Benchmark

Agile Manager 2.3 Patch 1 Benchmark Test Results (Updated for 2.40)

This document describes how resources are consumed in Agile Manager 2.3 patch 1 systems, in several hardware configurations. The data provided in this document was obtained by running the same scale test on environments of three different sizes.

Notes for Agile Manager 2.40

This document is relevant for Agile Manager 2.40 as well, with the following additions:

- In Agile Manager 2.40, you can create Release synchronization links in addition to Requirement and Defect links. Where this document refers to 600 or 800 links, this refers to the total number of links in the system, regardless of the link type.
- In Agile Manager 2.40, on a clustered system, you can designate Agile Manager nodes that will not handle synchronization processes. (See Help > Configuration > Agile Manager system configuration > Configure application server settings)

  If you expect your clustered Agile Manager system to handle an intensive load, we recommend allocating at least one such node to optimize the system's behavior.

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Test details

The scale test we performed is an extreme case, and is based on real Agile Manager customer usage data. It covers 90%-95% of the production actions taken on Agile Manager between November 2013 and April 2013.

This section includes the following:

- Virtual user types
- Test description

Virtual user types

The types of virtual users used in the scale test include the following:

- A – Viewing virtual user
- B – Add items virtual user
- C – Login virtual user
- D – Synchronization virtual user

A – Viewing virtual user

The Viewing virtual user's time is divided as follows:

Percentage of time	Action
40%	Navigates to and in the Release Management area
31%	Navigates to the Product Management area, including the Themes and Features grids
11%	Navigates directly to the Task Board
10%	Navigates to the Defect Management area
8%	Navigates to the Dashboard

B – Add items virtual user

The Add items virtual user's time is divided as follows:

Percentage of time	Action
43%	Navigates to the Release Backlog and creates a user story
28%	Navigates to the Defect Management area and creates a defect
13%	Navigates to the Themes and Features grids, and creates one theme and one feature
10%	Navigates to the Task Board and creates a task. Then: ▪ Changes the task status to In Progress ▪ Changes the task status to Done ▪ Deletes the task
6%	Deletes the newly created user stories, themes, features, and defects

C – Login virtual user

The Login virtual user logs in to Agile Manager, waits 10 seconds, and then logs out. Upon login, the last view opened is always the Sprint Backlog page.

D – Synchronization virtual user

The Synchronization virtual user simulates system load during synchronization with NextGen Synchronizer. It simulates two links; one for requirements/user stories and one for defects.

Both links are scheduled to synchronize at random intervals, of up to 60 seconds.

Each synchronization in the test creates one new defect and one new requirement. This is an extreme use case.

Test description

The test includes the following system configurations:

- Agile Manager without NextGen Synchronizer
- Agile Manager with NextGen Synchronizer / Clustered Agile Manager with NextGen Synchronizer

Agile Manager without NextGen Synchronizer

Every 80 seconds, the following occurs:

- A Viewing virtual user (type A) logs in to Agile Manager and browses until the end of the test. All of these users work in the same workspace, which is already loaded.
- A Login virtual user (type C) logs in to Agile Manager, and browses until the end of the test. Each user logs in to a different workspace.

Every 6 minutes, an Add items virtual user (type B) logs in to Agile Manager and browses until the end of the test.

The test ends when the system exhausts its ability to support additional virtual users.

Agile Manager with NextGen Synchronizer / Clustered Agile Manager with NextGen Synchronizer

The same test is run as with Agile Manager without NextGen Synchronizer.

Changes are made in hardware, including the number of nodes and CPUs, RAM size, and so on.

The same load is used as in testing Agile Manager without NextGen Synchronizer.

Background process for synchronization, using NextGen Synchronizer

The following background process is designed to have a low impact on the servers, while ensuring that all links are synchronizing actual changes in the entities:

- Every 10 minutes, 1 defect and 1 user story is added.
- Every 2 minutes, each new defect and user story is updated 4 times.
- Every 10th defect or user story is deleted.

Each defect and user story has 1 attachment and 1 linked entity.

ALM testing

When testing a single node of Agile Manager with NextGen Synchronizer, we also measured the impact on the ALM system.

The ALM load included 1000 ALM users, performing various actions in ALM in the following two scenarios:

- Without synchronizing
- During synchronization using NextGen Synchronizer

Data load details

The data load used in the test is determined using one of the most loaded sets of customer data in Agile Manager. The data load used includes:

- 5300 listed users
- 400 workspaces with the following distribution:
    - The first workspace is the workspace that all **Viewing virtual users (type A)** log in to. It contains:
        - 50 releases
        - 30 products
        - 20-200 themes. Each theme contains 1-20 features, totaling up to 800 features per release.
        - 100-2000 user stories per release
        - 6-600 defects per workspace
    - 150 workspaces, containing between 65%-85% of the content of the first one. All **Login virtual users (type C)** log in to one of these workspaces.
    - The remaining 249 workspaces are almost, but not completely, empty. They function simply as background load. No virtual users log in to them.

Environment details

All environments are hosted on a dedicated virtual machine. No environments are shared, and all resources are reserved and isolated. Each virtual machine is a physical grade server, and includes the following types of hardware:

Hardware	Description
CPU	Intel(R) Xeon(R) CPU E5-2670 0 @ 2.60GHz
Disk	2 local disks ; RAID 1 disk
Network	1 GB LAN
Database	Oracle 11.2.0.4 Enterprise Edition
Application server OS	RHEL 6.4 64 bit

The test was performed in the following three configurations:

Component	Agile Manager, without NextGen Synchronizer	Agile Manager, with NextGen Synchronizer	Clustered Agile Manager, with NextGen Synchronizer
Application server	4 CPU 8 GB RAM Max 4 GB heap	16 CPU 16 GB RAM Max 10 GB heap	4 nodes, clustered. Each node has: 8 CPU 12 GB RAM Max 8 GB heap
Database server	8 CPU 16 GB RAM	12 CPU 32 GB RAM	16 CPU 64 GB RAM
Oracle parameter settings			
sga_target	12G	24G	48G
db_cache_size	4300M	8601M	12695M
Shared_pool_size	5530M	9765M	21484M
pga_aggregate_target	615M	1128M	2458M

Test results

This section presents the test results in each of the configurations described above.

- Agile Manager without NextGen Synchronizer
- Agile Manager with NextGen Synchronizer
- Clustered Agile Manager with NextGen Synchronizer

Agile Manager without NextGen Synchronizer

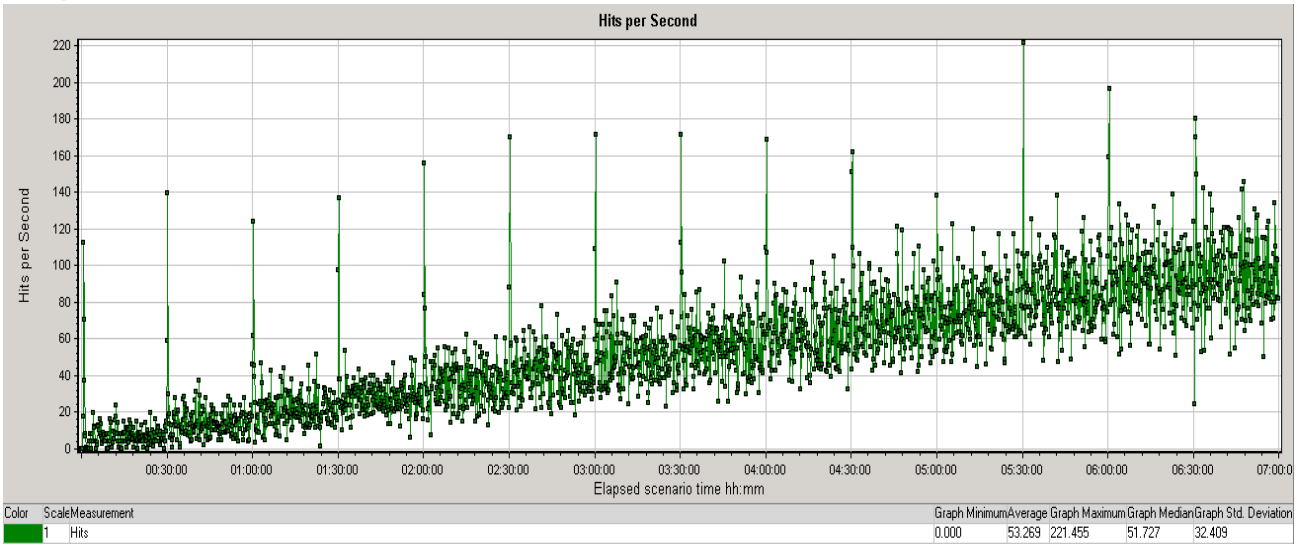
This configuration includes the following:

- Application server 4 CPU, 8 GB RAM, Max 4 GB heap
- Database server 8 CPU, 16 GB RAM

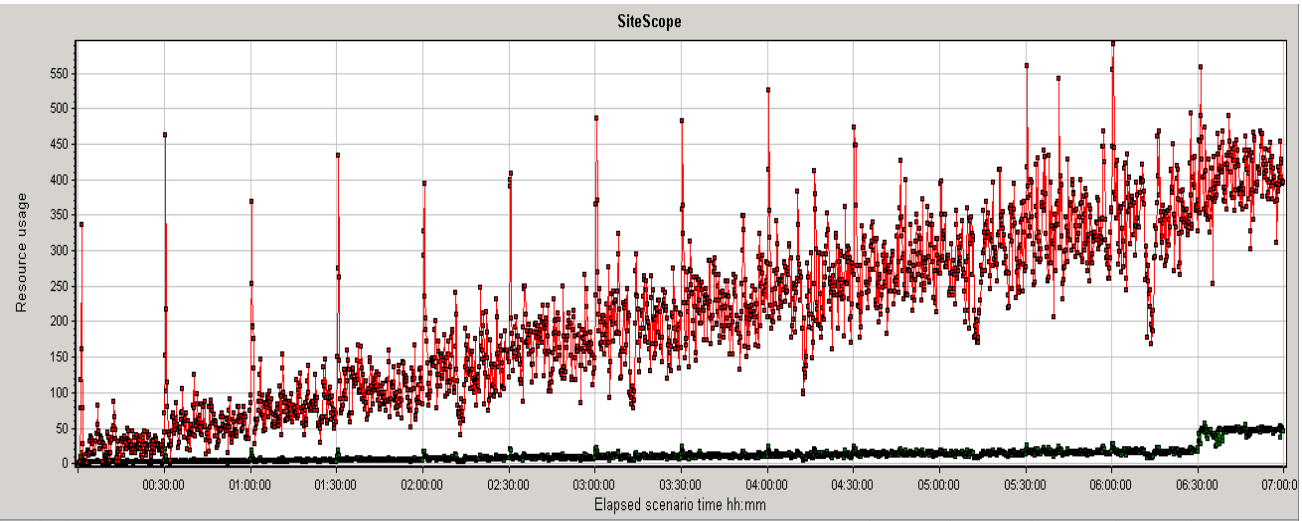
No. of Concurrent users	100	200	300	400	500	600	700	800
App server CPU utilization (max stable 300%)	85%	126%	188%	210%	250%	275%	340%	360%

Used Java heap size (%) (max 100%)	30	35	30	40	35	45	60	65
DB server CPU utilization (max stable 700%)	40	60	90	130	160	180	200	210
DB server free memory (min 100 MB)	2.65GB	2.6GB	2.55GB	2.5GB	2.45GB	2.4GB	2.4GB	2.4GB
DB concurrent users	47	50	52	55	60	62	65	75
Hits per second (server load)	20	30	40	60	80	100	110	110

Hits per second

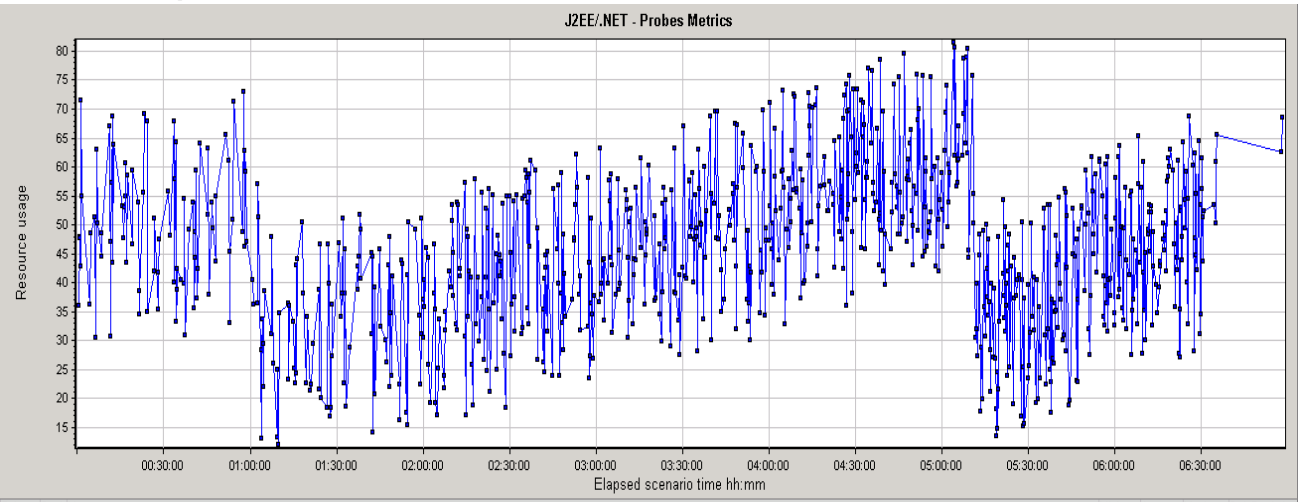


Application server CPU (user in red 0.1, system in green)



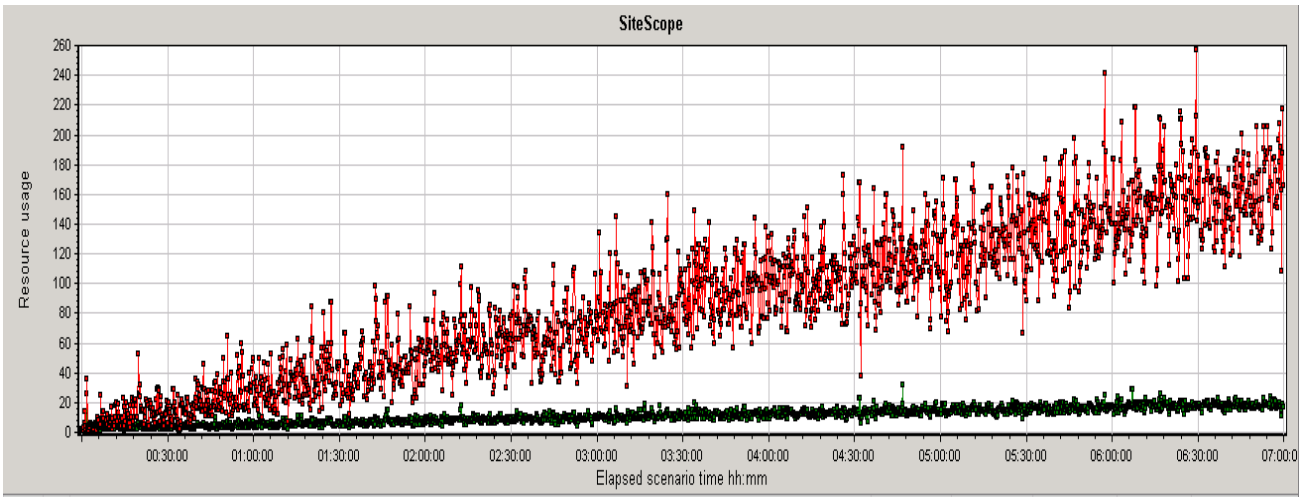
Color	Scale	Measurement	Graph's Minimum	Graph's Average	Graph's Maximum	Graph's Median	Graph's Std. Deviation
	1	/Moran/AGM_OP/AGM_OP_AppVM_smallprofile/Processor\Total\System:myd-vm03769	0.356	11.810	55.801	9.746	10.525
	1	/Moran/AGM_OP/AGM_OP_AppVM_smallprofile/Processor\Total\User:myd-vm03769	0.927	208.691	590.752	205.943	121.370

Used Java heap size (%)



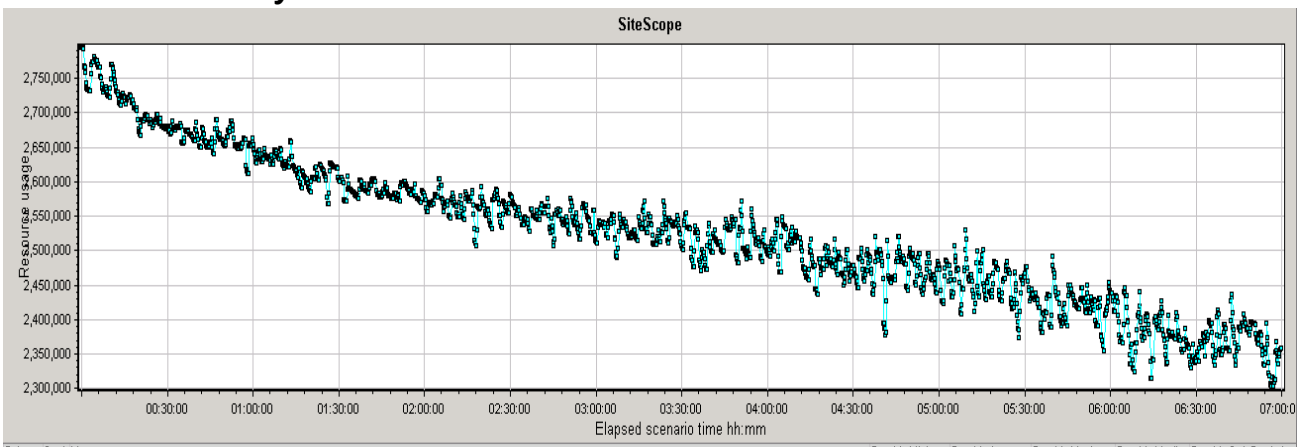
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	HeapUsedPct (PERCENT):Probe:vmperfagm0001	11.975	46.285	81.475	14.320

Database CPU



Color	Scale	Measurement	Graph's Minimum	Graph's Average	Graph's Maximum	Graph's Median	Graph's Std. Deviation
	1	/Moran/AGM_OP/OP_DB_smallprofile/Processor\Total\System:myd-vm03769	1.119	10.916	32.136	10.782	5.166
	1	/Moran/AGM_OP/OP_DB_smallprofile/Processor\Total\User:myd-vm03769	1.345	86.296	257.047	83.794	50.673

Database free memory



Color	Scale	Measurement	Graph's Minimum	Graph's Average	Graph's Maximum	Graph's Median	Graph's Std. Deviation
	1	/Moran/AGM_OP/OP_DB_smallprofile/Memory\MemFree:myd-vm03769	2,302,424.000	2,523,565.841	2,793,956.000	2,525,094.000	102,036.845

Agile Manager with NextGen Synchronizer

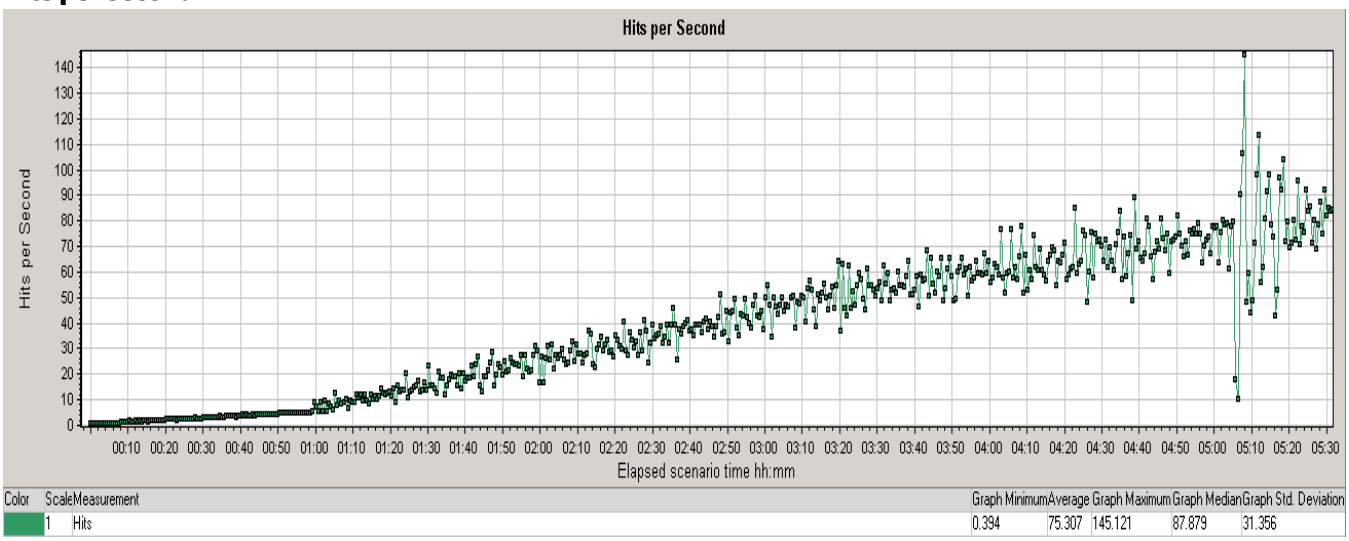
This configuration includes the following:

- Application server 12 CPU, 16 GB RAM, Max 10 GB heap
- Database server 12 CPU, 32 GB RAM

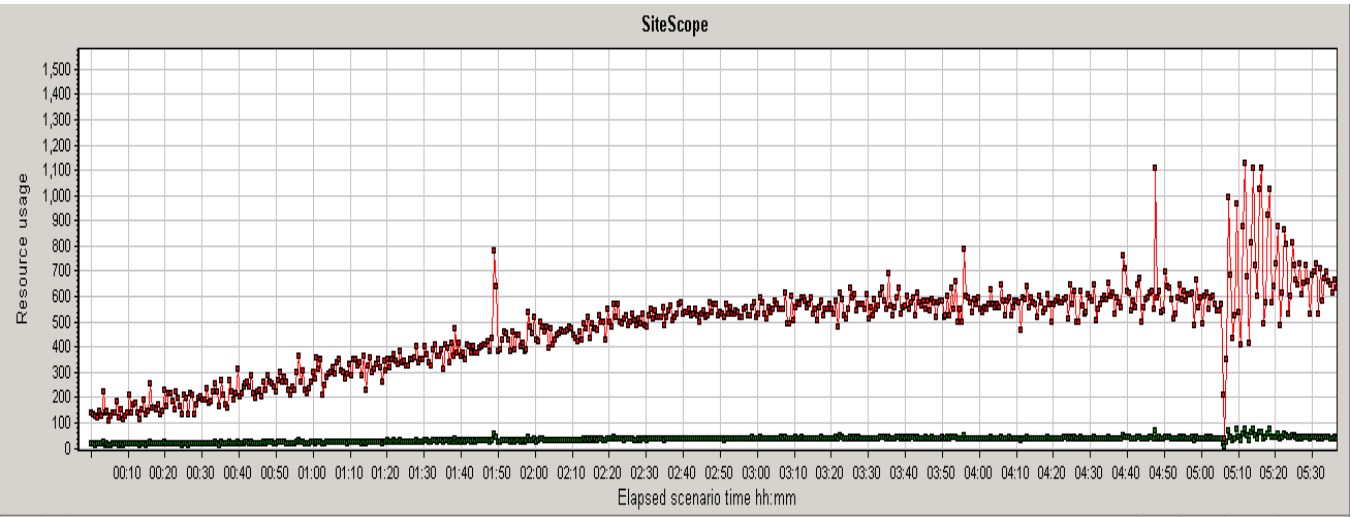
No. of Concurrent users	250	300	350	400
No. of Synchronizer links	800	800	800	800
App server CPU utilization (max stable 1000%)	650%	650%	650%	700%

Used Java heap size (%) (max 100%)	30%	40%	55%	70%
DB server CPU utilization (max stable 1100%)	150%	175%	200%	225%
DB server free memory (min 100 MB)	600	600	600	400
DB concurrent users	65	65	65	131
Hits per second	55	65	75	140

Hits per second

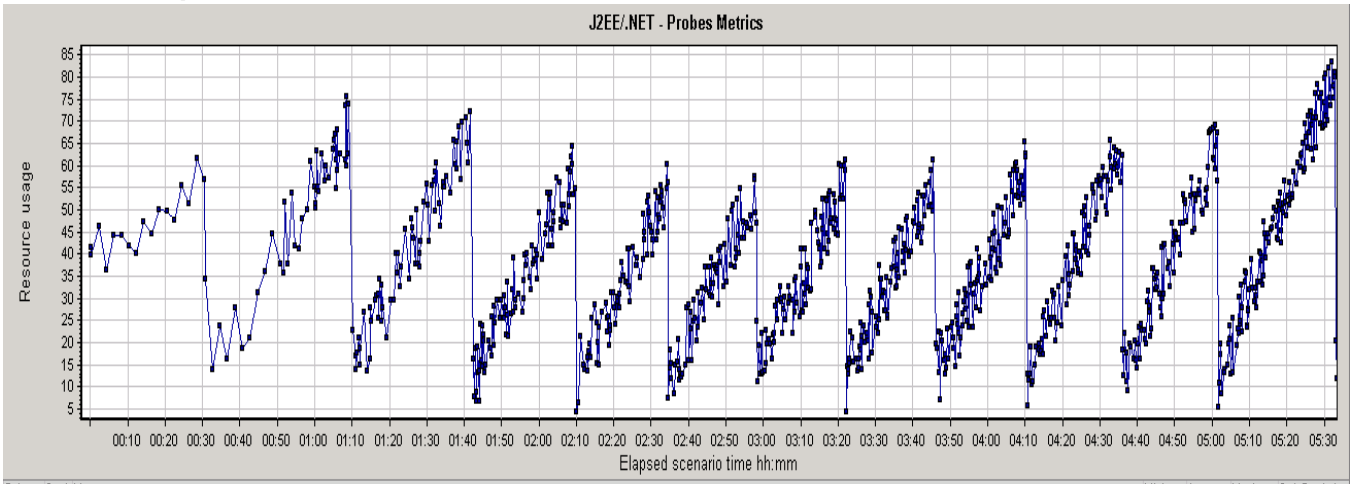


Application server CPU (user in red, system in green)



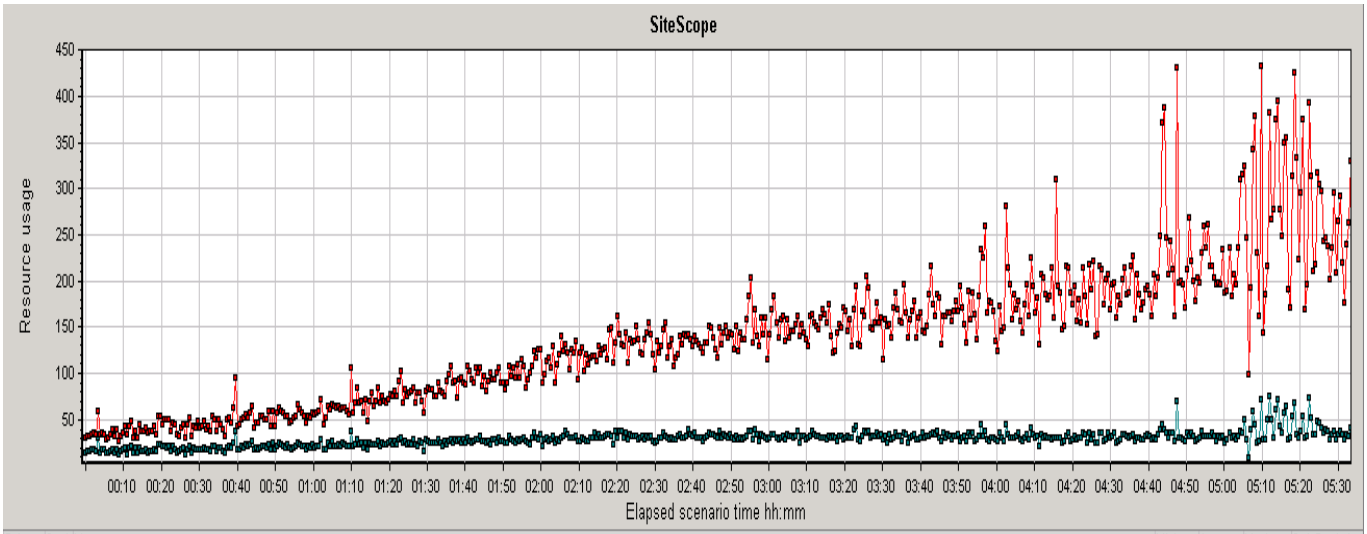
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	/Moran/AGMsyncOP/OPSyncAppVM_smallprofile/Processor\Total\System:myd-vm03769	1.763	34.976	92.740	8.036
	1	/Moran/AGMsyncOP/OPSyncAppVM_smallprofile/Processor\Total\User:myd-vm03769	32.515	550.785	1,822.205	143.982

Used Java heap size (%)



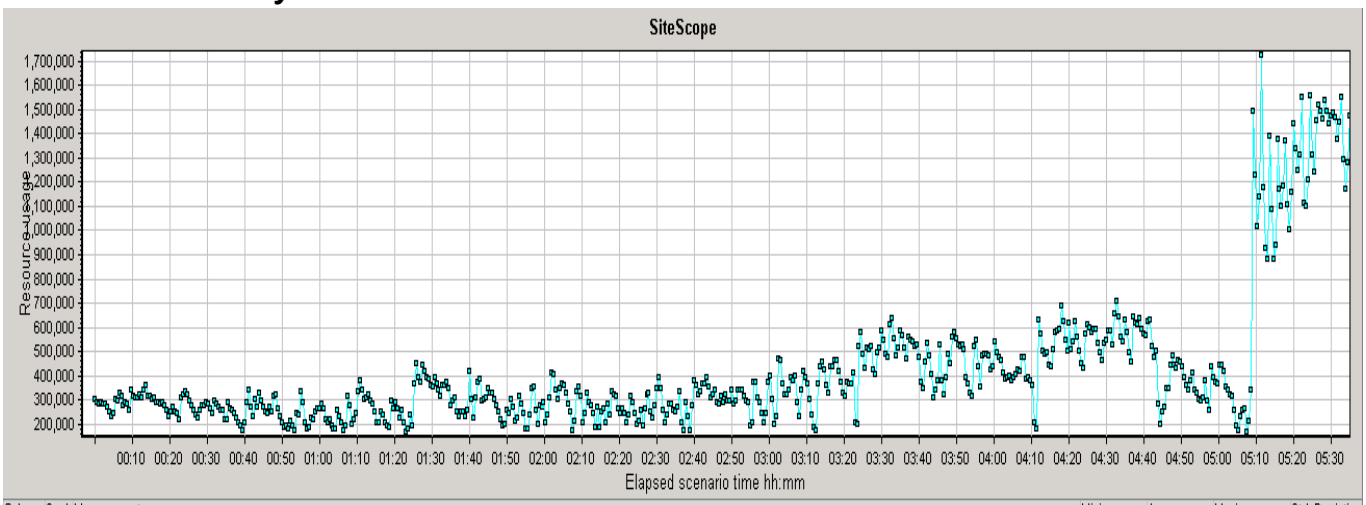
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	HeapUsedPct (PERCENT):Probe:vmperfsync0002	4.178	41.487	87.041	17.214

Database CPU



Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	/Moran/AGMsyncOP/OPSyncDB_smallprofile/Processor\Total\System:myd-vm03769	6.941	29.036	98.016	7.593
	1	/Moran/AGMsyncOP/OPSyncDB_smallprofile/Processor\Total\User:myd-vm03769	16.658	218.760	618.007	88.889

Database free memory



Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	/Moran/AGMsyncOP/OPSyncDB_smallprofile/Memory\MemFree:myd-vm03769	161,656.000	902,670.324	1,916,412.000	419,397.440

Impact on ALM

When testing a single node of Agile Manager with NextGen Synchronizer, we also measured the impact on the ALM system.

Results show that:

- The CPU on both the ALM Application and Database servers increased 10%
- The total response time increased by an average of 160 ms.

These results indicate that the impact on the ALM system is low.

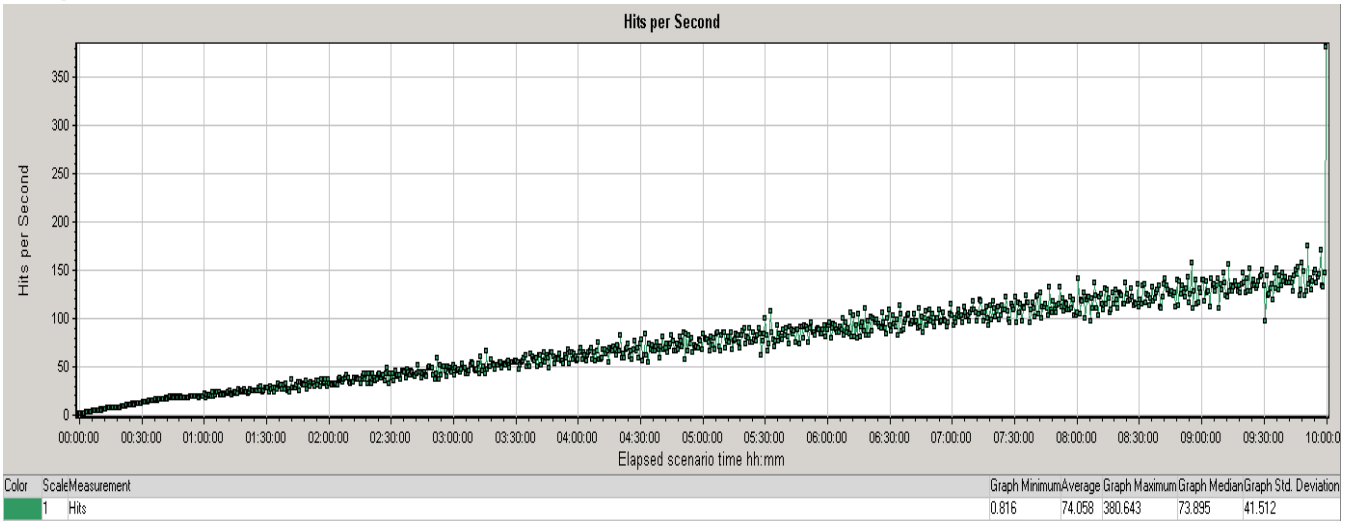
Clustered Agile Manager with NextGen Synchronizer

This configuration includes the following:

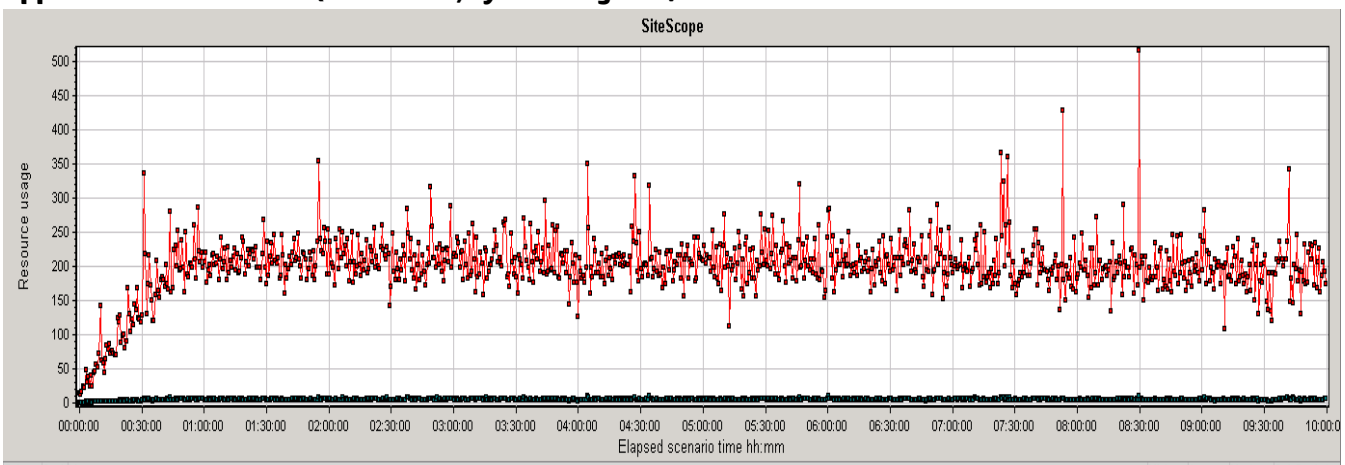
- 4 nodes, each application server 4 CPU, 8 GB RAM, Max 6 GB heap
- Database server 16 CPU , 64 GB RAM

No. of Concurrent users	200	400	600	800
No. of Synchronization links	800	800	800	800
App server CPU utilization (max stable 700%) Value for node with the highest CPU	220	220	220	220
Used Java heap size (%) (max 100%) Value for node with the highest heap	20	20	20	20
DB server CPU utilization (max stable 1500%)	100	200	200	400
DB server free memory (min 100 MB)	11GB	10GB	8.5GB	7GB
DB concurrent users	100	100	110	140
Total HPS (all nodes)	50	75	100	150

Hits per second

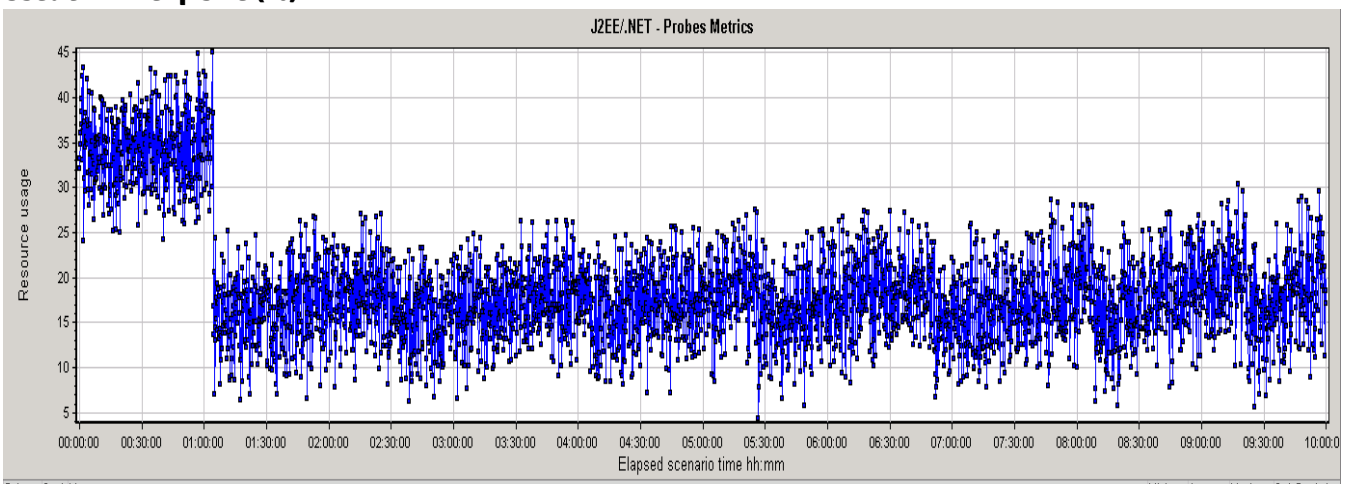


Application server 1 CPU (user in red, system in green)



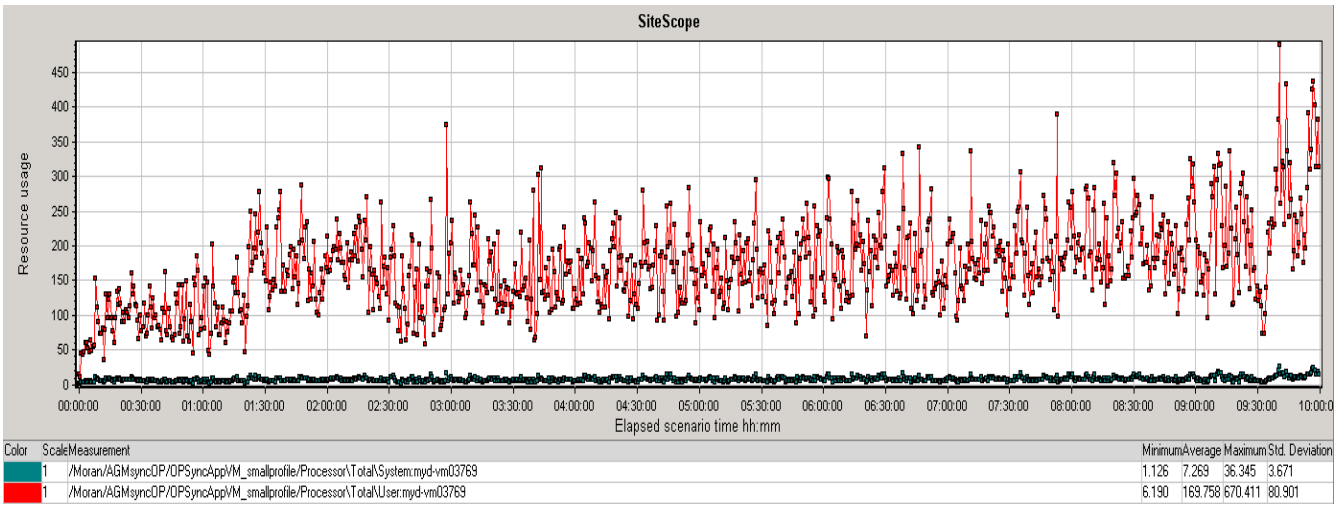
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	/Moran/AGMsyncOP/OPsync_ALM_smallprofile/Processor\Total\System:myd-vm03769	0.755	5.559	15.452	1.618
	1	/Moran/AGMsyncOP/OPsync_ALM_smallprofile/Processor\Total\User:myd-vm03769	10.225	200.137	832.266	61.389

Used Java heap size (%)



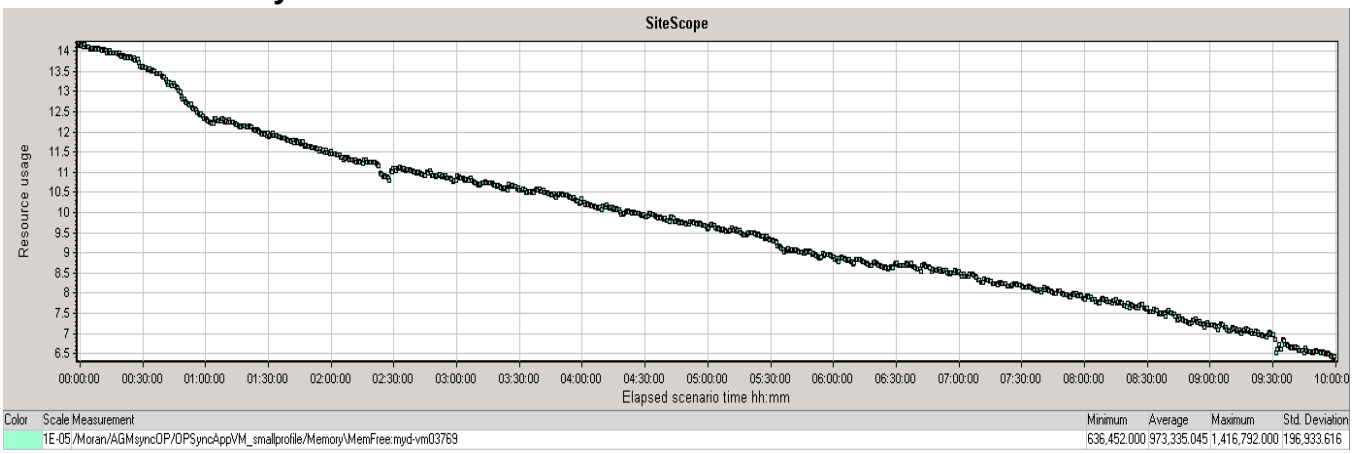
Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	HeapUsedPct (PERCENT):Probe:vmperfsync0002	4.143	19.087	45.653	8.118

Database CPU



Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1	/Moran/AGMsyncOP/OPSyncAppVM_smallprofile/Processor\Total\System:myd-vm03769	1.126	7.269	36.345	3.671
	1	/Moran/AGMsyncOP/OPSyncAppVM_smallprofile/Processor\Total\User:myd-vm03769	6.190	169.758	670.411	80.901

Database free memory



Color	Scale	Measurement	Minimum	Average	Maximum	Std. Deviation
	1E-05	/Moran/AGMsyncOP/OPSyncAppVM_smallprofile/Memory\MemFree:myd-vm03769	636,452.000	973,335.045	1,416,792.000	196,933.616

Test result recommendations

The following table presents a summary of the scale test results, as well as the recommended system configuration for each system size (based on number of concurrent users and links).

No. of Concurrent users	200-600	200-400	200-800
No. of Synchronization links	0	800	800
Application server configuration	4 CPU , 8 GB RAM, Max 4 GB heap	12 CPU , 16 GB RAM, Max 10 GB heap	4 nodes , each app server 4 CPU , 8 GB RAM, Max 6 GB heap
DB server configuration	8 CPU , 16 GB RAM	12 CPU , 32 GB RAM	16 CPU , 64 GB RAM

In each configuration, the test first encountered problems with the database server CPU. When estimating sizes for your system, experiment with different CPU sizes, depending on the number of concurrent users you require.

Integration Bridge maximum configuration

Test results show that a single Integration bridge can support a maximum of 600 active NextGen Synchronizer links.

In such cases, we recommend that the bridge be installed on a system with the following:

- 4 core CPU
- Heap size = 4 GB

Appendix A – RHEL system changes before starting

Before starting the test, we modified the maximum number of open files on the RHEL 6 system.

The default maximum number is 4096. We modified this to a minimum of 8000 files for 100 users.

Increase this number by 1000 for every additional 100 concurrent users.

You can modify this setting at every restart, using the following command:

ulimit <limit>

For example, to set the limit to 8000, enter:

ulimit 8000

Learn more at
hp.com/go/agilemanager

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