

Performance Benchmark Report for Service Manager 9.30

Performance Test using LoadRunner against a Service Manager 9.30 system on Windows running with an Oracle Database on Windows.

HP® Software — Service Management



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Introduction

Hewlett-Packard is ranked among the top software companies worldwide. HP provides solutions that enable companies to manage infrastructure and simplify employee access to that infrastructure, as well as extend next generation e-Business capabilities inside the enterprise and outside the firewall.

HP software delivers rich functionality with robust performance. To ensure that this performance is maintained at high volumes, HP's development team routinely conducts benchmarks on all HP products.

The benchmarks demonstrate HP software's performance characteristics for a range of processing volumes in a specific configuration. Customers and prospects can use this information to determine the software, hardware, and network configurations necessary to support their processing volumes.

This document details the benchmark of HP Service Manager 9.30 on Windows Server 2008 and Oracle 11.0 with a 2500 concurrent user load.

Scope

Service Manager 9.30 was benchmarked in a horizontally load balanced configuration with Oracle on Windows via the web-based client interface. The software used to conduct the benchmark was LoadRunner 11.0. LoadRunner is a capacity-testing tool that records the user actions and compiles them into a script used by one or more virtual users. The test administrator can specify the number of users, the types of transactions, transaction arrival and duration of the test. Different user transaction profiles running during a 120-minute timeframe were simulated for 2500 plus concurrent users.

Test Environment

Hardware

All tests were conducted at the HP Rancho Bernardo facility in San Diego, CA using the following physical assets:

ID	Usage	CPU and RAM	OS
1	SM 9.30 Server (loadBalancer and Background Processes, 16 servlets)	Xeon X55702 x 2.93GHz w/72GB	Win 2008 64-bit
2	SM 9.30 Server (22 servlets)	Xeon X5365 2 x 3.00GHz w/32GB	Win 2008 64-bit
3	SM 9.30 Server (22 servlets)	Xeon X5365 2 x 3.00GHz w/32GB	Win 2008 64-bit
4	LoadRunner /VU Controller	Xeon X55702 x 2.93GHz w/3GB	Win 2003
5	VU generator	Xeon X55702 x 2.93GHz w/32GB	Win 2008 64-bit
6	VU generator	Xeon X55702 x 2.93GHz w/32GB	Win 2008 64-bit
7	SM 9.30 Web- tier Apache + Tomcat (10 instances)	Xeon X55702 x 2.93GHz w/72GB	Win 2008 64-bit
8	Oracle 11.1 Database server	AMD 8220 4 x 2.80GHz w/32GB	Win 2003 64bit

Software

All tests were conducted with the following software set:

- Service Manager 9.30
- Oracle 11.1
- Windows Server 2008 Enterprise and Standard Editions (32 and 64 bit)
- HP LoadRunner 11.0
- Apache HTTP Server 2.0.61
- Apache Tomcat Server 6.0.30
- Java 6

Performance Test Information

Setup and Tuning

Service Manager was configured to utilize a four-tier client/server architecture that allows for maximum flexibility and customization within a given networked environment. All testing was conducted using the Service Manager web client interface supported by Apache HTTP and Tomcat servers.

Testing was performed with the Windows systems in an *as installed* state with incident matching turned off. During the course of testing, no tuning of the Service Manager or Oracle 11.1 server was required.

Test Scenario

Workflow	Number Of Users	Start Time	Ramp-up Rate
Change Management	800	+0:00:00	9 users every 30 seconds
Incident Management	800	+0:02:20	9 users every 30 seconds
ESS Interaction	800	+0:05:10	9 users every 30 seconds
Problem Management	130	+0:51:30	10 users every 30 seconds
Service Desk	110	+0:59:30	10 users every 30 seconds
Ess Catalog	80	+1:06:30	10 users every 30 seconds

Please see appendix B for details steps/transactions in each workflow.

Performance Benchmarks

The goal of this testing was to determine the system performance when executing the above test script with 2500 users.

Success Criteria

The benchmark tests were considered successful when:

- 2500 users are simultaneously logged in and able to complete the recorded tests.
- The response time goals need to go here

Reporting Methodology

Reports consist of metrics from the HP LoadRunner generated charts, along with a detailed report of what was done and modified to accomplish the test.

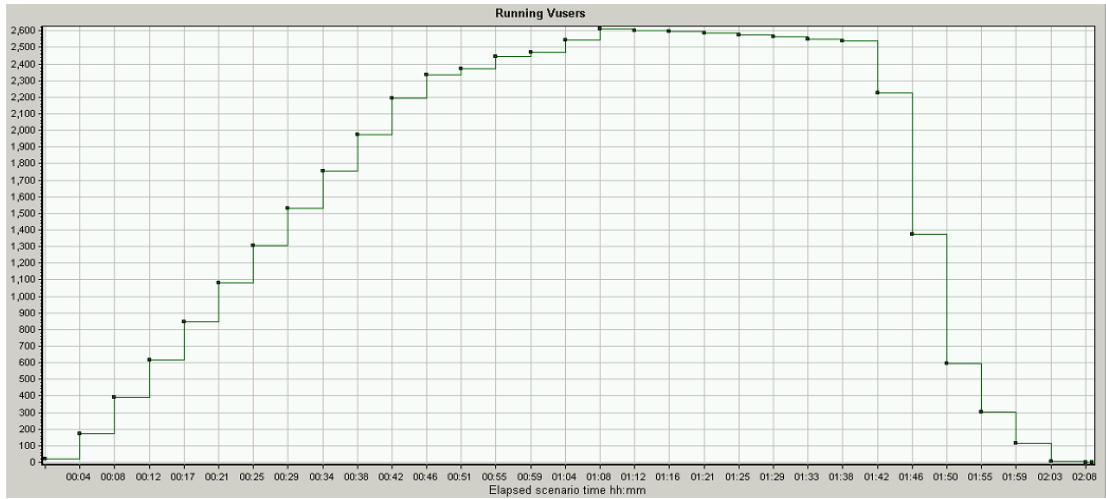
Tools

HP LoadRunner 11.0

This load testing software is produced by Hewlett-Packard. LoadRunner simulates high user loads to gauge hardware limitations of a given system. Data gathered from these tests help to determine if a system can handle a given user load with acceptable response times. The tool launches a predetermined number of users that perform a specific number of transactions in a specified period of time, and records elapsed time, CPU time and number of string copies for each transaction.

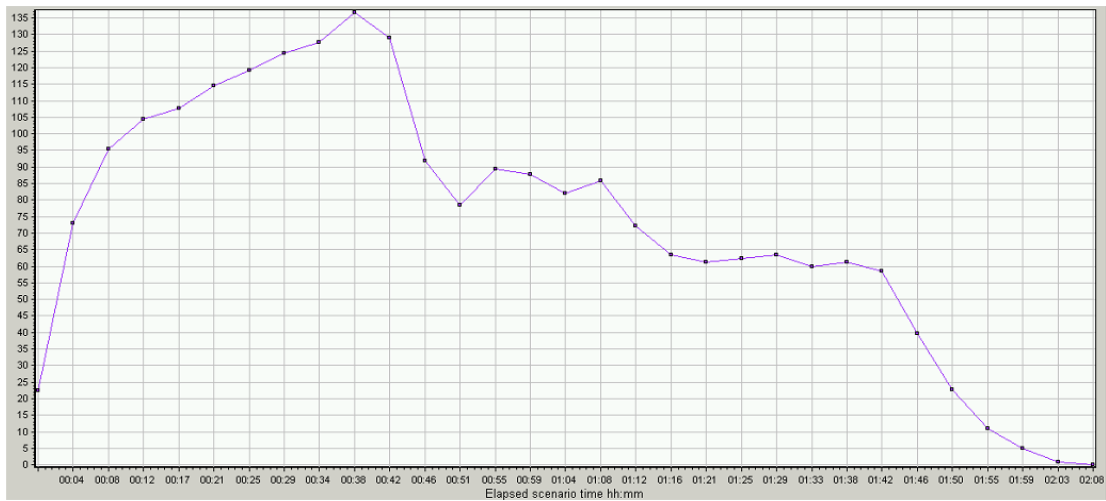
Test Statistics

Maximum Running Vusers: 2,615



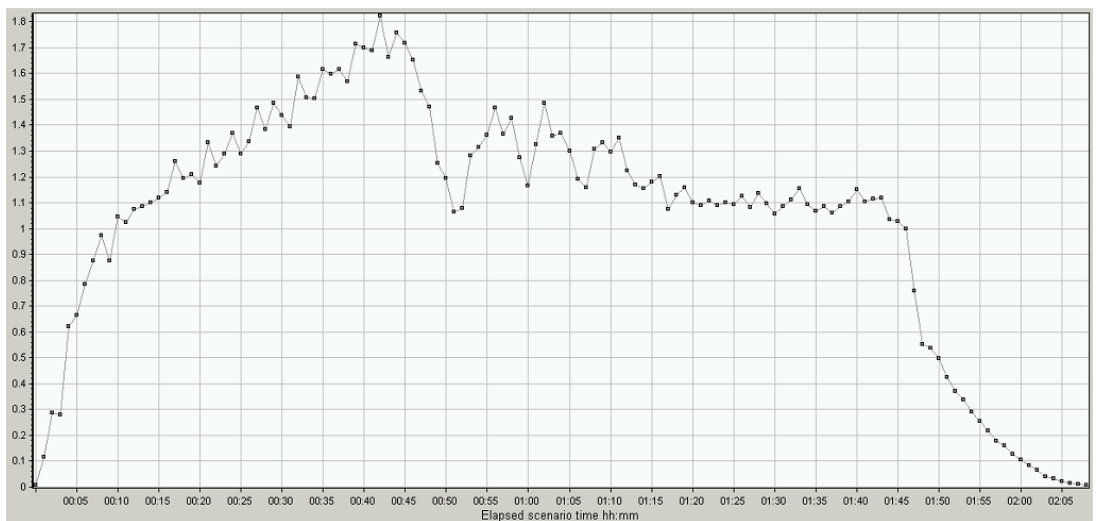
Total Hits: 576,142

Average Hits per Second: 74.543



Total Throughput (bytes): 3,330,513,213

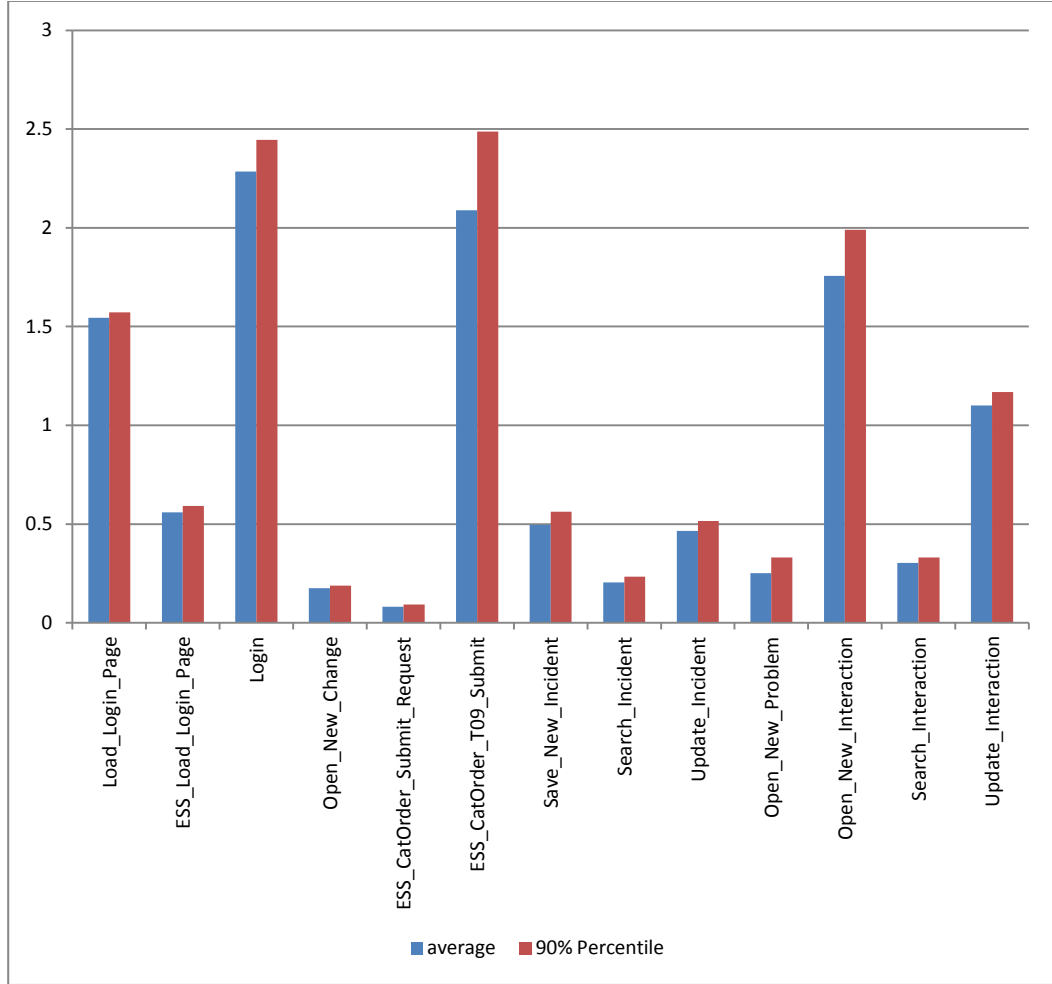
Average Throughput (bytes/second): 430,911



Test Results

The testing conducted during this engagement was concentrated on a horizontally load balanced Service Manager Configuration. The load balanced environment proved to be very robust in its ability to handle large user counts at average ticket volumes.

Important Transactions



Categorized Details

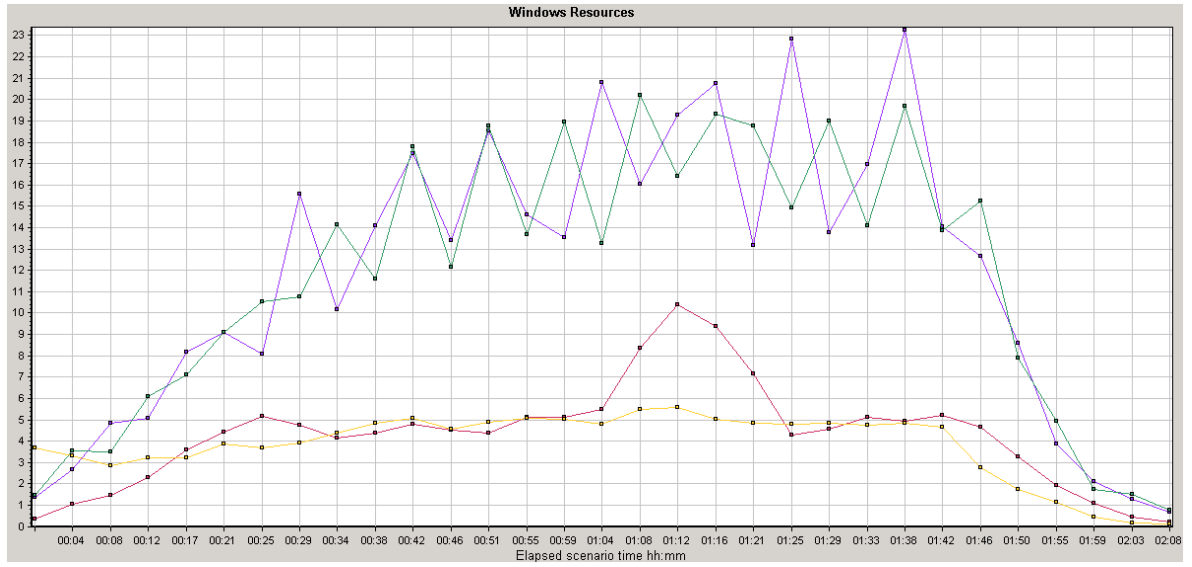
Transaction Name	Minimum	Average	Maximum	90 Percent	Pass	Fail
General transactions						
T00 Load Login Page	1.469	1.545	4.406	1.572	1,837	0
T01 Login	1.858	2.285	12.198	2.446	1,834	0
Change Management						
CM T03 Open New Change	0.047	0.176	0.984	0.188	9,209	0
CM T04 Select Category	0.331	0.557	2.824	0.642	9,209	0
CM T05 Fill Initiated By	0.359	0.469	1.719	0.5	9,209	0
CM T06 Save and Exit	0.203	0.3	2.371	0.337	9,209	0
CM T08 Logout	0.016	0.031	0.359	0.047	800	0
Incident Management						
IM T03 Open New Incident	0.063	0.114	1.035	0.2	3,606	0
IM T04 Fill Area	0.062	0.165	0.797	0.18	3,578	0
IM T05 Select Subarea	0.047	0.073	0.5	0.08	3,578	0
IM T06 Save New Incident	0.375	0.496	1.483	0.562	3,578	0
IM T07 Cancel From Open New Inci	0.016	0.035	0.531	0.071	3,578	0

IM T08 Click Search Incidents	0.125	0.211	0.946	0.371	3,578	0
IM T09 Search Incident 1	0.141	0.205	1.297	0.234	3,578	0
IM T10 Update Incident 1	0.349	0.466	1.375	0.516	3,578	0
IM T11 Update Incident 2	0.141	0.215	0.969	0.25	3,578	0
IM T12 Update Incident 2	0.331	0.448	1.891	0.484	3,578	0
IM T13 Search Incident 3	0.156	0.221	1.326	0.25	3,578	0
IM T14 Fill Closure Code	0.155	0.247	0.734	0.266	3,552	0
IM T15 Select Cause Code	0.125	0.193	0.794	0.219	3,552	0
IM T16 Close Incident	0.034	0.165	0.984	0.178	3,552	0
IM T17 Save and Exit	0.221	0.472	1.588	0.516	3,552	0
IM T18 Cancel From Search Incidents	0	0.024	0.703	0.031	3,552	0
IM T20 Logout	0.016	0.028	0.464	0.031	796	0
ESS Interaction						
T00 ESS Load Login Page	0.489	0.559	1.97	0.592	853	0
T01 ESS Login	1.051	1.304	6.148	1.405	853	0
ESS Inc T02 Request Help	0.09	0.138	1.279	0.157	10,011	0
ESS Inc T03 Submit Request	0.203	0.289	1.97	0.316	10,011	0
ESS Inc T04 Logout	0.019	0.03	0.244	0.04	773	0
Problem Management						
PM T03 Open New Problem	0.165	0.251	5.308	0.331	941	0
PM T04 Fill Assignment Group	0.14	0.196	0.792	0.216	936	0
PM T05 Select Network Group	0.131	0.172	0.663	0.186	936	0
PM T06 Fill Area	0.143	0.194	0.764	0.216	928	0
PM T07 Select Subarea	0.13	0.172	0.613	0.184	928	0
PM T08 Save and Exit	0.308	0.407	0.992	0.464	928	0
PM T10 Logout	0.018	0.039	0.188	0.075	130	0
Service Desk						
SD T03 Register New Interaction	0.096	0.177	0.672	0.242	212	0
SD T04 Fill Contact	0.065	0.085	0.339	0.095	212	0
SD T05 Fill Recipient	0.065	0.085	0.404	0.092	212	0
SD T06 Fill Service	0.079	0.111	0.891	0.122	212	0
SD T07 Fill Category	0.15	0.192	0.564	0.215	209	0
SD T08 Select Area	0.148	0.197	0.846	0.212	203	0
SD T09 Select Subarea	0.069	0.094	0.51	0.105	203	0
SD T10 Escalate	0.127	0.189	0.891	0.206	203	0
SD T11 Escalate Next	1.384	1.756	3.17	1.99	203	0
SD T12 Save and Exit	0.876	1.096	1.608	1.206	203	0
SD T13 Cancel From New Interaction	0.08	0.095	0.199	0.111	203	0
SD T14 Click Search Interaction Records	0.109	0.196	0.574	0.249	203	0
SD T15 Search Interaction 1	0.243	0.303	0.63	0.331	203	0
SD T16 Update Interaction 1	0.924	1.1	1.589	1.169	203	0
SD T17 Search Interaction 2	0.245	0.306	0.731	0.326	203	0
SD T18 Update Interaction 2	0.776	0.931	1.384	1.001	203	0
SD T19 Search Interaction 3	0.258	0.309	0.66	0.337	203	0
SD T20 Update Interaction 3	0.753	0.931	1.366	0.992	203	0
SD T21 Search Interaction 4	0.243	0.32	0.617	0.354	203	0
SD T22 Fill Closure Code	0.214	0.255	0.505	0.278	199	0

SD T23 Select Cause Code	0.226	0.296	0.676	0.33	199	0
SD T24 Close Interaction	0.85	1.03	1.526	1.093	199	0
SD T25 Save and Exit	0.548	0.668	1.051	0.713	199	0
SD T26 Cancel From Interaction Search Form	0.019	0.036	0.08	0.048	199	0
SD T28 Logout	0.019	0.042	0.232	0.13	108	0
ESS Catalog						
T00 ESS Load Login Page	0.489	0.559	1.97	0.592	853	0
T01 ESS Login	1.051	1.304	6.148	1.405	853	0
ESS CatOrder T02 Order From Services Catalog	0.75	0.919	1.91	1.016	240	0
ESS CatOrder T03 Personal Productivity Services	0.743	0.911	1.51	0.973	240	0
ESS CatOrder T04 Hardware Bundles	0.421	0.522	1.046	0.559	240	0
ESS CatOrder T05 Basic PC Package	0.16	0.239	1.081	0.277	240	0
ESS CatOrder T06 Add to Cart	0.166	0.209	0.858	0.216	240	0
ESS CatOrder T07 View Cart Checkout	0.061	0.088	0.719	0.097	240	0
ESS CatOrder T08 Submit Request	0.054	0.082	0.551	0.093	240	0
ESS CatOrder T09 Submit	1.563	2.089	2.85	2.488	240	0
ESS CatOrder T10 Continue	0.026	0.038	0.265	0.043	240	0
ESS CatOrder T12 Logout	0.035	0.044	0.079	0.051	80	0

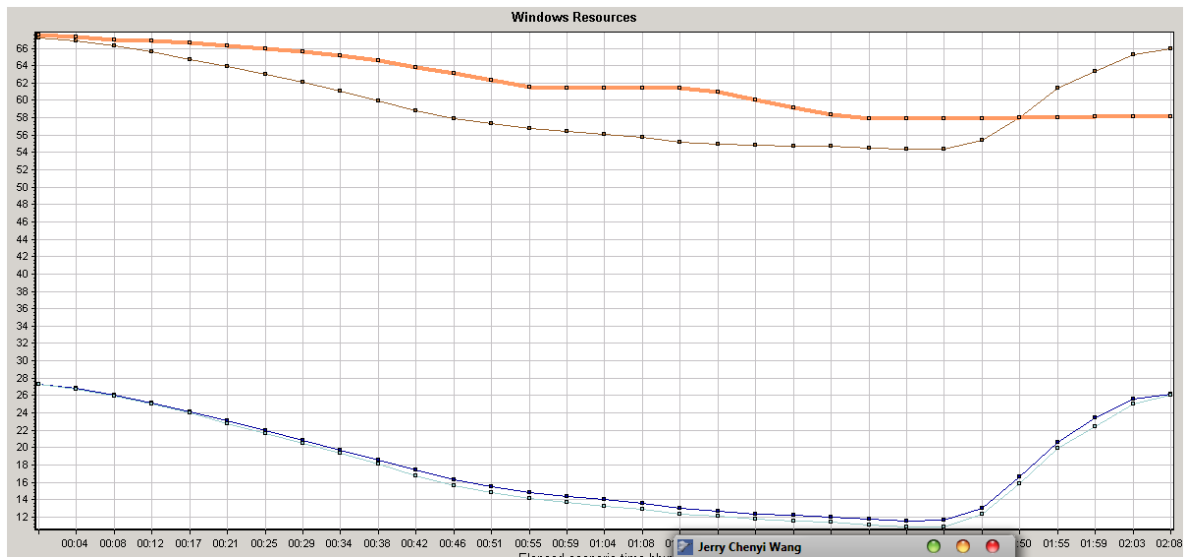
System Resource Consumption

CPU



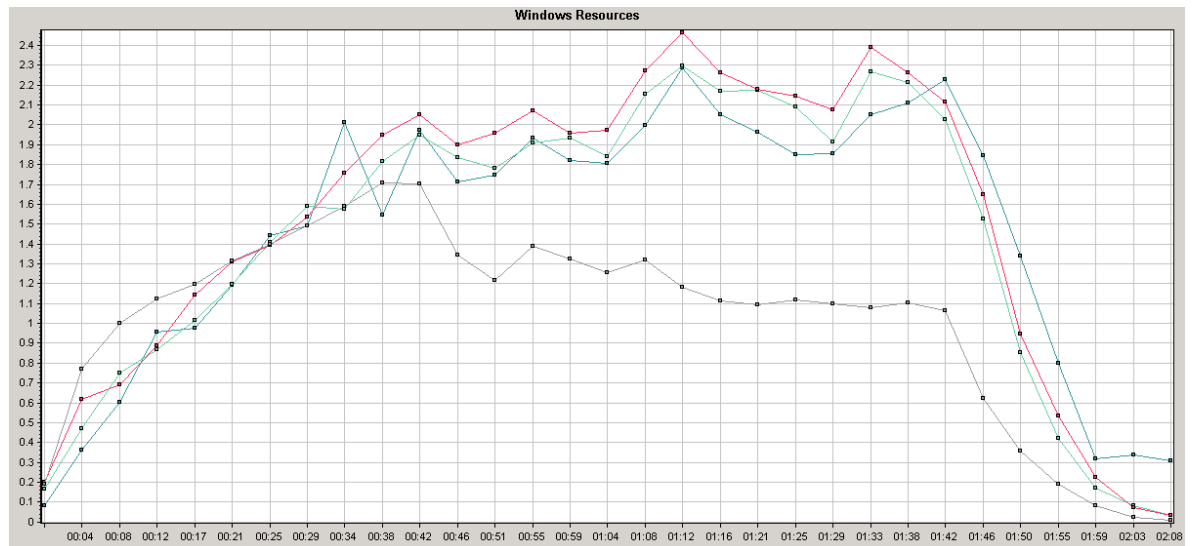
Color	CPU Utilization	Minimum	Average	Maximum
■	SM Primary Server	0	4.368	19.106
■	Apache Load-balancer and SM Webtier	0	3.892	35.254
■	SM Secondary Server	0	12.13	40.104
■	SM Secondary Server	0	11.929	35.807

Memory



Color	Memory Available(in MB)	Minimum	Average	Maximum
■	SM Primary Server	54327	59404.12	67216
■	Apache Loadbalancer and SM Webtier	57899	62037.22	67693
■	SM Secondary Server	11488	17918.7	27395
■	SM Secondary Server	10731	17375.53	27385

Network



Color	Total Bytes Per Second	Minimum	Average	Maximum
Green	SM Primary Server	7672.223	1556383	4245873
Tan	Apache Loadbalancer and SM Webtier	6881.352	1042072	2713261
Magenta	SM Secondary Server	7474.527	1481531	4987746
Cyan	SM Secondary Server	6687.668	1472440	4430678

Oracle

AWR report during test period shows no contention or slow SQL queries.

Problems and Issues

There were no Service Manager problems or issues encountered during testing.

Conclusions

Service Manager performed acceptably during testing and demonstrated good scalability. All of the response time goals, up to the maximum tested concurrent user level of 2500 users, were met with a significant margin for increased workload.

Service Manager 9.30 is a complex product and extensive customization is possible that will substantially affect system response. Care should be taken when customizing Service Manager to ensure no adverse conditions are introduced. Implementers should evaluate performance continually throughout the Development and UAT implementation phases. Due to limitations of the 32-bit Windows architecture and Oracle's Windows product architecture, it is not recommended to implement more than a small environment with Service Manager or the Oracle RDBMS on 32-bit Windows. Service Manager Implementations in medium or larger environments that wish to use Service Manager or Oracle RDBMS on Windows should move to the 64-bit AMD or Intel architecture.

Appendix A: Service Manager Settings

Sm.ini

```
# ServiceManager Initialization file
# (c) Copyright 2008 Hewlett-Packard Development Company, L.P.
# Configuration Modified Date:6/22/11 11:07 AM
shared_memory:128000000
log:../logs/sm.log
system:62271
httpPort:62271
sslConnector:0
#httpsPort:13443
sqldictionary:oracle10
[oracle10]
sqldb:pdoperf04
sqllogin:*****/*****
sqllibrary:sqoracle.oci10.DLL
plugin0:kmplugin.dll
[oracle10]
groupname:SM930RC_Perf_Test
groupport:55000
grouplicenseip:15.178.176.226
ir_asynchronous:1
threadsperprocess:50
ntservice:HP_SM930RC
```

Sm.cfg

Load Balancer machine:

```
sm -loadBalancer -httpPort:62271 -recordtestscript:1
sm -httpPort:62273 -recordtestscript:1 -log:../logs/sm.62273.log
sm -httpPort:62275 -recordtestscript:1 -log:../logs/sm.62275.log
sm -httpPort:62277 -recordtestscript:1 -log:../logs/sm.62277.log
sm -httpPort:62279 -recordtestscript:1 -log:../logs/sm.62279.log
sm -httpPort:62281 -recordtestscript:1 -log:../logs/sm.62281.log
sm -httpPort:62283 -recordtestscript:1 -log:../logs/sm.62283.log
sm -httpPort:62285 -recordtestscript:1 -log:../logs/sm.62285.log
sm -httpPort:62287 -recordtestscript:1 -log:../logs/sm.62287.log
sm -httpPort:62289 -recordtestscript:1 -log:../logs/sm.62289.log
sm -httpPort:62291 -recordtestscript:1 -log:../logs/sm.62291.log
sm -httpPort:62293 -recordtestscript:1 -log:../logs/sm.62293.log
sm -httpPort:62295 -recordtestscript:1 -log:../logs/sm.62295.log
sm -httpPort:62297 -recordtestscript:1 -log:../logs/sm.62297.log
sm -httpPort:62299 -recordtestscript:1 -log:../logs/sm.62299.log
sm -httpPort:62301 -recordtestscript:1 -log:../logs/sm.62301.log
sm -httpPort:62307 -recordtestscript:1 -log:../logs/sm.62307.log

#
# start background schedulers
#
sm system.start
sm -que:ir
```

Appendix B: Steps / Transactions In Each Workflow

Workflows

(In all Vuser_end there is only one transaction: Logout)

Workflow	Vuser_Init	Action
Change Management	Start page; Login; Navigate to Open_New_Change;	(3 iterations) <ul style="list-style-type: none"> • Open New Change; • Select Category; • Fill Initiated By; • Save And Exit;
Incident Management	Start page; Login;	(3 iterations) <ul style="list-style-type: none"> • Open New Incident • Fill hardware; • Fill Area; • Select Sub Area; • Fill Service; • Save New Incident; • Cancel From Open New Incident; • Click Search Incident; • Search Incident_1; • Update Incident_1; • Search Incident_2; • Update Incident_2; • Search Incident_3; • Update Incident_3 • Cancel From Search Incident;
ESS Interaction	Start page; Login;	(3 iterations) <ul style="list-style-type: none"> • Request help; • Submit request;
Problem Management	Start page; Login; Navigate to Open_New_Problem;	(3 iterations) <ul style="list-style-type: none"> • Open New Problem; • Fill Area; • Select Sub Area; • Save And Exit;
Service Desk	Start page; Login; Navigate to Open_New_Interaction	<ul style="list-style-type: none"> • Register New Interaction; • Fill Contact; • Fill Recipient; • Fill Service; • Fill Category; • Save New Incident; • Fill Area; • Select Sub Area; • Escalate; • Escalate Next; • Save And Exit; • Cancel From New Interaction; • Click Search Interaction_1; • Update Interaction_1; • Click Search Interaction_2; • Update Interaction_2; • Click Search Interaction_3; • Update Interaction_3; • Click Search Interaction_4; • Fill Closure Code; • Save And Exit; • Cancel From Interaction Search;
Ess Catalog	Start page; Login;	(2 iterations) <ul style="list-style-type: none"> • Order From Product; • Personal Productivity; • Hardware Bundles; • Basic_PC_Package; • Add To Cart; • View Cart Checkout; • Submit Request; • Submit; • Continue; • Select Main Menu;

For more information

Please visit the HP Software support Web site at:

www.hp.com/go/hpssoftwaresupport

This Web site provides contact information and details about the products, services, and support that HP Software offers.

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- Submit and track progress on support cases
- Submit enhancement requests online
- Download software patches
- Manage a support contract
- Look up HP support contacts
- Review information about available services
- Enter discussions with other software customers
- Research and register for software training

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www.hp.com/go/hpssoftwaresupport/new_access_levels

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www.hp.com/go/hpssoftwaresupport/passport-registration

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