HP OpenView Storage Area Manager

Session ID# 2546

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OpenView Storage Area Manager Agenda

- Feature Overview

- Product Architecture

- HP OpenView Integration Points

- Product Demonstration

- Questions

Integrated storage resource management

HP OpenView building blocks

System Management	Application Management	Network Management	Performance and Resource Mgmt.	Storage Management

Centralized management and storage services

Device (array) management	Node management	Capacity management	Performance management	Usage metering and billing	Configure & provision

SMI-S and API's

HP and heterogeneous storage

hp invent · McDATA The experience to rely on · Sun microsystems · EMC² · HITACHI · STORAGETEK · BROCADE · CISCO SYSTEMS

Integrated Management
From Device To Service Level
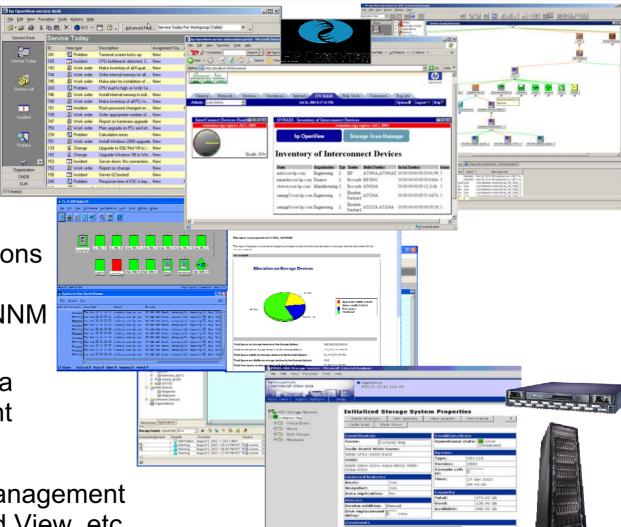
linked together

Service Centric
Management
- Svc Desk,
Navigator, SIP

Enterprise Operations
Management
- OVO, Reporter, NNM

Storage Area
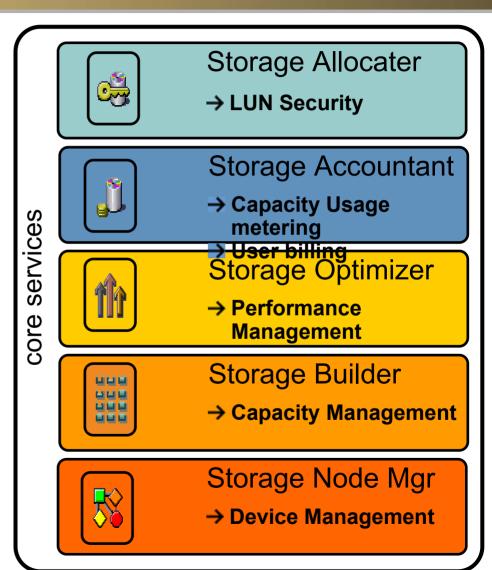Management
- OV SAM

Element Management
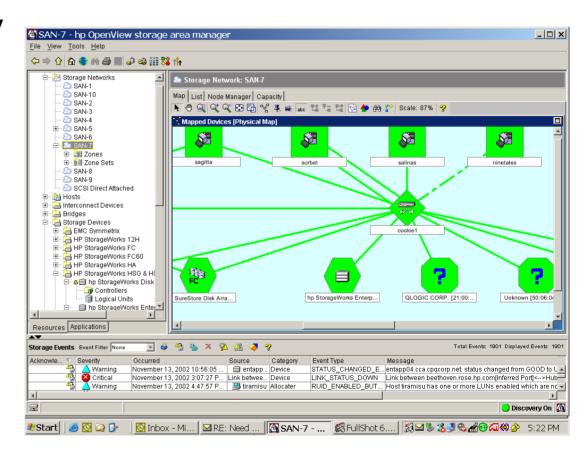- Command View, etc

HP OpenView Storage Area Manager

- **Single, Integrated Application**
- **Individual Licensed modules**
- **Shared services**
- **Central console**
- **Single agent**
- **Scalable**

core services

Storage Allocater
→ **LUN Security**

Storage Accountant
→ **Capacity Usage metering**
→ **User billing**

Storage Optimizer
→ **Performance Management**

Storage Builder
→ **Capacity Management**

Storage Node Mgr
→ **Device Management**

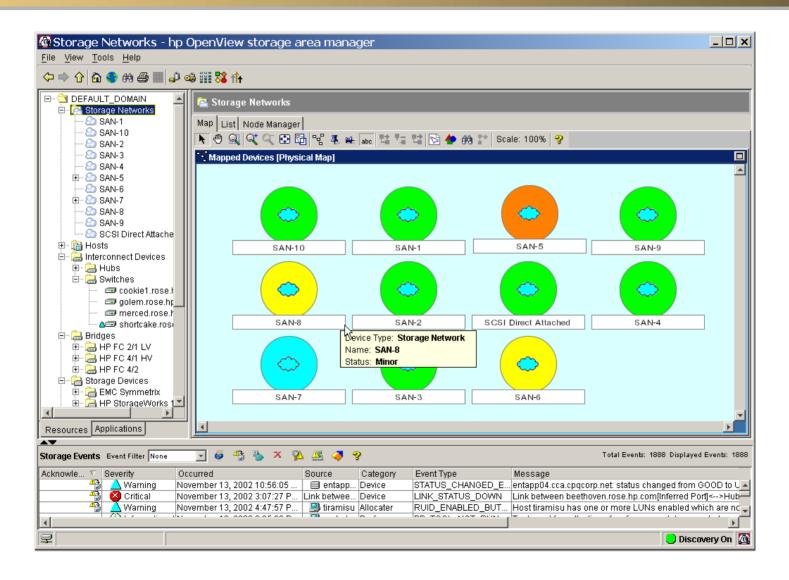# HP OpenView Storage Node Manager

Features

- Automated discovery
- Topology & device status display
- SAN, NAS and DAS discovery
- Status monitoring
- Event Management
- Zoning presentation
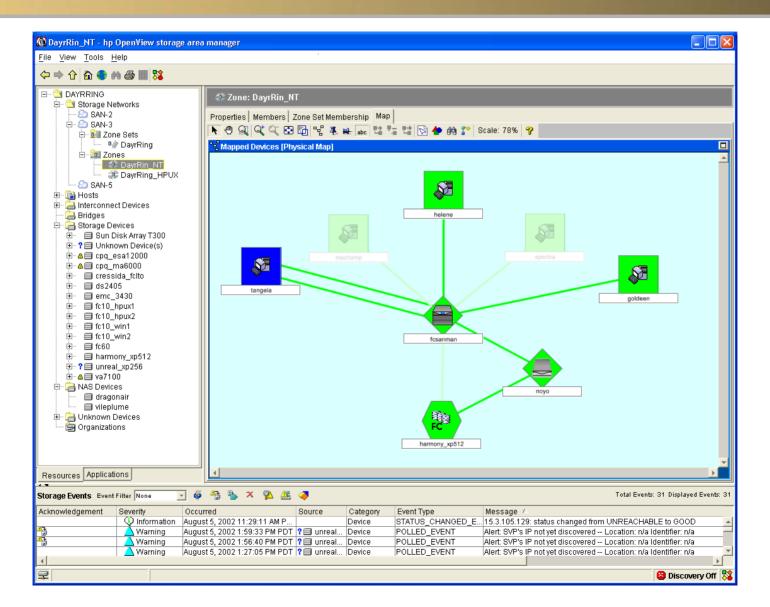- Device management
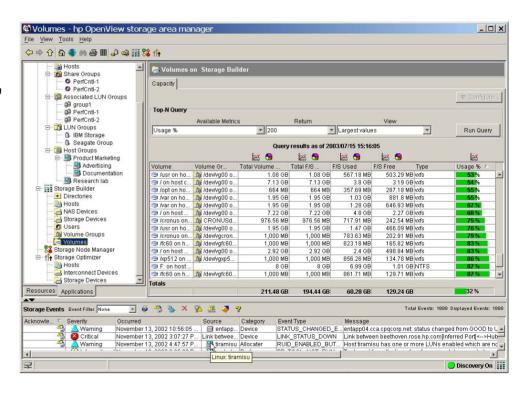- Policy Automation

Multi-Fabric Management
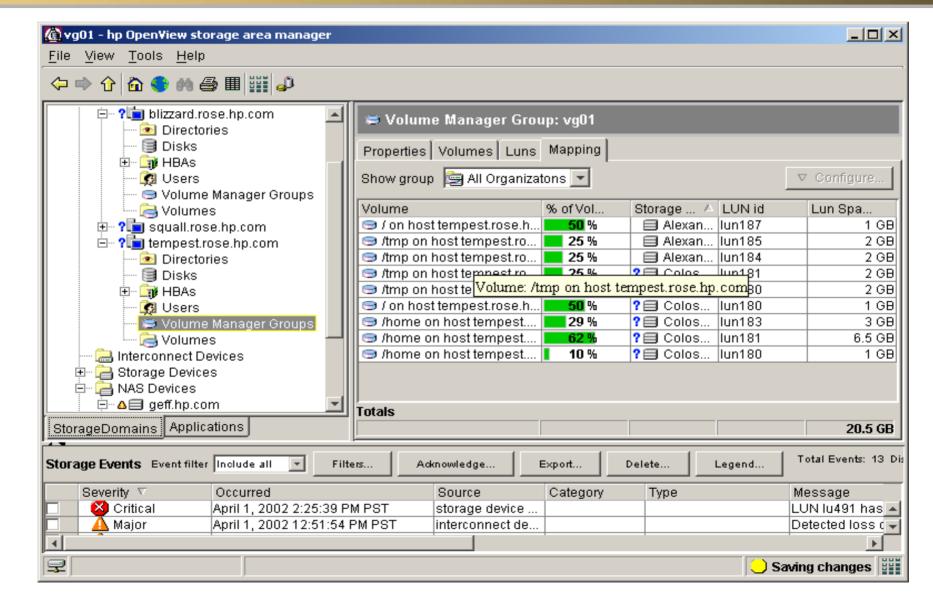
zone presentation

HP OpenView Storage Builder

Features

- **Capacity and utilization views by**

  - **Array, LUN, volume, host, user, & application**

- **Reports, graphs, and charts**

- **Historical trending and future extrapolations**

- **User defined capacity thresholds**

- **Event notification**

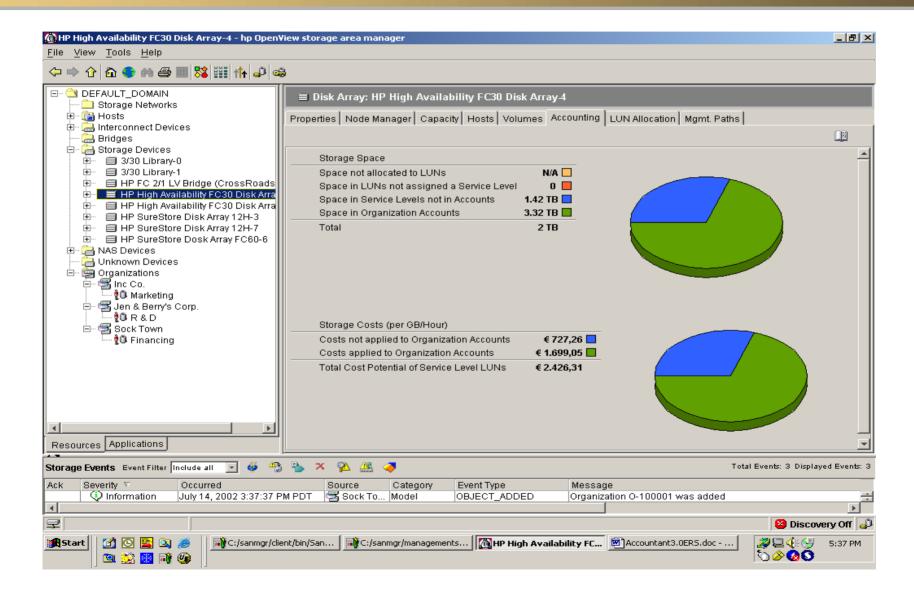- **Application - file - volume - LUN - array mapping**
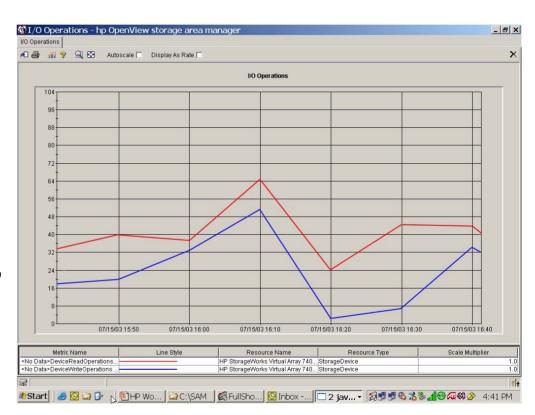
volume-to-LUN mapping

storage device usage

HP OpenView
Storage Optimizer

Features

- Storage array and switch performance monitoring with drill-down capabilities

- Automated base lining, threshold determination, and over-baseline notification

- Reporting, historical trending, and analysis
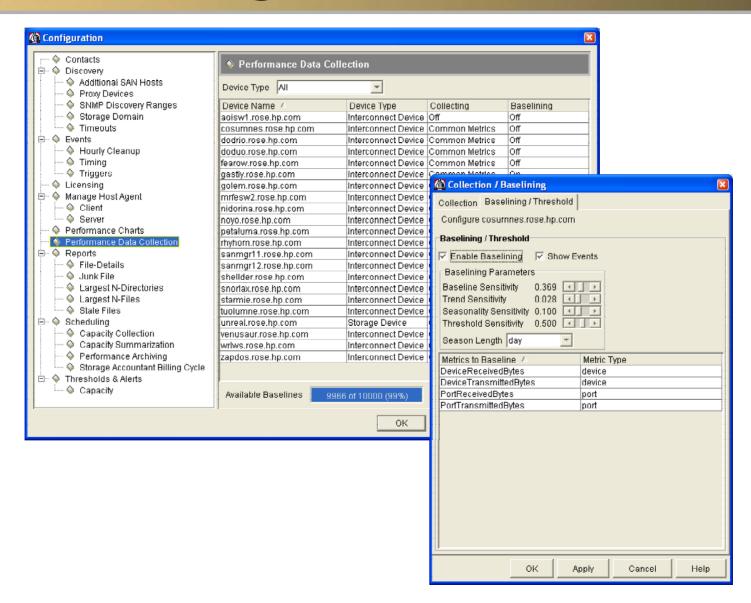
Performance Trending
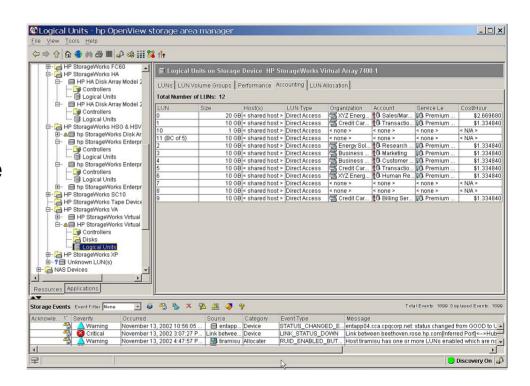
Auto-base lining

Features
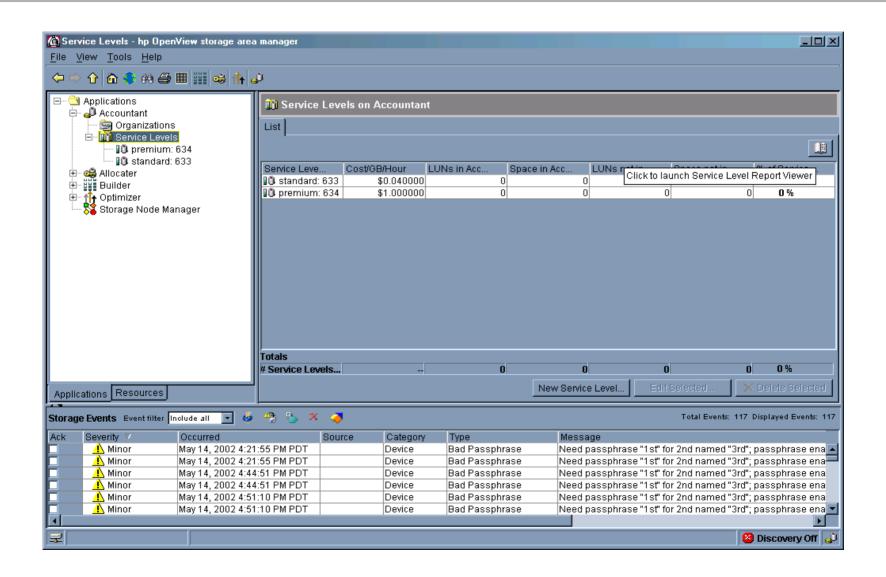
- Set up user accounts

- Measure, calculate, and bill based on assigned storage

- Assign service levels and price tiers based on associated storage and services

- Measure, calculate, and bill based on assigned storage

- Report on customer, service level and usage

service level management

HP OpenView Storage Allocater

Features

- Secured access control between host and multivendor storage (RAID, JBOD, tape)

- Drag-and-drop LUN assignment and reassignment without system reboot

- Configuration wizard

- Notification of unauthorized host

SAM modular building block architecture

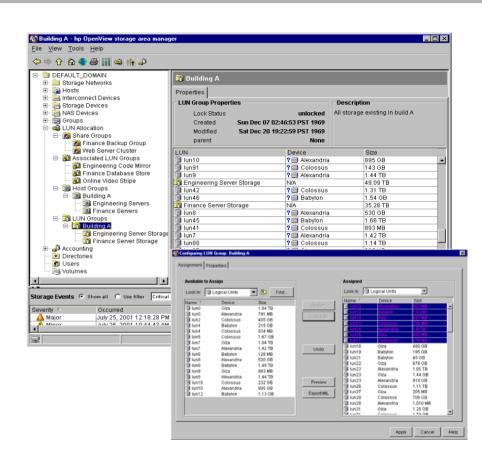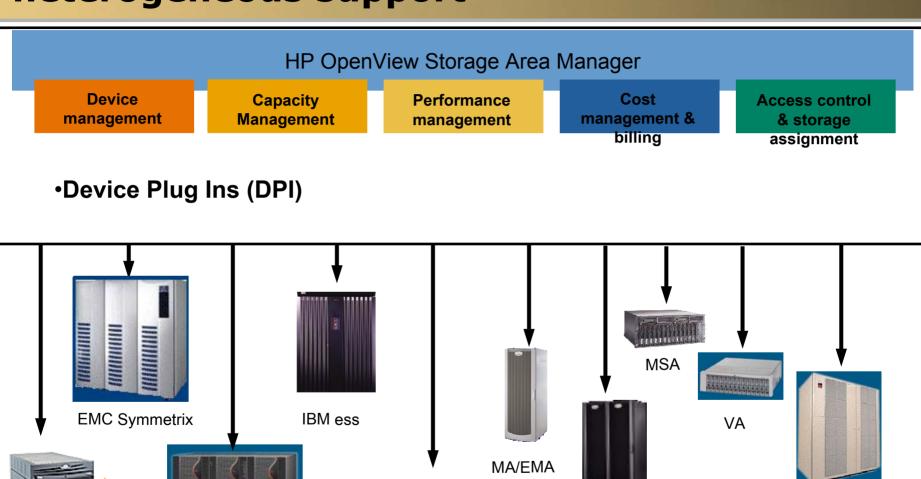|	SAM Suite	Storage Node Manager	Storage Builder	Storage Optimizer	Storage Accountant	Storage Allocater
Media Product						
Media Product	T2524AA					

Storage Capacity Tiers

	SAM Suite	Storage Node Manager	Storage Builder	Storage Optimizer	Storage Accountant	Storage Allocater
1 TB	T2525AA	T2526AA	T2528AA	T2527AA	T2529AA	T2530AA
5 TB	J5365AA	J5369AA	J5377AA	J5373AA	J5381AA	J5385AA
10 TB	J5366AA	J5370AA	J5378AA	J5374AA	J5382AA	J5386AA
50 TB	J5367AA	J5371AA	J5379AA	J5375AA	J5383AA	J5387AA

Install & Start-up Services	HA114A1-5G3
Consulting Services	HA114A1-GD7
Integration Services	HA114A1-5D8
Support Services	Options: OS6, 3Y2, 3Y3, 3Y6, H00, H24, L00, SL3, Q00

HP OpenView Storage Area Manager

Device management	Capacity Management	Performance management	Cost management & billing	Access control & storage assignment

- **Device Plug Ins (DPI)**

EMC Symmetrix

IBM ess

MSA

VA

EMC Clariion

Hitachi Freedom Storage

SUN T3

MA/EMA

EVA

XP

HP StorageWorks

Storage Area Manager Competitive Vendor Products
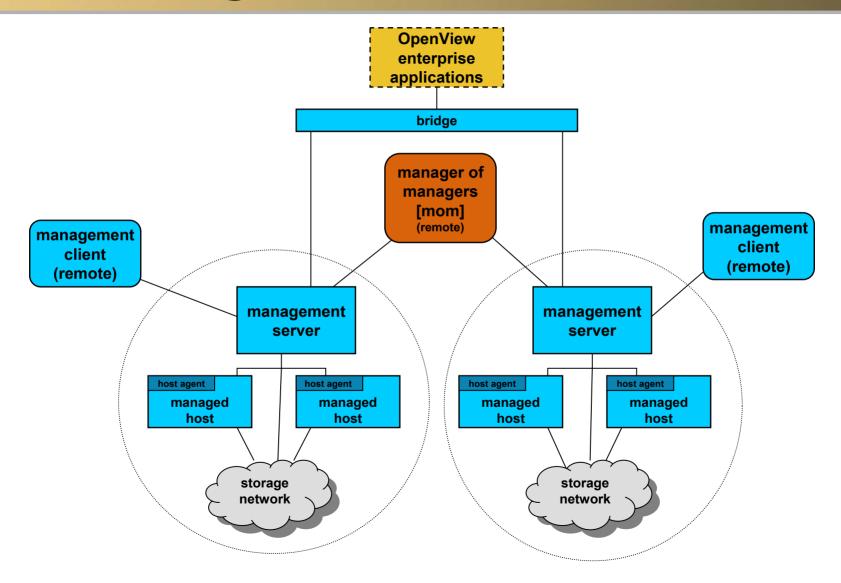
Key competitive features	SAM	EMC	Veritas	Tivoli	Creekpath	Fujitsu
Topology Map	Node Manager	SAN Manager	SANPoint Control	Network Mgr & Netview	AIM Suite	SANView
Event Management	Node Manager	SAN Manager	SANPoint Control	Network Mgr & Netview	AIM Suite	SANView
Chargeback	Accountant	Storage Scope	None	SRM for Chargeback	None	Storage Manager
LUN Mask	Allocater	Automated Resource Mgr	SANPoint & Volume Mgr	Total Expert ESS	AIM Suite	None
Resource Management	Builder	Storage Scope	Storage Reporter	SRM	AIM Suite	Storage Manager
Performance Monitoring	Optimizer	Workload Analyzer	SANPoint Control	None	AIM Suite	SANView
Storage Provisioning	Provisioner	Automated Resource Mgr	None	None	AIM Suite	Provisioner

Storage Area Manager Architecture

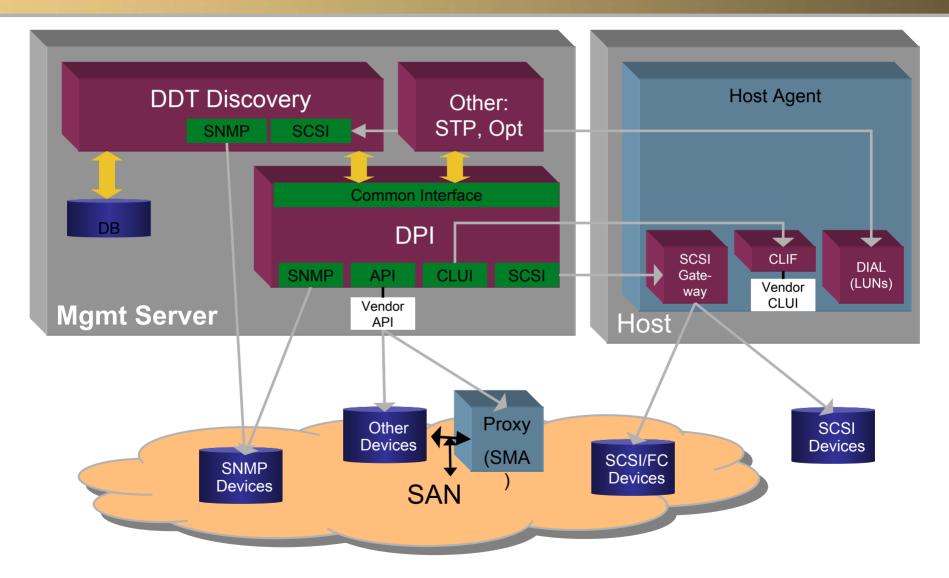# Illustration of an Storage Area Manager installation

Discovery & Device Plug-in Architecture

ovsam architecture & technologies

agents & topology

- model which is shared across all products in the suite

scsi gateway

- provides ability to remotely manage devices
- as light as possible

event export dial
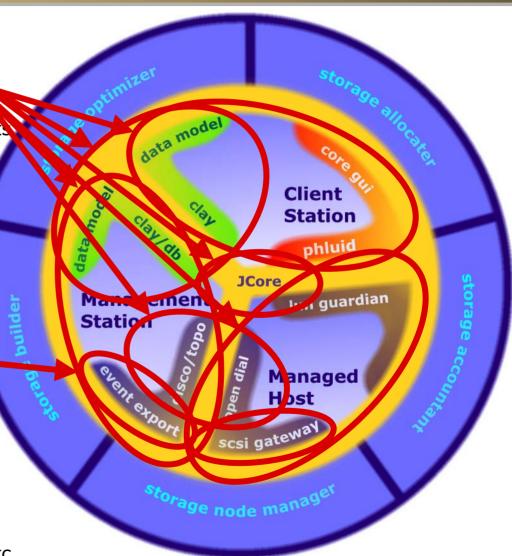
- provides ability to export events generated within and detected by ovsam to other event management systems
- provides local device discovery from the view-point of each managed host
- feeds information not only about the device but also about the path to the device, such as HBA, local device files, etc.

architecture outline

- suite of storage management products
  - predominantly written in Java, as a distributed application
  - ~1.8M lines of code

- built on a *common framework*
  - extensible & component-based
  - distributed across network: gui clients & mom ↔ server ↔ host agents

- provides a common card-cage which houses
  - general service (*horizontal)* components
  - storage management (*vertical)* components

architecture outline

- shared *horizontal* service components include:
  - persistent data model & repository
  - event log, user notification, audit log, licensing, security, logging & tracing
  - common gui and clui client & toolkits
  - common host agent & agent deployment
  - *... many more …*

- shared *vertical* components include:
  - device discovery & topology (with device plug-in interface mechanism)
  - network topology visualization – maps
  - *... many more …*

component technology - *JCore*

- 100% java
- component-based software framework
- uses RMI as means of distributed method calls
- remote event delivery
  - across JVMs and across network
- remote & local interface brokering
- matching service discovery & lookup
- supports several methods of client authentication

component technology - *JCore*

- tracing & logging facilities

- remote, remsh-like, command-line interface client

- toolkit of miscellaneous general-purpose mechanisms:
  - thread pool, remote i/o streams, property db, etc.

- offers automatic component update mechanism

persistence technology - *clay*

- 100% java using jdbc
- object-oriented persistency api
  - insulates application developers from jdbc complexities

- uses java reflection at build-time & at run-time to:
  - generate sql schema from java model classes
  - produce boilerplate java model code (~16,000 -> ~41,000 sloc)
  - generate meta-data for faster access at run-time
  - generate, prepare and cache sql statements
  - 3 patents awarded in this area

persistence technology - *clay*

- allows user-defined transactions
- generates model change events (via *JCore*)
- supports multiple connection contexts
- uses connection context-specific object caches
- performs selective field update
- offers full command-line access to model api (via JCore clif)

gui technology - *phluid*

- 100% java using java swing components

- provides an extensible gui navigation infrastructure
  - integration framework for the client-side gui components
  - uses and extends JCore component-based mechanism
  - based on explorer-style gui
  - patent awarded in this area

- promotes and aids achieving common *"look and feel"* to the products
  - serves as the platform for the new cssi common user interface

- all content provided by the product phluid client components
  - these are specialized JCore client components

gui technology - *phluid*

- the common *phluid* client gui app provides:
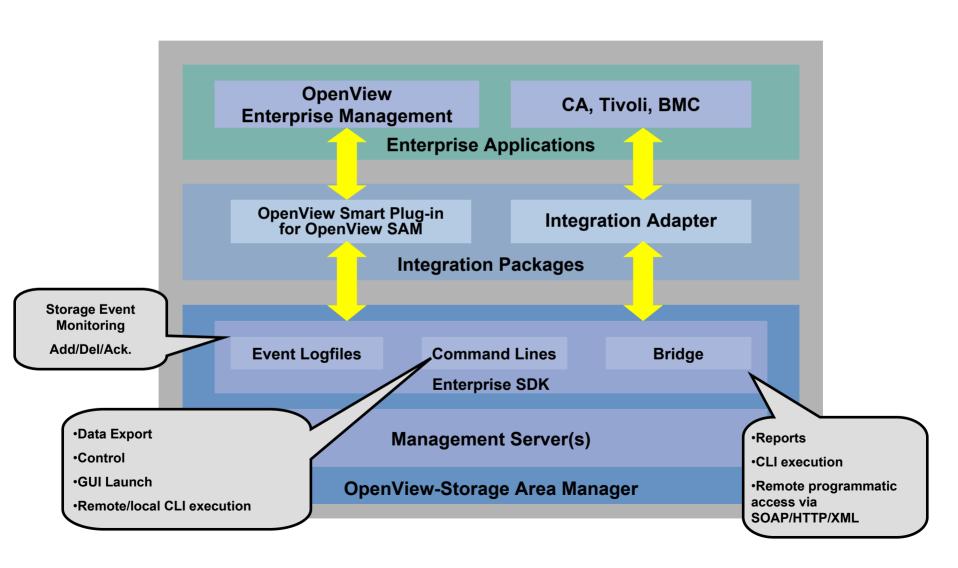 - main application window frame
  - explorer-style navigation with browser-style history, back, forward, up, etc.
  - hyperlink-style selection of items from any view
  - ability to tear-off views into a new window
  - extensible popup & pulldown menus, toolbars, tabbed views
  - shared progress/status bar
  - server connection status indicator

HP OpenView Integration Points

Enterprise Framework Integration SDK

OpenView Enterprise Management

CA, Tivoli, BMC

Enterprise Applications

OpenView Smart Plug-in for OpenView SAM

Integration Adapter

Integration Packages

Storage Event Monitoring

Add/Del/Ack.

Event Logfiles

Command Lines

Bridge

Enterprise SDK

- Data Export
- Control
- GUI Launch
- Remote/local CLI execution

Management Server(s)

OpenView-Storage Area Manager

- Reports
- CLI execution
- Remote programmatic access via SOAP/HTTP/XML

OpenView Integration Architecture
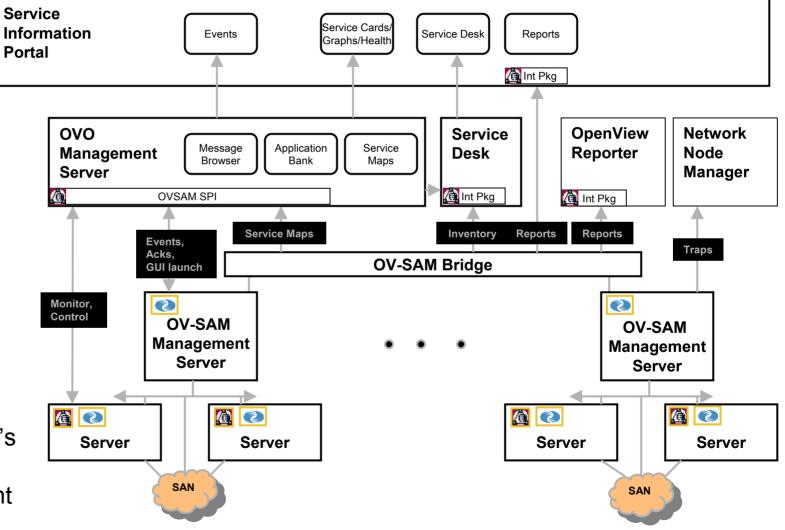
3-Enterprise Mgmt Framework

Service Information Portal

Events	Service Cards/ Graphs/Health	Service Desk	Reports

Int Pkg

4-Integration installed

OVO Management Server

Message Browser	Application Bank	Service Maps

OVSAM SPI

Service Desk

Int Pkg

OpenView Reporter

Int Pkg

Network Node Manager

6-Integration complete

Service Maps

Inventory   Reports

Reports

Events, Acks, GUI launch

OV-SAM Bridge

Traps

5-OV Agents Installed

Monitor, Control

OV-SAM Management Server

OV-SAM Management Server

2-OV-SAM deployment

● ● ●

1-Customer's IT Environment
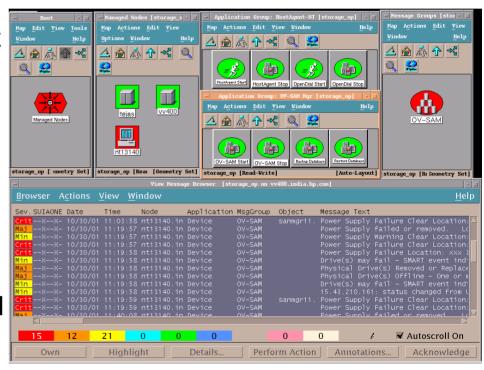
Server

Server

Server

Server

SAN

SAN

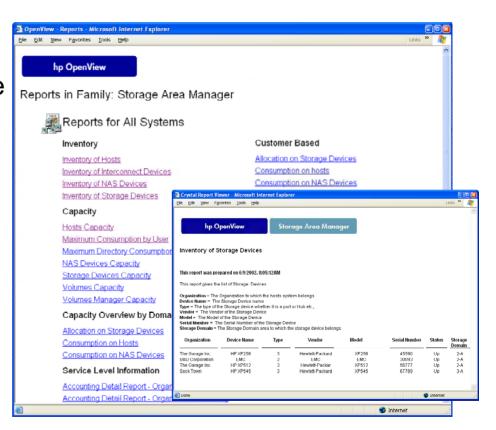# HP OpenView Operations

Features

- Centralized, automated health monitoring and fault management
- Event filtering, forwarding, correlation
- OpenView SAM process and service monitoring
- Start & stop SAM process, backup & restore OpenView SAM db
- Context-sensitive OpenView SAM GUI launching
- Event acknowledgement
- Integration of IT and storage network event management
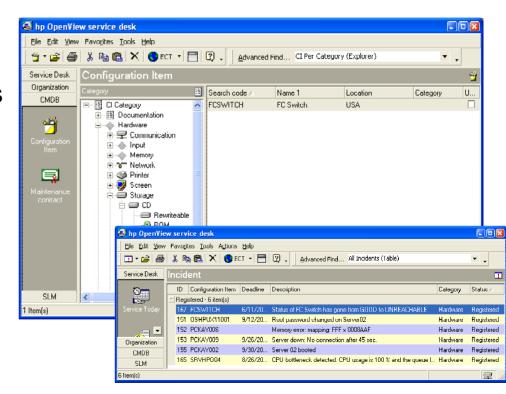
HP OpenView Reporter

Features

- Central reporting on inventory, capacity, performance and service levels

- 34 templates for reports

- Automated report scheduling
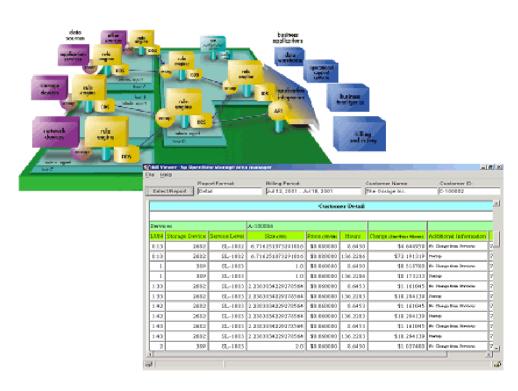
HP OpenView Service Desk

Features

- Solution that enables enterprise service organizations to implement world-class support processes and align IT processes with business needs

- Integrated Call mgmt, incident mgmt, problem mgmt configuration mgmt, change mgmt, service level mgmt.

- Integrated with OVO and other OV products.

- Integration of OpenView SAM events into OpenView Service Desk via OpenView Operations

HP OpenView Internet Usage Manager

Features

- Collects, aggregates, and correlates usage data from across your network (traffic flows), systems (CPU utilization), and storage

- Implements usage-based billing systems, manage capacity, and analyze subscribers' behavior

- Takes input from Storage Accountant and Storage Builder

  - LUN allocation

  - File System (volume) utilization of the discovered hosts.

  - Directory consumption

  - User consumption

  - LUN utilization (on LUNs used by host volume managers, such as LVM and VxVM)

SAM Demo & Questions