



Scaling to 50,000 Virtual Desktops

Architectural Requisites for Success

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Promise of Desktop Virtualization

- Desktop management cost & complexity
- Improves business continuance
- Enables security and compliance
- End-point device independent

Virtual Desktop: Ready for Most Use Cases

Mobile



Non-
mobile



Transaction

Consumption

Creation

October 11-14, 2010
The Gaylord Texan
Dallas, Texas



Desktop Virtualization Challenges

- Alignment of IT resources
- IT vs. end users
- Security and isolation on shared infrastructure
- End user acceptance



Different Approaches

VDI

Hosted
Shared
Desktops

Streamed
Desktops

Streamed
Apps

Storage



Virtual Desktop Complexity

- Two primary types of data
- Each with different requirements

| OS Image Data | User Data |
|-------------------------|---------------------------|
| Highly redundant | Less Redundant |
| High IO spikes | Low IO load |
| Low latency required | Latency tolerant |
| Limited Backup required | Stringent Backup required |



Storage is Fundamental for Success

“If you don’t architect storage correctly your solution is likely to be over-built and too expensive, or under-built and unable to deliver the performance to meet end user requirements. Both scenarios put desktop virtualizations projects at risk to fail.”

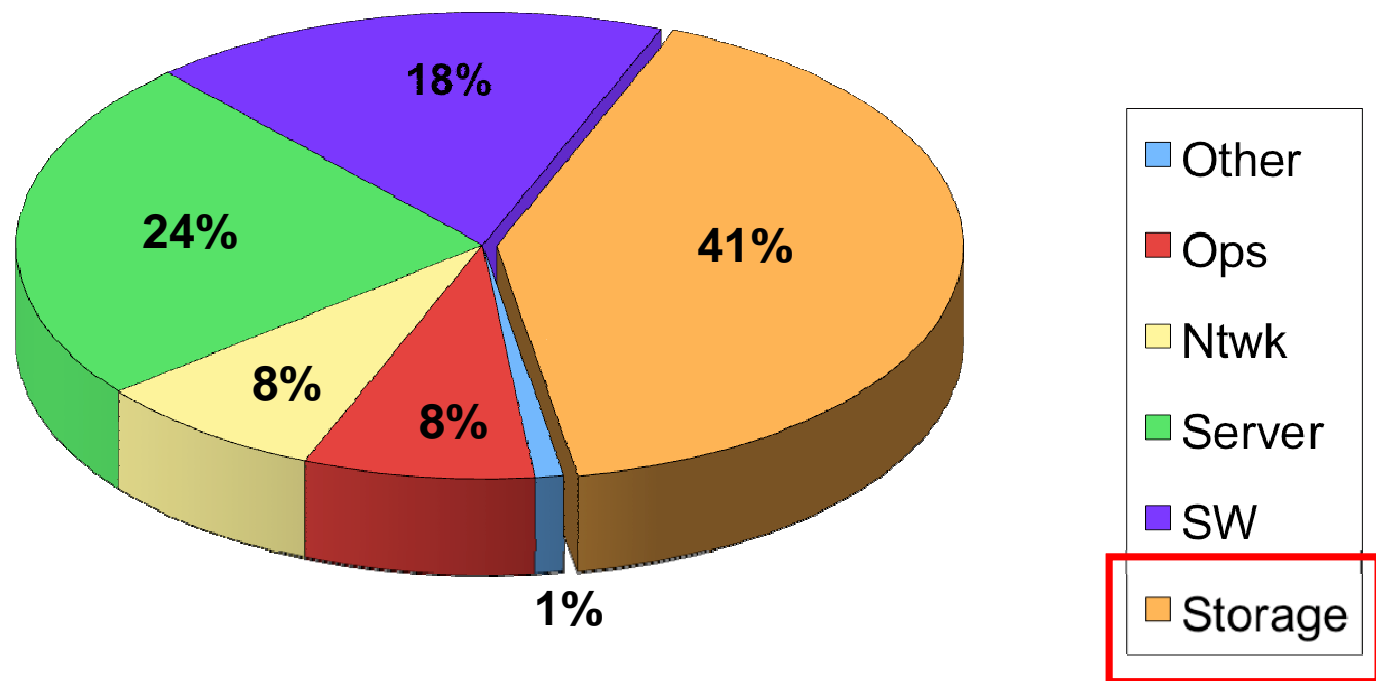


Storage Challenges for Virtual Desktops

- Lengthy mass deployment timeframes
- Storage performance bottlenecks
- Maintaining high availability
- Security and control of user data
- Storage costs



Desktop Virtualization Infrastructure Expenses Categories



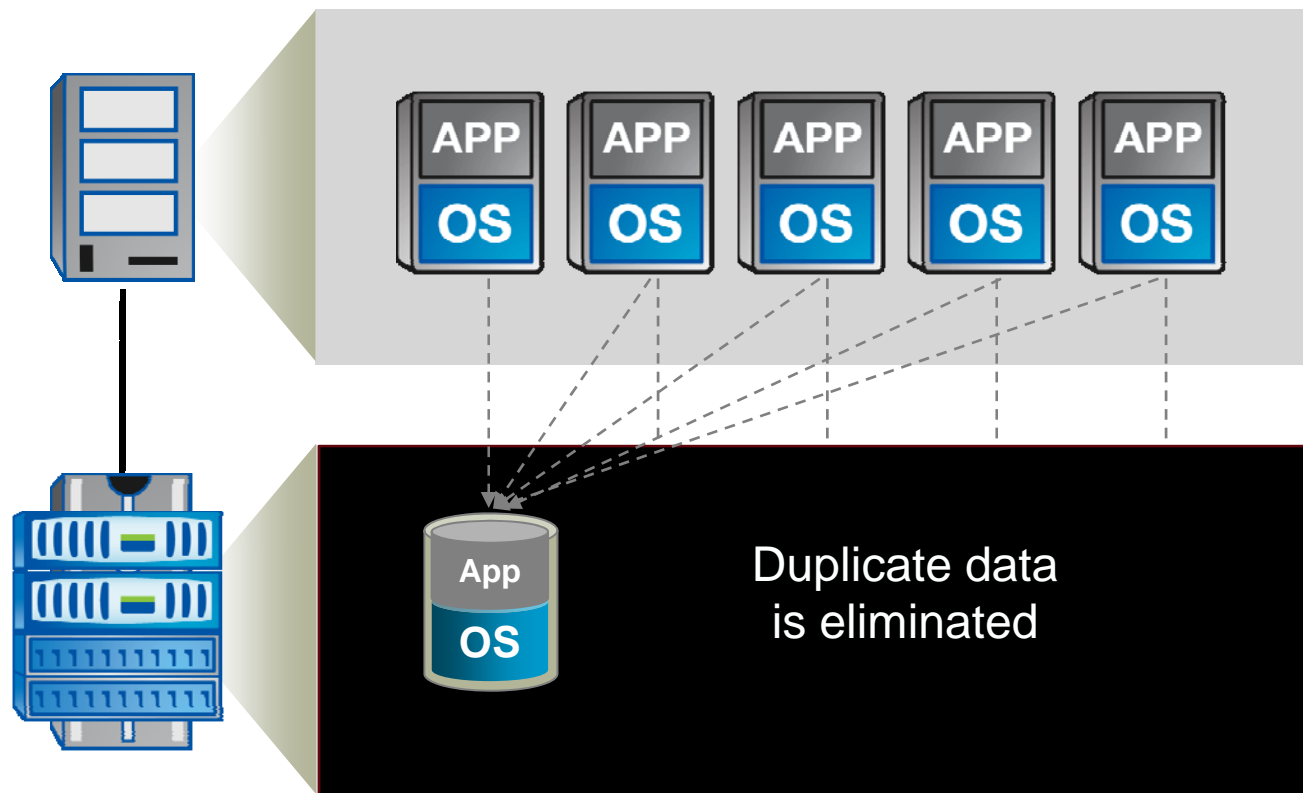
Source: Gartner Dataquest



Benefits of Shared Storage for VDI

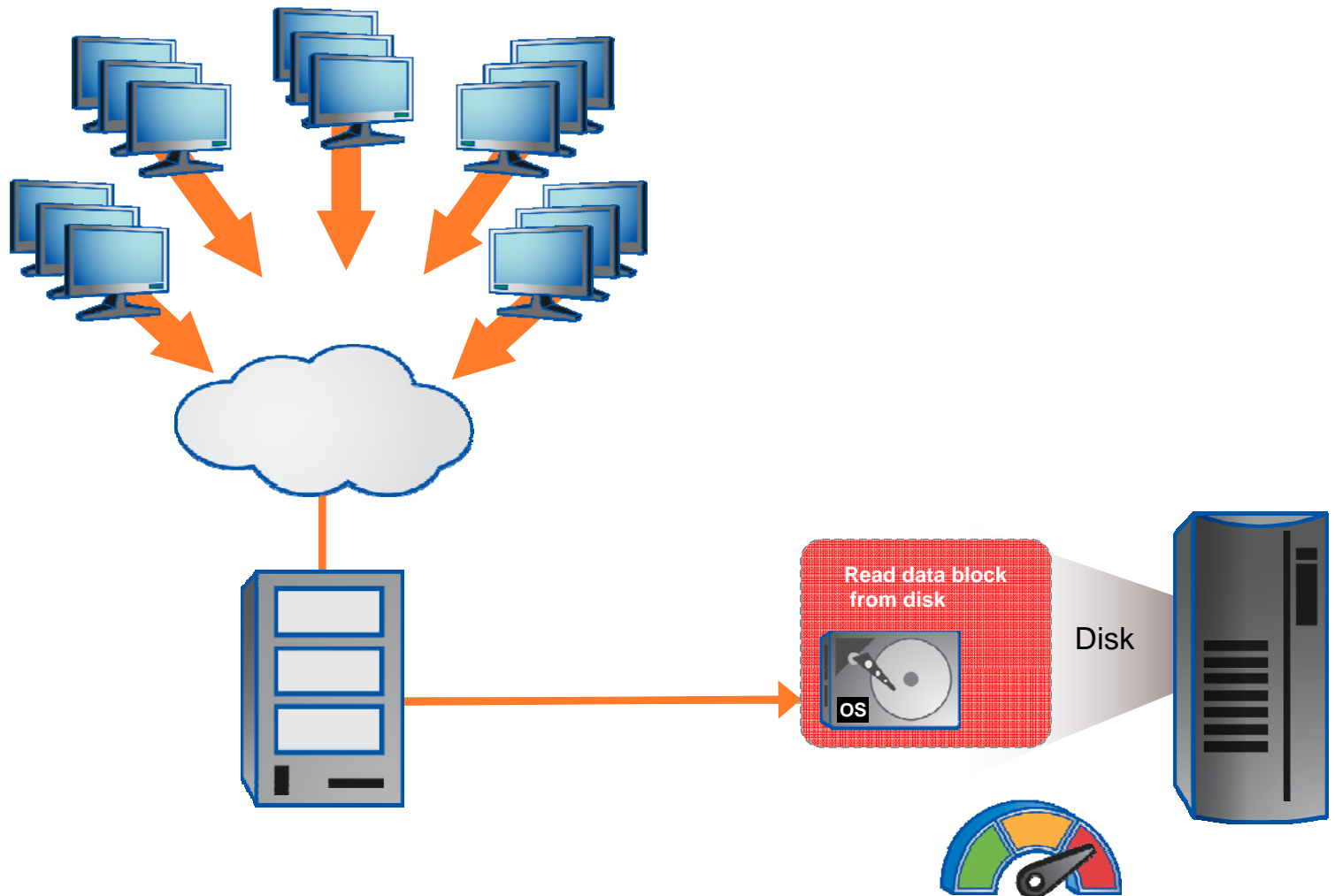
- Manageability
 - Automatic Migrations, failover
 - Storage-assisted VM Cloning
 - Centralized Management of Infrastructure & Images
- Unified storage, multi-protocol capability
 - For Desktops & User Data
- Performance acceleration
- Resiliency
 - High availability
 - Backup and recovery/data protection
 - Disaster Recovery

Deduplication for Extreme Storage Savings

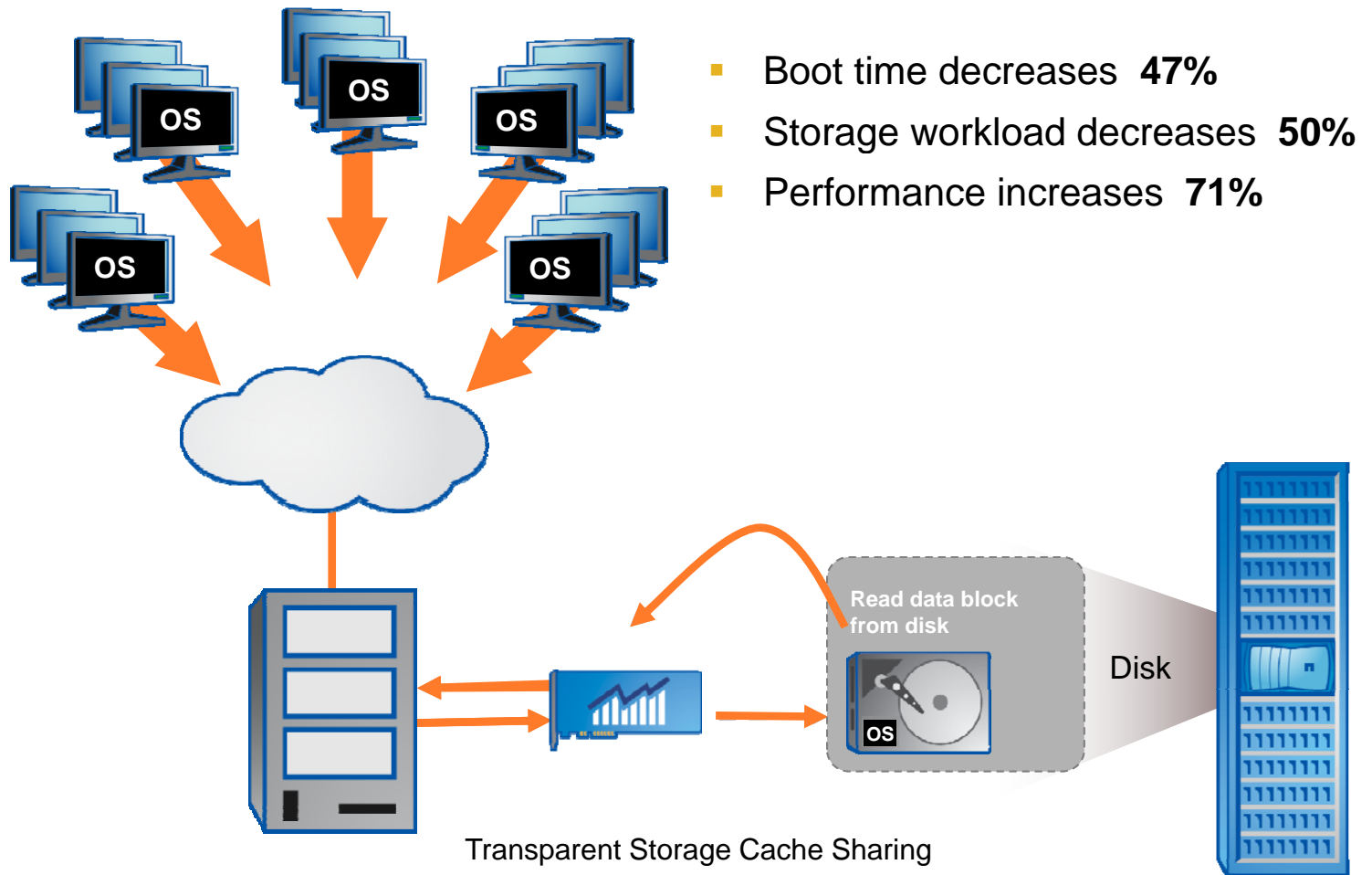


- Savings extend to all copies of the data
 - Including backup, DR, test clones and archival copies

Storage Impact on Desktop Performance



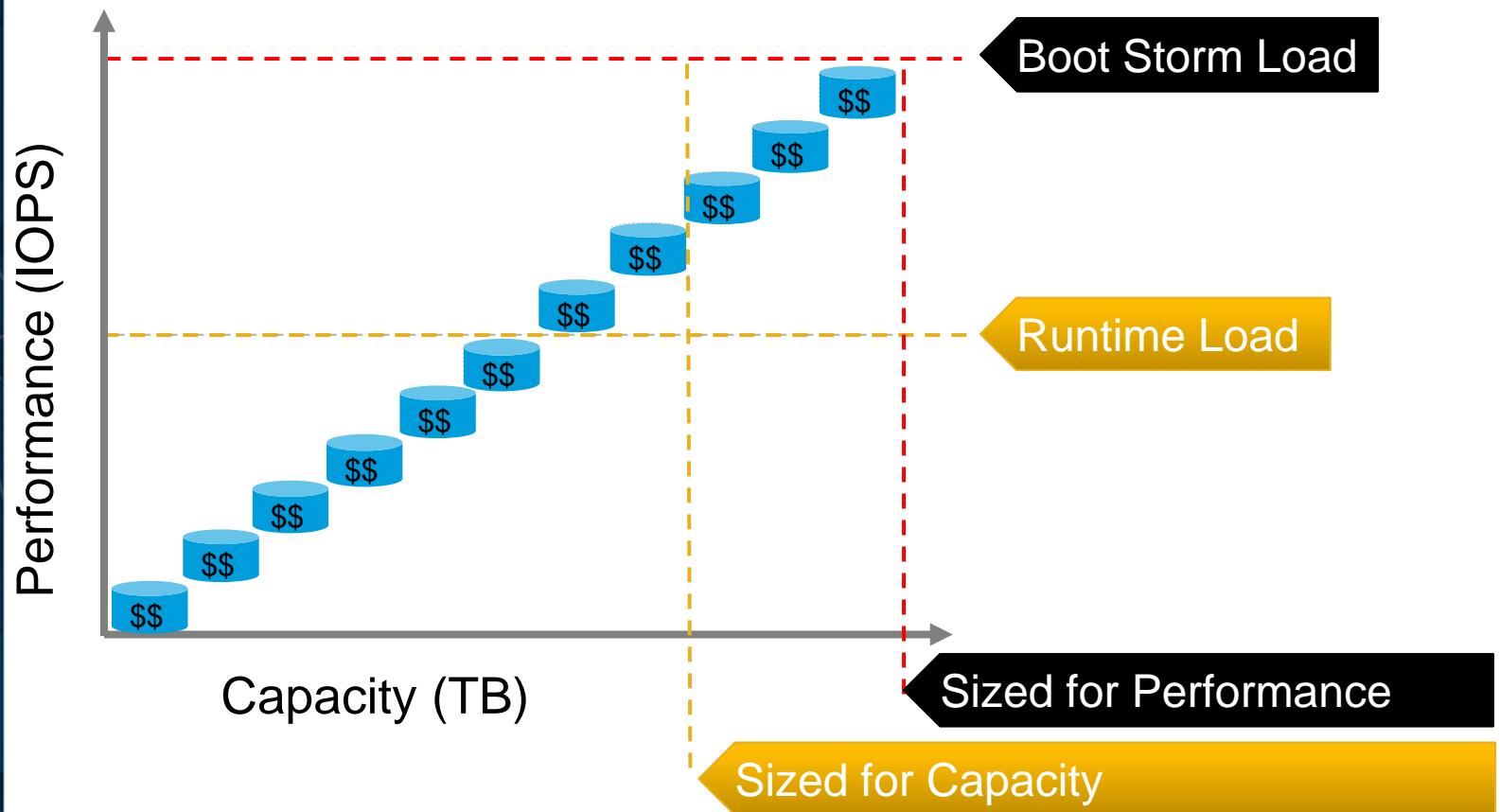
Eliminate Boot and Login Storms



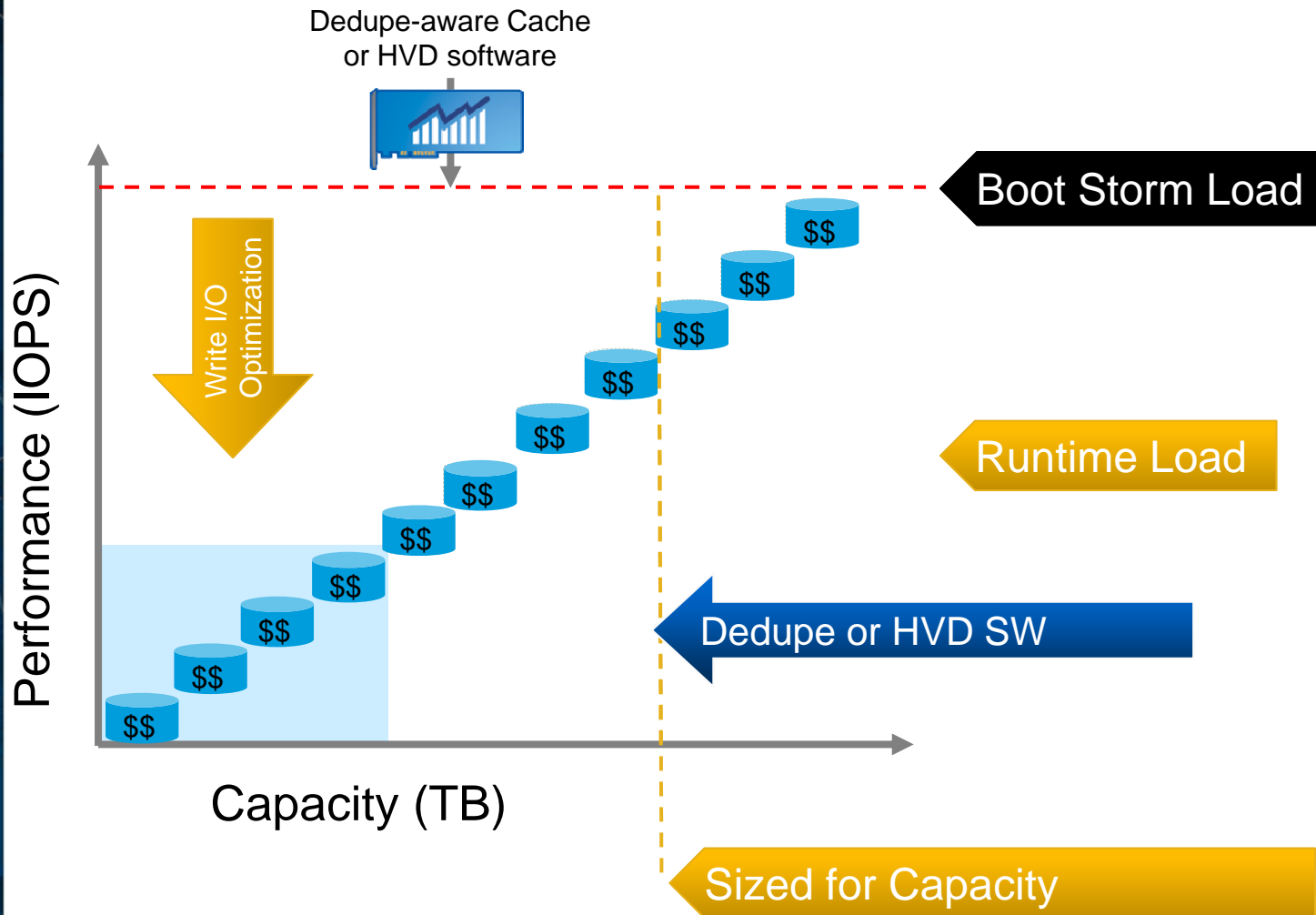
Desktop users aren't affected during simultaneous boot or log on

Challenges Unique to Virtual Desktops

Delivering Performance and Economics



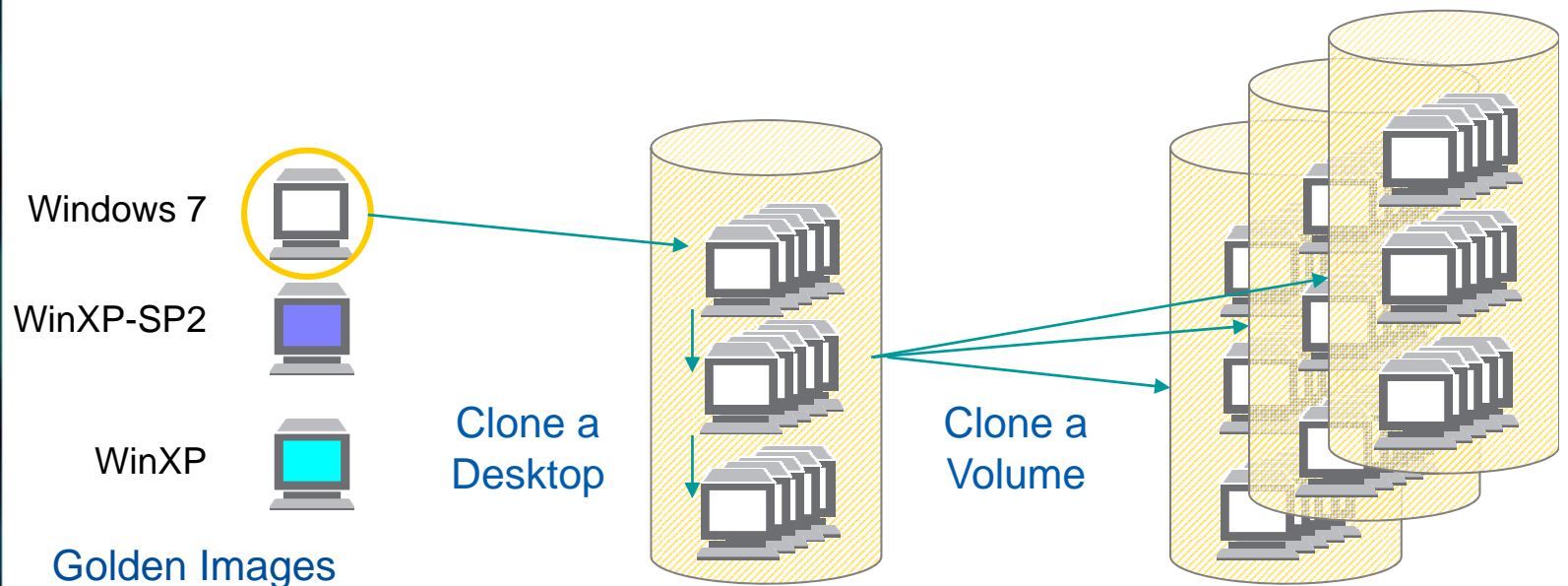
Delivering Performance and Economics





Enabling Agility...

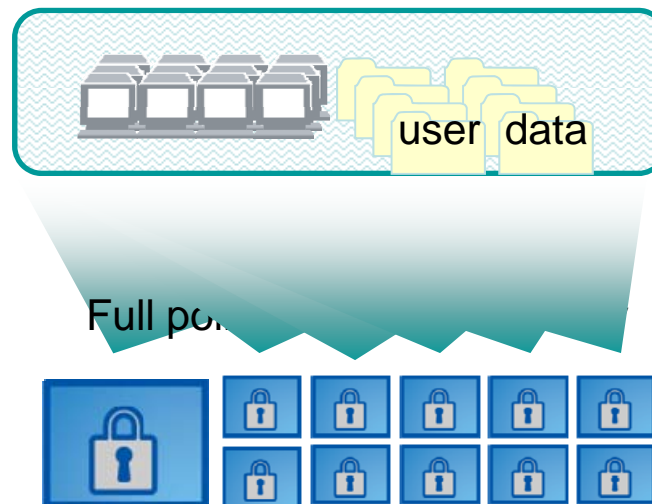
- Create 1000s of virtual desktops in a few minutes:
 - Install a security patch in minutes, vs. days
 - Bring new users on line quickly to meet demand
 - Agile “plumbing” enables agile IT processes
- Space Frugal Clones rapidly provisioned





Data Protection, Rapid Recovery

- Advanced storage features, integrated with desktop virtualization management console
 - Restore desktop to previous state
 - Restore user data to previous state
 - Restore and recover databases in a few minutes
 - Underlying technology: snapshots, typically hourly





Full Stack Integration Required

Management Integration:

Control, Automation & Service Delivery

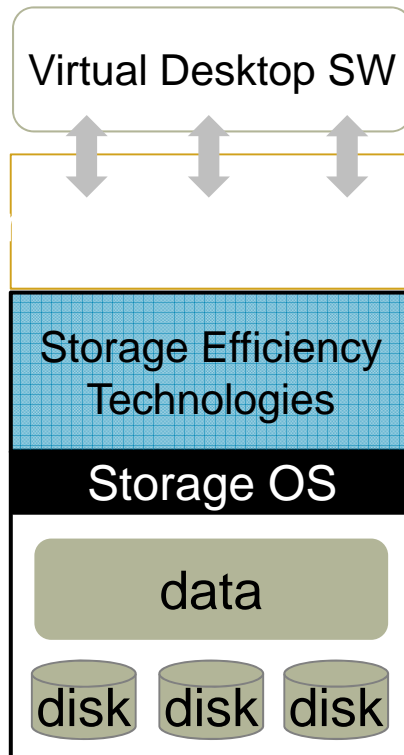
- Integrated data management
- Integrated data protection

Innovation that attacks data growth

- Reduces storage overhead with dedupe, cloning, thin provisioning, compression

Virtualized Storage Operating System

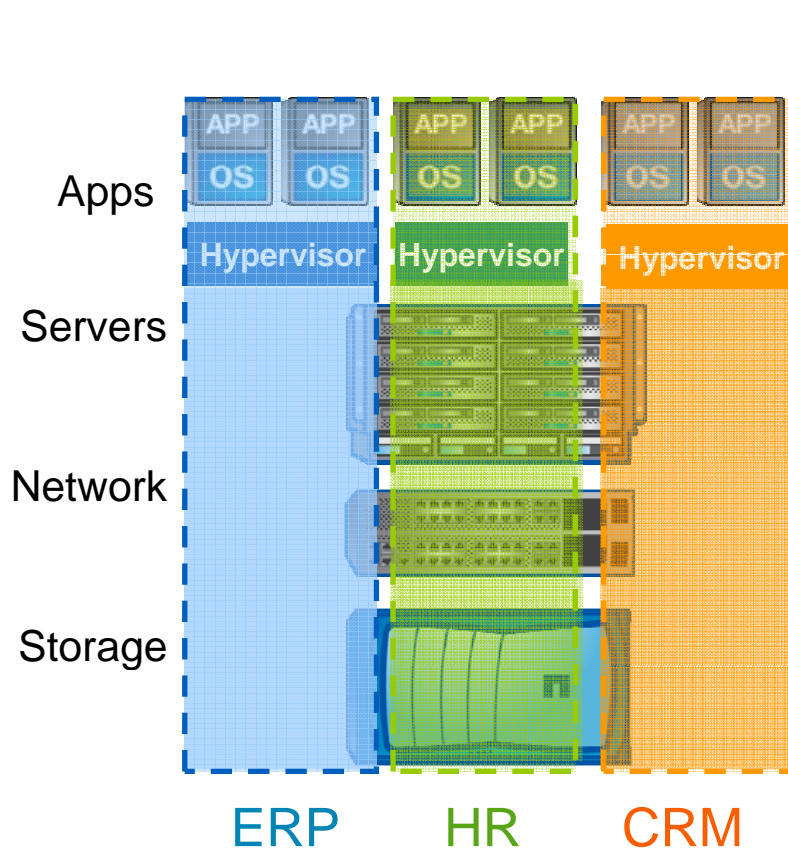
- Aggregates logical data from physical disks:
 - Within a single storage system
 - Across multiple storage systems
 - Among multiple vendor's systems
 - Across locations





Securely Share Your Infrastructure

No Compromise: Share, Control, and Improve Efficiency



Secure Shared Resources

- End-to-end isolation
- Share more infrastructure across all your customers and applications
- Share more = save more
- Maintain the same control physical silos provided
- Increase infrastructure efficiency
- Reduce risks in deploying shared infrastructures



50,000 Seat VDI Deployment

- World's largest documented VDI deployment
- Industry leaders collaborating together
- Cutting edge hardware and software
- Validates performance and scalability of solution
- Proof-point for technology, integration, & best practices



Goals of the Reference Architecture

1. Create a "POD" design that is...
 - Scalable
 - Cost Effective / Efficient
 - High Performing
 - Proven
2. Thorough solution component testing
 - Hypervisor, Server, Network, Storage, Thin Clients
 - State-of-the-art desktop OS and virtualization SW
 - Randomly generated workloads on desktops
3. Provide a blueprint to customers



5000 Seat POD Architecture

WYSE Zero Client



VMware View 4.5

Windows 7

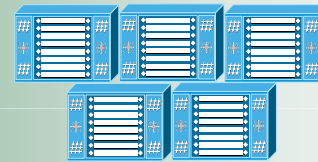
VMware vSphere 4.1

Connection Broker



Hypervisor

Cisco UCS 5100
Blade Server (60 blades)

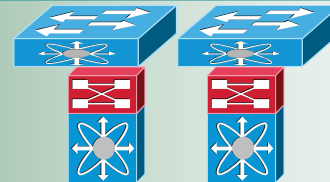


Cisco UCS 6100
Fabric Interconnect



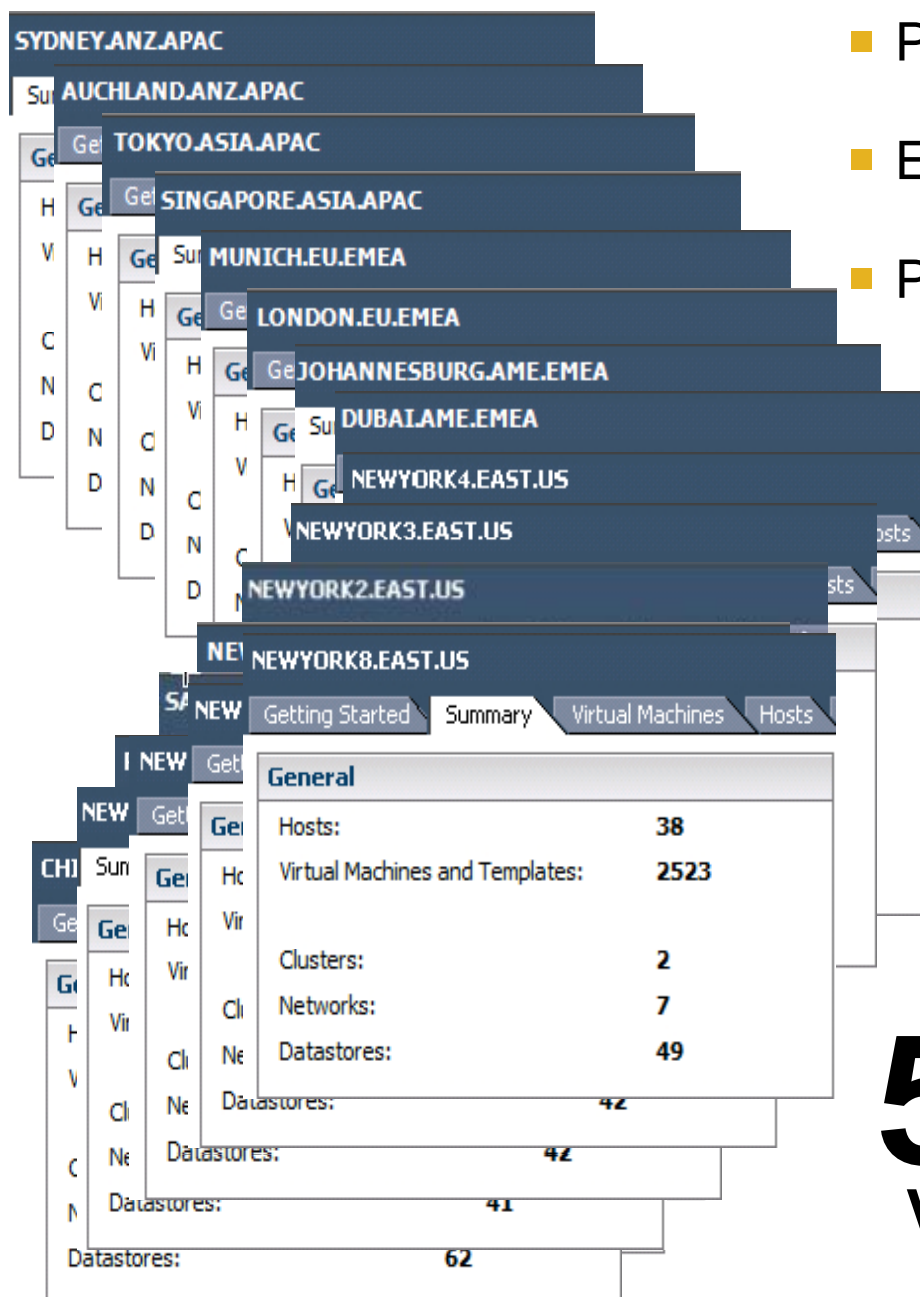
Cisco Nexus 5020

Cisco Nexus 7018



NetApp FAS 3170 Cluster





- Pod-based architecture
- Easily expandable
- Predictable performance

50,000
Virtual Desktops



Roadmap for Large-scale Deployments

- **Virtualize** everything
 - Servers, Networks, Storage, Desktop
- **Standardize** architectures
 - Converged networks & unified storage
- **Optimize** for greater efficiency
 - Deploy automation & efficiency technologies
- **Deploy** in phases
 - Test, scale, test, deploy

Networked Storage Enables Large-scale Desktop Virtualization



Addressing the Storage Challenges

Challenges

Agility and provisioning

End user experience

Security, availability

Economic challenges

Answers

- Rapid cloning

- Performance acceleration
- Intelligent cache

- Storage-based backup & DR
- Self-service file recovery

- Deduplication
- Storage-based cloning
- Storage Efficiency

COMPUTERWORLD

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SNW

OCTOBER
11-14
2010

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