



ProLiant Essentials Performance Management Pack: Case Study



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Agenda

- **Introduction**
- Performance Management Pack (PMP) overview
 - Installation
 - Licensing
 - UI
- Nationwide Implementation
 - Case Studies
 - Benefits
 - Lessons Learned
- PMP ROI Calculator
- Useful Links and Tips
- Q&A



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PMP 3.0: What is it?

A ProLiant performance management solution integrated with HP SIM 4.1 and Insight Manager Agents

- Performance Analysis
 - On-Line
 - Off-Line
 - Static
- Nothing to install if you have SIM 4.1 and “recent” agents
- Only pertinent performance parameters and an explanation of the values are presented

PMP 3.0: What does it monitor?

- CPU
- Memory
- Smart Array/SCSI/IDE controllers
- Direct-attached SCSI/ATA disks
- Network Interface Controllers
- Fibre Channel Host Bus Adapters
- PCI Bus
- HP MSA500 and MSA1000 storage devices

Static Analysis

Processors

- Mixed Cache Sizes
- Mixed Frequencies

Memory

- Available physical memory <20MB

Network Interface Controllers

- Running at speeds lower than the maximum
- Teaming Issues

Storage

- Negotiated speed slower than supported
- Logical disk comprised of disks with different drive speeds
- Logical disk comprised of disks with different drive capacities

Host buses

- Bus overload
- Bus unbalanced

PMP 3.0 Product Architecture

Front tier:

- Windows system running Internet Explorer 6.0 or later

Middle tier:

SIM 4.1 running under:

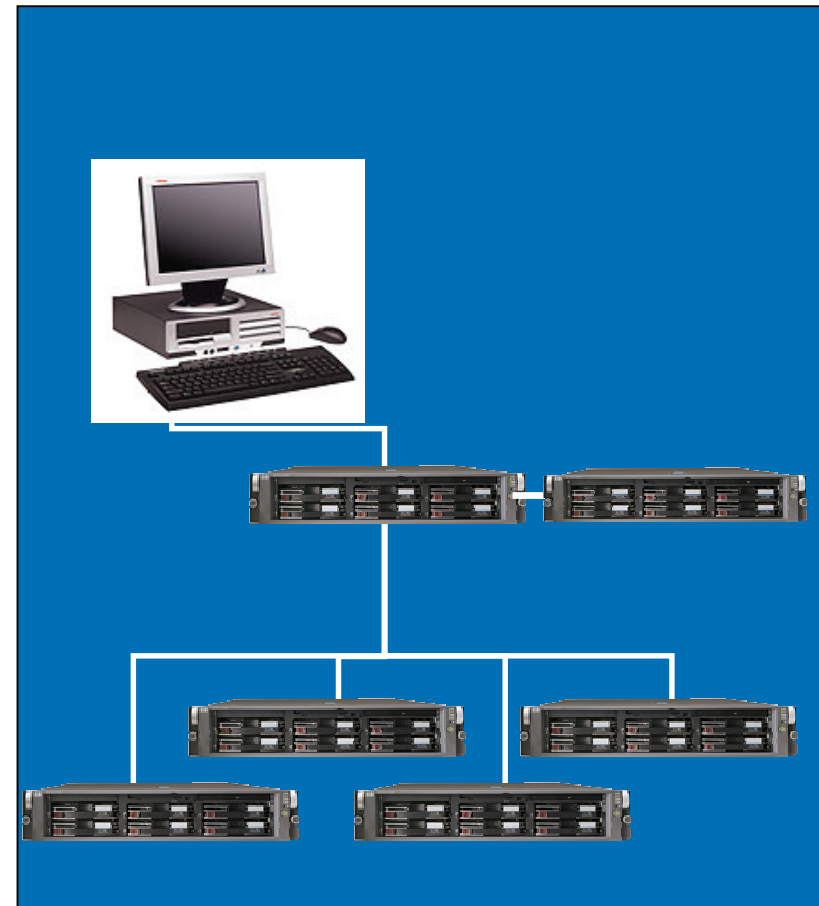
- Windows XP Pro SP1
- Windows 2000 SP2
- Windows Server 2003

Using either:

- MSDE SP3 (local only)
- SQL Server 2000 SP3

Monitored servers:

- NT 4.0 SP6a: Insight Agents 6.10.1.0
- W2K SP2: Insight Agents 6.20
- W2K3: Insight Agents 6.40



Installation Overview

- PMP 3.0 is automatically installed with both typical and custom installations of SIM 4.1 for Windows
- Same database type (MSDE/SQL) and location (remote/local) as other SIM 4.1 components
- PMP 3.0 will migrate existing logged data and licenses from PMP 2.1

Installation Overview (contd.)

PMP modifies the SIM 4.1 menus as follows:

- Optimize
 - Performance Management Pack
 - Online Analysis
 - Offline Analysis
- Reports
 - Performance Management Pack Reports
 - Static Analysis Report
 - System Summary Report
 - CSV (comma-separated-value) File Generator
- Options
 - Performance Management Pack Options
 - Licensing
 - Configuration
 - Manual Log Purge

Licensing Overview

Free Licenses

- Central Management Server
- Pre ML/DL Servers (ProLiant 5500, 6400R, 6500, 7000, 8000, and 8500 equipped with Pentium III Xeon or better)
- 5 Additional Servers

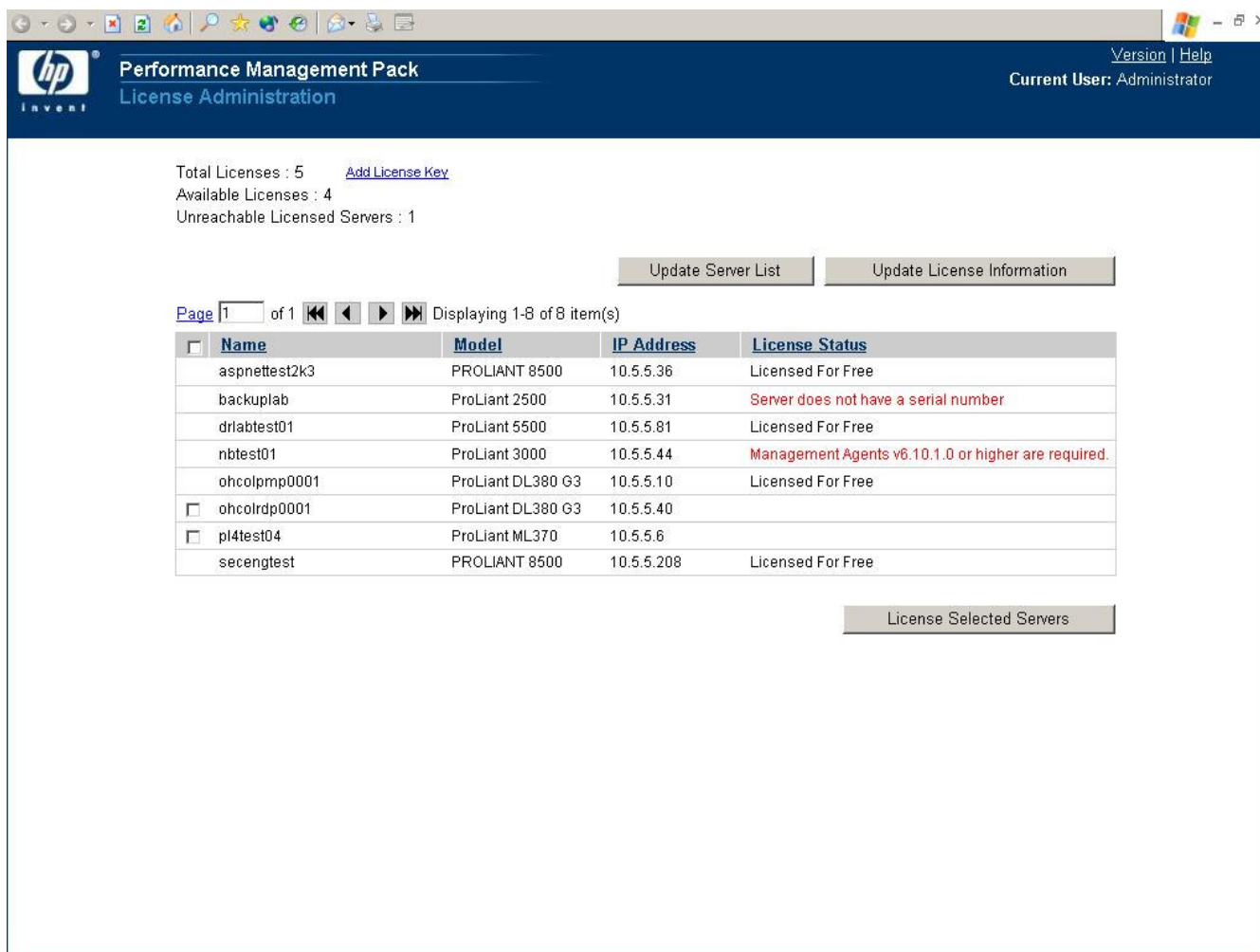
Additional Trial Licenses

- Contact HP sales team

For Fee Licenses

- Single License
- Flexible License
- Tracking License

PMP Licensing Screen



Performance Management Pack
 License Administration

Version | Help
 Current User: Administrator

Total Licenses : 5 [Add License Key](#)
 Available Licenses : 4
 Unreachable Licensed Servers : 1

Update Server List Update License Information

Page 1 of 1 Displaying 1-8 of 8 item(s)

<input type="checkbox"/>	Name	Model	IP Address	License Status
<input type="checkbox"/>	aspmtest2k3	PROLIANT 8500	10.5.5.36	Licensed For Free
<input type="checkbox"/>	backiplab	ProLiant 2500	10.5.5.31	Server does not have a serial number
<input type="checkbox"/>	drlabtest01	ProLiant 5500	10.5.5.81	Licensed For Free
<input type="checkbox"/>	nbtest01	ProLiant 3000	10.5.5.44	Management Agents v6.10.1.0 or higher are required.
<input type="checkbox"/>	ohcolpmp0001	ProLiant DL380 G3	10.5.5.10	Licensed For Free
<input type="checkbox"/>	ohcolrdp0001	ProLiant DL380 G3	10.5.5.40	
<input type="checkbox"/>	pl4test04	ProLiant ML370	10.5.5.6	
<input type="checkbox"/>	secengtest	PROLIANT 8500	10.5.5.208	Licensed For Free

License Selected Servers

Licensing Rules

Licenses cannot be applied under these conditions:

- The server is not supported
- The server does not have a serial number
- The agents do not meet version requirements
- The Service Pack level does not meet the minimum requirements

After a license is applied it is permanently “attached” to that server. When that server is retired the license is retired along with the server.

Data Collection Overview

- Data collection intervals configured globally or per-server via Management agents on servers
- Configure performance management parameters globally or per-server (via Options - Performance Management Pack Options – Configuration) and apply

Data Collection Overview (contd.)



Performance Management Pack
Monitoring Administration

Version | Help
Current User: Administrator

Server | Network Storage

Last Updated: Jul 12, 2004 12:32:03 PM
Unreachable Licensed Servers : 1

Update Server List

Page 1 of 1 Displaying 1-4 of 4 item(s)

<input type="checkbox"/>	PE	Name	Model	IP Address	Monitor Status	Alert	Log	Sample Rate	Samples
<input type="checkbox"/>	?	aspnertest2k3	PROLIANT 8500	10.5.5.36	Started	✓	✓	1800	5
<input type="checkbox"/>	?	drialtest01	ProLiant 5500	10.5.5.81	Started	✓		1800	10
<input type="checkbox"/>	?	ohcolpmp0001	ProLiant DL380 G3	10.5.5.10	Started	✓	✓	120	5
<input type="checkbox"/>	?	secengtest	PROLIANT 8500	10.5.5.208	Started	✓	✓	1800	5

Apply the following parameters on the selected servers

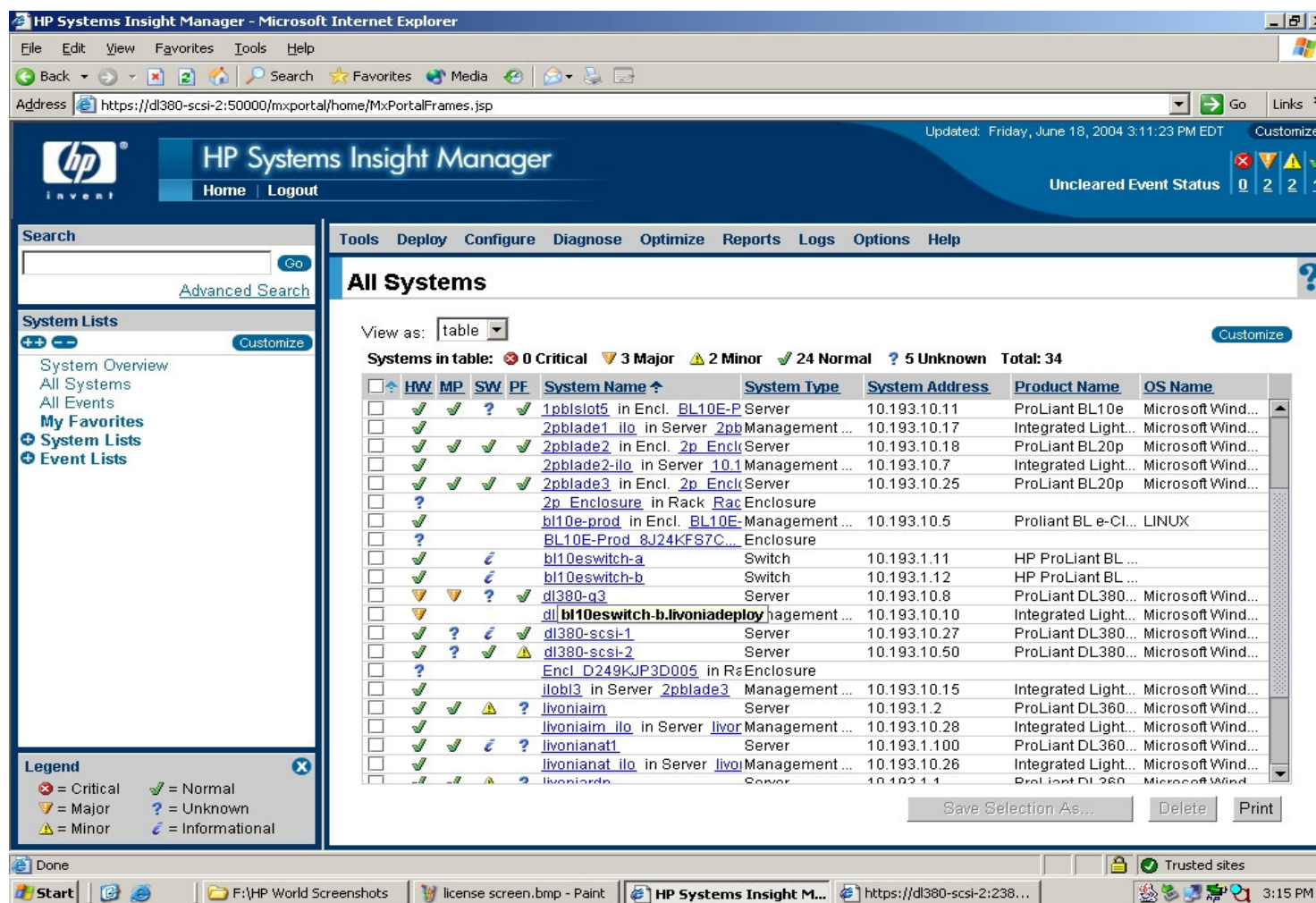
☒ Monitor ☒ Alert ☐ Log

Number of samples to determine status: 5

Apply

- **Monitor:** Enables monitoring of the status of the servers, updating information displayed in SIM and PMP
- **Alert:** Sends alerts to SIM whenever the status of a server changes
- **Log:** Stores detailed performance information for later reporting or playback

SIM 4.1 All Systems View



HP Systems Insight Manager - Microsoft Internet Explorer

Address: <https://dl380-scsi-2:50000/mxportal/home/MxPortalFrames.jsp>

Updated: Friday, June 18, 2004 3:11:23 PM EDT

Uncleared Event Status: 0 Critical, 3 Major, 2 Minor, 24 Normal, 5 Unknown

Tools: Deploy, Configure, Diagnose, Optimize, Reports, Logs, Options, Help

All Systems

View as: table Customize

Systems in table: 0 Critical, 3 Major, 2 Minor, 24 Normal, 5 Unknown, Total: 34

	HW	MP	SW	PF	System Name	System Type	System Address	Product Name	OS Name
<input type="checkbox"/>	✓	✓	?	✓	1pblslot5 in Encl. BL10E-P Server	Server	10.193.10.11	ProLiant BL10e	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	2pblade1 ilo in Server 2pb Management ...	Server	10.193.10.17	Integrated Light...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	2pblade2 in Encl. 2p Encl Server	Server	10.193.10.18	ProLiant BL20p	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	2pblade2-ilo in Server 10.1 Management ...	Server	10.193.10.7	Integrated Light...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	2pblade3 in Encl. 2p Encl Server	Server	10.193.10.25	ProLiant BL20p	Microsoft Wind...
<input type="checkbox"/>	?	?	?	?	2p Enclosure in Rack Rac Enclosure	Enclosure			
<input type="checkbox"/>	✓	✓	✓	✓	bl10e-prod in Encl. BL10E- Management ...	Server	10.193.10.5	ProLiant BL e-Cl...	LINUX
<input type="checkbox"/>	?	?	?	?	BL10E-Prod 8J24KF87C...	Enclosure			
<input type="checkbox"/>	✓	✓	✓	✓	bl10eswitch-a	Switch	10.193.1.11	HP ProLiant BL...	
<input type="checkbox"/>	✓	✓	✓	✓	bl10eswitch-b	Switch	10.193.1.12	HP ProLiant BL...	
<input type="checkbox"/>	✓	✓	✓	✓	dl380-g3	Server	10.193.10.8	ProLiant DL380...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	dl bl10eswitch-b.livoniadeploy	Management ...	10.193.10.10	Integrated Light...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	dl380-scsi-1	Server	10.193.10.27	ProLiant DL380...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	dl380-scsi-2	Server	10.193.10.50	ProLiant DL380...	Microsoft Wind...
<input type="checkbox"/>	?	?	?	?	Encl D249KJP3D005 in R Enclosure	Enclosure			
<input type="checkbox"/>	✓	✓	✓	✓	ilobl3 in Server 2pblade3 Management ...	Server	10.193.10.15	Integrated Light...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	ilvoniainm	Server	10.193.1.2	ProLiant DL360...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	ilvoniainm ilo in Server ilvor Management ...	Server	10.193.10.28	Integrated Light...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	ilvoniainat1	Server	10.193.1.100	ProLiant DL360...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	ilvoniainat ilo in Server ilvor Management ...	Server	10.193.10.26	Integrated Light...	Microsoft Wind...
<input type="checkbox"/>	✓	✓	✓	✓	ilvoniainat	Server	10.193.1.1	ProLiant DL360...	Microsoft Wind...

Save Selection As... Delete Print

Legend:
 ✖ = Critical, ✓ = Normal, ⚠ = Major, ? = Unknown, ⚡ = Minor, ⓘ = Informational

PMP: Server Drill Down

Performance Management Pack - Online Analysis - Microsoft Internet Explorer

Address: https://dl380-scsi-2:2381/PMP/DeviceMain.htm?device_key=D223KGY1D033&device_type=Server&deviceKey=1&deviceName=dl380-scsi-2

Performance Management Pack Online Analysis

Server Name: dl380-scsi-2
 Server IP: 10.193.10.50
 Sample Rate: 120 s
 Samples for Status: 3
☒ Alert ☒ Log

Server Configuration

- ProLiant DL380 G2
- Processors
- Memory
- Network Connections
- Storage
- Host Buses

ProLiant DL380 G2

Status Graph Inventory Last Updated: Jun 18, 2004 3:12:03 PM

Analysis Explanation

At least one component is reporting a performance bottleneck. At least one additional component cannot be completely monitored.

Analysis Data

Counters	Last	Average	Minimum	Maximum
Average Processor Utilization%	2	4.333	2	6
Available MBytes	45.22	30.39	9.715	45.22
Page Faults/Sec	43	109	19	265
Network MBytes/Sec	0	0	0	0
Storage MBytes/Sec	0	0.8666	0	2.468
Host Bus MBytes/Sec	0	0.8666	0	2.468

Recommendation

Refer to Memory for more information.

PMP: Server Component Drill Down

Performance Management Pack - Online Analysis - Microsoft Internet Explorer

Address: https://dl380-scsi-2:2381/PMP/DeviceMain.htm?device_key=D223KGY1D033&device_type=Server&deviceKey=1&deviceName=dl380-scsi-2

Performance Management Pack Online Analysis

Server Name: dl380-scsi-2
 Server IP: 10.193.10.50
 Sample Rate: 120 s
 Samples for Status: 3
☒ Alert ☒ Log

Server Configuration

- ProLiant DL380 G2
 - Processors
 - Memory**
 - Network Connections
 - Storage
 - Host Buses

Memory

Status Graph Inventory

Last Updated : Jun 18, 2004 3:12:03 PM

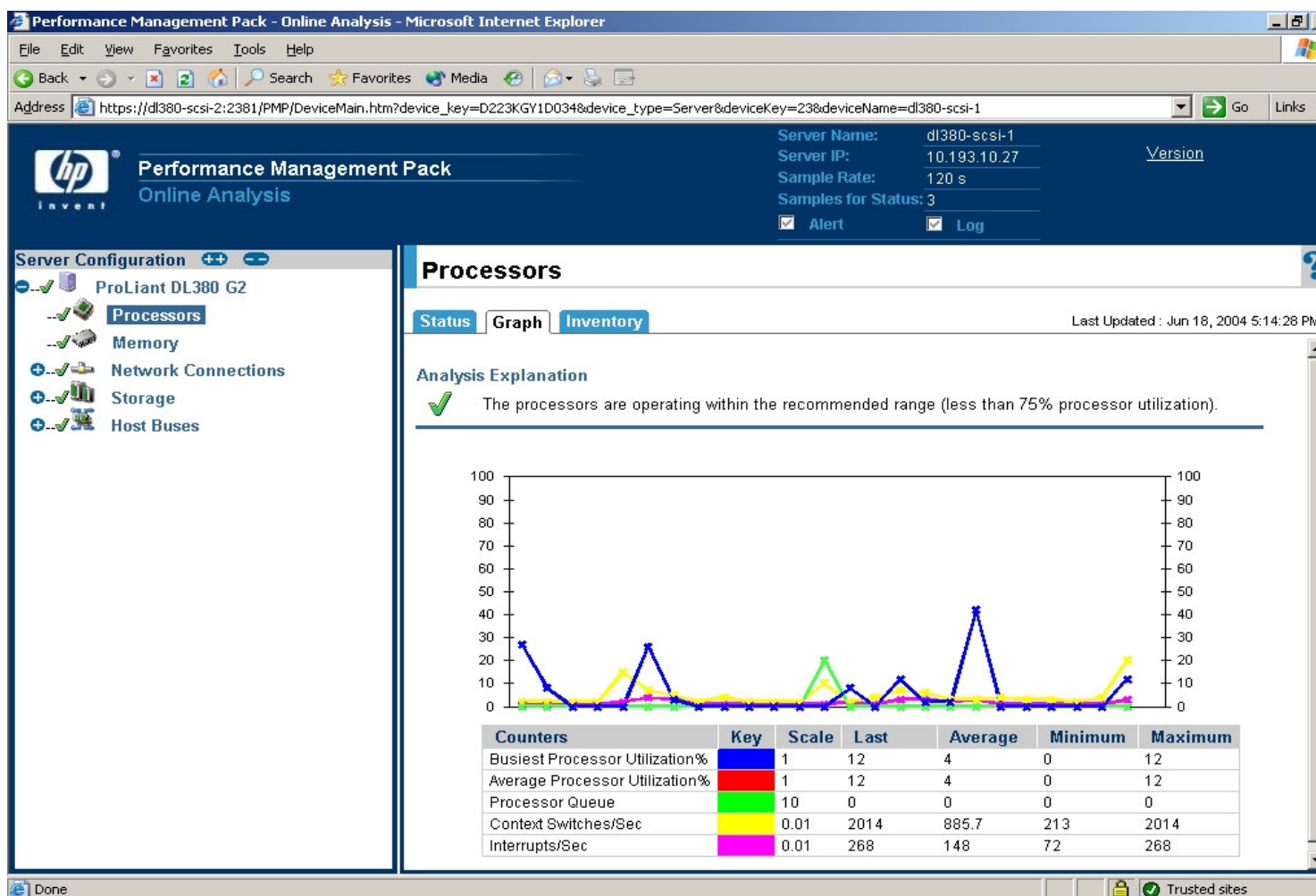
Analysis Explanation

High average page read rate (below 5 is normal). However, there is still at least 20 MB of available memory. This can happen when a process is limited in the amount of memory it can allocate and results in high paging even though more memory is available. Thus this situation may look like a bottleneck when it is not.

Analysis Data

Counters	Last	Average	Minimum	Maximum
Available MBytes	45.22	30.39	9.715	45.22
Page Reads/Sec	0	30.9	0	91.72
Pages Input/Sec	0	31	0	92
Page Faults/Sec	43	109	19	265
%Hard Page Faults	0	13.33	0	34.72

PMP: Server Component Graph





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About Nationwide

- Leading insurance and financial services company with more than \$148 billion in statutory assets worldwide
- Ranked 118th in Fortune 500
- Over 30,000 employees (not including agents)
- Over 3,500 ProLiant servers

Nationwide Monitoring Environment

Nationwide currently utilizes the following server hardware and performance-monitoring tools:

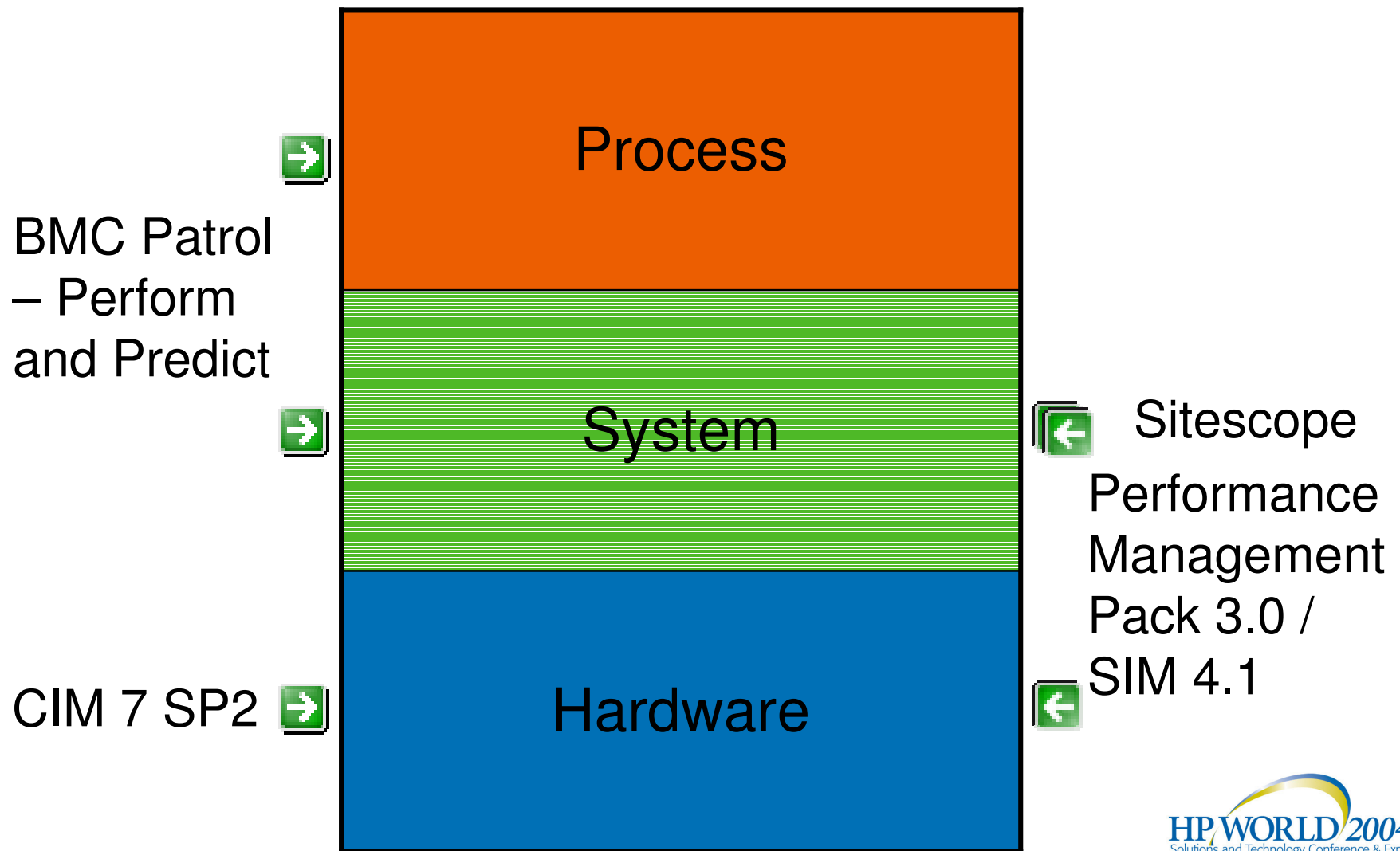
- Compaq Insight Manager 7 (Production)
 - Hardware monitoring for failure/pre-failure notifications
 - H/W S/W reporting
- Systems Insight Manager 4.1
 - Production Pilot
- BMC Patrol - Perform and Predict (Best/1)
 - Capacity/performance data collection, monitoring, and modeling (down to process level)

Nationwide Monitoring Environment (contd.)



- Sherlock
 - In-house tool used for monitoring of host-up/down in DMZ's
- Mercury Interactive Sitescope
 - Agent-less host up/host down and performance monitoring tool
- Performance Management Pack 3.0
 - Production Pilot
 - 400+ Servers running PMP

Nationwide Monitoring Environment (contd.)



Nationwide SIM/PMP Implementation

- SNMP agents send traps to DNS alias
- Alias points to production server in one data center
- In case of issue, alias reconfigured for secondary server in other data center
- Currently maintained on dual-processor DL380G2 with 1GB memory
- DB housed on external SQL Server
- Our new production implementation will be a clustered solution

Case Study 1

Server Consolidation



In our ongoing server consolidation process, PMP helps by allowing us to determine the next best candidates for migration based on servers that are severely underutilized that can likely be moved to shared servers

PMP value:

- Detailed offline analysis of performance data showing average utilization for user-defined time period
- Real-time monitoring of shared servers for potential performance issues as servers are migrated to them

Case Study 2

Storage Subsystem Incident

Drive replacements have moved from the SA's to data center operators. One potential issue would be if a 10K RPM drive were inserted into a 15K RPM-based RAID set.

PMP value:

- Real-time monitoring will detect any actual performance impact and report if encountered
- PMP will log the issue of drive mismatch so corrective action can be taken

Case Study 3

After-hours Performance Issues

Sustained system performance issues without logging/trending occasionally leads to the need to monitor the issues as they happen. This is an issue when support is not on-site 24/7.

PMP value:

- Performance data collection/retention allows for “after the fact”, point-in-time views as well as user-defined timeframe reports
- Playback feature allows VCR-like ability to play, forward, pause, stop through collection data as it happened

Case Study 4

Performance Issue Proactivity



The ability to react to server availability and/or performance issues as they occur is a necessity but being proactive will reduce unplanned server downtime.

PMP value:

- Continuous real-time monitoring of performance data allows support to be notified when performance degradation is rising but not yet critical

Benefits to Nationwide

- Ease of use
- Simplified management thus reducing administrative costs
- Reduction of 3rd party toolsets
- Reduced tool cost without sacrificing functionality
- Easy to implement (no additional tool/agents to install)

Nationwide Implementation Timeline

- Pilot group using PMP on over 400 production servers
- We have tested this product in our internal lab environments as well as in a Hewlett Packard lab in Michigan, noting/correcting several performance issues impacting customers in the process
- In process of upgrading agents on servers that were out of date
- SIM 4.1 and PMP 3.0 should be used in all production environments by end of 2004.

Lessons Learned



Performance Management Pack - Online Analysis - Microsoft Internet Explorer

Address: https://dl380-scsi-2:2381/PMP/DeviceMain.htm?device_key=8329JQX1501J&device_type=Server&deviceKey=24&deviceName=2pblade3

Server Name: 2pblade3
Server IP: 10.193.10.25
Sample Rate: 10 s
Samples for Status: 3
☒ Alert ☒ Log

hp iNvent Performance Management Pack Online Analysis

Server Configuration

- ProLiant BL20p
 - Processors
 - Memory
 - Network Connections
 - Storage
 - SA 5i
 - Array A (2 drives)
 - Port 2: Internal Drive Cage
 - Host Buses

SA 5i

Status Graph Inventory Last Updated: Jun 18, 2004 4:18:34 PM

Analysis Explanation

This Smart Array cannot be monitored either because configuration information required to analyze this controller cannot be determined or one or more Drive Arrays or SCSI buses cannot be monitored. All possible Drive Array and SCSI Bus analysis is currently being performed.

Analysis Data

Counters	Last	Average	Minimum	Maximum
Transfers/Sec	3.005	1.335	0	3.005
MBytes/Sec	0.0164	0.0062	0	0.0164
Millisec/Transfer	6	4.267	0	6.8
Queue Length	0.018	0.0083	0	0.018

Configuration Issues

At least one failed drive has been detected in Array A.
The drive at SCSI ID 1 on SCSI Port 2 has failed

- Unknown status due to "broken array" i.e. due to the failed drive.
- Not necessarily a bottleneck; remaining drives aren't yet over taxed.

Lessons Learned (contd.)



- PMP logs a potential issue, however, in this case, there is no performance problem
- There is no icon for a detected configuration issue that does not impact performance



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PMP ROI Calculator



ProLiant Essentials Performance Management Pack Return-on-investment calculator

Performance resolution costs without PMP

Number of servers to analyze	<input type="text" value="1,500"/>	totals/yr
Average number of performance issues experienced per year per server	<input type="text" value="1"/>	<input type="text" value="1,500"/>
To analyze each performance issue:		
average hours spent	<input type="text" value="2"/>	
number of people	<input type="text" value="3"/>	<input type="text" value="9,000"/>
Average hourly rates (loaded costs):		
internal personnel	<input type="text" value="\$85"/>	
outside consultants	<input type="text" value="\$180"/>	
%age of hours by outside consultants	<input type="text" value="0%"/>	<input type="text" value="\$765,000"/>

Performance resolution costs with PMP

Number of servers to analyze	<input type="text" value="1,500"/>	totals/yr
Average number of performance issues experienced per year per server	<input type="text" value="1"/>	<input type="text" value="1,500"/>
To analyze each performance issue:		
average hours spent	<input type="text" value="1/2"/>	
number of people	<input type="text" value="1"/>	<input type="text" value="750"/>
Average hourly rates (loaded costs):		
internal personnel	<input type="text" value="\$85"/>	
outside consultants	<input type="text" value="\$180"/>	
%age of hours by outside consultants	<input type="text" value="0%"/>	<input type="text" value="\$63,750"/>

Acquisition and deployment costs of PMP

Cost per PMP license	<input type="text" value="\$99"/>	<input type="text" value="\$148,500"/>
Is Insight Manager already installed?	<input type="text" value="Yes"/>	
deployment time for IM7 console (hours)	<input type="text" value="0"/>	<input type="text" value="\$0"/>
console server hardware	<input type="text" value="\$0"/>	<input type="text" value="\$0"/>
Management agent installation/upgrade time per server (hours)	<input type="text" value="1/2"/>	<input type="text" value="\$63,750"/>
Total acquisition & deployment costs		<input type="text" value="\$212,250"/>

Total savings with PMP

Performance resolution costs per year:	
<u>without</u> PMP	<input type="text" value="\$765,000"/>
<u>with</u> PMP	<input type="text" value="\$63,750"/> -/-
Cost of deployment of PMP	<input type="text" value="\$212,250"/> -/-
Total first-year net savings	<input type="text" value="\$489,000"/>
Net first-year savings per server	<input type="text" value="\$326"/>
Time to ROI (months)	<input type="text" value="3.6"/>

PMP ROI Calculator version 1.7e — © 2004 Hewlett-Packard Company, L.P.





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Useful Links

- Home page
<http://www.hp.com/products/pmp>
- Interactive flash product demonstration
[http://h18004.www1.hp.com/products/servers/proliantesse
ntials/valuepack/pmp/download/english/launch.html](http://h18004.www1.hp.com/products/servers/proliantesse
ntials/valuepack/pmp/download/english/launch.html)
- PMP ROI calculator
[http://h18004.www1.hp.com/products/servers/proliantesse
ntials/valuepack/PMP/pmp-roi-calculator.xls](http://h18004.www1.hp.com/products/servers/proliantesse
ntials/valuepack/PMP/pmp-roi-calculator.xls)
- SIM home page
[http://h18013.www1.hp.com/products/servers/manageme
nt/hpsim/index.html](http://h18013.www1.hp.com/products/servers/manageme
nt/hpsim/index.html)

Tips

- Graphs not shown
 - Browser security and privacy options on Local Intranet Web content zone needs configured to:
 - Enable Download signed ActiveX Controls
 - Prompt to Download unsigned ActiveX Controls
 - Enable Run ActiveX controls and plug-ins
 - Enable Script ActiveX controls marked safe for scripting
 - Enable Active scripting
 - Allow stored and per-session cookies
- All text/screen does not fit on display
 - Remedy by running in at least 1024x768, 256 colors maximized.



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Q&A

- Questions
- Comments
- Concerns

Thank You!



i n v e n t

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