

ALARMWORX32 SERVER V8

Performance White Paper

Version 8
August 2004



OPC Automation at your fingertips

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1 About This Document

1.1 Scope of the Document

This document contains the performance test results for AlarmWorX32 Server. The intended audience includes the design engineers working on the product, sales and marketing management as well as key customers providing input as to the features of this product.

1.2 Copyright and Confidentiality

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1.3 Revision History

Version 1.0 – Madhavi Mukkavilli, May 2004

2 Introduction

2.1 Overview

The intention for this document is to summarize the performance test results for AlarmWorX32 Server V8

In these tests, we are measuring the CPU, and Virtual Memory Usage by AlarmWorX32 Server. We also compare the performance between Genesis V 7.1 and Genesis V8 in terms of CPU and Memory Usage.

We measure the performance of AlarmWorX32 Server in terms of

- ✓ Increasing number of tags
- ✓ The speed/rate at which tags change
- ✓ Number of clients the Alarm Server is serving data to

3 Test Setup

3.1 Hardware

3.1.1 PC1: OPC Server

OS: Windows XP, Service Pack 1
RAM: 512 MB
Processor: Pentium 4, CPU 1.79 GHz

3.1.2 PC2: AlarmWorX32 Server

OS: Windows 2000, Service Pack 4
RAM: 260 MB
Processor: Pentium 4, CPU 1.80 GHz

3.1.3 PC3: Client 1 and AlarmWorX32 Logger

OS: Windows XP, Service Pack 1
RAM: 504 MB
Processor: Pentium 4, CPU 2.50 GHz

3.1.4 PC4: Client 2

OS: Windows 2000, Service Pack 4
RAM: 130 MB
Processor: Pentium 2, CPU 400 MHz

3.1.5 PC5: Client 3

OS: Windows XP, Service Pack 1
RAM: 512 MB
Processor: Pentium 4, CPU 2.50 GHz

3.2 Software

3.2.1 PC1: OPC Server

ICONICS Simulator 3.05

For V 7.1 Test: Genesis V 7.1 and

For V8: Genesis V8 Beta IV

Boolean Tags:

G01-G05: 1000 Tags each group changing every 1-second

G06-G10: 1000 Tags each group changing every 10 seconds

G11-G15: 1000 Tags each group changing every 1-minute

G16: 5000 Tags changing every 1-minute

G19, G20: 1000 Tags each group changing every 1-second

Analog Tags

G17: 1000 tags changing every 5000 msec

G18: 1000 tags changing every 1 sec

3.2.2 PC2: AlarmWorX32 Server

For V 7.1 Test: Genesis V 7.1 and

For V8: Genesis V8 Beta IV

3.2.3 PC3: Client 1 and AlarmWorX32 Logger

For V 7.1 Test: Genesis V 7.1 and

For V8: Genesis V8 Beta IV

3.2.4 PC4: Client 2

For V 7.1 Test: Genesis V 7.1 and

For V8: Genesis V8 Beta IV

3.2.5 PC5: Client 3

For V 7.1 Test: Genesis V 7.1 and

For V8: Genesis V8 Beta IV

3.3 Network Layout

The following diagram gives an idea of the network setup. These tests were run during normal office hours and so take into account normal network load:

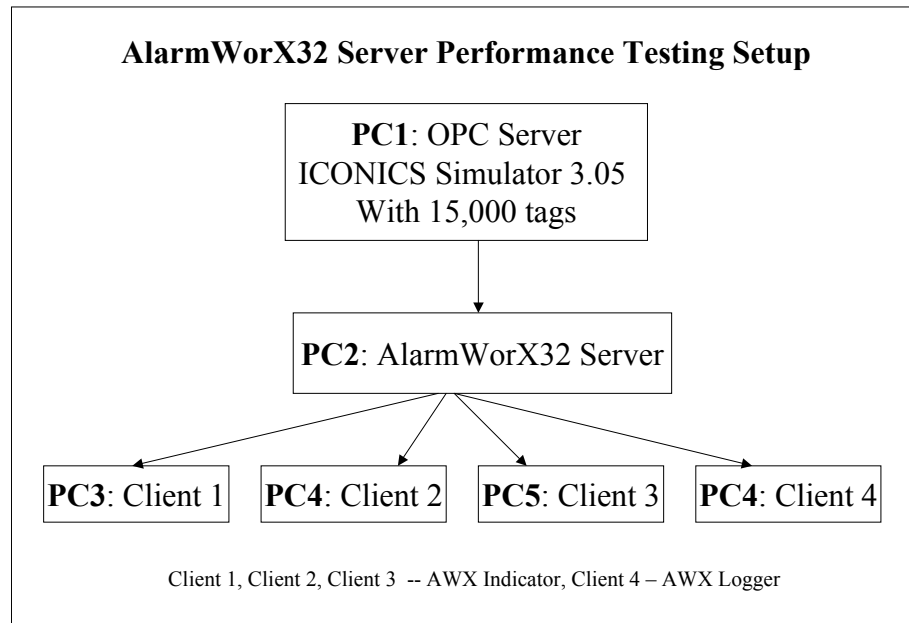


Figure 3.3

3.4 Testing Methodology

We ran several tests to measure the performance of the AlarmWorX32 Server. The following tables will give an idea of the various combinations of number of tags, rate at which tags change and number of clients.

Alarm Indicator is considered to be a client in most of the cases. Alarm Logger is also considered as a client and at the same time, the performance is measured for Alarm Logger. Alarm Logger is logging alarms to a remote SQL Server.

First the Alarm Server was started and after 10 minutes, the values were noted. Then start the first client and wait for 10 minutes before noting the values and start the second client and so on.

Note1: 4 clients mean 3 Alarm Indicator clients and one AlarmWorX32 Logger.

Note2: The client machines have GraphWorX32 with AlarmWorX32 Indicator ActiveX running on them

Test Cases 4.1 to 4.9 are done in Genesis V7.1

Test Cases from 4.10 onwards till the end are done in Genesis V8.0 Beta IV

4 Test Results

4.1 Test Case 1 Alarm Server with 1000 Alarms

Alarm Server with 1000 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	5.6	12.04
1 Client	7.0	13.20
2 Clients	8.4	14.48
3 Clients	9.9	14.88
4 Clients	13.5	15.90
AlarmWorX32 Logger	39	20.89

Table 4.1

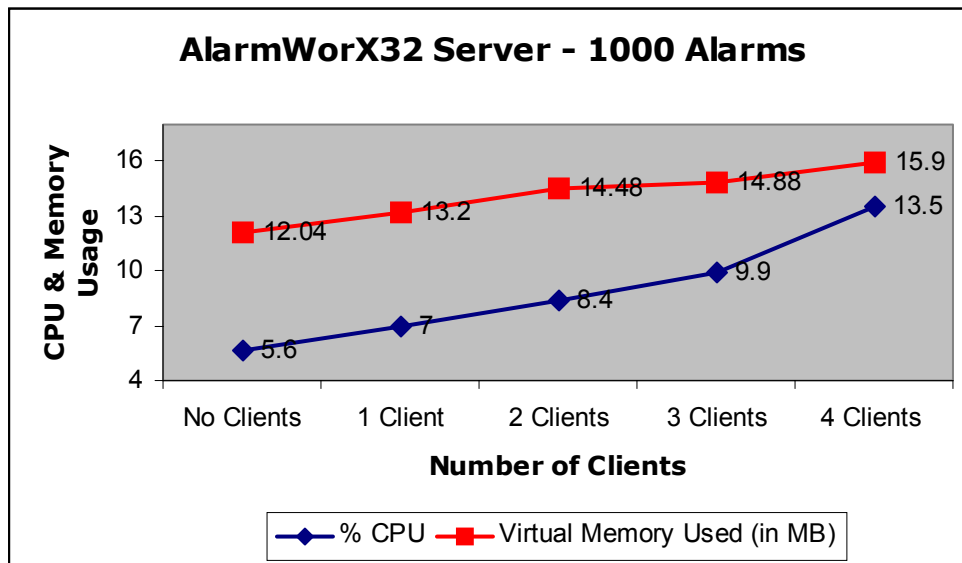


Chart 4.1

4.2 Test Case 2 Alarm Server with 2000 Alarms

Alarm Server with 2000 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	11.6	16.37
1 Client	19.2	18.00
2 Clients	19.7	19.09
3 Clients	21.1	19.24
4 Clients	27	21.22
AlarmWorX32 Logger	42	21.11

Table 4.2

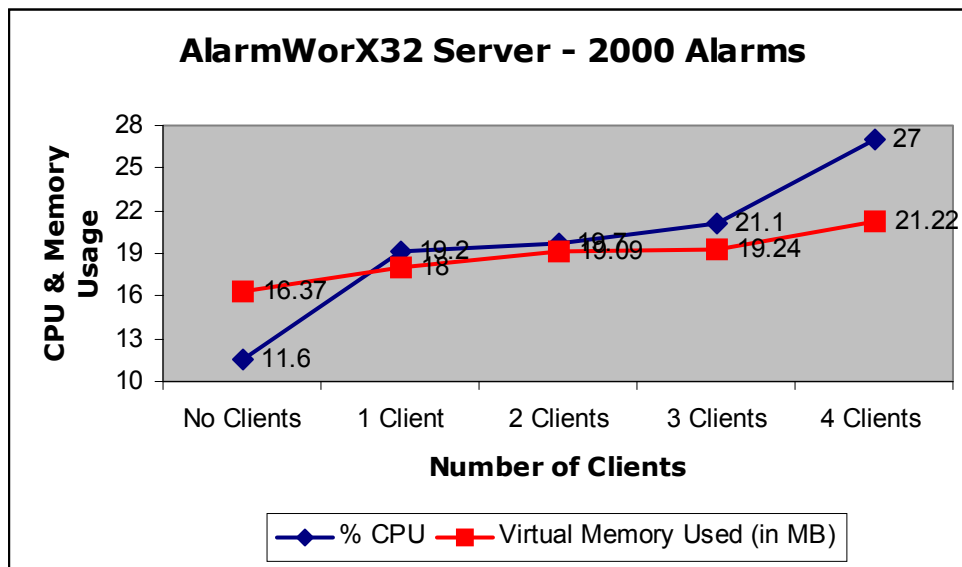


Chart 4.2

4.3 Test Case 3 Alarm Server with 2500 Alarms

Alarm Server with 2500 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	18.4	20.13
1 Client	29	21.69
2 Clients	33.28	24.37
3 Clients	28	24.05
4 Clients	30	24.71
AlarmWorX32 Logger	38	21.73

Table 4.3

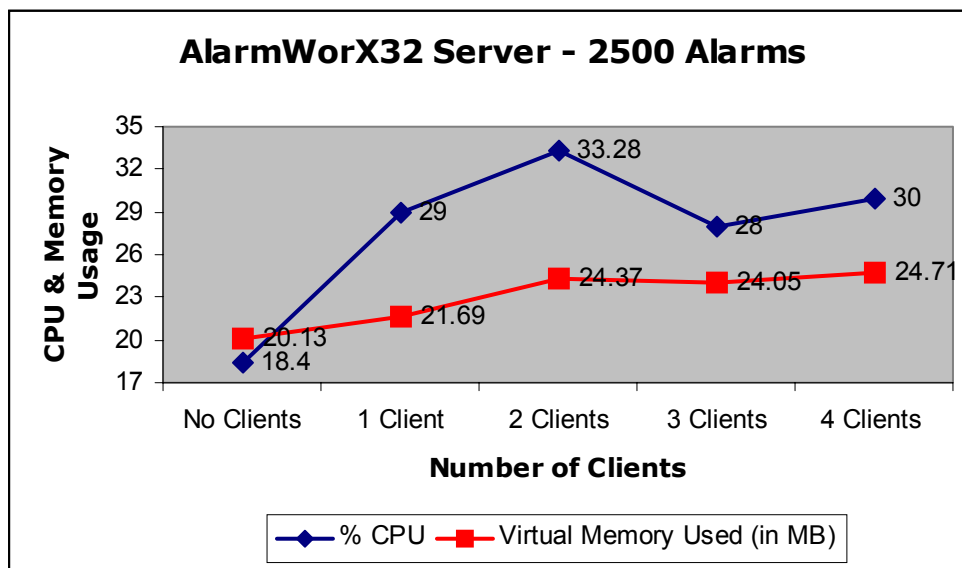


Chart 4.3

4.4 Test Case 4 Alarm Server with 6000 Alarms

Alarm Server with 5000 tags changing every 1 minute, 1000 tags changing every 10 seconds

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	1.5	31.68
1 Client	1.9	32.23
2 Clients	2.7	32.56
3 Clients	3.2	33.34
4 Clients	3.6	34.90
AlarmWorX32 Logger	41	13.14

Table 4.4

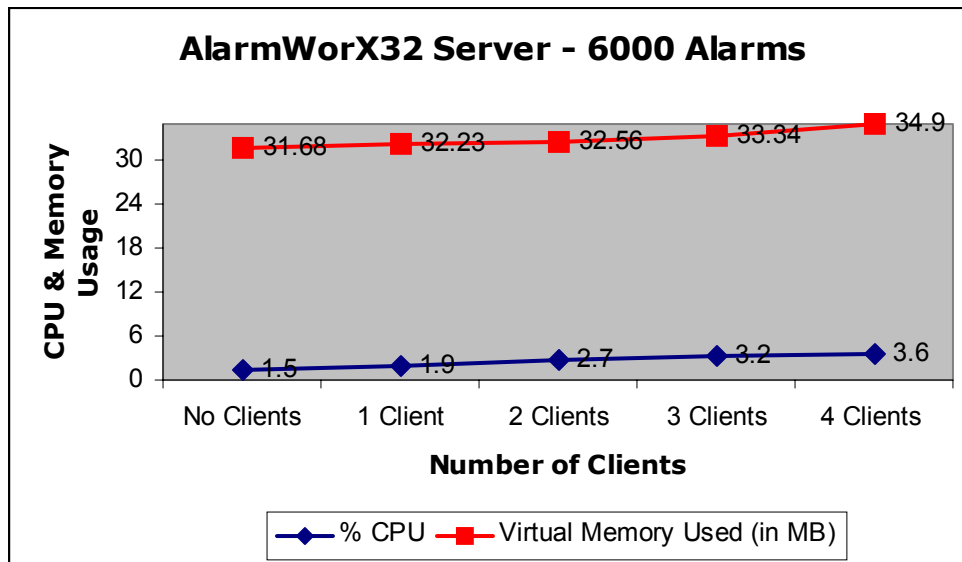


Chart 4.4

4.5 Test Case 5 Alarm Server with 5500 Alarms

Alarm Server with 5000 tags changing every 1-minute, 500 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	2.4	29.72
1 Client	4.5	30.31
2 Clients	4.1	32.55
3 Clients	4.1	32.01
4 Clients	6.4	32.75
AlarmWorX32 Logger	42	18.10

Table 4.5

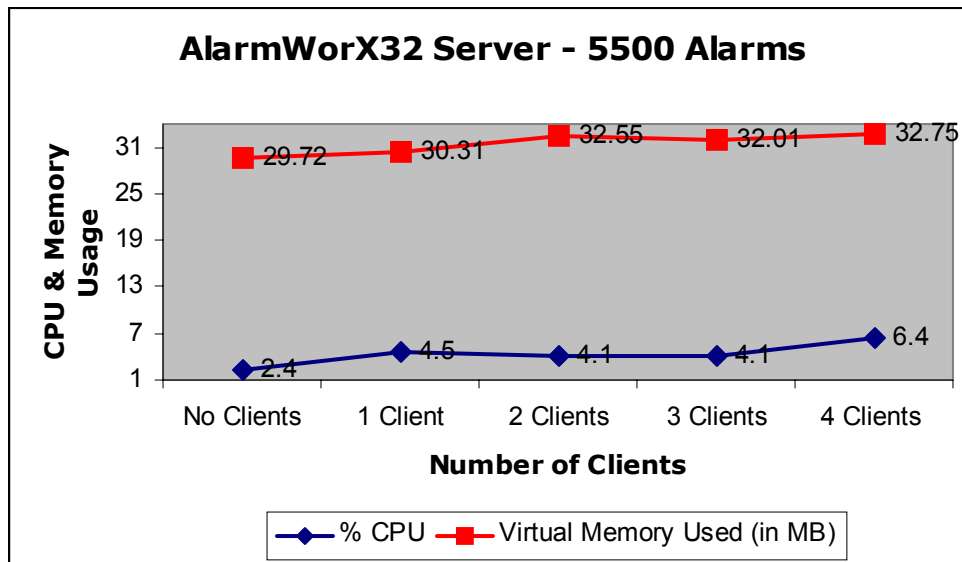


Chart 4.5

4.6 Test Case 6 Alarm Server with 9500 Alarms

Alarm Server with 7500 tags changing every minute, 2000 tags changing every 10 seconds

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	2.3	44.02
1 Client	4.2	45.24
2 Clients	4.5	45.82
3 Clients	6.5	45.94
AlarmWorX32 Logger	38	9.39

Table 4.6

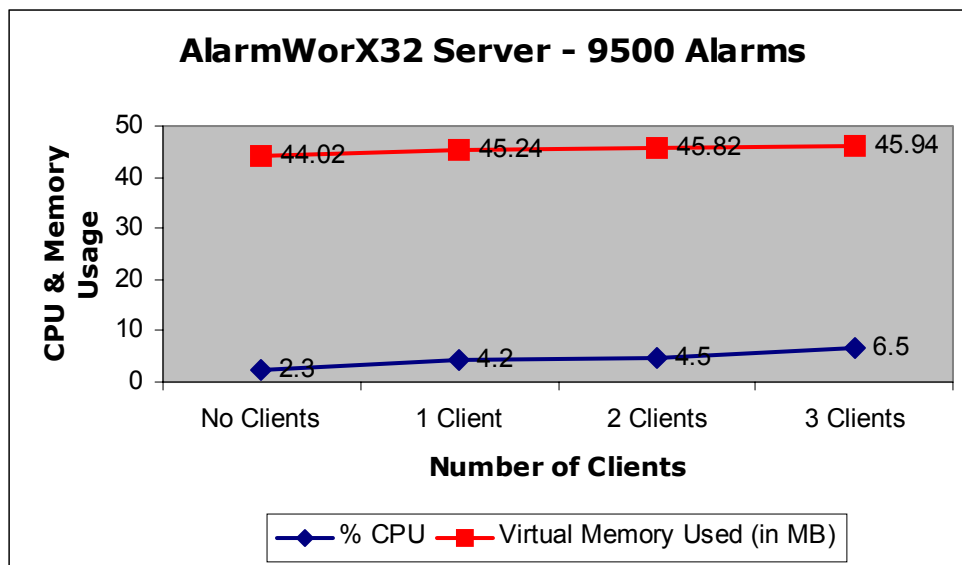


Chart 4.6

4.7 Test Case 7 Alarm Server with 8000 Alarms

Alarm Server with 7500 tags changing every 1-minute with 500 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	2.3	39.08
1 Client	5.0	40.25
2 Clients	6.3	41.54
3 Clients	9.4	42.12
AlarmWorX32 Logger	33	20.89

Table 4.7

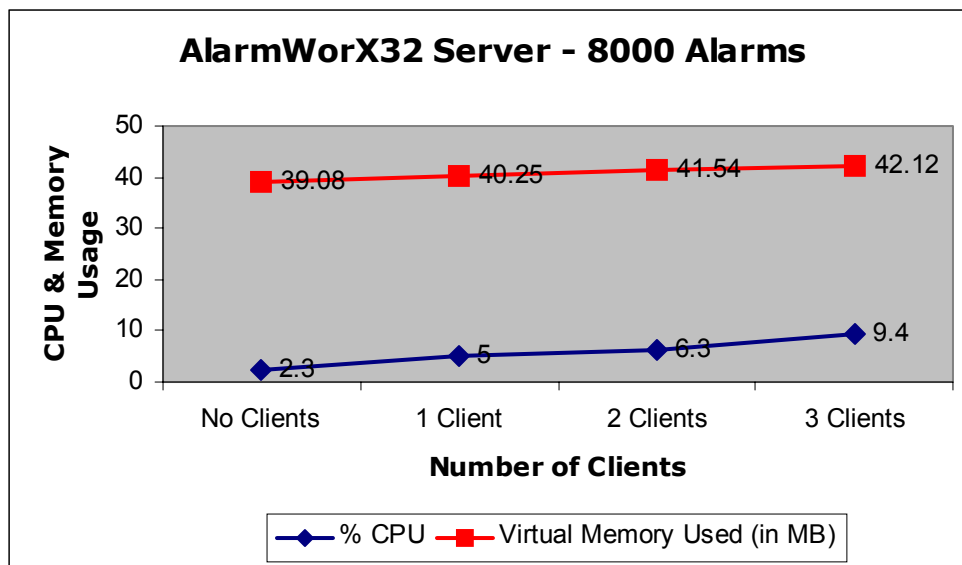


Chart 4.7

4.8 Test Case 8 Alarm Server with 10,000 Alarms

Alarm Server with 10,000 tags changing every 1-minute

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	1.4	47.70
1 Client	2.7	47.08
2 Clients	3.7	48.86
3 Clients	4.2	50.70
AlarmWorX32 Logger	36	8.88

Table 4.8

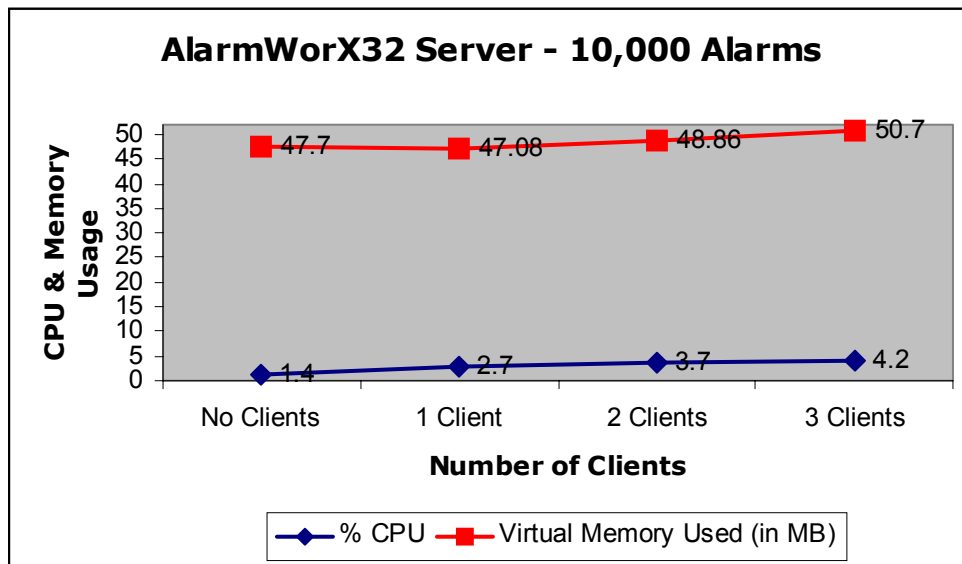


Chart 4.8

4.9 Test Case 9 Alarm Server with 2000 Alarms – Digital and Analog.

Alarm Server with 2000 tags, 1000 Digital changing every 1 sec, 500 Analog changing once a second, and 500 Analog changing once every 500 msecs.

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	14.8	22.95
1 Client	21.9	24.98
2 Clients	24.1	26.09
3 Clients	29.41	26.11
4 Clients	34.7	26.65
AlarmWorX32 Logger	38	21.59

Table 4.9

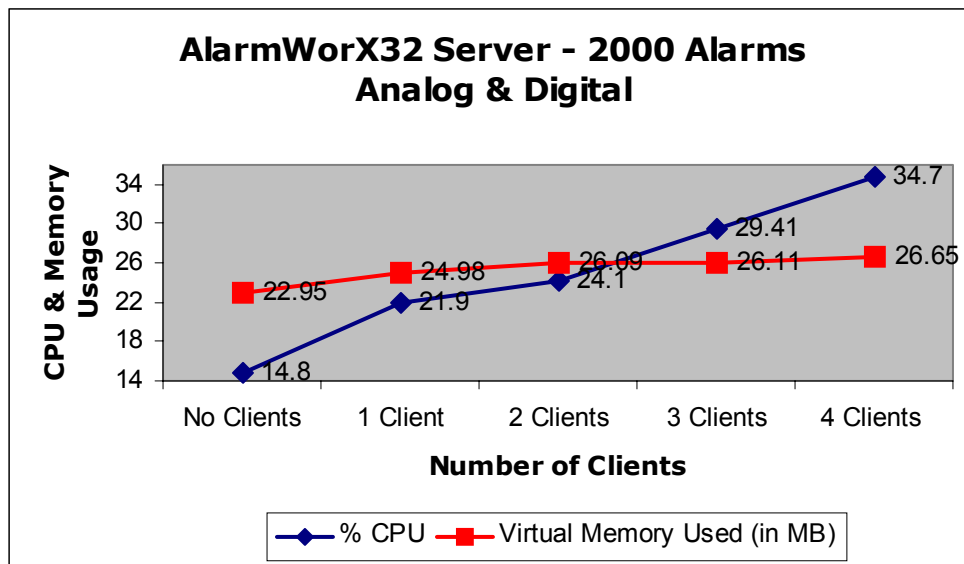


Chart 4.9

4.10 Test Case 10 Alarm Server with 1000 Alarms

Alarm Server with 1000 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	7.7	12.42
1 Client	9.7	13.93
2 Clients	11.14	15.00
3 Clients	12.57	15.69
4 Clients	14.45	16.88
AlarmWorX32 Logger	34	20.64

Table 4.10

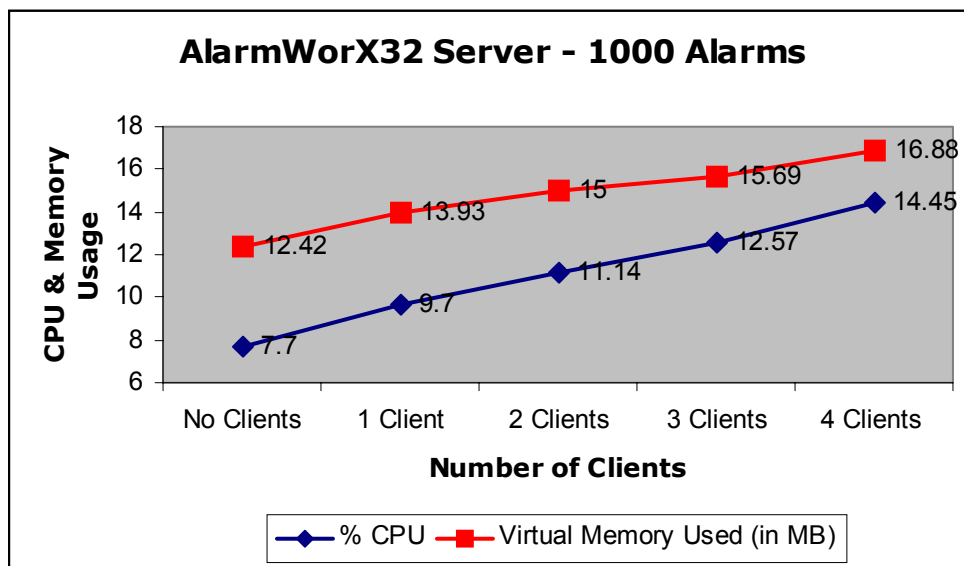


Chart 4.10

4.11 Test Case 11 Alarm Server with 2000 Alarms

Alarm Server with 2000 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	15.1	17.41
1 Client	20.9	18.72
2 Clients	21.8	19.93
3 Clients	23.3	20.01
4 Clients	28.9	21.64
AlarmWorX32 Logger	40	21.10

Table 4.11

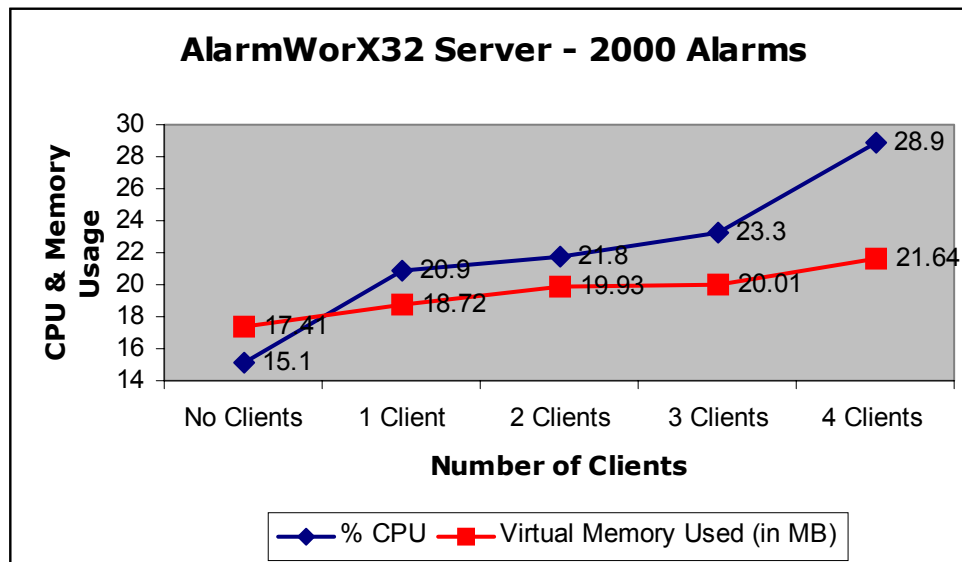


Chart 4.11

4.12 Test Case 12 Alarm Server with 2500 Alarms

Alarm Server with 2500 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	18.4	19.00
1 Client	29.7	20.82
2 Clients	36	22.09
3 Clients	39	22.41
4 Clients	42.5	23.39
AlarmWorX32 Logger	33	21.78

Table 4.12

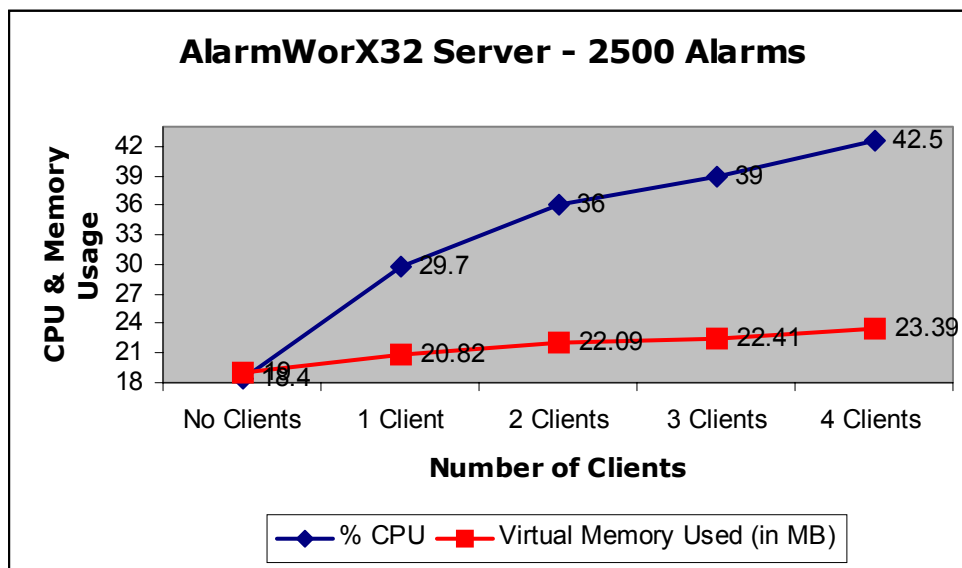


Chart 4.12

4.13 Test Case 13 Alarm Server with 6000 Alarms

Alarm Server with 5000 tags changing every 1 minute, 1000 tags changing every 10 seconds

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	1.7	32.95
1 Client	2.2	34.40
2 Clients	3.3	35.05
3 Clients	4.0	36.20
4 Clients	4.5	37.11
AlarmWorX32 Logger	23	15.15

Table 4.13

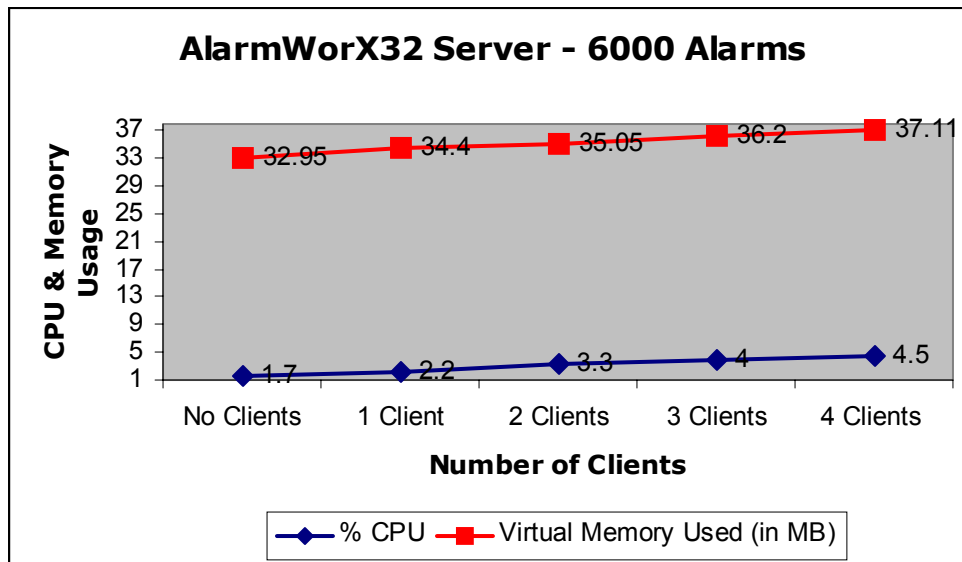


Chart 4.13

4.14 Test Case 14 Alarm Server with 5500 Alarms

Alarm Server with 5000 tags changing every 1-minute, 500 tags changing every second.

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	4.9	31.49
1 Client	5.1	32.86
2 Clients	7.3	33.66
3 Clients	9.0	34.28
4 Clients	11.2	35.36
AlarmWorX32 Logger	36	24.26

Table 4.14

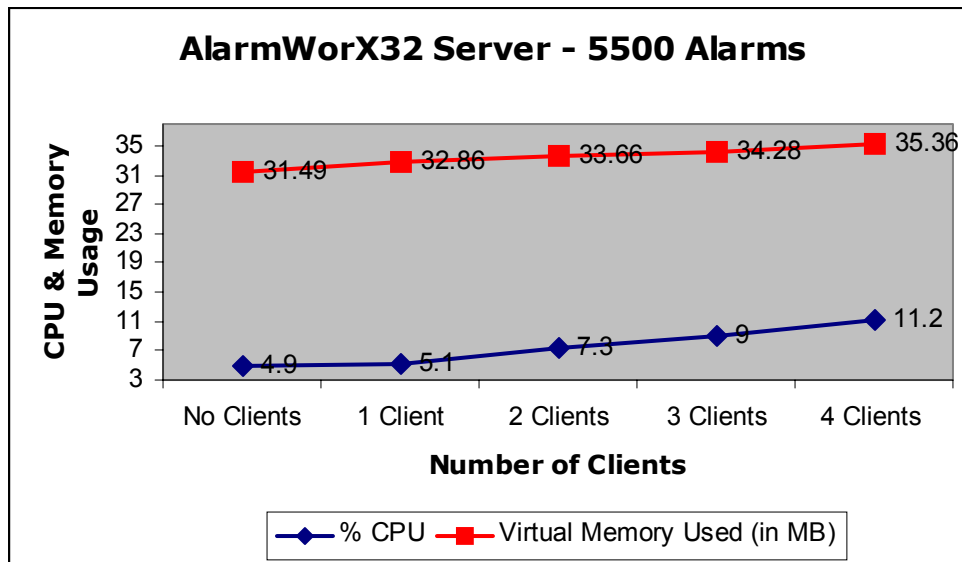


Chart 4.14

4.15 Test Case 15 Alarm Server with 9500 Alarms

Alarm Server with 7500 tags changing every minute, 2000 tags changing every 10 seconds.

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	2.8	46.23
1 Client	6.2	47.33
2 Clients	8.1	48.25
3 Clients	9.1	52.20
4 Clients	10.2	53.93
AlarmWorX32 Logger	37	20.12

Table 4.15

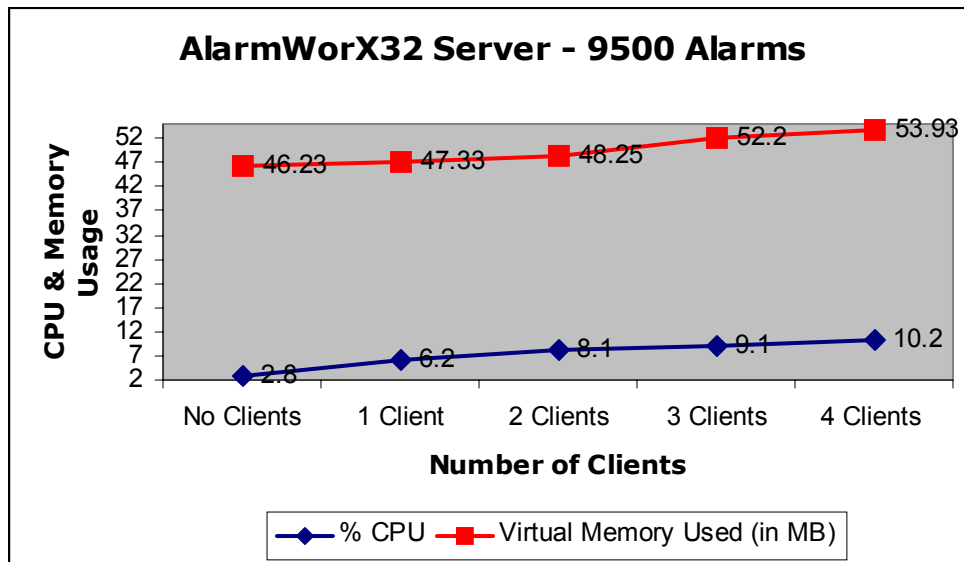


Chart 4.15

4.16 Test Case 16 Alarm Server with 8000 Alarms

Alarm Server with 7500 tags changing every 1-minute with 500 tags changing every second

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	3.8	40.92
1 Client	5.6	42.00
2 Clients	6.5	43.20
3 Clients	8.0	45.53
4 Clients	11.5	46.68
AlarmWorX32 Logger	38	25.72

Table 4.16

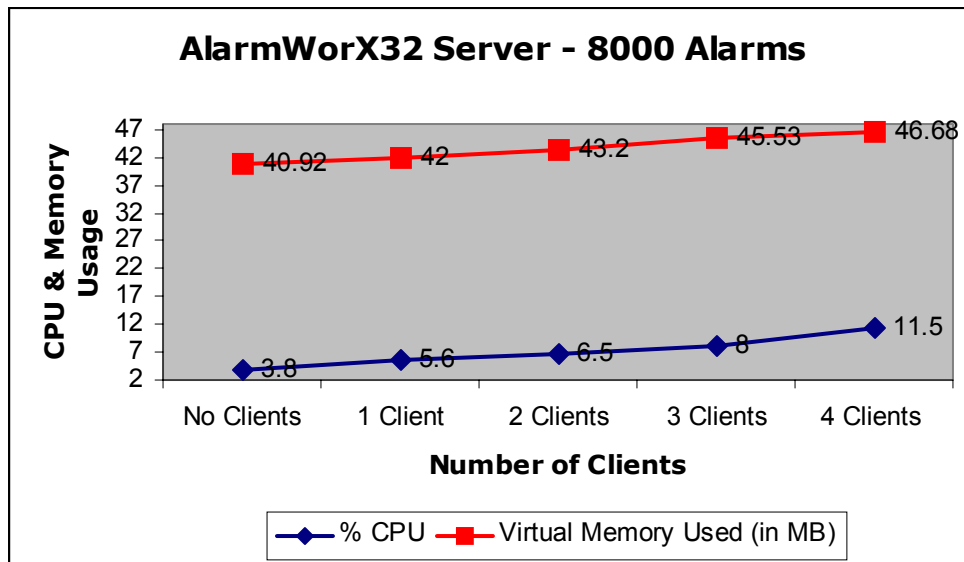


Chart 4.16

4.17 Test Case 17 Alarm Server with 10,000 Alarms

Alarm Server with 10,000 tags changing every 1-minute

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	1.8	18.16
1 Client	3.2	49.85
2 Clients	5.2	51.14
3 Clients	6.4	54.41
4 Clients	7.4	55.60
AlarmWorX32 Logger	33	19.05

Table 4.17

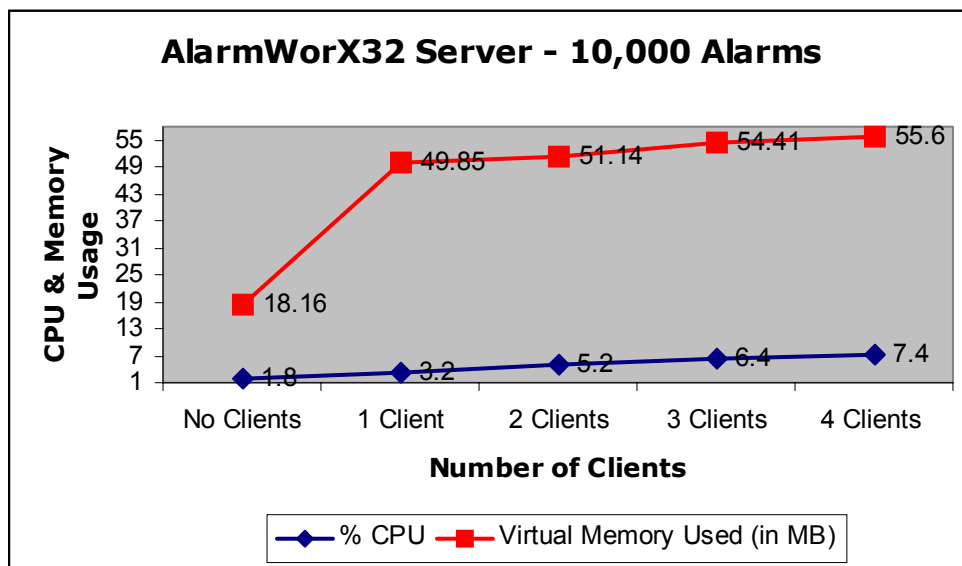


Chart 4.17

4.18 Test Case 18 Alarm Server with 2000 Alarms – Analog and Digital

Alarm Server with 2000 tags. 1000 Digital changing every 1 sec, 500 Analog changing once a second, and 500 Analog changing once every 500 msecs

Number of Clients	% CPU	Virtual Memory Used (in MB)
No Clients	10	18.85
1 Client	13.8	20.39
2 Clients	14.5	21.45
3 Clients	15.4	22.22
4 Clients	18.8	22.63
AlarmWorX32 Logger	32	21.55

Table 4.18

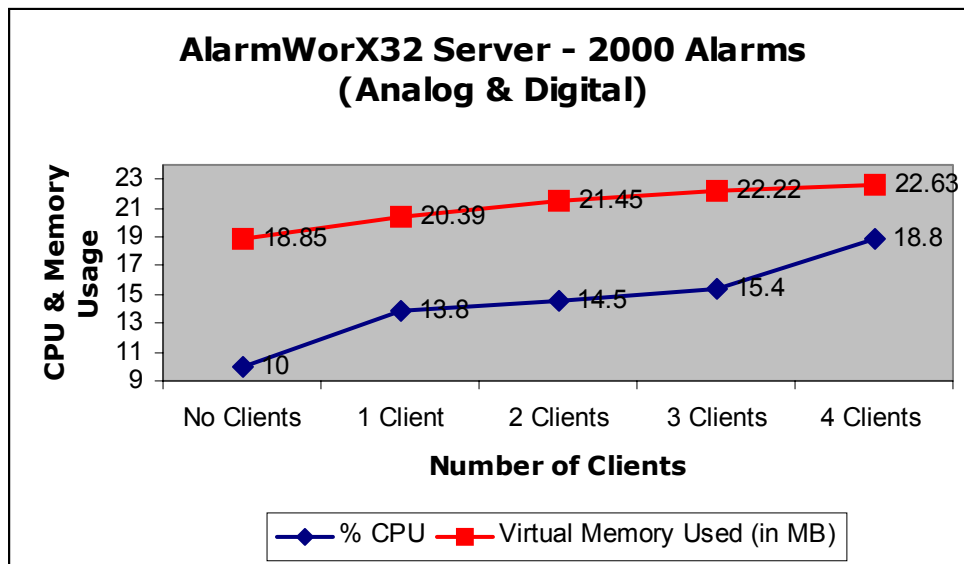


Chart 4.18

5 Conclusions

- ✓ The performance of the AlarmWorX32 Server has not changed between V7.1 and V8. The slight increase in CPU could be because of the new GenClient.dll
- ✓ Memory Usage also seems to be similar to V7.1
- ✓ AlarmWorX32 Server can handle up to 10,000 Alarms changing every 1-minute. It can also handle up to 4 clients
- ✓ AlarmWorX32 Server can handle up to 2500 Alarms changing every 1 sec. It can also handle up to 4 clients

The tables below show the performance of AlarmWorX32 Server with 3 clients and increasing number of tags:

AlarmWorX32 Server V 7.1

Number of Tags	% CPU	Virtual Memory Used (in MB)
1000	9.9	14.88
2000	21.1	19.24
2500	28	24.05
6000	3.2	33.34
5500	4.1	32.01
9500	6.5	45.94
8000	9.4	42.12
10,000	4.2	50.70
2000 (Analog + Digital)	29.41	26.11

AlarmWorX32 Server V8

Number of Tags	% CPU	Virtual Memory Used (in MB)
1000	12.57	15.69
2000	23.3	20.01
2500	39	22.41
6000	4.0	36.20
5500	9.0	34.28
9500	9.1	52.20
8000	8.0	45.53
10,000	6.4	54.41
2000 (Analog + Digital)	15.4	22.22