Implementing OpenView Storage Area Management

Tony Catone

Philadelphia Stock Exchange

Hardware Environment

- Sun Enterprise and Sun Fire servers
- HP servers
- EMC Symmetrix
- HDS 9200
- VA 7100
- Sun and HP disks for OS

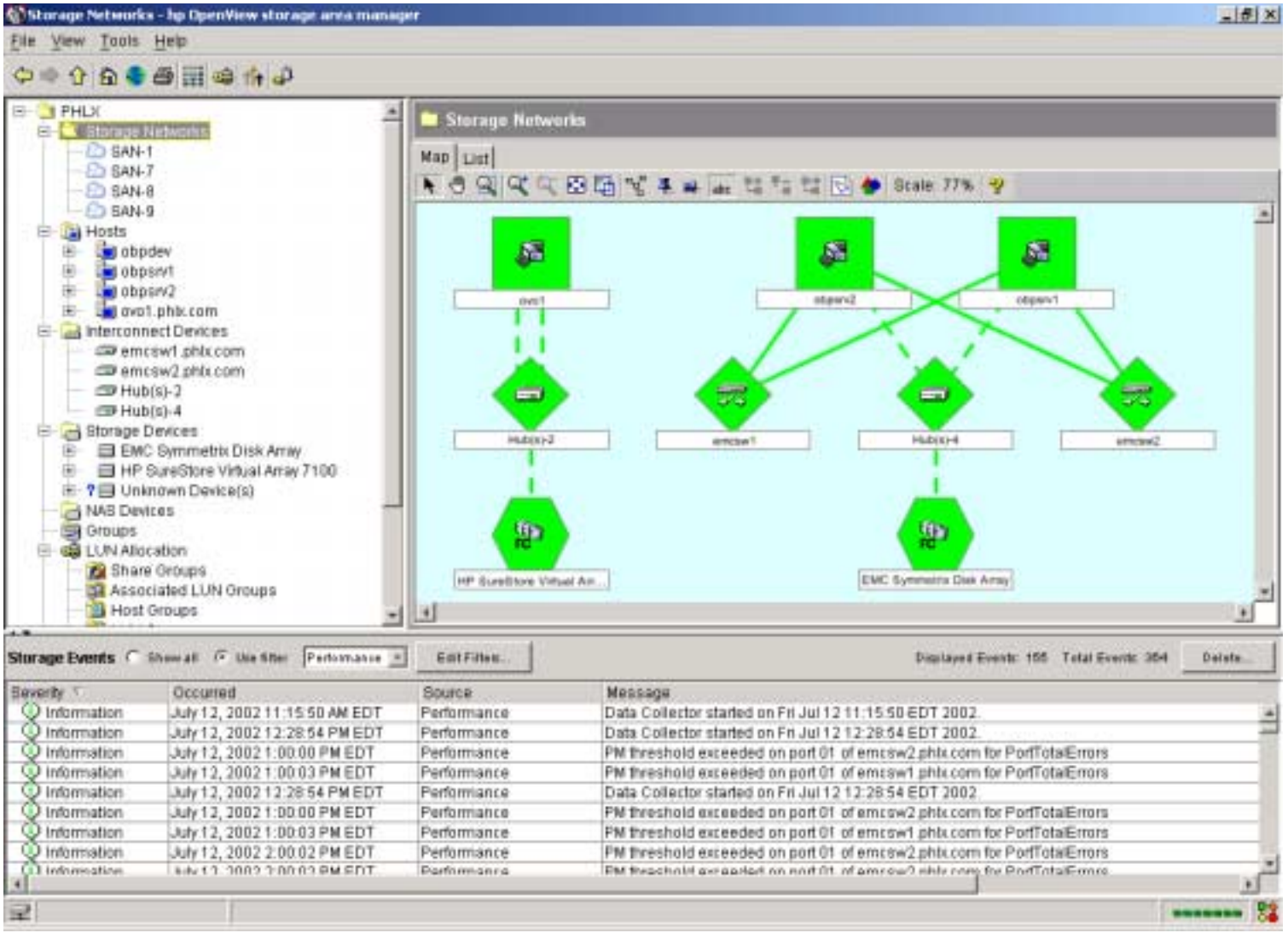
Application Environment

- Real-time high data rate transaction processing systems
- OLTP databases
- Data Warehouse databases

Drivers

- Over 7 TB of data with no consolidated management view
- Time consuming to generate reports of data usage by group across servers
- Complex to manage environment using individual management tools (switches, arrays, HBAs)

PHLX - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
FC Direct Attached
SAN-1
Hosts
obpdev
obpsrv1
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-1
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 710
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Accounting
Customers
Service Levels
Storage Domain: PHLX
Home
List
Capacity
LUN Allocation
Performance
Accounting
invent
hp OpenView
storage area manager
storage node manager
storage network map
discovery overview
storage domain summary
storage optimizer
hosts performance
storage device performance
interconnect performance
storage allocater
storage domain summary
host-lun allocation
host groups
storage builder
storage availability
host storage utilization
storage reports
storage accountant
accounting summary
customers
service levels
Storage Events
Show all
Use filter
Critical only
Edit Filter...
Displayed Events: 222
Total Events: 222
Delete...
Severity
Occurred
Source
Message
Warning July 12, 2002 11:21:42 AM EDT emcsw2.phlx.com 192.9.201.56: status changed from UNKNOWN to UNREACHABLE
Warning July 12, 2002 12:37:17 PM EDT obpsrv1 Device 192.9.201.25: changed status from GOOD to UNREACHABLE
Warning July 12, 2002 12:41:02 PM EDT EMC Symmetrix Disk Array EMCSYMMETRIX500374: status changed from GOOD to UNREACHABLE
Warning July 12, 2002 1:03:25 PM EDT obpdev Device 192.9.201.254: changed status from GOOD to UNREACHABLE
Warning July 12, 2002 12:41:02 PM EDT EMC Symmetrix Disk Array EMCSYMMETRIX500374: status changed from GOOD to UNREACHABLE
Warning July 12, 2002 12:37:17 PM EDT obpsrv1 Device 192.9.201.25: changed status from GOOD to UNREACHABLE


Storage Networks - hp OpenView storage area manager
File View Tools Help
PHLX
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SAN-1
SAN-7
SAN-8
SAN-9
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Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
Storage Networks
Map
List
Scale: 77%
ovo1
obpsrv2
obpsrv1
Hub(s)-2
emcsw1
Hub(s)-4
emcsw2
HP SureStore Virtual Ar...
EMC Symmetrix Disk Array
Storage Events
Show all
Use filter
Performance
Edit Filter...
Displayed Events: 155 Total Events: 364
Delete...
Severity
Occurred
Source
Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
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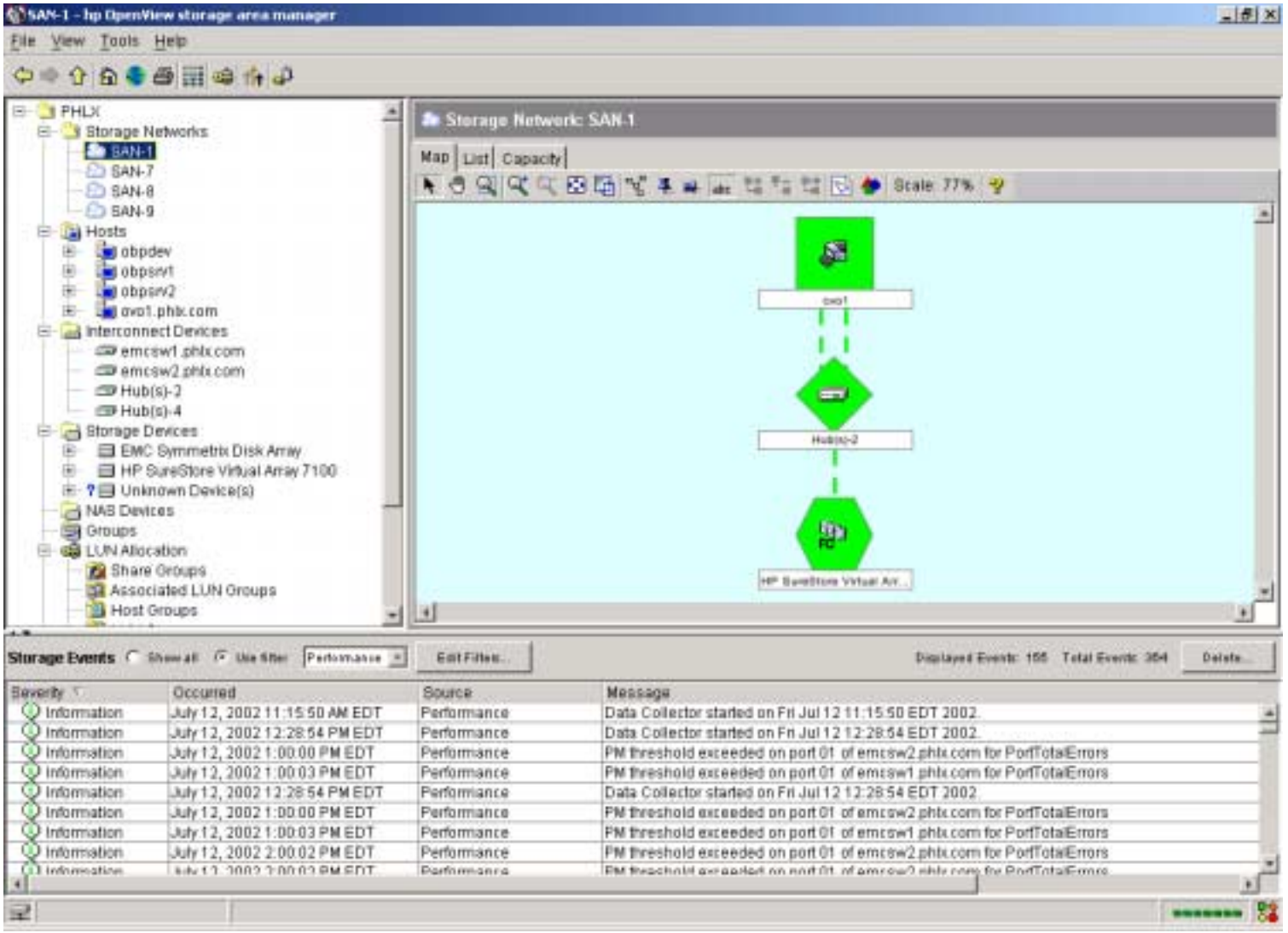
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File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
obpsrv1
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
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Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
Storage Network: SAN-1
Map
List
Capacity
Scale: 77%
ovo1
Hub(s)-2
FC
Storage Events
Edit Filter...
Delete...
Severity
Occurred
Source
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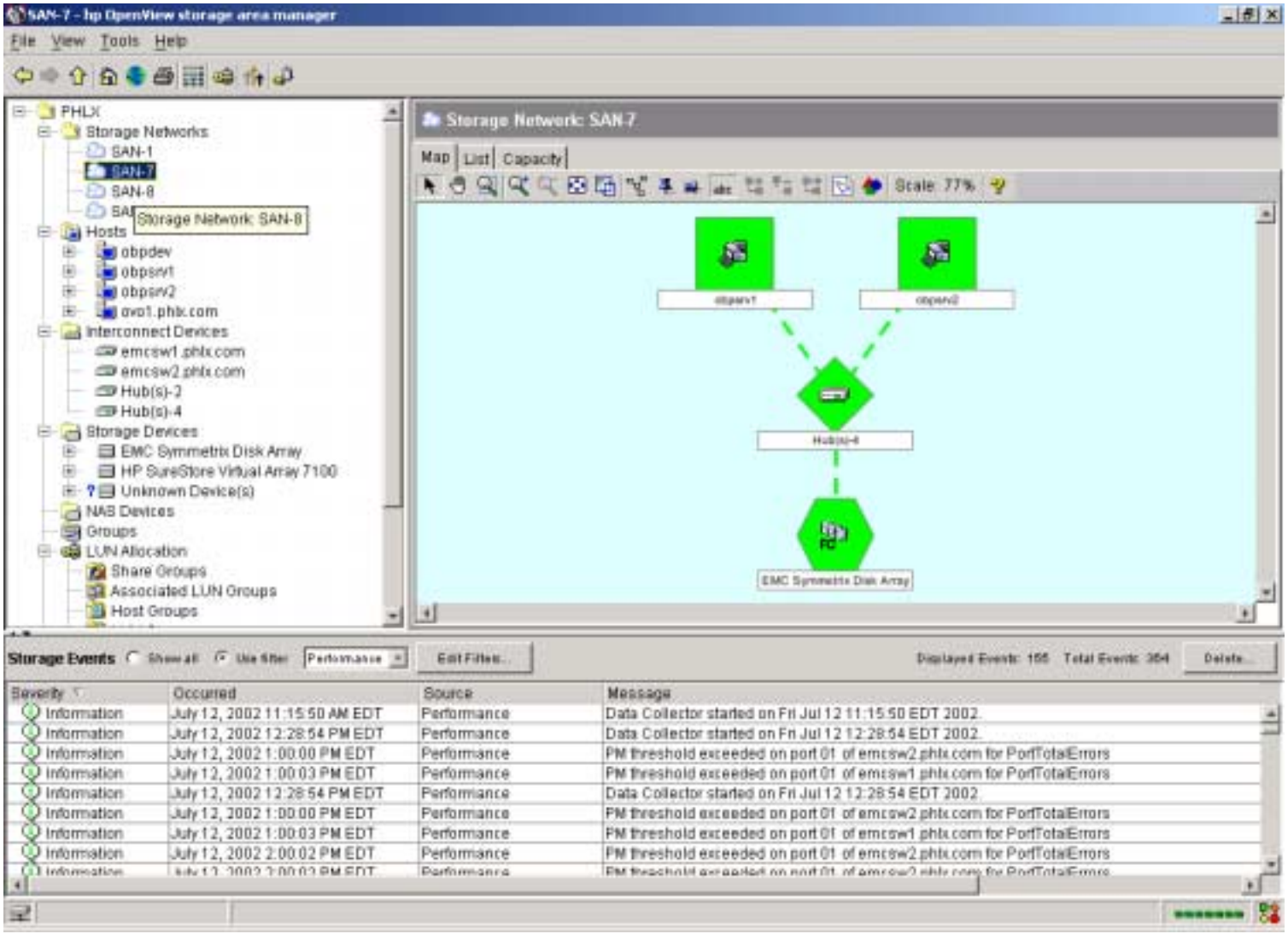
SAN-7 - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
Storage Network: SAN-8
Hosts
obpdev
obpsrv1
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
Storage Network: SAN-7
Map
List
Capacity
Scale: 77%
obpsrv1
obpsrv2
Hub(s)-4
FC
EMC Symmetrix Disk Array
Storage Events
Show all
Use filter
Performance
Edit Filter...
Displayed Events: 155 Total Events: 364
Delete...
Severity
Occurred
Source
Message
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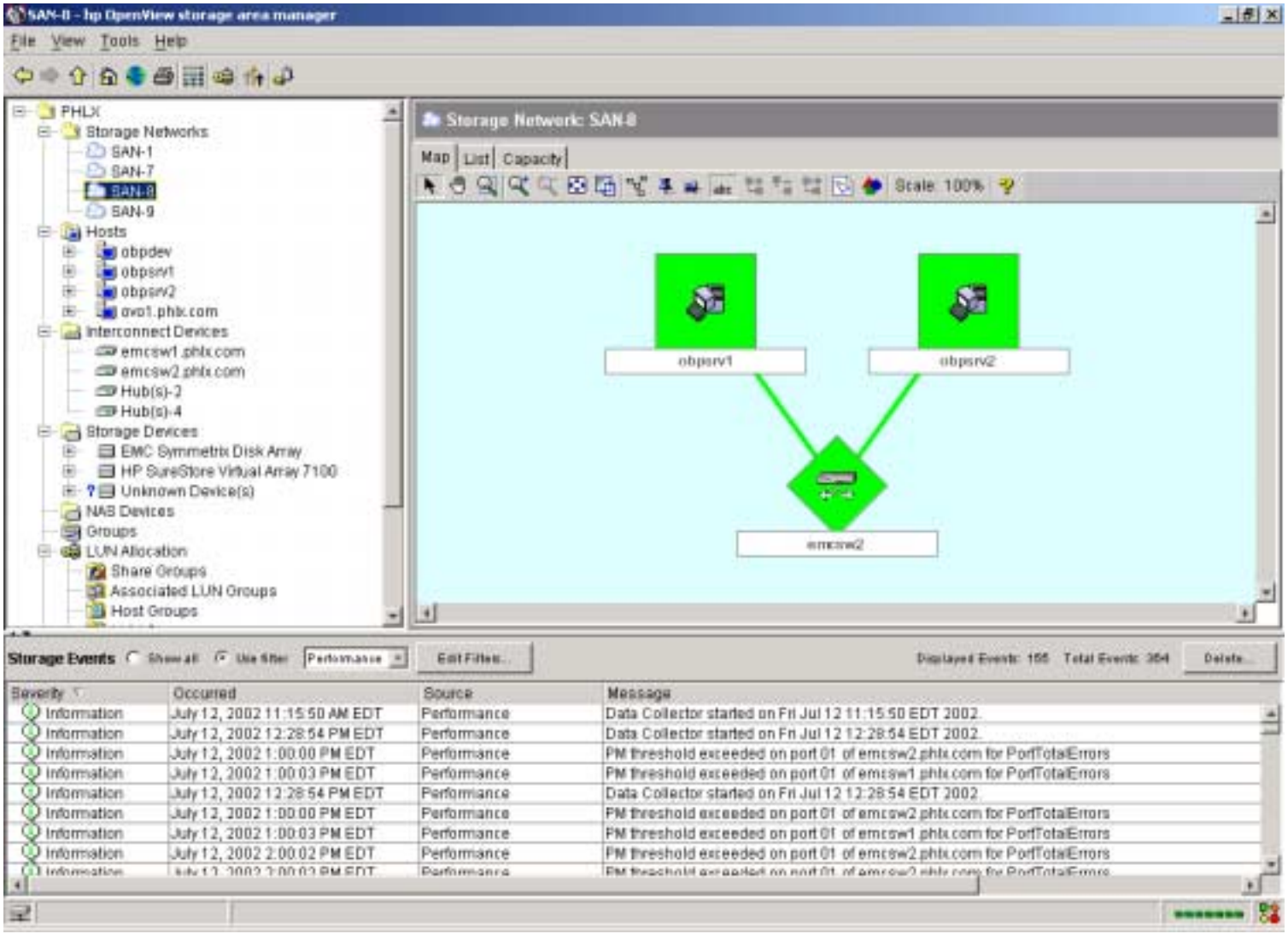
SAN-8 - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
obpsrv1
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
Storage Network: SAN-8
Map
List
Capacity
Scale 100%
obpsrv1
obpsrv2
emcsw2
Storage Events
Show all
Use filter
Performance
Edit Filter...
Displayed Events: 155 Total Events: 364
Delete...
Severity
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Source
Message
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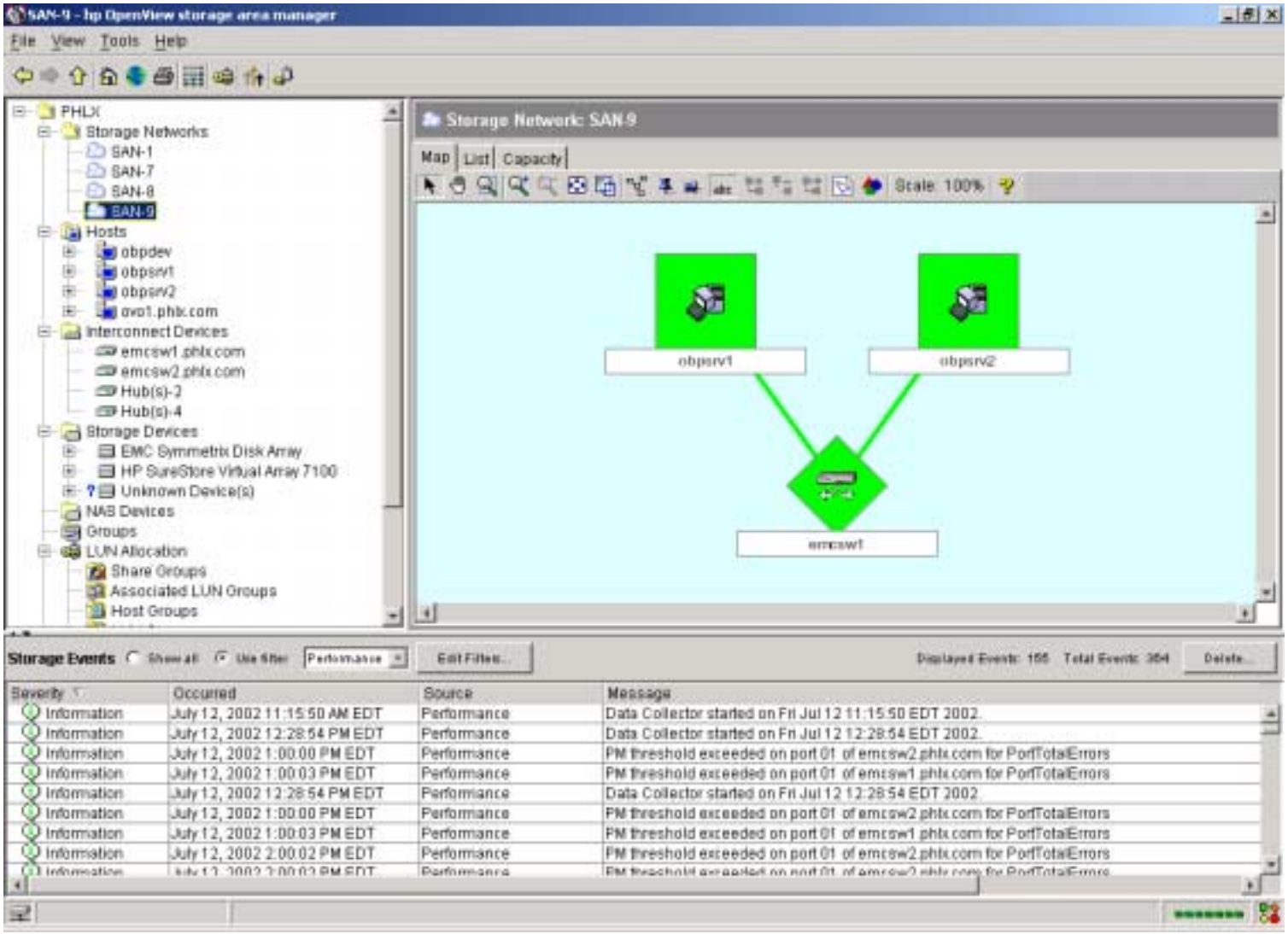
SAN-9 - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
obpsrv1
obpsrv2
ovo1.phlx.com
Interconnect Devices
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emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
Storage Network: SAN-9
Map
List
Capacity
Scale 100%
obpsrv1
obpsrv2
emcsw1
Storage Events
Edit Filter...
Delete...
Severity
Occurred
Source
Message
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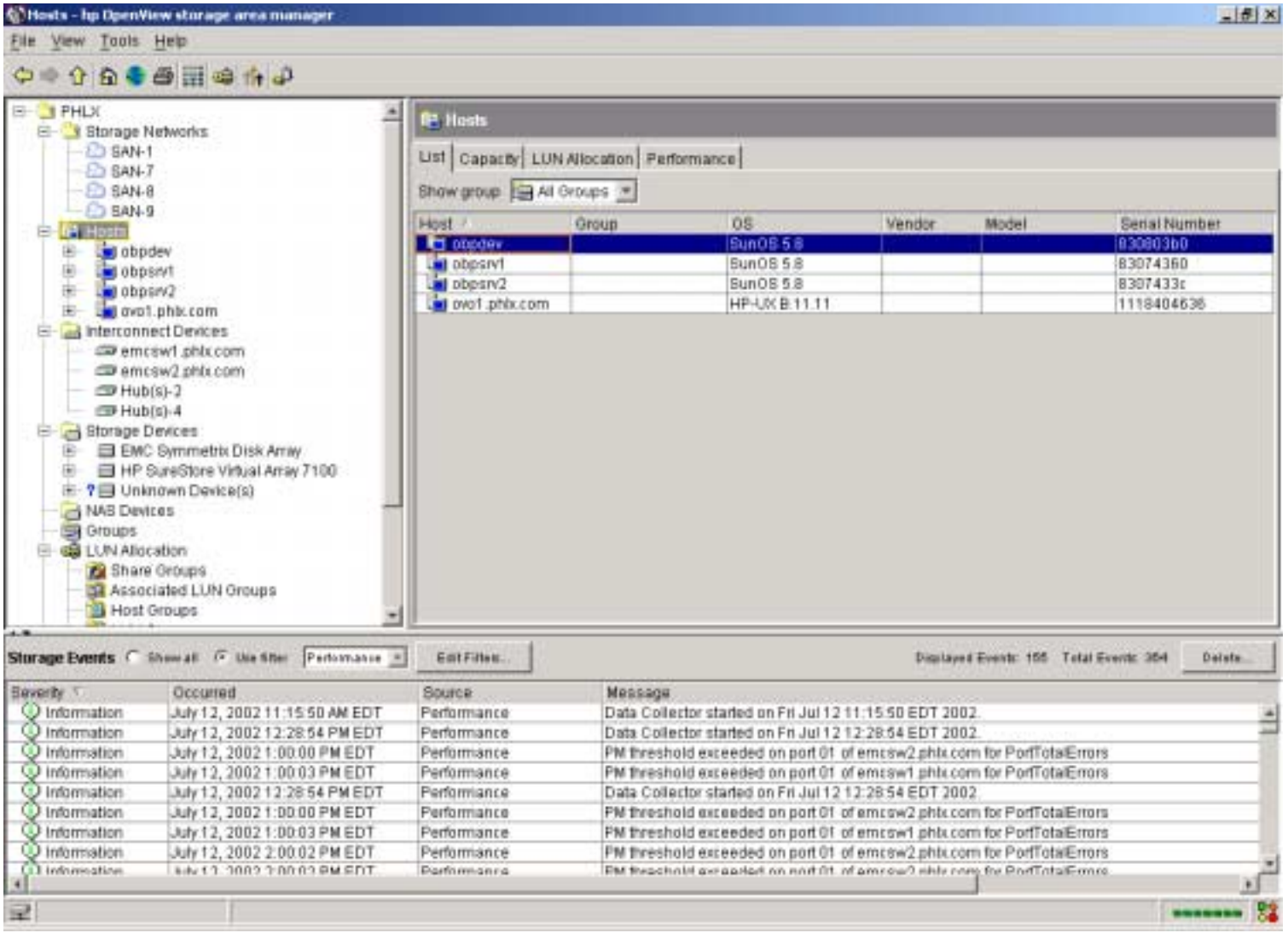
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PHLX
Storage Networks
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SAN-7
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SAN-9
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obpsrv2
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Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
Hosts
List
Capacity
LUN Allocation
Performance
Show group
All Groups
Host
Group
OS
Vendor
Model
Serial Number
obpdev
SunOS 5.8
83080360
obpsrv1
SunOS 5.8
83074360
obpsrv2
SunOS 5.8
8307433c
ovo1.phlx.com
HP-UX B.11.11
1118404636
Storage Events
Show all
Use filter
Performance
Edit Filter...
Displayed Events: 155
Total Events: 364
Delete...
Severity
Occurred
Source
Message
Information
July 12, 2002 11:15:50 AM EDT
Performance
Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information
July 12, 2002 12:28:54 PM EDT
Performance
Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information
July 12, 2002 1:00:00 PM EDT
Performance
PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
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July 12, 2002 1:00:03 PM EDT
Performance
PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
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July 12, 2002 12:28:54 PM EDT
Performance
Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information
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Performance
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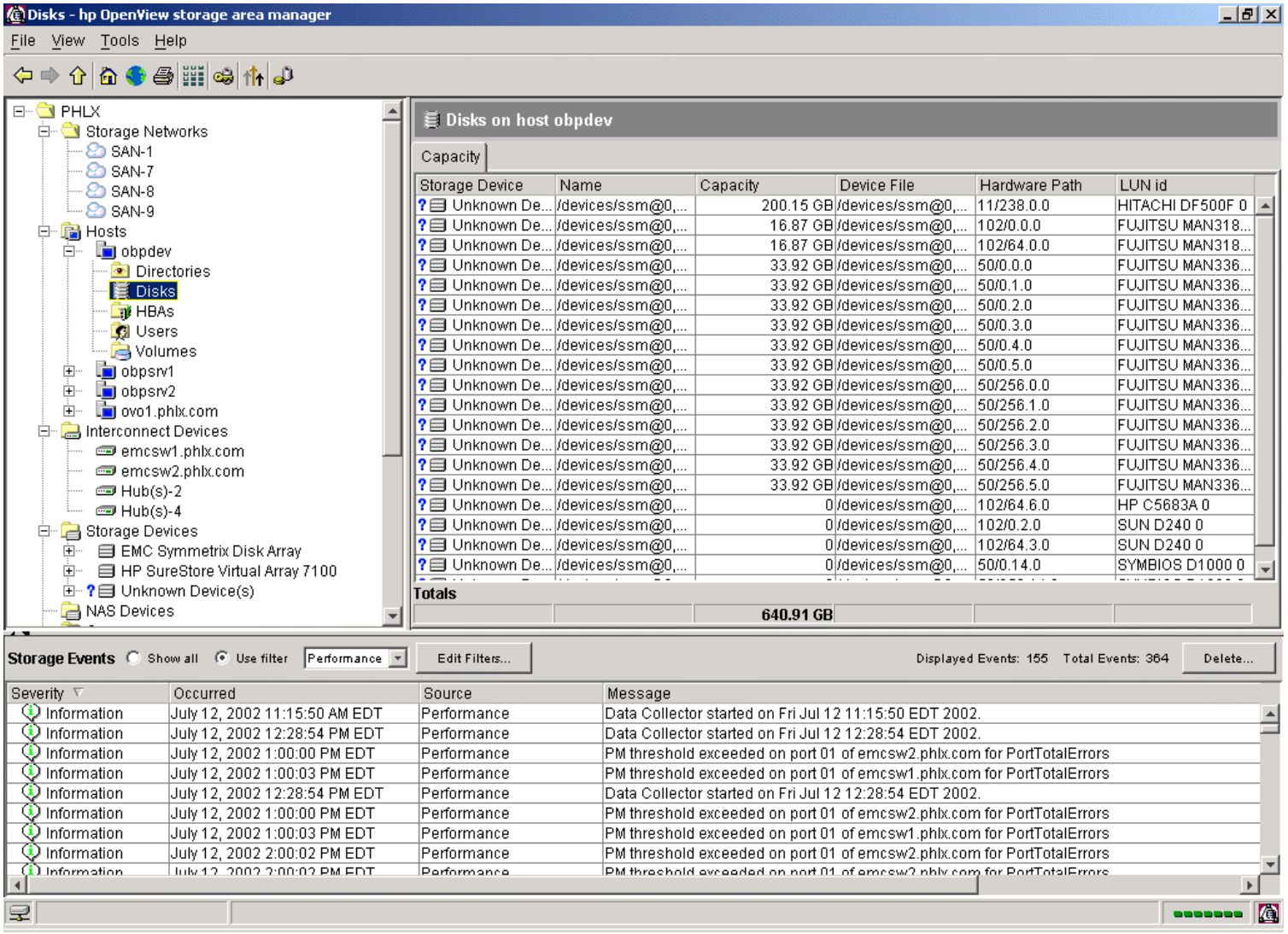
Disks - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
Directories
Disks
HBAs
Users
Volumes
obpsrv1
obpsrv2
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Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Disks on host obpdev
Capacity
Storage Device | Name | Capacity | Device File | Hardware Path | LUN id
Unknown De... /devices/ssm@0,... 200.15 GB /devices/ssm@0,... 11/238.0.0 HITACHI DF500F 0
Unknown De... /devices/ssm@0,... 16.87 GB /devices/ssm@0,... 102/0.0.0 FUJITSU MAN318...
Unknown De... /devices/ssm@0,... 16.87 GB /devices/ssm@0,... 102/64.0.0 FUJITSU MAN318...
Unknown De... /devices/ssm@0,... 33.92 GB /devices/ssm@0,... 50/0.0.0 FUJITSU MAN336...
Unknown De... /devices/ssm@0,... 33.92 GB /devices/ssm@0,... 50/0.1.0 FUJITSU MAN336...
Unknown De... /devices/ssm@0,... 33.92 GB /devices/ssm@0,... 50/0.2.0 FUJITSU MAN336...
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Unknown De... /devices/ssm@0,... 33.92 GB /devices/ssm@0,... 50/0.4.0 FUJITSU MAN336...
Unknown De... /devices/ssm@0,... 33.92 GB /devices/ssm@0,... 50/0.5.0 FUJITSU MAN336...
Unknown De... /devices/ssm@0,... 33.92 GB /devices/ssm@0,... 50/256.0.0 FUJITSU MAN336...
Unknown De... /devices/ssm@0,... 33.92 GB /devices/ssm@0,... 50/256.1.0 FUJITSU MAN336...
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Unknown De... /devices/ssm@0,... 0 /devices/ssm@0,... 102/64.6.0 HP C5683A 0
Unknown De... /devices/ssm@0,... 0 /devices/ssm@0,... 102/0.2.0 SUN D240 0
Unknown De... /devices/ssm@0,... 0 /devices/ssm@0,... 102/64.3.0 SUN D240 0
Unknown De... /devices/ssm@0,... 0 /devices/ssm@0,... 50/0.14.0 SYMBIOS D1000 0
Totals
640.91 GB
Storage Events
Show all
Use filter
Performance
Edit Filters...
Displayed Events: 155 Total Events: 364
Delete...
Severity | Occurred | Source | Message
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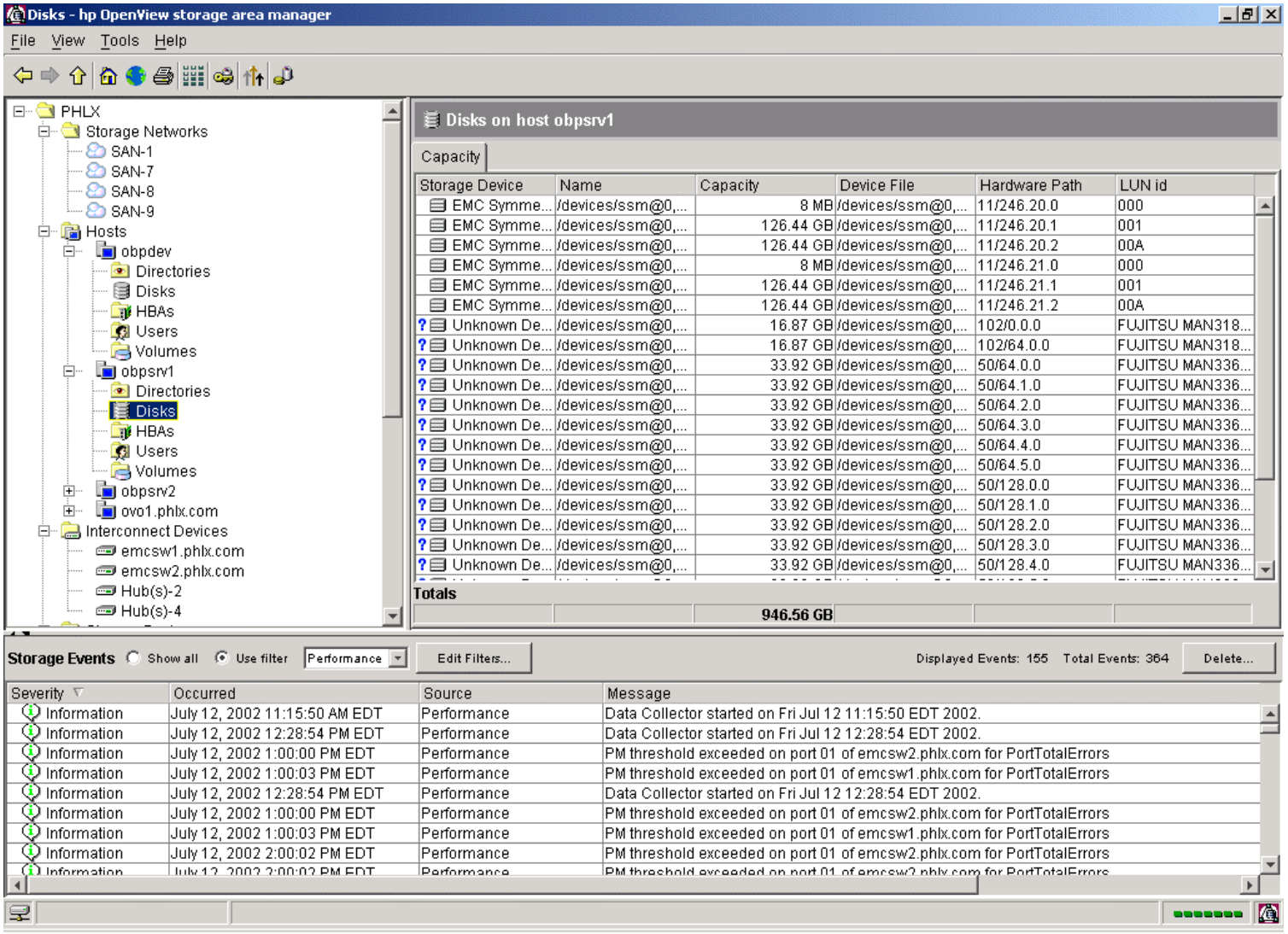
Disks - hp OpenView storage area manager
File View Tools Help
PHLX
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SAN-1
SAN-7
SAN-8
SAN-9
Hosts
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obpsrv1
Directories
Disks
HBAs
Users
Volumes
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Disks on host obpsrv1
Capacity
Storage Device | Name | Capacity | Device File | Hardware Path | LUN id
EMC Symme... | /devices/ssm@0,... | 8 MB | /devices/ssm@0,... | 11/246.20.0 | 000
EMC Symme... | /devices/ssm@0,... | 126.44 GB | /devices/ssm@0,... | 11/246.20.1 | 001
EMC Symme... | /devices/ssm@0,... | 126.44 GB | /devices/ssm@0,... | 11/246.20.2 | 00A
EMC Symme... | /devices/ssm@0,... | 8 MB | /devices/ssm@0,... | 11/246.21.0 | 000
EMC Symme... | /devices/ssm@0,... | 126.44 GB | /devices/ssm@0,... | 11/246.21.1 | 001
EMC Symme... | /devices/ssm@0,... | 126.44 GB | /devices/ssm@0,... | 11/246.21.2 | 00A
Unknown De... | /devices/ssm@0,... | 16.87 GB | /devices/ssm@0,... | 102/0.0.0 | FUJITSU MAN318...
Unknown De... | /devices/ssm@0,... | 16.87 GB | /devices/ssm@0,... | 102/64.0.0 | FUJITSU MAN318...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/64.0.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/64.1.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/64.2.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/64.3.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/64.4.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/64.5.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/128.0.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/128.1.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/128.2.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/128.3.0 | FUJITSU MAN336...
Unknown De... | /devices/ssm@0,... | 33.92 GB | /devices/ssm@0,... | 50/128.4.0 | FUJITSU MAN336...
Totals
946.56 GB
Storage Events
Show all
Use filter
Performance
Edit Filters...
Displayed Events: 155 Total Events: 364
Delete...
Severity | Occurred | Source | Message
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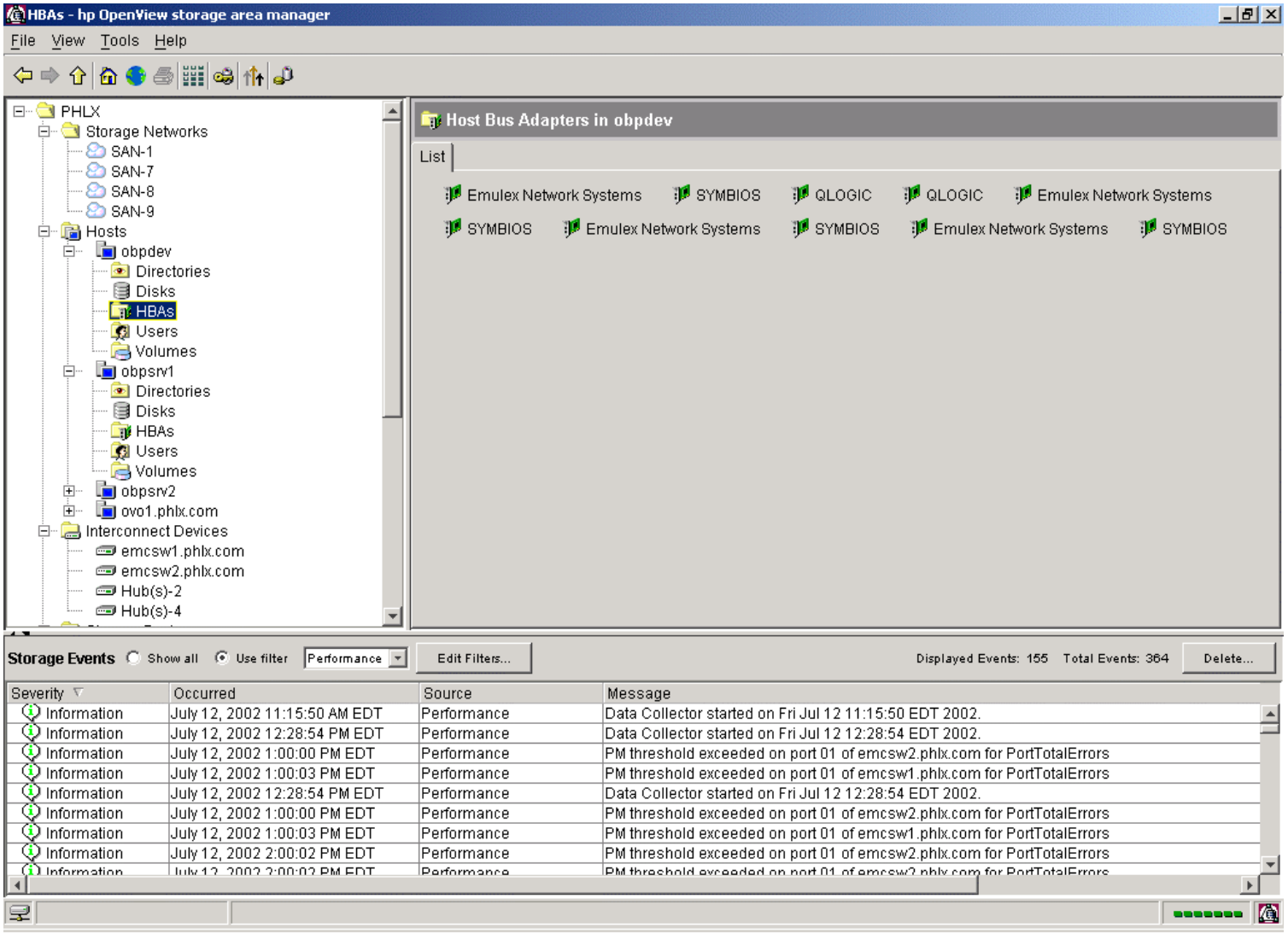
HBAs - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
Directories
Disks
HBAs
Users
Volumes
obpsrv1
Directories
Disks
HBAs
Users
Volumes
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Host Bus Adapters in obpdev
List
Emulex Network Systems
SYMBIOS
QLOGIC
QLOGIC
Emulex Network Systems
SYMBIOS
Emulex Network Systems
SYMBIOS
Emulex Network Systems
SYMBIOS
Storage Events
Show all
Use filter
Performance
Edit Filters...
Displayed Events: 155 Total Events: 364
Delete...
Severity
Occurred
Source
Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
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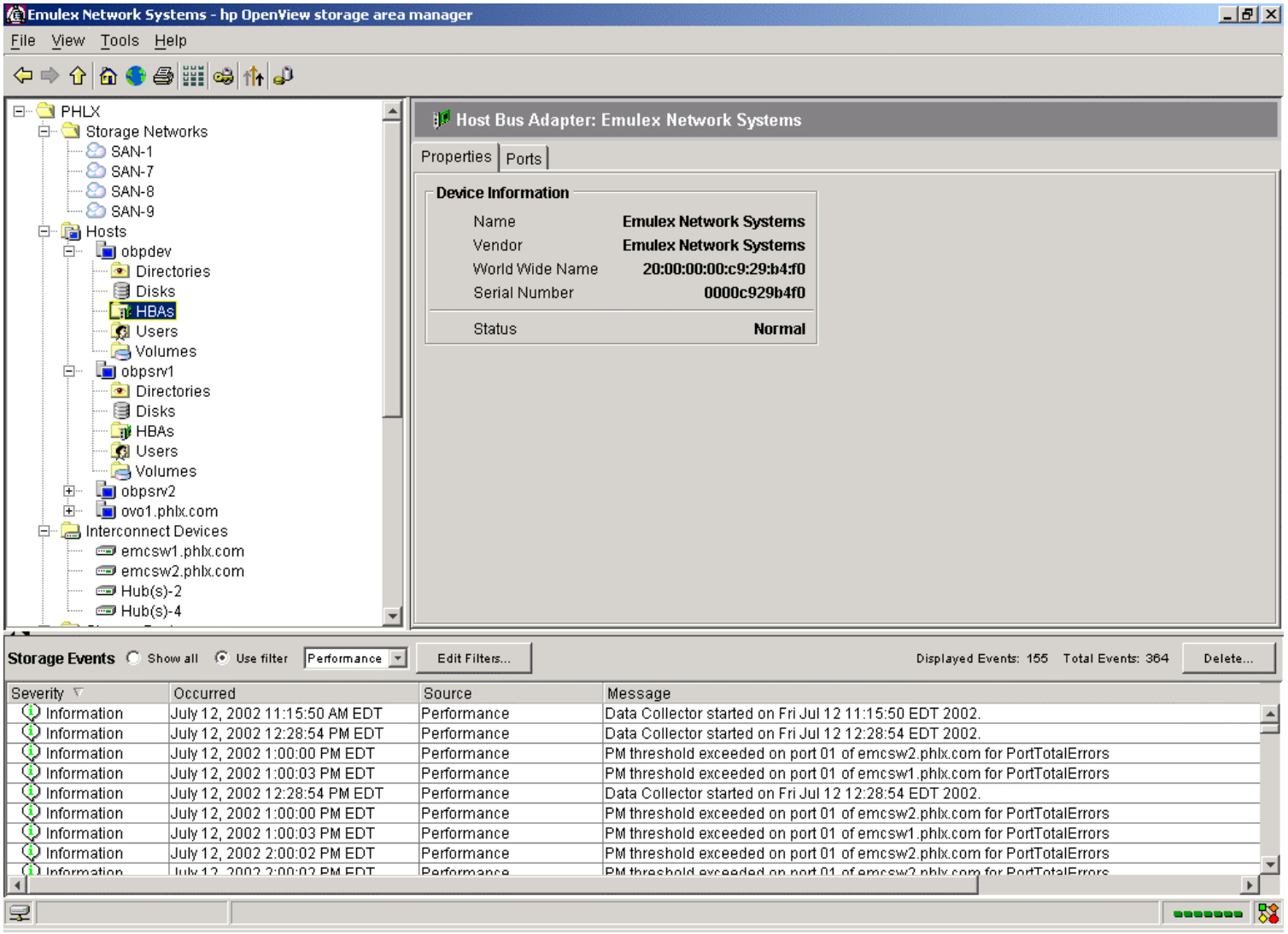
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors


Emulex Network Systems - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
Directories
Disks
HBAs
Users
Volumes
obpsrv1
Directories
Disks
HBAs
Users
Volumes
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Host Bus Adapter: Emulex Network Systems
Properties
Ports
Device Information
Name Emulex Network Systems
Vendor Emulex Network Systems
World Wide Name 20:00:00:00:c9:29:b4:f0
Serial Number 0000c929b4f0
Status Normal
Storage Events
Show all
Use filter
Performance
Edit Filters...
Displayed Events: 155 Total Events: 364
Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
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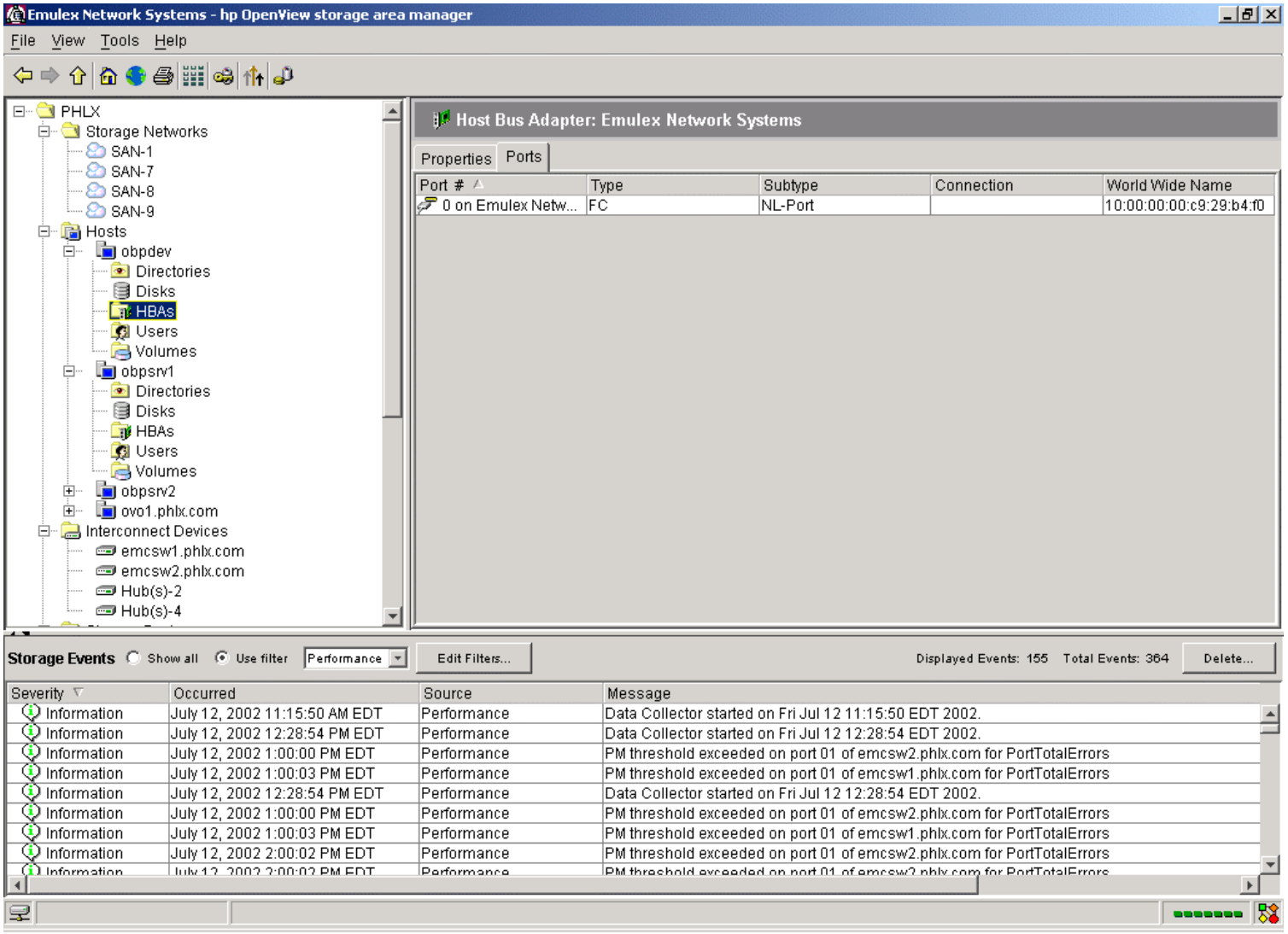
Emulex Network Systems - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
Directories
Disks
HBAs
Users
Volumes
obpsrv1
Directories
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HBAs
Users
Volumes
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Host Bus Adapter: Emulex Network Systems
Properties
Ports
Port # | Type | Subtype | Connection | World Wide Name
0 on Emulex Netw... | FC | NL-Port | | 10:00:00:00:c9:29:b4:f0
Storage Events
Show all
Use filter
Performance
Edit Filters...
Displayed Events: 155 Total Events: 364
Delete...
Severity | Occurred | Source | Message
Information | July 12, 2002 11:15:50 AM EDT | Performance | Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
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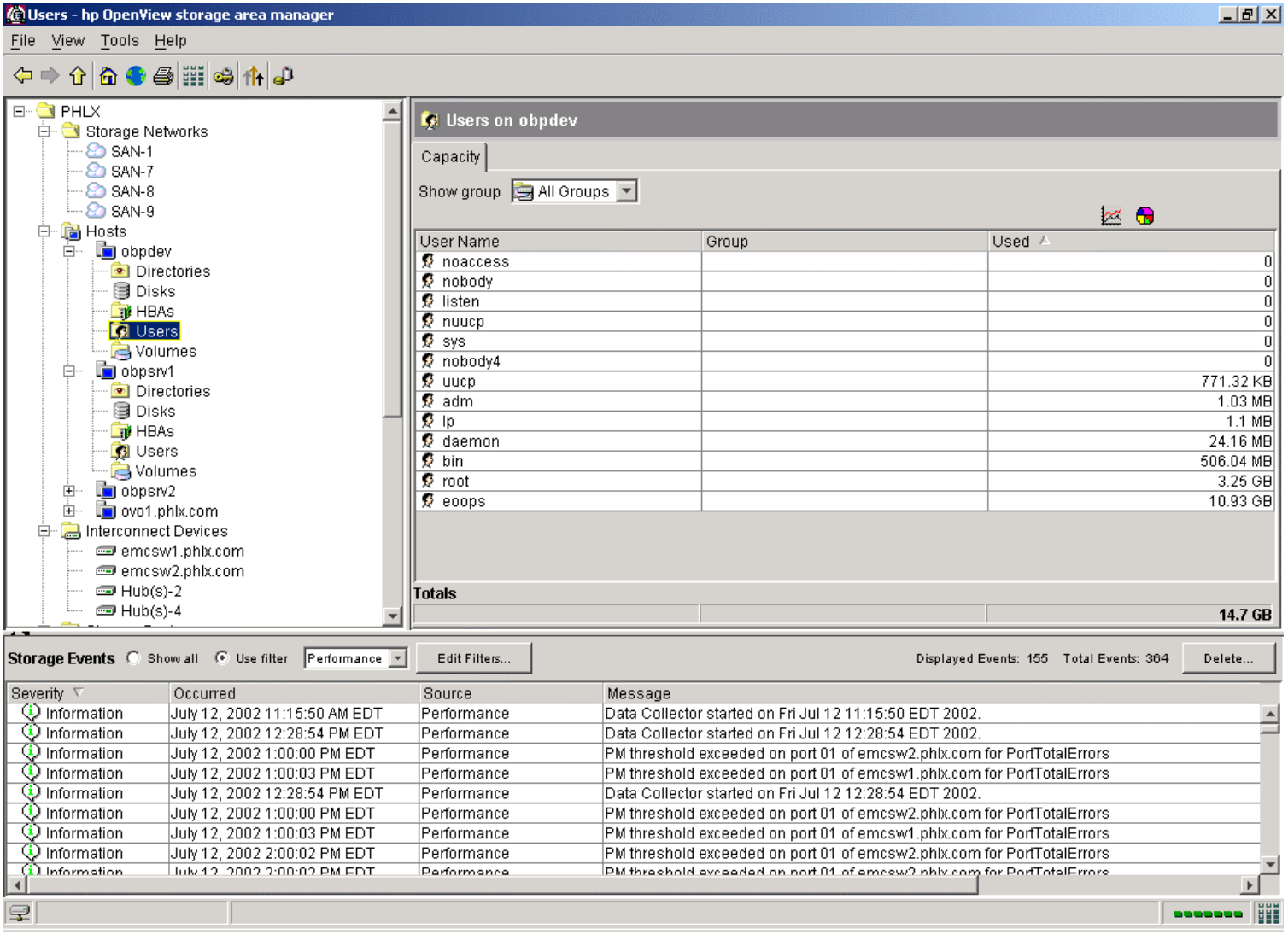
Users - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
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HBAs
Users
Volumes
obpsrv1
Directories
Disks
HBAs
Users
Volumes
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Users on obpdev
Capacity
Show group All Groups
User Name | Group | Used
noaccess 0
nobody 0
listen 0
nuucp 0
sys 0
nobody4 0
uucp 771.32 KB
adm 1.03 MB
lp 1.1 MB
daemon 24.16 MB
bin 506.04 MB
root 3.25 GB
eoops 10.93 GB
Totals 14.7 GB
Storage Events Show all Use filter Performance Edit Filters... Displayed Events: 155 Total Events: 364 Delete...
Severity | Occurred | Source | Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
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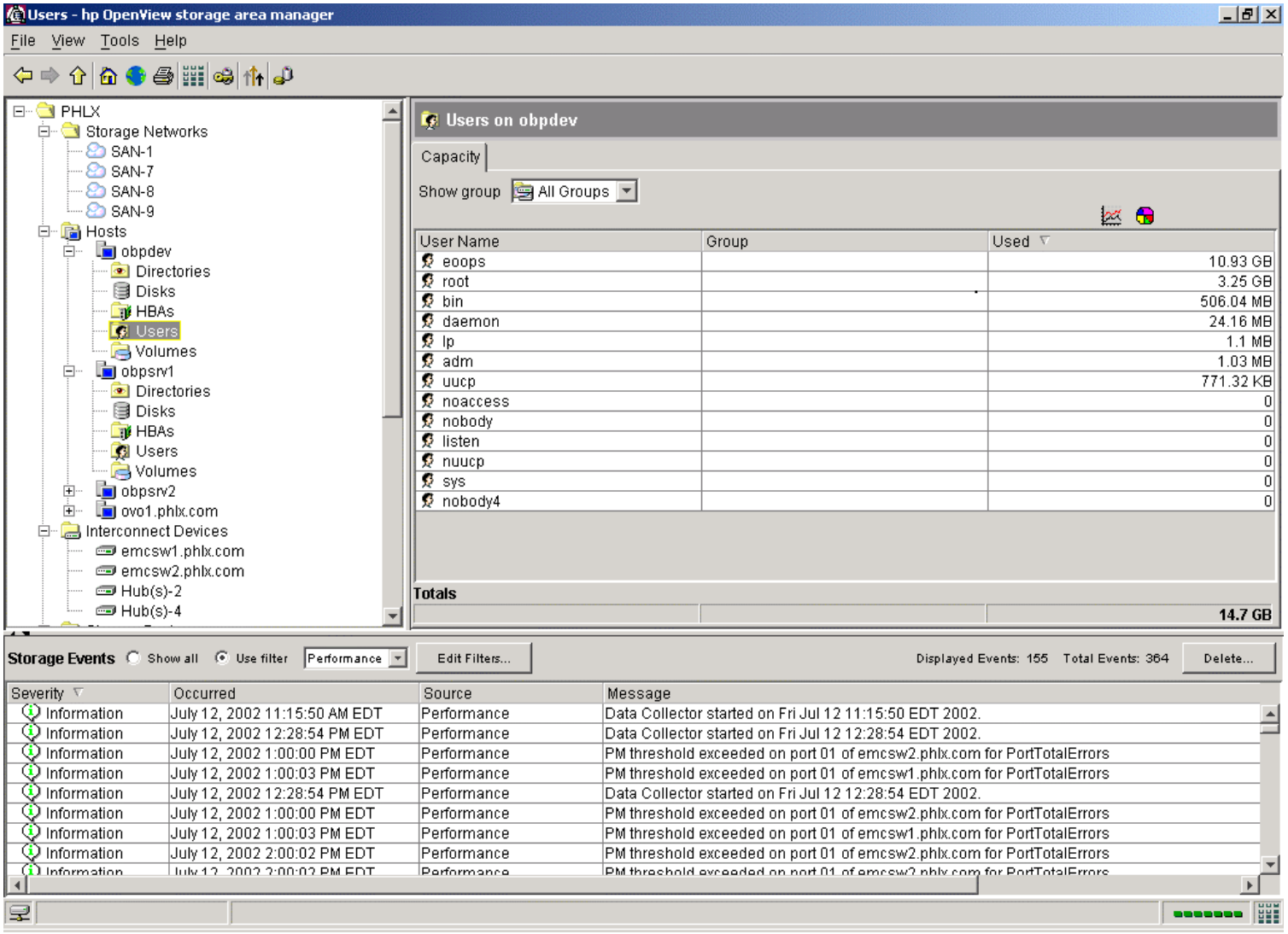
Users - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
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HBAs
Users
Volumes
obpsrv1
Directories
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ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Users on obpdev
Capacity
Show group All Groups
User Name Group Used
eoops 10.93 GB
root 3.25 GB
bin 506.04 MB
daemon 24.16 MB
lp 1.1 MB
adm 1.03 MB
uucp 771.32 KB
noaccess 0
nobody 0
listen 0
nuucp 0
sys 0
nobody4 0
Totals
14.7 GB
Storage Events Show all Use filter Performance Edit Filters... Displayed Events: 155 Total Events: 364 Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
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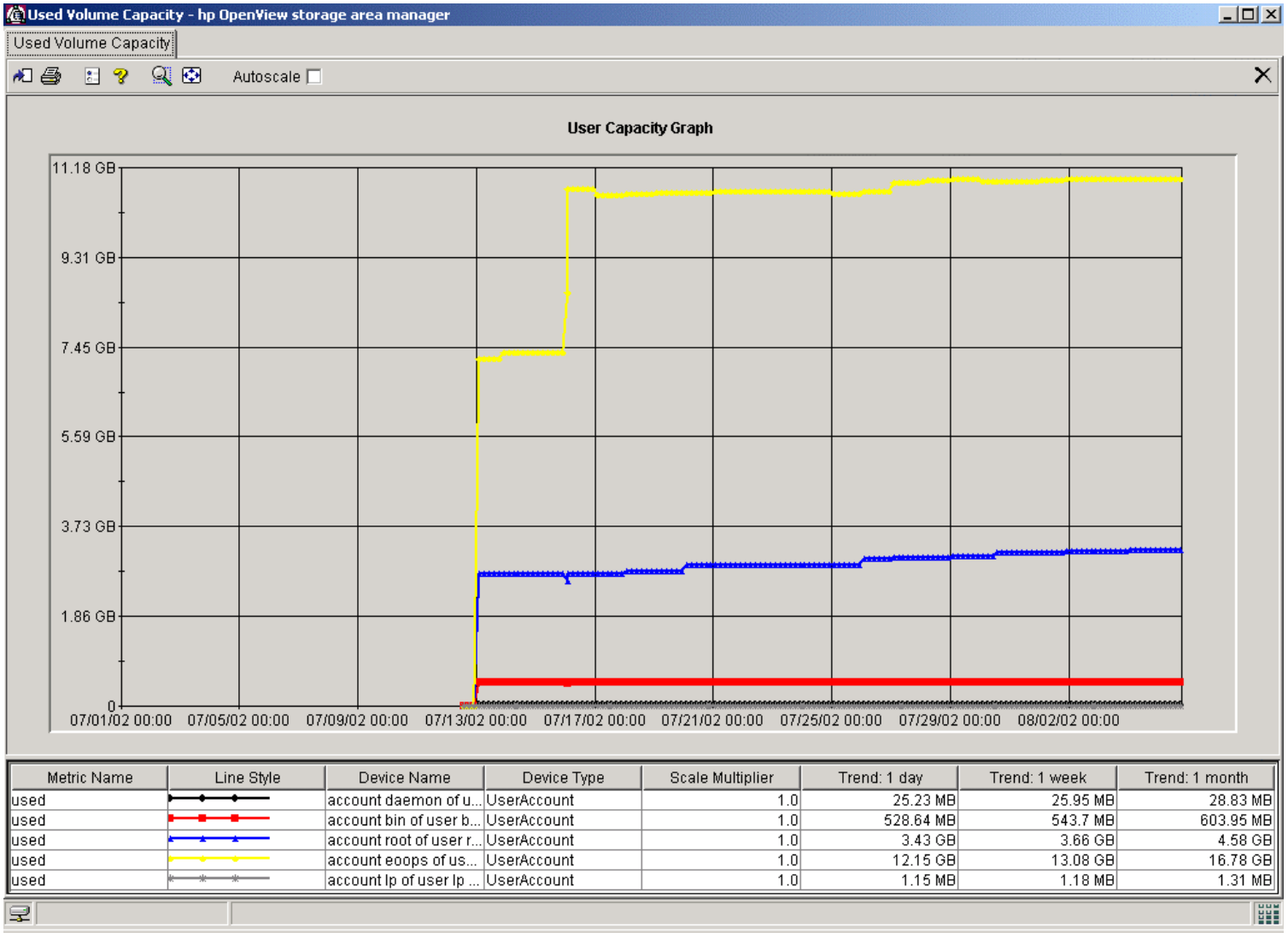
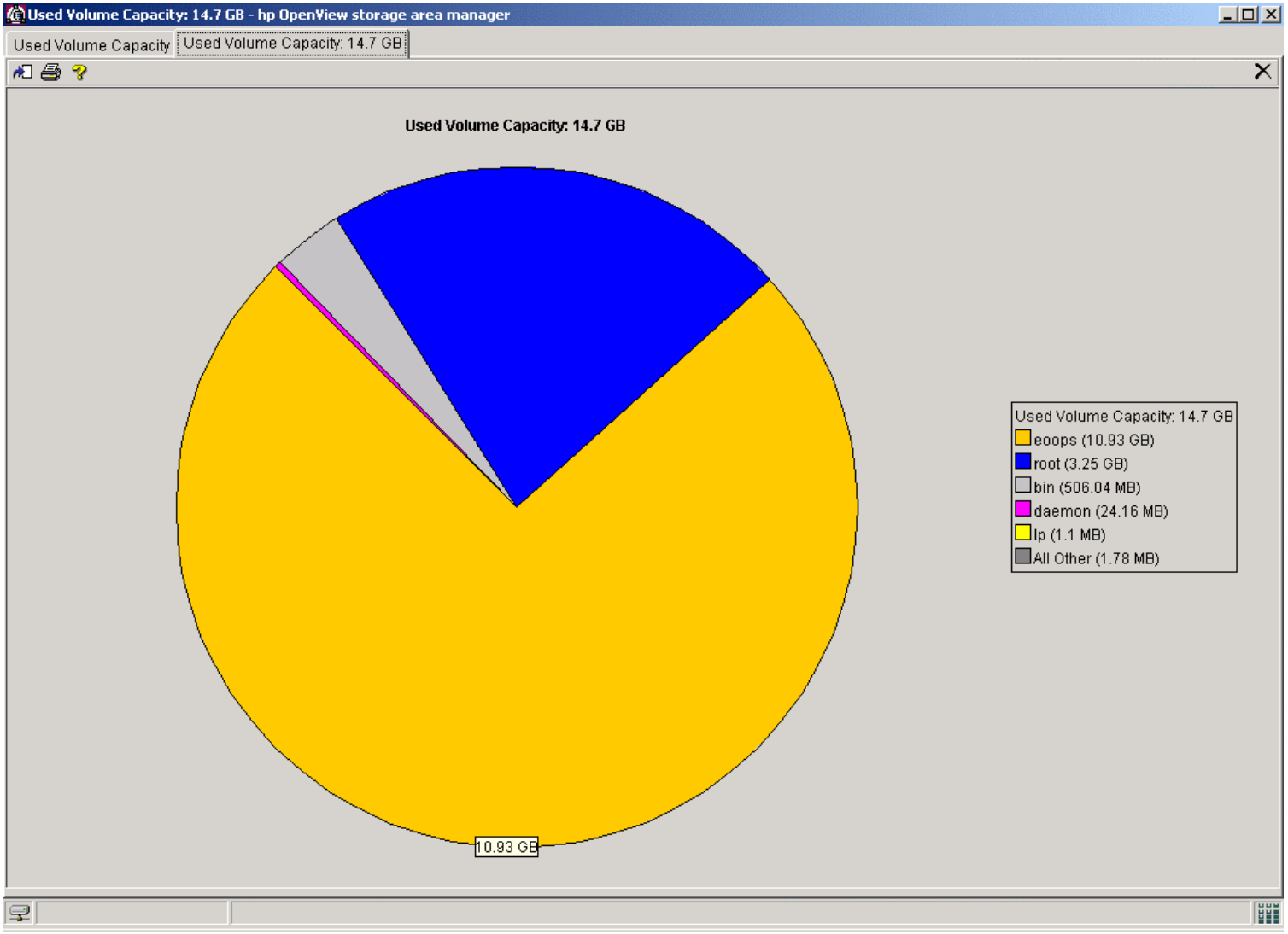
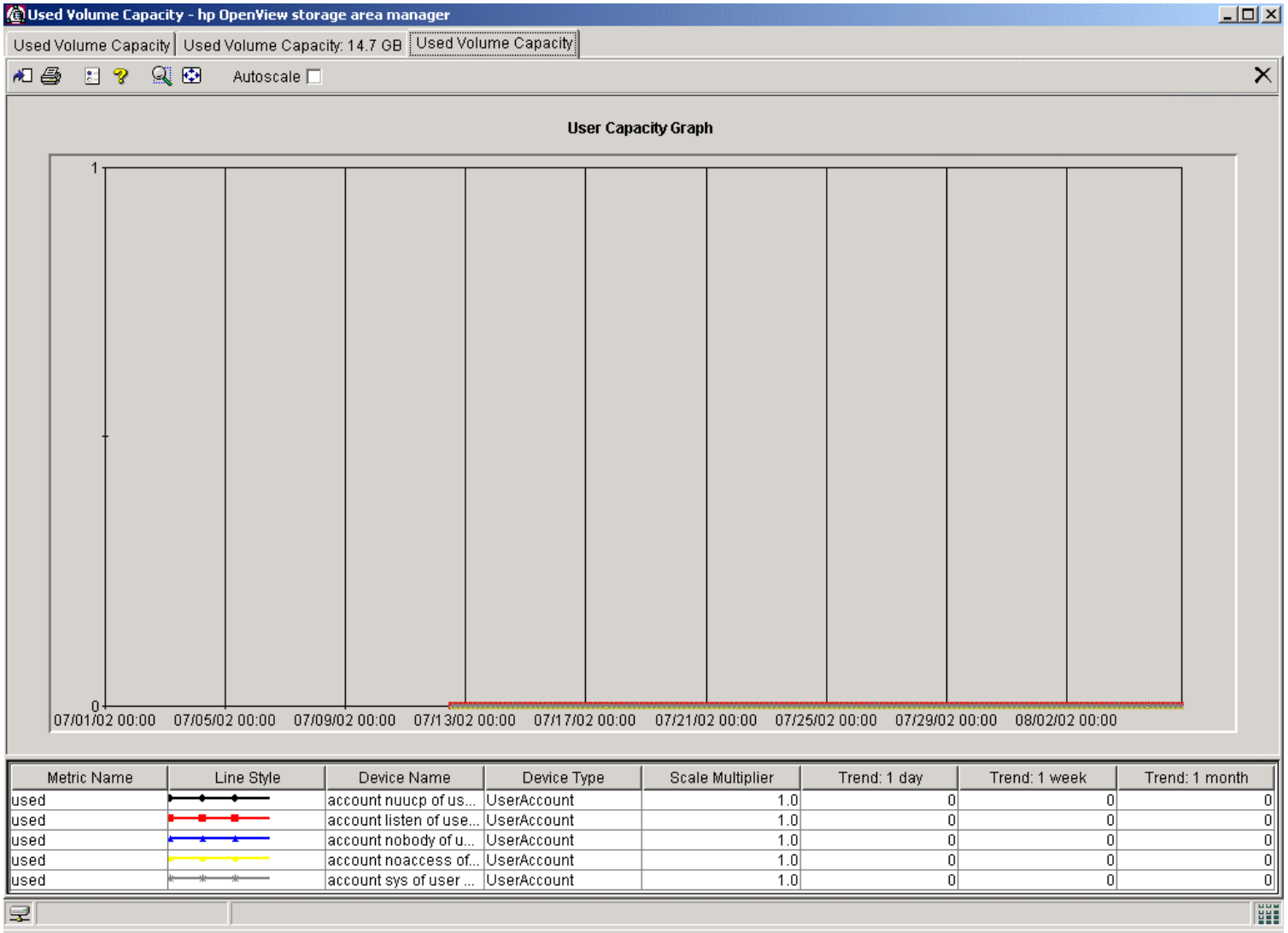
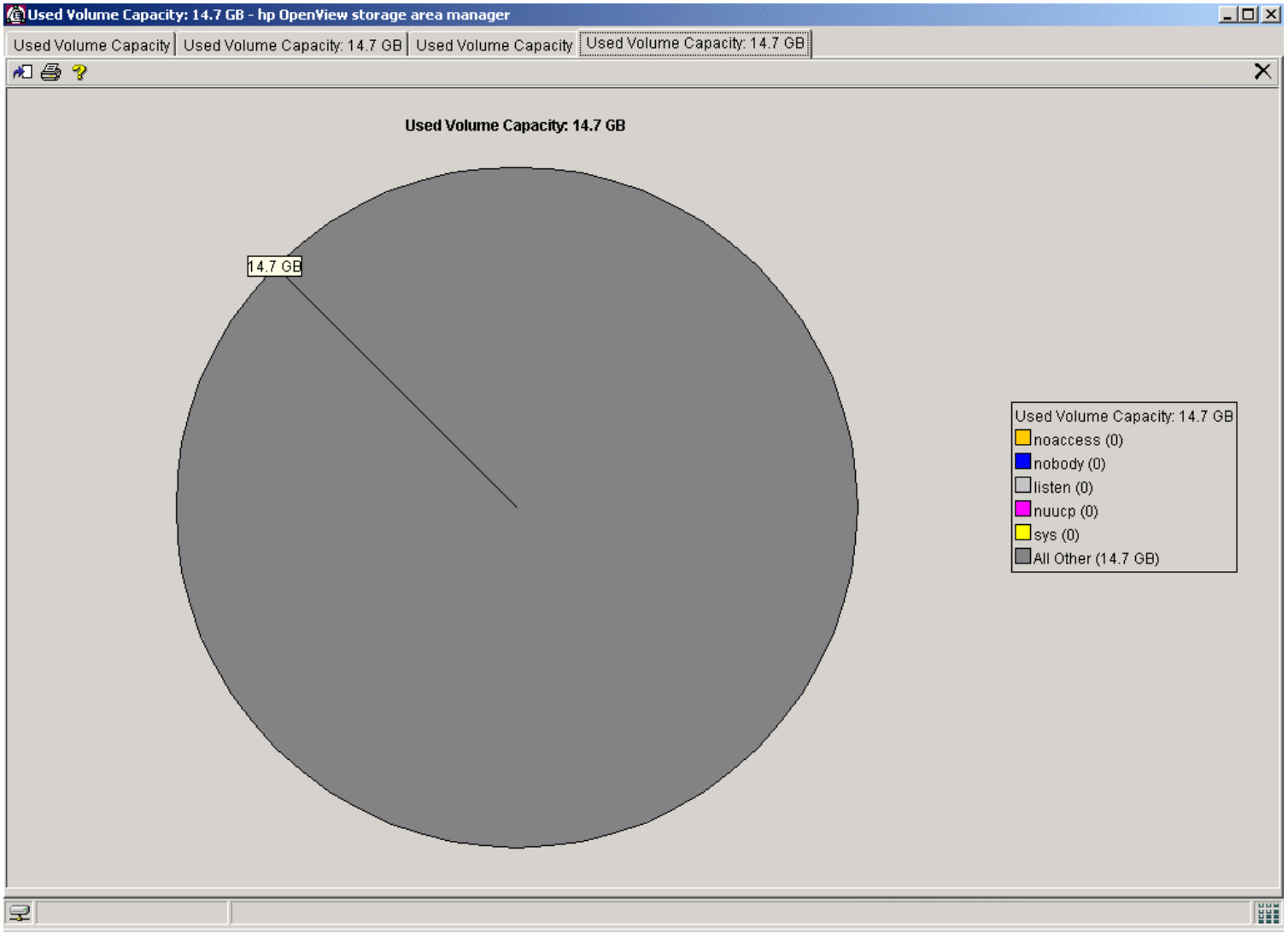


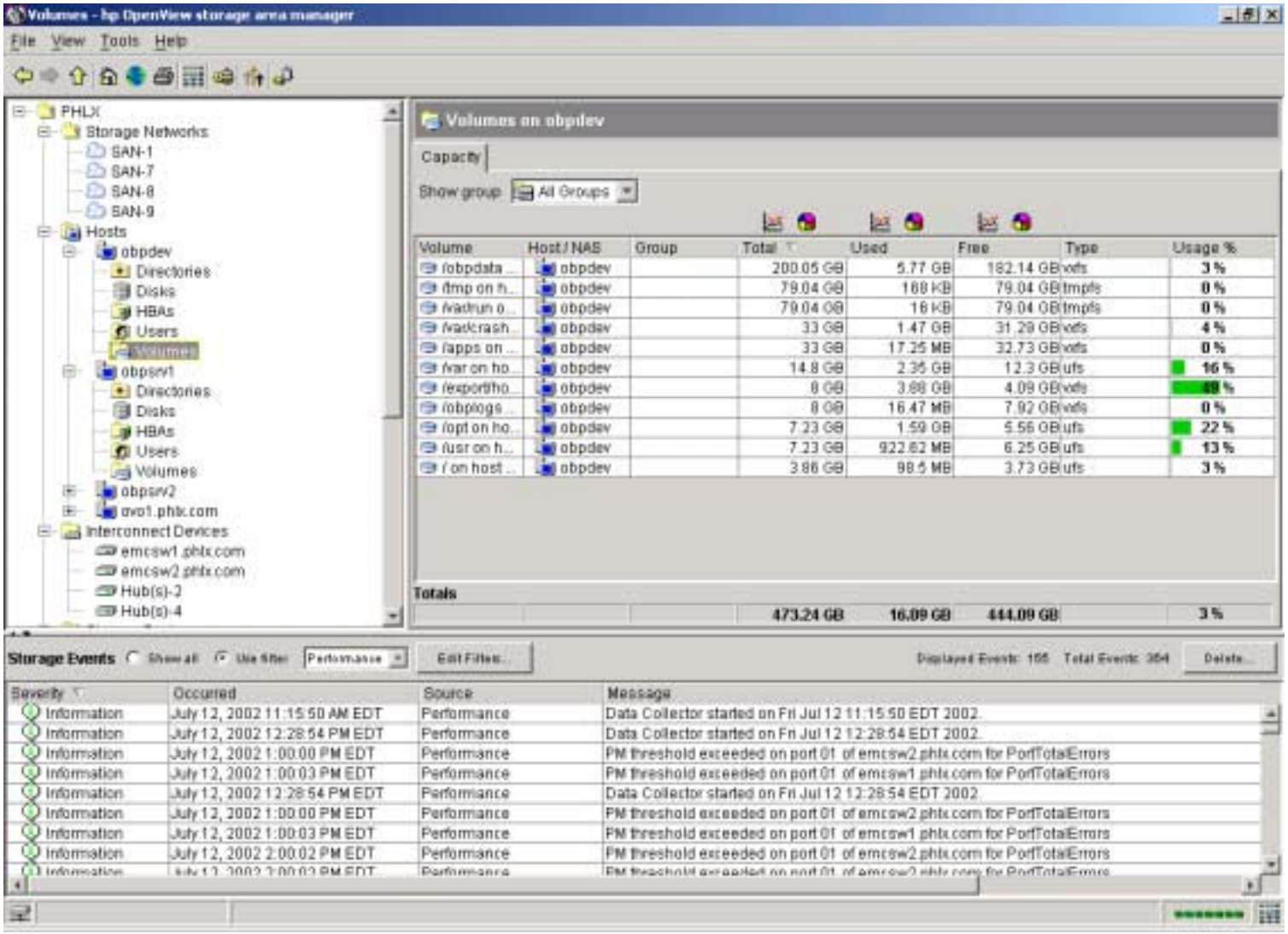
Metric Name	Line Style	Device Name	Device Type	Scale Multiplier	Trend: 1 day	Trend: 1 week	Trend: 1 month
used		account daemon of u...	UserAccount	1.0	25.23 MB	25.95 MB	28.83 MB
used		account bin of user b...	UserAccount	1.0	528.64 MB	543.7 MB	603.95 MB
used		account root of user r...	UserAccount	1.0	3.43 GB	3.66 GB	4.58 GB
used		account eoops of us...	UserAccount	1.0	12.15 GB	13.08 GB	16.78 GB
used		account lp of user lp ...	UserAccount	1.0	1.15 MB	1.18 MB	1.31 MB

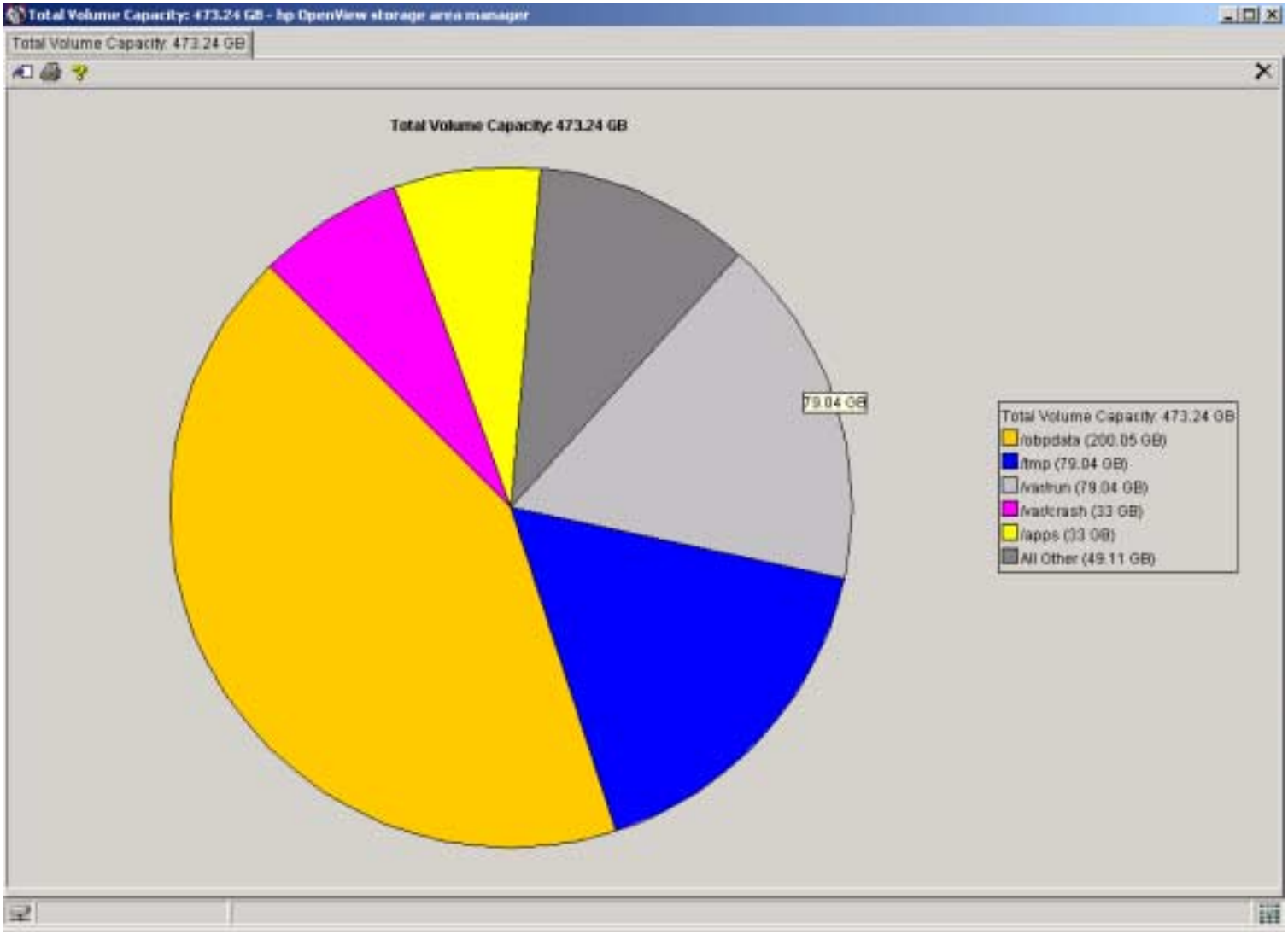

Used Volume Capacity: 14.7 GB - hp OpenView storage area manager
Used Volume Capacity
Used Volume Capacity: 14.7 GB
Used Volume Capacity: 14.7 GB
10.93 GB
Used Volume Capacity: 14.7 GB
eoops (10.93 GB)
root (3.25 GB)
bin (506.04 MB)
daemon (24.16 MB)
lp (1.1 MB)
All Other (1.78 MB)

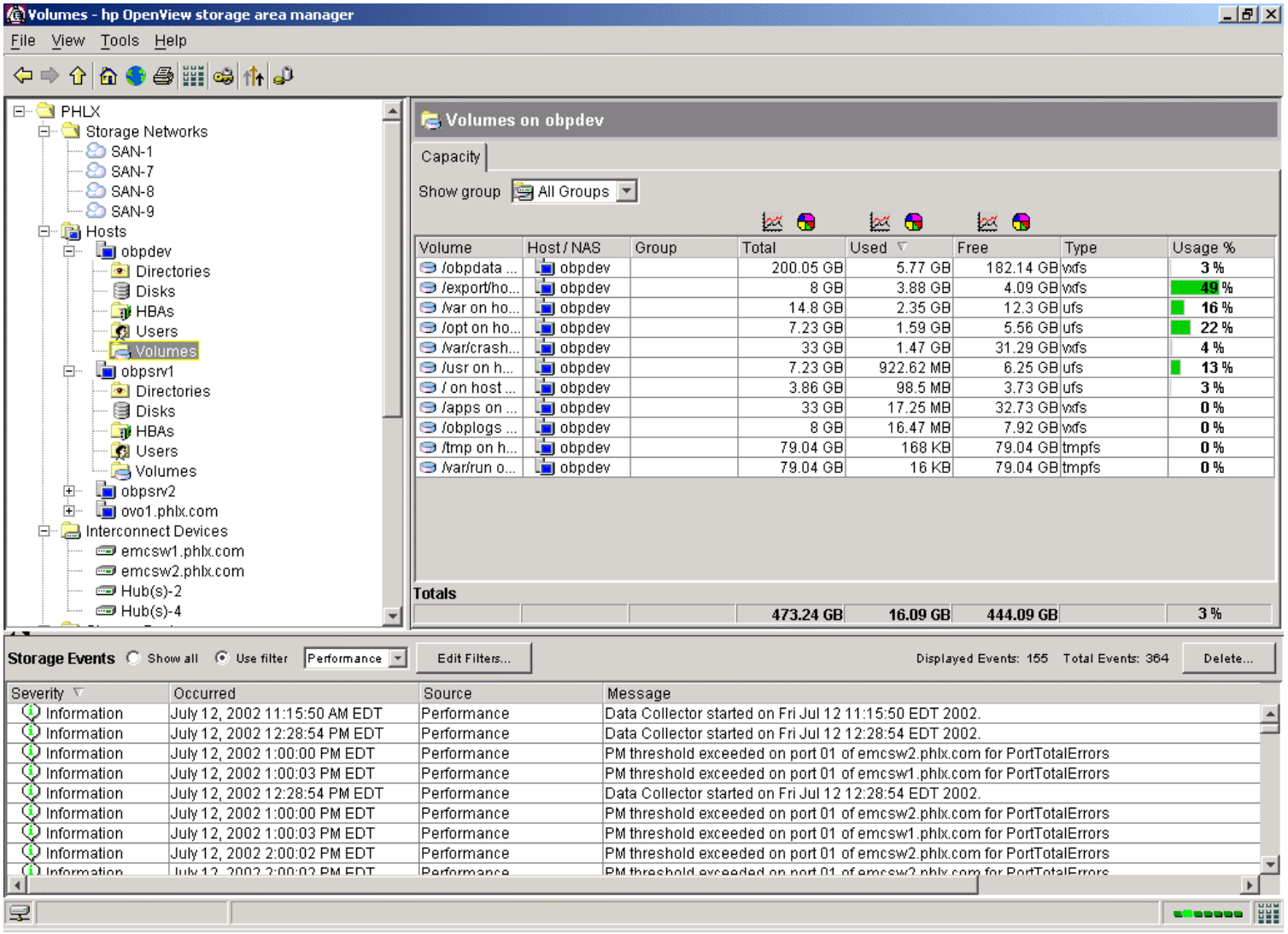


Metric Name	Line Style	Device Name	Device Type	Scale Multiplier	Trend: 1 day	Trend: 1 week	Trend: 1 month
used		account nuucp of us...	UserAccount	1.0	0	0	0
used		account listen of use...	UserAccount	1.0	0	0	0
used		account nobody of u...	UserAccount	1.0	0	0	0
used		account noaccess of...	UserAccount	1.0	0	0	0
used		account sys of user ...	UserAccount	1.0	0	0	0


Used Volume Capacity: 14.7 GB - hp OpenView storage area manager
Used Volume Capacity
Used Volume Capacity: 14.7 GB
Used Volume Capacity
Used Volume Capacity: 14.7 GB
Used Volume Capacity: 14.7 GB
14.7 GB
Used Volume Capacity: 14.7 GB
noaccess (0)
nobody (0)
listen (0)
nuucp (0)
sys (0)
All Other (14.7 GB)


Volumes - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
Directories
Disks
HBAs
Users
Volumes
obpsrv1
Directories
Disks
HBAs
Users
Volumes
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Volumes on obpdev
Capacity
Show group: All Groups
Volume | Host / NAS | Group | Total | Used | Free | Type | Usage %
/obpdata ... | obpdev | | 200.05 GB | 5.77 GB | 182.14 GB | vxfs | 3 %
/tmp on h... | obpdev | | 79.04 GB | 188 KB | 79.04 GB | tmpfs | 0 %
/var/adrun o... | obpdev | | 79.04 GB | 16 KB | 79.04 GB | tmpfs | 0 %
/var/crash ... | obpdev | | 33 GB | 1.47 GB | 31.29 GB | vxfs | 4 %
/apps on ... | obpdev | | 33 GB | 17.25 MB | 32.73 GB | vxfs | 0 %
/var on ho... | obpdev | | 14.8 GB | 2.35 GB | 12.3 GB | ufs | 16 %
/export/ho... | obpdev | | 8 GB | 3.88 GB | 4.09 GB | vxfs | 48 %
/obplogs ... | obpdev | | 8 GB | 16.47 MB | 7.92 GB | vxfs | 0 %
/opt on ho... | obpdev | | 7.23 GB | 1.59 GB | 5.56 GB | ufs | 22 %
/usr on h... | obpdev | | 7.23 GB | 922.82 MB | 6.25 GB | ufs | 13 %
/ on host ... | obpdev | | 3.86 GB | 98.5 MB | 3.73 GB | ufs | 3 %
Totals
473.24 GB 16.09 GB 444.09 GB 3 %
Storage Events
Show all
Use filter
Performance
Edit Filter...
Displayed Events: 155 Total Events: 364
Delete...
Severity | Occurred | Source | Message
Information | July 12, 2002 11:15:50 AM EDT | Performance | Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information | July 12, 2002 12:28:54 PM EDT | Performance | Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information | July 12, 2002 1:00:00 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information | July 12, 2002 1:00:03 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information | July 12, 2002 12:28:54 PM EDT | Performance | Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information | July 12, 2002 1:00:00 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information | July 12, 2002 1:00:03 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information | July 12, 2002 2:00:02 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors


Total Volume Capacity: 473.24 GB - hp OpenView storage area manager
Total Volume Capacity: 473.24 GB
Total Volume Capacity: 473.24 GB
79.04 GB
Total Volume Capacity: 473.24 GB
/obpdata (200.05 GB)
/tmp (79.04 GB)
/var/run (79.04 GB)
/var/crash (33 GB)
/apps (33 GB)
All Other (49.11 GB)


Volumes - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
SAN-1
SAN-7
SAN-8
SAN-9
Hosts
obpdev
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obpsrv1
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Users
Volumes
obpsrv2
ovo1.phlx.com
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Volumes on obpdev
Capacity
Show group All Groups
Volume | Host / NAS | Group | Total | Used | Free | Type | Usage %
/obpdata ... | obpdev | | 200.05 GB | 5.77 GB | 182.14 GB | vxfs | 3 %
/export/ho... | obpdev | | 8 GB | 3.88 GB | 4.09 GB | vxfs | 49 %
/var on ho... | obpdev | | 14.8 GB | 2.35 GB | 12.3 GB | ufs | 16 %
/opt on ho... | obpdev | | 7.23 GB | 1.59 GB | 5.56 GB | ufs | 22 %
/var/crash... | obpdev | | 33 GB | 1.47 GB | 31.29 GB | vxfs | 4 %
/usr on h... | obpdev | | 7.23 GB | 922.62 MB | 6.25 GB | ufs | 13 %
/ on host ... | obpdev | | 3.86 GB | 98.5 MB | 3.73 GB | ufs | 3 %
/apps on ... | obpdev | | 33 GB | 17.25 MB | 32.73 GB | vxfs | 0 %
/obplogs ... | obpdev | | 8 GB | 16.47 MB | 7.92 GB | vxfs | 0 %
/tmp on h... | obpdev | | 79.04 GB | 168 KB | 79.04 GB | tmpfs | 0 %
/var/run o... | obpdev | | 79.04 GB | 16 KB | 79.04 GB | tmpfs | 0 %
Totals
473.24 GB | 16.09 GB | 444.09 GB | 3 %
Storage Events Show all Use filter Performance Edit Filters... Displayed Events: 155 Total Events: 364 Delete...
Severity | Occurred | Source | Message
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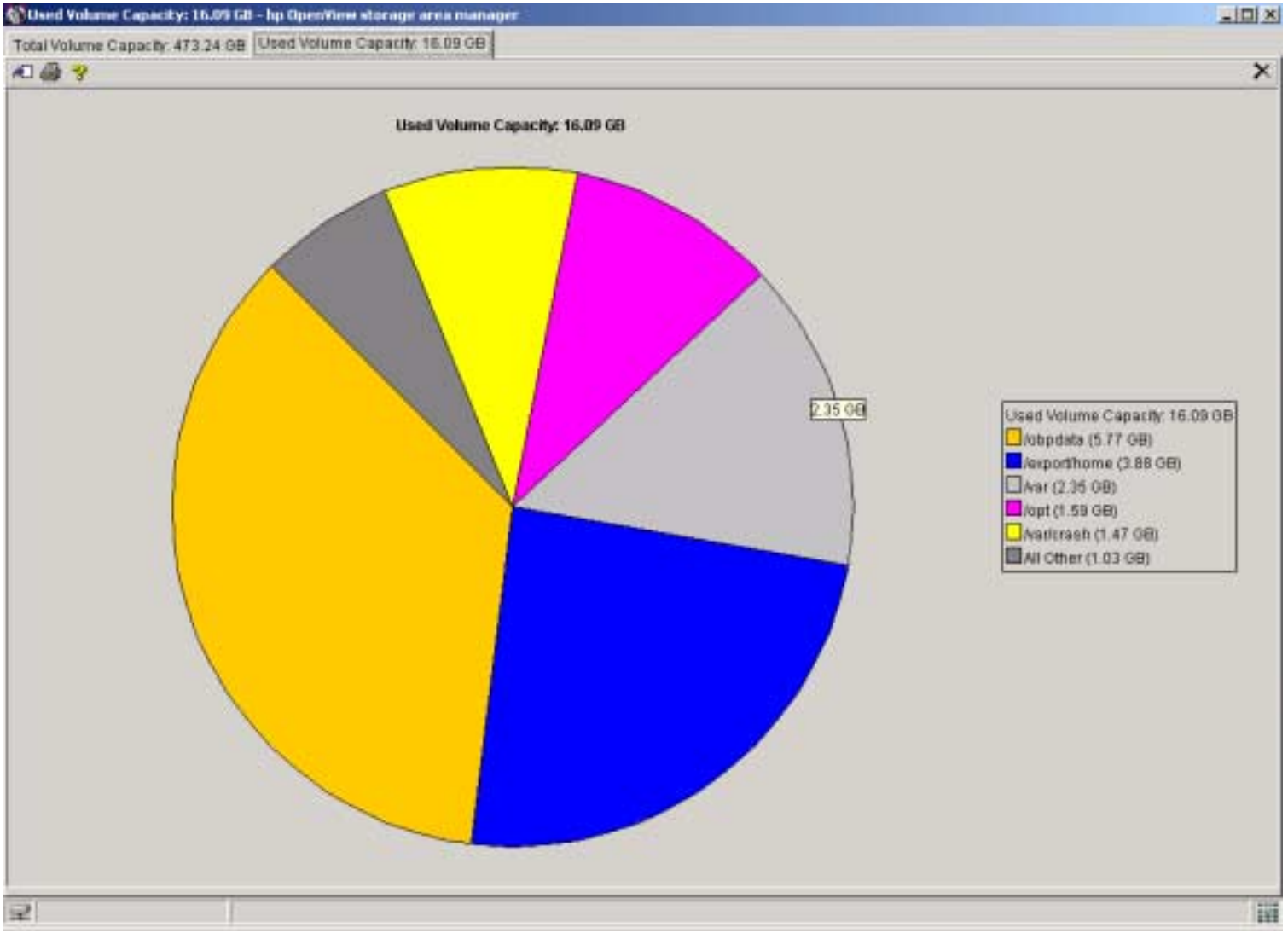
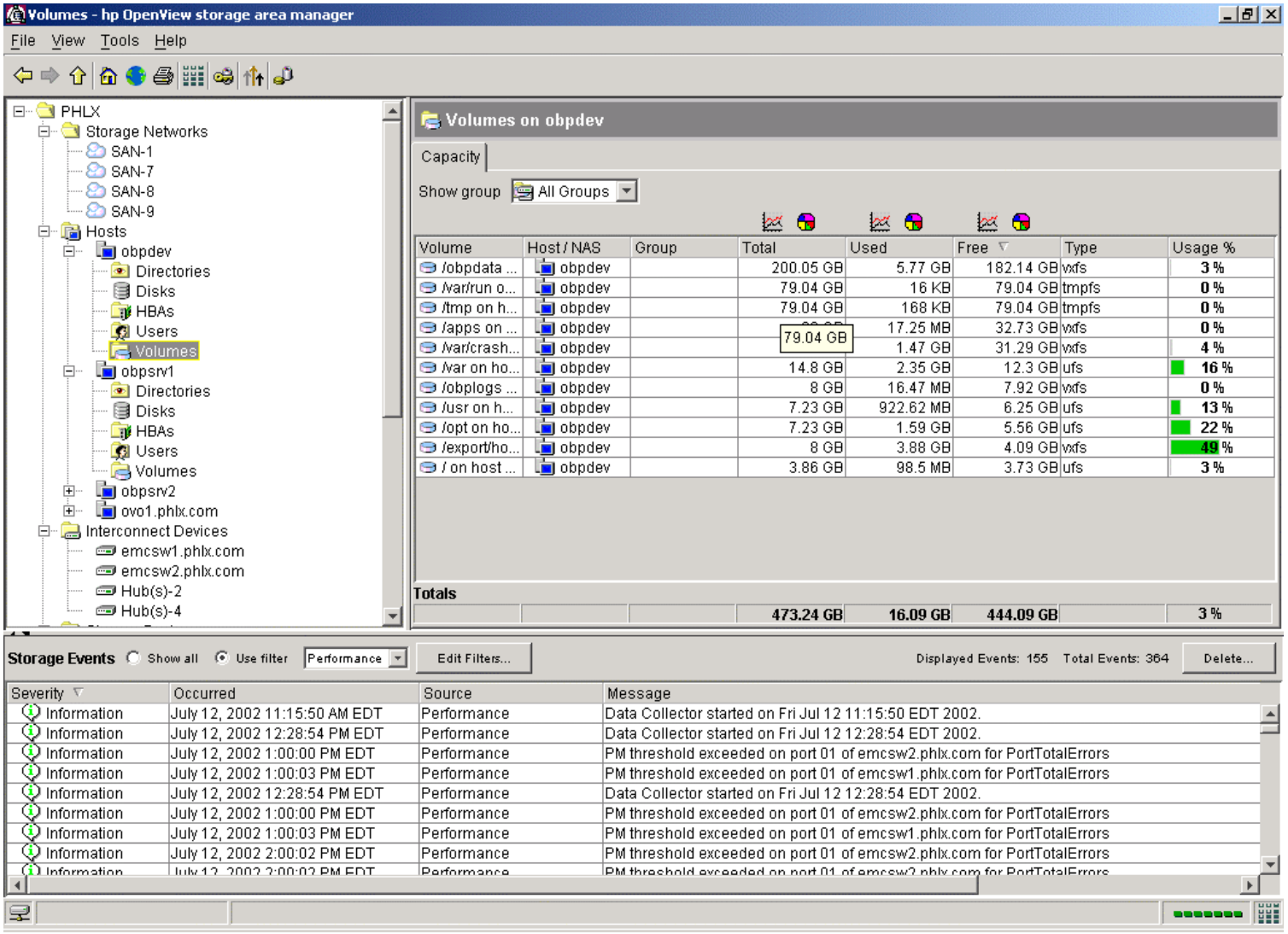

Used Volume Capacity: 16.09 GB - hp OpenView storage area manager
Total Volume Capacity: 473.24 GB
Used Volume Capacity: 16.09 GB
Used Volume Capacity: 16.09 GB
2.35 GB
Used Volume Capacity: 16.09 GB
/obpdata (5.77 GB)
/export/home (3.88 GB)
/var (2.35 GB)
/opt (1.59 GB)
/var/crash (1.47 GB)
All Other (1.03 GB)


Volumes - hp OpenView storage area manager
File View Tools Help
PHLX
Storage Networks
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SAN-7
SAN-8
SAN-9
Hosts
obpdev
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obpsrv1
Directories
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ovo1.phlx.com
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emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Volumes on obpdev
Capacity
Show group All Groups
Volume | Host / NAS | Group | Total | Used | Free | Type | Usage %
/obpdata ... | obpdev | | 200.05 GB | 5.77 GB | 182.14 GB | vxfs | 3 %
/var/run o... | obpdev | | 79.04 GB | 16 KB | 79.04 GB | tmpfs | 0 %
/tmp on h... | obpdev | | 79.04 GB | 168 KB | 79.04 GB | tmpfs | 0 %
/apps on ... | obpdev | | | 17.25 MB | 32.73 GB | vxfs | 0 %
/var/crash... | obpdev | | | 1.47 GB | 31.29 GB | vxfs | 4 %
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/opt on ho... | obpdev | | 7.23 GB | 1.59 GB | 5.56 GB | ufs | 22 %
/export/ho... | obpdev | | 8 GB | 3.88 GB | 4.09 GB | vxfs | 49 %
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Totals
473.24 GB 16.09 GB 444.09 GB 3 %
Storage Events Show all Use filter Performance Edit Filters... Displayed Events: 155 Total Events: 364 Delete...
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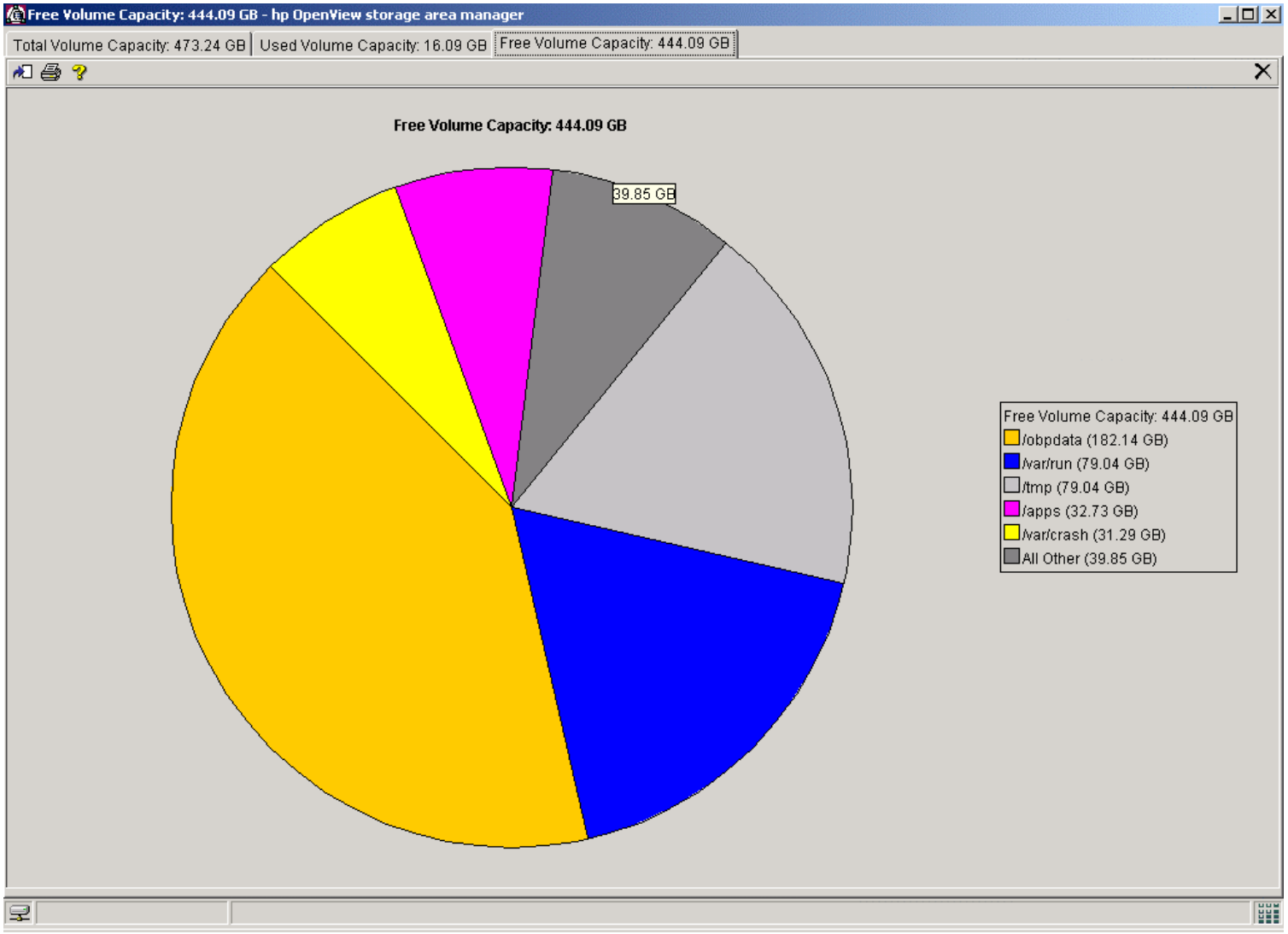
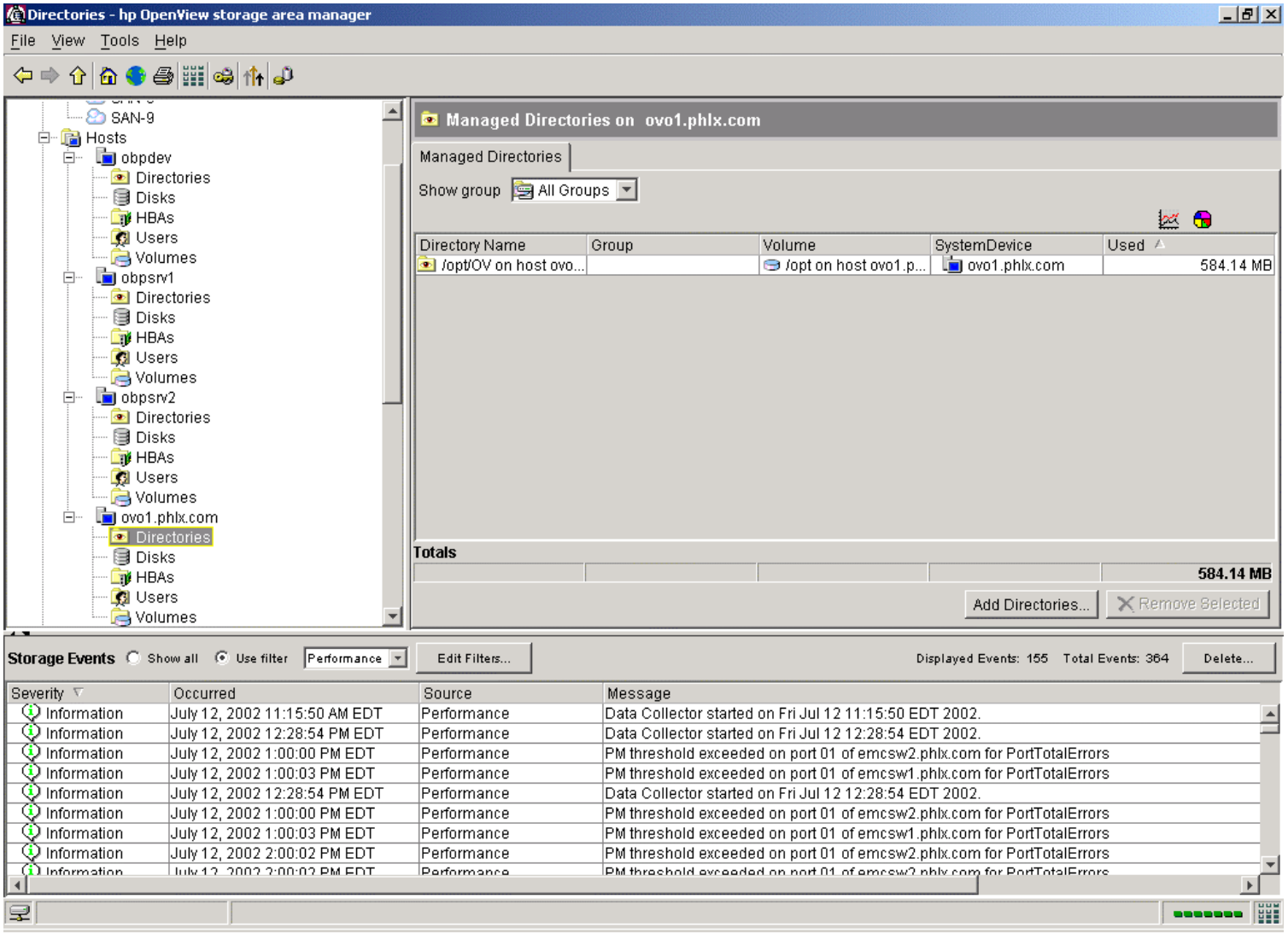
Information | July 12, 2002 1:00:00 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information | July 12, 2002 1:00:03 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information | July 12, 2002 2:00:02 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors


Free Volume Capacity: 444.09 GB - hp OpenView storage area manager
Total Volume Capacity: 473.24 GB
Used Volume Capacity: 16.09 GB
Free Volume Capacity: 444.09 GB
Free Volume Capacity: 444.09 GB
39.85 GB
Free Volume Capacity: 444.09 GB
/obpdata (182.14 GB)
/var/run (79.04 GB)
/tmp (79.04 GB)
/apps (32.73 GB)
/var/crash (31.29 GB)
All Other (39.85 GB)


Directories - hp OpenView storage area manager
File View Tools Help
SAN-9
Hosts
obpdev
Directories
Disks
HBAs
Users
Volumes
obpsrv1
Directories
Disks
HBAs
Users
Volumes
obpsrv2
Directories
Disks
HBAs
Users
Volumes
ovo1.phlx.com
Directories
Disks
HBAs
Users
Volumes
Managed Directories on ovo1.phlx.com
Managed Directories
Show group All Groups
Directory Name Group Volume SystemDevice Used
/opt/OV on host ovo... /opt on host ovo1.p... ovo1.phlx.com 584.14 MB
Totals
584.14 MB
Add Directories...
Remove Selected
Storage Events Show all Use filter Performance Edit Filters... Displayed Events: 155 Total Events: 364 Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
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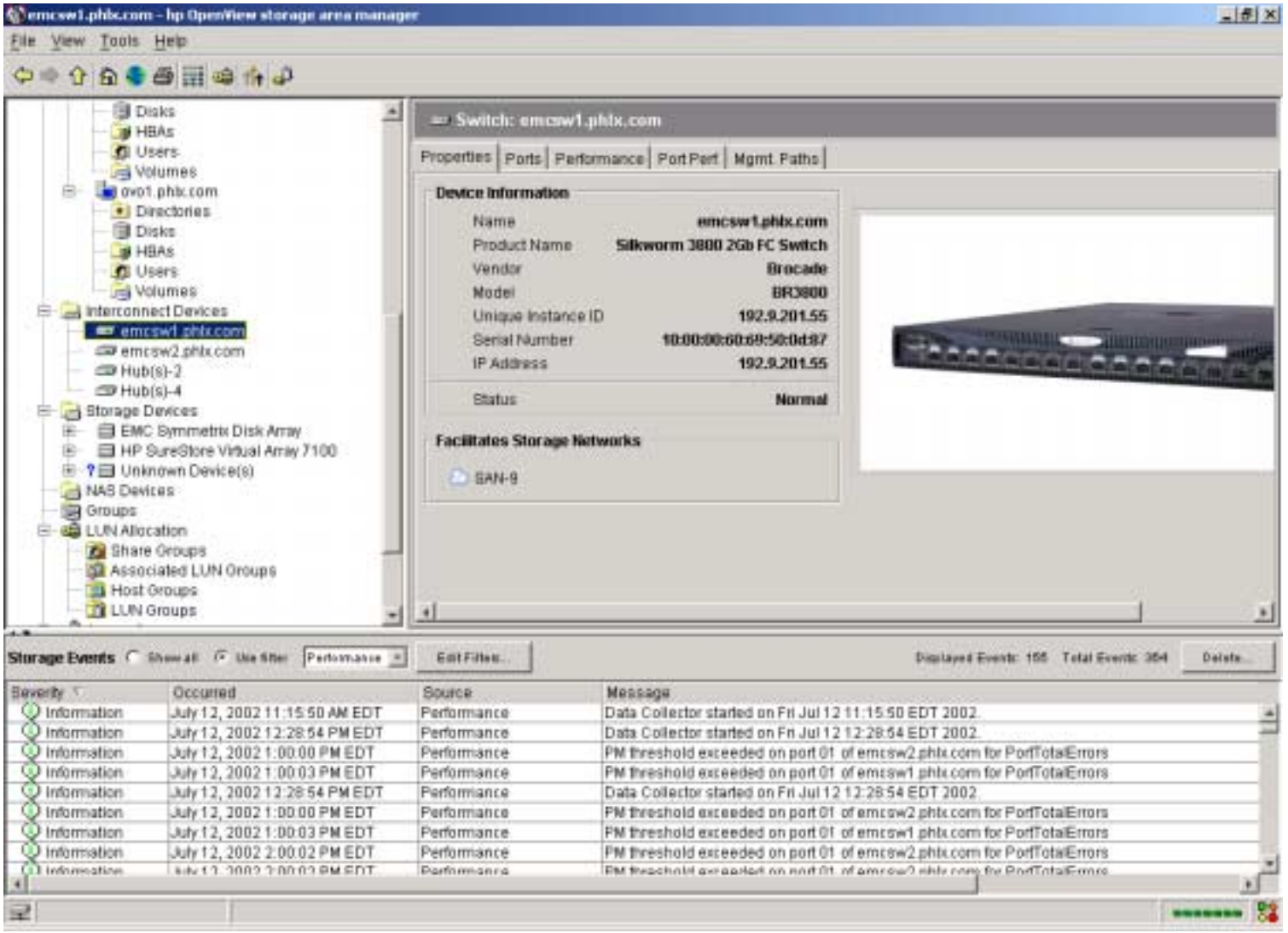
emcsw1.phlx.com – hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phlx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Switch: emcsw1.phlx.com
Properties Ports Performance Port Port Mgmt. Paths
Device Information
Name emcsw1.phlx.com
Product Name Silkworm 3800 2Gb FC Switch
Vendor Brocade
Model BR3800
Unique Instance ID 192.9.201.55
Serial Number 10:00:00:60:69:50:0d:87
IP Address 192.9.201.55
Status Normal
Facilitates Storage Networks
SAN-9
Storage Events
Edit Filter...
Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
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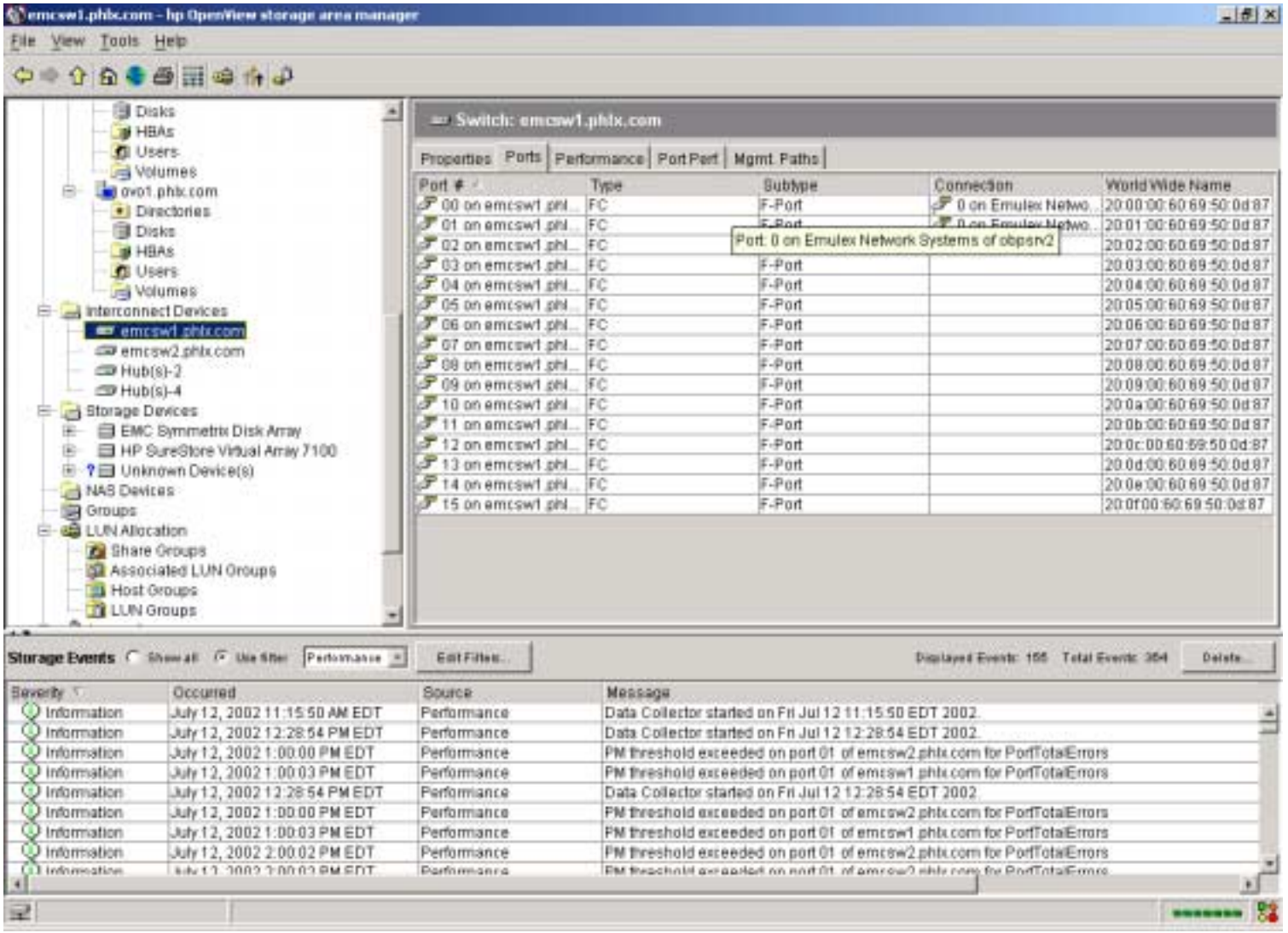
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors


emcsw1.phlx.com – hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phlx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Switch: emcsw1.phlx.com
Properties Ports Performance Port Perf Mgmt Paths
Port # Type Subtype Connection World Wide Name
00 on emcsw1.phl... FC F-Port 0 on Emulex Netwo... 20:00:00:60:69:50:0d:87
01 on emcsw1.phl... FC F-Port 0 on Emulex Netwo... 20:01:00:60:69:50:0d:87
02 on emcsw1.phl... FC F-Port 20:02:00:60:69:50:0d:87
03 on emcsw1.phl... FC F-Port 20:03:00:60:69:50:0d:87
04 on emcsw1.phl... FC F-Port 20:04:00:60:69:50:0d:87
05 on emcsw1.phl... FC F-Port 20:05:00:60:69:50:0d:87
06 on emcsw1.phl... FC F-Port 20:06:00:60:69:50:0d:87
07 on emcsw1.phl... FC F-Port 20:07:00:60:69:50:0d:87
08 on emcsw1.phl... FC F-Port 20:08:00:60:69:50:0d:87
09 on emcsw1.phl... FC F-Port 20:09:00:60:69:50:0d:87
10 on emcsw1.phl... FC F-Port 20:0a:00:60:69:50:0d:87
11 on emcsw1.phl... FC F-Port 20:0b:00:60:69:50:0d:87
12 on emcsw1.phl... FC F-Port 20:0c:00:60:69:50:0d:87
13 on emcsw1.phl... FC F-Port 20:0d:00:60:69:50:0d:87
14 on emcsw1.phl... FC F-Port 20:0e:00:60:69:50:0d:87
15 on emcsw1.phl... FC F-Port 20:0f:00:60:69:50:0d:87
Port: 0 on Emulex Network Systems of obpsrv2
Storage Events Show all Use filter Performance Edit Filter... Displayed Events: 155 Total Events: 364 Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
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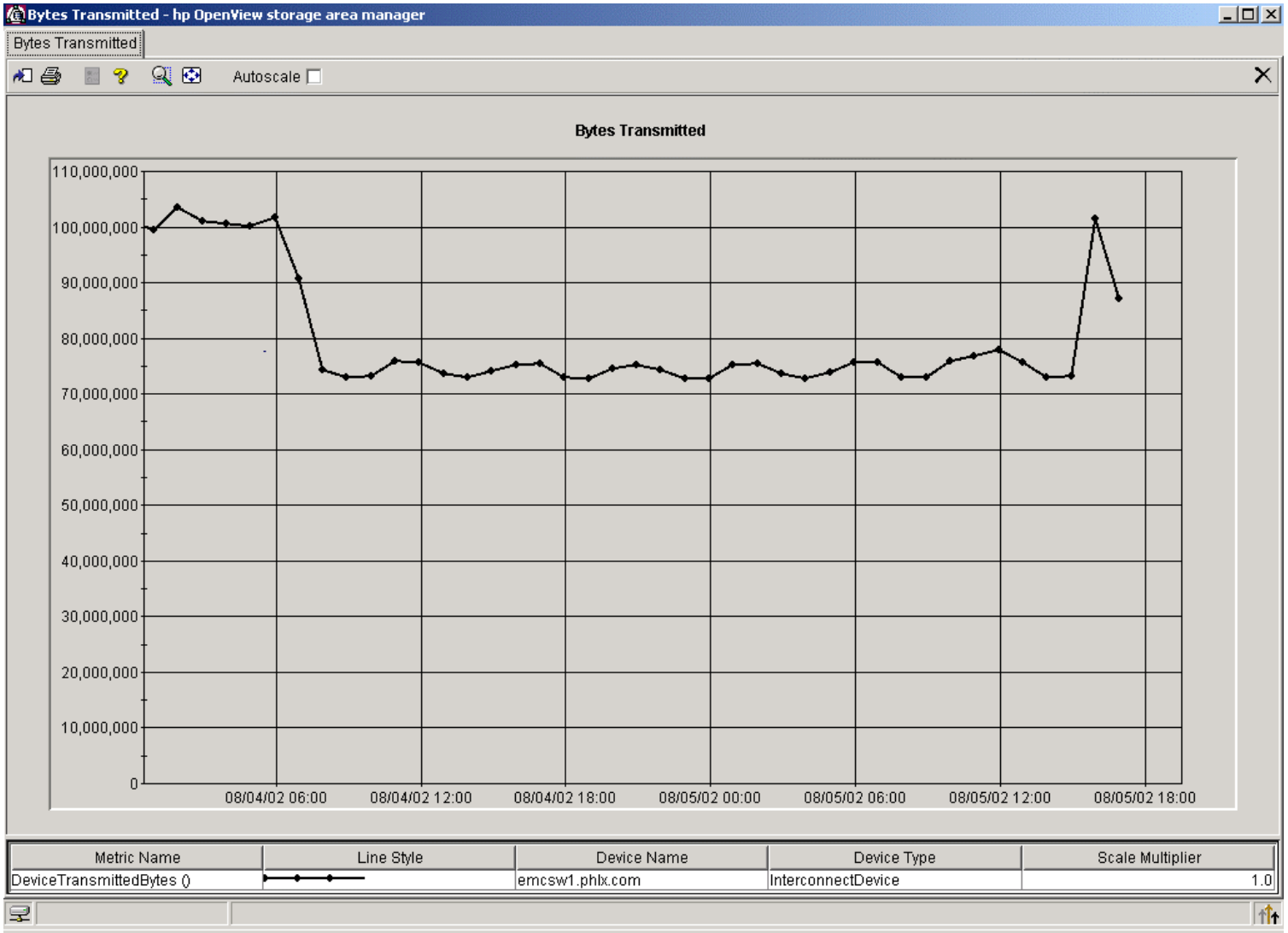
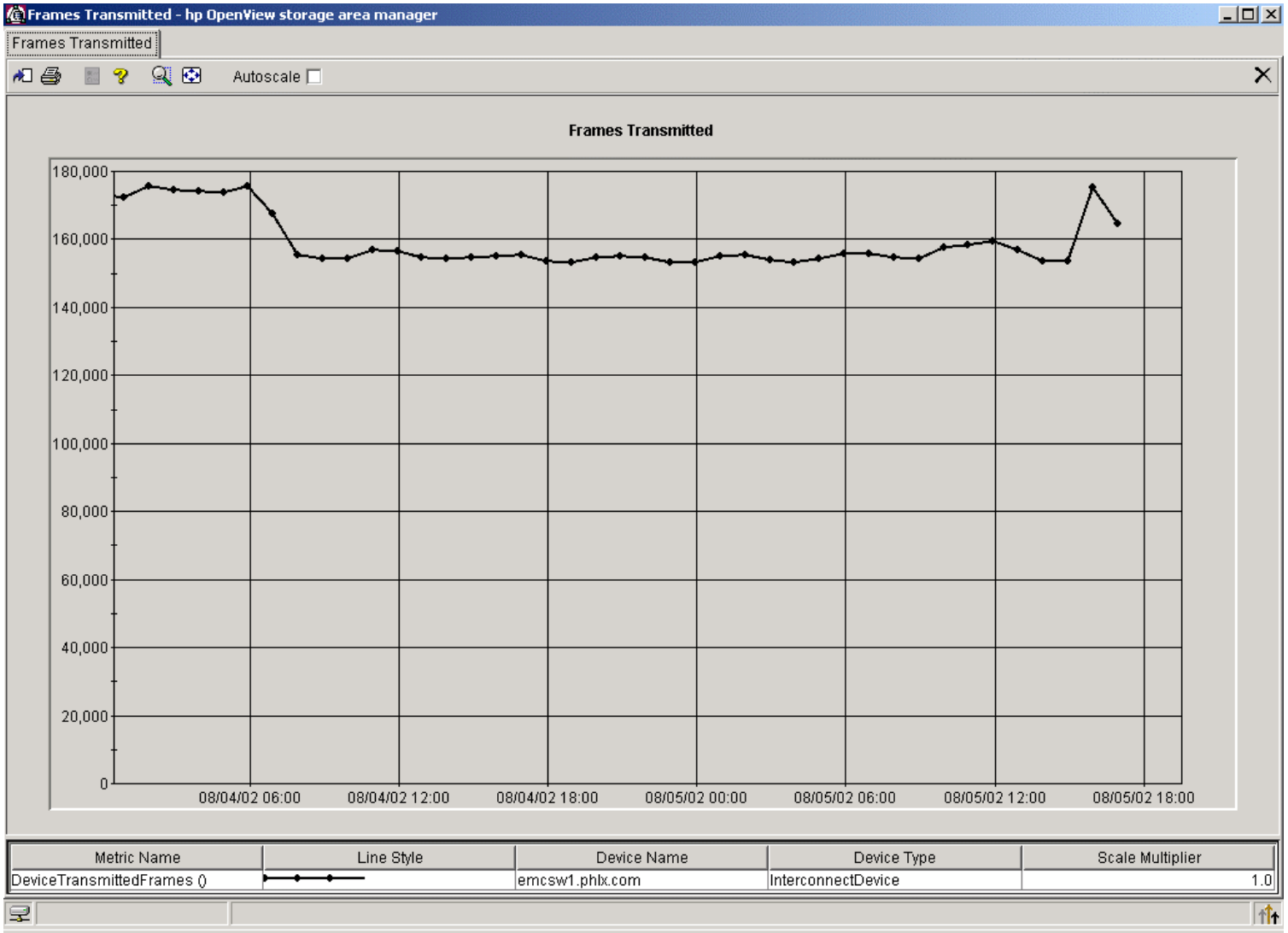
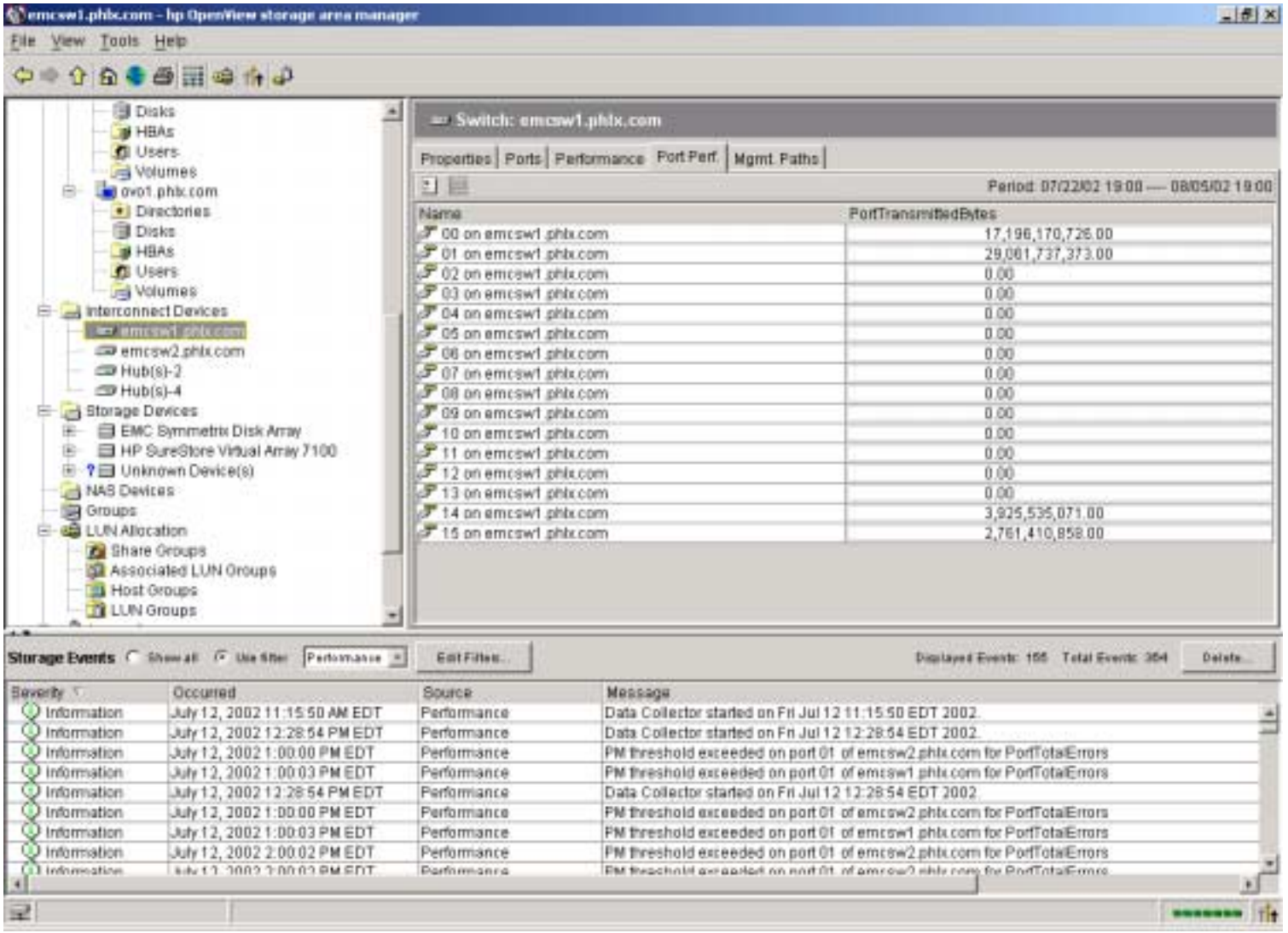
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors


Bytes Transmitted - hp OpenView storage area manager
Bytes Transmitted
Autoscale
Bytes Transmitted
110,000,000
100,000,000
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
0
08/04/02 06:00
08/04/02 12:00
08/04/02 18:00
08/05/02 00:00
08/05/02 06:00
08/05/02 12:00
08/05/02 18:00
Metric Name
Line Style
Device Name
Device Type
Scale Multiplier
DeviceTransmittedBytes ()
emcsw1.phlx.com
InterconnectDevice
1.0


Frames Transmitted - hp OpenView storage area manager
Frames Transmitted
Autoscale
Frames Transmitted
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
08/04/02 06:00
08/04/02 12:00
08/04/02 18:00
08/05/02 00:00
08/05/02 06:00
08/05/02 12:00
08/05/02 18:00
Metric Name
Line Style
Device Name
Device Type
Scale Multiplier
DeviceTransmittedFrames ()
emcsw1.phlx.com
InterconnectDevice
1.0


emcsw1.phlx.com – hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phlx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Switch: emcsw1.phlx.com
Properties Ports Performance Port Perf. Mgmt. Paths
Period: 07/22/02 19:00 — 08/05/02 19:00
Name
PortTransmittedBytes
00 on emcsw1.phlx.com 17,196,170,726.00
01 on emcsw1.phlx.com 29,061,737,373.00
02 on emcsw1.phlx.com 0.00
03 on emcsw1.phlx.com 0.00
04 on emcsw1.phlx.com 0.00
05 on emcsw1.phlx.com 0.00
06 on emcsw1.phlx.com 0.00
07 on emcsw1.phlx.com 0.00
08 on emcsw1.phlx.com 0.00
09 on emcsw1.phlx.com 0.00
10 on emcsw1.phlx.com 0.00
11 on emcsw1.phlx.com 0.00
12 on emcsw1.phlx.com 0.00
13 on emcsw1.phlx.com 0.00
14 on emcsw1.phlx.com 3,925,535,071.00
15 on emcsw1.phlx.com 2,761,410,858.00
Storage Events
Edit Filter...
Delete...
Severity
Occurred
Source
Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
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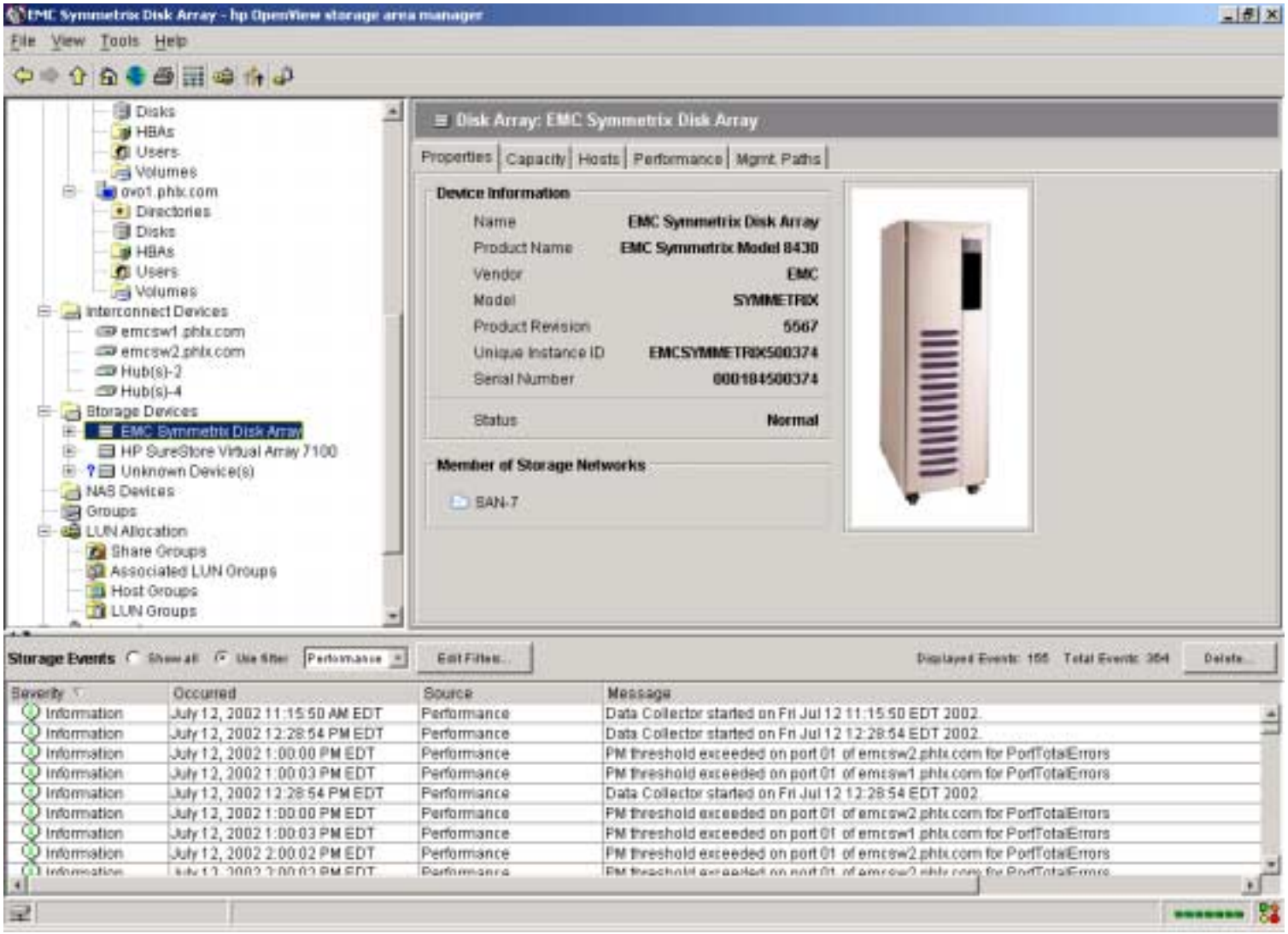
EMC Symmetrix Disk Array - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phtx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phtx.com
emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: EMC Symmetrix Disk Array
Properties
Capacity
Hosts
Performance
Mgmt Paths
Device Information
Name EMC Symmetrix Disk Array
Product Name EMC Symmetrix Model 8430
Vendor EMC
Model SYMMETRIX
Product Revision 5567
Unique Instance ID EMCSYMMETRIX500374
Serial Number 000184500374
Status Normal
Member of Storage Networks
SAN-7
Storage Events
Edit Filter...
Delete...
Severity
Occurred
Source
Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
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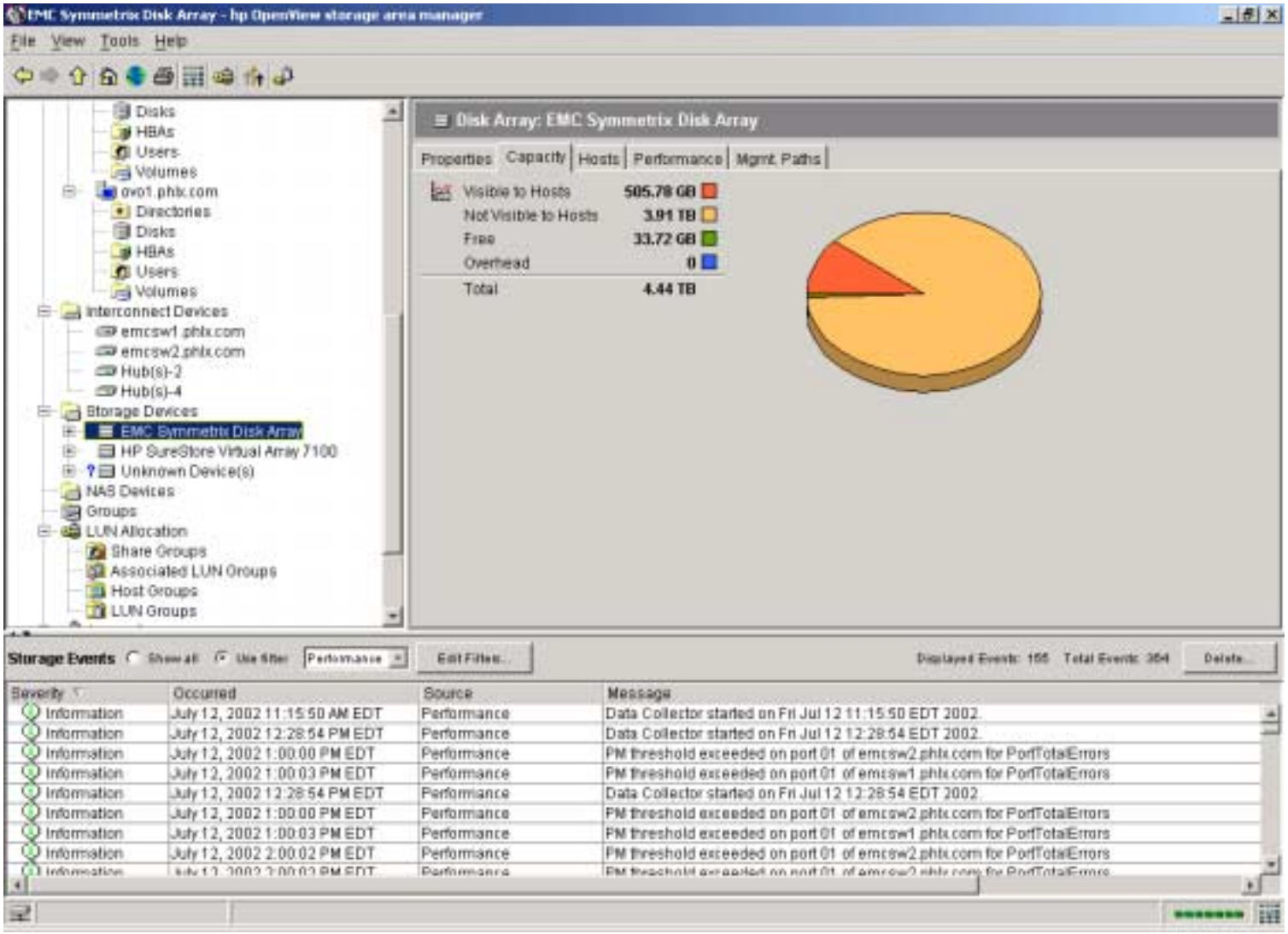
EMC Symmetrix Disk Array - hp OpenView storage area manager
File View Tools Help
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Interconnect Devices
emcsw1.phtx.com
emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: EMC Symmetrix Disk Array
Properties Capacity Hosts Performance Mgmt Paths
Visible to Hosts 505.78 GB
Not Visible to Hosts 3.91 TB
Free 33.72 GB
Overhead 0
Total 4.44 TB
Storage Events
Edit Filter...
Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
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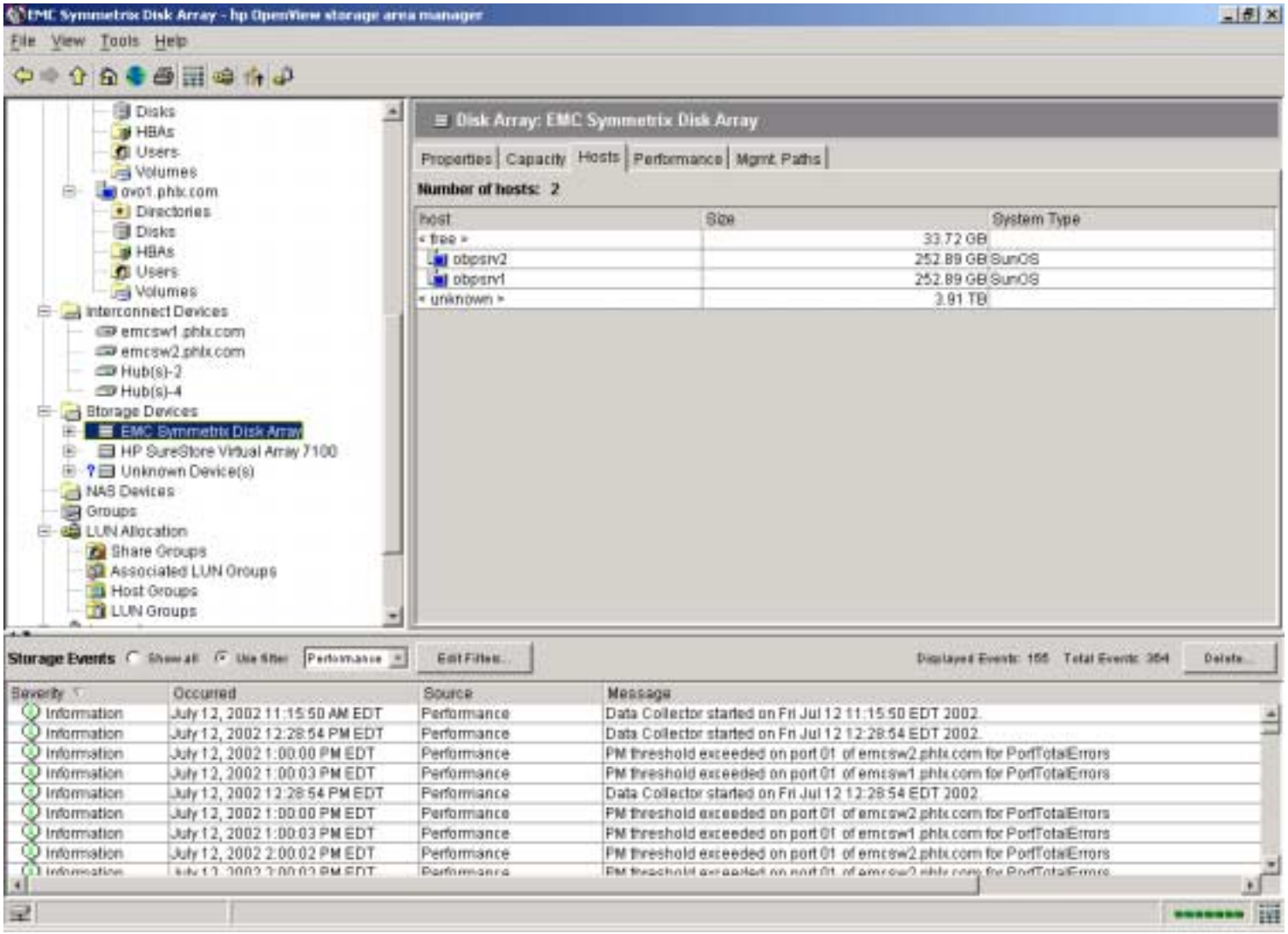
EMC Symmetrix Disk Array - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phtx.com
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HBAs
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emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: EMC Symmetrix Disk Array
Properties Capacity Hosts Performance Mgmt Paths
Number of hosts: 2
host Size System Type
< free > 33.72 GB
obpsrv2 252.89 GB SunOS
obpsrv1 252.89 GB SunOS
< unknown > 3.91 TB
Storage Events Show all Use filter Performance Edit Filter... Displayed Events: 155 Total Events: 364 Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
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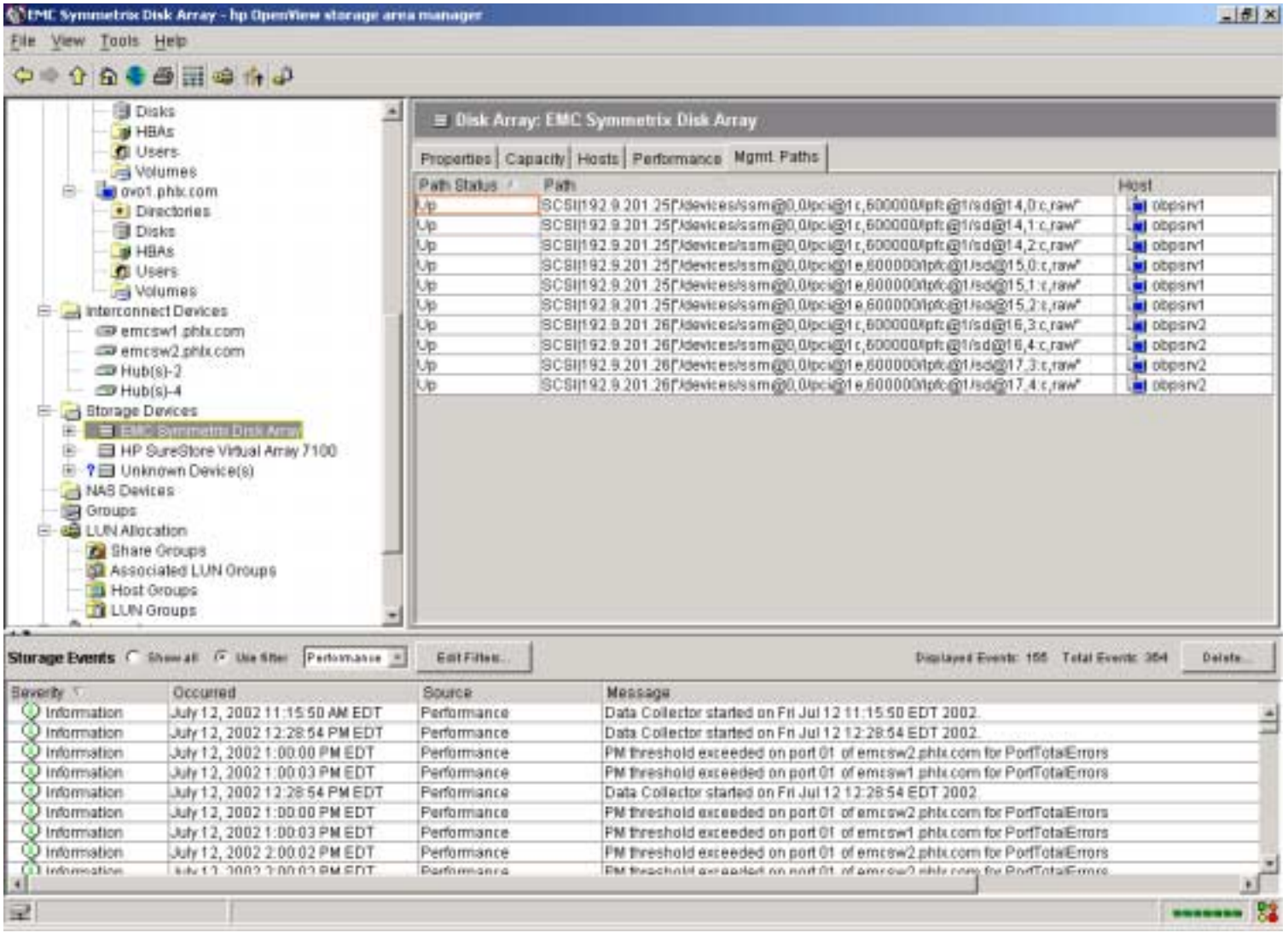
EMC Symmetrix Disk Array - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phlx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: EMC Symmetrix Disk Array
Properties Capacity Hosts Performance Mgmt. Paths
Path Status
Path
Host
Up SCSI[192.9.201.25[/devices/ssm@0,0/pci@1c,600000/pfc@1/sd@14,0:c,raw" obpsrv1
Up SCSI[192.9.201.25[/devices/ssm@0,0/pci@1c,600000/pfc@1/sd@14,1:c,raw" obpsrv1
Up SCSI[192.9.201.25[/devices/ssm@0,0/pci@1c,600000/pfc@1/sd@14,2:c,raw" obpsrv1
Up SCSI[192.9.201.25[/devices/ssm@0,0/pci@1e,600000/pfc@1/sd@15,0:c,raw" obpsrv1
Up SCSI[192.9.201.25[/devices/ssm@0,0/pci@1e,600000/pfc@1/sd@15,1:c,raw" obpsrv1
Up SCSI[192.9.201.25[/devices/ssm@0,0/pci@1e,600000/pfc@1/sd@15,2:c,raw" obpsrv1
Up SCSI[192.9.201.26[/devices/ssm@0,0/pci@1c,600000/pfc@1/sd@16,3:c,raw" obpsrv2
Up SCSI[192.9.201.26[/devices/ssm@0,0/pci@1c,600000/pfc@1/sd@16,4:c,raw" obpsrv2
Up SCSI[192.9.201.26[/devices/ssm@0,0/pci@1e,600000/pfc@1/sd@17,3:c,raw" obpsrv2
Up SCSI[192.9.201.26[/devices/ssm@0,0/pci@1e,600000/pfc@1/sd@17,4:c,raw" obpsrv2
Storage Events Show all Use filter Performance Edit Filter... Displayed Events: 155 Total Events: 364 Delete...
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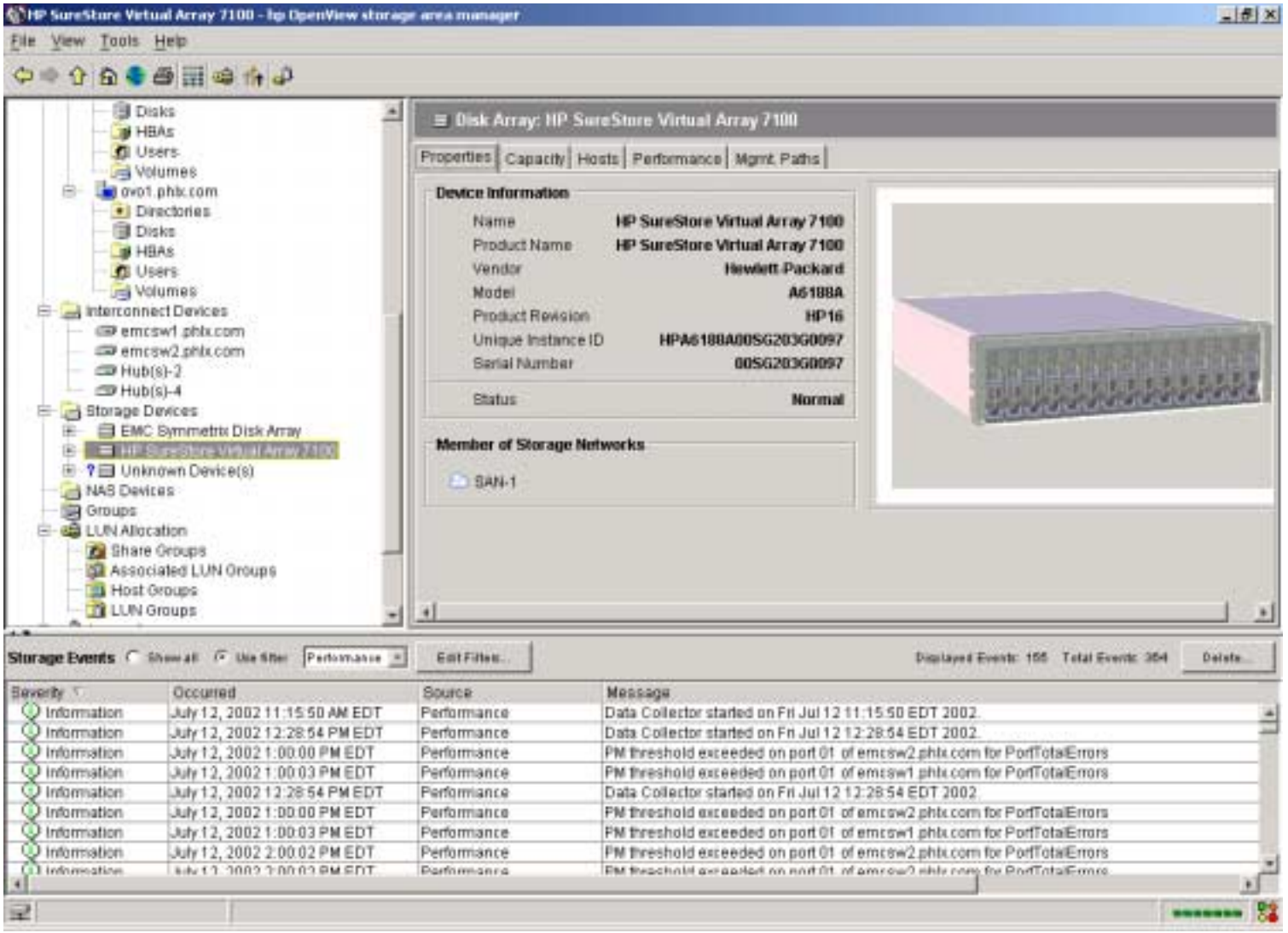
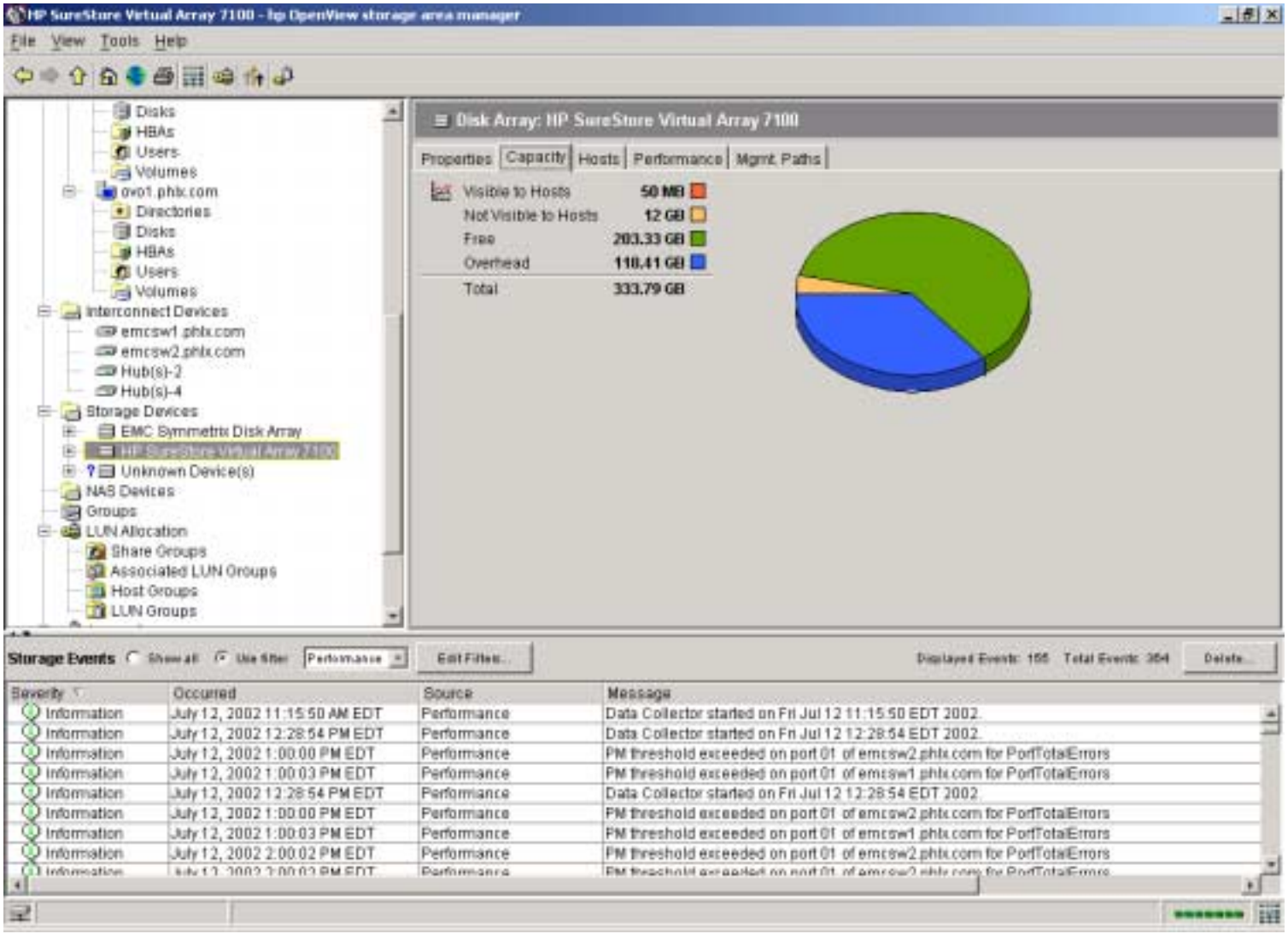
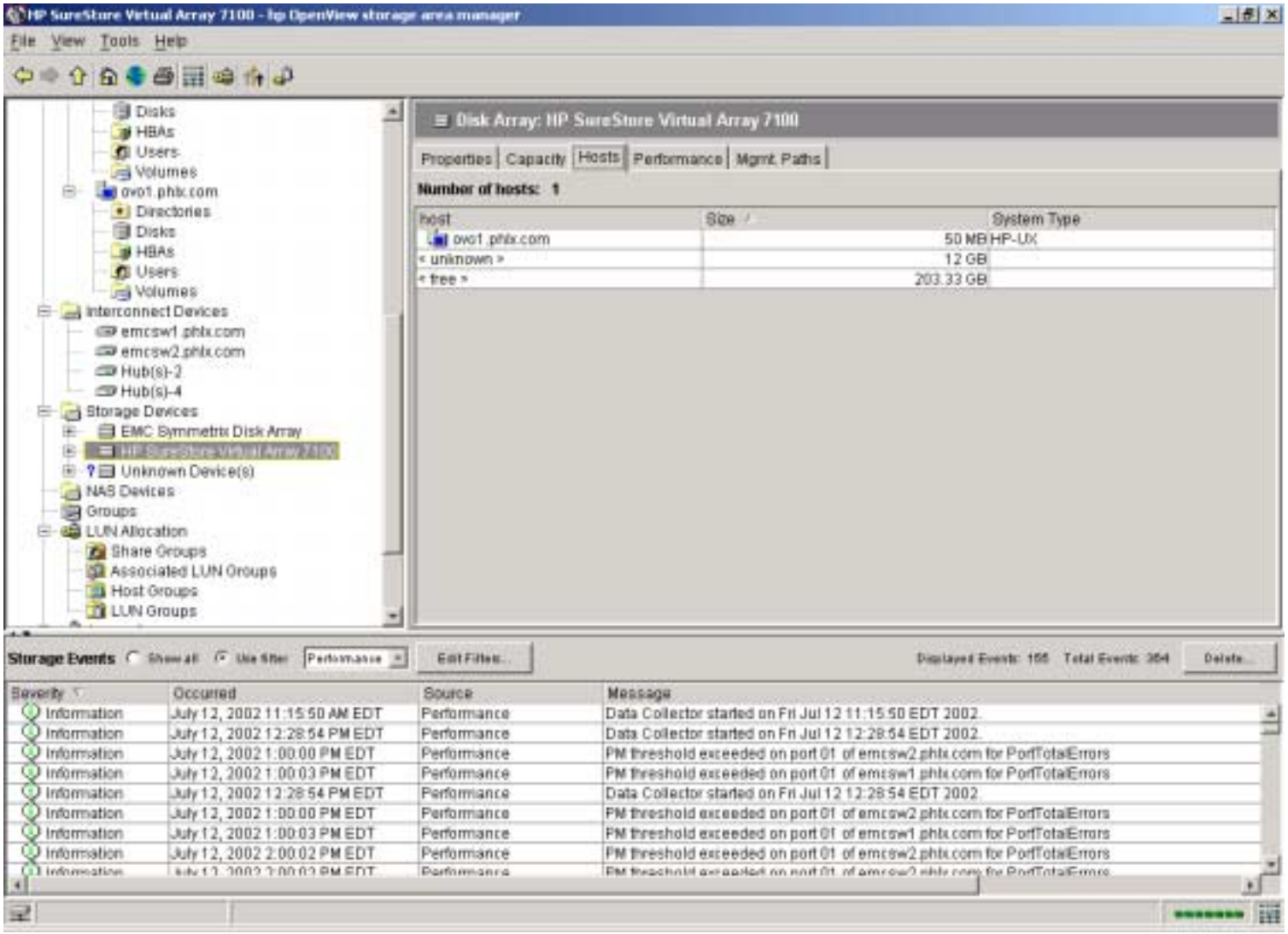
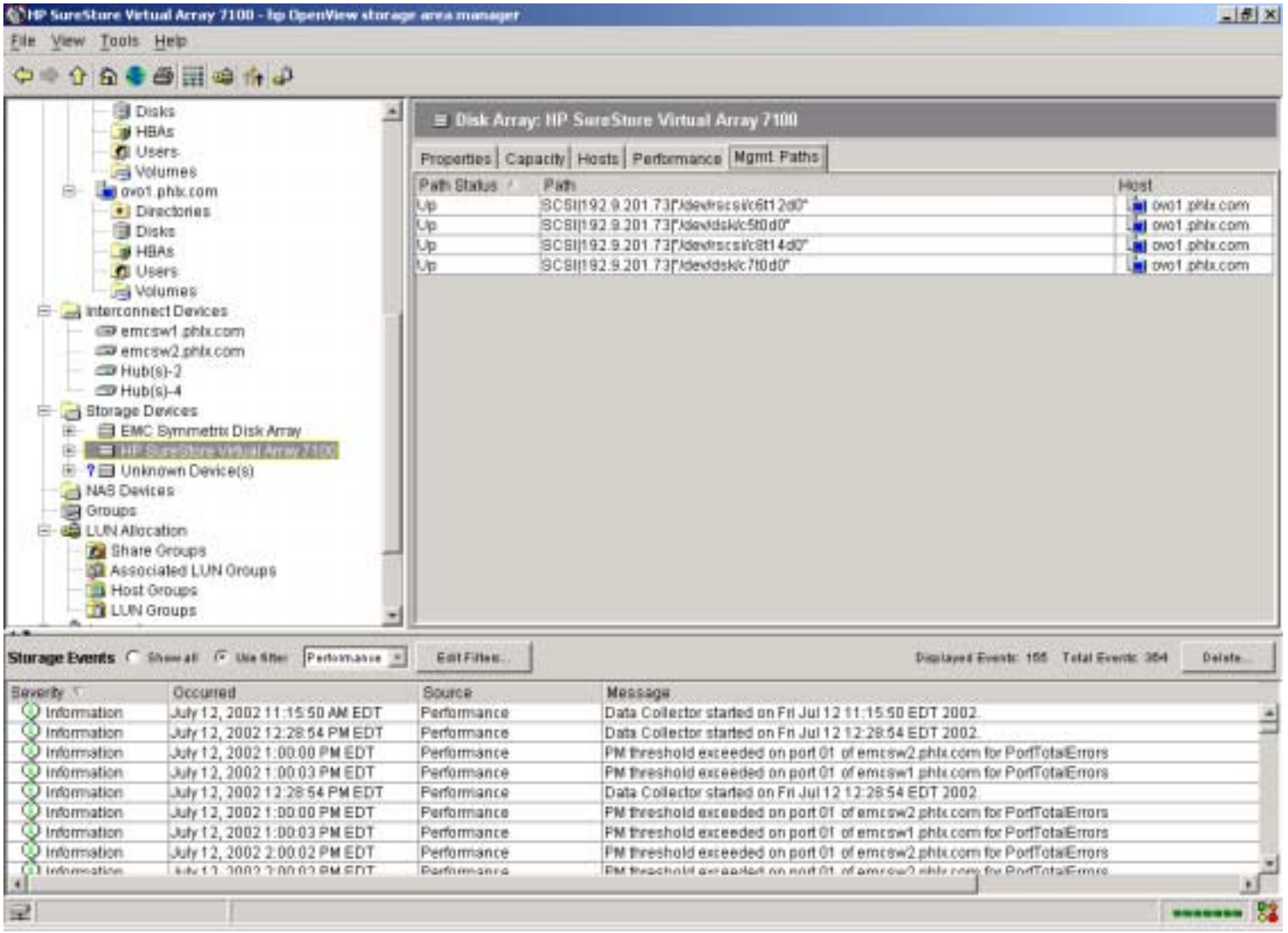
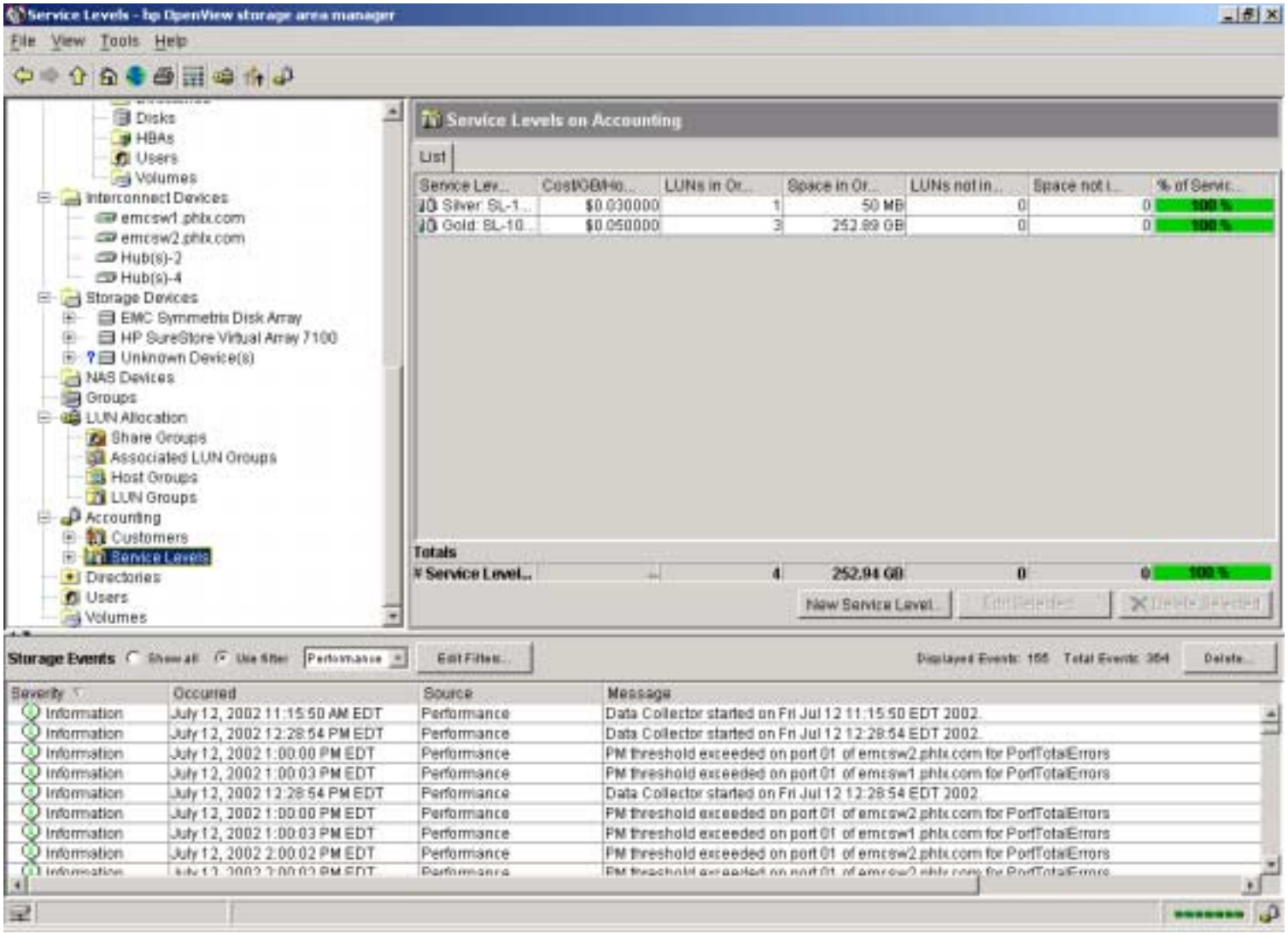
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors

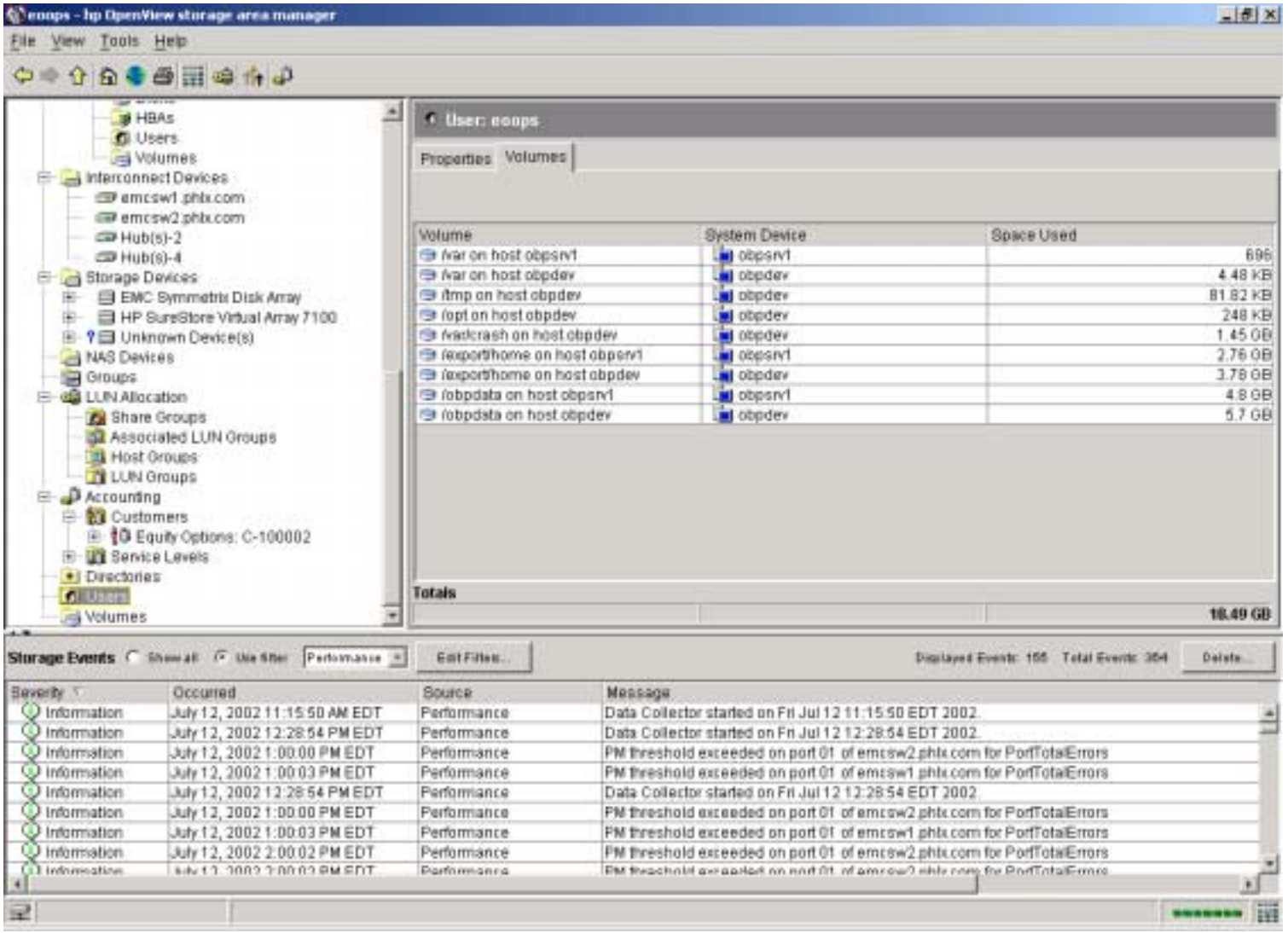

HP SureStore Virtual Array 7100 - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phtx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phtx.com
emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: HP SureStore Virtual Array 7100
Properties
Capacity
Hosts
Performance
Mgmt Paths
Device Information
Name HP SureStore Virtual Array 7100
Product Name HP SureStore Virtual Array 7100
Vendor Hewlett-Packard
Model A6188A
Product Revision HP16
Unique Instance ID HPA6188A00SG203G0097
Serial Number 00SG203G0097
Status Normal
Member of Storage Networks
SAN-1
Storage Events
Edit Filter...
Delete...
Severity
Occurred
Source
Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors

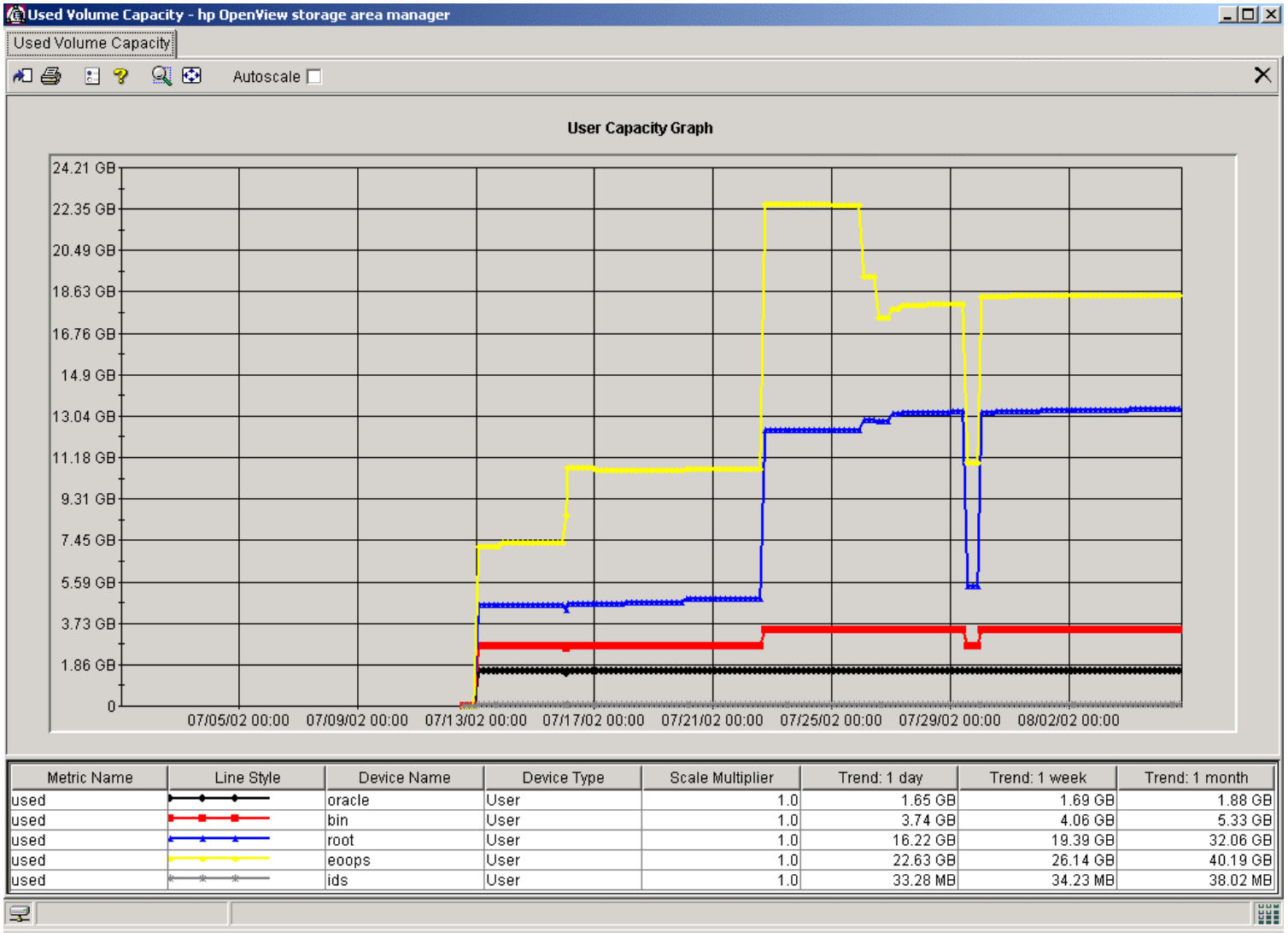

HP SureStore Virtual Array 7100 - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phtx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phtx.com
emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: HP SureStore Virtual Array 7100
Properties Capacity Hosts Performance Mgmt Paths
Visible to Hosts 50 MB
Not Visible to Hosts 12 GB
Free 203.33 GB
Overhead 118.41 GB
Total 333.79 GB
Storage Events
Edit Filter...
Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors


HP SureStore Virtual Array 7100 - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phlx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: HP SureStore Virtual Array 7100
Properties Capacity Hosts Performance Mgmt Paths
Number of hosts: 1
host Size System Type
ovo1.phlx.com 50 MB HP-UX
< unknown > 12 GB
< free > 203.33 GB
Storage Events Show all Use filter Performance Edit Filter... Displayed Events: 155 Total Events: 364 Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors

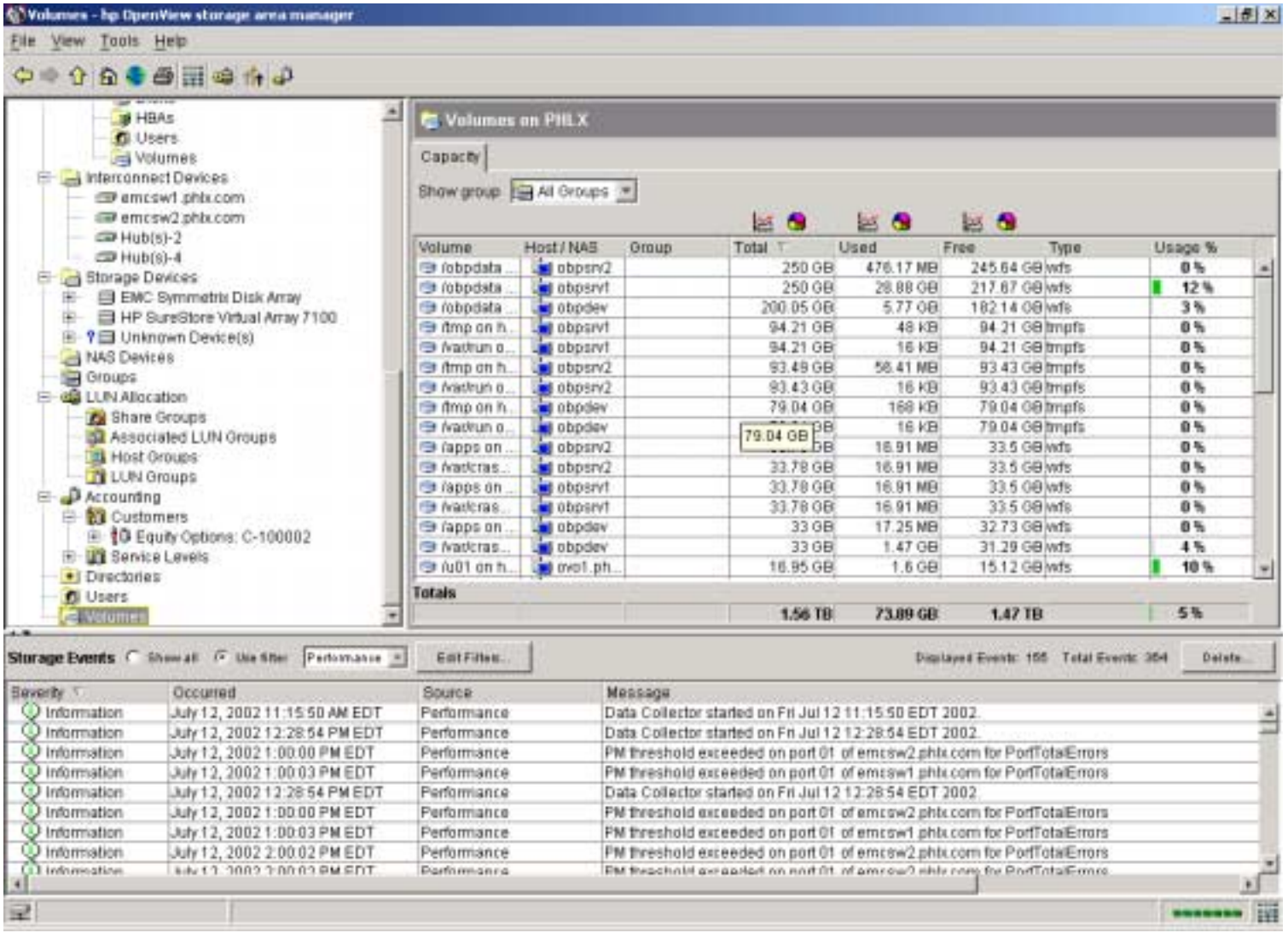

HP SureStore Virtual Array 7100 - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
ovo1.phlx.com
Directories
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phlx.com
emcsw2.phlx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Disk Array: HP SureStore Virtual Array 7100
Properties Capacity Hosts Performance Mgmt. Paths
Path Status
Path
Host
Up SCSI(192.9.201.73)[/dev/rscsi/c6t1 2d0" ovo1.phlx.com
Up SCSI(192.9.201.73)[/dev/dsk/c5t0d0" ovo1.phlx.com
Up SCSI(192.9.201.73)[/dev/rscsi/c8t1 4d0" ovo1.phlx.com
Up SCSI(192.9.201.73)[/dev/dsk/c7t0d0" ovo1.phlx.com
Storage Events
Edit Filter...
Delete...
Severity
Occurred
Source
Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phlx.com for PortTotalErrors
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phlx.com for PortTotalErrors

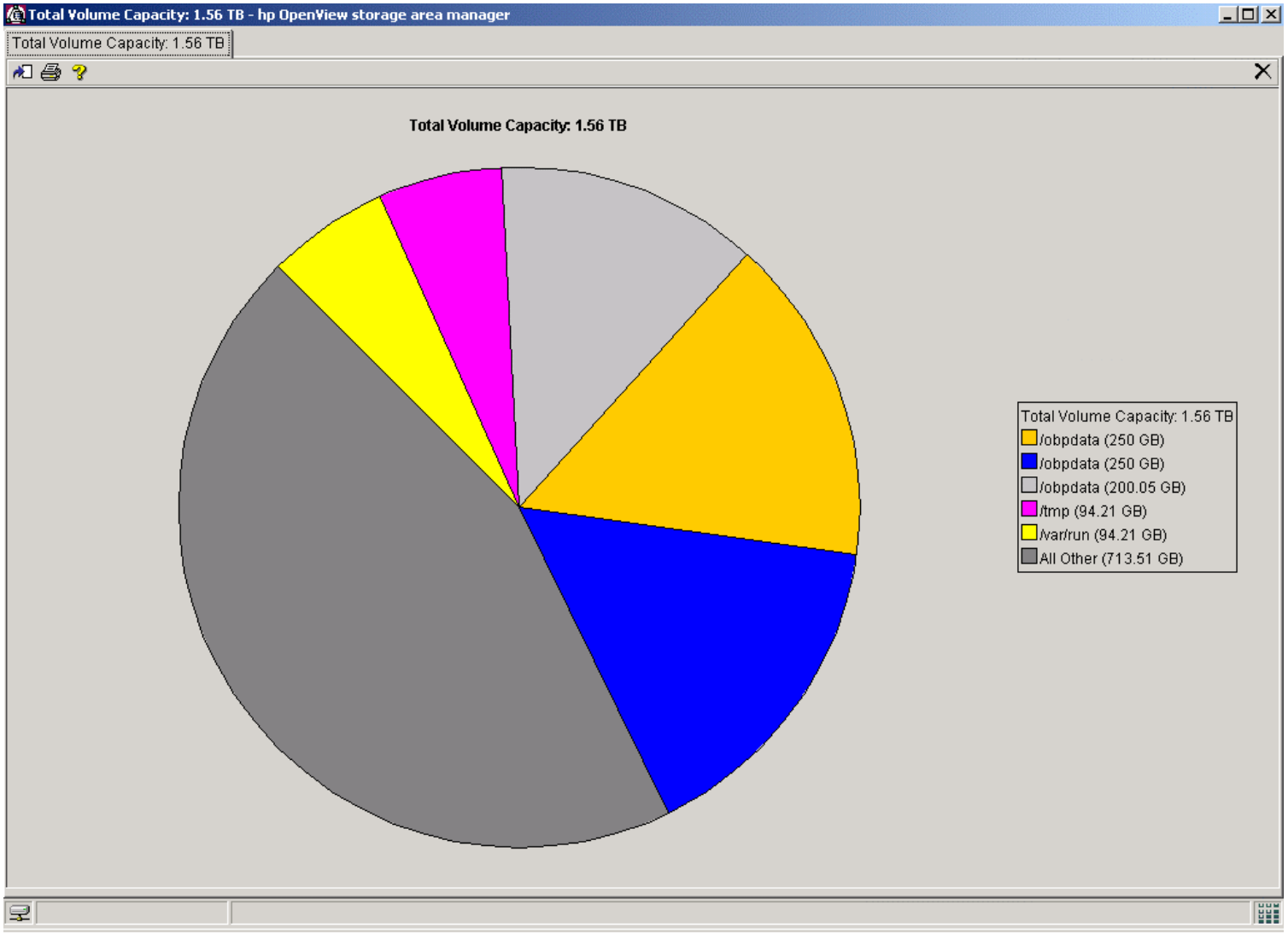

Service Levels - hp OpenView storage area manager
File View Tools Help
Disks
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phtx.com
emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Accounting
Customers
Service Levels
Directories
Users
Volumes
Service Levels on Accounting
List
Service Lev... Cost/GB/Mo... LUNs in Or... Space in Or... LUNs not in... Space not i... % of Servic...
Silver: SL-1... $0.030000 1 50 MB 0 0 100 %
Gold: SL-10... $0.050000 3 252.89 GB 0 0 100 %
Totals
Service Level... 4 252.94 GB 0 0 100 %
New Service Level...
Storage Events
Show all
Use filter
Performance
Edit Filter...
Displayed Events: 155 Total Events: 364
Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors

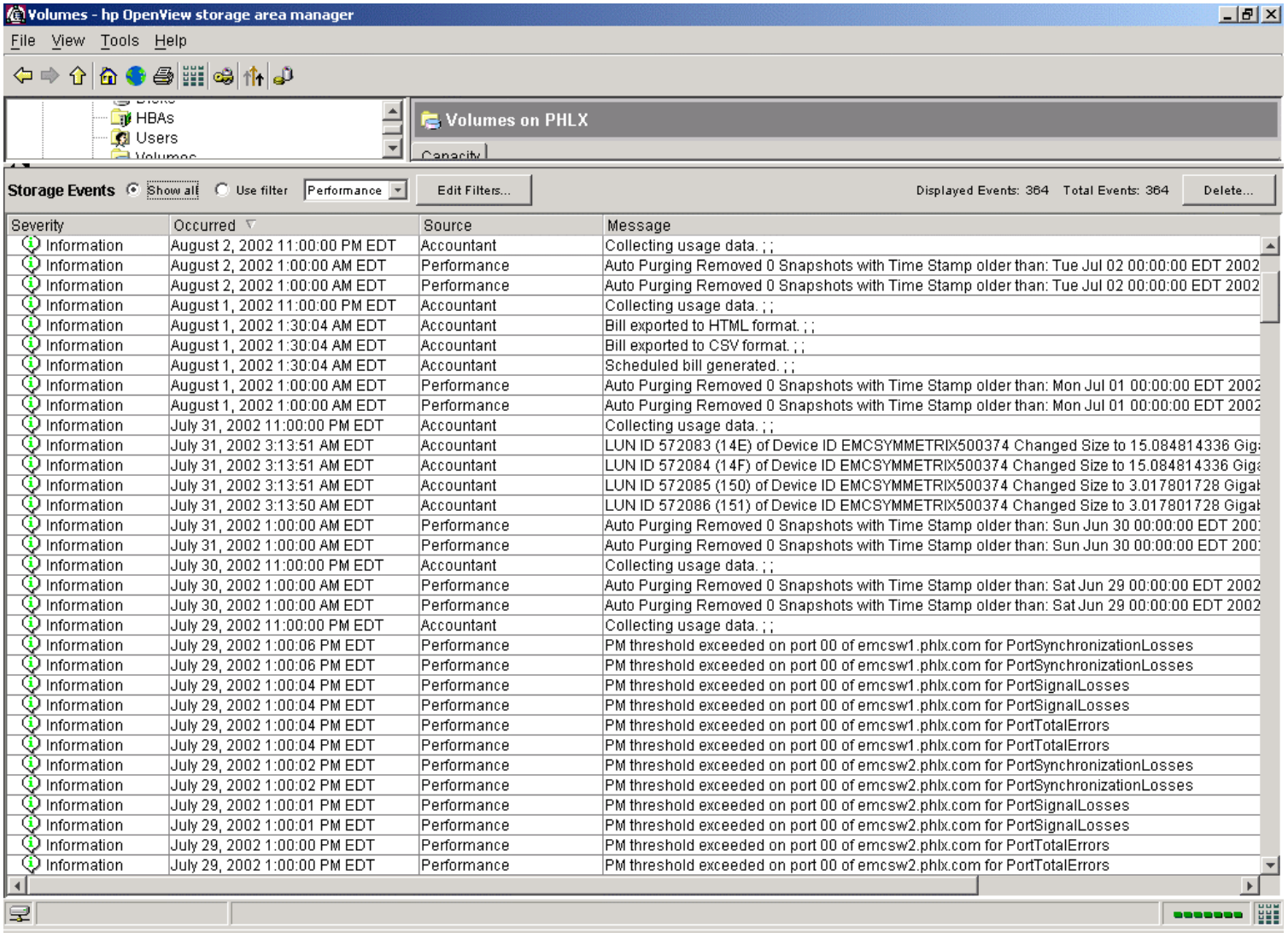

eoops - hp OpenView storage area manager
File View Tools Help
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phtx.com
emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Accounting
Customers
Equity Options: C-100002
Service Levels
Directories
Users
Volumes
User: eoops
Properties Volumes
Volume System Device Space Used
/var on host obpsrv1 obpsrv1 696
/var on host obpdev obpdev 4.48 KB
/tmp on host obpdev obpdev 81.82 KB
/opt on host obpdev obpdev 248 KB
/vadcrash on host obpdev obpdev 1.45 GB
/export/home on host obpsrv1 obpsrv1 2.76 GB
/export/home on host obpdev obpdev 3.78 GB
/obpdata on host obpsrv1 obpsrv1 4.8 GB
/obpdata on host obpdev obpdev 5.7 GB
Totals
18.49 GB
Storage Events
Edit Filter...
Delete...
Severity Occurred Source Message
Information July 12, 2002 11:15:50 AM EDT Performance Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 12:28:54 PM EDT Performance Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information July 12, 2002 1:00:00 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information July 12, 2002 1:00:03 PM EDT Performance PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information July 12, 2002 2:00:02 PM EDT Performance PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors



Metric Name	Line Style	Device Name	Device Type	Scale Multiplier	Trend: 1 day	Trend: 1 week	Trend: 1 month
used		oracle	User	1.0	1.65 GB	1.69 GB	1.88 GB
used		bin	User	1.0	3.74 GB	4.06 GB	5.33 GB
used		root	User	1.0	16.22 GB	19.39 GB	32.06 GB
used		eoops	User	1.0	22.63 GB	26.14 GB	40.19 GB
used		ids	User	1.0	33.28 MB	34.23 MB	38.02 MB


Volumes - hp OpenView storage area manager
File View Tools Help
HBAs
Users
Volumes
Interconnect Devices
emcsw1.phtx.com
emcsw2.phtx.com
Hub(s)-2
Hub(s)-4
Storage Devices
EMC Symmetrix Disk Array
HP SureStore Virtual Array 7100
Unknown Device(s)
NAS Devices
Groups
LUN Allocation
Share Groups
Associated LUN Groups
Host Groups
LUN Groups
Accounting
Customers
Equity Options: C-100002
Service Levels
Directories
Users
Volumes
Volumes on PHLX
Capacity
Show group: All Groups
Volume | Host / NAS | Group | Total | Used | Free | Type | Usage %
/obpdata... | obpsrv2 | 250 GB | 476.17 MB | 245.64 GB | wfs | 0 %
/obpdata... | obpsrv1 | 250 GB | 28.88 GB | 217.67 GB | wfs | 12 %
/obpdata... | obpdev | 200.05 GB | 5.77 GB | 182.14 GB | wfs | 3 %
/tmp on h... | obpsrv1 | 94.21 GB | 48 kB | 94.21 GB | tmpfs | 0 %
/vatrun o... | obpsrv1 | 94.21 GB | 16 kB | 94.21 GB | tmpfs | 0 %
/tmp on h... | obpsrv2 | 93.49 GB | 56.41 MB | 93.43 GB | tmpfs | 0 %
/vatrun o... | obpsrv2 | 93.43 GB | 16 kB | 93.43 GB | tmpfs | 0 %
/tmp on h... | obpdev | 79.04 GB | 168 kB | 79.04 GB | tmpfs | 0 %
/vatrun o... | obpdev | 79.04 GB | 16 kB | 79.04 GB | tmpfs | 0 %
/apps on ... | obpsrv2 | 33.78 GB | 16.91 MB | 33.5 GB | wfs | 0 %
/vatcras... | obpsrv2 | 33.78 GB | 16.91 MB | 33.5 GB | wfs | 0 %
/apps on ... | obpsrv1 | 33.78 GB | 16.91 MB | 33.5 GB | wfs | 0 %
/vatcras... | obpsrv1 | 33.78 GB | 16.91 MB | 33.5 GB | wfs | 0 %
/apps on ... | obpdev | 33 GB | 17.25 MB | 32.73 GB | wfs | 0 %
/vatcras... | obpdev | 33 GB | 1.47 GB | 31.29 GB | wfs | 4 %
/u01 on h... | ovo1.ph... | 16.95 GB | 1.6 GB | 15.12 GB | wfs | 10 %
Totals | | | 1.56 TB | 73.89 GB | 1.47 TB | 5 %
Storage Events
Severity | Occurred | Source | Message
Information | July 12, 2002 11:15:50 AM EDT | Performance | Data Collector started on Fri Jul 12 11:15:50 EDT 2002.
Information | July 12, 2002 12:28:54 PM EDT | Performance | Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information | July 12, 2002 1:00:00 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information | July 12, 2002 1:00:03 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information | July 12, 2002 12:28:54 PM EDT | Performance | Data Collector started on Fri Jul 12 12:28:54 EDT 2002.
Information | July 12, 2002 1:00:00 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors
Information | July 12, 2002 1:00:03 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw1.phtx.com for PortTotalErrors
Information | July 12, 2002 2:00:02 PM EDT | Performance | PM threshold exceeded on port 01 of emcsw2.phtx.com for PortTotalErrors


Total Volume Capacity: 1.56 TB - hp OpenView storage area manager
Total Volume Capacity: 1.56 TB
Total Volume Capacity: 1.56 TB
Total Volume Capacity: 1.56 TB
/obpdata (250 GB)
/obpdata (250 GB)
/obpdata (200.05 GB)
/tmp (94.21 GB)
/var/run (94.21 GB)
All Other (713.51 GB)


Volumes - hp OpenView storage area manager
File View Tools Help
HBAs
Users
Volumes on PHLX
Capacity
Storage Events
Show all
Use filter
Performance
Edit Filters...
Displayed Events: 364 Total Events: 364
Delete...
Severity | Occurred | Source | Message
Information | August 2, 2002 11:00:00 PM EDT | Accountant | Collecting usage data. ; ;
Information | August 2, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Tue Jul 02 00:00:00 EDT 2002
Information | August 2, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Tue Jul 02 00:00:00 EDT 2002
Information | August 1, 2002 11:00:00 PM EDT | Accountant | Collecting usage data. ; ;
Information | August 1, 2002 1:30:04 AM EDT | Accountant | Bill exported to HTML format. ; ;
Information | August 1, 2002 1:30:04 AM EDT | Accountant | Bill exported to CSV format. ; ;
Information | August 1, 2002 1:30:04 AM EDT | Accountant | Scheduled bill generated. ; ;
Information | August 1, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Mon Jul 01 00:00:00 EDT 2002
Information | August 1, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Mon Jul 01 00:00:00 EDT 2002
Information | July 31, 2002 11:00:00 PM EDT | Accountant | Collecting usage data. ; ;
Information | July 31, 2002 3:13:51 AM EDT | Accountant | LUN ID 572083 (14E) of Device ID EMCSYMMETRIX500374 Changed Size to 15.084814336 Gig
Information | July 31, 2002 3:13:51 AM EDT | Accountant | LUN ID 572084 (14F) of Device ID EMCSYMMETRIX500374 Changed Size to 15.084814336 Giga
Information | July 31, 2002 3:13:51 AM EDT | Accountant | LUN ID 572085 (150) of Device ID EMCSYMMETRIX500374 Changed Size to 3.017801728 Gigab
Information | July 31, 2002 3:13:50 AM EDT | Accountant | LUN ID 572086 (151) of Device ID EMCSYMMETRIX500374 Changed Size to 3.017801728 Gigab
Information | July 31, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Sun Jun 30 00:00:00 EDT 200
Information | July 31, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Sun Jun 30 00:00:00 EDT 200
Information | July 30, 2002 11:00:00 PM EDT | Accountant | Collecting usage data. ; ;
Information | July 30, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Sat Jun 29 00:00:00 EDT 2002
Information | July 30, 2002 1:00:00 AM EDT | Performance | Auto Purging Removed 0 Snapshots with Time Stamp older than: Sat Jun 29 00:00:00 EDT 2002
Information | July 29, 2002 11:00:00 PM EDT | Accountant | Collecting usage data. ; ;
Information | July 29, 2002 1:00:06 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw1.phlx.com for PortSynchronizationLosses
Information | July 29, 2002 1:00:06 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw1.phlx.com for PortSynchronizationLosses
Information | July 29, 2002 1:00:04 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw1.phlx.com for PortSignalLosses
Information | July 29, 2002 1:00:04 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw1.phlx.com for PortSignalLosses
Information | July 29, 2002 1:00:04 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw1.phlx.com for PortTotalErrors
Information | July 29, 2002 1:00:04 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw1.phlx.com for PortTotalErrors
Information | July 29, 2002 1:00:02 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw2.phlx.com for PortSynchronizationLosses
Information | July 29, 2002 1:00:02 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw2.phlx.com for PortSynchronizationLosses
Information | July 29, 2002 1:00:01 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw2.phlx.com for PortSignalLosses
Information | July 29, 2002 1:00:01 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw2.phlx.com for PortSignalLosses
Information | July 29, 2002 1:00:00 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw2.phlx.com for PortTotalErrors
Information | July 29, 2002 1:00:00 PM EDT | Performance | PM threshold exceeded on port 00 of emcsw2.phlx.com for PortTotalErrors

Lessons Learned

- Validate hardware, firmware and required software levels in support matrix
- Understand your HBA vendor's SNIA library implementation
- Expect periodic warning messages from some vendor's equipment

Lessons Learned (cont'd)

- Reporting on non-SAN attached storage can also be valuable
- Understand the relationship with other OpenView components to augment data gathering from hosts