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BUSINESS WITHOUT INTERRUPTION™

Evolution of SAN Management and Virtualization in a Multi-Platform Enterprise-9038

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VERITAS Software

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Situation Analysis

- **Computing is cheap**
  - Moore's law is holding
  - GHz home computers, $1K servers,…
- **Bandwidth is cheap**
  - ISDN, *x*DSL, cable modem,…
- **Storage is cheap**
  - <$.01 megabytes for the home, enterprise $.03
- **All this cheap stuff is being applied to make business more effective**
- **Result: fundamental changes in IT**
  - New application ⇒ new server
  - Email to the next cubicle
  - Text is a dying data form
  - Keep everything online forever, and

Situation Analysis Continued

- **“Information islands”**
  - It seems that data is never where it needs to be
- **Results:**
  - Applications are less available than they could be
  - Responsiveness to partners and customers is less than it could be
- **IT management nightmares**
  - Thousands of servers
  - Millions of files
  - Trillions of bytes
  - Tens of sysadmins
- **Results:**
  - impending data chaos
  - IT management cost consumes technology savings

What is a SAN?

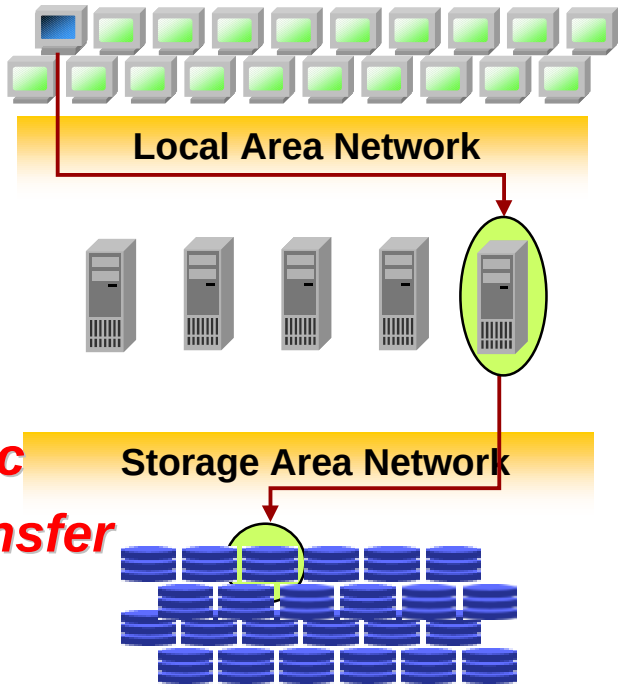
- **1996: Fibre Channel trying to get launched against a strong incumbent**
  - *Much* more expensive than SCSI
  - 80 MB/s on SCSI roadmaps
- ***Very* unproven**
  - Few devices with poor interoperability
  - Little infrastructure or system support
  - Disjoint topologies
  - Warring industry associations
- **Problem for promoters**
  - Make it seem like Fibre Channel offers something not available with alternative interconnects
  - Hold attention share until products mature

What You Were Supposed To Think

- ***Local Area Network***
  - Any-to-any connectivity
  - >>bandwidth
  - New computing "style" *client-server*
  - New apps, e.g. *collaborative computing*

by analogy:

- ***Storage Area Network***
- **Any-to-any connectivity**
- **>>bandwidth**
- **New storage "style" *storage-centric***
- **New apps, e.g. *server free data transfer***



Surprise: It Happened!

- **Today,**
  - It is possible to connect tens of thousands of storage devices to hundreds of servers
- **Today,**
  - Fully interconnected system I/O bandwidth of tens of gigabytes per second can be purchased off the shelf
- **Today,**
  - It is possible to share automated tape libraries among servers, to move data directly between devices, and build large computer clusters
- **Today,**
  - Storage vendors talk openly of building computing strategies around a central storage strategy *and system vendors listen!*

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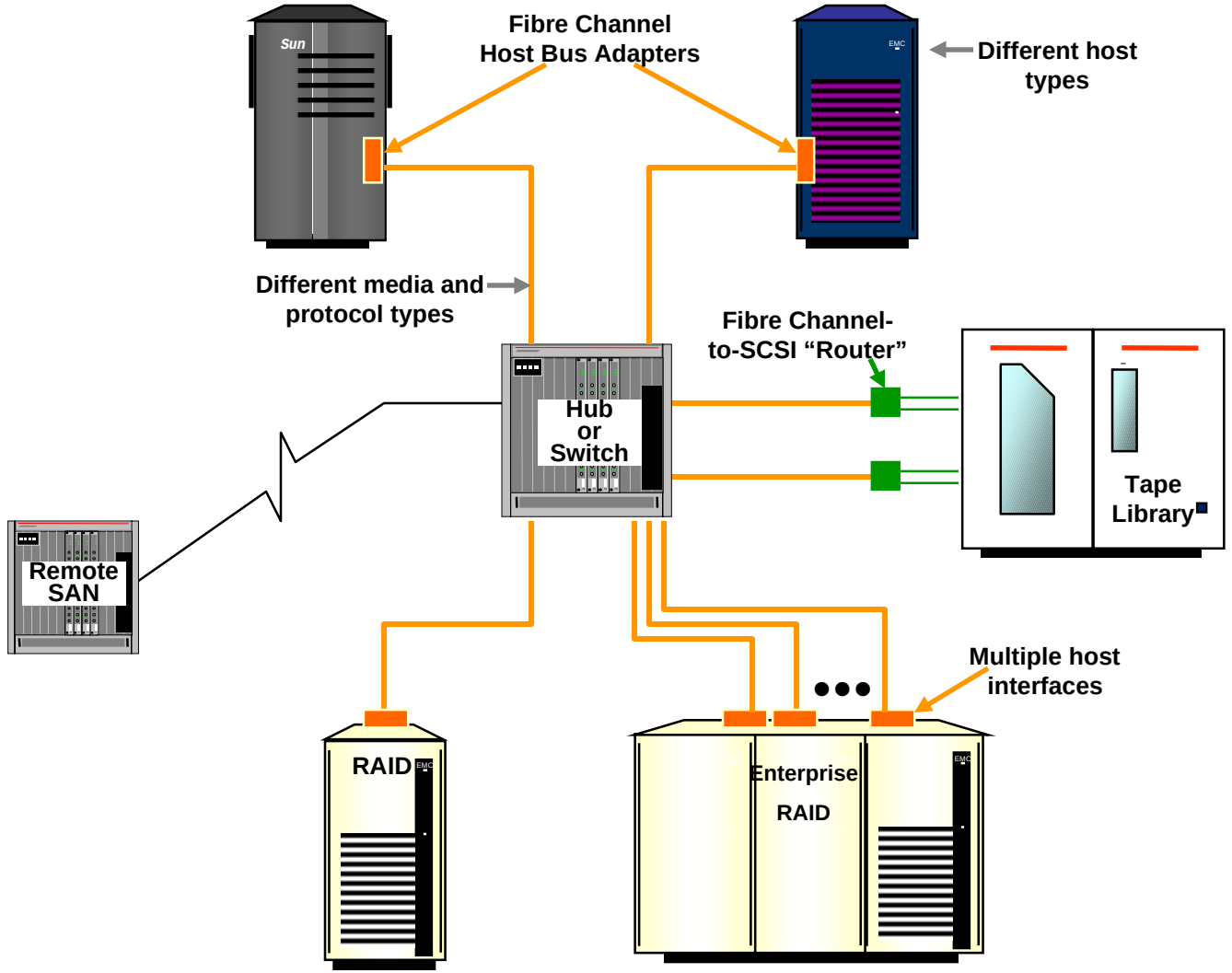
Data Access

Data Protection

Anatomy Of A SAN

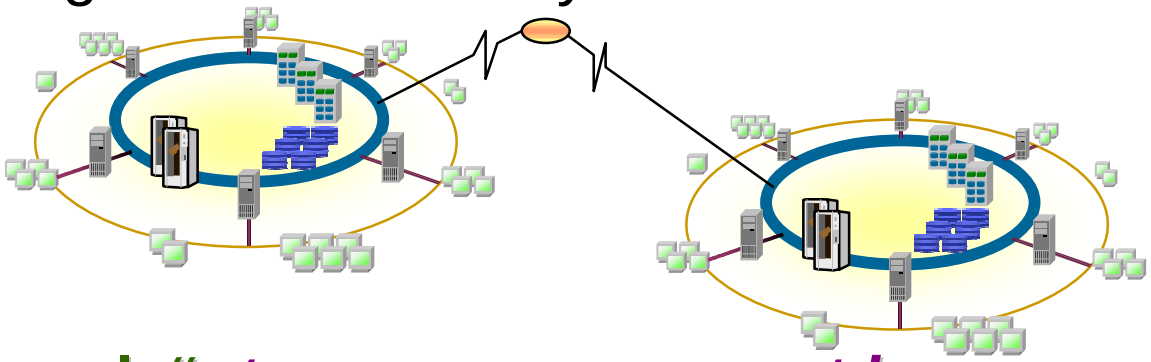


"Infrastructure" Media And Protocols

- **Function**
  - Links between SAN components
  - Protocols: "languages" optimized for data movement
- **What's new with SAN**
  - Short-haul copper (30m/link)
  - Campus and long-haul fiber (2km-10km/link)
  - Multiple data protocols on one physical interconnect
- **What's enabled by SAN capabilities**
  - **Trading cost for distance**
  - **Remote mirroring and vaulted tape drives**
  - **A single communications infrastructure for volumes and files**

The SAN Storage Challenge

- **SAN storage has network-like characteristics**
  - Too many devices to enumerate
    - Physical and logical devices
  - Devices come and go
  - Devices can be widely separated
  - Device capabilities can vary
  - Storage access security is an issue



In general, "*storage management by wandering around*" is no longer a viable option

Why Aren't We "There"?

- **SAN hardware is an enabler**
  - connects lots of servers to lots of storage
  - Provides enough bandwidth to do something useful
  - creates opportunity for innovation
- **The good news: lots of innovation is going on**
  - Everyone wants to be your SAN storage supplier
  - Everyone wants to run your SAN backups
  - Everyone wants to manage your SAN
- **The bad news: lots of innovation is going on**
  - Everyone's SAN storage is slightly different
  - Everyone has approached SAN backup differently
  - Everyone has his own ideas about management

SANs Need Cooperation

- **SANs have most value when connected entities cooperate**
  - To control storage device access
  - To negotiate storage device ownership
  - To share access to files or databases
  - To pass data directly between devices
- **Cooperation happens through software**
- **SANs have a software dimension**
  - And the software industry has largely been asleep at the switch!
    - The hardware is here
    - The software has yet to exploit it

Keys to SAN Success: Standards

- **VERITAS a leader in all key I/O industry interoperability standards groups**

SNIA
Storage Networking Industry Association

JIRO

Fibre Alliance

FCIA
FIBRE CHANNEL INDUSTRY ASSOCIATION

Until standards mature, SAN interoperability will be via case-by-case qualification

Companies In the SAN Space

BROCADE

COMPAQ

DELL

INRANGE

jni

EMC² The Enterprise Storage Company

gain systems

HEWLETT PACKARD

HITACHI DATA SYSTEMS

LSI LOGIC

McDATA CORPORATION

EMULEX We network storage

Agilent Technologies

Microsoft

ORACLE

Quantum. ATL PRODUCTS

StorageTek

Sun microsystems

qlogic Corp.

VIXEL

VERITAS SANPoint Control History Timeline

Nov. 1999 – V³ SAN Technology Initiative Announced

June 2000 – SUN Microsystems licenses V³ SAL and SPC

October 2000 – HDS bundle /reseller agreement

Dec. 31, 2000 – SPC Exceeds Revenue Forecasts

February 2001 – Hitachi worldwide agreement

1999 2000 2001

August 2000 – Qlogic bundle / reseller agreement

October 2000 – SPC 1.0 Ships with partnership agreements with Brocade, Emulex, JNI and McData

March 2001 – SPC 2.0 announced with all existing partnerships plus new INRANGE agreement

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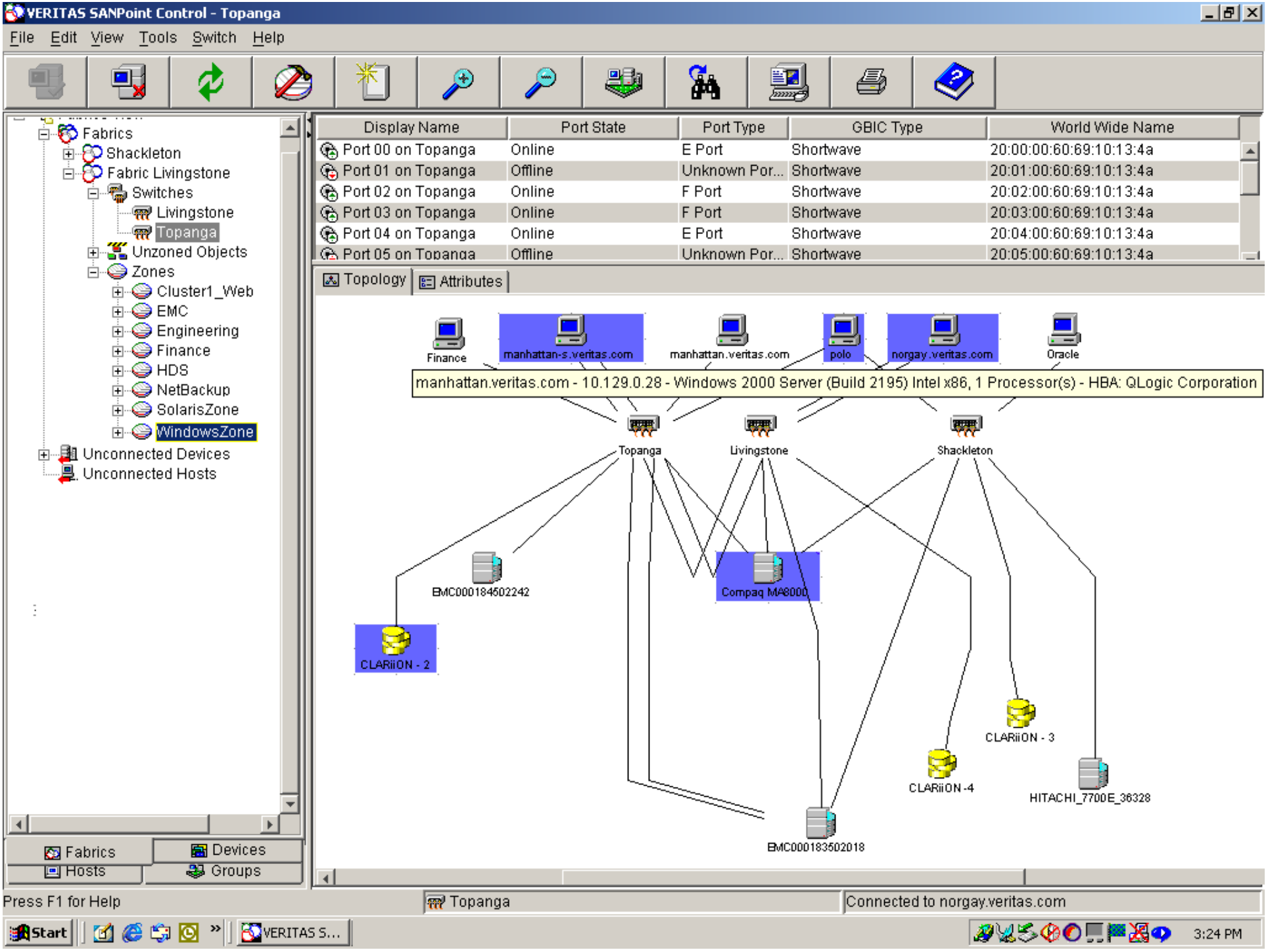
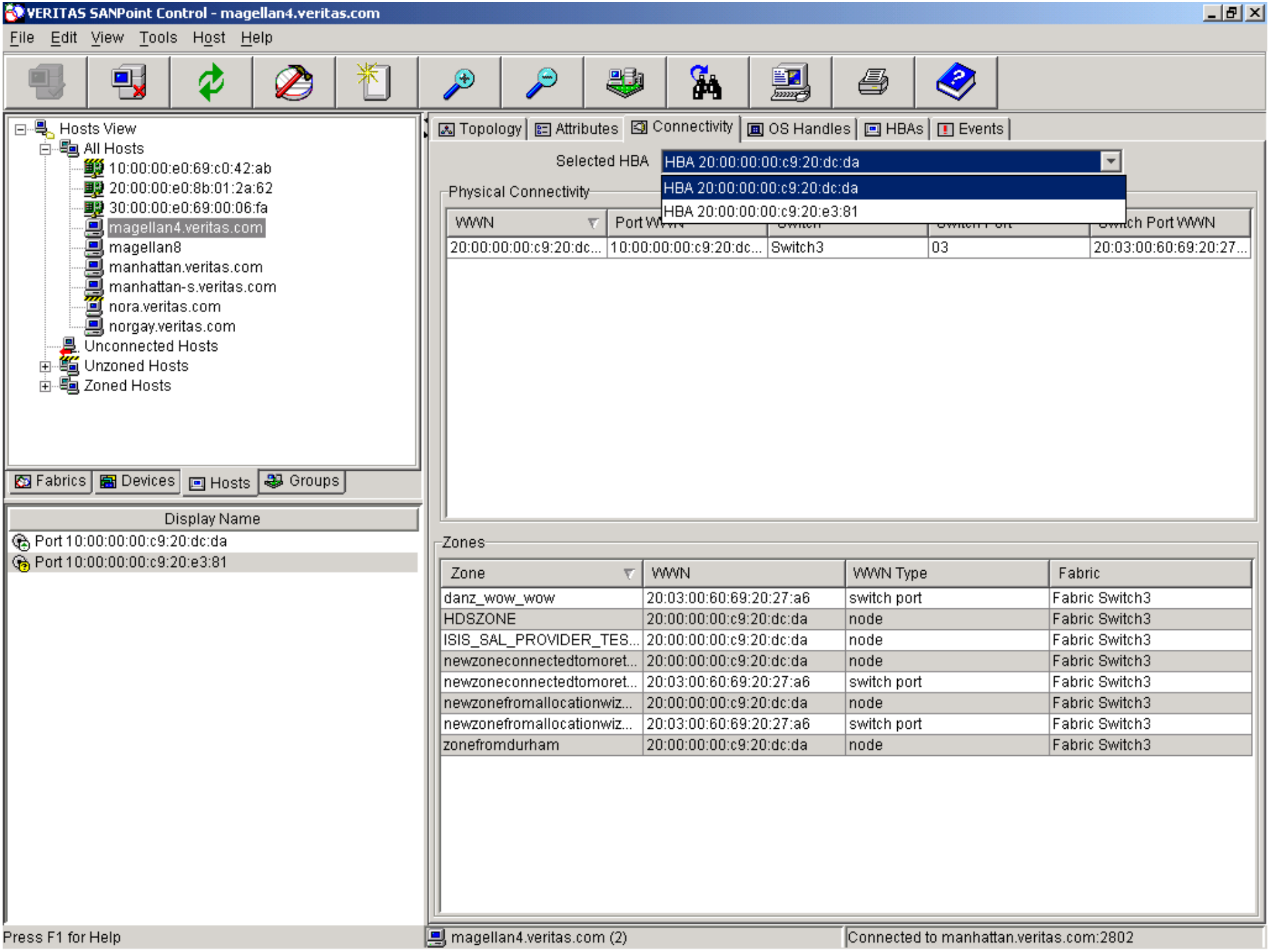
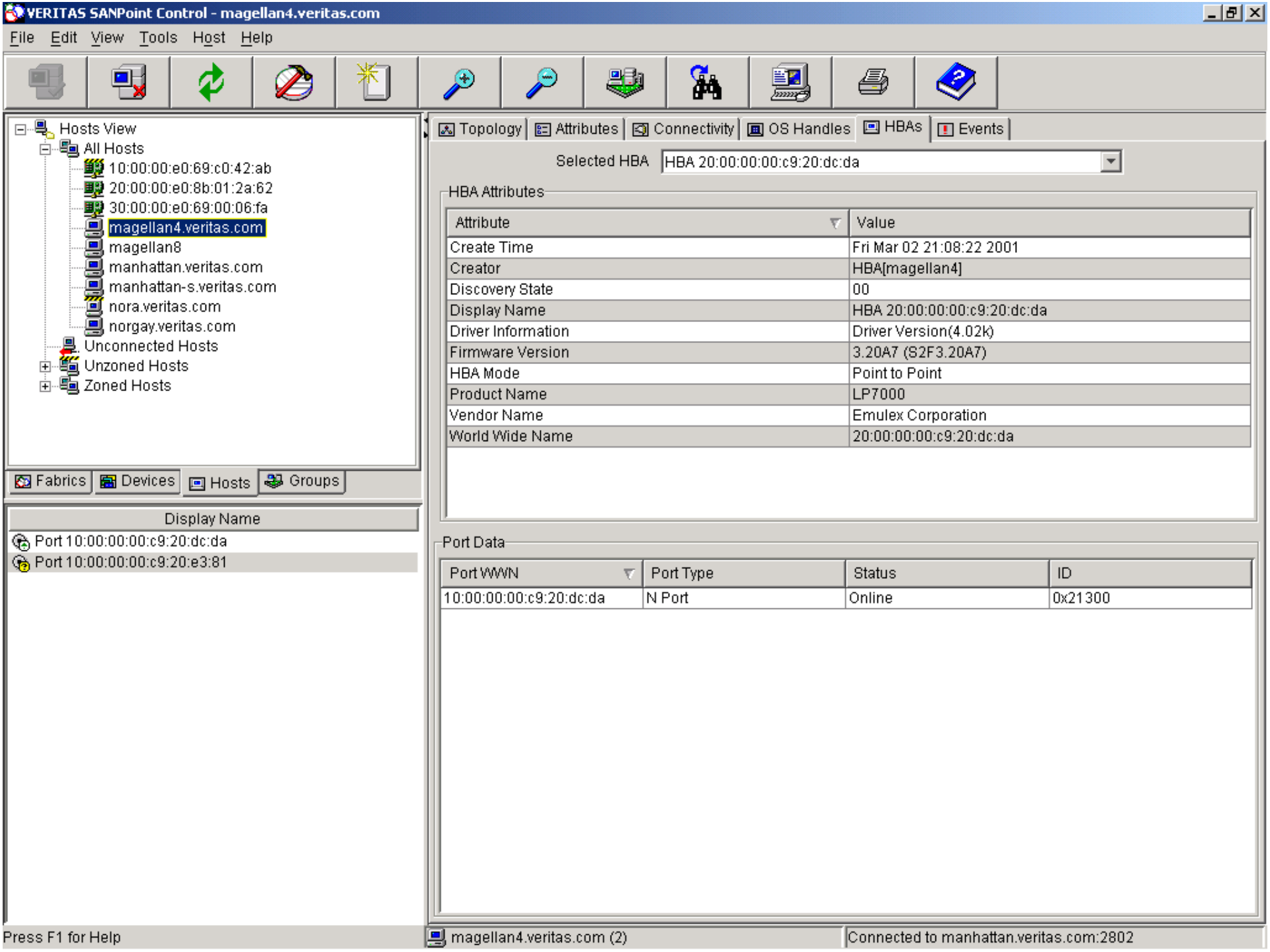
Data Access

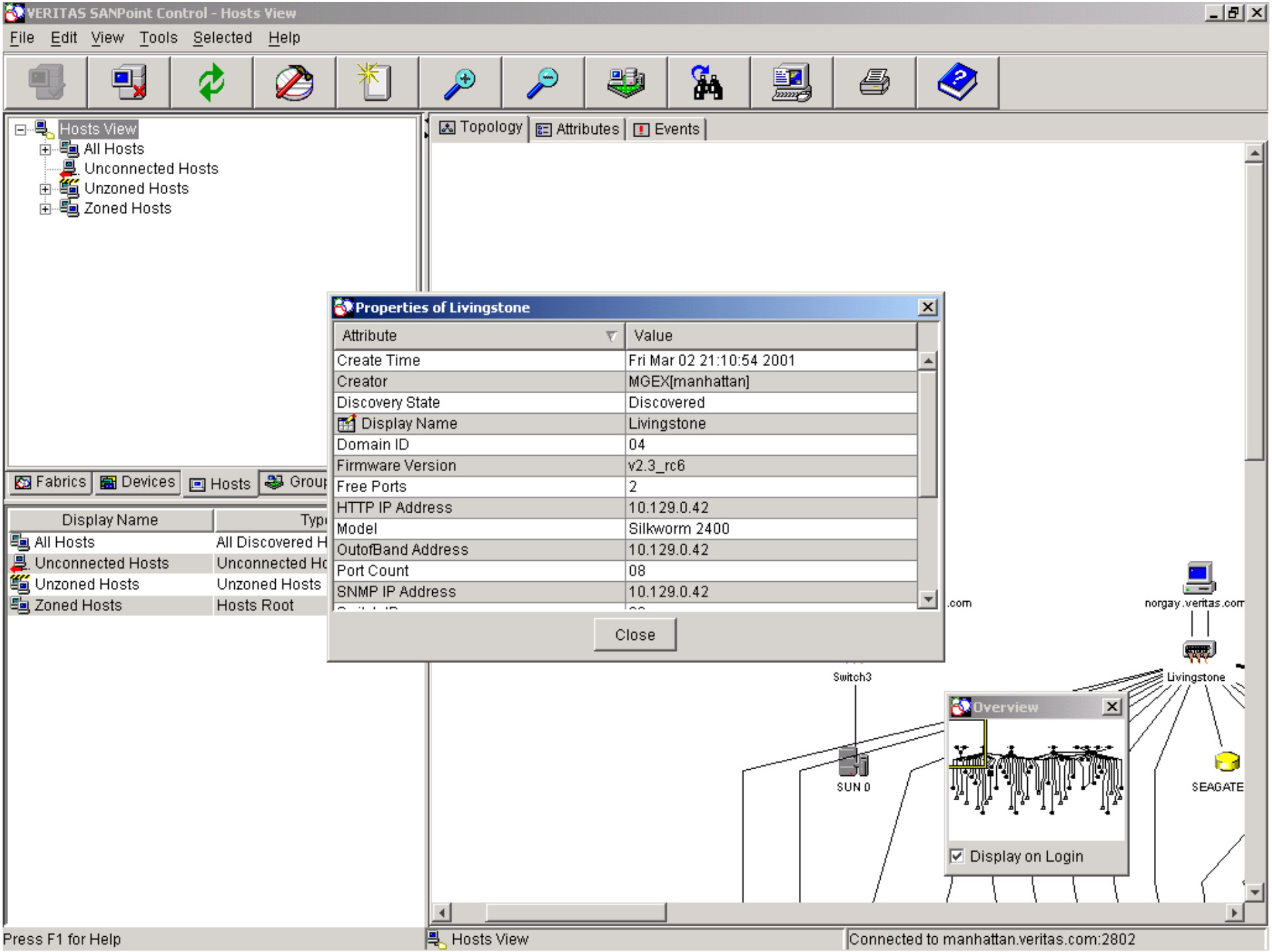
Data Protection

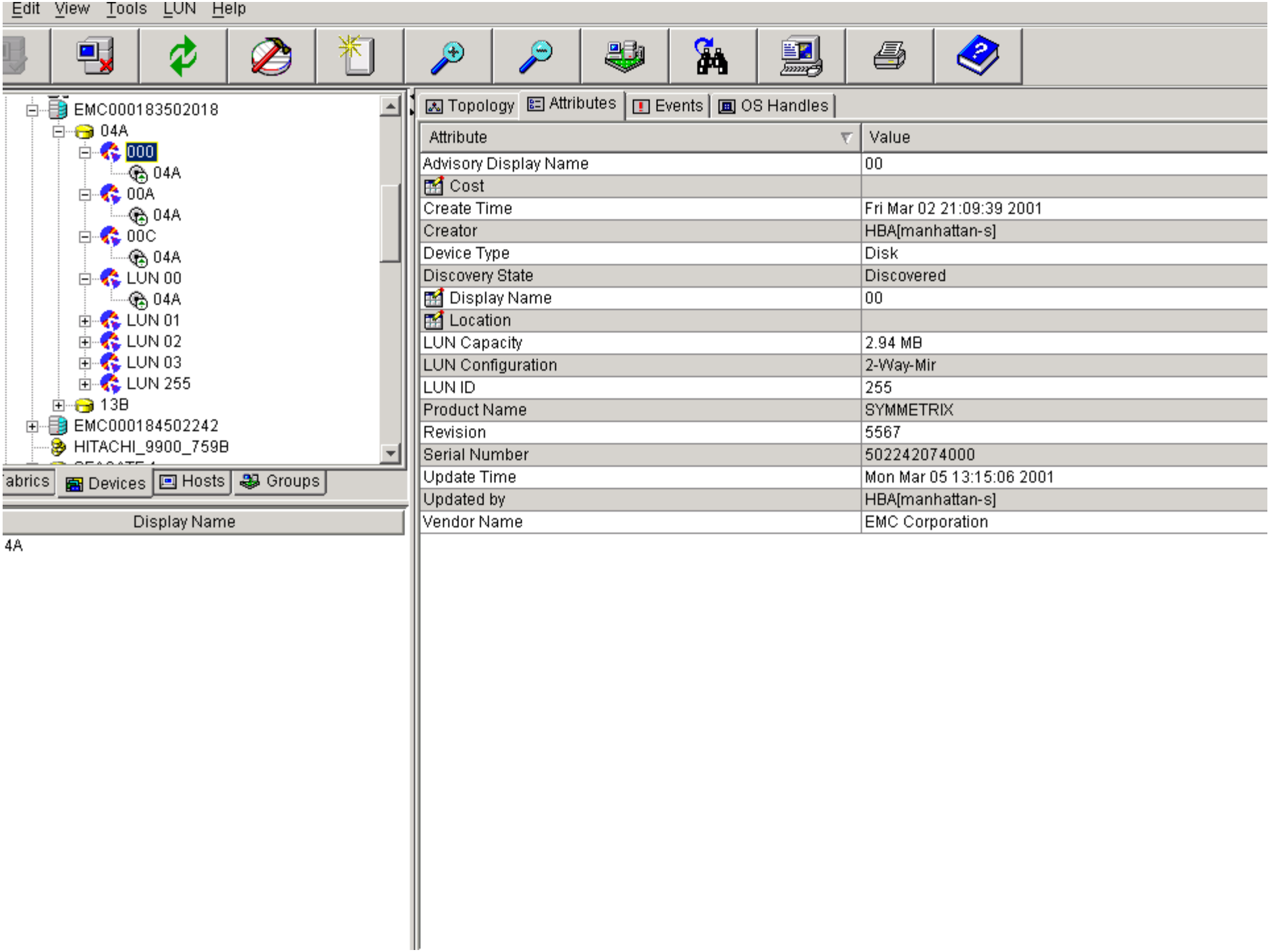
SAN Management Demonstration Using VERITAS SANPoint Control 2.0


VERITAS SANPoint Control - Topanga
File Edit View Tools Switch Help
Fabrics
Shackleton
Fabric Livingstone
Switches
Livingstone
Topanga
Unzoned Objects
Zones
Cluster1_Web
EMC
Engineering
Finance
HDS
NetBackup
SolarisZone
WindowsZone
Unconnected Devices
Unconnected Hosts
Fabrics
Devices
Hosts
Groups
Display Name | Port State | Port Type | GBIC Type | World Wide Name
Port 00 on Topanga | Online | E Port | Shortwave | 20:00:00:60:69:10:13:4a
Port 01 on Topanga | Offline | Unknown Por... | Shortwave | 20:01:00:60:69:10:13:4a
Port 02 on Topanga | Online | F Port | Shortwave | 20:02:00:60:69:10:13:4a
Port 03 on Topanga | Online | F Port | Shortwave | 20:03:00:60:69:10:13:4a
Port 04 on Topanga | Online | E Port | Shortwave | 20:04:00:60:69:10:13:4a
Port 05 on Topanga | Offline | Unknown Por... | Shortwave | 20:05:00:60:69:10:13:4a
Topology
Attributes
Finance
manhattan-s.veritas.com
manhattan.veritas.com
polo
norgay.veritas.com
Oracle
manhattan.veritas.com - 10.129.0.28 - Windows 2000 Server (Build 2195) Intel x86, 1 Processor(s) - HBA: QLogic Corporation
Topanga
Livingstone
Shackleton
BMC000184502242
Compaq MA8000
CLARiiON - 2
CLARiiON - 3
CLARiiON -4
HITACHI_7700E_36328
BMC000183502018
Press F1 for Help
Topanga
Connected to norgay.veritas.com
Start
VERITAS S...
3:24 PM


VERITAS SANPoint Control - magellan4.veritas.com
File Edit View Tools Host Help
Hosts View
All Hosts
10:00:00:e0:69:c0:42:ab
20:00:00:e0:8b:01:2a:62
30:00:00:e0:69:00:06:fa
magellan4.veritas.com
magellan8
manhattan.veritas.com
manhattan-s.veritas.com
nora.veritas.com
norgay.veritas.com
Unconnected Hosts
Unzoned Hosts
Zoned Hosts
Fabrics Devices Hosts Groups
Display Name
Port 10:00:00:00:c9:20:dc:da
Port 10:00:00:00:c9:20:e3:81
Topology Attributes Connectivity OS Handles HBAs Events
Selected HBA
HBA 20:00:00:00:c9:20:dc:da
HBA 20:00:00:00:c9:20:dc:da
HBA 20:00:00:00:c9:20:e3:81
Physical Connectivity
WWN
Port WWN
Switch
Switch Port
Switch Port WWN
20:00:00:00:c9:20:dc...
10:00:00:00:c9:20:dc...
Switch3
03
20:03:00:60:69:20:27...
Zones
Zone
WWN
WWN Type
Fabric
danz_wow_wow 20:03:00:60:69:20:27:a6 switch port Fabric Switch3
HDSZONE 20:00:00:00:c9:20:dc:da node Fabric Switch3
ISIS_SAL_PROVIDER_TES... 20:00:00:00:c9:20:dc:da node Fabric Switch3
newzoneconnectedtomoret... 20:00:00:00:c9:20:dc:da node Fabric Switch3
newzoneconnectedtomoret... 20:03:00:60:69:20:27:a6 switch port Fabric Switch3
newzonefromallocationwiz... 20:00:00:00:c9:20:dc:da node Fabric Switch3
newzonefromallocationwiz... 20:03:00:60:69:20:27:a6 switch port Fabric Switch3
zonefromdurham 20:00:00:00:c9:20:dc:da node Fabric Switch3
Press F1 for Help
magellan4.veritas.com (2)
Connected to manhattan.veritas.com:2802


VERITAS SANPoint Control - magellan4.veritas.com
File Edit View Tools Host Help
Hosts View
All Hosts
10:00:00:e0:69:c0:42:ab
20:00:00:e0:8b:01:2a:62
30:00:00:e0:69:00:06:fa
magellan4.veritas.com
magellan8
manhattan.veritas.com
manhattan-s.veritas.com
nora.veritas.com
norgay.veritas.com
Unconnected Hosts
Unzoned Hosts
Zoned Hosts
Fabrics Devices Hosts Groups
Display Name
Port 10:00:00:00:c9:20:dc:da
Port 10:00:00:00:c9:20:e3:81
Topology Attributes Connectivity OS Handles HBAs Events
Selected HBA HBA 20:00:00:00:c9:20:dc:da
HBA Attributes
Attribute Value
Create Time Fri Mar 02 21:08:22 2001
Creator HBA[magellan4]
Discovery State 00
Display Name HBA 20:00:00:00:c9:20:dc:da
Driver Information Driver Version(4.02k)
Firmware Version 3.20A7 (S2F3.20A7)
HBA Mode Point to Point
Product Name LP7000
Vendor Name Emulex Corporation
World Wide Name 20:00:00:00:c9:20:dc:da
Port Data
Port WWN Port Type Status ID
10:00:00:00:c9:20:dc:da N Port Online 0x21300
Press F1 for Help
magellan4.veritas.com (2)
Connected to manhattan.veritas.com:2802


VERITAS SANPoint Control - Hosts View
File Edit View Tools Selected Help
Hosts View
All Hosts
Unconnected Hosts
Unzoned Hosts
Zoned Hosts
Topology
Attributes
Events
Properties of Livingstone
Attribute
Value
Create Time
Fri Mar 02 21:10:54 2001
Creator
MGEX[manhattan]
Discovery State
Discovered
Display Name
Livingstone
Domain ID
04
Firmware Version
v2.3_rc6
Free Ports
2
HTTP IP Address
10.129.0.42
Model
Silkworm 2400
OutofBand Address
10.129.0.42
Port Count
08
SNMP IP Address
10.129.0.42
Close
Fabrics
Devices
Hosts
Display Name
All Hosts
Unconnected Hosts
Unzoned Hosts
Zoned Hosts
Hosts Root
norgay.veritas.com
Switch3
Livingstone
Overview
SUN 0
SEAGATE
Display on Login
Press F1 for Help
Hosts View
Connected to manhattan.veritas.com:2802


Edit View Tools LUN Help
EMC000183502018
04A
000
04A
00A
04A
00C
04A
LUN 00
04A
LUN 01
LUN 02
LUN 03
LUN 255
13B
EMC000184502242
HITACHI_9900_759B
abrics
Devices
Hosts
Groups
Display Name
4A
Topology
Attributes
Events
OS Handles
Attribute
Value
Advisory Display Name
00
Cost
Create Time
Fri Mar 02 21:09:39 2001
Creator
HBA[manhattan-s]
Device Type
Disk
Discovery State
Discovered
Display Name
00
Location
LUN Capacity
2.94 MB
LUN Configuration
2-Way-Mir
LUN ID
255
Product Name
SYMMETRIX
Revision
5567
Serial Number
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Update Time
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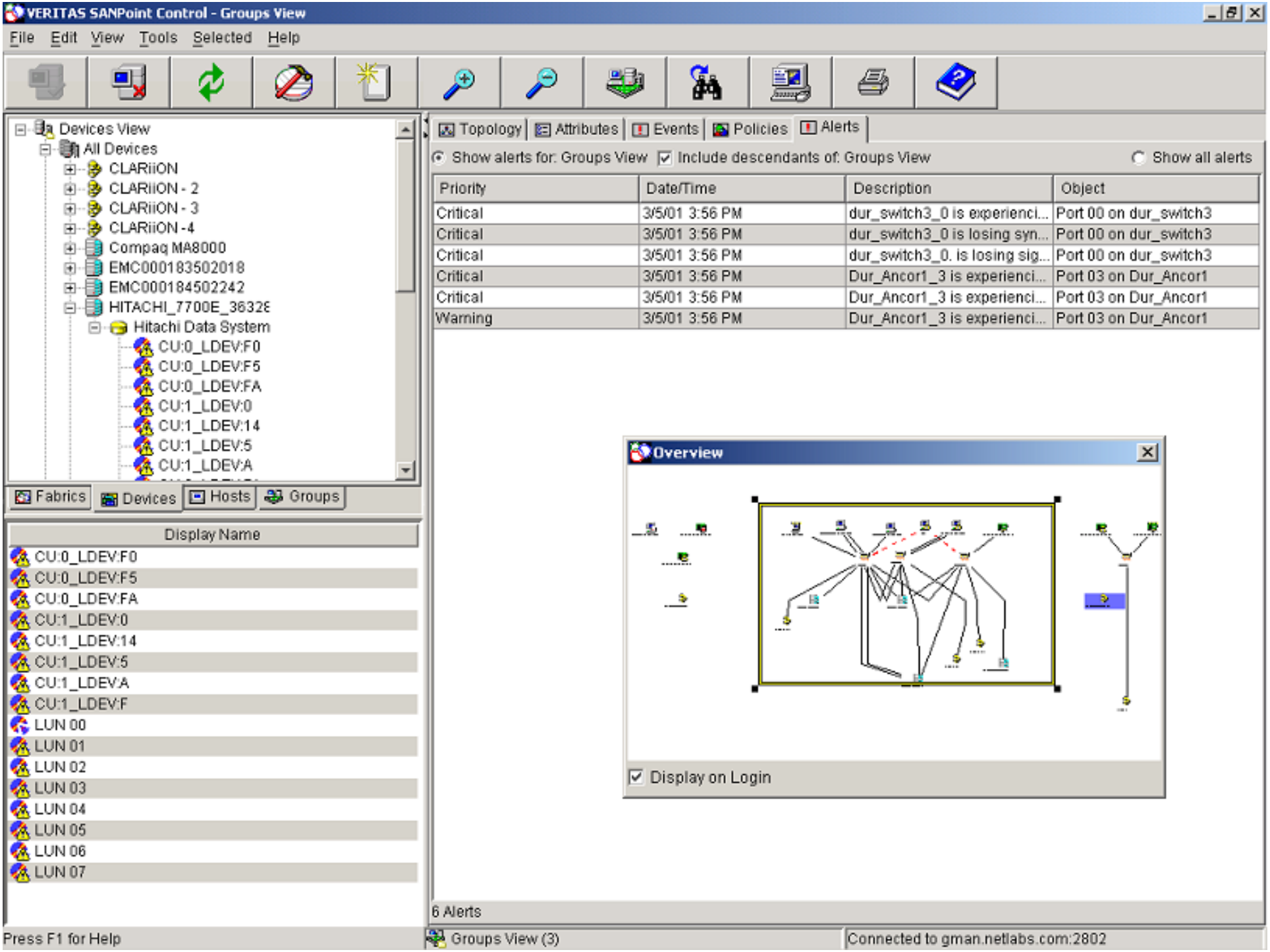
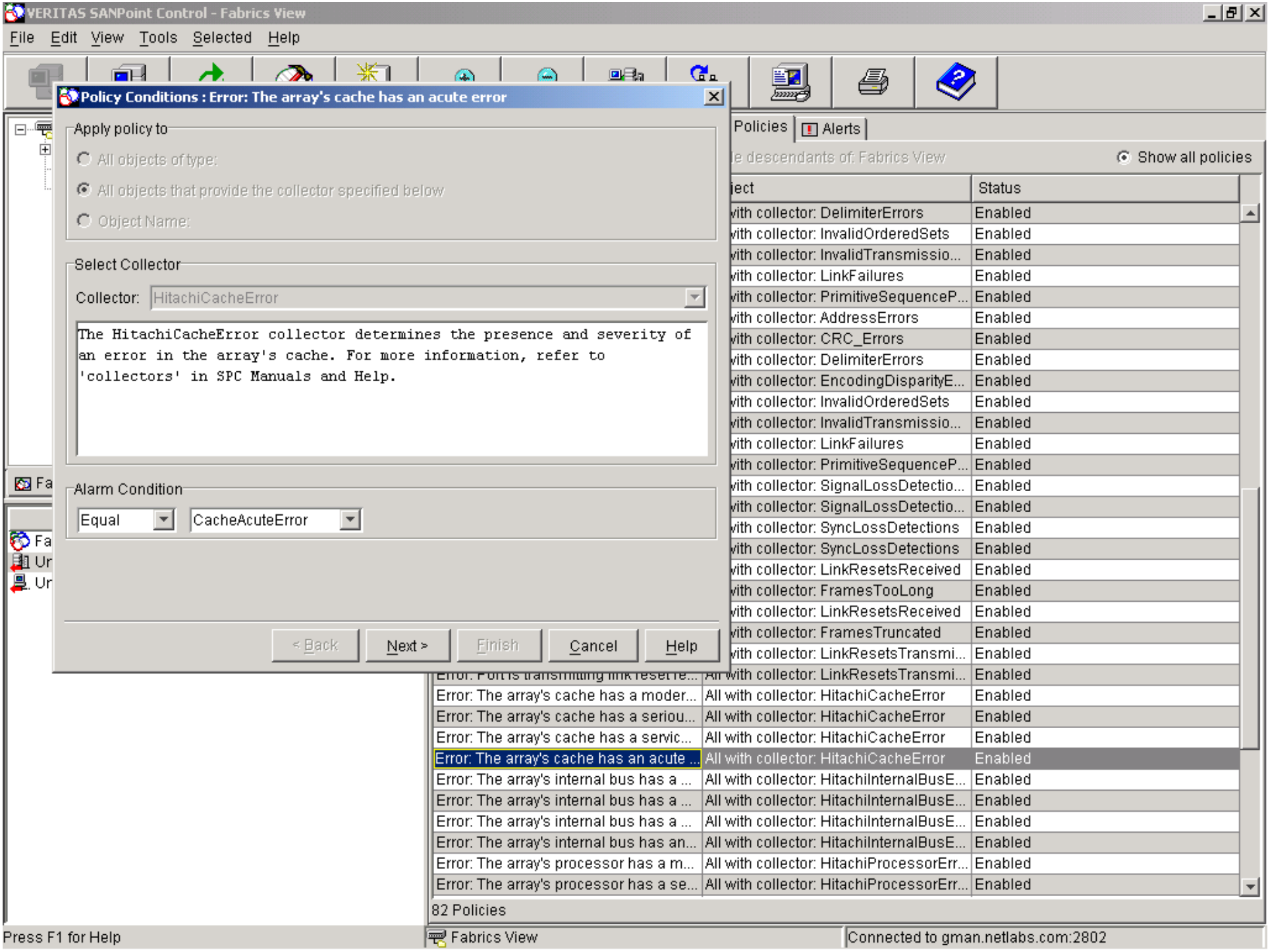
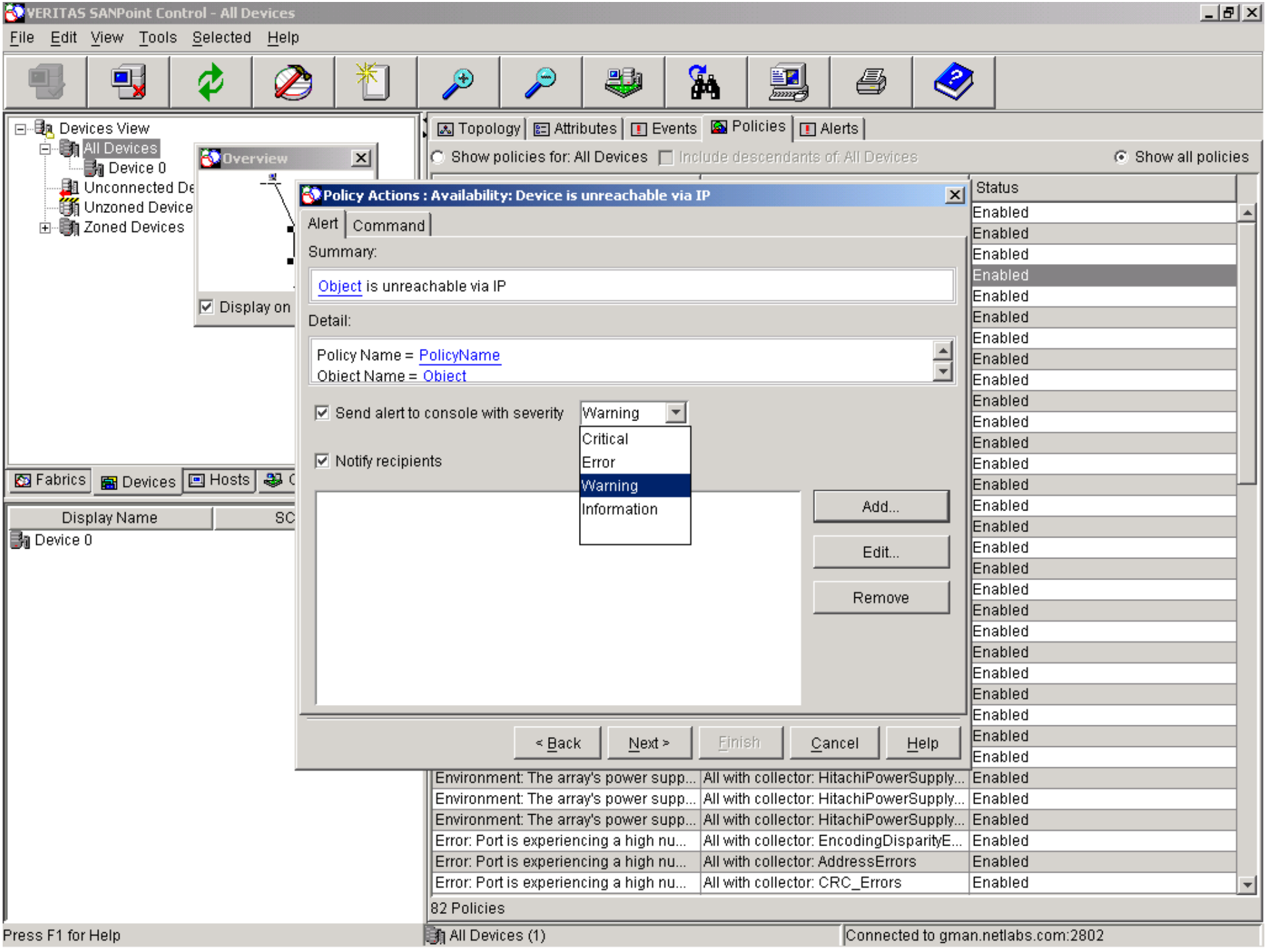
Updated by
HBA[manhattan-s]
Vendor Name
EMC Corporation


VERITAS SANPoint Control - Groups View
File Edit View Tools Selected Help
Devices View
All Devices
CLARiiON
CLARiiON - 2
CLARiiON - 3
CLARiiON -4
Compaq MA8000
EMC000183502018
EMC000184502242
HITACHI_7700E_3632E
Hitachi Data System
CU:0_LDEV:F0
CU:0_LDEV:F5
CU:0_LDEV:FA
CU:1_LDEV:0
CU:1_LDEV:14
CU:1_LDEV:5
CU:1_LDEV:A
Fabrics Devices Hosts Groups
Display Name
CU:0_LDEV:F0
CU:0_LDEV:F5
CU:0_LDEV:FA
CU:1_LDEV:0
CU:1_LDEV:14
CU:1_LDEV:5
CU:1_LDEV:A
CU:1_LDEV:F
LUN 00
LUN 01
LUN 02
LUN 03
LUN 04
LUN 05
LUN 06
LUN 07
Topology Attributes Events Policies Alerts
Show alerts for: Groups View
Include descendants of: Groups View
Show all alerts
Priority | Date/Time | Description | Object
Critical | 3/5/01 3:56 PM | dur_switch3_0 is experienci... | Port 00 on dur_switch3
Critical | 3/5/01 3:56 PM | dur_switch3_0 is losing syn... | Port 00 on dur_switch3
Critical | 3/5/01 3:56 PM | dur_switch3_0. is losing sig... | Port 00 on dur_switch3
Critical | 3/5/01 3:56 PM | Dur_Ancor1_3 is experienci... | Port 03 on Dur_Ancor1
Critical | 3/5/01 3:56 PM | Dur_Ancor1_3 is experienci... | Port 03 on Dur_Ancor1
Warning | 3/5/01 3:56 PM | Dur_Ancor1_3 is experienci... | Port 03 on Dur_Ancor1
Overview
Display on Login
6 Alerts
Press F1 for Help
Groups View (3)
Connected to gman.netlabs.com:2802


VERITAS SANPoint Control - Fabrics View
File Edit View Tools Selected Help
Policy Conditions : Error: The array's cache has an acute error
Apply policy to
All objects of type:
All objects that provide the collector specified below
Object Name:
Select Collector
Collector: HitachiCacheError
The HitachiCacheError collector determines the presence and severity of an error in the array's cache. For more information, refer to 'collectors' in SPC Manuals and Help.
Alarm Condition
Equal
CacheAcuteError
< Back
Next >
Finish
Cancel
Help
Policies
Alerts
Show all policies
Status
Error: The array's cache has a moder... All with collector: HitachiCacheError Enabled
Error: The array's cache has a seriou... All with collector: HitachiCacheError Enabled
Error: The array's cache has a servic... All with collector: HitachiCacheError Enabled
Error: The array's cache has an acute ... All with collector: HitachiCacheError Enabled
82 Policies
Press F1 for Help
Fabrics View
Connected to gman.netlabs.com:2802


VERITAS SANPoint Control - All Devices
File Edit View Tools Selected Help
Devices View
All Devices
Device 0
Unconnected De
Unzoned Device
Zoned Devices
Overview
Display on
Topology Attributes Events Policies Alerts
Show policies for: All Devices
Include descendants of: All Devices
Show all policies
Policy Actions : Availability: Device is unreachable via IP
Alert Command
Summary:
Object is unreachable via IP
Detail:
Policy Name = PolicyName
Object Name = Object
Send alert to console with severity
Warning
Critical
Error
Warning
Information
Notify recipients
Add...
Edit...
Remove
< Back
Next >
Finish
Cancel
Help
Status
Enabled
Fabrics Devices Hosts
Display Name
Device 0
Environment: The array's power supp... All with collector: HitachiPowerSupply... Enabled
Error: Port is experiencing a high nu... All with collector: EncodingDisparityE... Enabled
Error: Port is experiencing a high nu... All with collector: AddressErrors Enabled
Error: Port is experiencing a high nu... All with collector: CRC_Errors Enabled
82 Policies
Press F1 for Help
All Devices (1)
Connected to gman.netlabs.com:2802

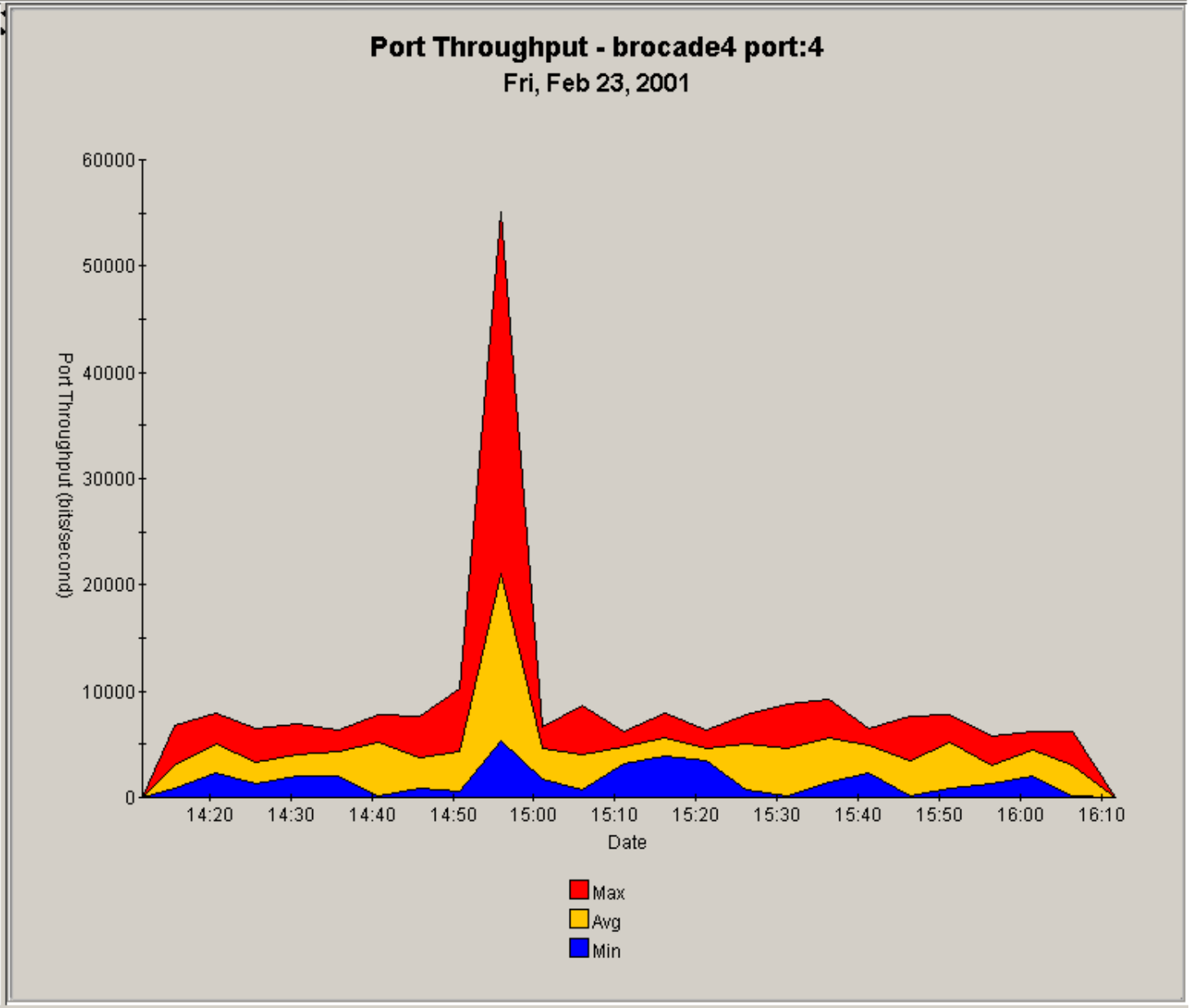
VERITAS SANPoint Control Reports

File View Reports Help

brocade4 port:4

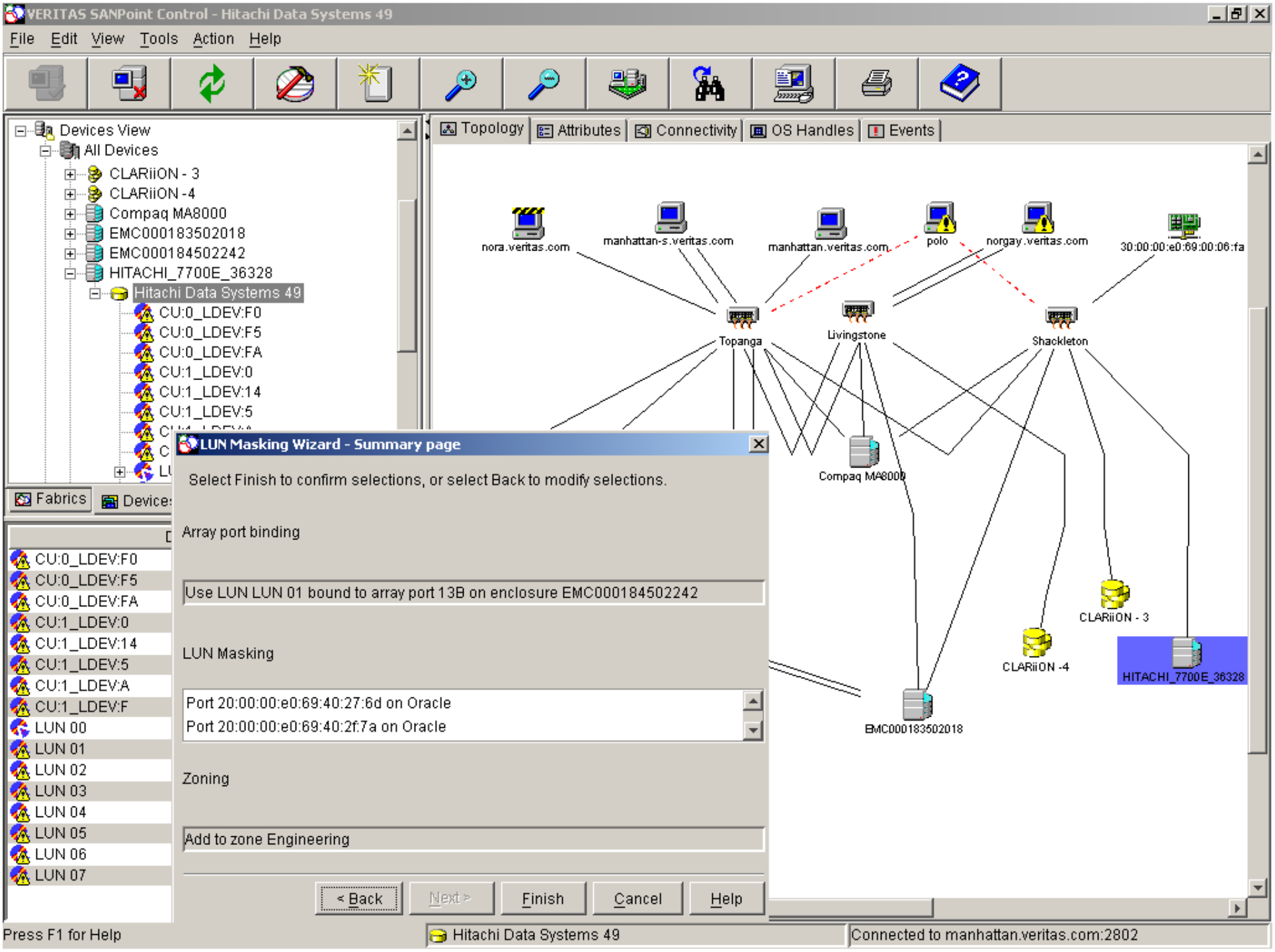
Port Throughput - brocade4 port:4

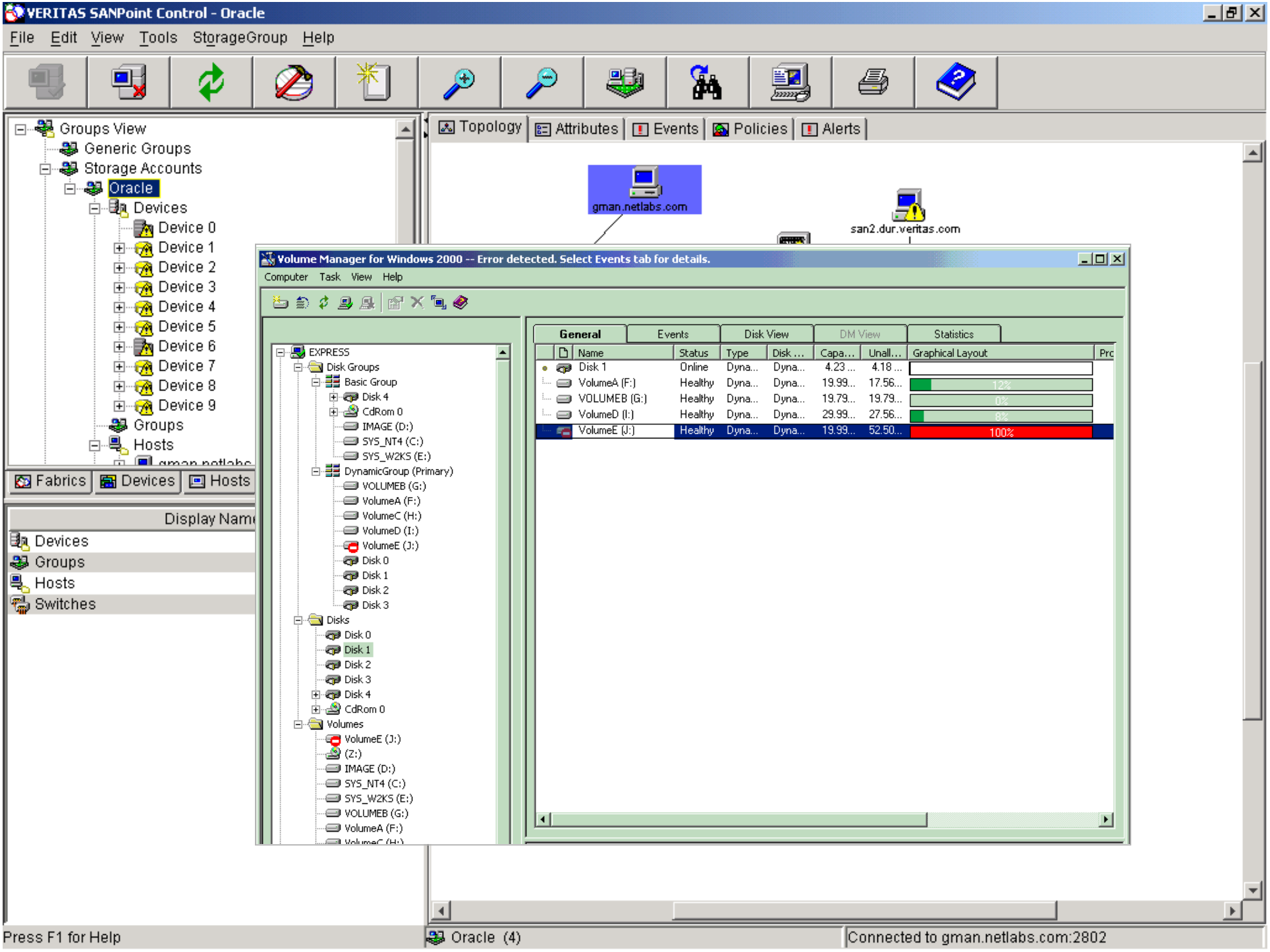
- Reports
  - Fabric
  - Device
  - Host
    - HostOverview
    - HostAllocation
  - Switch
    - SwitchHardware
    - SwitchFabric
    - SwitchPort
    - SwitchPortConnections
  - HBA
    - HBAHardware
  - Groups
  - Alerts
  - Performance
    - PortThroughput
    - PortUtilization
    - TotalFramesTransmitted
    - TotalFramesReceived
    - SignalLossDetections
    - PortLinkFailures
    - CRCErrors
    - Class3Discards
    - AddressErrors
    - Class1FramesRejected
    - Class2FramesRejected
    - DelimiterErrors
    - EncodingDisparityErrors
    - FramesTooLong
    - FramesTruncated
    - InvalidOrderedSets
    - InvalidTransmissionWords
    - LinkResetsReceived
    - LinkResetsTransmitted
    - PrimitiveSequenceProtocolErro
    - SyncLossDetections
    - Class1FramesReceived
    - Class1FramesTransmitted
    - Class2FramesReceived

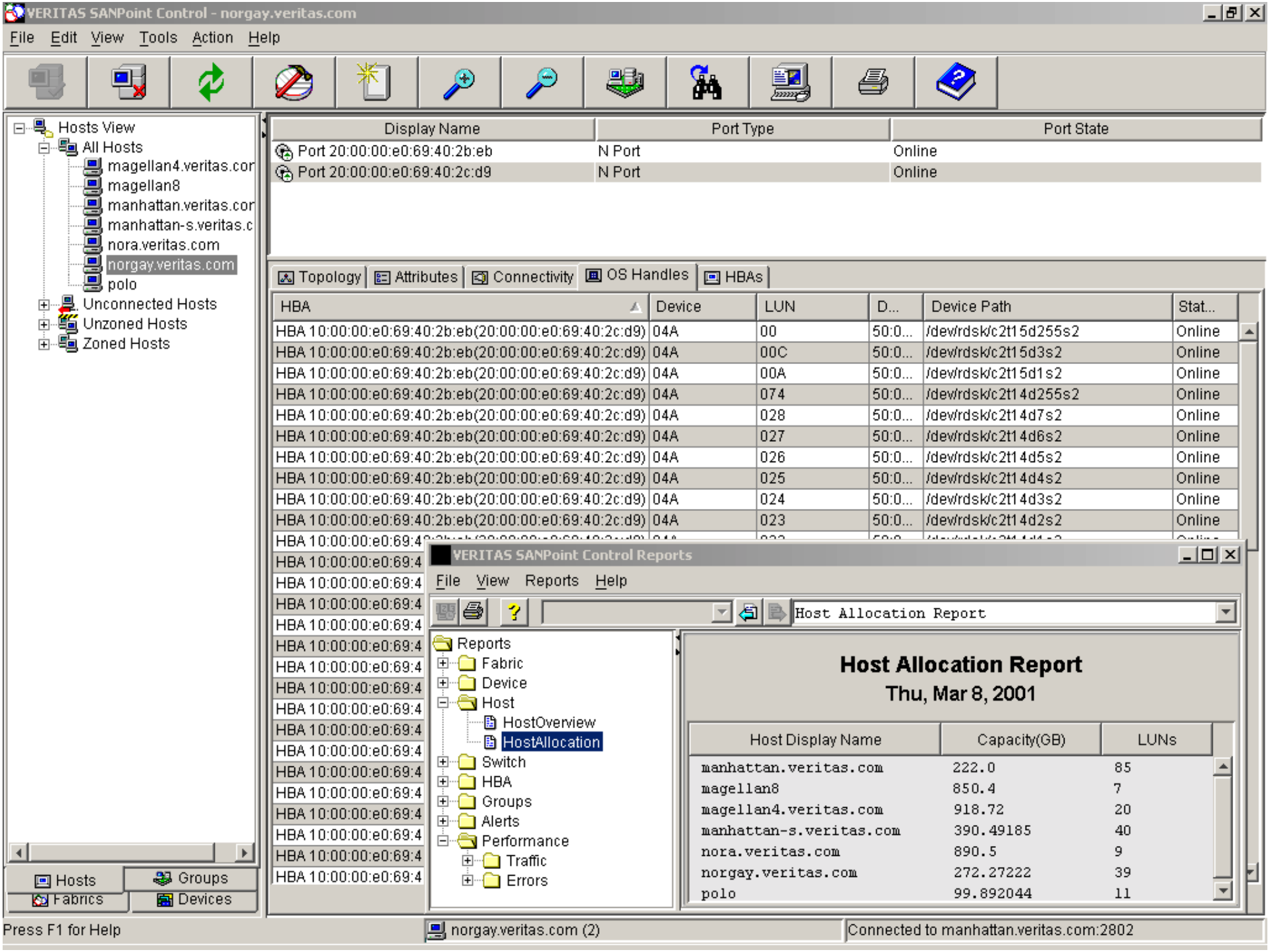


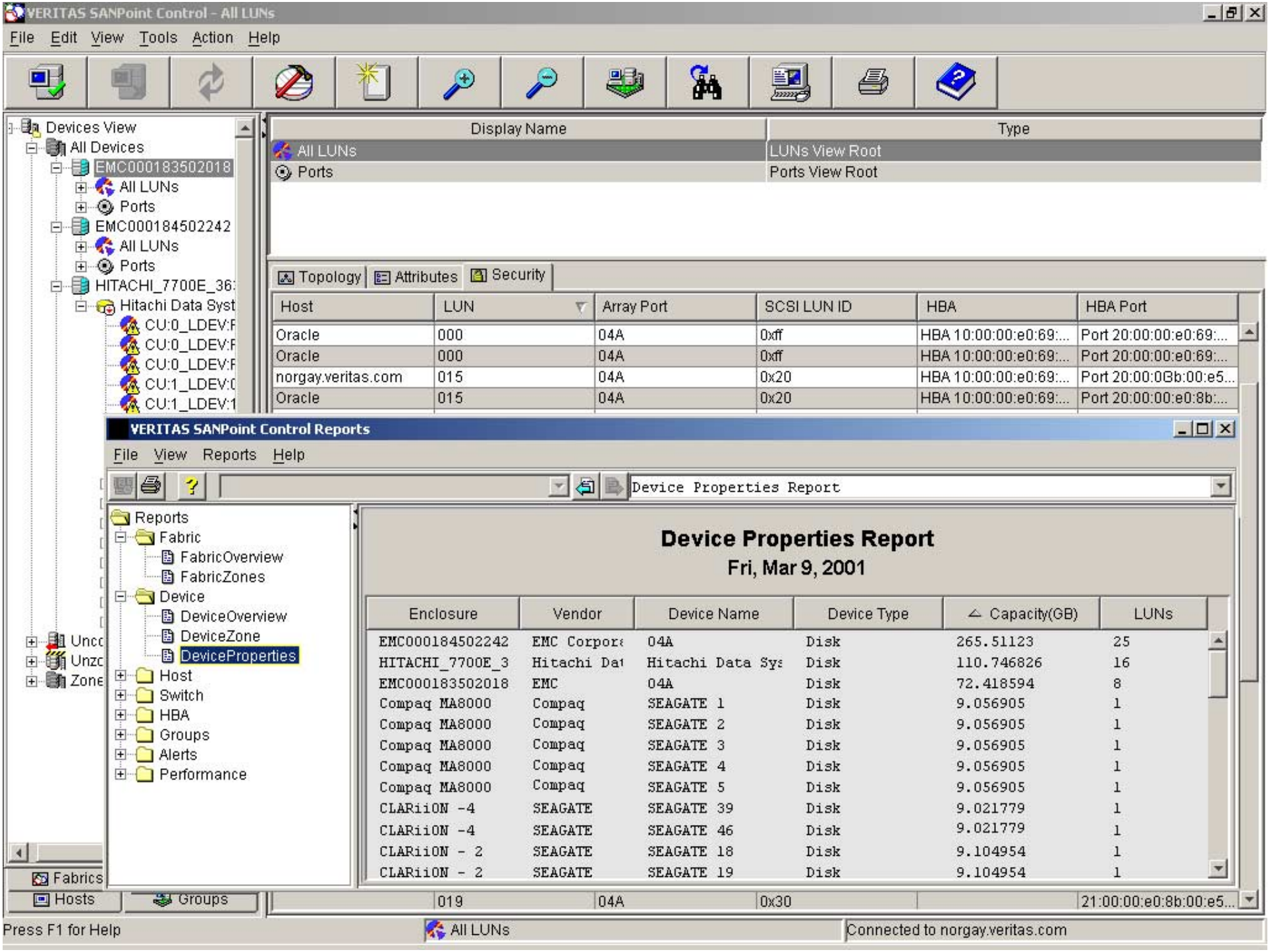
Records retrieved:23

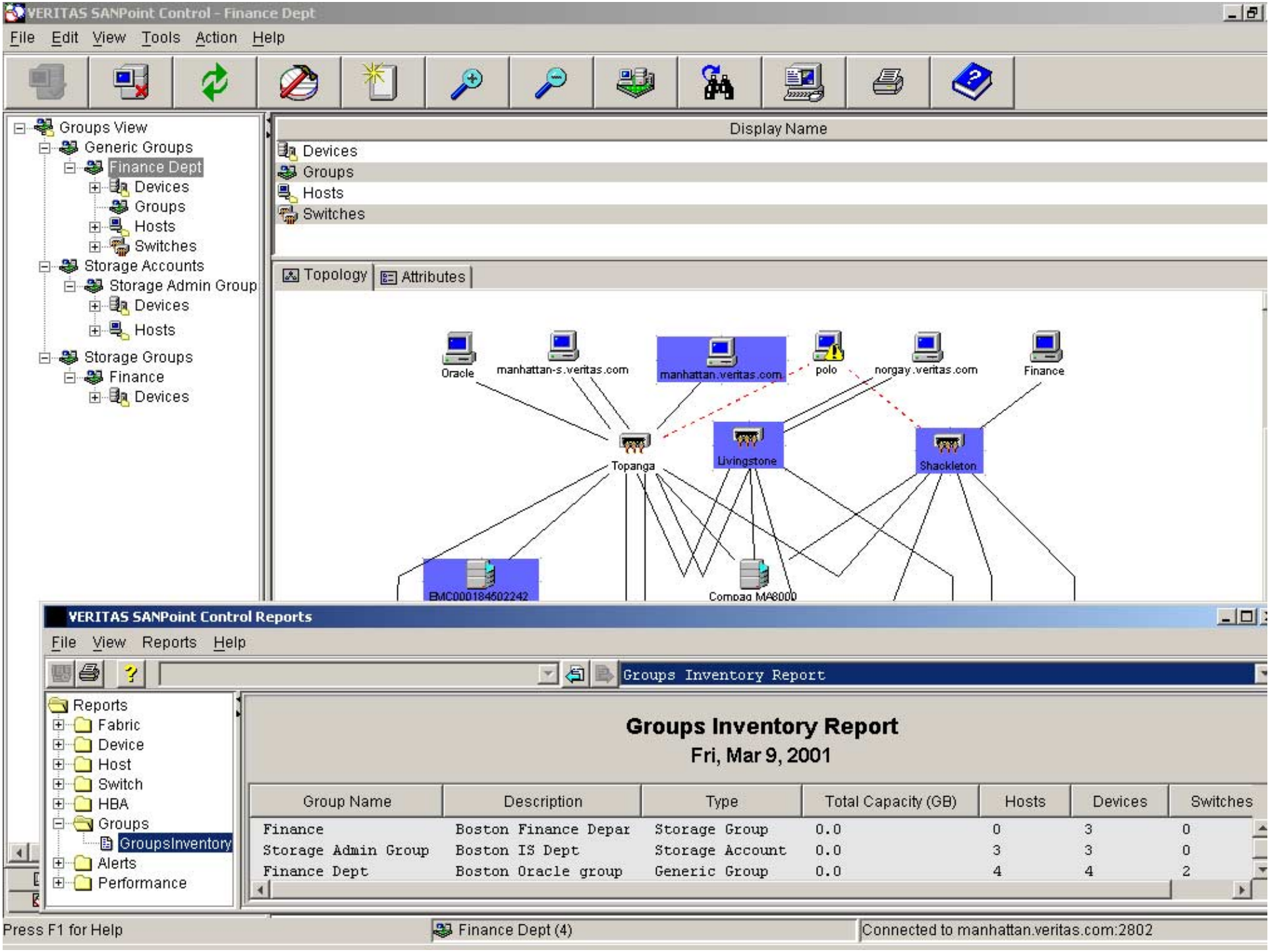
Start VERITAS S... VERITAS S... 4:14 PM


VERITAS SANPoint Control - Hitachi Data Systems 49
File Edit View Tools Action Help
Devices View
All Devices
CLARiiON - 3
CLARiiON -4
Compaq MA8000
EMC000183502018
EMC000184502242
HITACHI_7700E_36328
Hitachi Data Systems 49
CU:0_LDEV:F0
CU:0_LDEV:F5
CU:0_LDEV:FA
CU:1_LDEV:0
CU:1_LDEV:14
CU:1_LDEV:5
Topology
Attributes
Connectivity
OS Handles
Events
nora.veritas.com
manhattan-s.veritas.com
manhattan.veritas.com
polo
norgay.veritas.com
30:00:00:e0:69:00:06:fa
Topanga
Livingstone
Shackleton
Compaq MA8000
CLARiiON - 3
CLARiiON -4
HITACHI_7700E_36328
EMC000183502018
LUN Masking Wizard - Summary page
Select Finish to confirm selections, or select Back to modify selections.
Array port binding
Use LUN LUN 01 bound to array port 13B on enclosure EMC000184502242
LUN Masking
Port 20:00:00:e0:69:40:27:6d on Oracle
Port 20:00:00:e0:69:40:2f:7a on Oracle
Zoning
Add to zone Engineering
< Back
Next >
Finish
Cancel
Help
Fabrics
CU:0_LDEV:F0
CU:0_LDEV:F5
CU:0_LDEV:FA
CU:1_LDEV:0
CU:1_LDEV:14
CU:1_LDEV:5
CU:1_LDEV:A
CU:1_LDEV:F
LUN 00
LUN 01
LUN 02
LUN 03
LUN 04
LUN 05
LUN 06
LUN 07
Press F1 for Help
Hitachi Data Systems 49
Connected to manhattan.veritas.com:2802


VERITAS SANPoint Control - Oracle
File Edit View Tools StorageGroup Help
Groups View
Generic Groups
Storage Accounts
Oracle
Devices
Device 0
Device 1
Device 2
Device 3
Device 4
Device 5
Device 6
Device 7
Device 8
Device 9
Groups
Hosts
Fabrics Devices Hosts
Display Name
Devices
Groups
Hosts
Switches
Topology Attributes Events Policies Alerts
gman.netlabs.com
san2.dur.veritas.com
Volume Manager for Windows 2000 -- Error detected. Select Events tab for details.
Computer Task View Help
EXPRESS
Disk Groups
Basic Group
Disk 4
CdRom 0
IMAGE (D:)
SYS_NT4 (C:)
SYS_W2K5 (E:)
DynamicGroup (Primary)
VOLUMEB (G:)
VolumeA (F:)
VolumeC (H:)
VolumeD (I:)
VolumeE (J:)
Disk 0
Disk 1
Disk 2
Disk 3
Disks
Disk 0
Disk 1
Disk 2
Disk 3
Disk 4
CdRom 0
Volumes
VolumeE (J:)
(Z:)
IMAGE (D:)
SYS_NT4 (C:)
SYS_W2K5 (E:)
VOLUMEB (G:)
VolumeA (F:)
General Events Disk View DM View Statistics
Name Status Type Disk ... Capa... Unall... Graphical Layout
Disk 1 Online Dyna... Dyna... 4.23 ... 4.18 ...
VolumeA (F:) Healthy Dyna... Dyna... 19.99... 17.56... 12%
VOLUMEB (G:) Healthy Dyna... Dyna... 19.79... 19.79... 0%
VolumeD (I:) Healthy Dyna... Dyna... 29.99... 27.56... 8%
VolumeE (J:) Healthy Dyna... Dyna... 19.99... 52.50... 100%
Press F1 for Help
Oracle (4)
Connected to gman.netlabs.com:2802


VERITAS SANPoint Control - norgay.veritas.com
File Edit View Tools Action Help
Hosts View
All Hosts
magellan4.veritas.cor
magellan8
manhattan.veritas.cor
manhattan-s.veritas.c
nora.veritas.com
norgay.veritas.com
polo
Unconnected Hosts
Unzoned Hosts
Zoned Hosts
Hosts
Groups
Fabrics
Devices
Display Name
Port Type
Port State
Port 20:00:00:e0:69:40:2b:eb
N Port
Online
Port 20:00:00:e0:69:40:2c:d9
N Port
Online
Topology
Attributes
Connectivity
OS Handles
HBAs
HBA
Device
LUN
D...
Device Path
Stat...
HBA 10:00:00:e0:69:40:2b:eb(20:00:00:e0:69:40:2c:d9)
04A
00
50:0...
/dev/rdsk/c2t15d255s2
Online
00C
/dev/rdsk/c2t15d3s2
00A
/dev/rdsk/c2t15d1s2
074
/dev/rdsk/c2t14d255s2
028
/dev/rdsk/c2t14d7s2
027
/dev/rdsk/c2t14d6s2
026
/dev/rdsk/c2t14d5s2
025
/dev/rdsk/c2t14d4s2
024
/dev/rdsk/c2t14d3s2
023
/dev/rdsk/c2t14d2s2
VERITAS SANPoint Control Reports
File View Reports Help
Host Allocation Report
Reports
Fabric
Device
Host
HostOverview
HostAllocation
Switch
HBA
Groups
Alerts
Performance
Traffic
Errors
Host Allocation Report
Thu, Mar 8, 2001
Host Display Name
Capacity(GB)
LUNs
manhattan.veritas.com
222.0
85
magellan8
850.4
7
magellan4.veritas.com
918.72
20
manhattan-s.veritas.com
390.49185
40
nora.veritas.com
890.5
9
norgay.veritas.com
272.27222
39
polo
99.892044
11
Press F1 for Help
norgay.veritas.com (2)
Connected to manhattan.veritas.com:2802


VERITAS SANPoint Control - All LUNs
File Edit View Tools Action Help
Devices View
All Devices
EMC000183502018
All LUNs
Ports
EMC000184502242
All LUNs
Ports
HITACHI_7700E_36
Hitachi Data Syst
CU:0_LDEV:F
CU:0_LDEV:F
CU:0_LDEV:F
CU:1_LDEV:(
CU:1_LDEV:1
Display Name
Type
All LUNs
LUNs View Root
Ports
Ports View Root
Topology
Attributes
Security
Host
LUN
Array Port
SCSI LUN ID
HBA
HBA Port
Oracle
000
04A
0xff
HBA 10:00:00:e0:69:...
Port 20:00:00:e0:69:...
Oracle
000
04A
0xff
HBA 10:00:00:e0:69:...
Port 20:00:00:e0:69:...
norgay.veritas.com
015
04A
0x20
HBA 10:00:00:e0:69:...
Port 20:00:0Gb:00:e5...
Oracle
015
04A
0x20
HBA 10:00:00:e0:69:...
Port 20:00:00:e0:8b:...
VERITAS SANPoint Control Reports
File View Reports Help
Device Properties Report
Reports
Fabric
FabricOverview
FabricZones
Device
DeviceOverview
DeviceZone
DeviceProperties
Host
Switch
HBA
Groups
Alerts
Performance
Device Properties Report
Fri, Mar 9, 2001
Enclosure
Vendor
Device Name
Device Type
Capacity(GB)
LUNs
EMC000184502242 EMC Corpor 04A Disk 265.51123 25
HITACHI_7700E_3 Hitachi Dat Hitachi Data Sys Disk 110.746826 16
EMC000183502018 EMC 04A Disk 72.418594 8
Compaq MA8000 Compaq SEAGATE 1 Disk 9.056905 1
Compaq MA8000 Compaq SEAGATE 2 Disk 9.056905 1
Compaq MA8000 Compaq SEAGATE 3 Disk 9.056905 1
Compaq MA8000 Compaq SEAGATE 4 Disk 9.056905 1
Compaq MA8000 Compaq SEAGATE 5 Disk 9.056905 1
CLARiiON -4 SEAGATE SEAGATE 39 Disk 9.021779 1
CLARiiON -4 SEAGATE SEAGATE 46 Disk 9.021779 1
CLARiiON - 2 SEAGATE SEAGATE 18 Disk 9.104954 1
CLARiiON - 2 SEAGATE SEAGATE 19 Disk 9.104954 1
Fabrics
Hosts
Groups
019
04A
0x30
21:00:00:e0:8b:00:e5...
Press F1 for Help
All LUNs
Connected to norgay.veritas.com


VERITAS SANPoint Control - Finance Dept
File Edit View Tools Action Help
Groups View
Generic Groups
Finance Dept
Devices
Groups
Hosts
Switches
Storage Accounts
Storage Admin Group
Devices
Hosts
Storage Groups
Finance
Devices
Display Name
Devices
Groups
Hosts
Switches
Topology
Attributes
Oracle
manhattan-s.veritas.com
manhattan.veritas.com
polo
norgay.veritas.com
Finance
Topanga
Livingstone
Shackleton
EMC000184502242
Compaq MA8000
VERITAS SANPoint Control Reports
File View Reports Help
Groups Inventory Report
Reports
Fabric
Device
Host
Switch
HBA
Groups
GroupsInventory
Alerts
Performance
Groups Inventory Report
Fri, Mar 9, 2001
Group Name | Description | Type | Total Capacity (GB) | Hosts | Devices | Switches
Finance | Boston Finance Depar | Storage Group | 0.0 | 0 | 3 | 0
Storage Admin Group | Boston IS Dept | Storage Account | 0.0 | 3 | 3 | 0
Finance Dept | Boston Oracle group | Generic Group | 0.0 | 4 | 4 | 2
Press F1 for Help
Finance Dept (4)
Connected to manhattan.veritas.com:2802

VERITAS and SANs Today

- **Today VERITAS ships 6 SAN-enabled products:**
  - Cluster Server
  - Volume Manager
  - Backup Exec and NetBackup Shared Storage Option
    - More than 2000 licenses
  - Storage Migrator (HSM)
  - V^3 Storage Appliance
  - SANPoint Control
- **Soon More**
  - Allocation Solutions
  - Storage Application Management Solutions
  - And More…

Industry Support for SANPoint Control 2.0

- **SPC Distribution Partners**

BROCADE HITACHI DATA SYSTEMS INRANGE Technologies Corporation McDATA qlogic Corp.

- **Advanced Host Bus Adapter (HBA) Integration**

EMULEX NETWORK SYSTEMS jni qlogic Corp.

- **Advanced Switch Integration & Active Management**

BROCADE INRANGE Technologies Corporation McDATA qlogic Corp.

Testing the SAN Solutions

- **VERITAS has created the iLab whose role it is to:**
  - Find out what really works and what doesn't
    - Testing and certifying solutions
    - Make the information available to the world
  - Interoperability testing of VERITAS applications
    - On supported hardware and OS platforms
- **Located in two locations:**
  - VERITAS Headquarters location in Mountain View, California (USA)
  - VERITAS Orlando location

SANPoint Control Vision

Product Themes 2001 and beyond

- Expanded Operating System and Device Support Coverage
- Installation and Usability Enhancements
- Secure Storage Allocation and Provisioning
- Enhancing Quality of Storage Service (QoSS) through Performance & Capacity Management
- Integrated Solutions with VERITAS Software Applications

Expanded Operating System and Device Support Coverage

- Expand OS coverage to HP-UX, AIX, Whistler, and Linux
- Ongoing addition of support for the most recently available devices from our established SAN partners
- Add support for emerging SAN device vendors such as INRANGE and Troika
- Support new technologies, including 2GB HBAs, third party copy data movers, and WAN Storage Routers (Fibre, iSCSI)
- Direct-attached and Network-Attached storage

Installation and Usability Enhancements

- Distributed installation enhancements using ‘push’ methodologies
- Web user interface
- Launch in-context
- Logical topology visualization and filtering
- Continual enhancements and additions to reporting
- Ongoing enhancements to ease of use based on customer feedback

Secure Allocation and Provisioning

- Extending storage access mechanisms (for example, adding INRANGE zoning and HP storage LUN security)
- Visualization of VERITAS volume (mapped to disks) and disk group (disk members) layout
- Storage account security and state tracking
- Request for storage triggered by monitoring of file system, volume, database table or application
- Ability to automatically grow VERITAS file system or VERITAS volume
- Intelligent provisioning engine through new V^3 Intelligent Provisioning Service (IPS) technology (optional component)

Enhancing QoSS through Performance & Capacity Management

- Capacity (usage, charge-back) tracking and reporting extended to volumes, file systems and applications
- ServPoint Appliance storage visualization, performance monitoring and capacity tracking
- Complex policies and correlation of events to determine root cause
- SAN configuration (hardware and software) snapshot and historical tracking
- Filtering of events/policies by logical groups

Integrated Solutions with VERITAS Software Applications

- **Integrated Solution with VERITAS Cluster Server**
  - Discovery and visualization of VCS clusters on the SAN; Cluster View showing members of the cluster and associated devices (physical device, physical data layout)
  - In-context launch from SANPoint Control clustered host to VCS and from VCS disk to SANPoint Control
  - SPC made highly available
- **Integrated solution with VERITAS Server Free backup**
  - Discovery and visualization of 3PC engines on the SAN; NBU Server Free View showing members (Master/Media) and their associated devices
  - In-context launch from SANPoint Control
  - Monitoring/Policy support for Server Free environment

Why VERITAS SANPoint Control?

- **Strategic VERITAS Investment**
- **Strong Market Position in SAN Management**
- **Broadest Range of Strategic Partnerships**
- **SPC 2.0 Delivers Industry-Leading Feature Set**
- **Exceptional Customer Demand and Adoption, Increasing Daily**
- **Visionary Futures and Aggressive Roadmap**