHz
RAM	512 MB
Database Server Configuration	
Processor	2*1400 MHz (Dual Processor)
RAM	2 GB
Front End Server Configuration	
Processor	1400 MHz
RAM	512 MB
Client Related Information	
No. of Application Clients	15

5.2.2 Combined Environment

The BE, FE, and MySQL database servers are installed in a single machine. The minimum required configurations of the system is listed below.

MOs	0-10 k
Server Configuration	
Processor	2*1500 MHz (Dual Processor)
RAM	2 GB
Client Related Information	
No. of Application Clients	15

5.3 Oracle 8.1.7 - Solaris

The sizing parameters for a Solaris machine with Oracle database in distributed and combined environments are listed below. Based on the load in the network, the system configurations for back-end server, front-end server, and the database server are determined.

5.3.1 Distributed Environment

The BE, FE, and Oracle database servers are installed in separate machines. The minimum required configurations for the 3 systems are listed below.

MOs	0-10k	10-100k	100-500k	500-1000k
Back End Server Configuration				
Processor	Sun Blade 1500 1.062GHz	Sun Blade 1500 1.062GHz	2*Sun Fire 280 R 1015 MHz	2*Sun Fire 1200 MHz
RAM	512MB	512MB	2GB	4GB
Database Server Configuration				
Processor	Sun Blade 1500 1.062GHz	2*Sun Blade 2000 900MHz	2*Sun Fire 280 R 1015 MHz	2*Sun Fire 280 R 1200 MHz
RAM	512MB	1GB	2GB	4GB
Front End Server Configuration				
Processor	Sun Blade 650MHz	Sun Blade 650MHz	Sun Blade 650MHz	Sun Blade 650MHz
RAM	512MB	512MB	512MB	512MB
Client Related Information				
No. of Application Clients	5	15	20	30

Note: In the system configuration values, 2*x.x GHz means dual processor while only x.x GHz means single processor.

5.3.2 Combined Environment

The BE, FE, and Oracle database servers are installed in a single machine. The minimum required configuration of the system is listed below.

MOs	0-10 k
Server Configuration	
Processor	2*Sun Blade 2000 1200MHz (Dual Processor)
RAM	1 GB
Client Related Information	
No. of Application Clients	5

5.4 MySQL 3.23.58 – Solaris

The sizing parameters for a Solaris machine with MySQL database in combined environment are listed below. MySQL can only be used to manage upto 10,000 MOs.

5.4.1 Combined Environment

The BE, FE, and MySQL database servers are installed in a single machine. The minimum required configurations of the system is listed below.

MOs	0-10 k
Server Configuration	
Processor	2*Sun Blade 2000 1200 MHz (Dual Processor)
RAM	512 MB
Client Related Information	
No. of Application Clients	5