VMware Horizon View 6 VDI Scalability Testing on Cisco UCS M2814 with E5-2660 v3 processor

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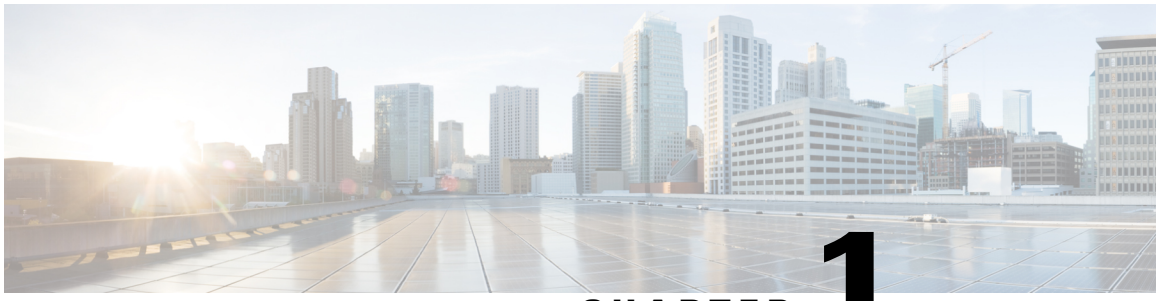


CHAPTER 1

VMWare VDI Scalability Testing on Cisco UCS M2814 Server

Overview

When deploying your virtual desktop solution, choosing server hardware that is powerful enough across the compute and memory dimensions to support a large number of virtual desktops is crucial. The more virtual desktops per server you can support, the fewer servers you need to buy to provide virtual desktops to support your desired number of users.

To find the virtual desktop capacity of a single Cisco UCS M2814 Server, we used the Login Consultants Virtual Session Indexer (Login VSI) 4.1.4 benchmark. The Login VSI workload we used performs a range of tasks to simulate a typical knowledge worker. The benchmark results show the maximum number of virtual desktops that a server can support by measuring response times throughout the test.

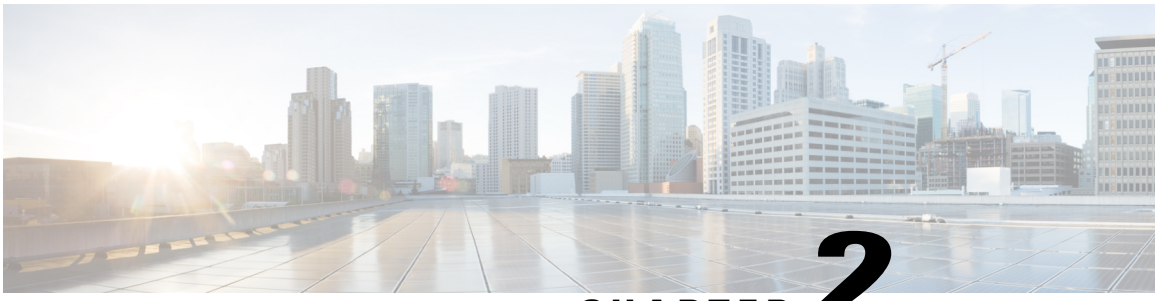
We set out to examine such a virtual desktop solution that consisted of the following components:

- Cisco UCS M2814 Modular Server with Intel(R) Xeon(R) E5-2660 v3.
- VMware vSphere 5.5 U2.
- A VMware Horizon View 6.0.2 virtual desktop linked clone pool consisting of Microsoft Windows 7 SP1 x86 VMs.
- All Virtual machines in the Desktop Pool are provisioned with 2 vCPU, 1.5 GB of reserved memory for Windows 7 SP1.
- All the VMs are created on the 3TB LUN provided from the Local SSDs of Cisco UCS 4308 Chassis.

Acronyms

Acronym	Description
LUN	Logical Unit Number
OS	Operating System
SSD	Solid State Disk

Acronym	Description
UCS	Unified Computing System
UCSM	Unified Computing System Manager
VDI	Virtual Desktop Infrastructure
VM	Virtual Machine
VSI	Virtual Session Index

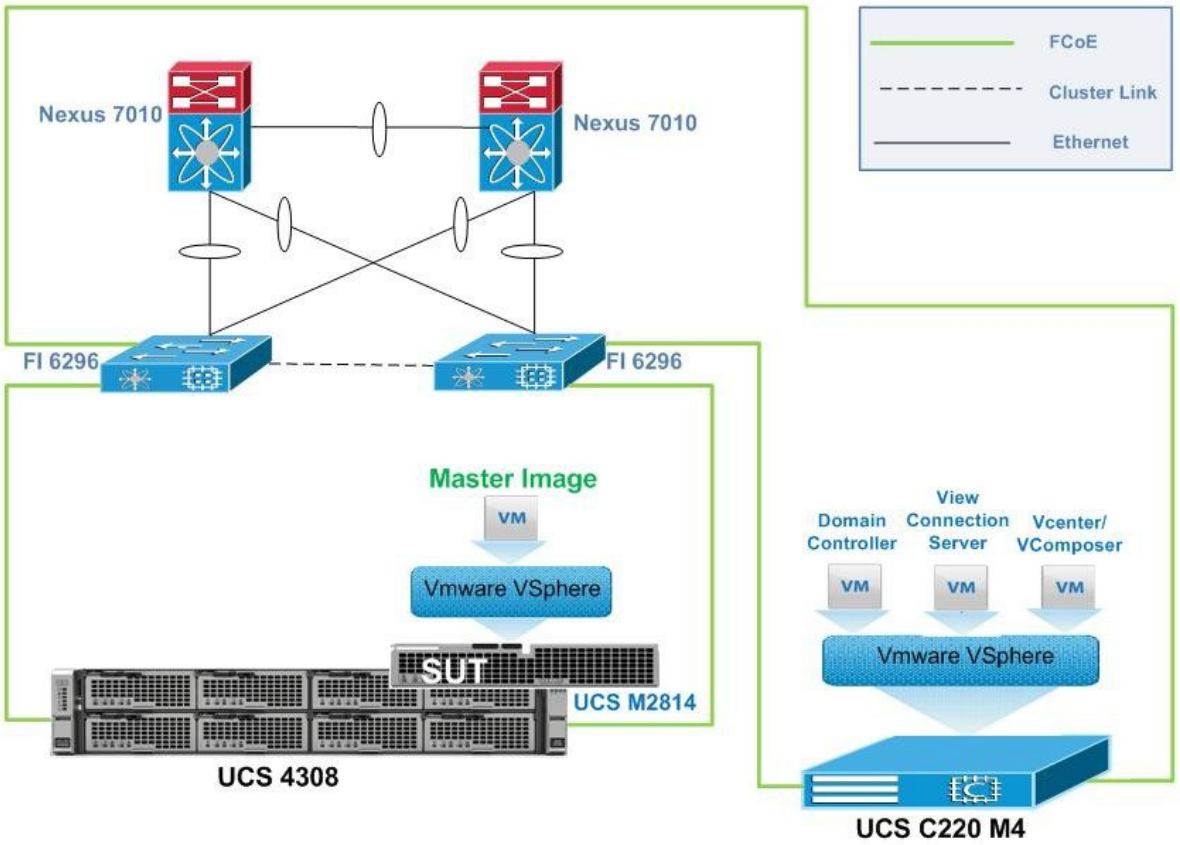


CHAPTER 2

Test Topology and Environment Matrix

Test Topology

Figure 1: Topology in use



Environment Matrix

Infra Components

Component	Version
UCS server	UCS C220 M4 (for Infra)
UCSM	3.1(1e)
Hypervisor	
ESXi	VMware ESXi 5.5 U2 (2068190)
Operating System	
Windows Server OS	Windows Server 2012 R2 x64 (Japanese/English)
Virtual Desktop Delivery Component	
VMware Horizon View	6.0.2
VDI Scalability measuring Tool	

Component	Version
Login VSI	4.1.4
Active Directory, DHCP & DNS	Windows Server 2012 R2 x64 (Japanese/English)
Login VSI Launcher, Analyzer and VSI share	Windows Server 2012 R2 x64 (Japanese/English)
Switches	
Nexus 7010	7.2(1)D1(1)

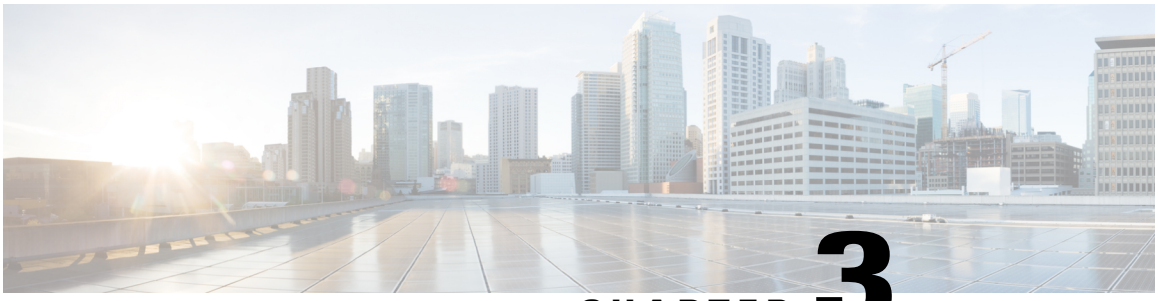
SUT Components

Component	Type
UCS Server	Cisco UCS M2814
UCSM	3.1(1e)
CPUs	
Vendor	Intel® Corporation
Name	Intel(R) Xeon(R) E5-2660 v3
Core Frequency (GHz)	2.6
Platform	
Vendor	Cisco
BIOS Settings	3.1(1e)
Memory modules	
Total RAM in the system (GB)	256
Type	DDR4
Speed (MHz)	2133
Size (GB)	32
Number of RAM modules	8
Chip organization	Double sided
Rank	Quad
Hypervisor	
Name	VMware ESXi 5.5. U2
Build number	2068190
Operating System Power Profile	Maximum Performance
Operating Systems	
Windows Desktop OS	Windows 7 SP1 x86 (Japanese/English)

Component	Type
Adapters	
IO Adapter	Cisco UCS Shared Virtual Adaptor

Tested Windows 7 SP1 VM Configuration

Components of VM	English	Japanese
Virtual Desktop - vCPU	2	2
Virtual Desktop - RAM	1.5 GB	1.5 GB
Virtual Desktop - HardDisk	32GB (Thin Provisioned)	32GB (Thin Provisioned)
Virtual Desktop -NetworkAdapter	Intel e1000	Intel e1000
OS Build No	677710	677757



CHAPTER 3

Implementation Steps and Test Execution Details

Implementation Steps for VMWare Horizon View

- Infra components such as Active Directory/DNS and DHCP server, vCenter server, View composer and View Connection server are deployed as Virtual machines on Cisco UCS C220 M4 server.
- Master image created on Server Under Test (Cisco UCS M2814) and installed with Windows 7 SP1 resides on 3TB LUN provided form local SSDs of Cisco UCS 4308 Chassis.
- Login VSI Launcher is deployed as VM to incrementally login the users to the virtual desktop sessions(created from master image) and begin the workload(Light, Medium, Heavy) on each.

Test Execution Details

Login VSI helps to test and compare the performance of different software and hardware solutions in VDI environment. Login VSI used to measure the maximum capacity of current infrastructure in a quick and easy way. The simulated users work with the same applications as your average employee such as Word, Excel, Outlook and Internet Explorer and also can easily add our own custom applications to the tests.

Light Workload

The light workload runs fewer applications and starts/stops them less frequently. This results in lower CPU, Memory and IO usage.

Medium Workload

Medium workload is the default workload in Login VSI. The standard Login VSI medium workload designed to run on 2vCPU's per desktop VM. This workload emulates a medium knowledge worker using Office, IE, PDF and Java/ FreeMind.

- Once a session has been started the workload will repeat (loop) every 48 minutes. The loop is divided in 4 segments, each consecutive Login VSI user logon will start a different segments. This ensures that all elements in the workload are equally used throughout the test.

- During each loop, the response time is measured every 3-4 minutes. The medium workload opens up to 5 applications simultaneously. The keyboard type rate is 160 ms for each character. Approximately 2 minutes of ideal time is included in simulate real-world users.

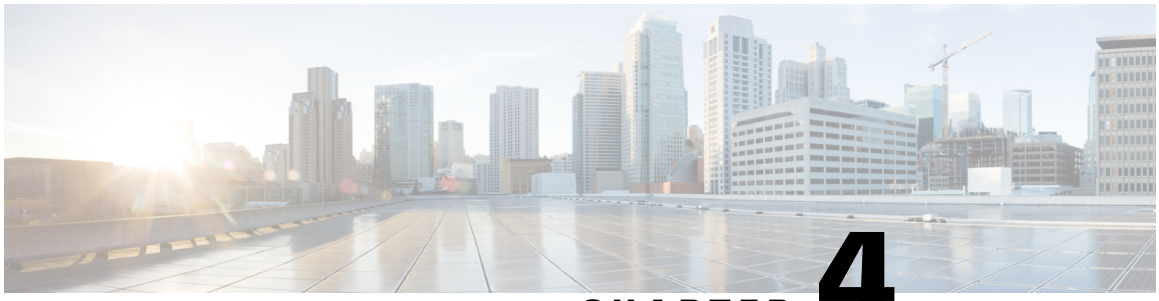
Each loop will open and use:

- Outlook, browse messages.
- Internet Explorer, browsing different web pages and a YouTube style video(480p Movie Trailer) is opened 3 times in every loop.
- Word, one instance to measure response time, one instance to review and edit the document.
- Doro PDF Printer & Acrobat reader, the word document is printed and reviewed to PDF.
- Excel, a very large randomized sheet is opened.

Heavy Workload

The heavy workload is based on the medium workload except that the heavy workload:

- Begins by opening 4 instance of internet explorer. These instances stay open throughout the workload loop.
- Begins by opening 2 instances of Adobe Reader. These instances stay open throughout the workload loop.
- There are more PDF Printer actions in the workload.
- Instead of 480p videos, a 720p and a 1080p videos are watched.
- Increased the time the workload plays the flash game.
- The ideal time is reduced to 2minutes.



CHAPTER 4

VMWare Horizon View VDI Scalability Testing on Cisco UCS M2814 Server

Comparison of Windows 7 SP1 x86 performance in Japanese and English Environment

VSIMax Results

Type of Workload	English	Japanese
Light	130	128
Medium	122	120
Heavy	114	111

Light Workload Result

Light		
Desktop OS	**No.of Launched Sessions**	**VSI Max**
English	140	130
Japanese	150	128

Login VSIMax

Figure 2: English

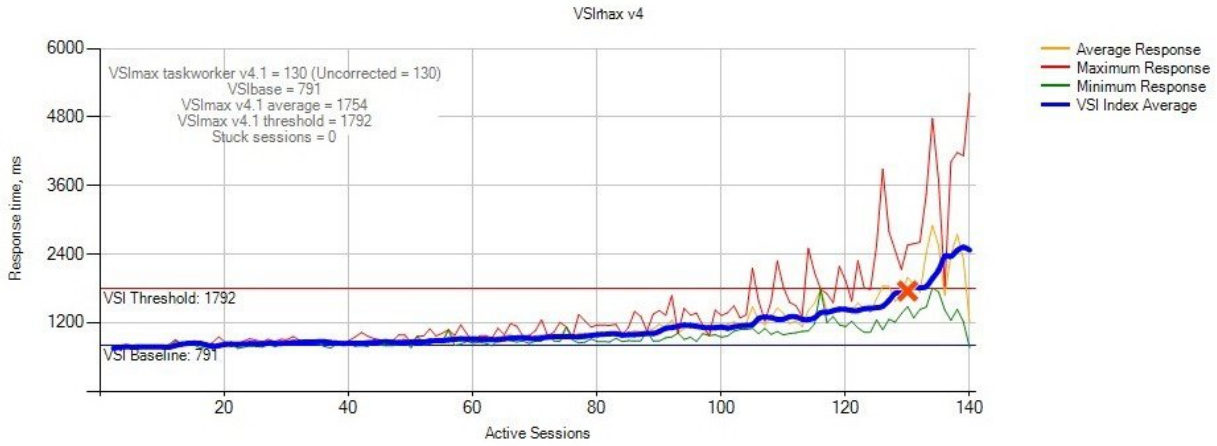


Figure 3: Japanese

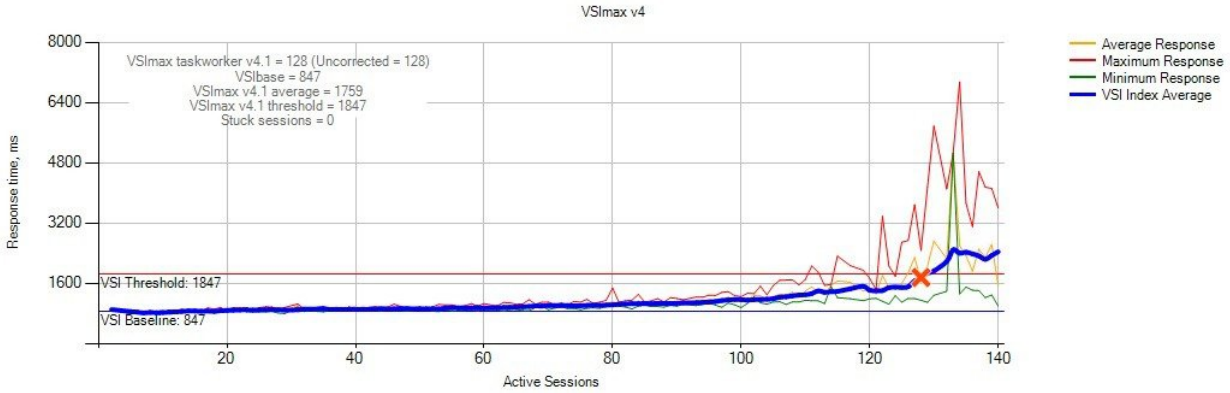


Fig 2 and 3: Average virtual desktop response times at various number of virtual desktops on the Cisco UCS M2814server

Processor And Memory Utilization throughout the test

Figure 4: English

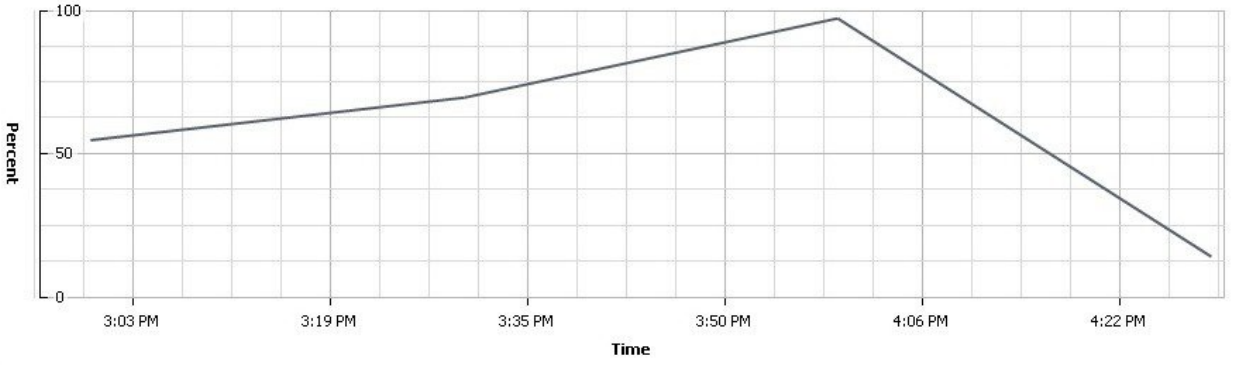


Figure 5: Japanese

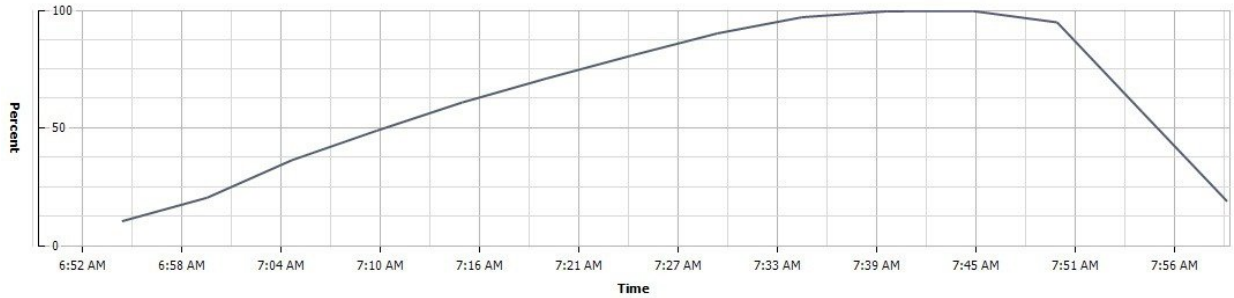


Figure 4 and 5 : CPU utilization throughout the test

Figure 6: English

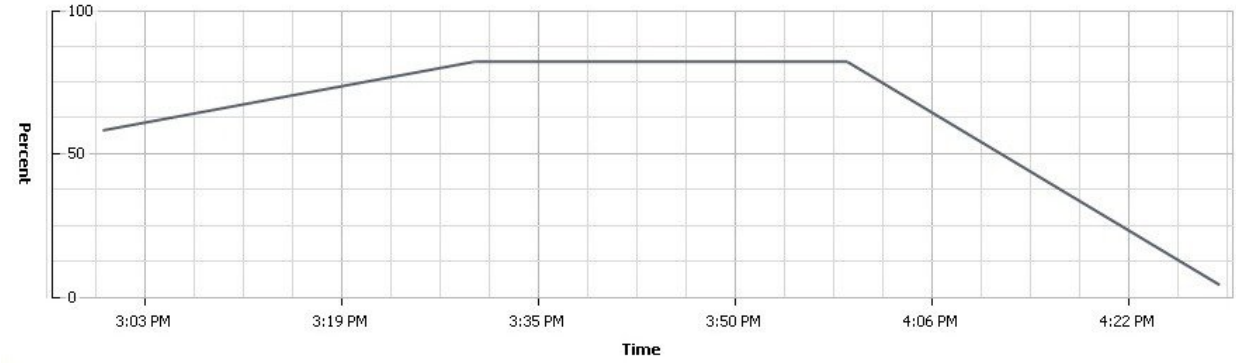


Figure 7: Japanese

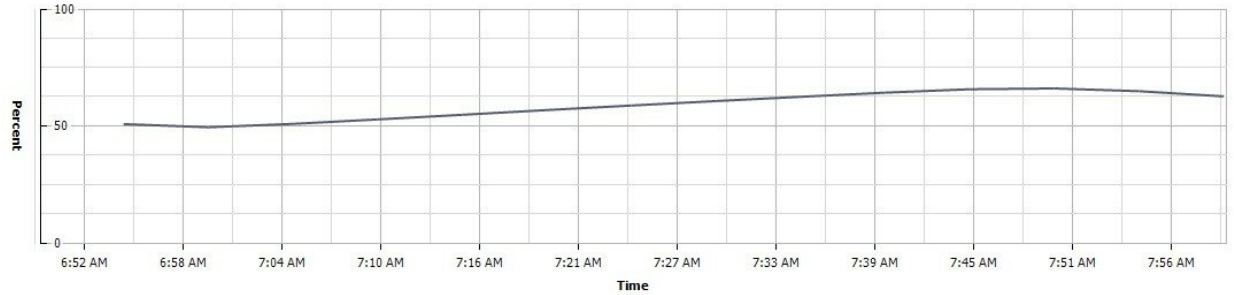


Figure 6 and 7 : Memory usage throughout the test

IO Throughout the Test

Figure 8: English

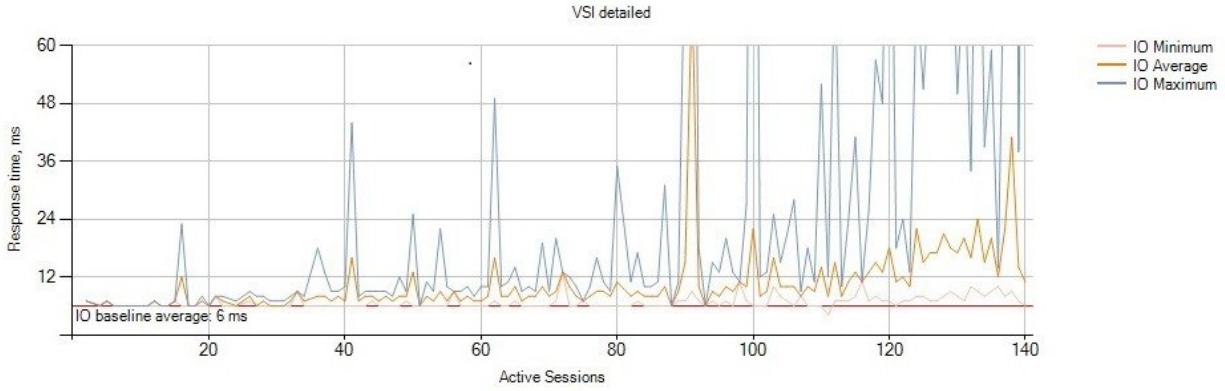


Figure 9: Japanese

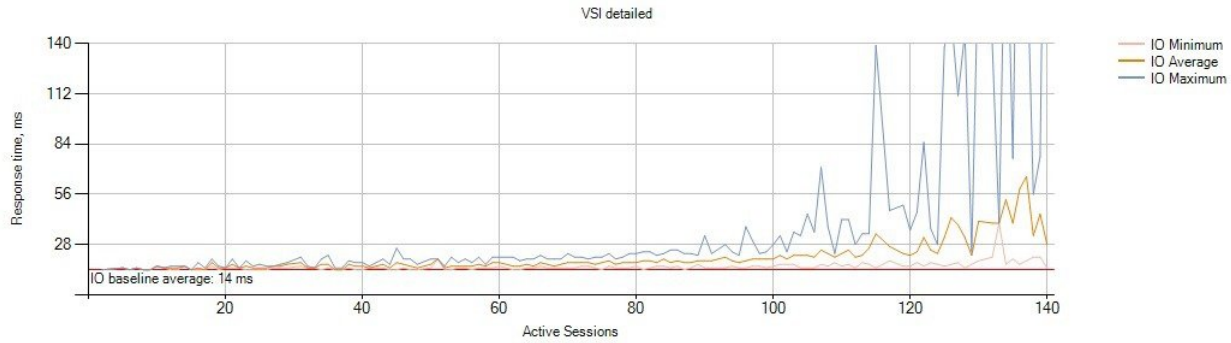


Figure 8 and 9 : IO throughout the test

Medium Workload Result

Medium		
Desktop OS	**No.of Launched Sessions**	**VSI Max**
English	130	122
Japanese	145	120

Login VSIMax

Figure 10: English

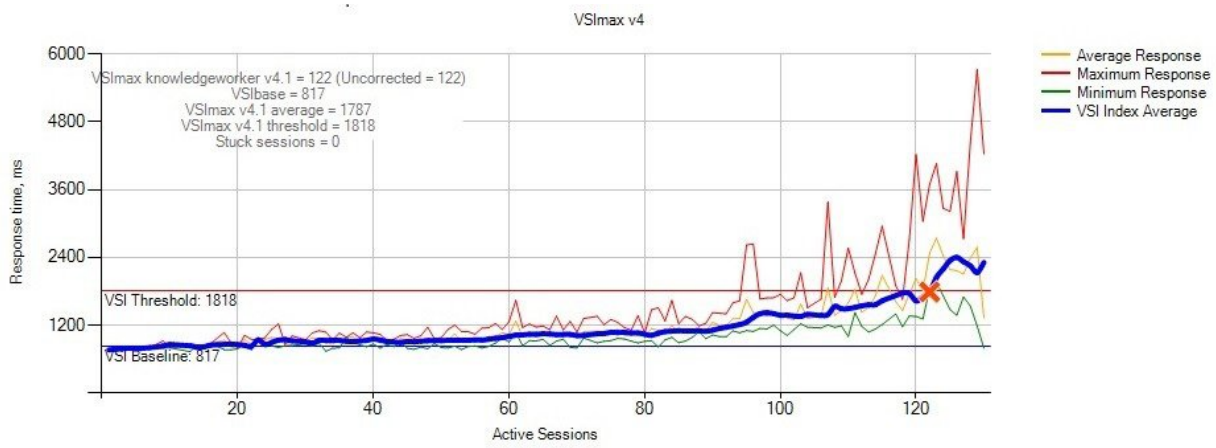


Figure 11: Japanese

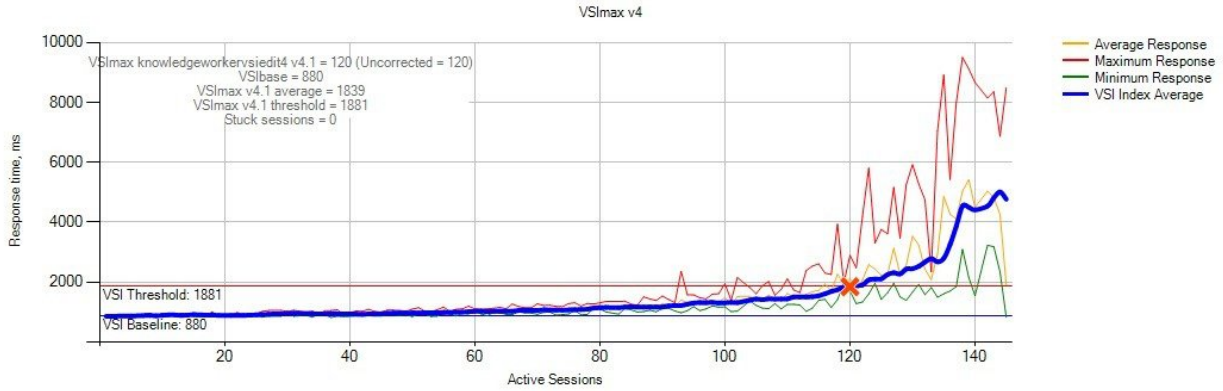


Fig 10 and 11: Average virtual desktop response times at various number of virtual desktops on the Cisco UCS M2814server

Processor And Memory Utilization throughout the test

Figure 12: English

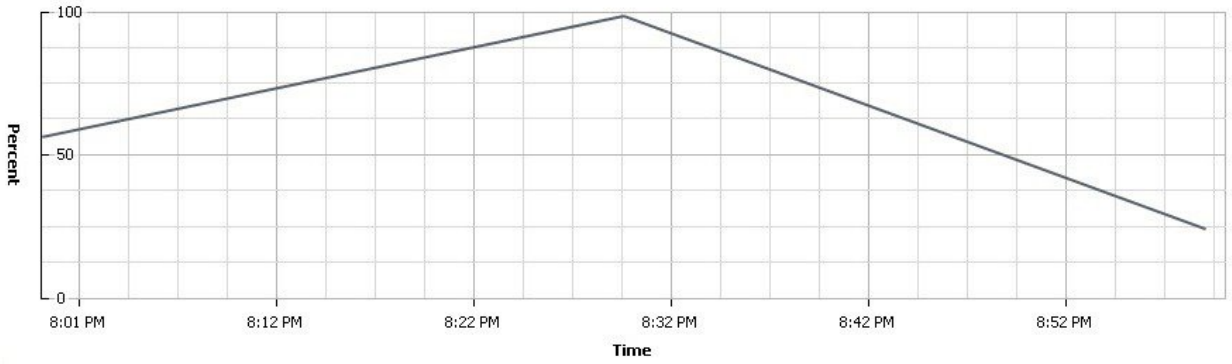


Figure 13: Japanese

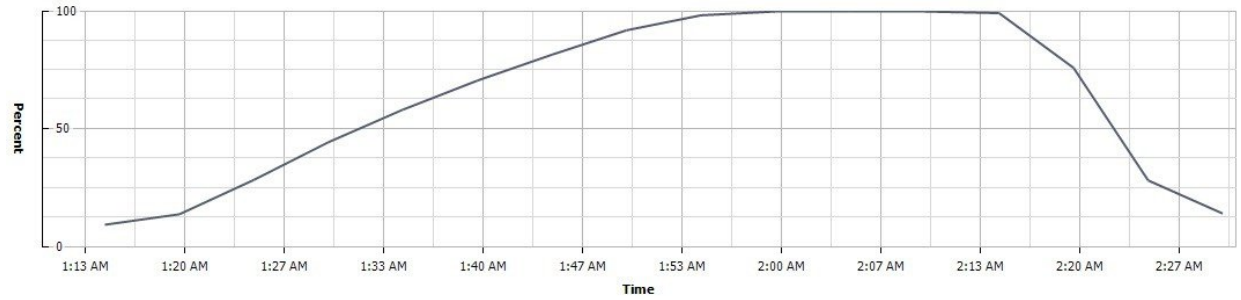


Figure 12 and 13 : CPU utilization throughout the test

Figure 14: English

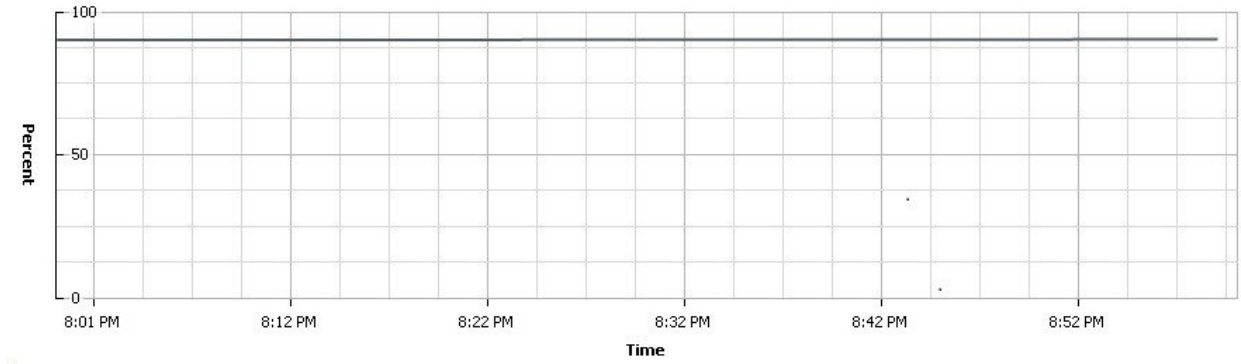


Figure 15: Japanese

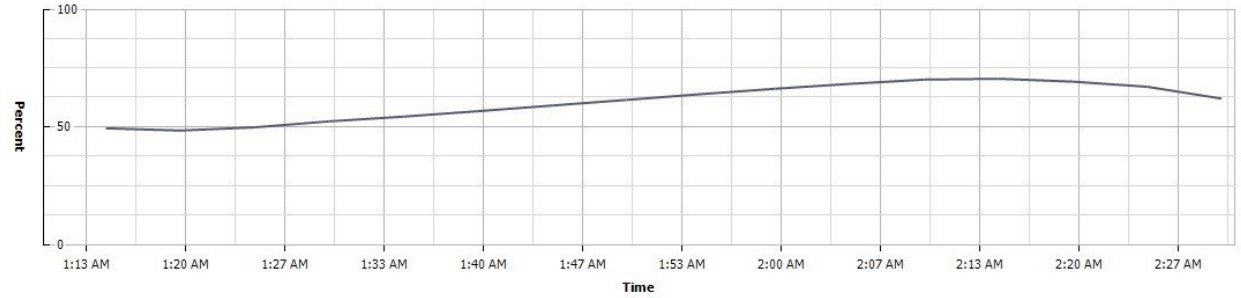


Figure 14 and 15: Memory usage throughout the test

IO Throughout the Test

Figure 16: English

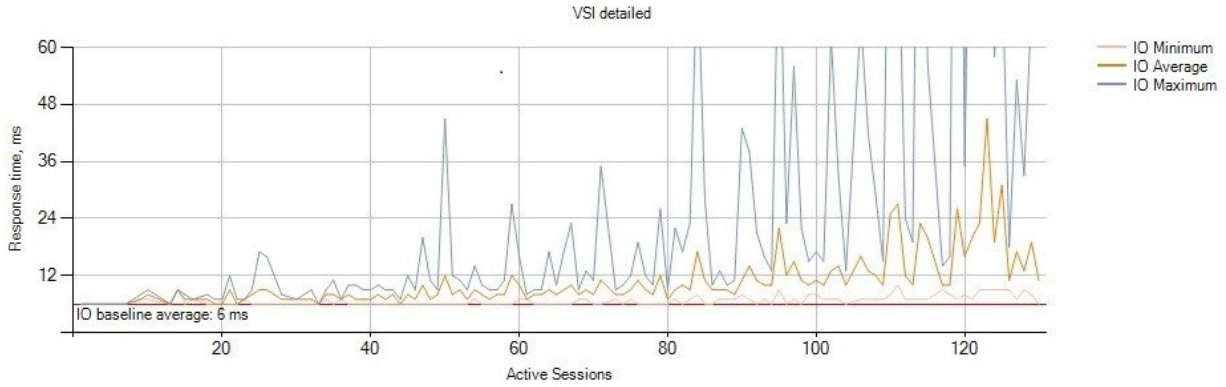


Figure 17: Japanese

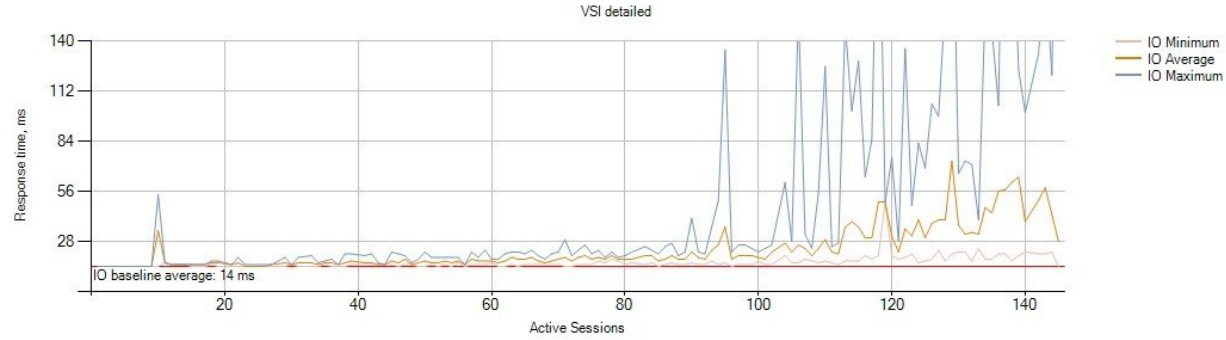


Figure 16 and 17: IO throughout the test

Heavy Workload Result

Heavy		
Desktop OS	**No.of Launched Sessions**	**VSI Max**
English	130	114
Japanese	130	111

Login VSIMax

Figure 18: English

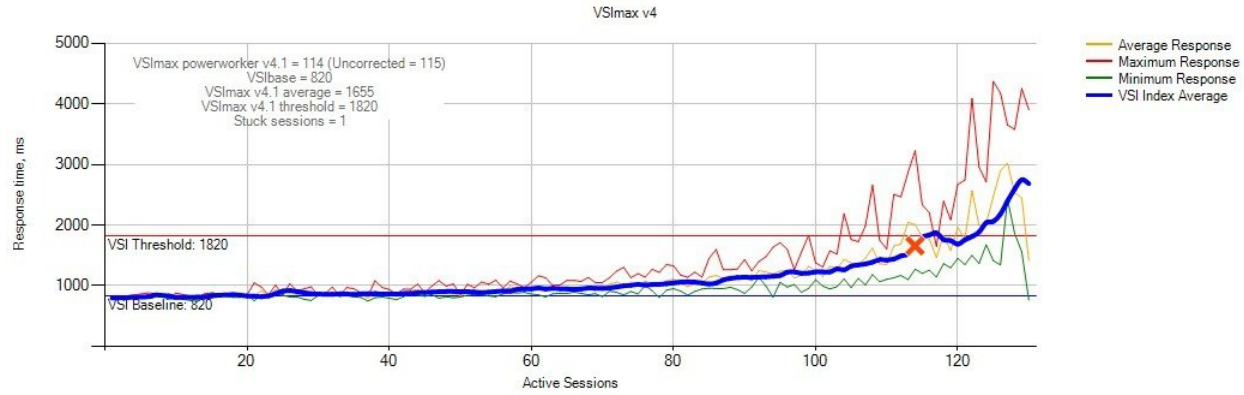


Figure 19: Japanese

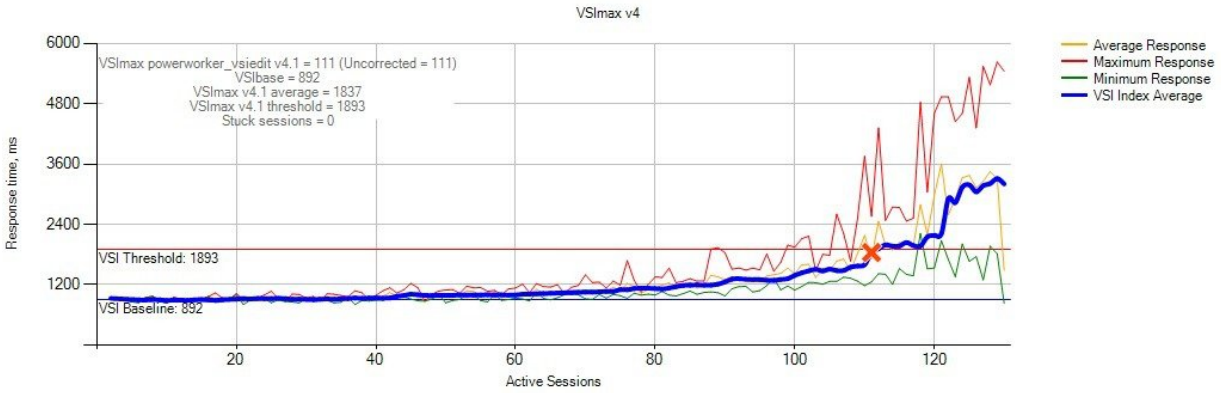


Fig 18 and 19: Average virtual desktop response times at various number of virtual desktops on the Cisco UCS M2814server

Processor And Memory Utilization throughout the test

Figure 20: English

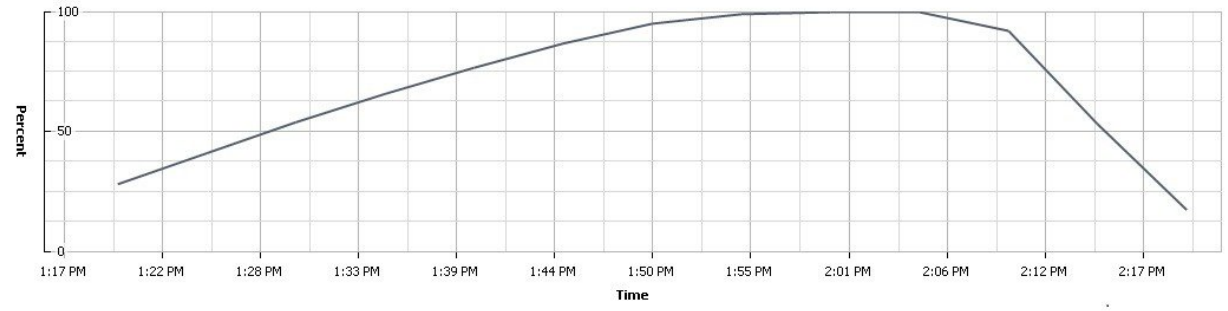


Figure 21: Japanese

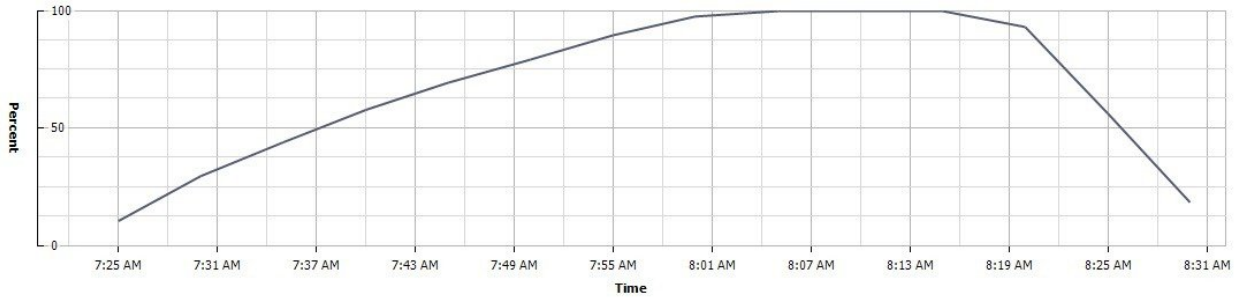


Figure 20 and 21: CPU utilization throughout the test

Figure 22: English

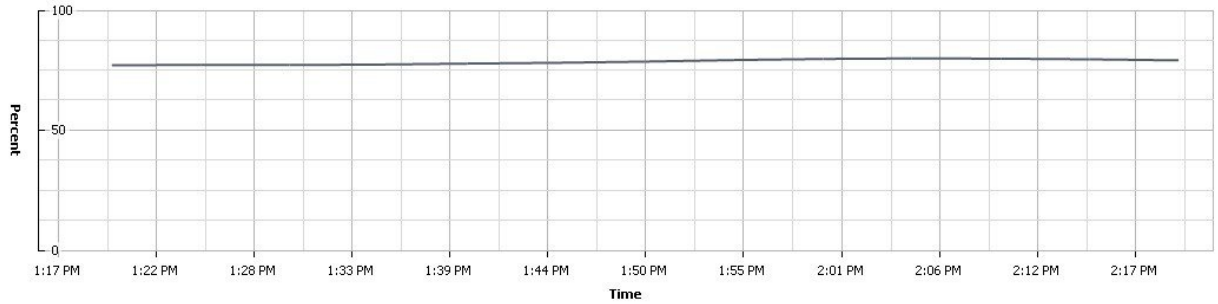


Figure 23: Japanese

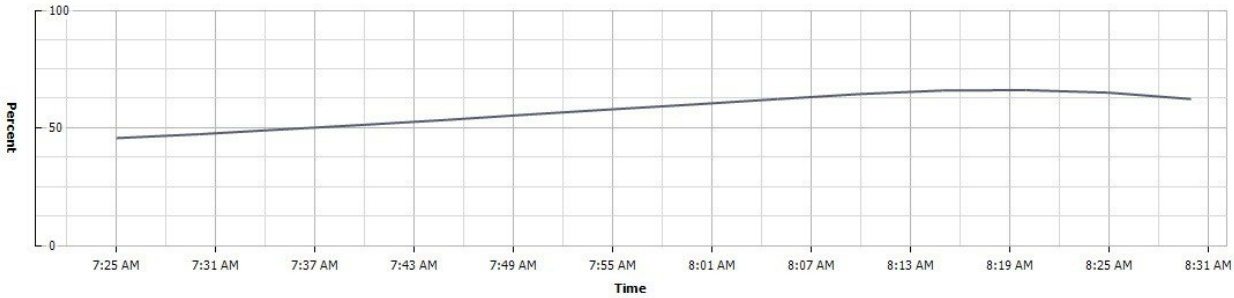


Figure 22 and 23: Memory usage throughout the test

IO Throughout the Test

Figure 24: English

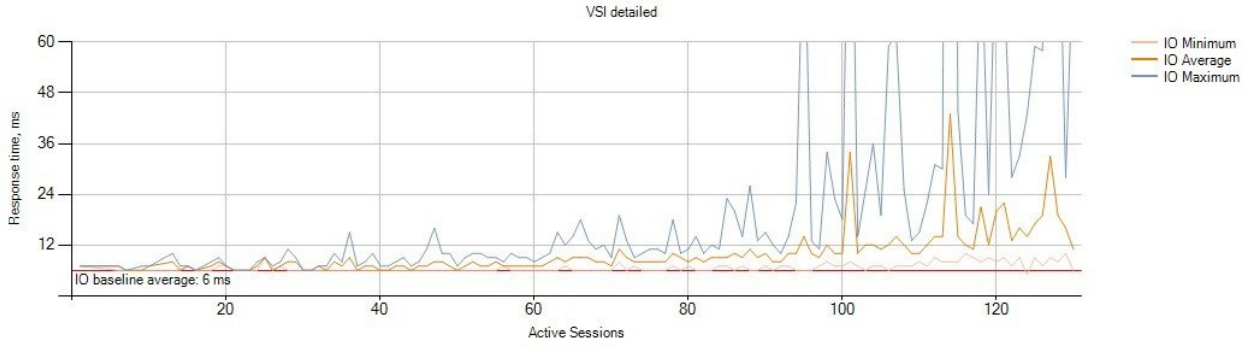


Figure 25: Japanese

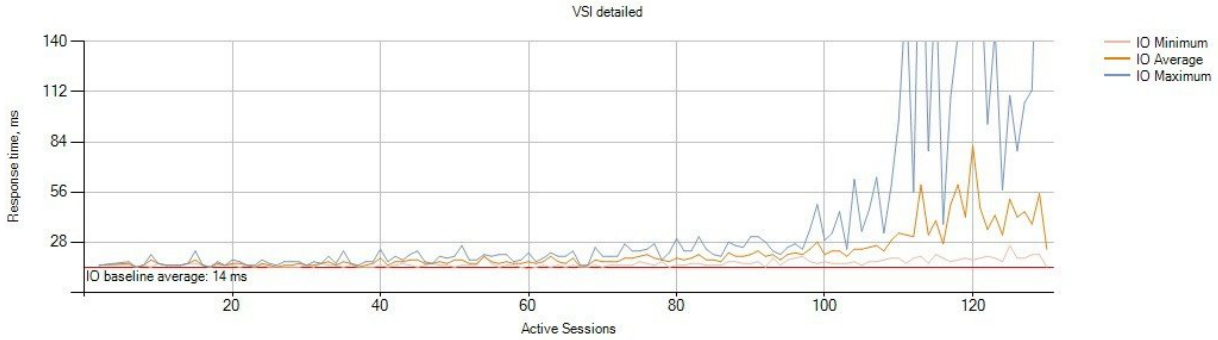


Figure 24 and 25: IO throughout the test

Related Documentation

Cisco Unified Computing

http://www.cisco.com/c/en/us/products/servers-unified-computing/index.html

http://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-m-series-modular-servers/datasheet-c78-735427.html

Login VSI

http://www.loginvsi.com/documentation/index.php?title=Main_Page

VMware Horizon View

https://www.vmware.com/support/horizon-view/doc/horizon-view-602-release-notes.html