

# Smarter Storage


**Luis E. Leon Castro**

System Storage technical Sales  
IBM Sales & Distribution, STG Sales  
[leleon@pe.ibm.com](mailto:leleon@pe.ibm.com)





# The Social Layer in an Instrumented Interconnected World

*12+ TBs*  
of tweet data  
every day

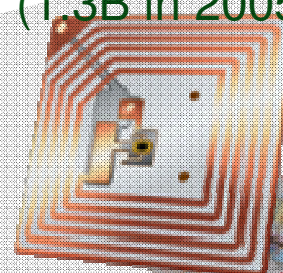


*? TBs of*  
data every  
day


*25+ TBs of*  
log data every  
day

*30 billion* RFID  
tags today  
(1.3B in 2005)



*4.6 billion*  
camera  
phones  
world  
wide



*100s of millions*  
of GPS  
enabled  
devices  
sold  
annually



*76 million* smart  
meters in 2009...  
200M by 2014

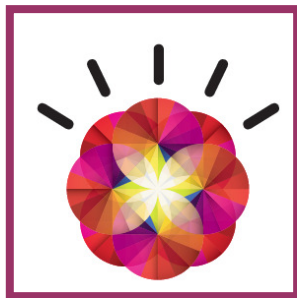


*2+ billion*  
people  
on the  
Web by  
end  
2011



http

# IBM Smarter Computing



## Cloud Ready

Improve efficiency and speed time to market by managing IT as a cloud

## Data Ready

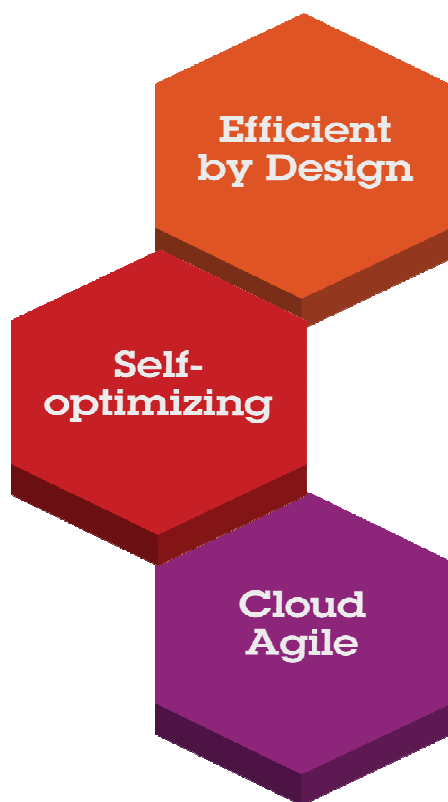
Deliver more actionable insights by unlocking the value of data

## Security Ready

Reduce risk and protect your customers by providing security of critical information

## IBM Smarter Storage for Smarter Computing

**IBM's approach to storage addresses today's challenges, and tomorrow's opportunities...**



- **Efficient by Design**

- Manage cost and capacity growth
- ↑Storage, ↓job ↑compression, ↓Energy Star
- Insights from a variety of data



- **Self-Optimizing**

- Automated and policy-driven
- Tiering

- **Cloud Agile**

- Respond quickly to changes
- Automatic self-service provisioning
- Deliver IT as a Service to increase information access and improve ROI

**m2**



## The IBM Storwize Family

### Comprehensive range of virtualized storage systems

- One code base on all platforms
- One set of functions (selectively licensed)
- One common, easy to use GUI
- One client experience

**New!**



SAN Volume Controller



Flex System V7000



Storwize V7000 Unified



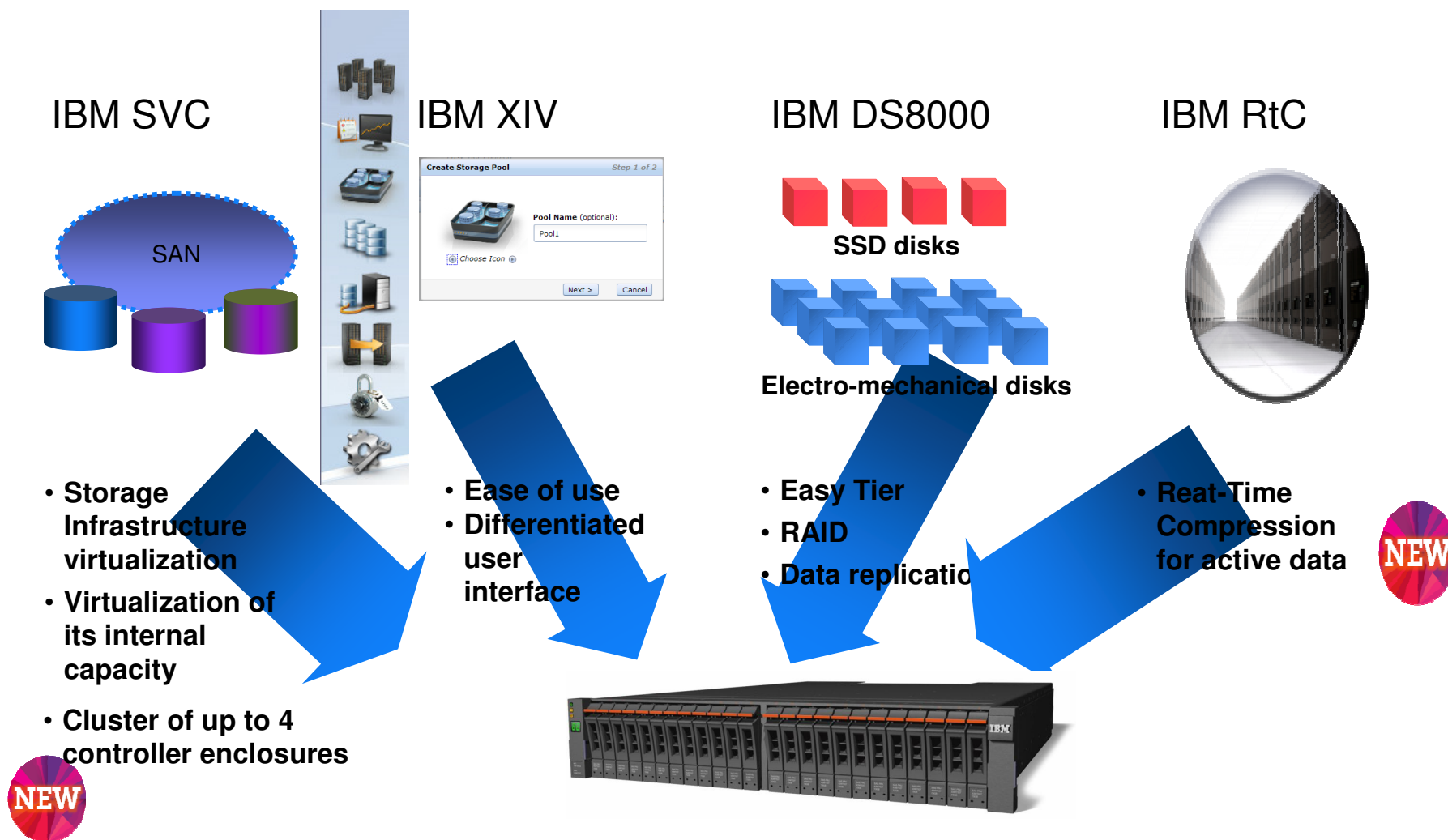
Storwize V7000



Storwize V3700

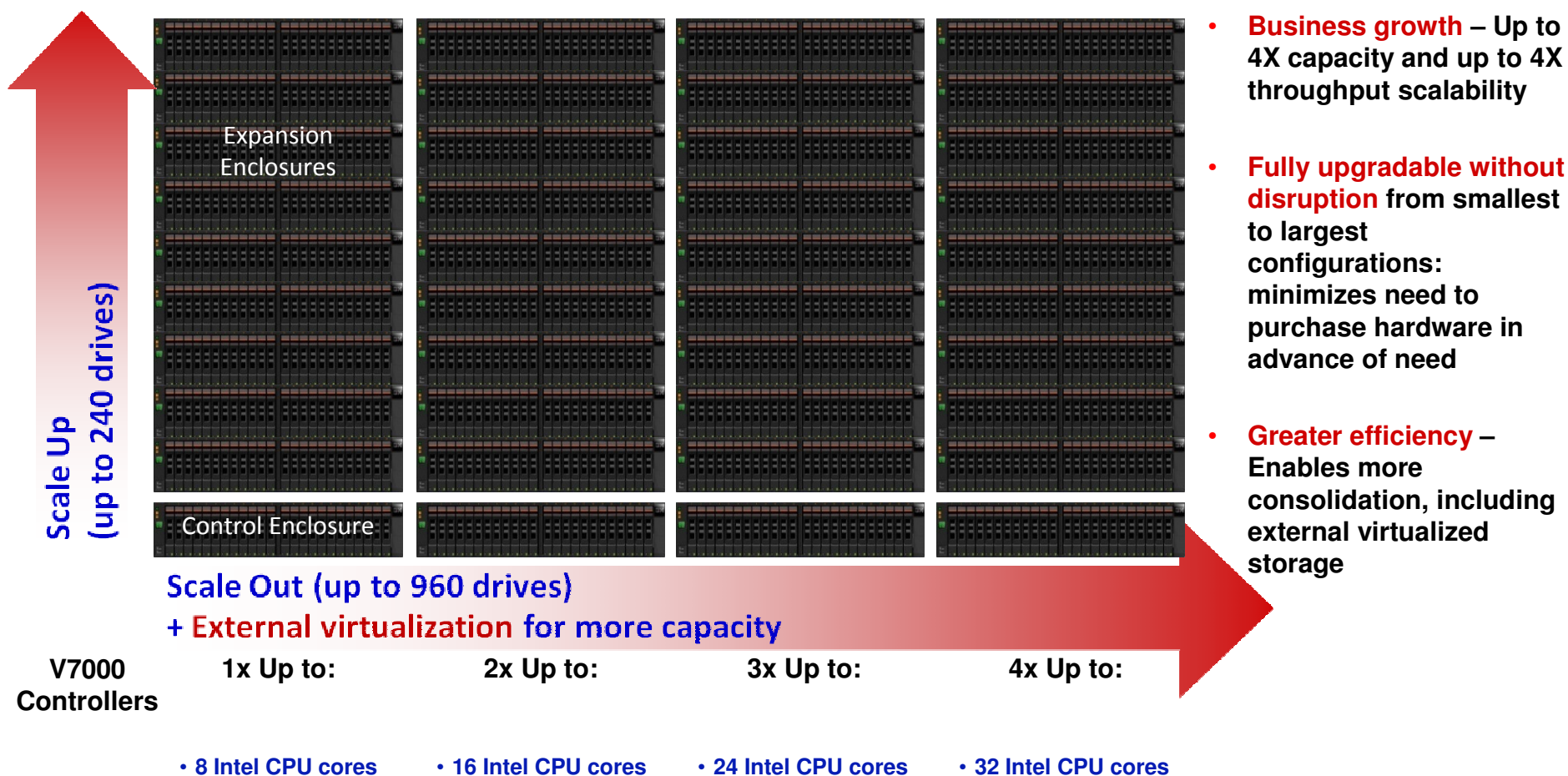
**New!**

## Herencia High End

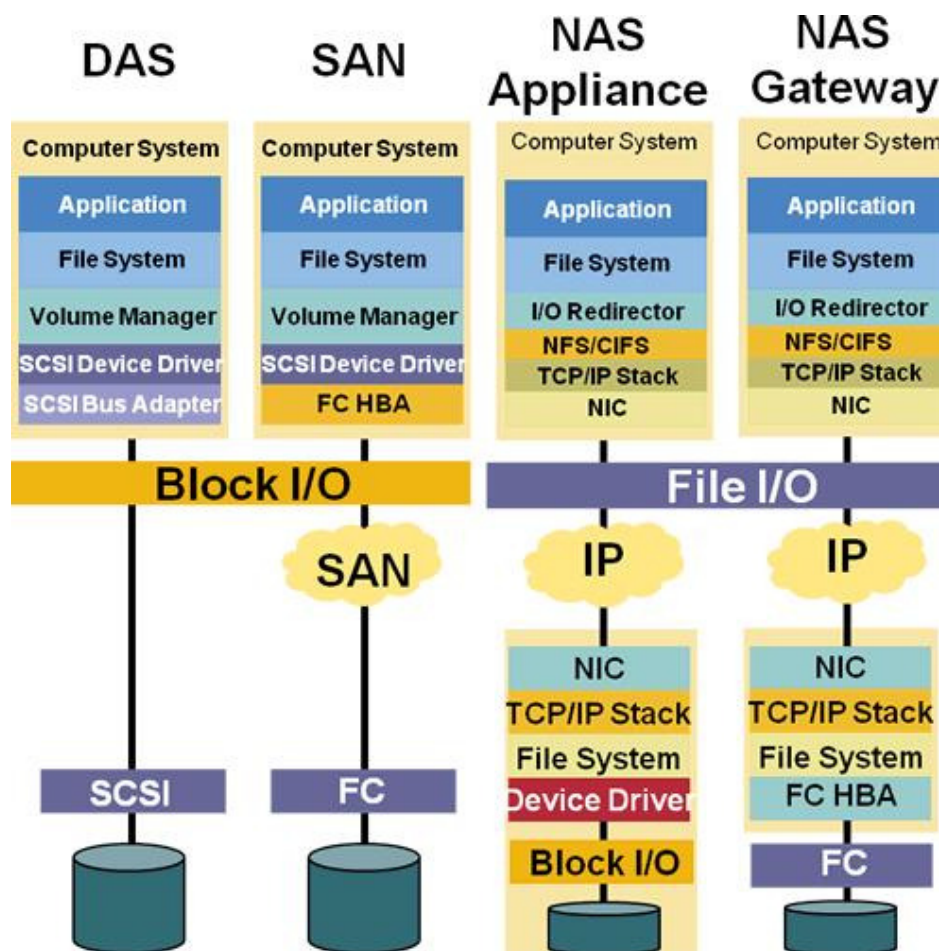


# IBM Storwize V7000U & Flex System V7000 Advanced Architecture

## Up to 4-way Clustering - Capacity and Performance Growth in One Model

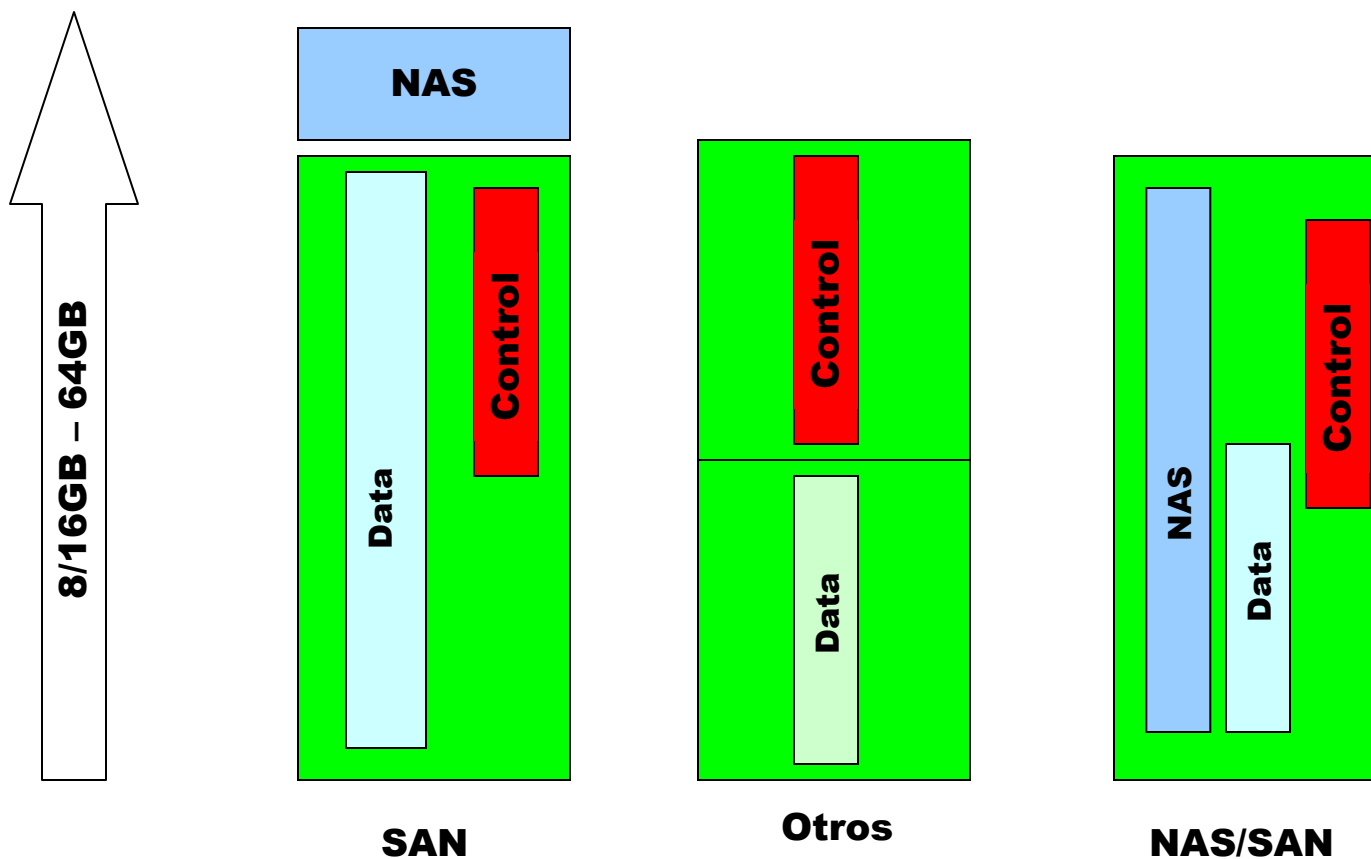


## Que es lo que necesitamos?

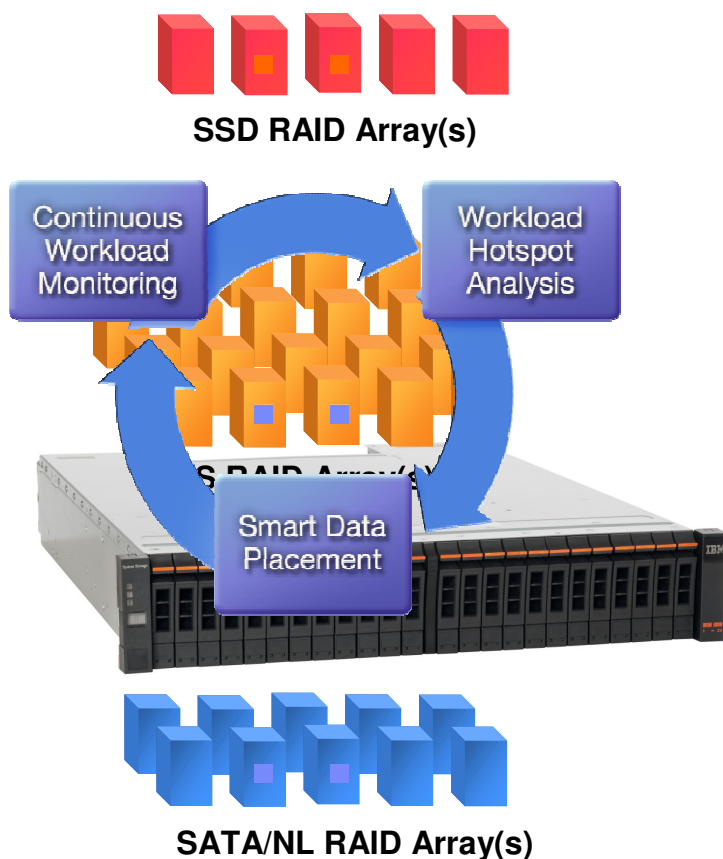


# Caché

**Cual necesitamos?**



## Automated Sub-Volume Tiering

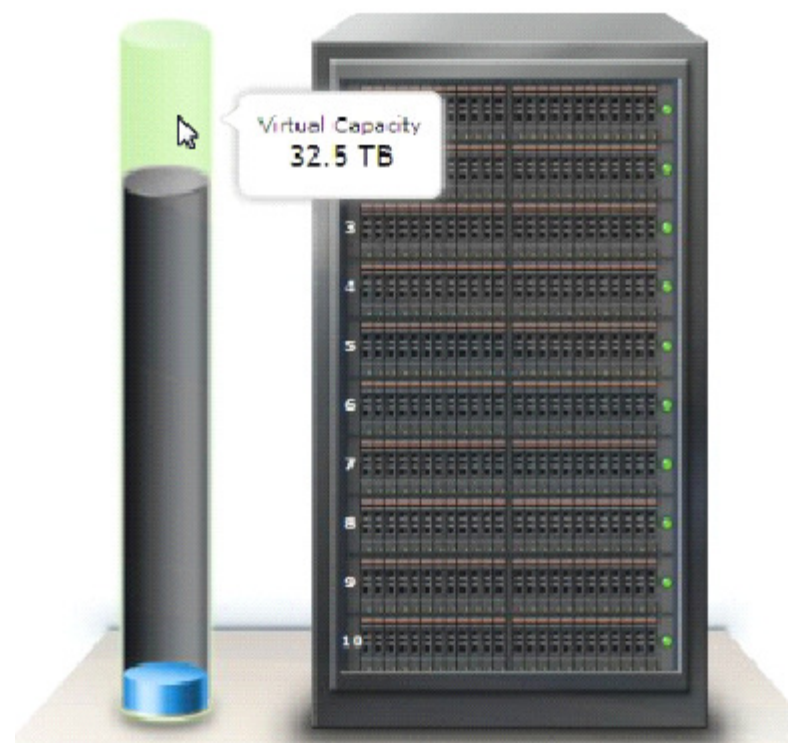
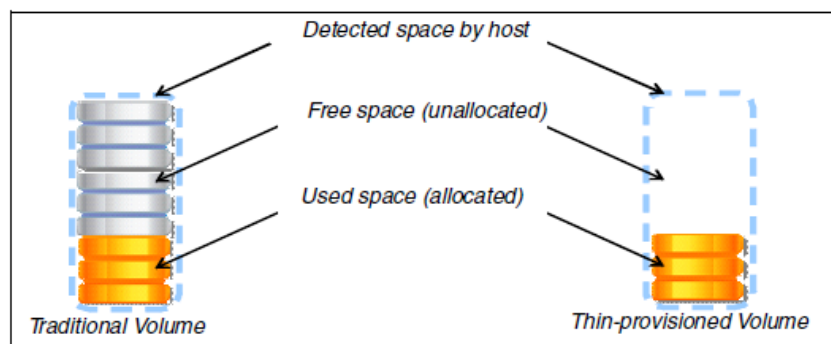


### ■ IBM Easy Tier

- Automatic movement of sub-volume extents between SSD, SAS and NL-SAS media
- Small amount of SSD can provide huge performance gains
- Up and down tier
- Two tiers in SVC and Storwize V7000
- Transparent to applications
- Just turn it on and let it work!

Up to **3X** performance increase with only 2/3% of your data on SSD

## Thin Provisioning

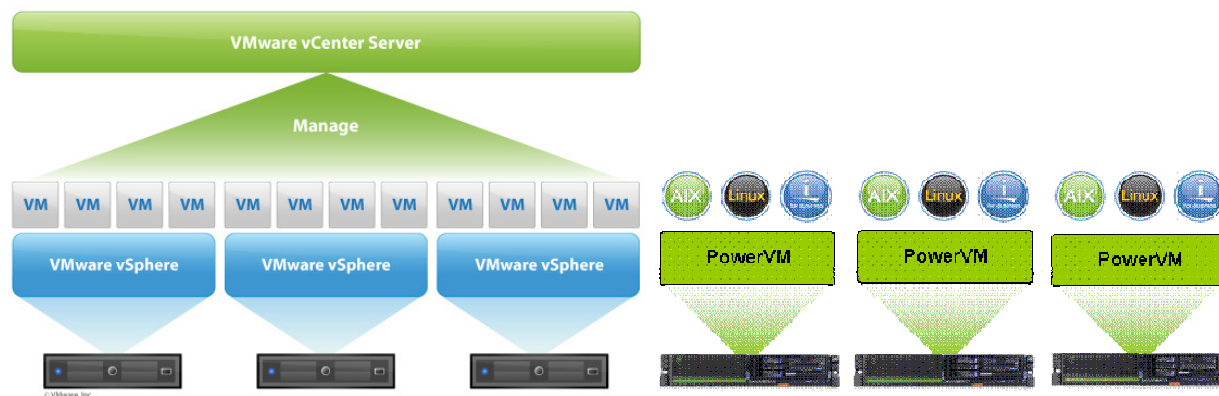


**“We have examples from customers who say Thin Provisioning took their capacity utilization from 40% to 80%, without impact on application performance.”**

-- Arun Taneja, Founder and Consulting Analyst, Taneja Group

# Virtualized Storage Infrastructure

## Virtual Server Infrastructure



Up to **5X** more usable capacity  
without performance degradation

# Compression



- **Real-Time Compression** is a method of reducing storage needs by changing the encoding scheme as the data is being read and written.
  - Short patterns for frequent data
  - Longer patterns for infrequent data.
  - Can achieve 50 to 80 percent reduction in storage capacity.

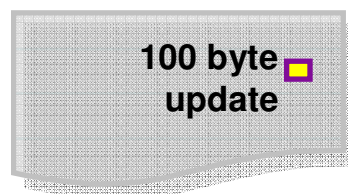
Databases		Up to 80%
Server Virtualization	Linux virtual OSes	Up to 70%
	Windows virtual OSes	Up to 55%
Collaboration	Office 2003	Up to 75%
	Office 2007 or later	Up to 25%
CAD/CAM		Up to 75%

## Por que la diferencia?

1 MB – “chunk”



**Traditional approach  
for data compression**

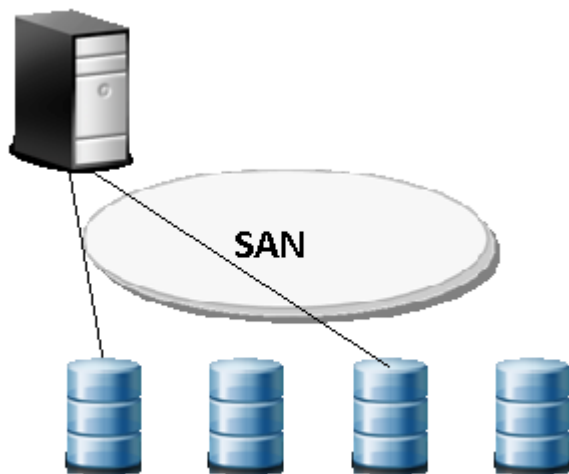


**Real-time  
Compression**

<b>Must decompress entire file to edit</b>  <b>Much more I/O</b>  <b>More ‘CPU work’</b>  <b>Network impact</b>  <b>No way to make real-time</b>	1 MB Read	0 MB Read	<b>No need to decompress data to modify data</b>  <b>No application performance impact</b>  <b>The only storage compression solution that works in real time on active data</b>
	1 MB Decompress	0 MB Decompress	
	100 Byte Update	0 Byte Update	
	1 MB Compress	100 Byte Compress	
	1 MB Write	< 100 Byte Write	
	2 MB I/O	< 100 Byte I/O	

## Traditional SAN

1. Stop applications
2. Move data
3. Re-establish host connections
4. Restart applications



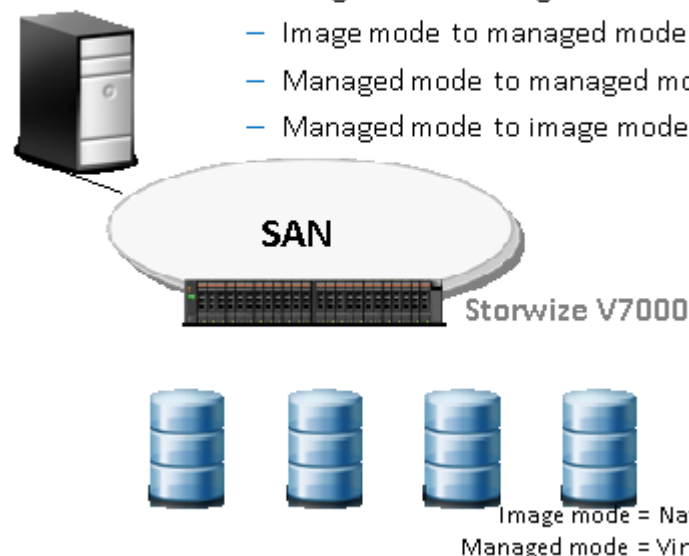
## Storwize V7000

1. Move data
  - Host systems and applications are not affected
  - In both cases, if it is with a new back-end external storage, you need to...
    - Cabling,
    - Change the SAN zoning,
    - Create arrays & create LUNs in the arrays,
    - Assign those LUNs to the server or Storwize V7000

Once Managed Disk Groups are created using the assigned LUNs, Volumes will be migrated between MDG with just one command/click

### Migration scenarios:

- Image mode to image mode
- Image mode to managed mode
- Managed mode to managed mode
- Managed mode to image mode



# Copy Services with Storwize V7000



## Volume Mirroring

- Volume Mirroring
- “outside the box”
- 2 close sites (<10Km)
- Warning, there is no consistency group

## FlashCopy

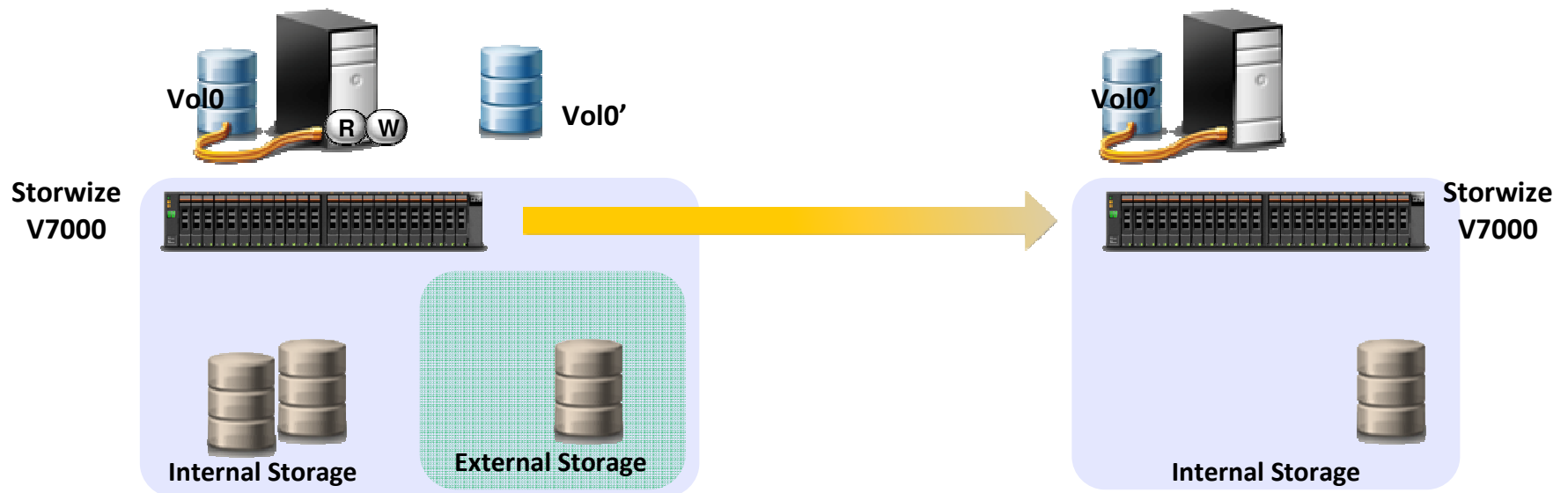
- Point-in-Time Copy
- “outside the box”
- 2 close sites (<10Km)
- Warning, this is not real time replication

## Metro Mirror

- Synchronous Mirror
  - Write IO response time doubled + distance latency
  - No data loss
- 2 close sites (<300 Km)
- Warning, production performance impact if inter-site links are unavailable, during microcode upgrades, etc.

## Global Mirror

- Consistent Asynchronous Mirror
  - Limited impact on write IO response time
  - Data loss
  - All write IOs are sent to the remote site in the same order they were received on source volumes
  - Only 1 source and 1 target volumes
- 2 remote sites (>300 Km)

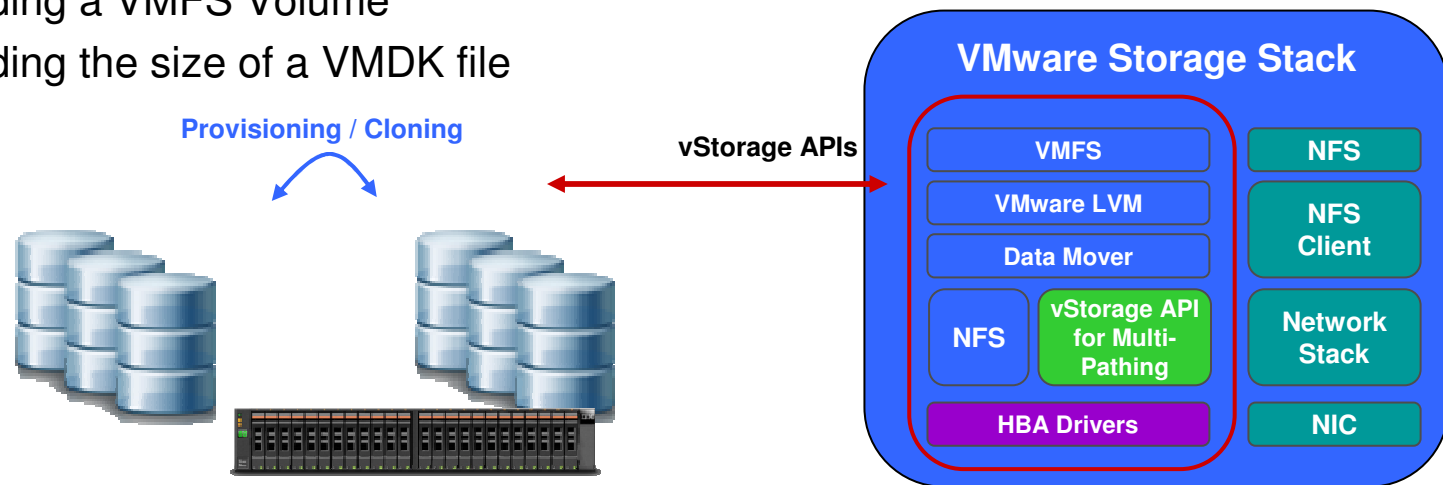


Source and target can have different characteristics and be from different vendors  
Source and target can be in the same cluster

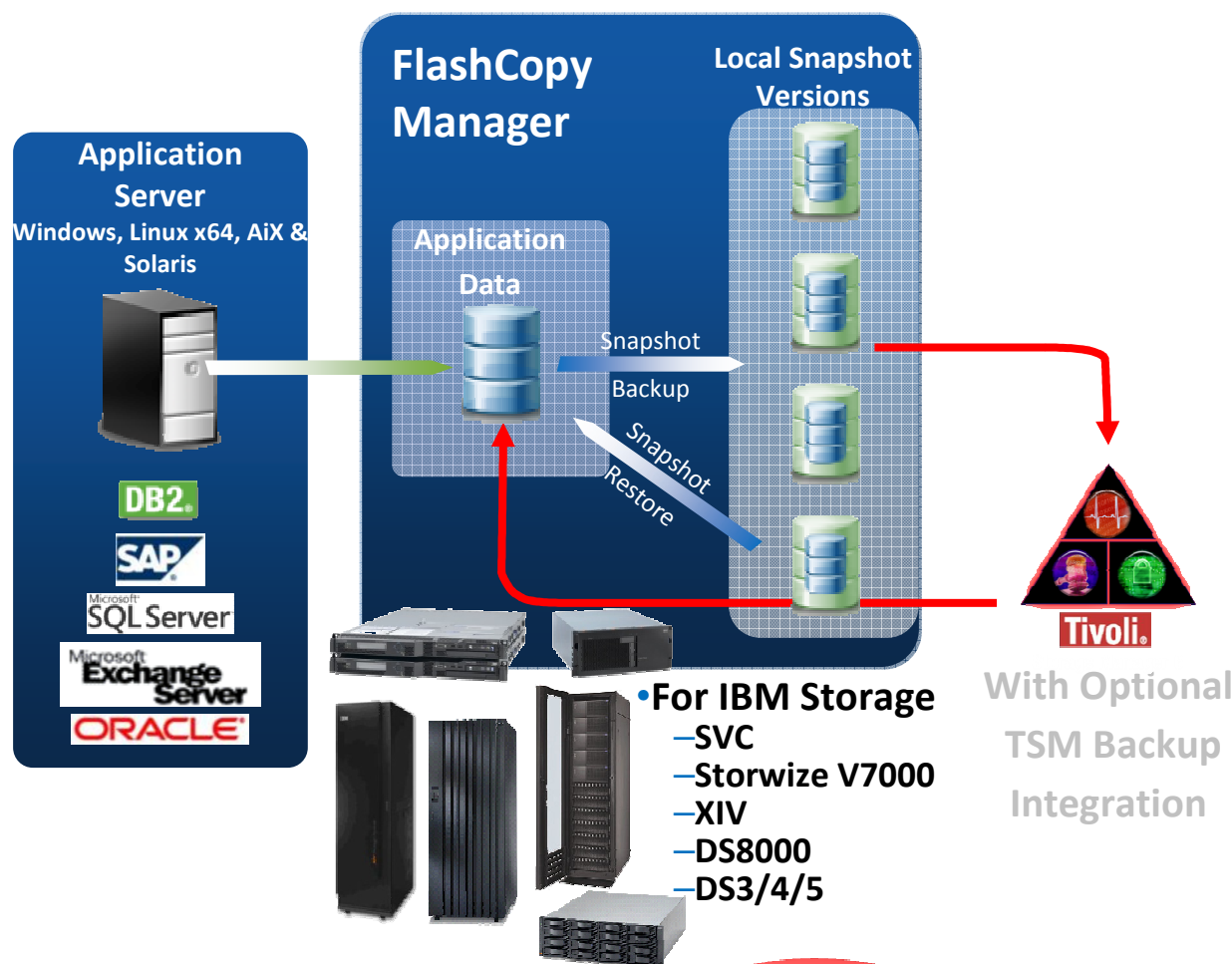
## VMware vStorage API for Array Integration

### VAAI support

- Integration with vStorage API's to improve performance
  - Full copy (and Block zeroing which was delivered in 6.1.0) offload work from production virtual servers to storage which improves application performance
  - Hardware-assisted locking enables a finer grained level of locking on VMFS metadata which is more efficient and also scales better in larger VMware clusters
- Example tasks that can benefit from improved performance :
  - VM creation/cloning/snapshots/deletion
  - vMotion and storage vMotion
  - Extending a VMFS Volume
  - Extending the size of a VMDK file



# FlashCopy Manager



- For IBM Storage
  - SVC
  - Storwize V7000
  - XIV
  - DS8000
  - DS3/4/5

Enhanced!

New!

- New with FCM 3.1:
  - File System & Custom Application for Windows
  - VMware datastore support
  - HP-UX

- Online, near instant snapshot backups with minimal performance impact
- High performance, near instant restore capability
- Integrated with IBM Storage Hardware
- Simplified deployment
- Database Cloning
- Snapshot backup to TSM server
  - Transfer outboard of application server to minimize impact to application
  - Copies on TSM server provide long-term retention and disaster recovery
- Support for multiple, persistent snapshots
  - Persistent snapshots retained locally
  - Very fast restore from the snapshot
- Policy-based management of local, persistent snapshots
  - Retention policies may be different for local snapshots and copies on TSM server
  - Automatic reuse of local snapshot storage as older snapshot versions expire
- File System & Custom Application for Unix & Windows

## Ease of Use Management – Unified Management



"unified"

Block Management    Filer X-Blade Management    File Tiering Management    Replication Management    Cluster Management

Revised launch Toolbar

Basically a Launch Manager for older GUIs

is a separate "Domain"



Fresh new user Interface based on the well-received XIV interface

### Storwize V7000

4-way Cluster Array  
Block/File GUI  
Active Cloud Engine  
Copy Services  
External Virtualization

Fully Integrated Management

Comprehensive consolidation of storage for up to 32PBs

One place to manage the Block & File Storage

One place to manage the SAN capacity

One place to manage Advance Functions

One place to manage Active Cloud Engine™

One place to manage Copy Services

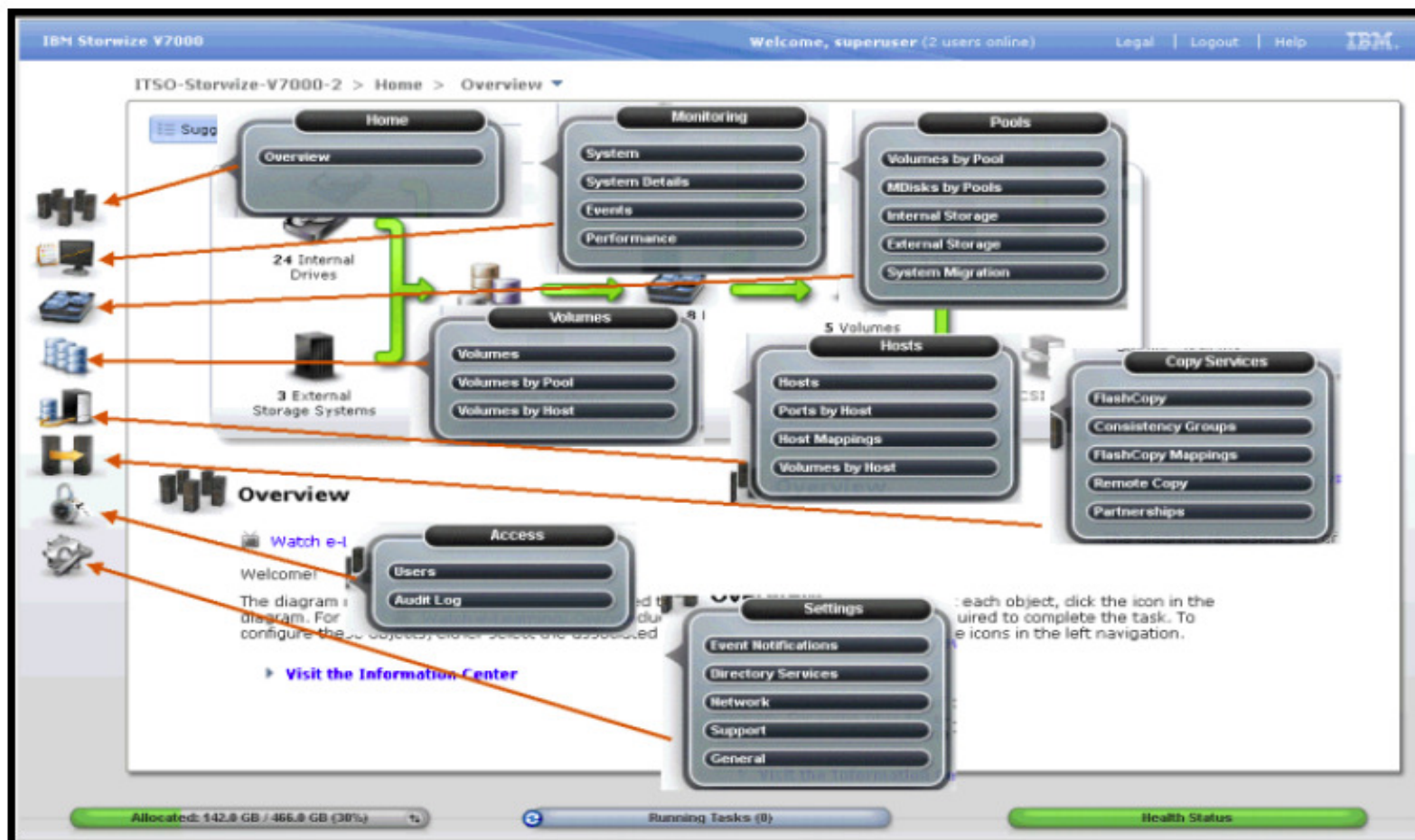
One place to manage external storage

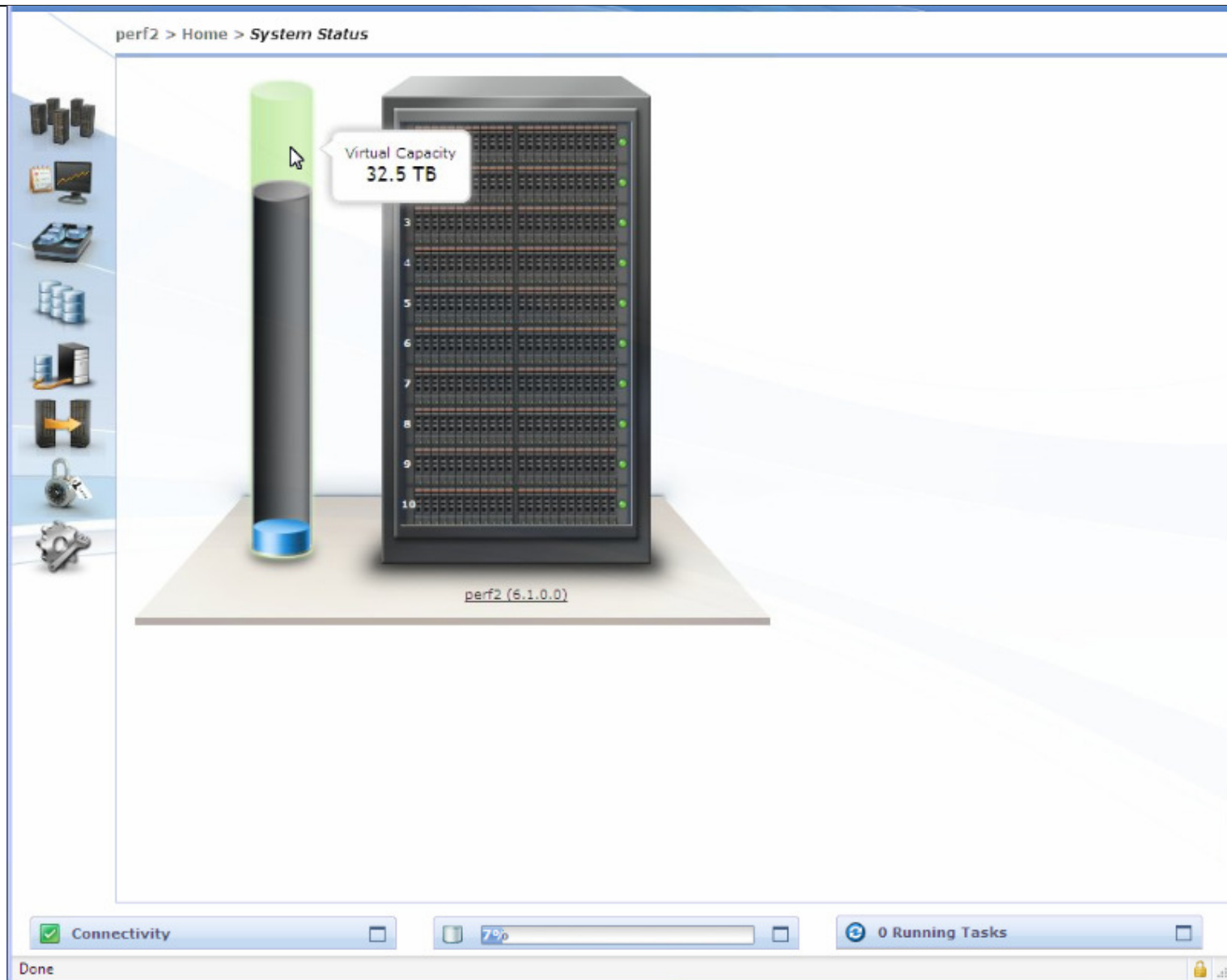
One multi-path driver to support all storage

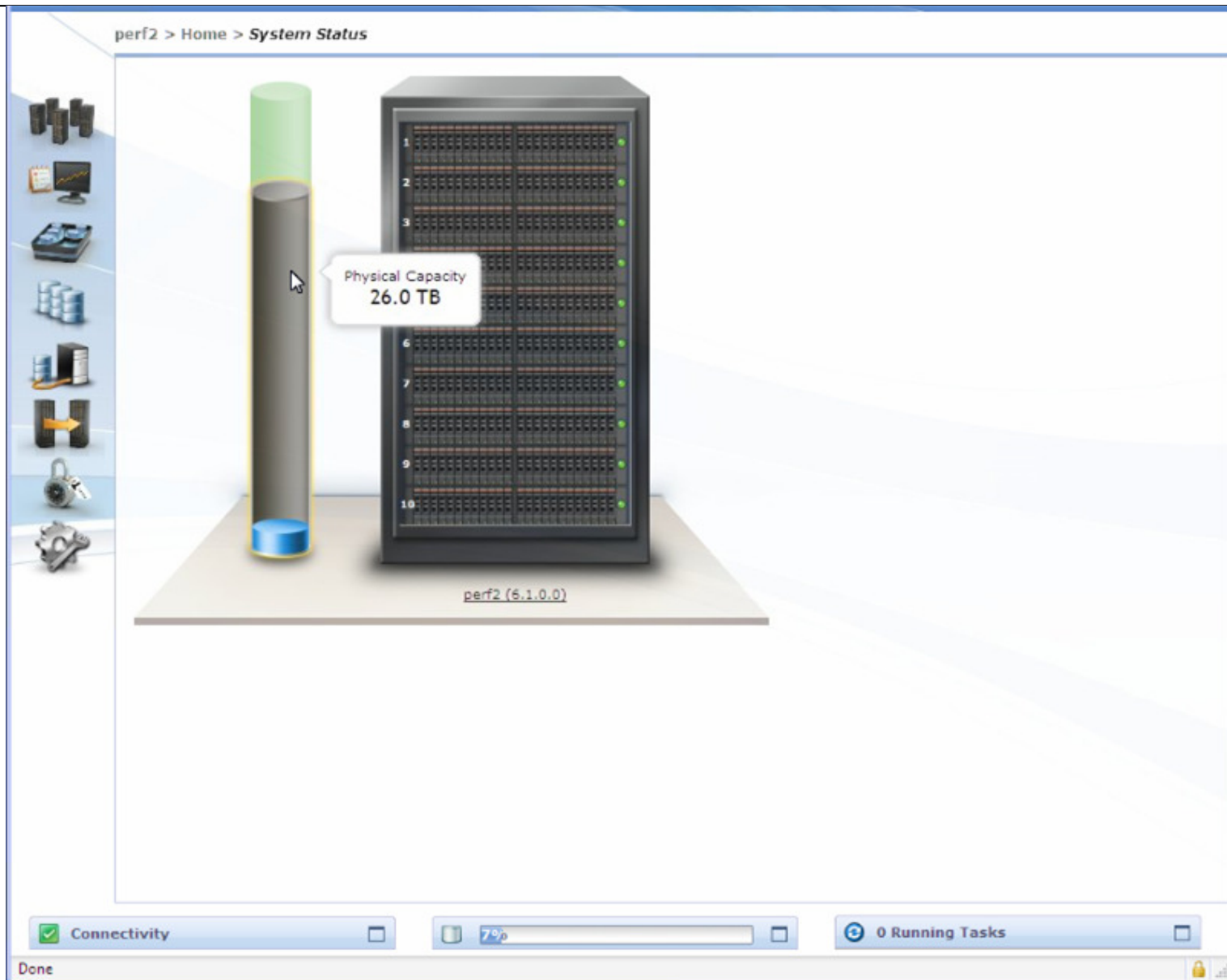
# User Interface

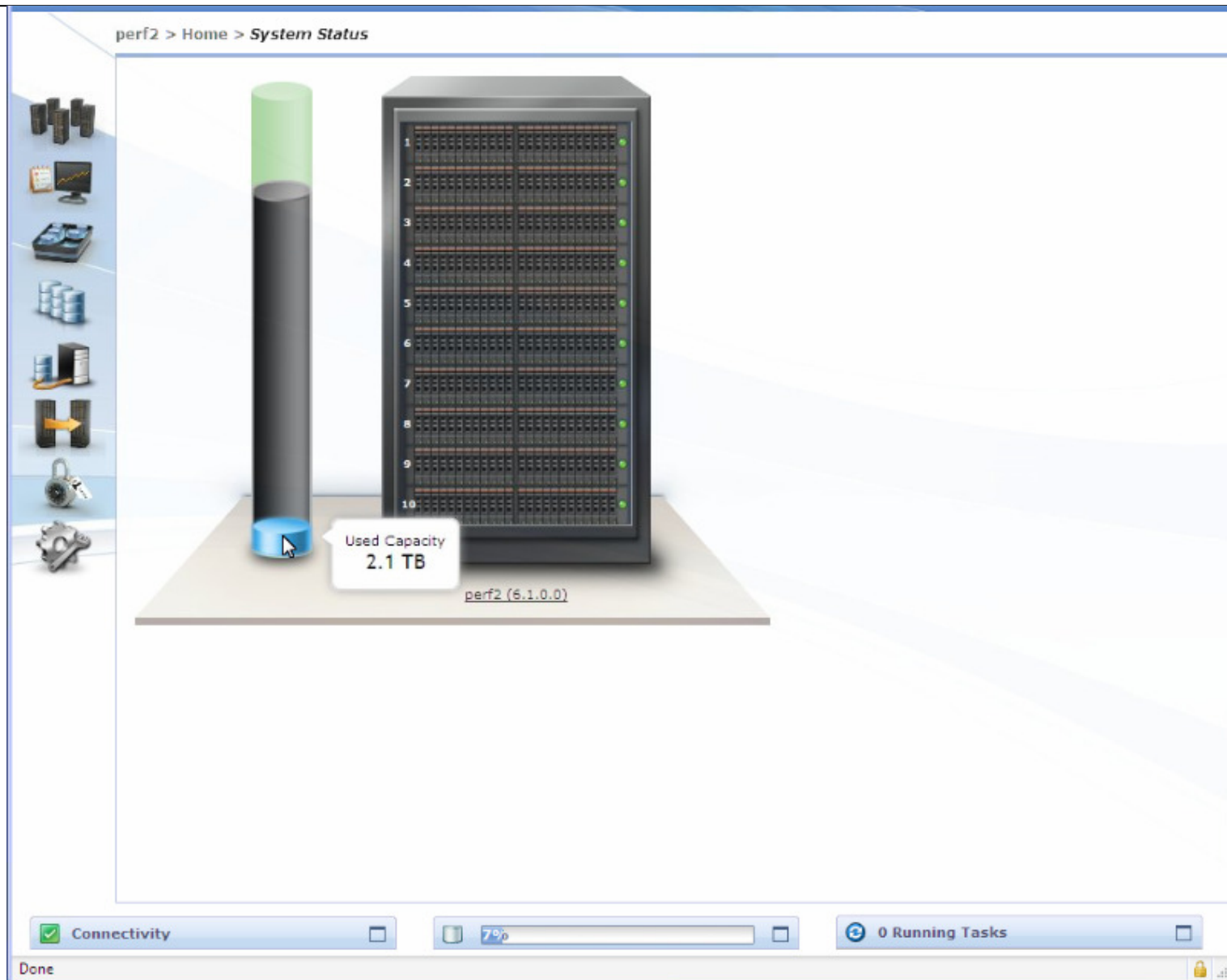


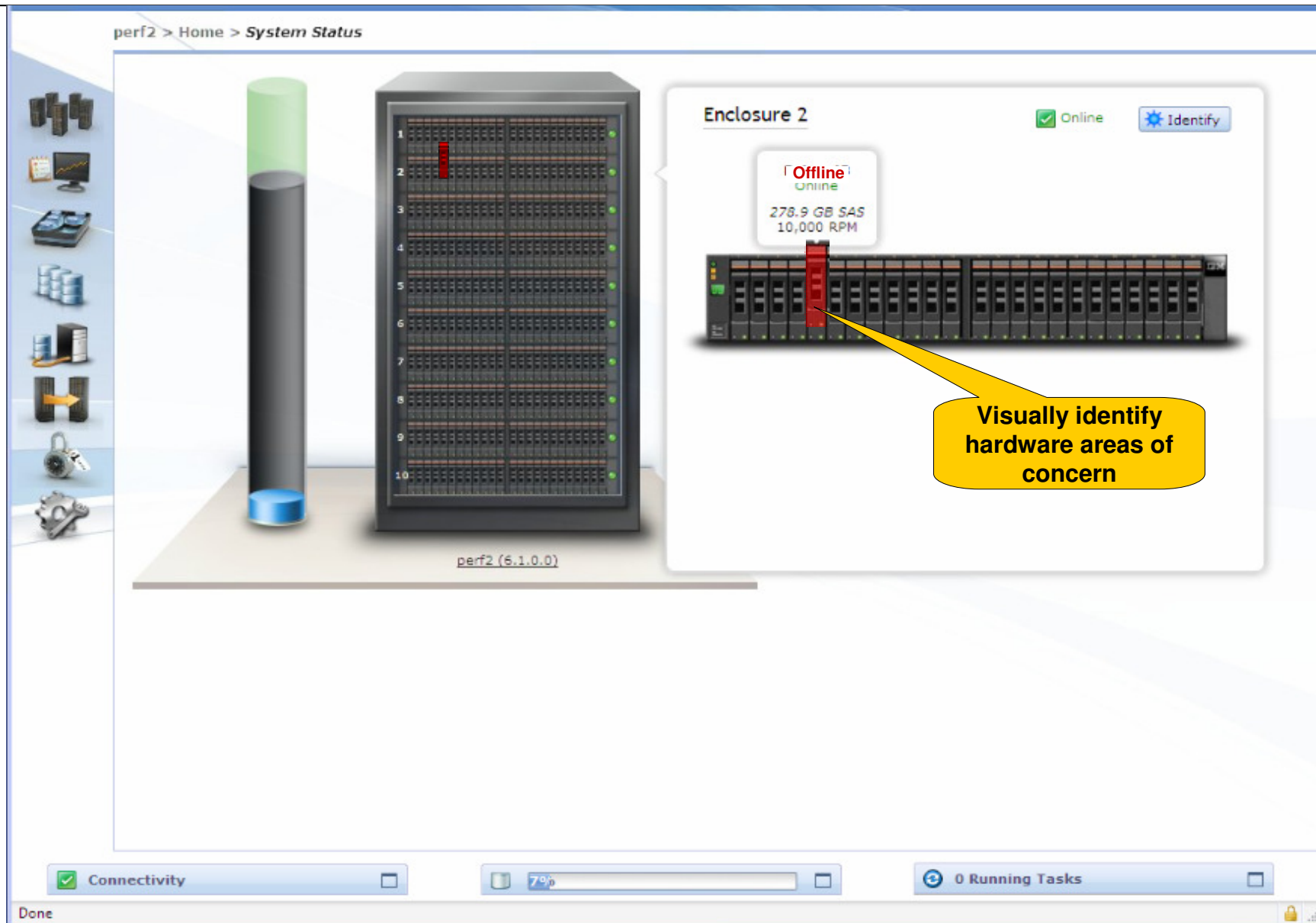
## User Interface

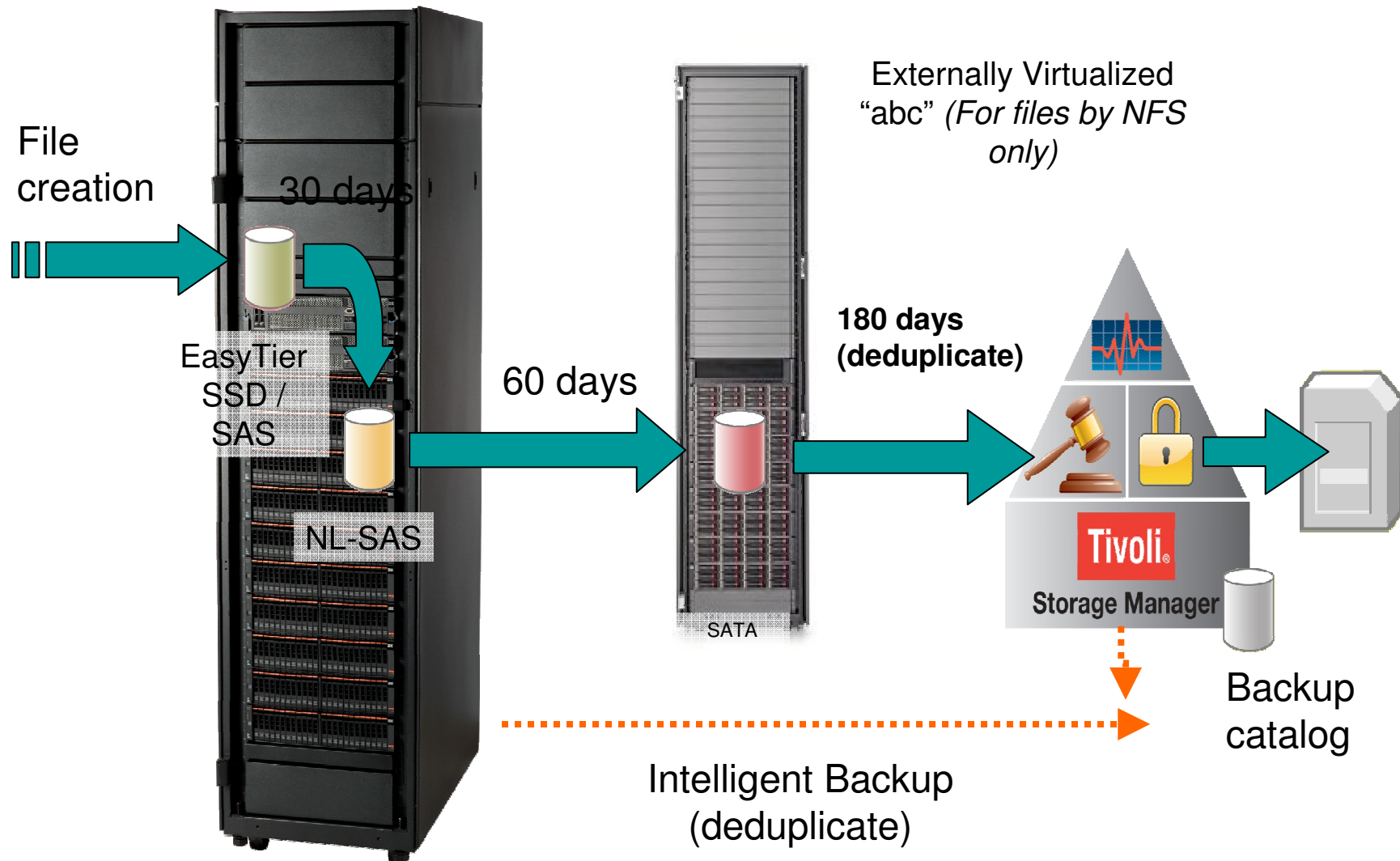












धन्यवाद

Hindi

谢谢

Simplified  
Chinese

תודה רבה

Hebrew

Спасибо

Russian

Gracias

Spanish

شكراً

Arabic

Thank You

English

Obrigado

Brazilian Portuguese

Grazie

Italian

감사합니다

Korean

Danke

German

Merci

French

நன்றி

Tamil

謝謝

Traditional Chinese

ขอบพระคุณ

Thai