NetApp

Go further, faster

Data Protection for Oracle

HroUG Conference, Rovinj

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What do dou need to be able to Go Further, Faster?

Increase Business Agility

Accelerate application deployments

Reduce time for upgrades or changes

Reduce Infrastructure Cost

Require less storage

Lower administration costs

Minimize Risk

Reduce downtime

Recover quickly from user errors

NetApp's Solution Focus

1 Simplifying Infrastructure

Consolidation, Virtualization, Easy Provisioning, Fast Cloning.....

2 Backup & Recovery

Increase availability, decrease backup and restore times

3 Business Continuance

Mirror sites to remote locations for instant recovery

4 Manage Archiving And Compliance

Integrate storage for archiving

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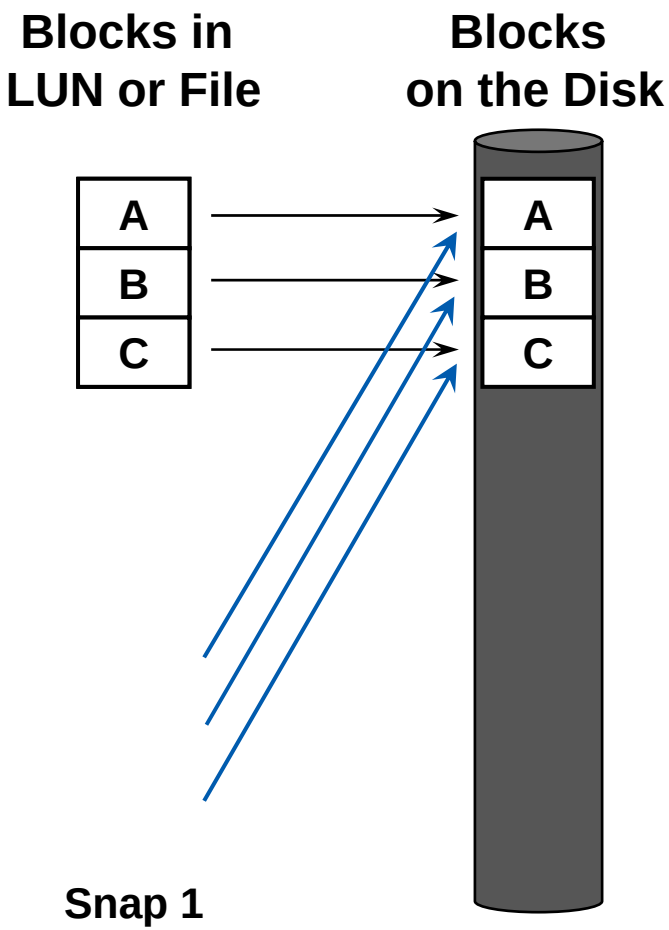
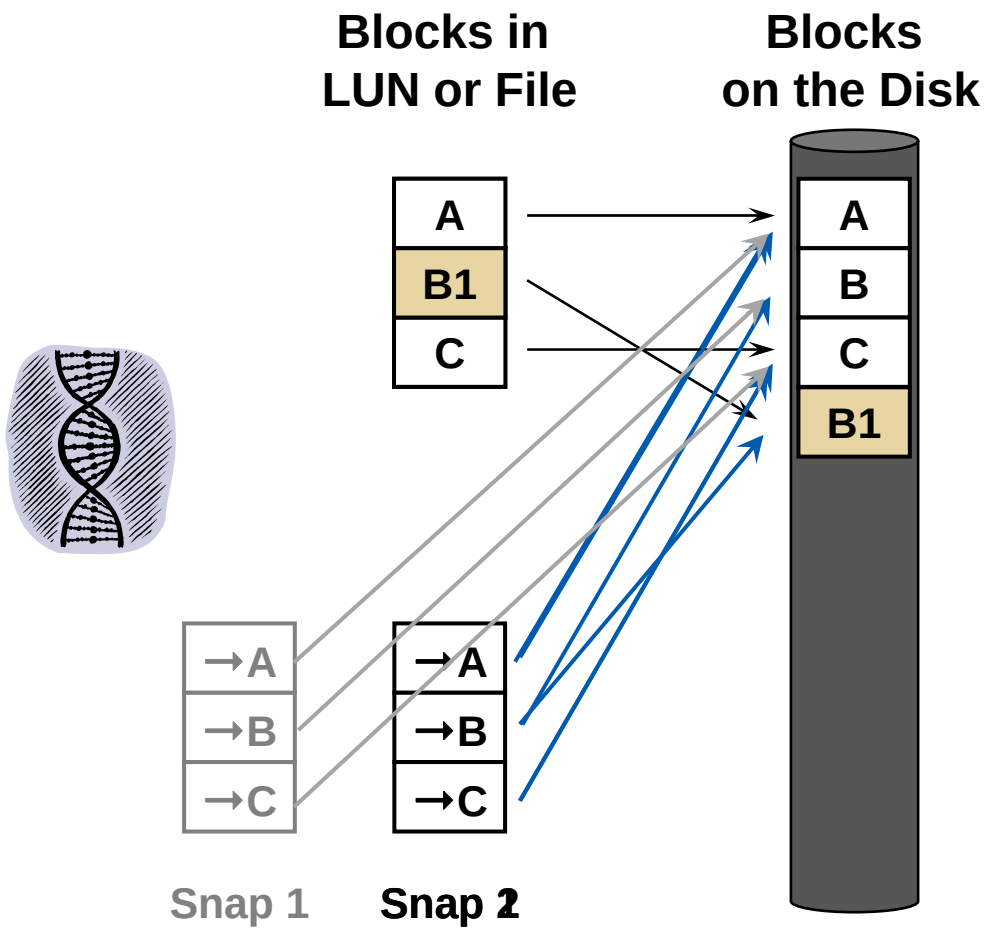
The Foundation – NetApp Snapshot™ Technology



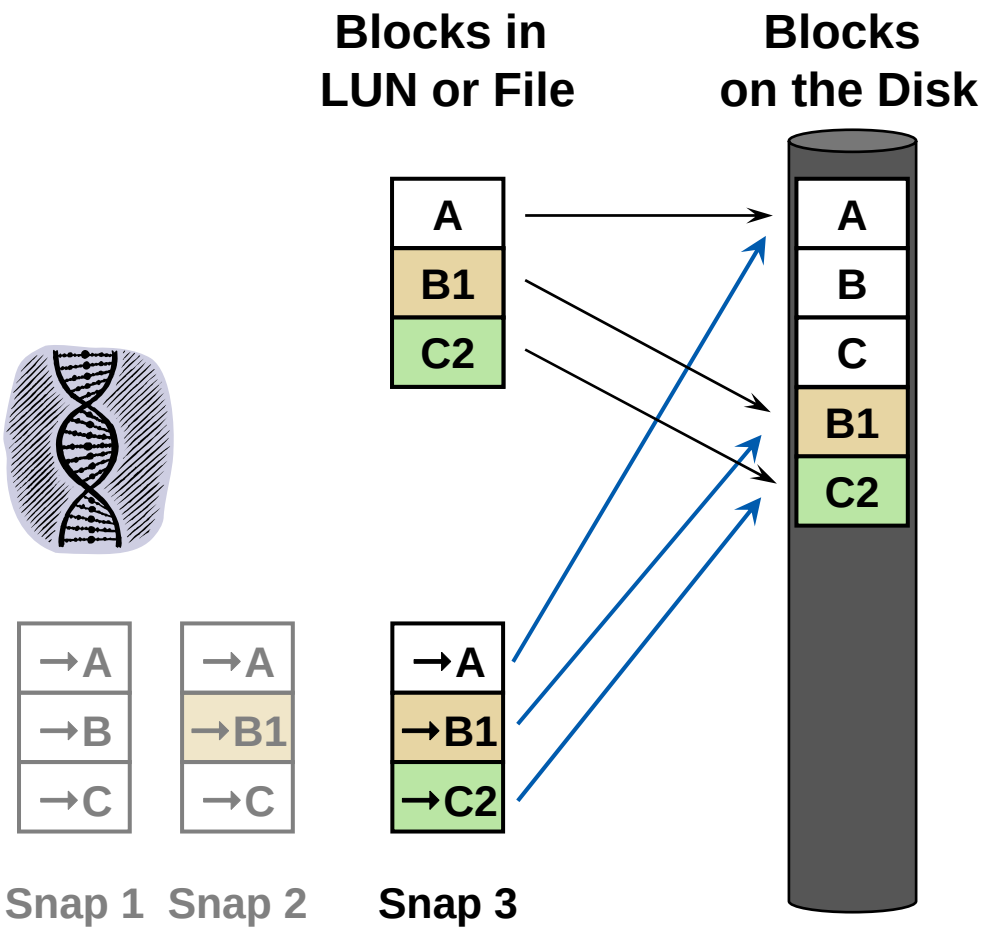
- Take snapshot 1
  - Copy pointers only
  - No data movement

The Foundation – NetApp Snapshot™ Technology



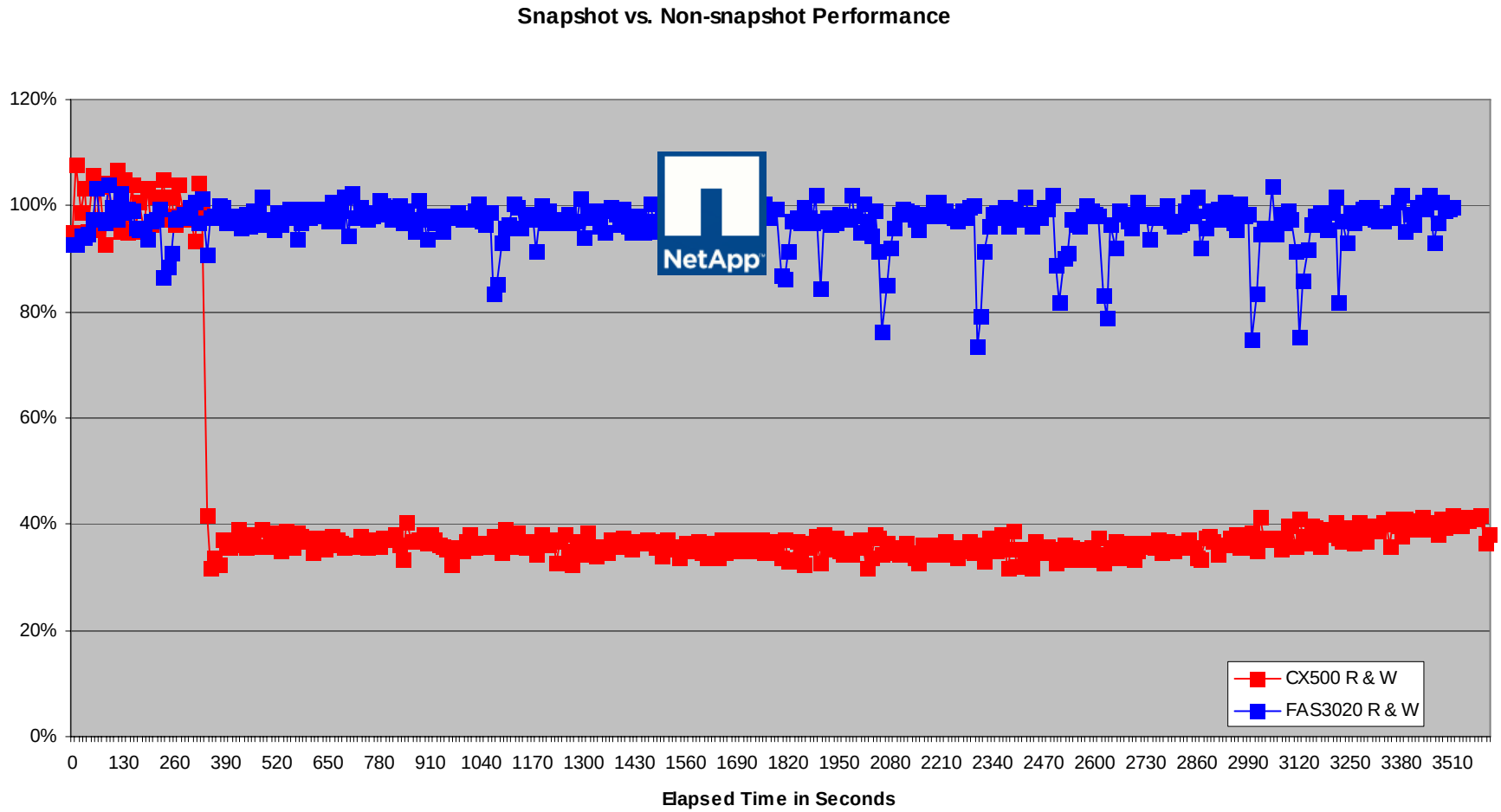
- Take snapshot 1
- Continue writing data
- Take snapshot 2
  - Copy pointers only
  - No data movement

The Foundation – NetApp Snapshot™ Technology



- Take snapshot 1
- Continue writing data
- Take snapshot 2
- Continue writing data
- Take snapshot 3
- Simplicity of model
  - Best disk utilization
  - Fastest performance
  - Many snapshots

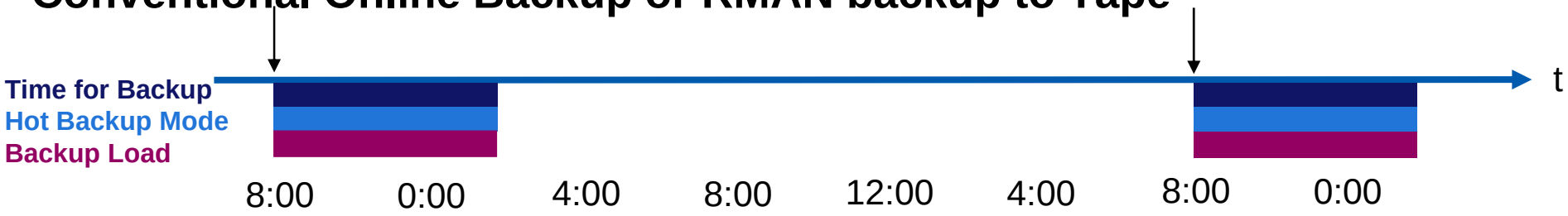
Real World - Snapshot Performance



CX500 Performance with Snapshots goes to < 40%

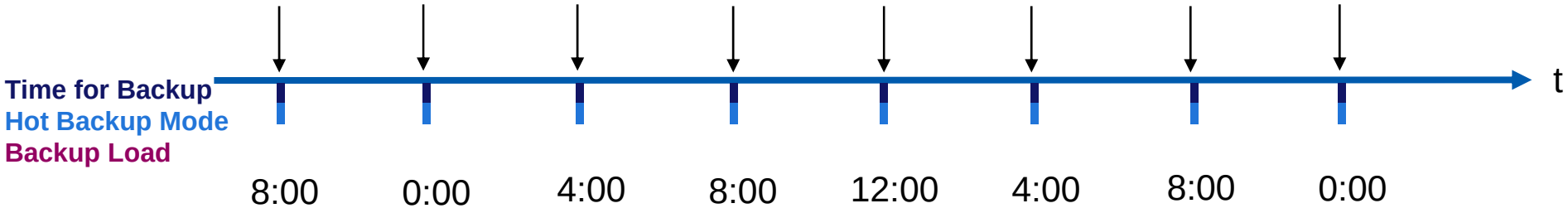
Snapshot Backup versus Tape Backup

Conventional Online Backup or RMAN backup to Tape



- Online or offline database backups take several hours
- Significant backup load on database server and storage
- Database backups are typically scheduled once a day

Online Backups based on Snapshots

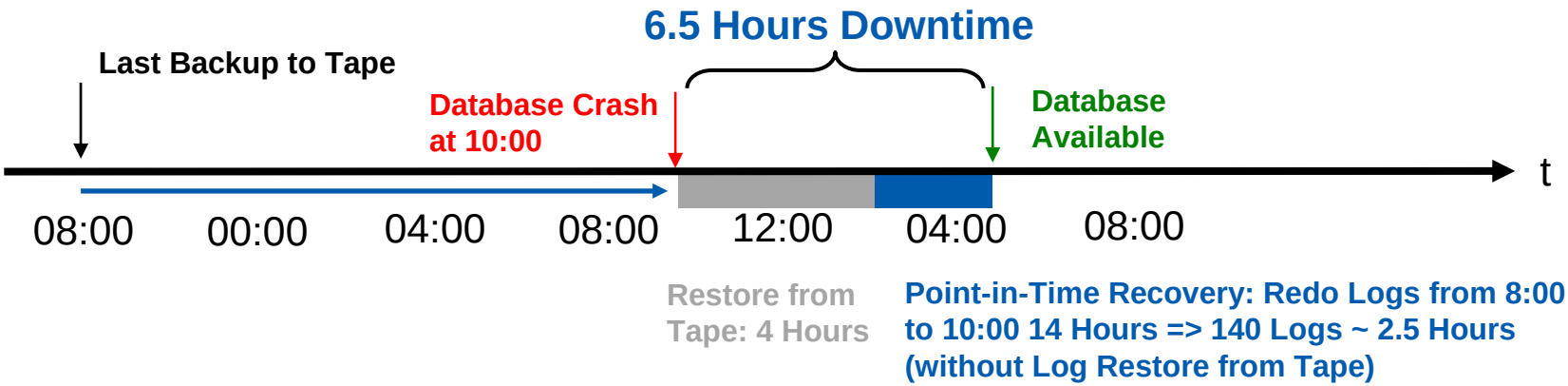


- Online or offline database backups in seconds
- No backup load on database server and storage
- Database backups can be scheduled more often e.g. every four hours

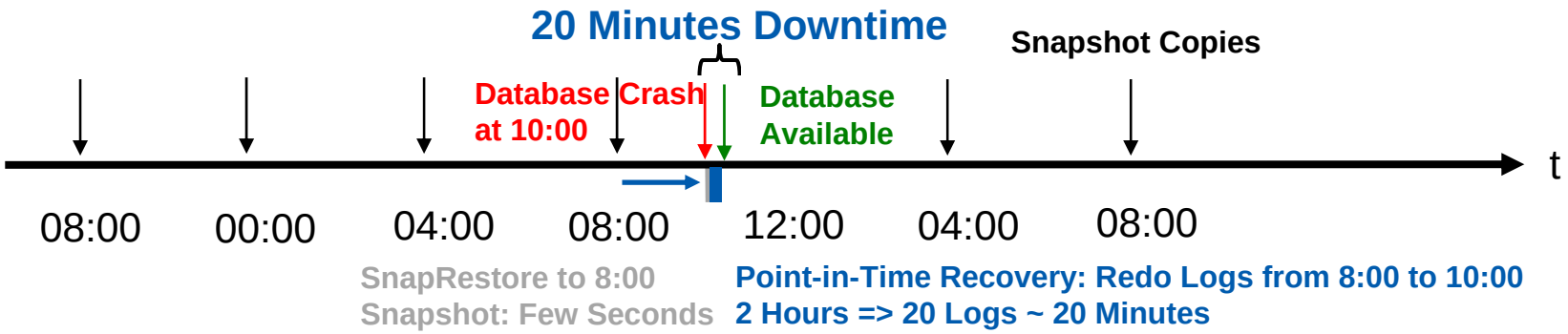
Restore and Recovery

- Database Size 700GB, Tape Restore with 50MB/s = 175GB/h
- System Produced 10 Redo Logs/Hour, Applying one Redo Log Takes 1 Minute

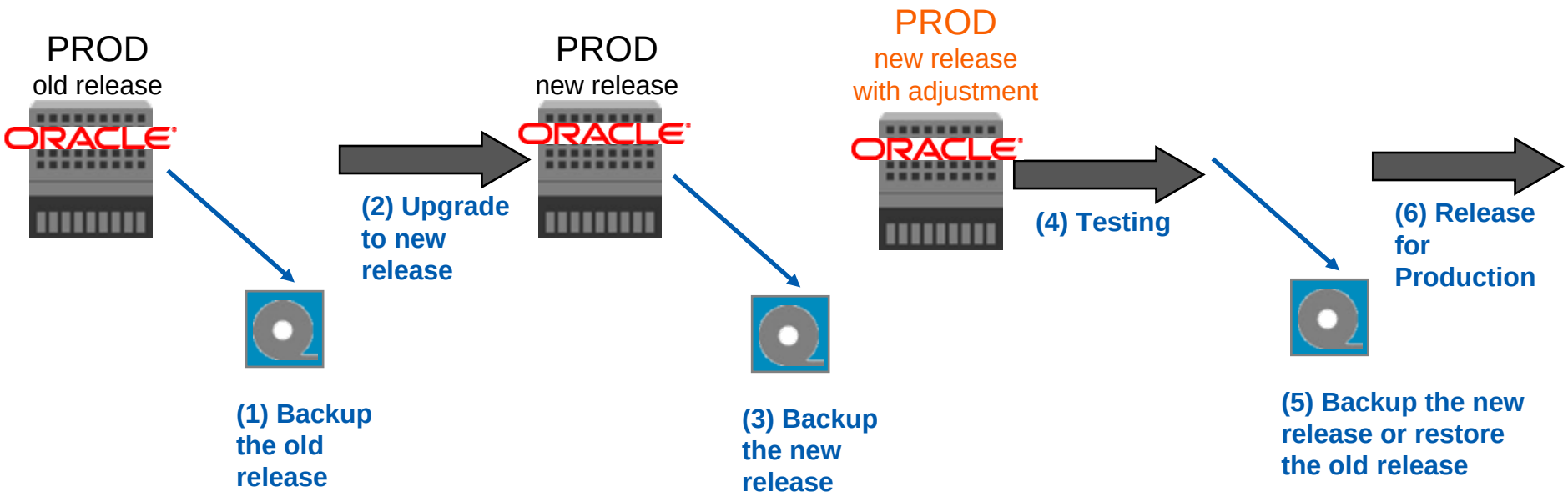
Conventional Tape Restore / Recovery

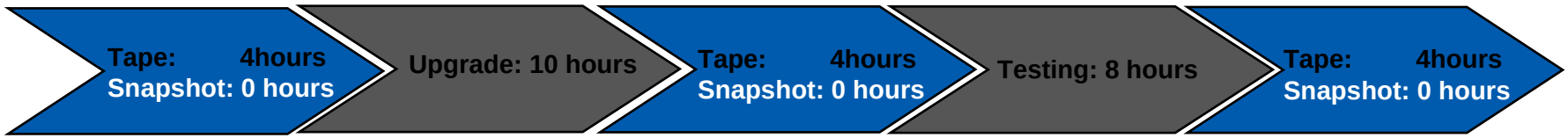


Restore / Recovery with Snapshot and SnapRestore



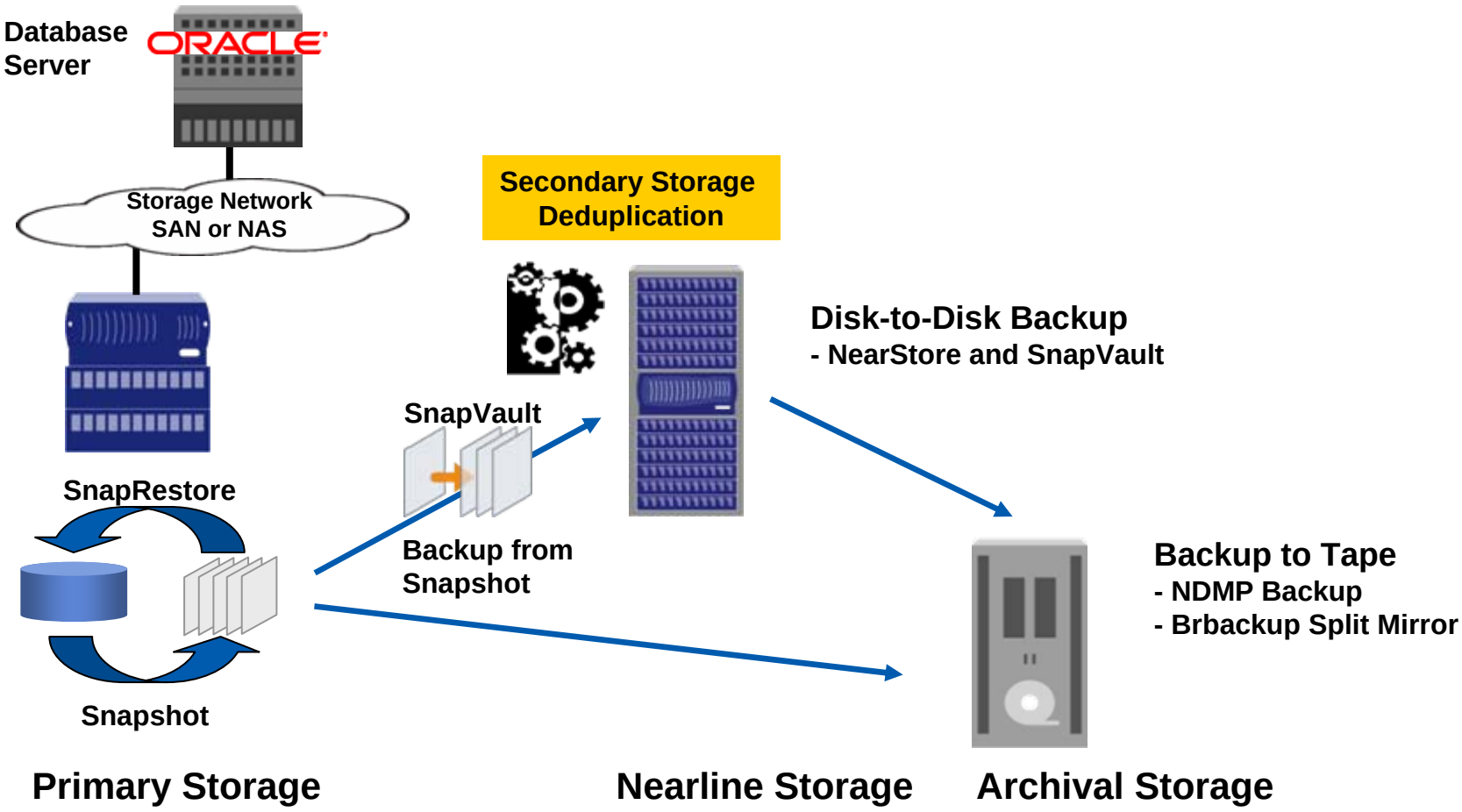
Application Upgrade – The Added Value



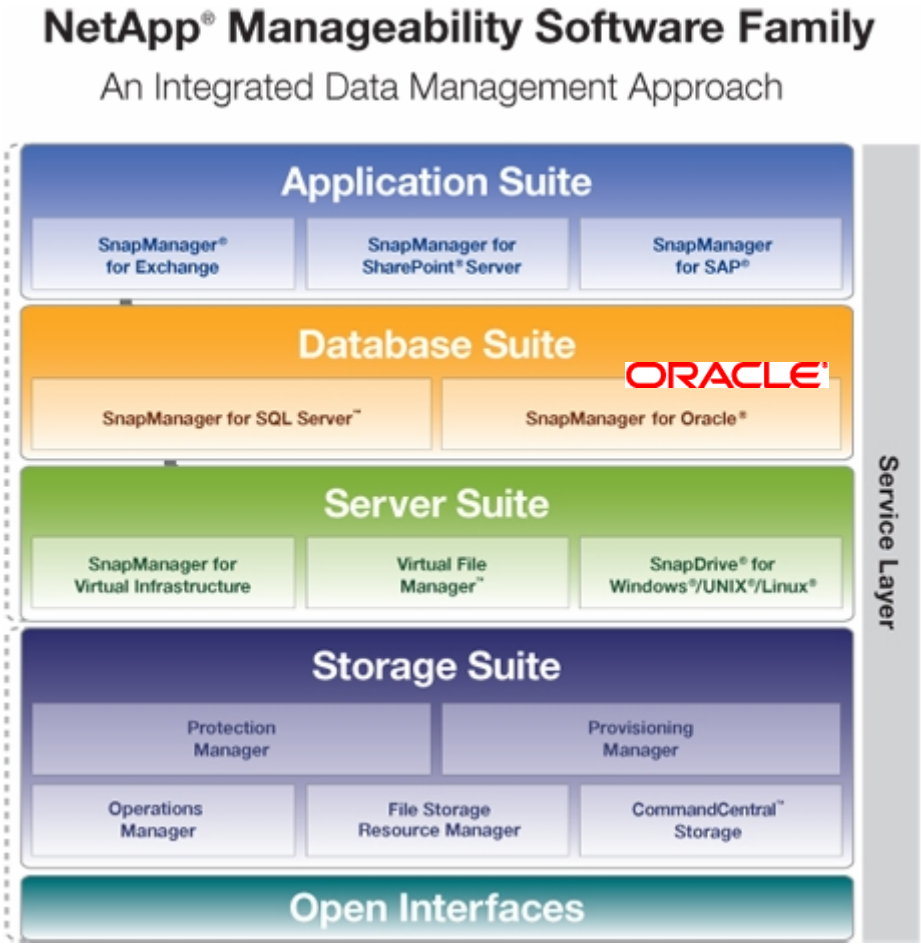


- ⇒ **Upgrade process and testing: 18hours**
- ⇒ **Backup: 12 hours**
- ⇒ **Productive system downtime reduced by 12 hours with Snapshot and SnapRestore**

Backup & Recovery- The Complete Picture



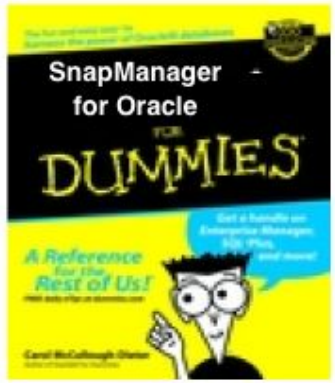
NetApp Manageability Software Family



- Bus. Applications Uptime:
  - **Enhanced data management for Oracle and Exchange**
- File Consolidation:
  - **Virtualized management of distributed files, simplifies migration & protection.**
- Backup and DR:
  - **Automating data protection in D2D environment**
- Storage Infrastructure:
  - **Extending manageability to high-end heterogeneous environments**

Increasing business value with higher productivity and flexibility

Snap Manager for Oracle



- *SnapManager for Oracle* provides Integrated Data Management for Oracle databases:
  - Application consistent snapshots
  - Recovery of data in case of errors or disaster
  - Clone for Test and Development

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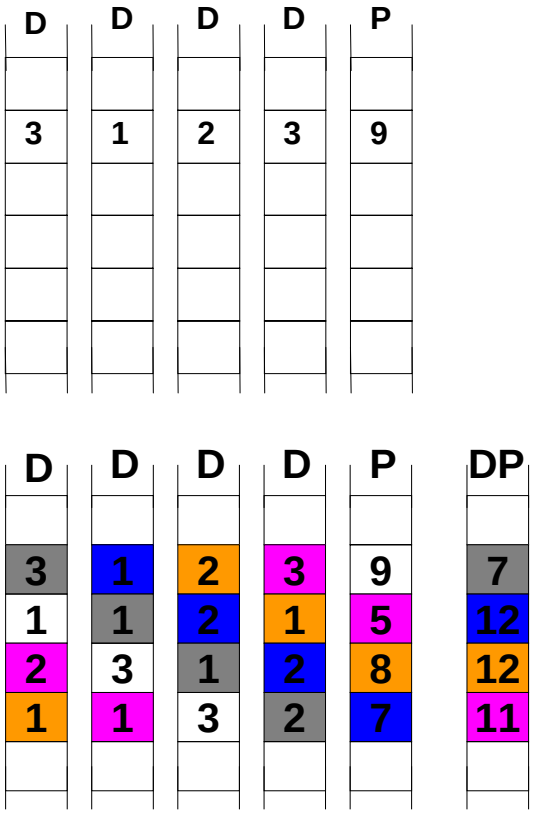
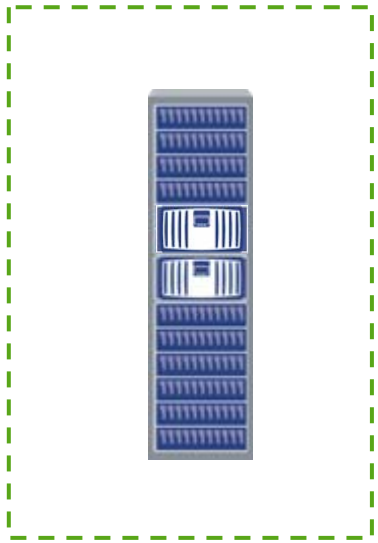
Studies And Surveys

- According to study over 50% of companies make no effort whatsoever to prevent avoidable disasters
- Of those companies that do plan, fewer than 50% actually have tested the strategy they developed (which is like having no strategy at all…..)
- Only 3% were confident that they can carry on with business as usual if a disaster strikes
- U.S. government study on the disasters and downtime on business and employment show that:
  - 93% of companies that suffer a significant data loss are out of business within five years ***(U.S. Bureau of Labor).***
  - 43% of U.S. businesses never reopen after a disaster, and 29% close within two years ***(University of Wisconsin).***
  - 30% of computer users say they spend the equivalent of one week per year reconstructing lost data ***(3M Corporation).***

NetApp RAID-DP® and Local Cluster Implementations

RAID-DP is an advanced, cost-effective solution protecting information in the event of a double disk or media failure within a single RAID group





FAS Storage System with RAID 4/RAID-DP

RAID-DP

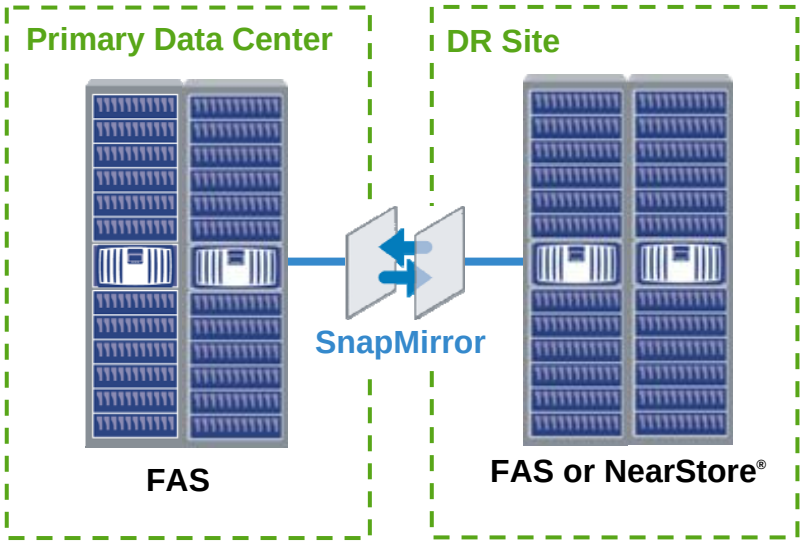
- Only Available from NetApp
- Extension to RAID4 Parity Scheme
- Provides Double Parity Protection

FAS Cluster

- Active/Active Cluster Providing Controller Outage Protection
- Controller Failover
- Local HA Solution

NetApp SnapMirror®

SnapMirror is a simple, flexible and cost-effective replication solution that enables you to protect more of your applications



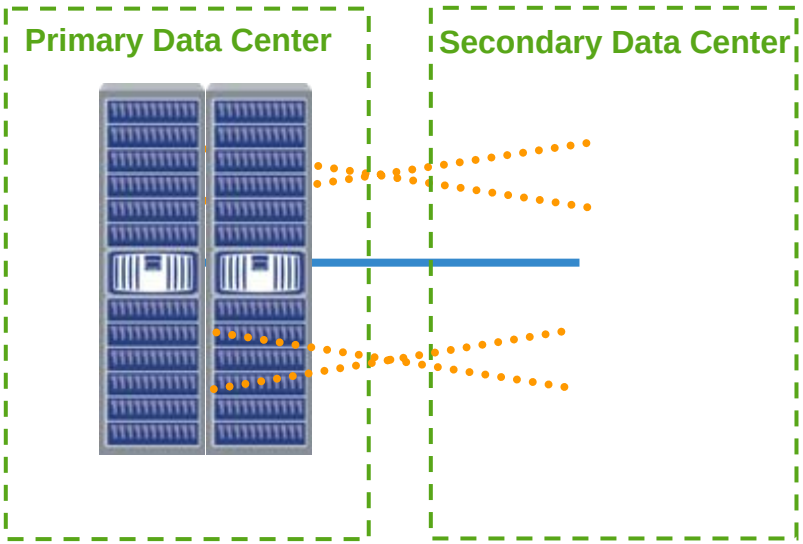
Proven technology – over 10K licenses installed

Benefits

- **Simplifies deployment and management**
  - Simple set up and recovery
  - Single product across all storage systems
  - Leverages SnapManager®, ensuring replication of application consistent snapshots
- **Cost-effective solution**
  - Mirror between FC and ATA systems
  - Leverages Snapshots – efficient storage and bandwidth utilization
- **Puts DR copy to active business use**
  - Remote read access for centralized backup, data distribution to remote sites
  - Remote clones for app testing, QA and production staging
  - Space efficient copies without impacting production system

NetApp MetroCluster®

MetroCluster is a unique, cost-effective synchronous replication solution for combined high availability and disaster recovery within a campus or metro area



FAS Cluster with SyncMirror

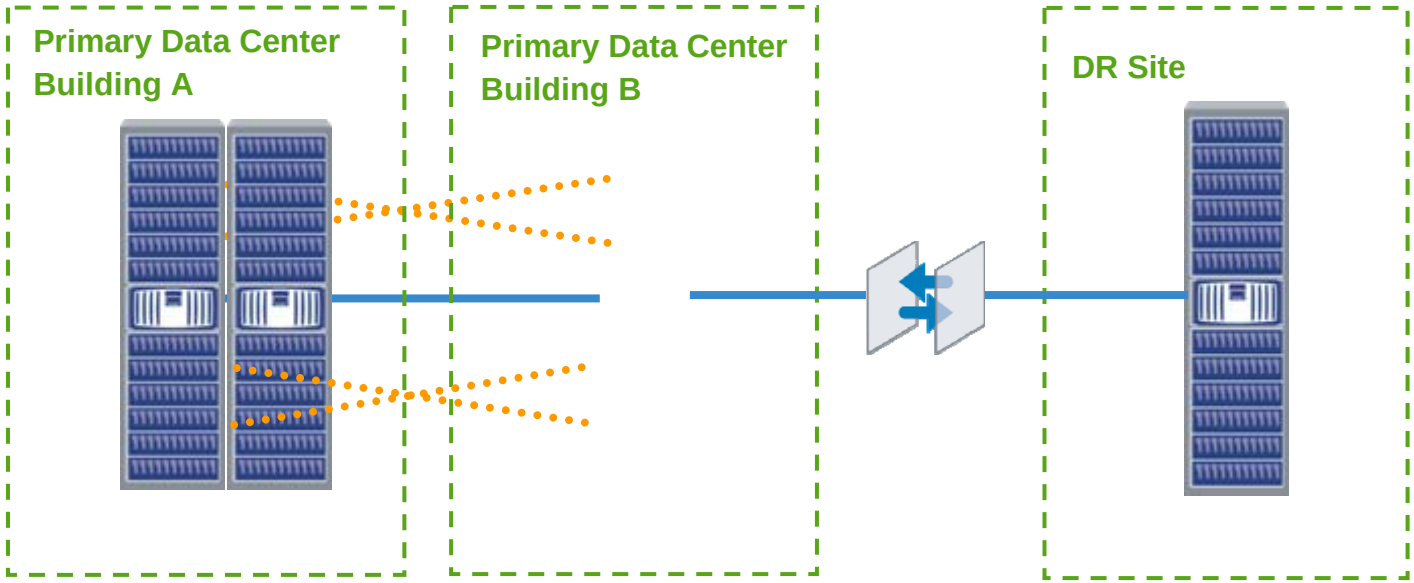
FAS MetroCluster with SyncMirror

Configurations

- Stretch MetroCluster provides Campus DR protection
  - Can stretch up to 300m
- Fabric MetroCluster provides Metropolitan DR protection
  - Can stretch up to 100km with FC switches

NetApp DR = Highest Variability

The NetApp technology enables various combinations of MetroCluster and Snap Mirror or Snap Vault implementations to fit exactly the customer needs and unique highly sophisticated DR scenarios



FAS Cluster with SyncMirror

FAS MetroCluster with SyncMirror

SnapMirror
SnapVault

NetApp™

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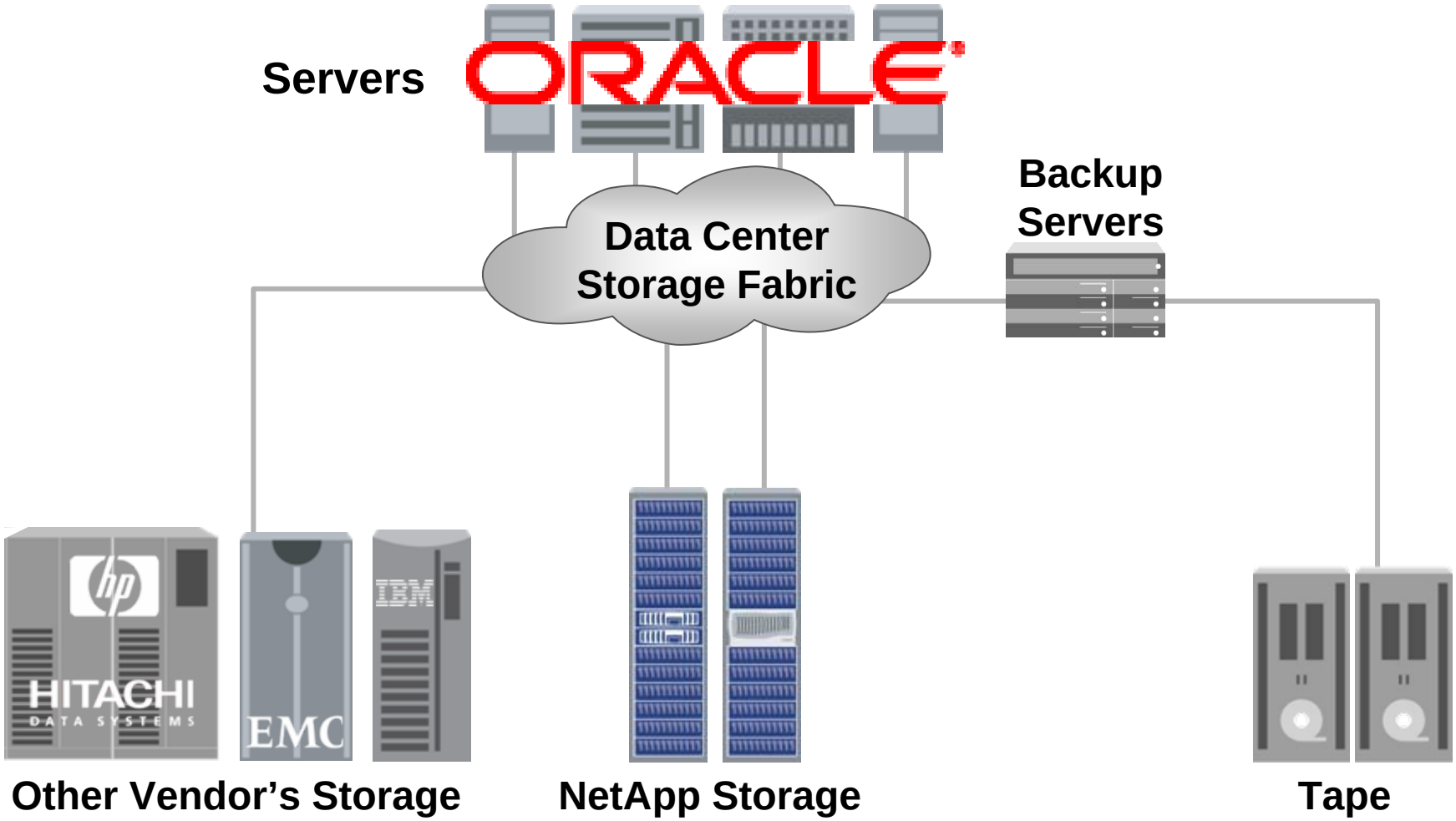
NetApp in Heterogeneous Environments

Heterogeneous Environments



FAS Series & Data ONTAP®

NetApp's Solutions for heterogeneous Environments

1 **NetApp V-Series**

Full virtualisation of non NetApp storage

2 **OSSM**

Synchronous mirroring of heterogeneous FC-SAN environments

3 **NetApp Nearstore VTL**

Heterogeneous D2D backup

4 **Decru**

End to end encryption solution

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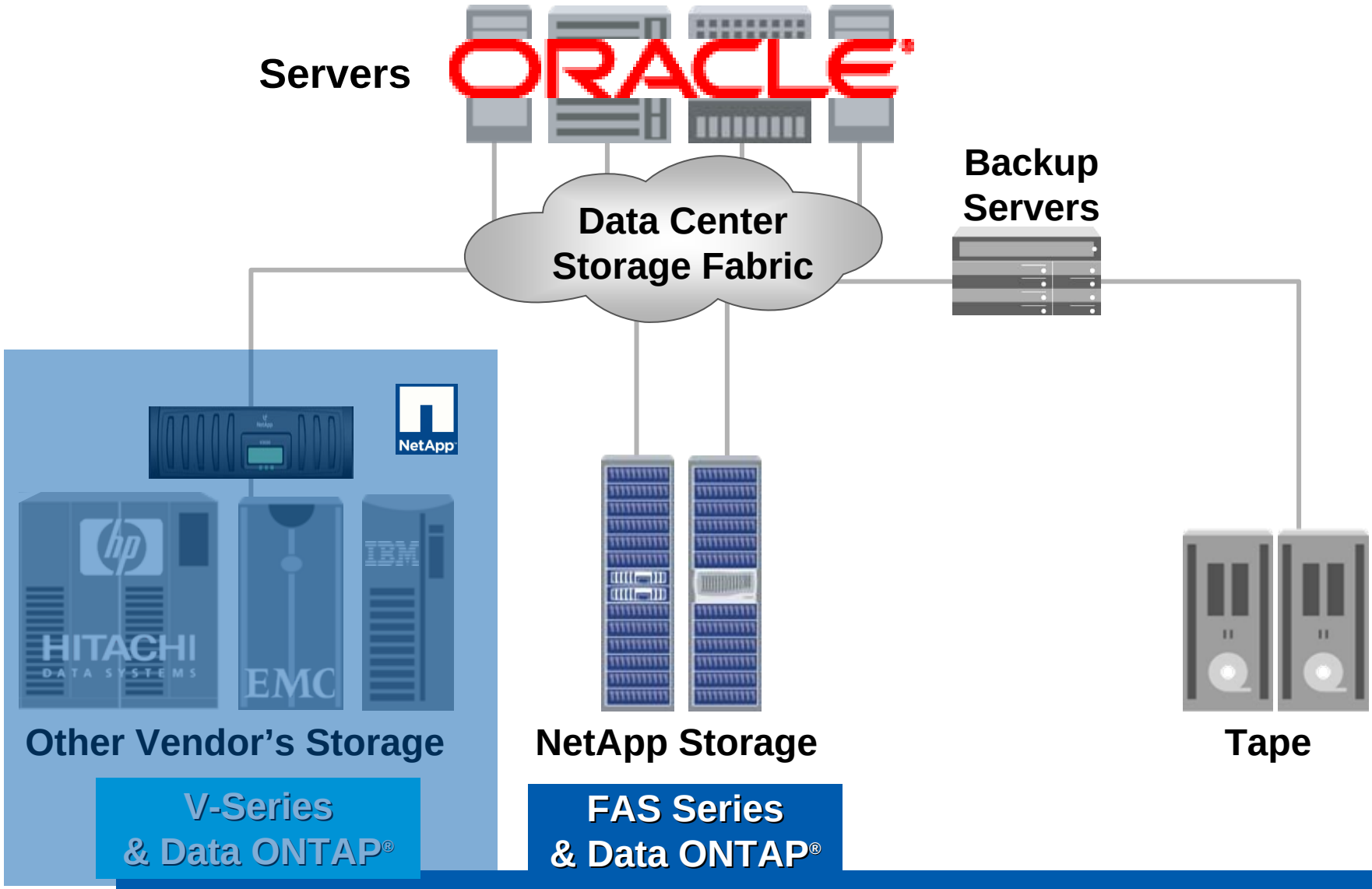
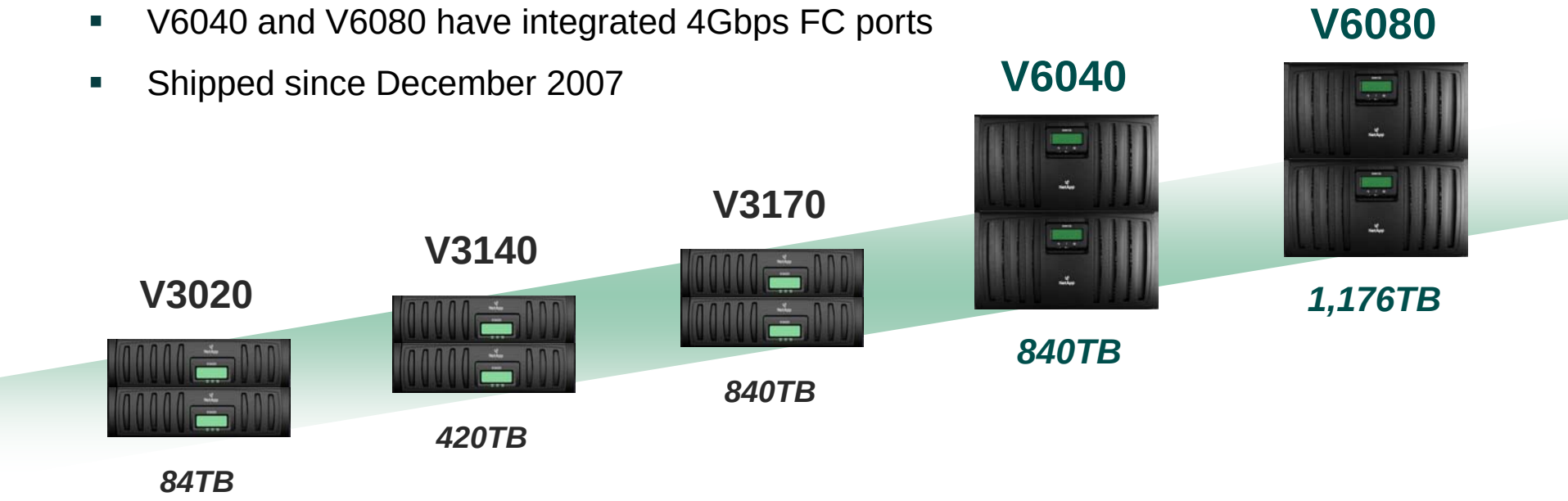
Heterogeneous Environment with NetApp V-Series



NetApp V-Series – *Virtualization for Heterogeneous Storage Environments*

Second-Generation V6000 Series

- V6080 scales to 1,176TB raw capacity (via up to 1,176 back-end LUNS)
- V6040 and V6080 have integrated 4Gbps FC ports
- Shipped since December 2007



Tiered Heterogeneous Storage

IBM HITACHI DATA SYSTEMS hp invent EMC² where information lives FUJITSU 3PAR Serving Information

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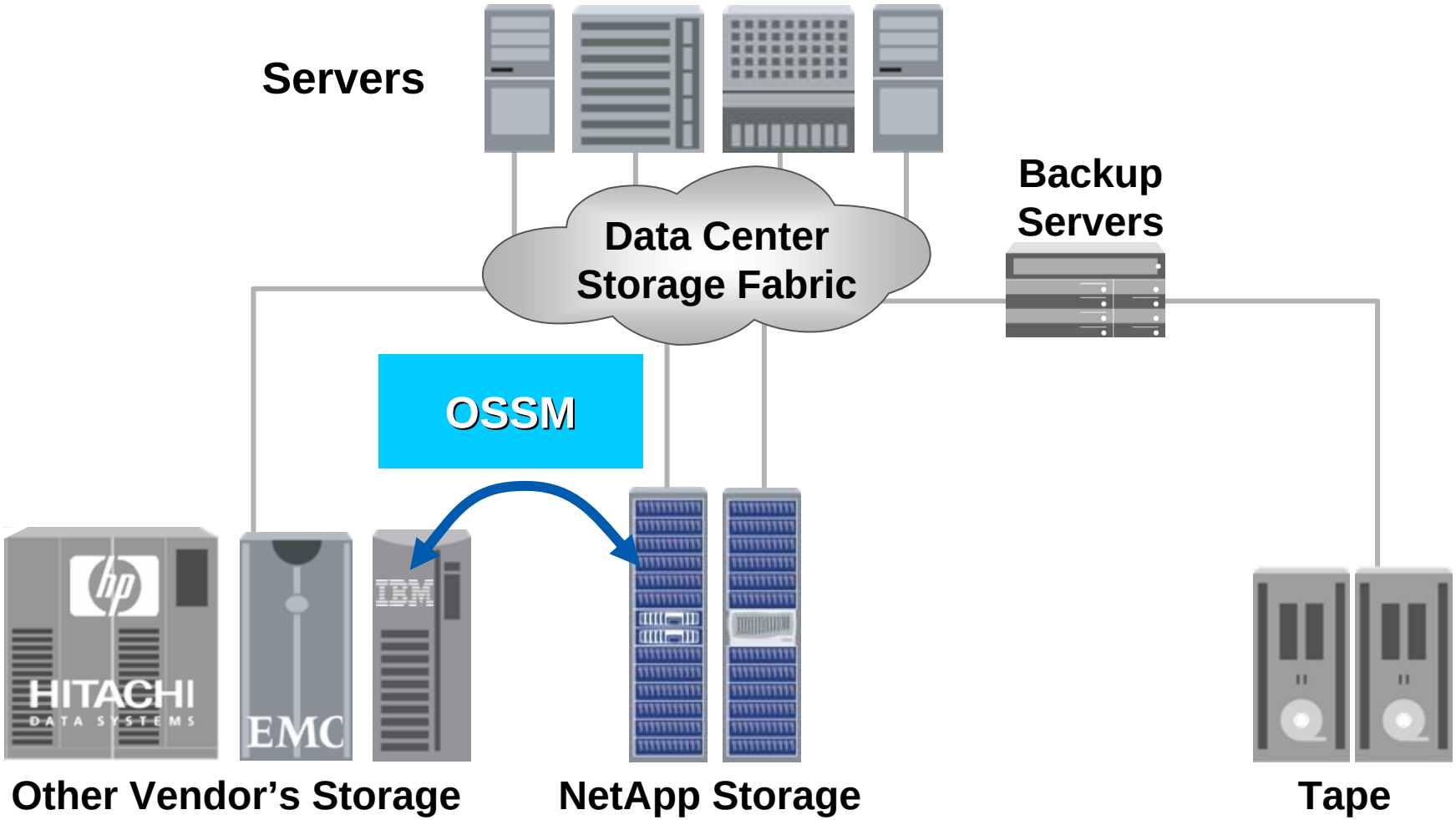
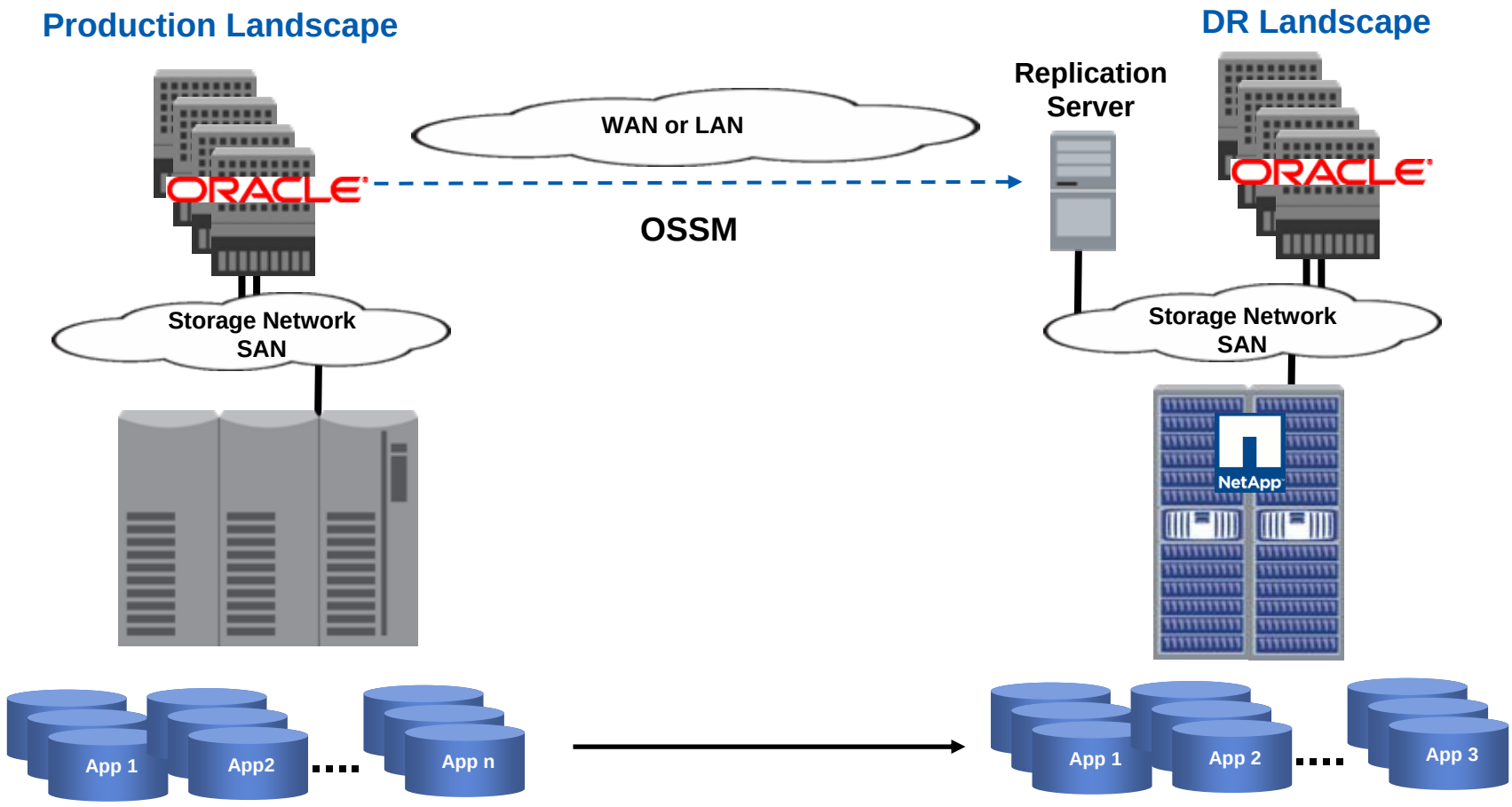
Heterogeneous Environment with NetApp OSSM



NetApp OSSM



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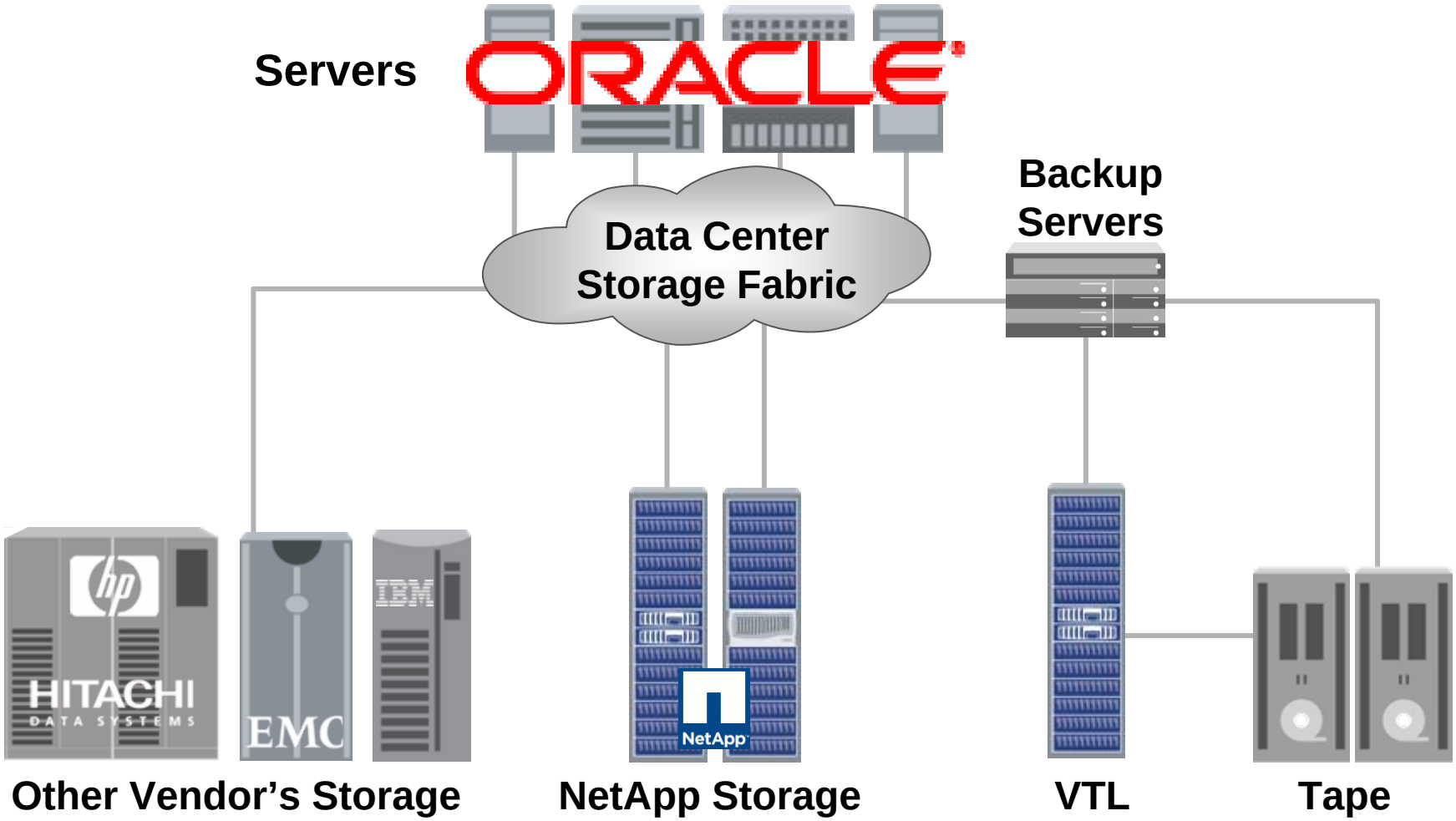
Heterogeneous Environment with NetApp NearStore VTL



Key NetApp NearStore VTL Differentiators

NearStore VTL

- Self-tuning Performance
  - **Automatically provides optimal performance - no manual tuning is required**
- Tape Smart Sizing
  - **50% savings in physical tape vs. other VTLs**
- NetApp Total VTL Technology Ownership
  - **Technology ownership for complete, end-to-end, single vendor solution**

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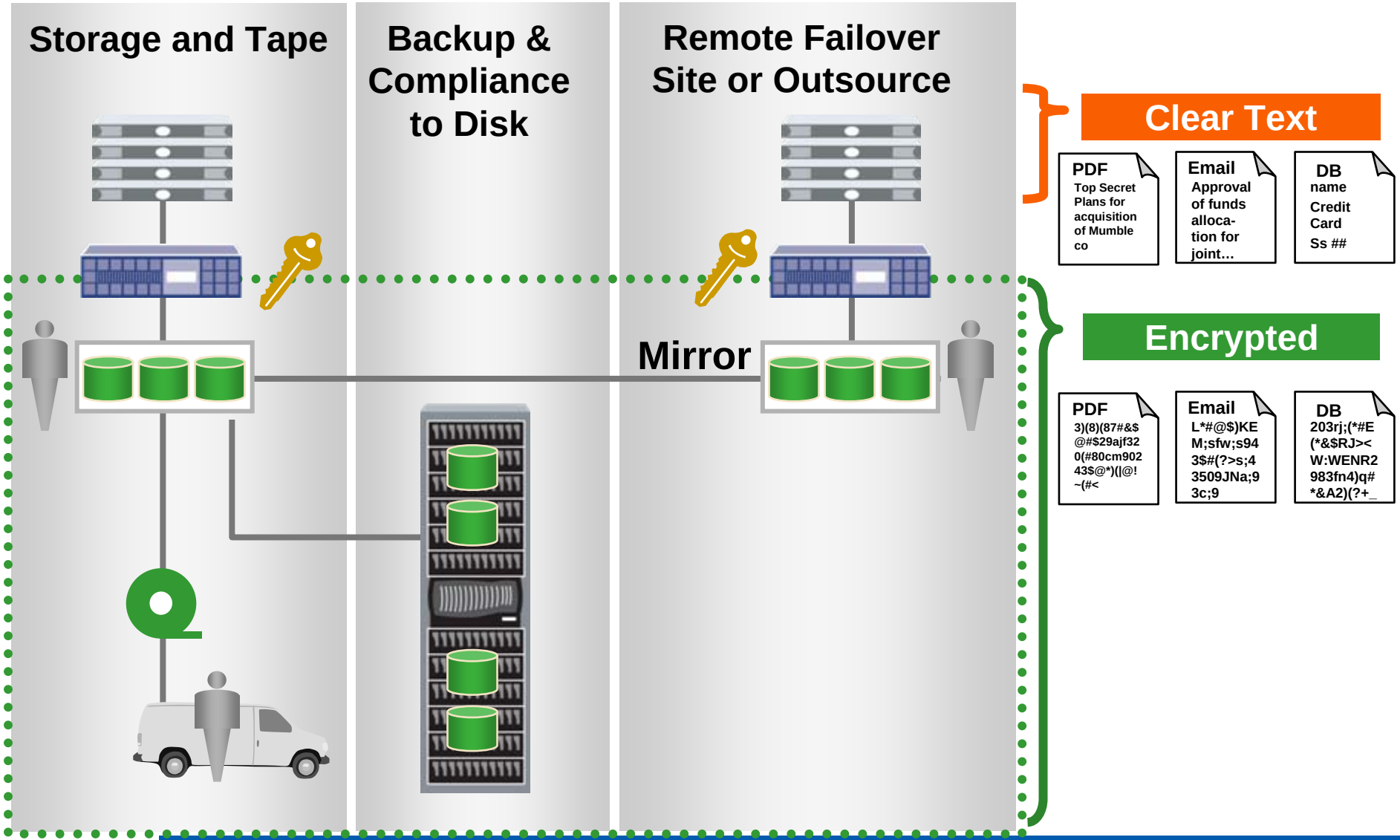
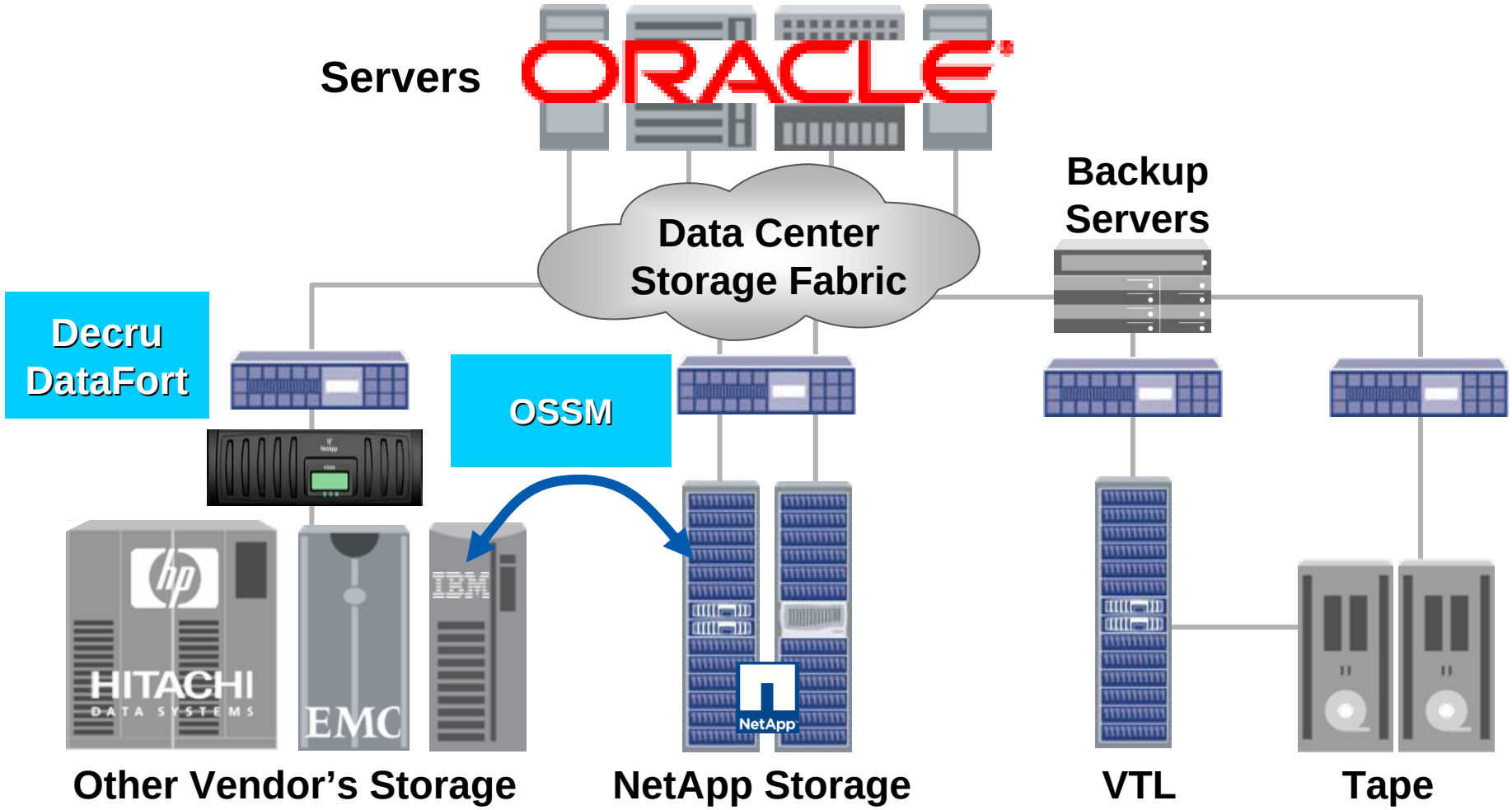
Decru DataFort

Secure Backup, Archive and Business Continuity



Heterogeneous Environment NetApp Application Overview



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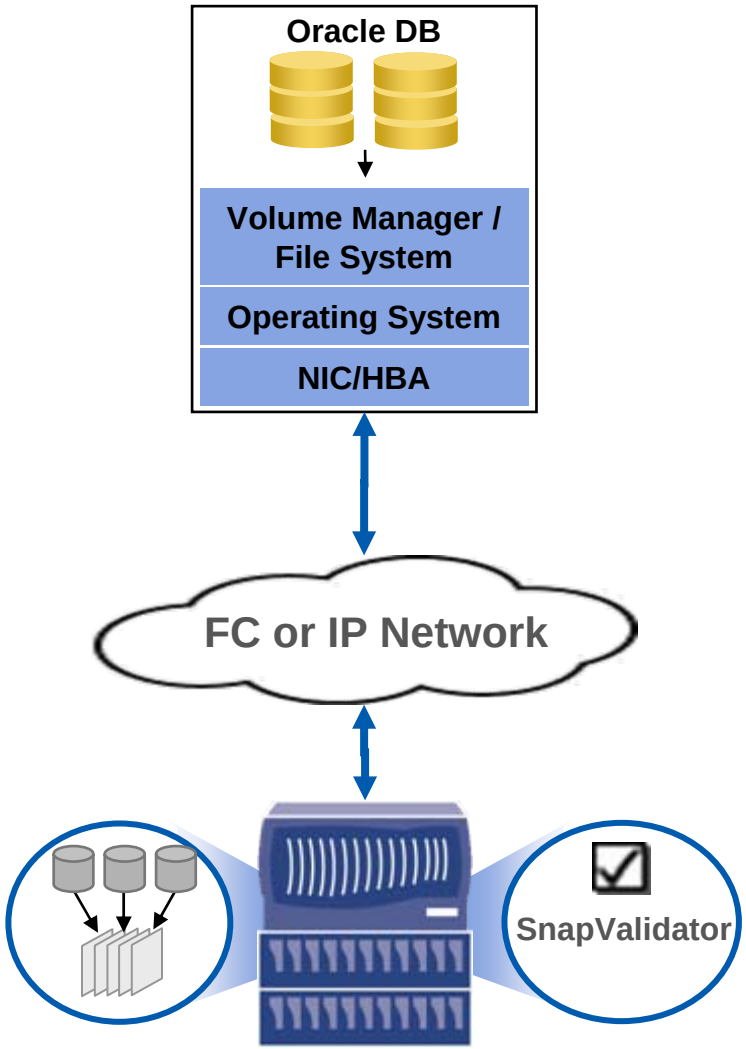
NetApp – Oracle Deep Integration Examples

Technology Integration
NetApp SnapValidator



- Brings Oracle HARD to modular systems
- Validation check for writes performed to the Oracle database
- Detect and prevent potential data corruption
- Prevent accidental overwrite of business-critical Oracle data

Q & A

Thank you !

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