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Agenda

- **Extraordinary Building Blocks**
- **The Making of a Solution**

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Storwize V7000

- Control enclosure: **dual controllers and up to twelve 3.5” or twenty-four 2.5” drives in just 2U**
- **Eight 8Gb FC ports plus four 1Gb iSCSI ports per controller pair initially** (10Gb iSCSI and FCoE post-GA)
- Expansion enclosure: **drives only**
- **Up to nine expansion enclosures attach to one control enclosure**

Built-in Software inherited from SVC and DS8000 RAID

- **RAID 0, 1, 5, 6, 10**
- **Storage Virtualization**
  (internal disks and external arrays)
- **Non-disruptive Data Migration**

Efficiency

- **Thin Provisioning**
- **Easy Tier**
  (dynamic data movement across SSD/HDD)

Manageability

- **New User interface** (easy-to-use, web based)
- **Integrated SAN-wide Management**
  (Tivoli Storage Productivity Center)
- **Integrated IBM server and storage mgmt** (Systems Director Storage Control)

Replication

- **Application integrated**
  (Oracle, DB2, SAP, Domino, Exchange, SQL Server)
- **Efficient use of space**
  (thin provisioned, incremental, deduplicated)
- **DR automation** (failover/fail back, site switching)
- **IP or Fibre Channel**

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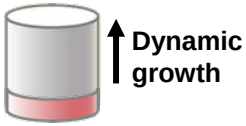
Efficiency Features

Thin provisioning

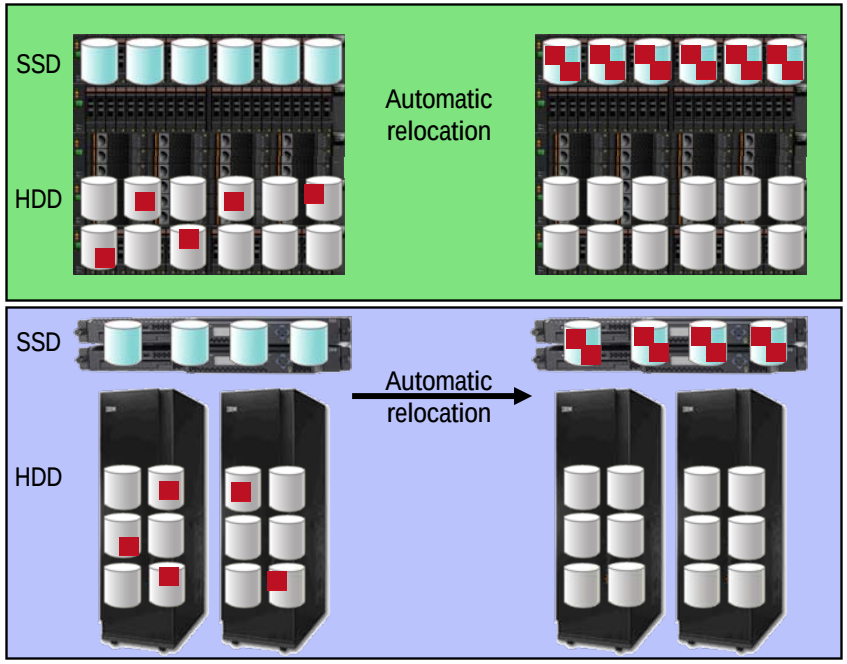
- ✓More productive use of available storage
- ✓Across all supported host platforms

Without thin provisioning, pre-allocated space is reserved whether the application uses it or not.



With thin provisioning, applications can grow dynamically, but only consume space they are actually using.

Easy Tier



- ✓"Easy Tier" pools identify the busiest data extents and automatically relocate them to highest performing Solid-state Disks
- ✓Remaining data extents can take advantage of higher capacity, price optimized disks

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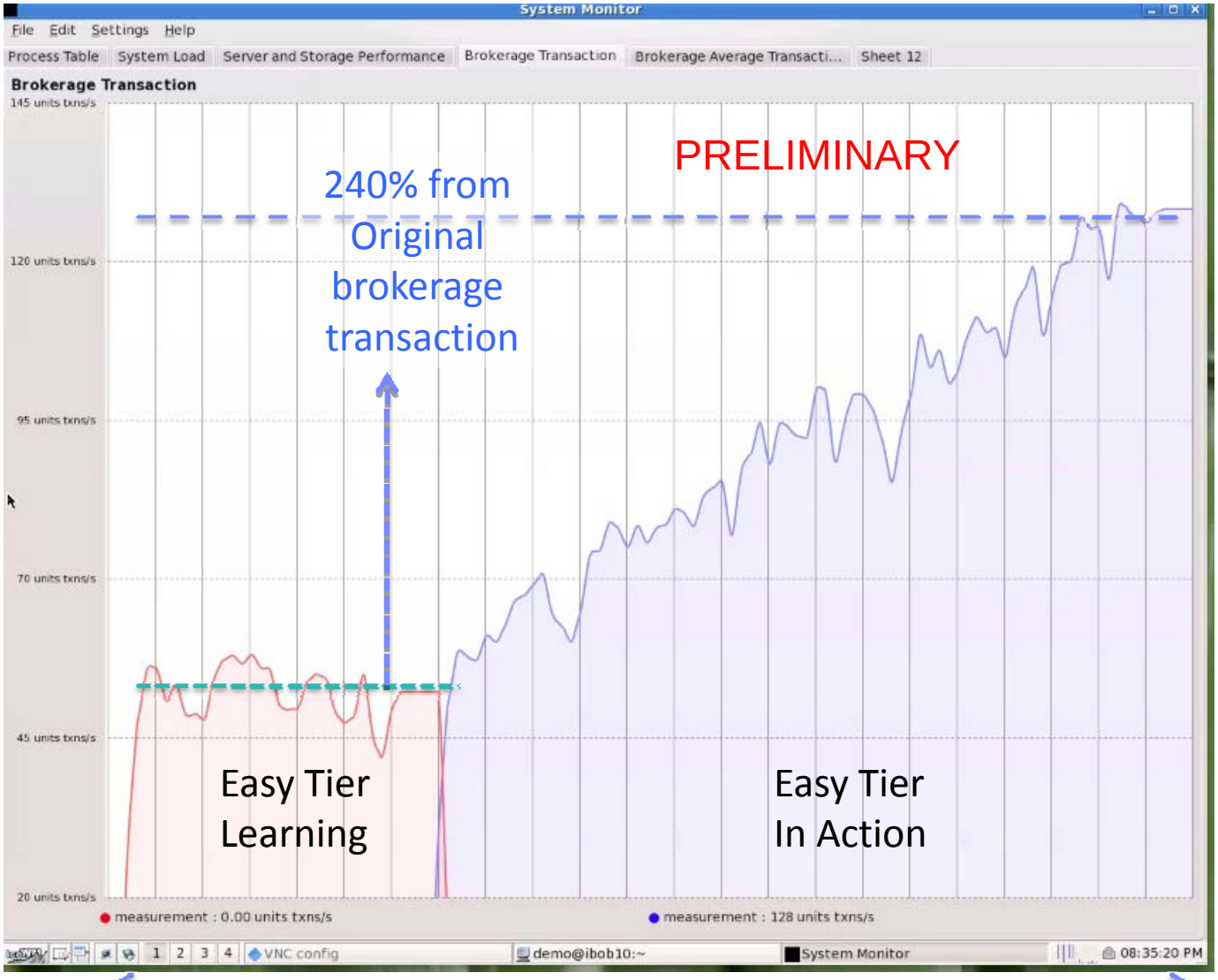
Easy Tier Application Transaction Improvement



Application Transaction Throughput

12 hours (Elapsed Time)

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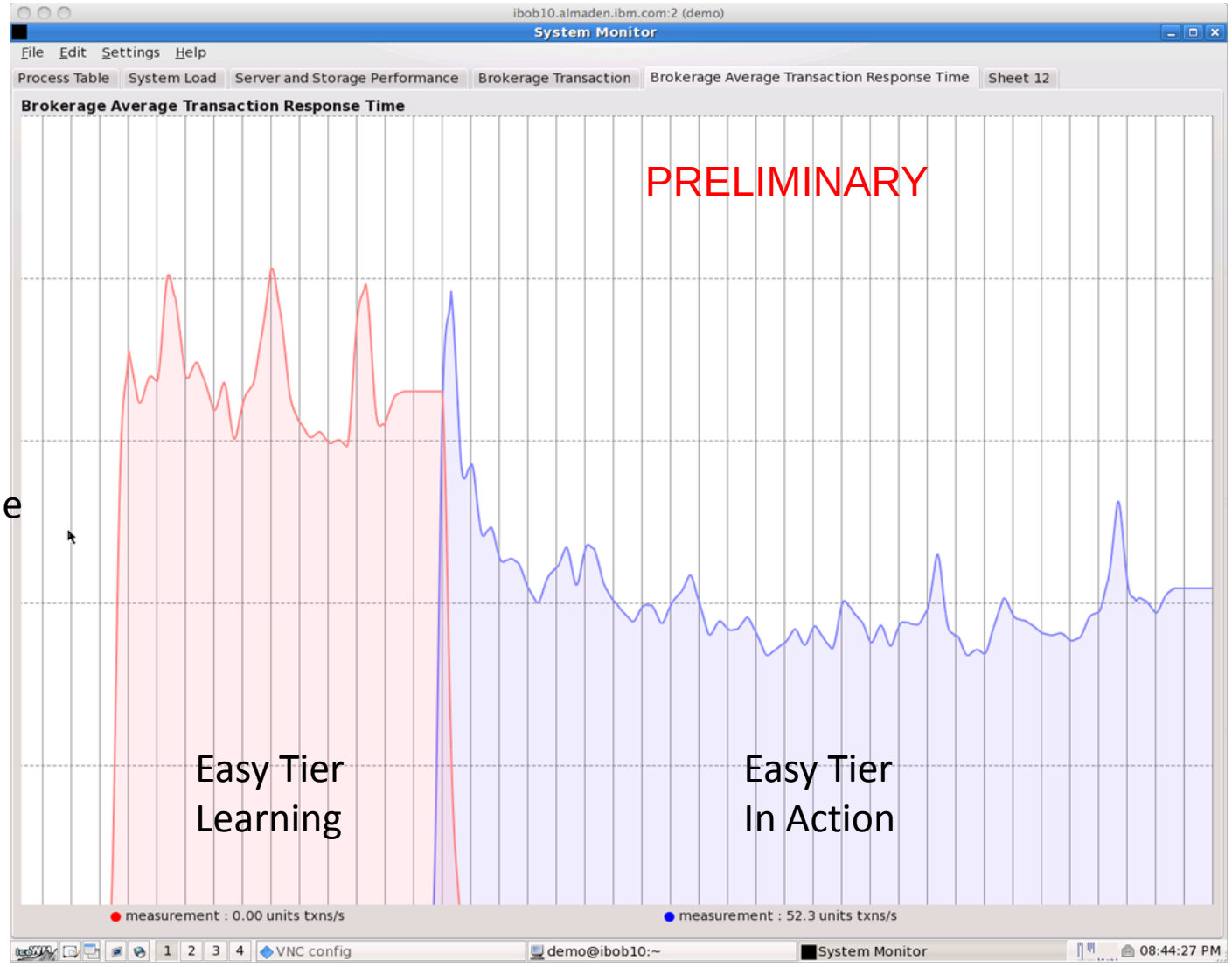
Easy Tier Application Transaction Improvement



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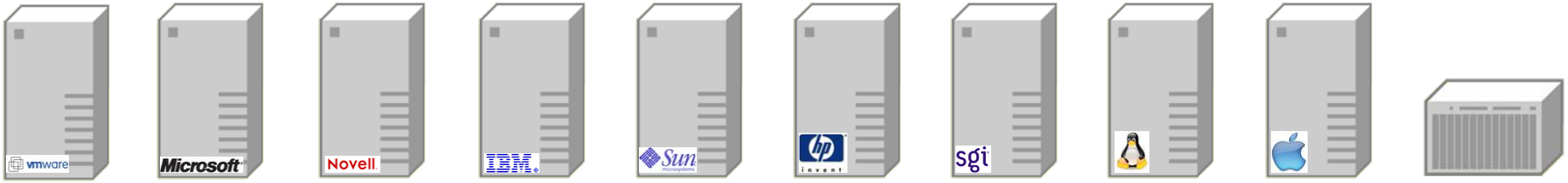
Host System Attach

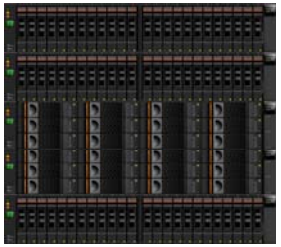
VMware	Microsoft	Novell	IBM	Sun	HP	SGI	Linux	Apple	IBM
SRM	Windows MSCS MPIO, VSS, GDS	NetWare Clustering	AIX i6 VIOS HACMP /XD GPFS / VIO	Solaris VCS/SUN clustering	HP-UX Tru64 OpenVMS ServiceGuard with SDD	IRIX	(Intel/Power/zLinux) RHEL/SUSE RHEL 5 ia32, x64 RHEL 3 Power SLES 9 ia64	Mac OS X	BladeCenter Win/Linux/VMWare/AIX OPM/FCS/IBS



Up to 1024 Hosts

Network

Storwize V7000



Clustered XIV
(SVC + XIV)

For the most current, and more detailed, information please visit **ibm.com**/storage/svc and click on “Interoperability”.

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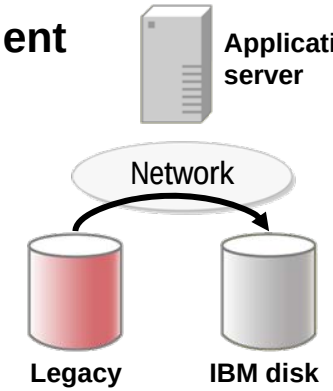
External Virtualization Features

Transparent data movement



✓Efficiently manage technology upgrades and lease terminations by transparently moving application data from legacy disk arrays to new IBM Virtualized Disk Solutions

Legacy disk attach

Hitachi	EMC	NetApp	IBM	Sun	HP	NEC	Bull	Fujitsu	Pillar
USP Lightning, Thunder TagmaStore	CLARiiON, Symmetrix, VMAX	FAS	ESS, FAStT DS3/4/5/6/8 XIV	StorageTek	MA, EMA MSA, EVA XP	iStorage	StoreWay	Eternus	Axiom

For the most current, and more detailed, information please visit **ibm.com**/storage/svc and click on “Interoperability”.

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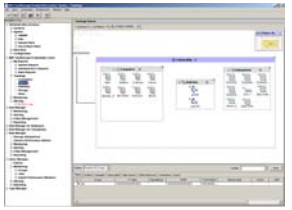
Manageability Features
Overview

- **User Interface**
  - Adopted from the easy-to-use XIV GUI
  - For clients where the Storwize V7000 “is” the infrastructure
- **Enterprise Management**
  - Integrated management with a SAN-wide perspective
  - For clients where the Storwize V7000 is connected to a SAN with other, perhaps heterogeneous storage
- **Server / Storage Management**
  - Integrated management with a Systems and Storage perspective
  - For clients with IBM servers and storage

Easy-to-use management GUI



Tivoli Storage Productivity Center
Integrated SAN-wide management

Systems Director Storage Control
Integrated IBM server and storage mgmt

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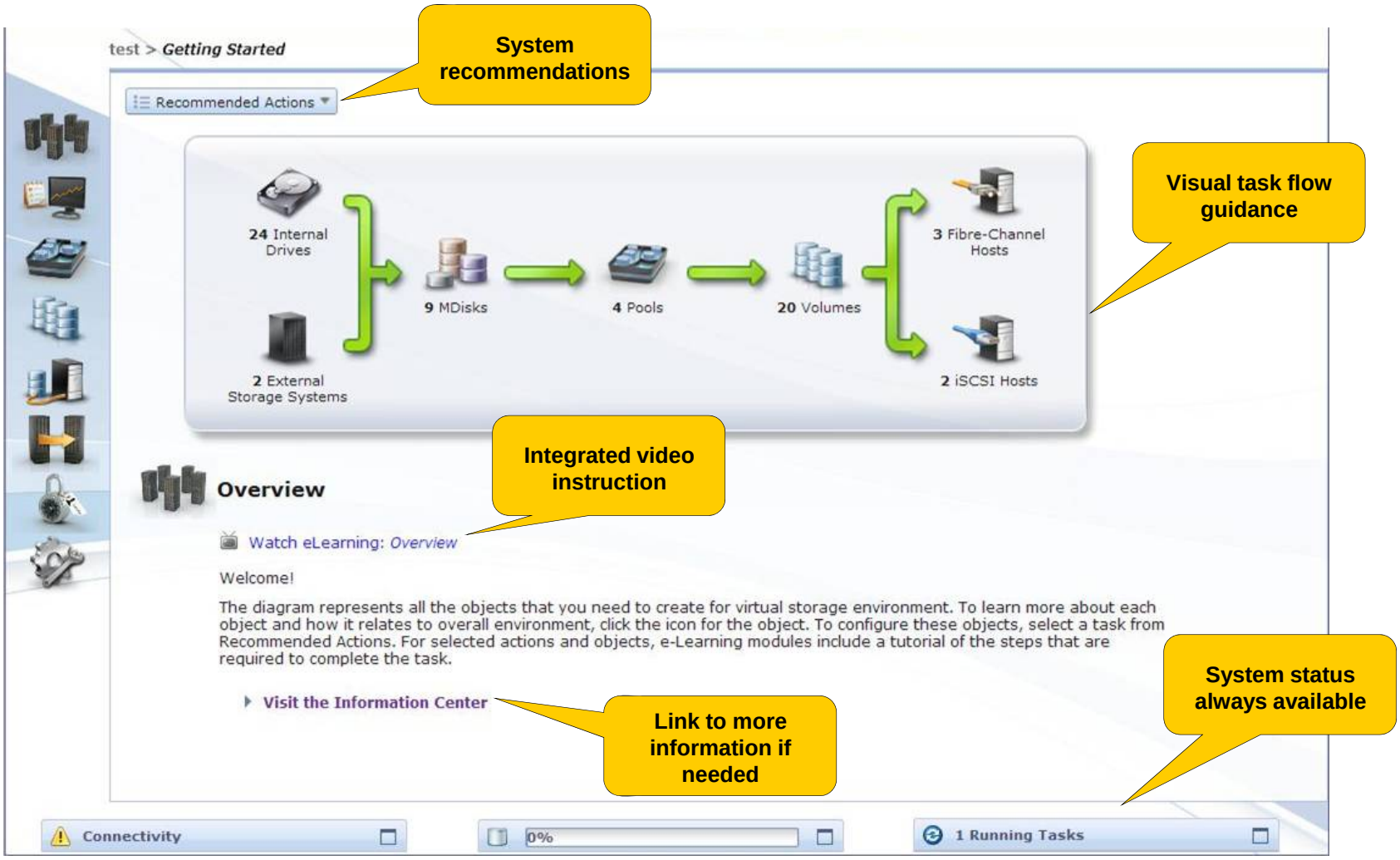
Fresh New User Interface

Based on the well-received XIV interface



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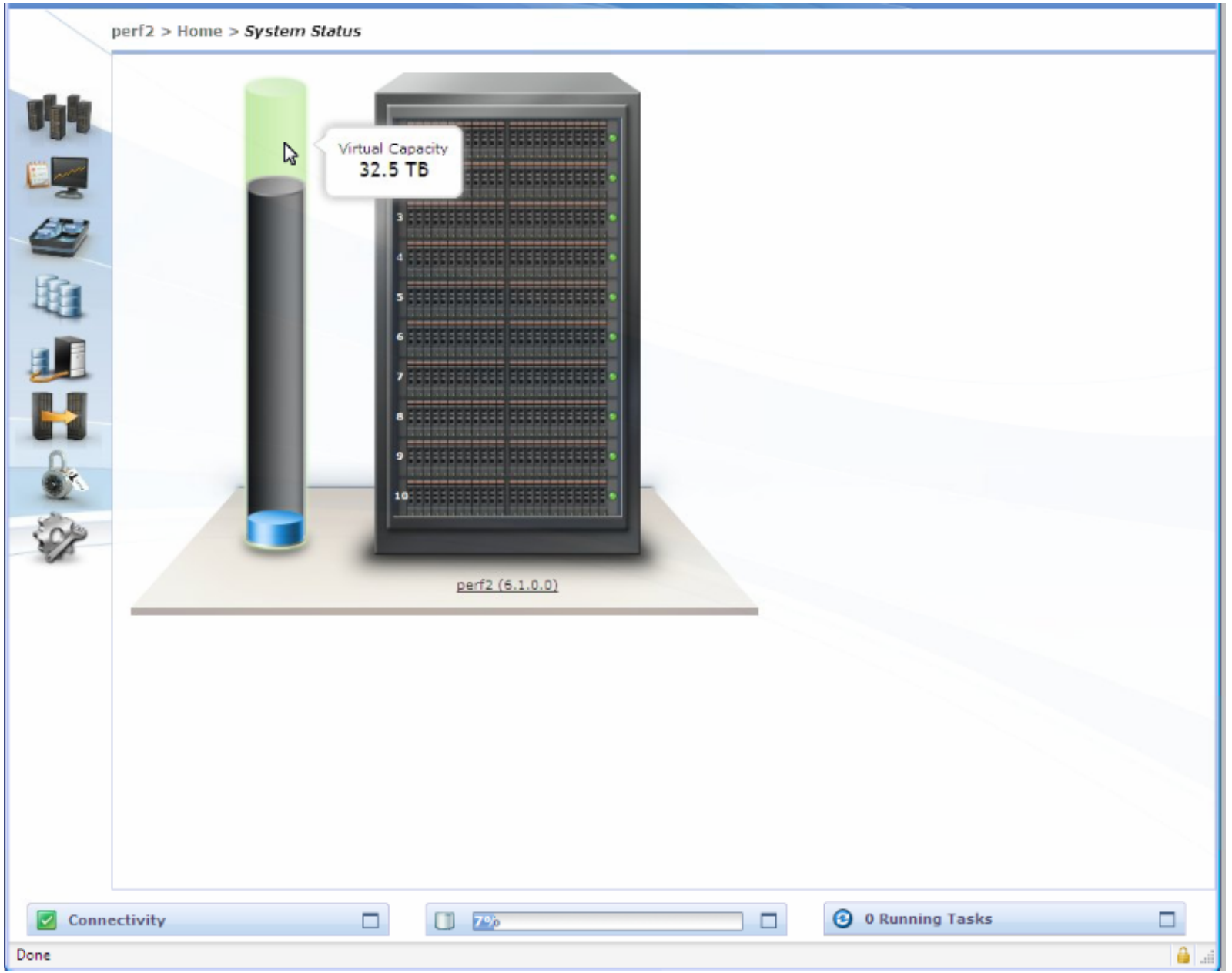

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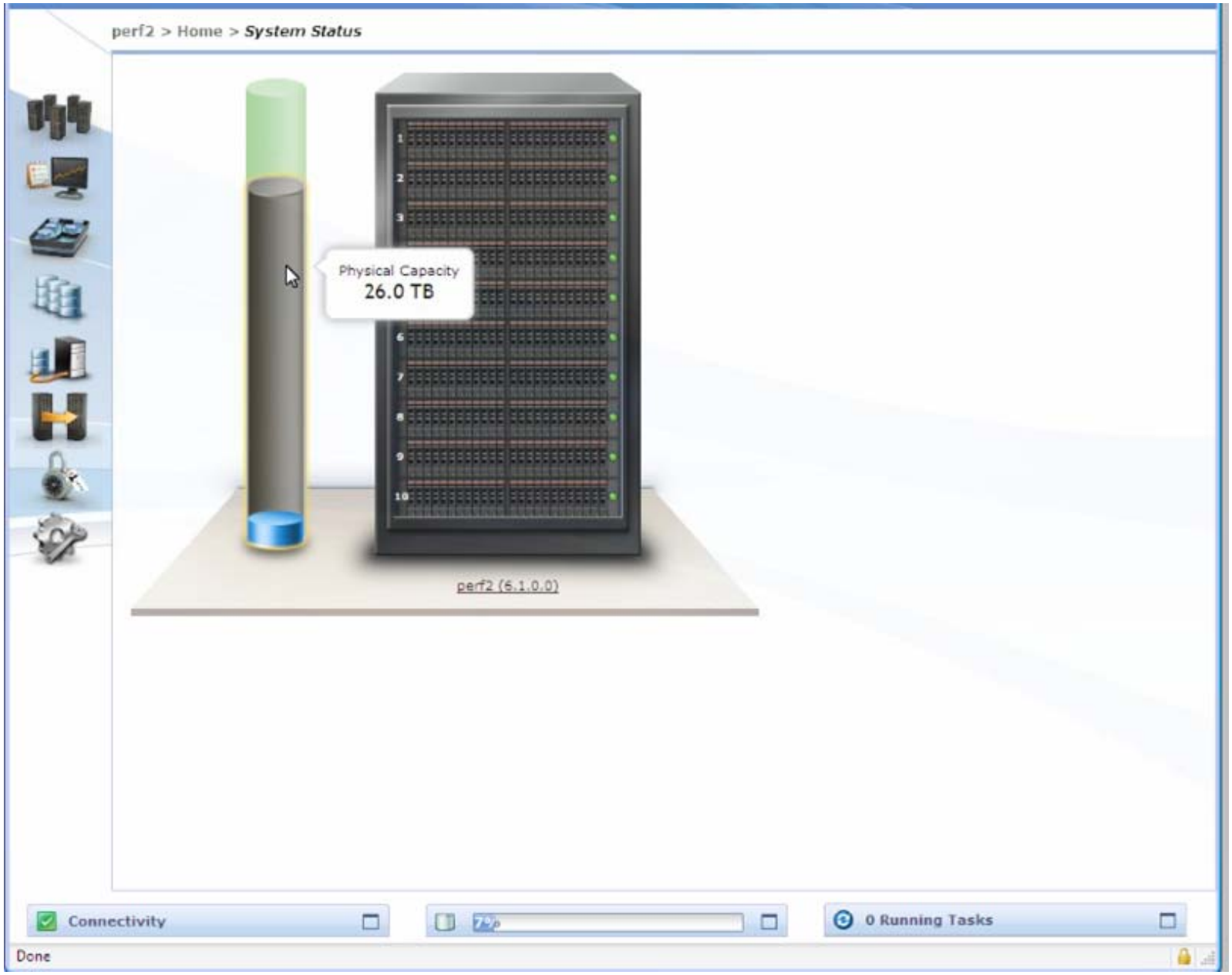

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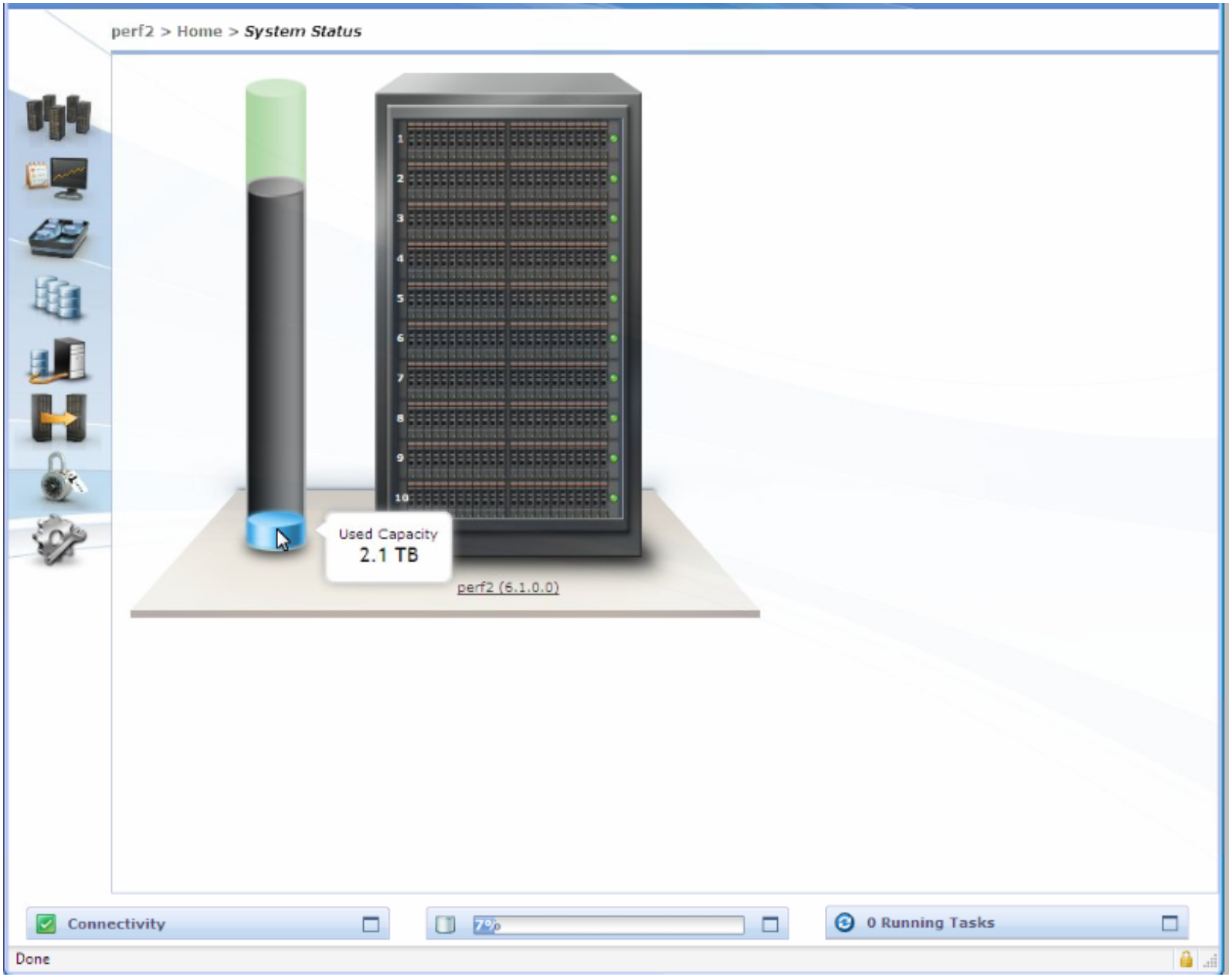

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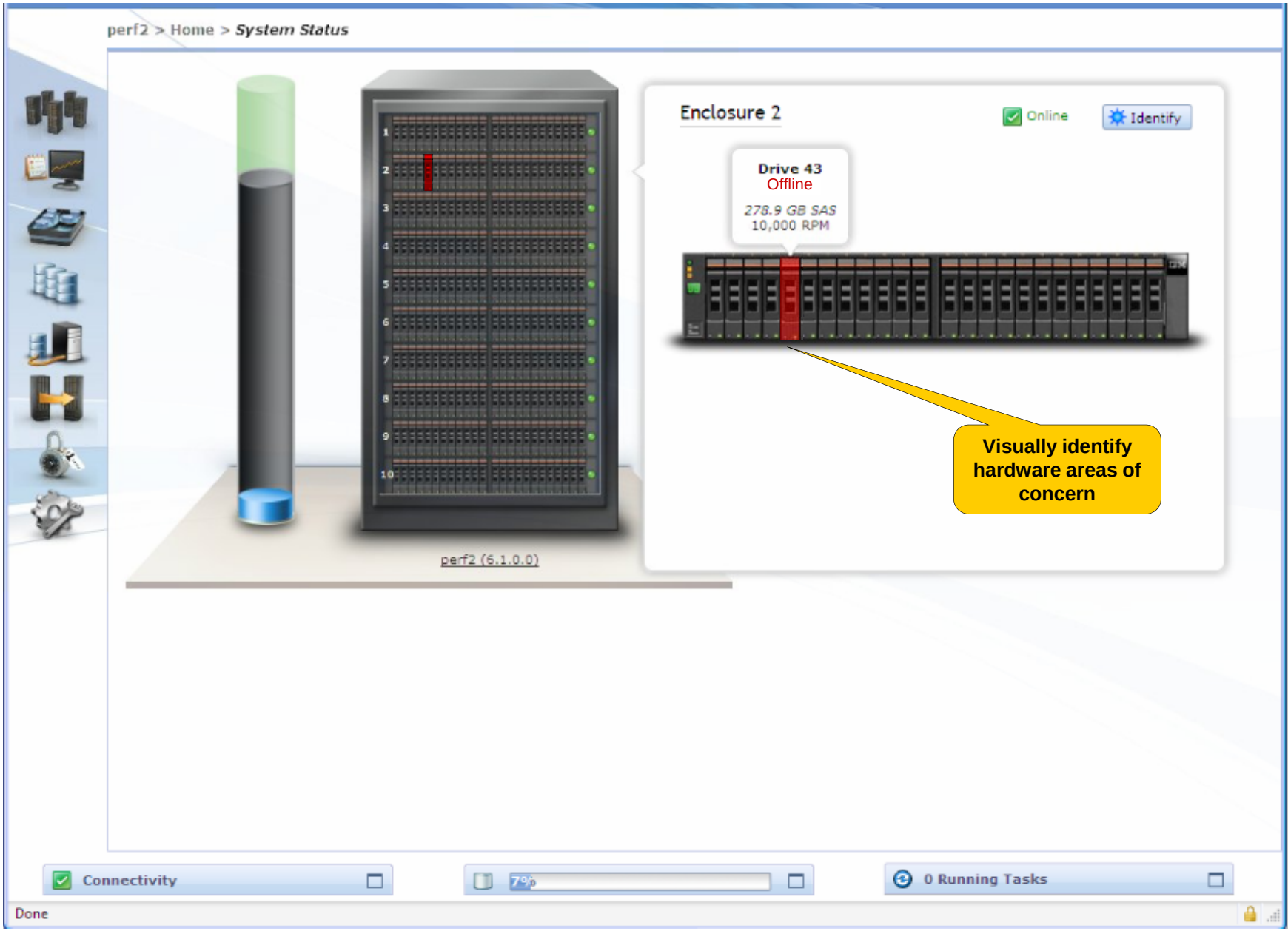

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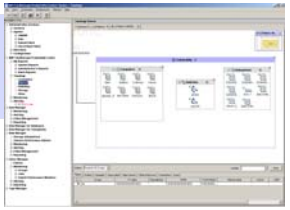
Easy-to-use management GUI



Tivoli Storage Productivity Center
Integrated SAN-wide management

Systems Director Storage Control
Integrated IBM server and storage mgmt

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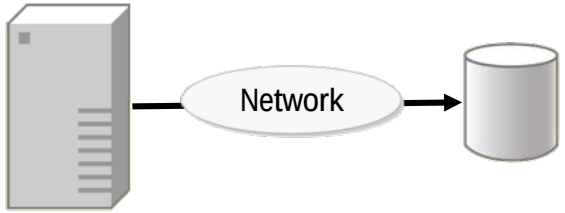
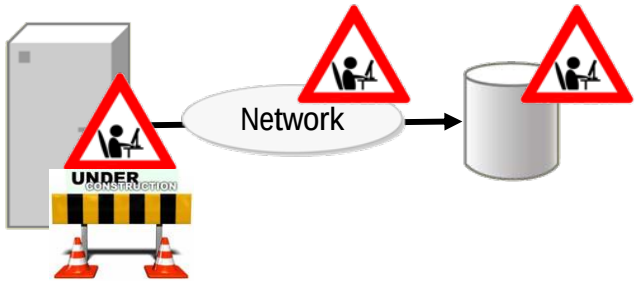
Enterprise Management Features

Visualize the SAN



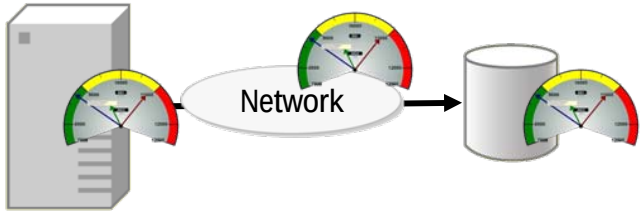
- ✓From virtual machines to the physical server they reside on, through the SAN, to the disk systems …
- ✓Physical topology and logical data path
- ✓Health/Status Monitoring
- ✓Event Management
- ✓Device Capacity Mgmt
- ✓Policy-based Alerting

Provision storage



- ✓For new or expanding applications, apply application-centric provisioning policies
- ✓Provision host multi-pathing, SAN zones, and array capacity in a single action

Analyze performance



- ✓Isolate application I/O performance problems across the entire data path
- ✓Report on performance history

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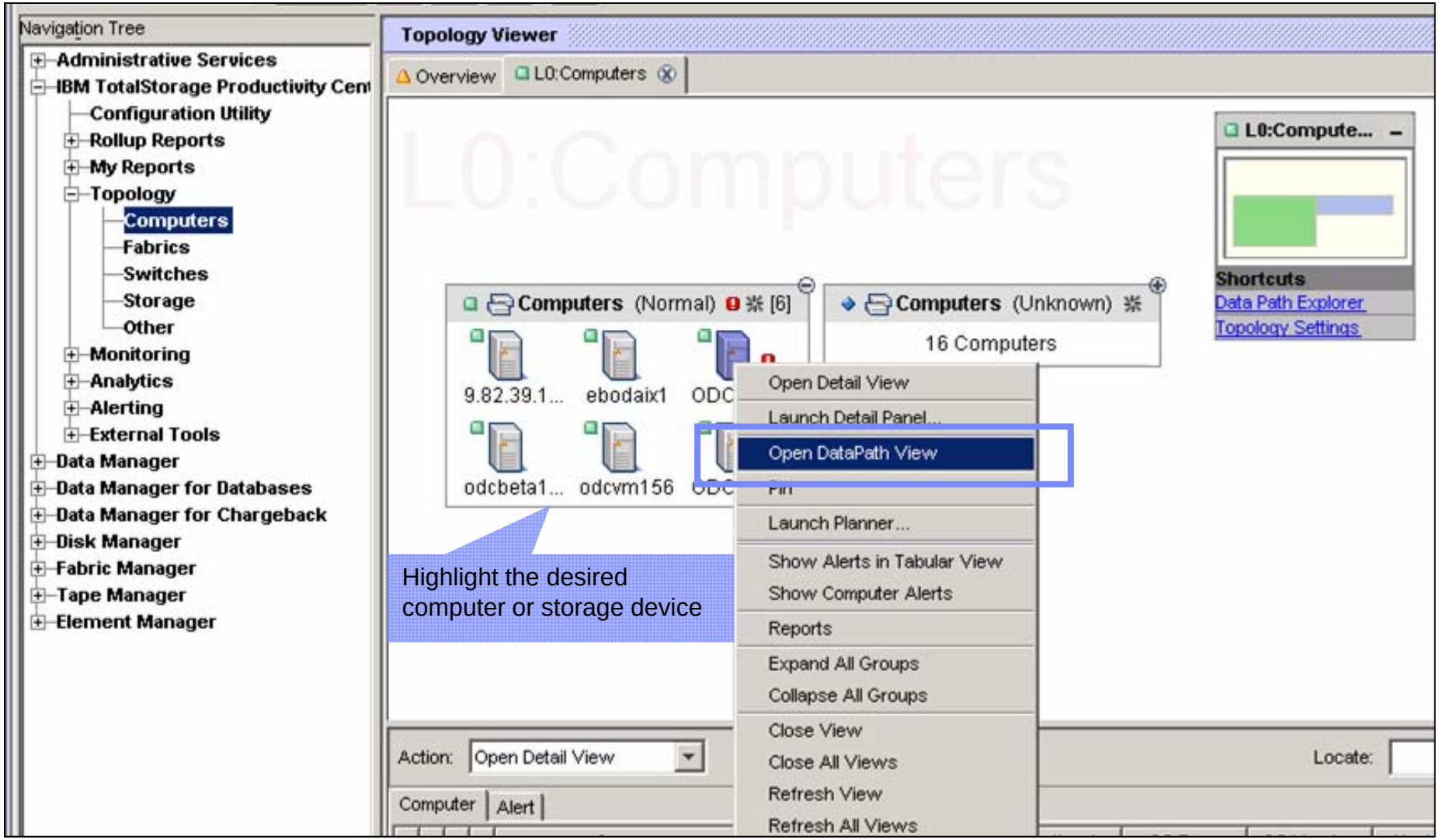
Analyzing Storage Performance



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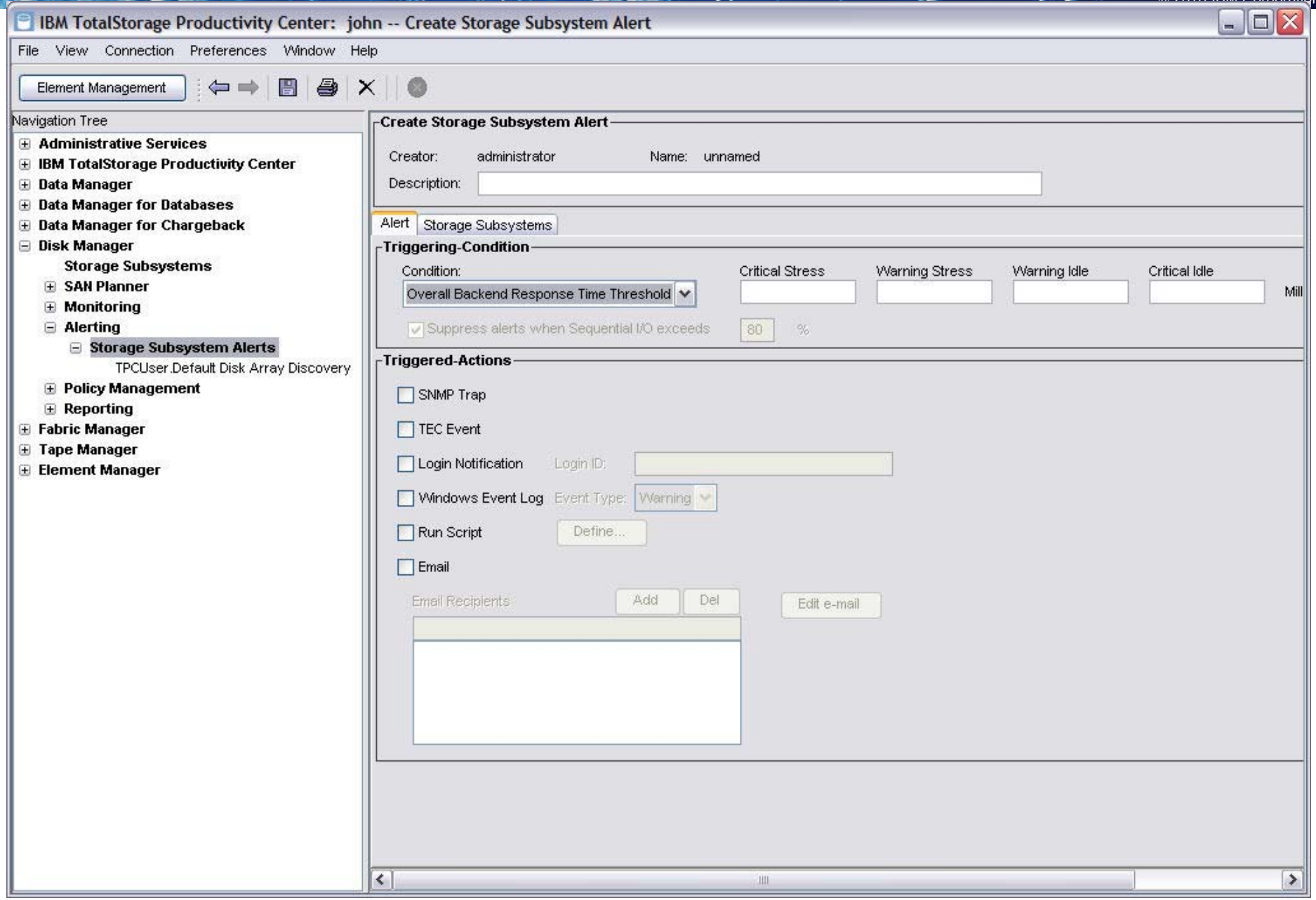

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Manageability Features
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Easy-to-use management GUI

Tivoli Storage Productivity Center
Integrated SAN-wide management

Systems Director Storage Control
Integrated IBM server and storage mgmt

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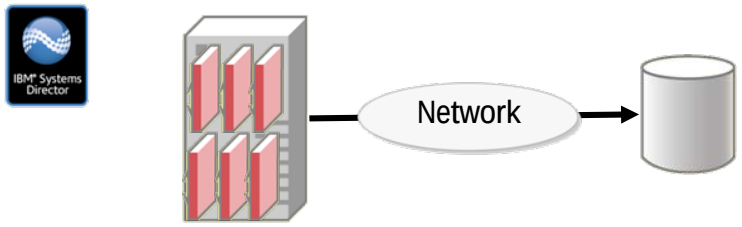
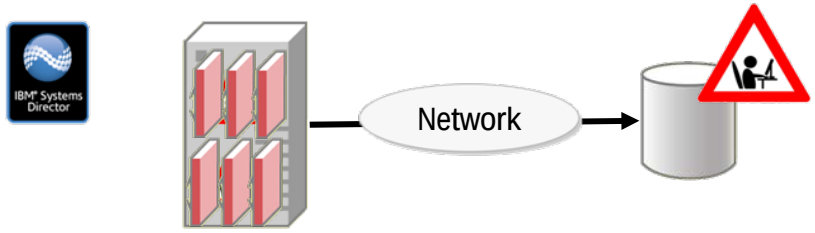
Server / Storage Management Features

Visualize and manage the complete infrastructure



- ✓From virtual machines to the physical server they reside on, through the SAN, to the disk systems …
- ✓Physical and virtual resource relationships and utilization
- ✓Health/Status Monitoring
- ✓Event Management
- ✓Triggered action plans

Provision Virtual Server Images and storage



- ✓For virtual server environments, dynamically provision virtual server images and array capacity in a single action

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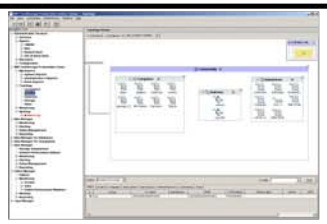
Manageability Features
Summary

	User Interface	Enterprise Management Tivoli Storage Productivity Center	Server / Storage Management Systems Director Storage Control
			
Perspective			
Device	✓	✓	✓
Device + surrounding SAN		✓	✓
Servers + Storage			✓
Capabilities			
Health	✓	✓	✓
Capacity	✓	✓	✓
File System Utilization Analytics		✓	
Provisioning	✓	✓	✓
Performance Analytics		✓	
Replication Management	✓	✓	
Recovery Automation		✓	

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Replication Features
Overview

- **IP Replication**
  - Application-integrated capabilities for clients needing instant recovery with cost-optimized disaster recovery options
- **Fibre Channel Replication**
  - Application-integrated capabilities for clients needing instant recovery with full-featured enterprise replication solutions

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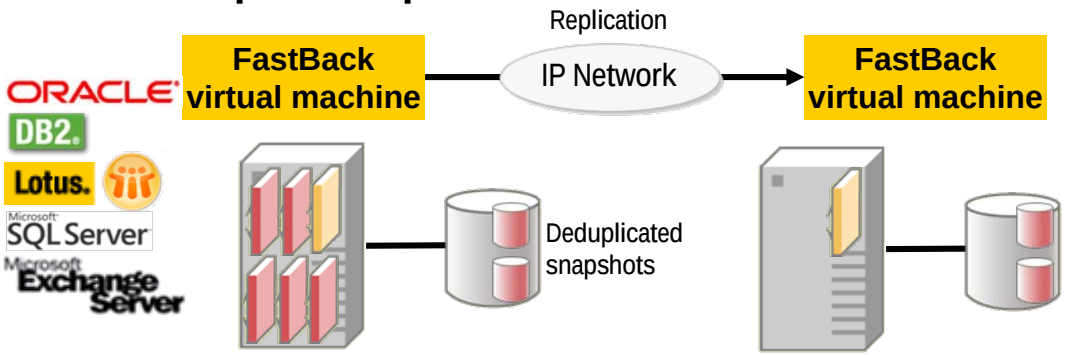
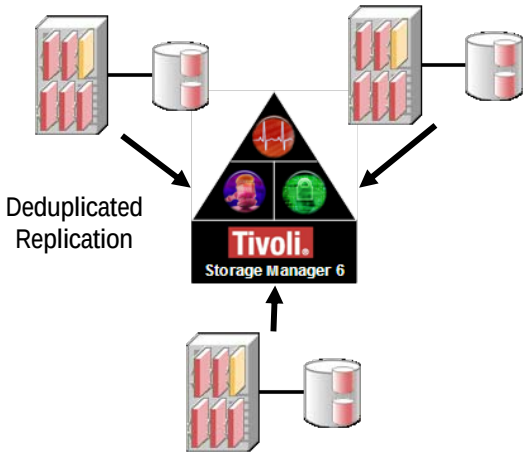
IP Replication Features

Snapshot replication



- ✓Create instant copies of applications or file systems for backup
- ✓Make better use of space with incremental (only changed blocks) and deduplicated snapshots
- ✓Replicate snapshots off-site for disaster recovery

Enterprise snapshot replication



- ✓For enterprise and branch office configurations
- ✓Replicate distributed snapshots to a central Tivoli Storage Manager server for Unified Recovery Management and disaster recovery
- ✓Make better use of network resources by deduplicating data before transmission

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Replication Features
Overview

- **IP Replication**
  - Application-integrated capabilities for clients needing instant recovery with cost-optimized disaster recovery options
- **Fibre Channel Replication**
  - Application-integrated capabilities for clients needing instant recovery with full-featured enterprise replication solutions

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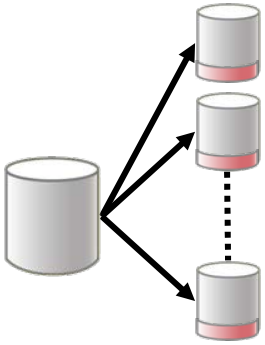
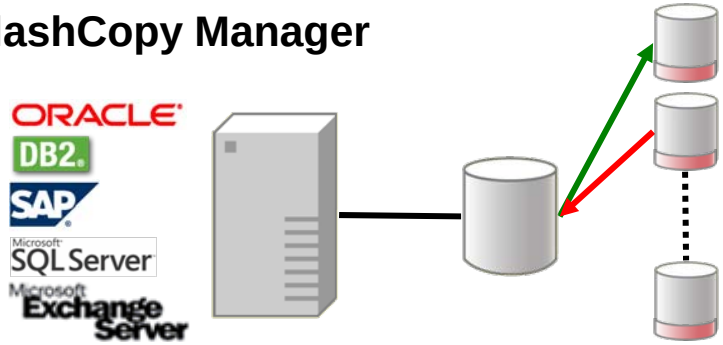
FlashCopy Features

FlashCopy



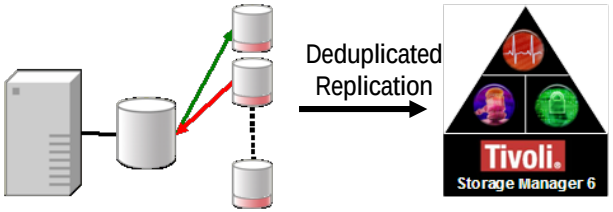
- ✓Create instant application copies for backup or application testing
- ✓Make better use of space with incremental (only changed blocks) or space-efficient (thin provisioned) snapshots

FlashCopy Manager



- ✓Integrated, instant copy for critical applications
- ✓Virtually eliminate backup windows
- ✓Rapidly create clones for application testing
- ✓View inventory of application copies and instantly restore

Enterprise FlashCopy Replication



- ✓Replicate FlashCopy's to a central Tivoli Storage Manager server for Unified Recovery Management and disaster recovery
- ✓Make better use of network resources by deduplicating data before transmission

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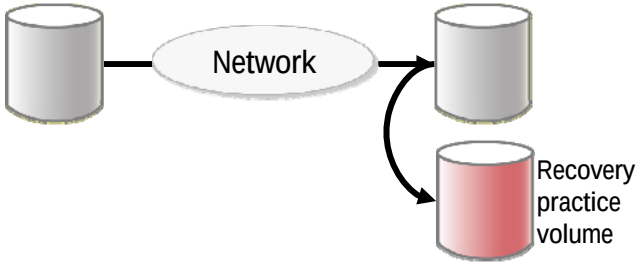
Fibre Channel Mirroring Features

Mirror data off-site

- ✓Synchronously over Metro distances
- ✓Asynchronously over Global distances
- ✓Application-level consistency groups

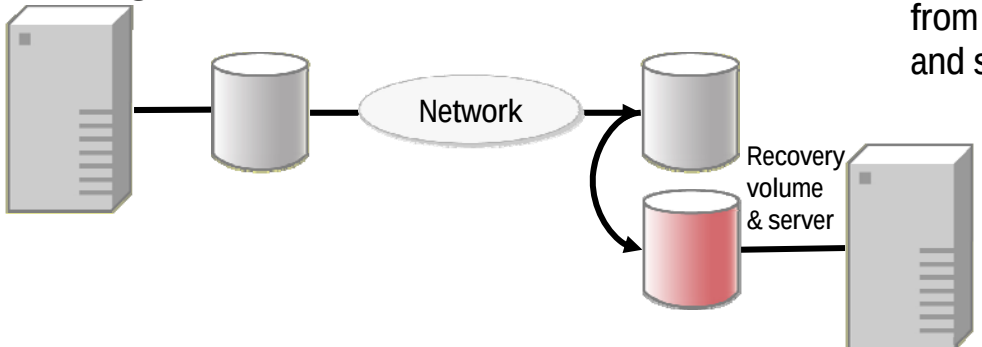
Practice and Automatically Respond to Disasters



- ✓For critical application consistency groups, freeze the Mirror and take a consistent FlashCopy
- ✓Practice application recovery procedures from the FlashCopy
- ✓Detect mirroring failure and automate failover to Recovery volume
- ✓Automate fail-back after repair

Site Switching Automation

ORACLE
DB2
SAP
WebSphere



- ✓Monitor and manage IT-wide site switching from a single console (Applications, servers, and storage)

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Replication Features
Summary

	IP Replication FastBack for Storwize V7000	**Fibre Channel Replication** FlashCopy and Mirroring
Optimal Client Environment	Entry and Lower Midrange	Upper Midrange
Application integrated		
Out-of-the-box Applications	ORACLE, DB2, Lotus., SQL Server, Exchange Server	ORACLE, DB2, SAP, SQL Server, Exchange Server
Operating Systems		AIX, solaris
Custom application support	✓	✓
Efficient Use of Space		
Incremental snapshot	✓	✓
Thin Provisioned snapshot	✓	✓
Deduplicated snapshot	✓	
Focus on Recovery		
Instant Restore	✓	✓
Off-site replication		
Synchronous mirroring		✓
Asynchronous mirroring		✓
Copy	✓	
Site Switching Automatioon		✓
Enterprise Recovery Management		
Replicate snapshots to Tivoli Storage Manager	✓	✓
Deduplicated network traffic to TSM repository	✓	✓