



Education

# Leveraging the Power of Compute and Storage Grids

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## Leveraging the Power of Compute and Storage Grids

As compute and storage resource requirements grow, enterprise IT users are redefining their server and storage infrastructure. An increasingly prevalent trend is to deploy large numbers of small servers and virtualize them, and to deploy modular storage, rather than large frame arrays, to serve core and departmental application workloads. Computing and storage grids are an emerging deployment topology designed to support this horizontal scaling need. Attendees will learn about the usage scenarios for grid computing in engineering test, core test and development, and production environments, and the best practices associated with multi-protocol grid deployments: Flexibly configuring and managing multiple and virtualized host operating environments, Provisioning storage, and Protecting data with advanced technologies such as software-based SAN boot.

# Challenges

- Growing computing needs
- More responsiveness
- Limited budget, space, energy and cooling

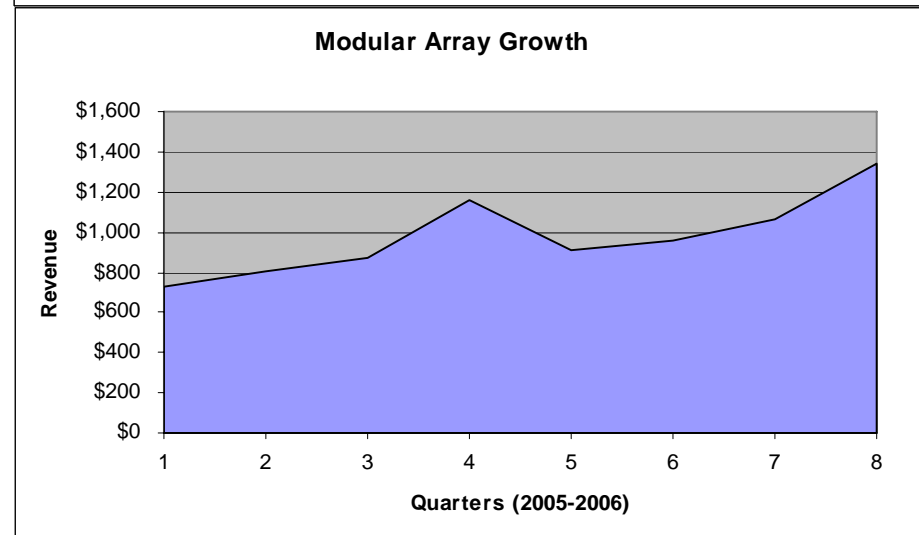
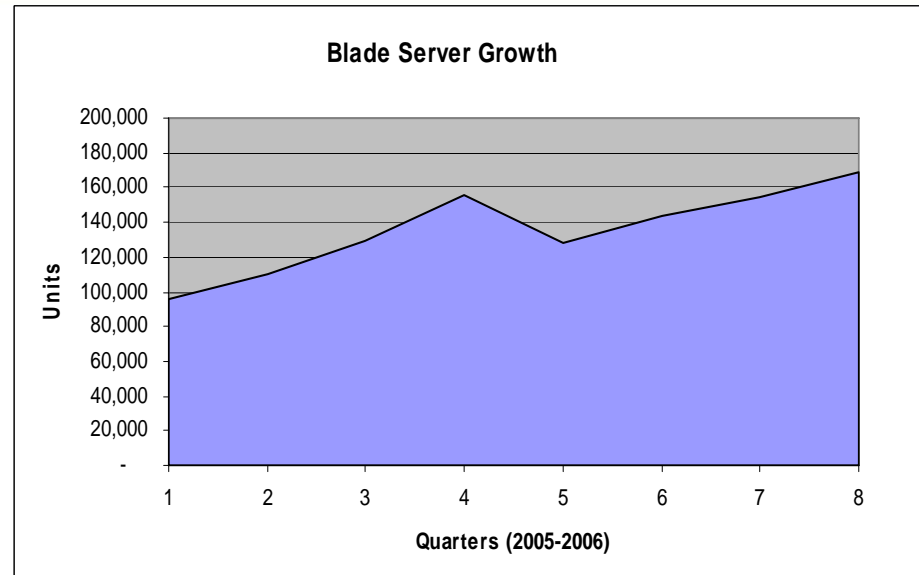
# Types of Grids

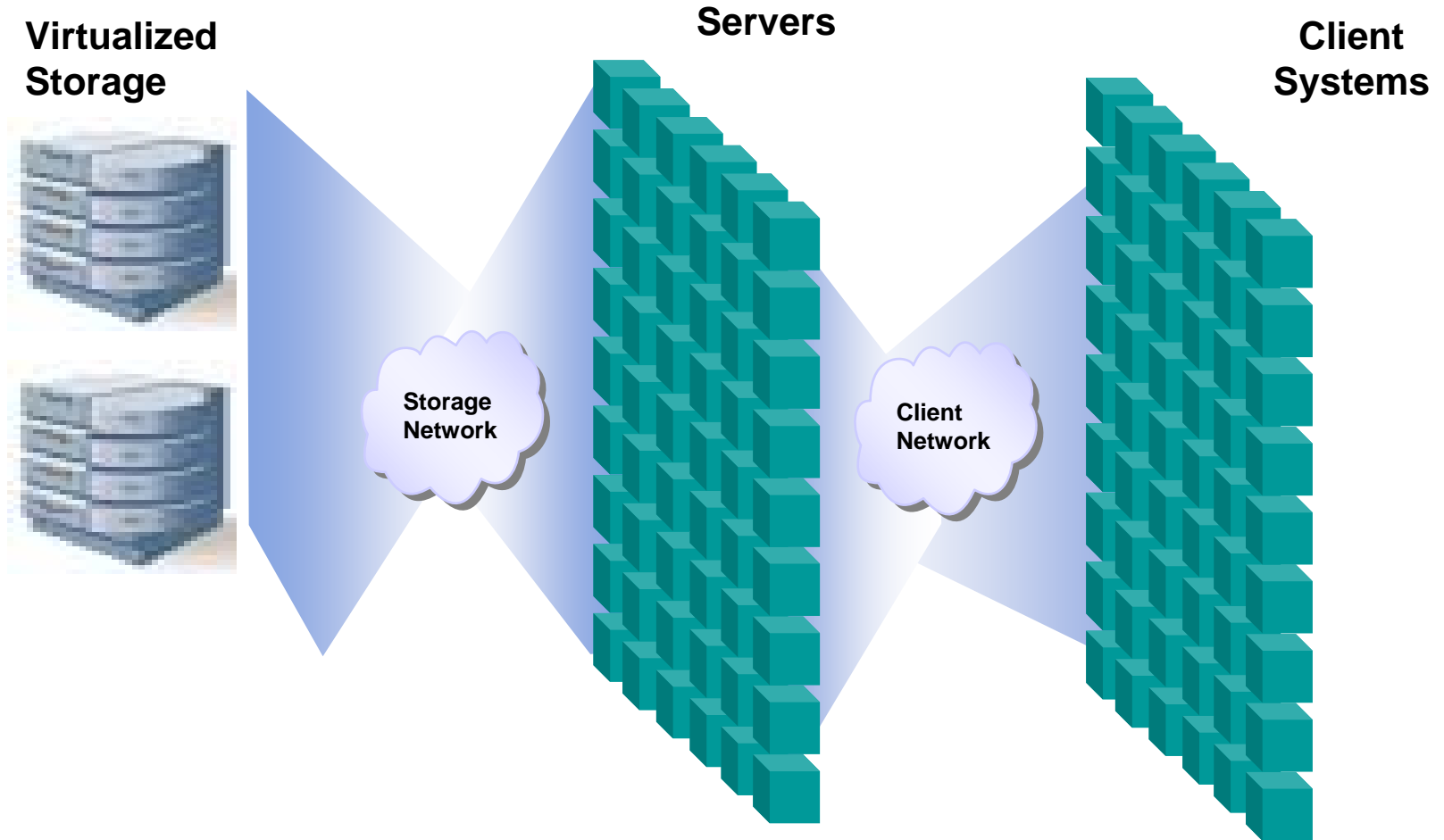


- ▶ Technical Computing Grids
- ▶ Data Grids
- ▶ Utility Computing Grids

# Enterprise Trends Supporting Utility Grids **SNIA**

- Small virtualized servers
- Modular storage for core workloads





- Server
- OS Provisioning
- Boot Protocol



## ➤ Blades

- ◆ Pro
  - › Space
  - › Power
  - › Infrastructure
- ◆ Con
  - › Flexibility

## ➤ Racks/Towers

- ◆ Pro
  - › Lower fixed cost
- ◆ Con
  - › Infrastructure

# OS Provisioning

## ➤ Disk-full

- ◆ Pro
  - › Installed base
  - › Availability of commercial software
- ◆ Con
  - › Bare metal installation
  - › Tools to track and manage images

## ➤ Diskless

- ◆ Pro
  - › Reliability
  - › Performance
  - › Supportability
  - › Rapid Provisioning / Re-purposing
- ◆ Con
  - › Availability of commercial software
  - › Installed base

# Boot Protocol

## ➤ iSCSI

- ◆ Pro - Cost, Flexibility, Scalability
- ◆ Con - Installed base

## ➤ NFS

- ◆ Pro - Cost, Flexibility, Scalability
- ◆ Con – OS support

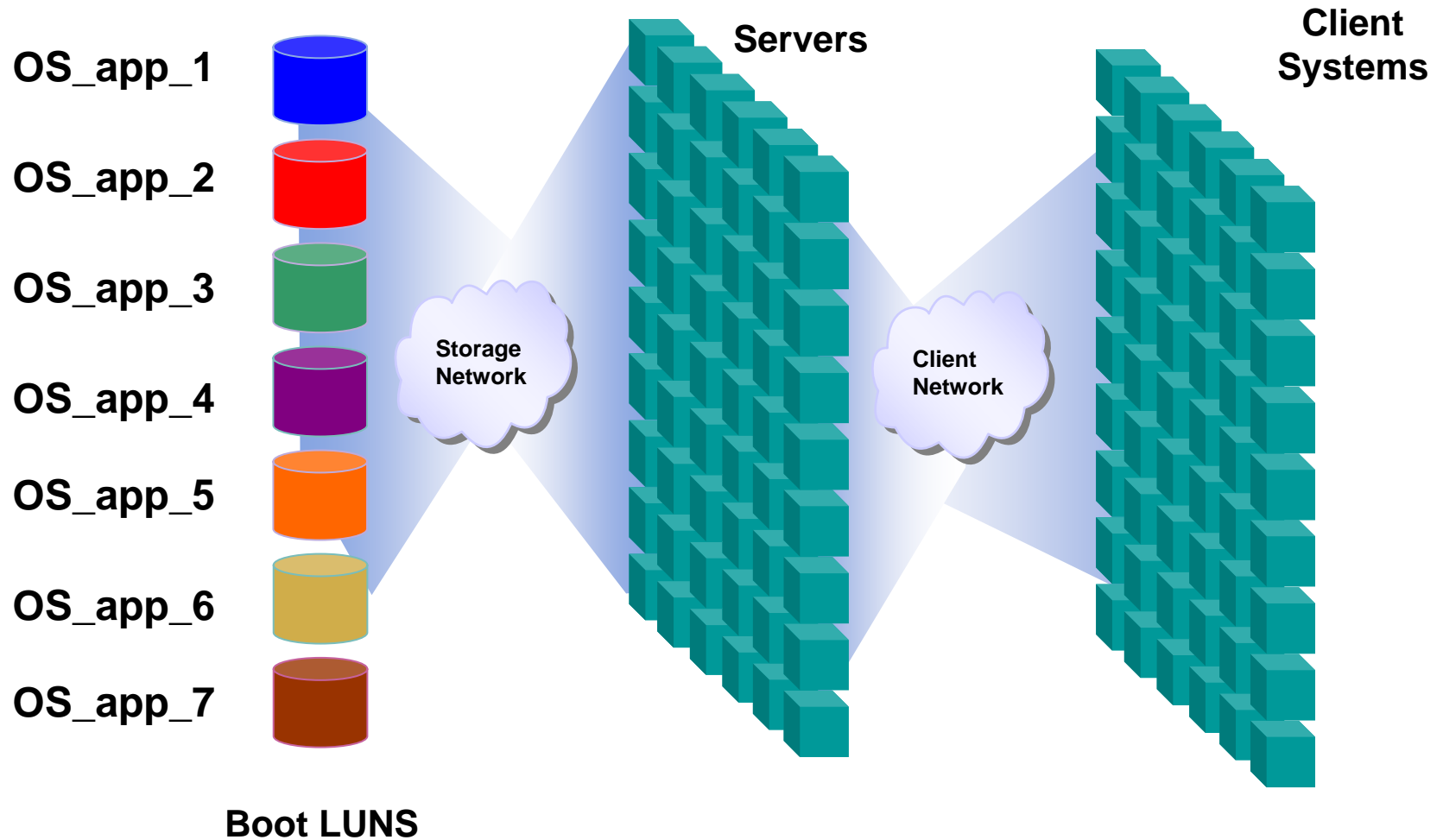
## ➤ Fibre Channel

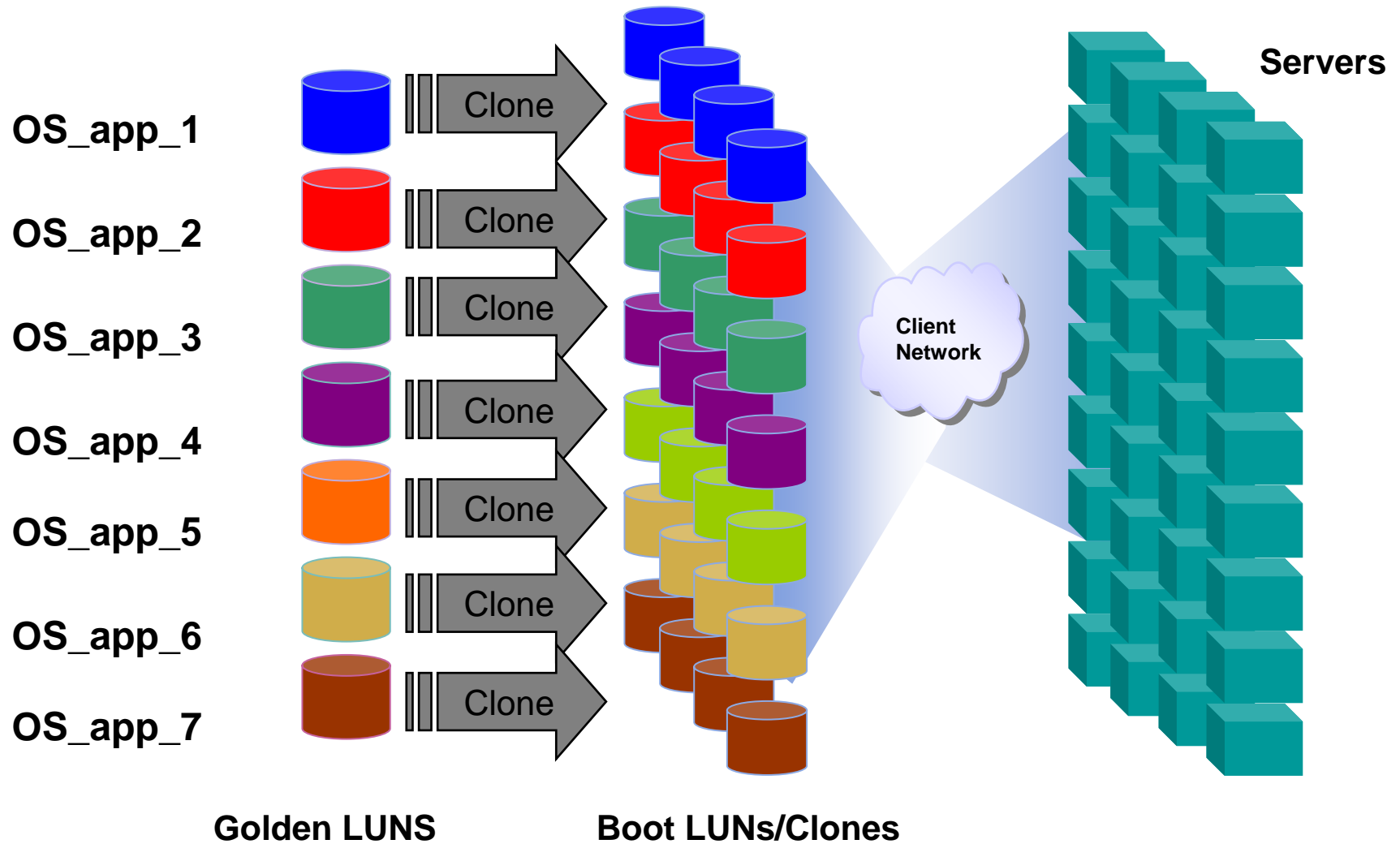
- ◆ Pro - Installed base, Performance
- ◆ Con - Cost, Scalability

# Advantages of Virtualized Storage

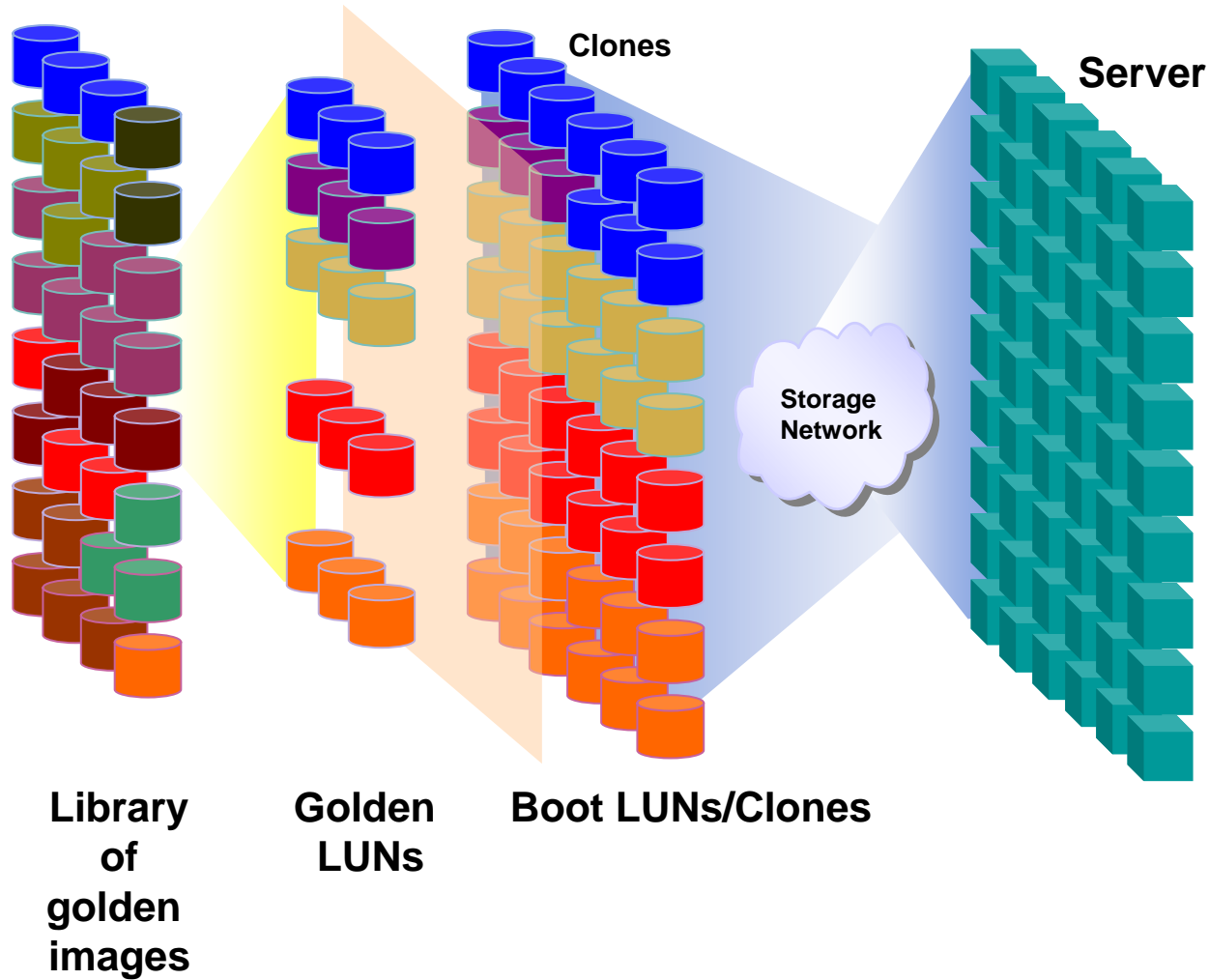
- Flexibility / Speed
- Capacity
- Business Continuity
- Availability

# Flexibility / Speed

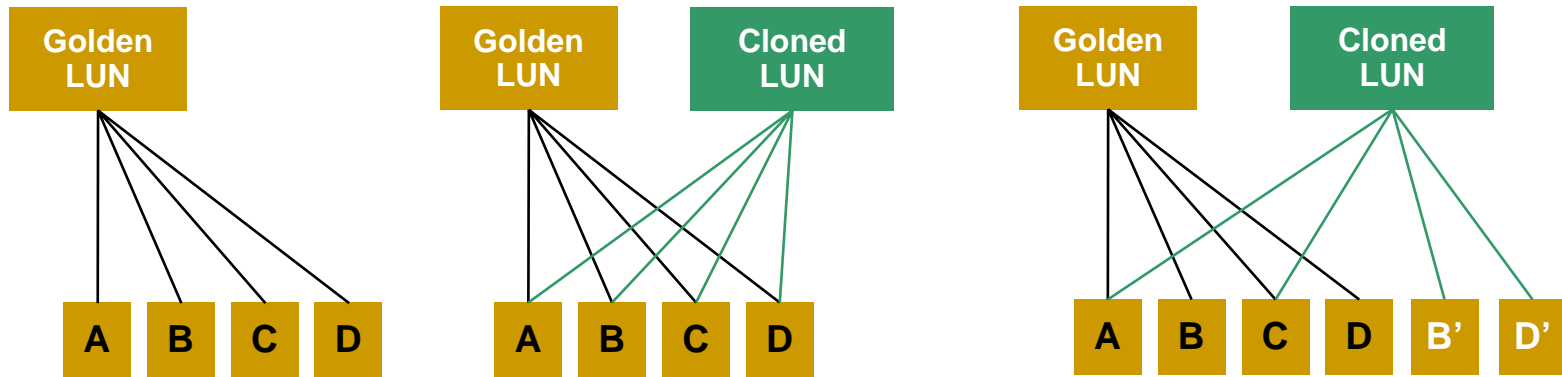




# Capacity



# Flexibility and Capacity - Cloning



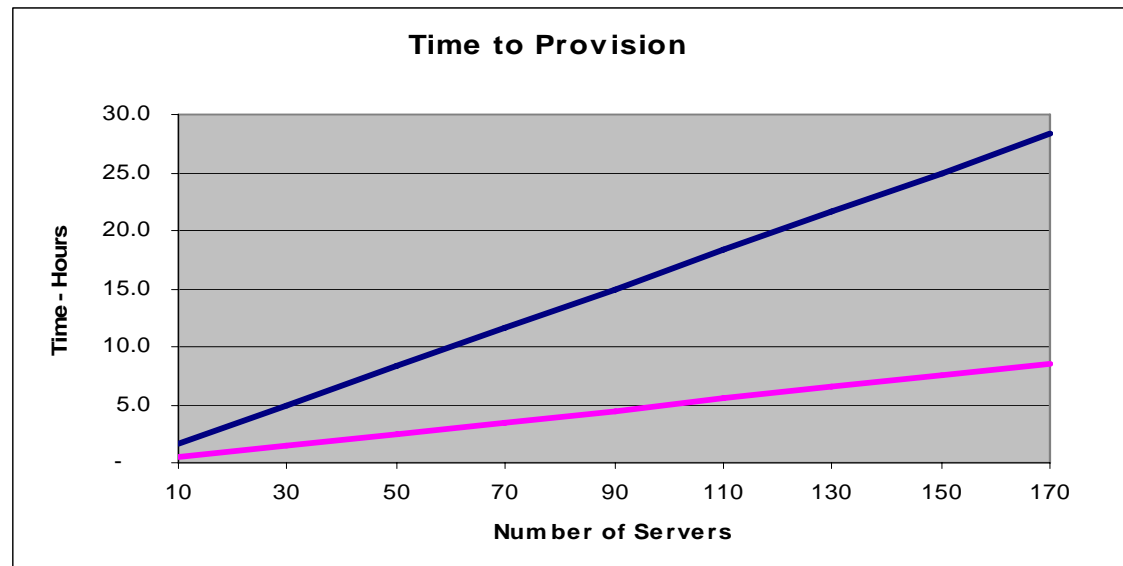


# Clone Deployment Process

- Install OS
- Remove identity (name, IP, etc...) off image
- Lock it as golden image
- Clone image
- Image gets identity based on MAC address during boot

# Clones – Speed and Capacity Advantages **SNIA**

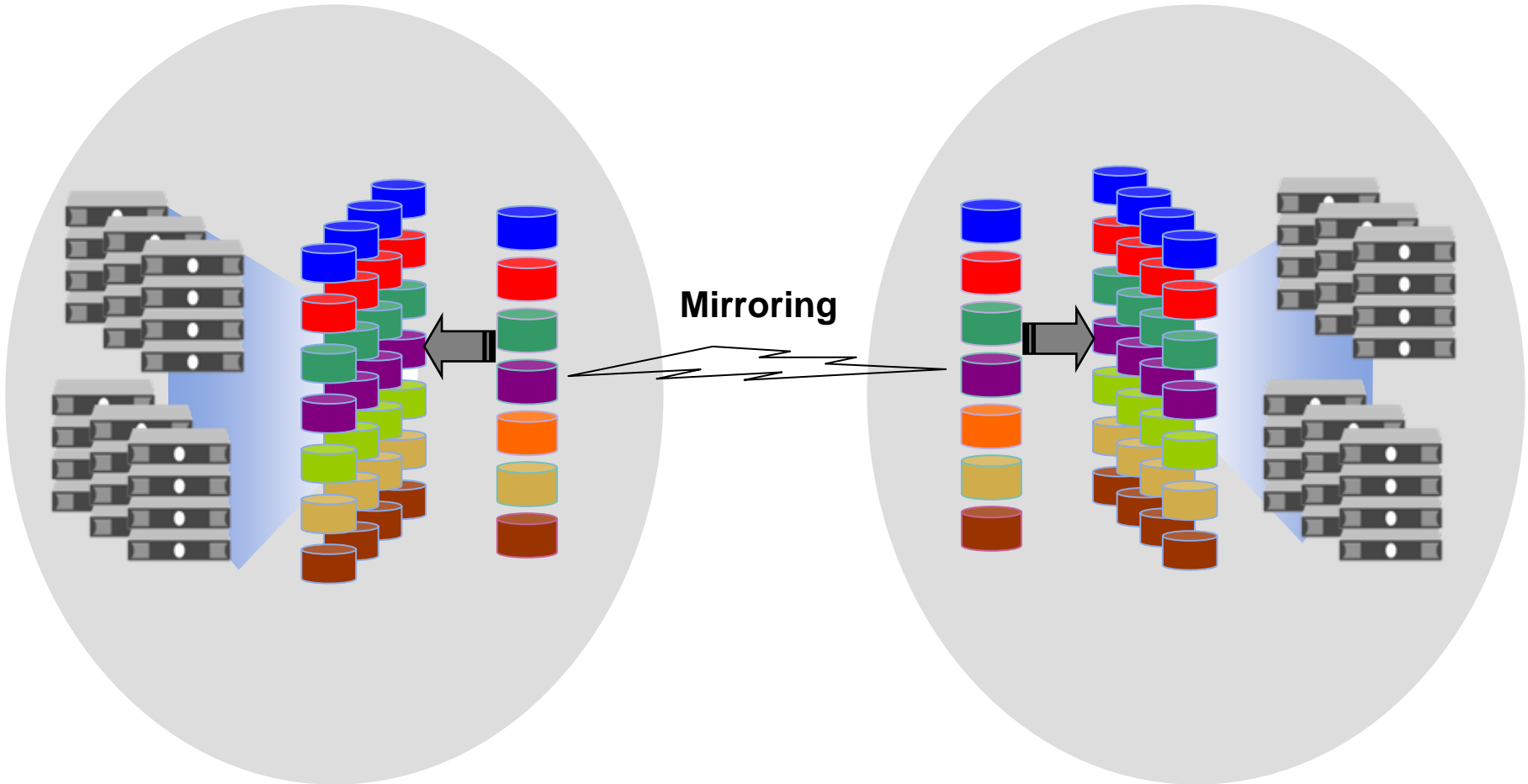
Space to Provision				
	Without Cloning:	With Cloning:	Without Cloning:	With Cloning:
Number of unique images:	1000	50	60	10
Image Size (GB):	15	15	15	15
Number of clones:	0	1000	0	60
Clone Size- 10% (GB):	1.5	1.5	1.5	1.5
<b>Total needed capacity (GB):</b>	<b>15,000</b>	<b>2,250</b>	<b>900</b>	<b>240</b>



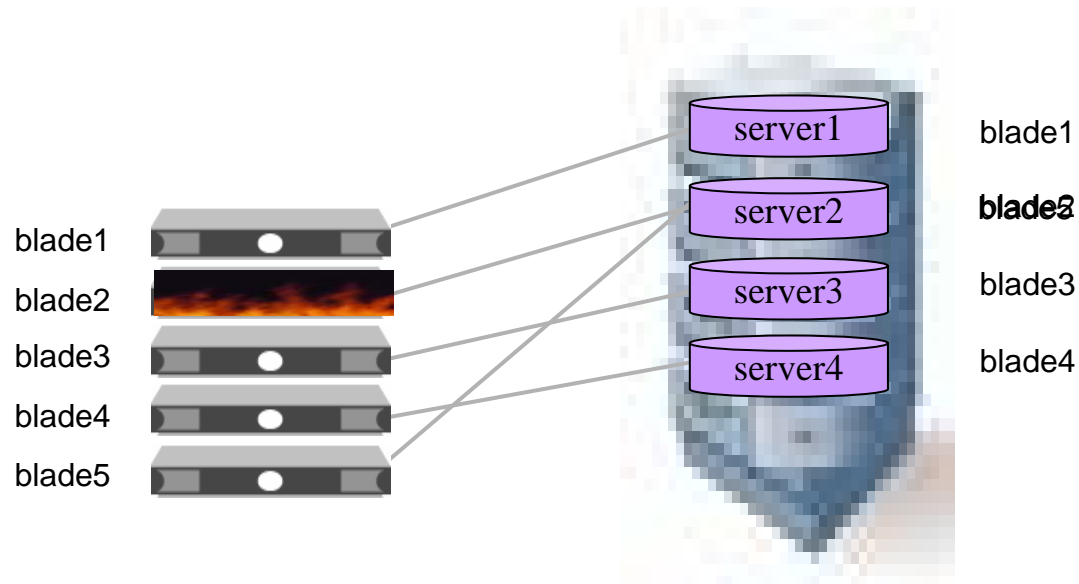
# Business Continuity

**Data Center 1**

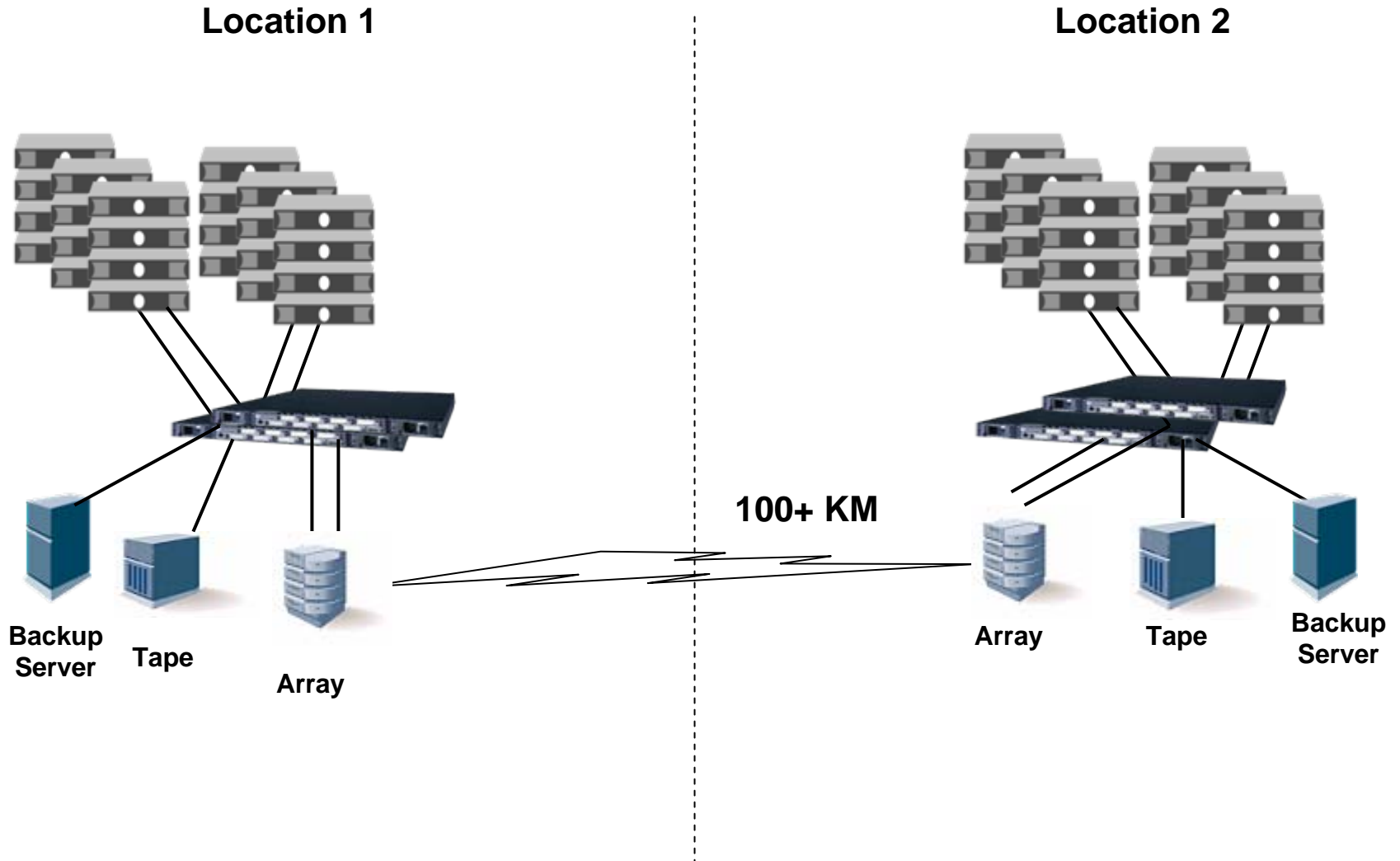
**Data Center 2**



# Availability



# Case Study



- ▶ Utility Grid computing is happening
- ▶ Virtualized Storage is a key enabling technology to make Utility computing grids a possibility

- Please send any questions or comments on this presentation to SNIA: [trackvirtualization@snia.org](mailto:trackvirtualization@snia.org)

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