EMC Celerra Replicator

Advanced IP Storage Protection

IT Challenges for Information Protection

EMC²
where information lives

Improve protection/recovery
- Matching availability to a range of service-level requirements

Simplify the environment
- Easily implement service requirements

Drive down TCO
- Utilization, consolidation, automated management

Increase access and availability
- Information growth greater than 50 percent annually

Provide investment protection
- Utilize existing infrastructure and expertise

The right replication solution can overcome these challenges

Remote Replication Benefits

Protect against local and regional site disruptions

- Continuous data availability
- Multiple remote-recovery sites
- Meet regulatory requirements
- Support multiple service levels with tiered storage

Provide near-instant data recovery

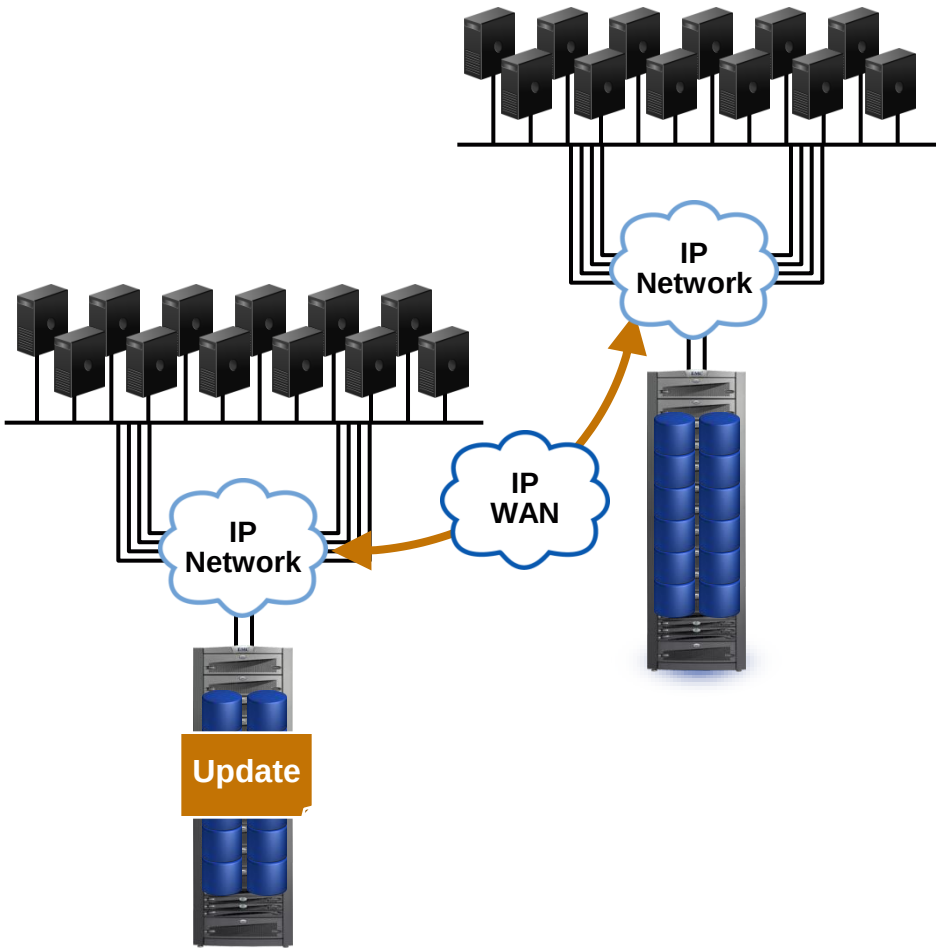
- Restore from offsite tapes can take weeks

Leverage second site for:

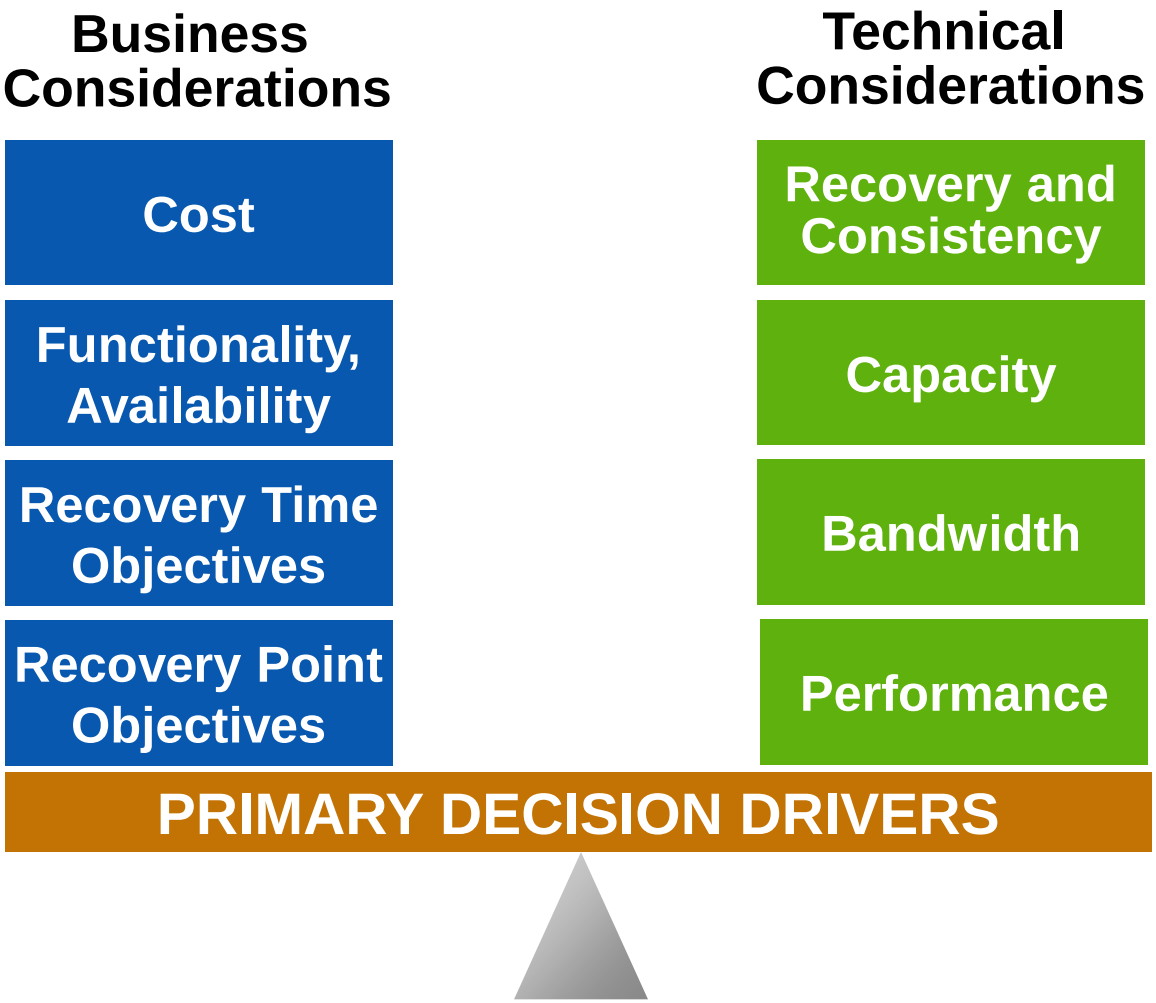
- Application testing, development, and training (productive protection)
- Relocate your tape backups to a second site

Enable non-stop operations

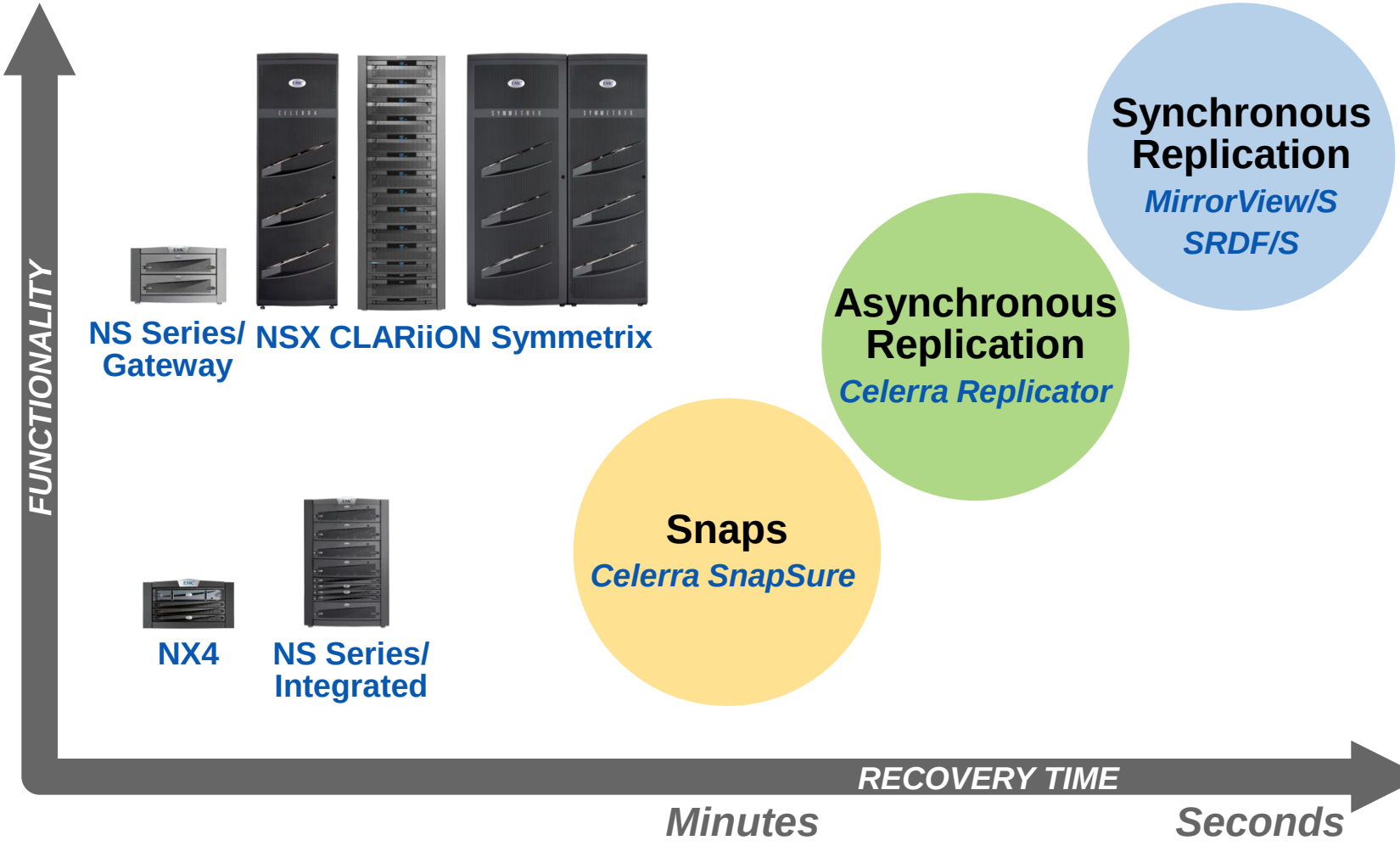
- Business continuity—fast restore to full operation



Decision Drivers to Consider



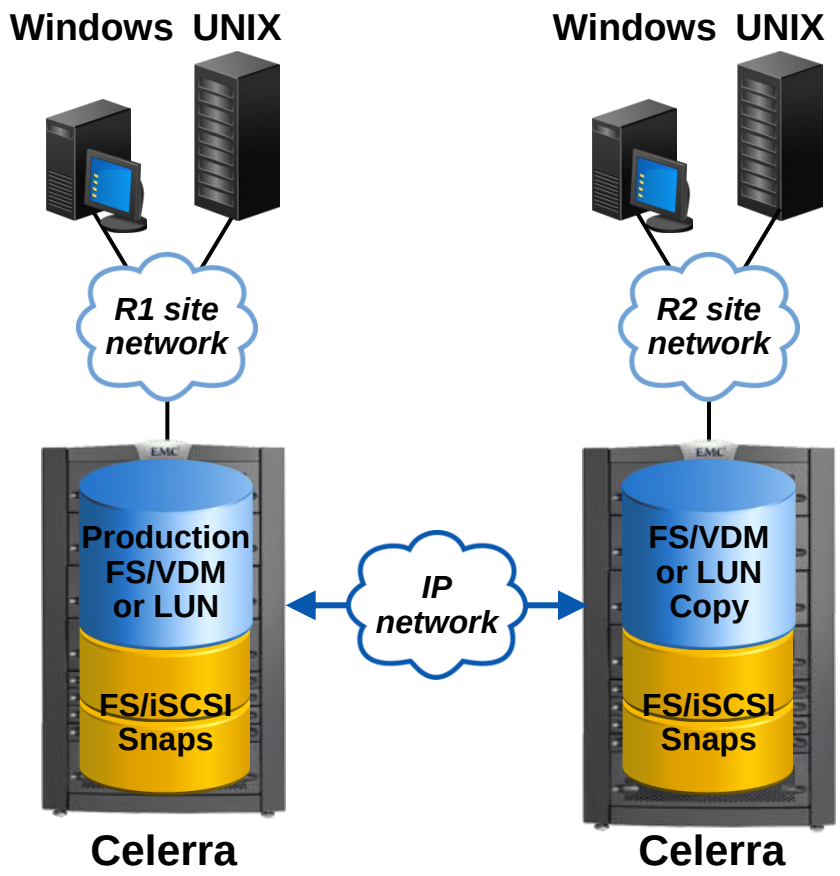
Celerra Disk-Based Replication and Recovery



Celerra Replicator

Point-in-time Asynchronous File System and iSCSI LUN Replication

- Production data available during replication
- Initial synch via IP network, tape, or additional Celerra
- Sends only changed data over the wire
- Local or remote replication
- Application-consistent replication
  - iSCSI Controlled by Replication Manager
- Server consistent replication
  - Integration with CIFS Virtual Data Mover (VDM) maintains context with data
- Asynchronous data recovery
  - Copy can be made available as read/write
  - Changes to the copy can be incrementally reapplied to the primary on failback



Celerra Replicator Enhancements

New with DART 5.6

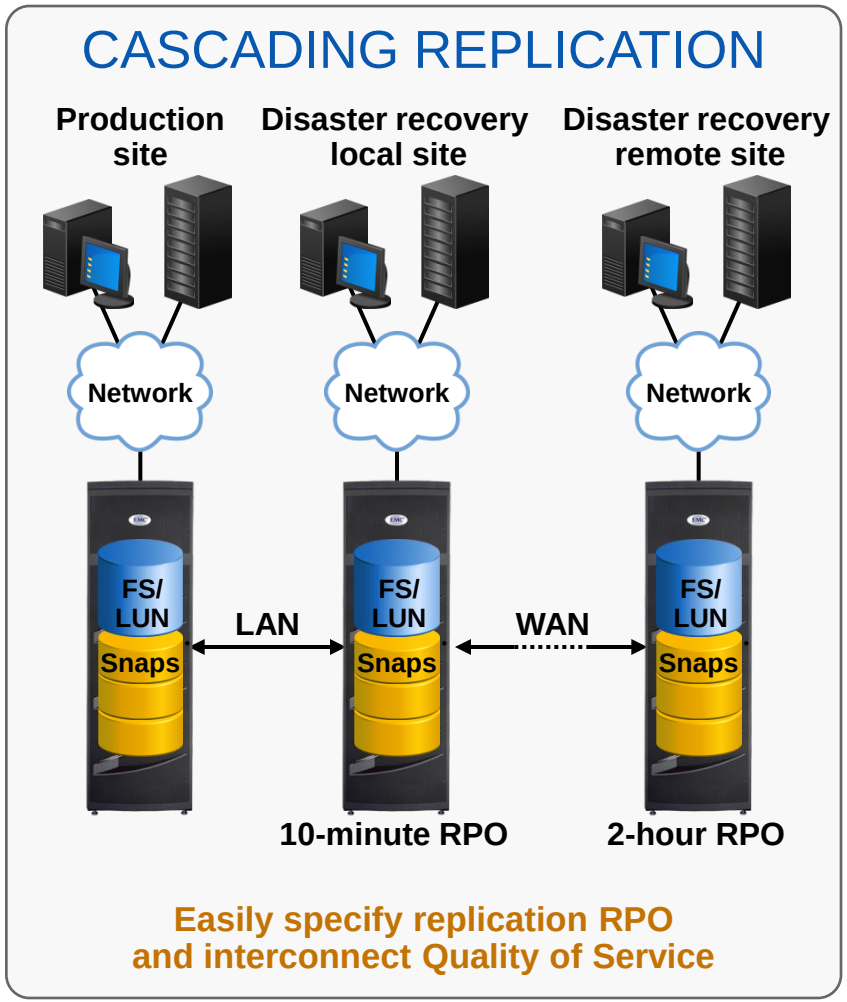
Service-level enhancements
- Automated, business oriented policy definitions for RPO
- Set interconnect QoS by scheduled bandwidth throttling

Advanced functionality
- 1-to-N replication for data distribution
- Cascading replication for multi-site disaster recovery

Improved scalability
- Faster failovers
- Up to 1024 replication sessions

Common replication management for NAS and iSCSI

Integrates with writable NAS snaps



EMC Replication Manager

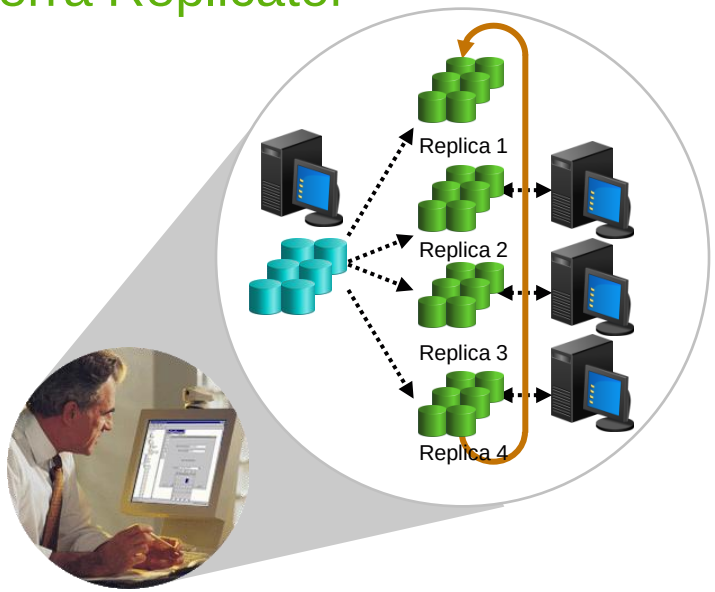
iSCSI Support for Celerra SnapSure and Celerra Replicator

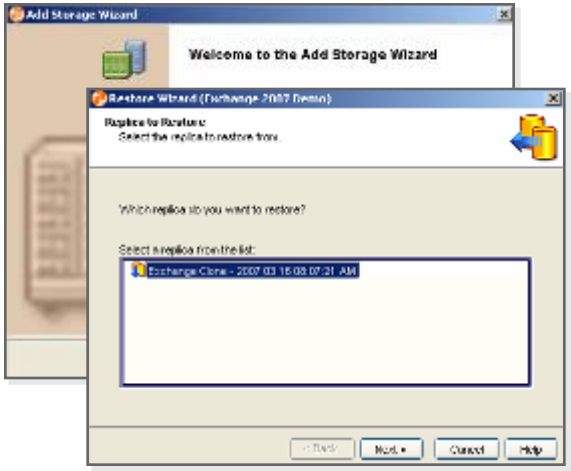
Software that **simplifies** management of EMC replication technology

Automates the creation, management, and usage of replicas for multiple purposes from the context of the application

Maps applications on the host to the underlying storage infrastructure

Enables storage managers to **delegate** replication tasks to multiple Administrators





Application-consistent replication supports Exchange, SQL and VMware host-based disaster recovery management

Celerra Replicator Management

Common Replication for NAS and iSCSI

Screens in Celerra Manager Basic Edition

View replication status

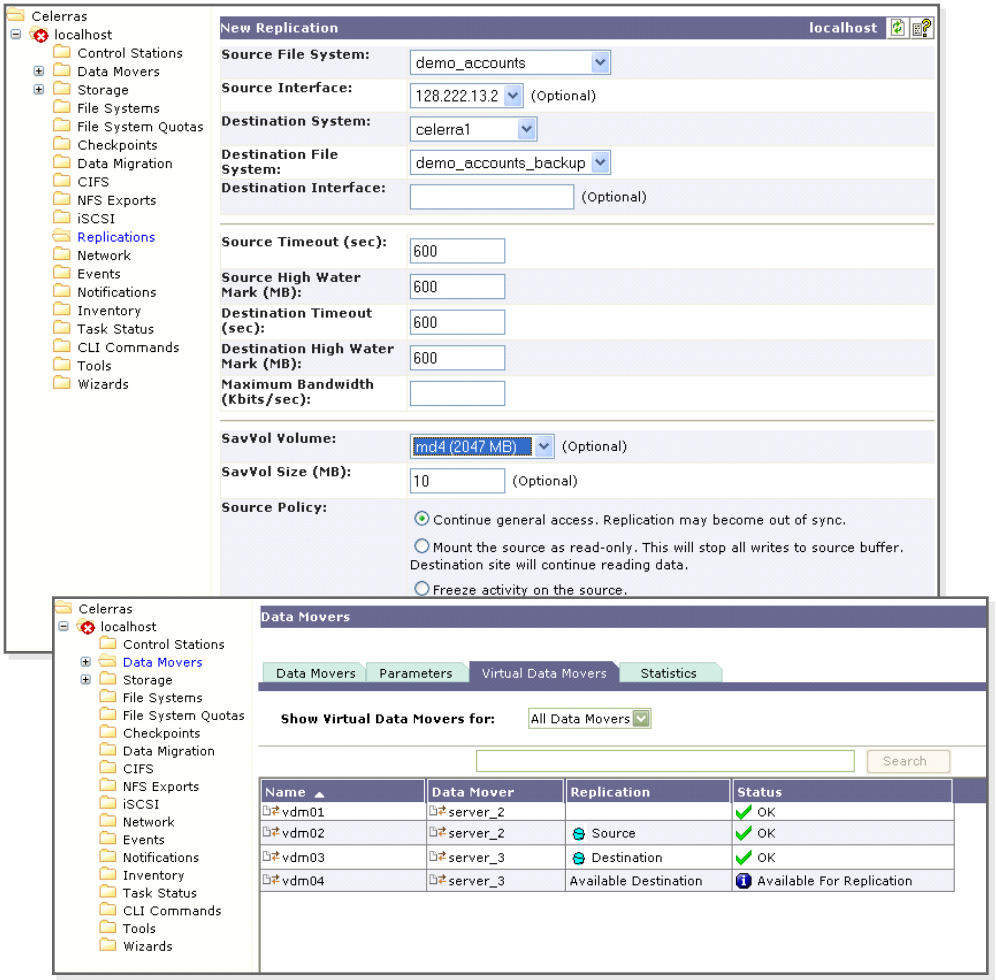
Manage replications

Perform remote failover

Manage all replications

- Filesystems
- Virtual Data Movers
- iSCSI LUNS

Server-consistent replication



Replication Source Objects

File Systems

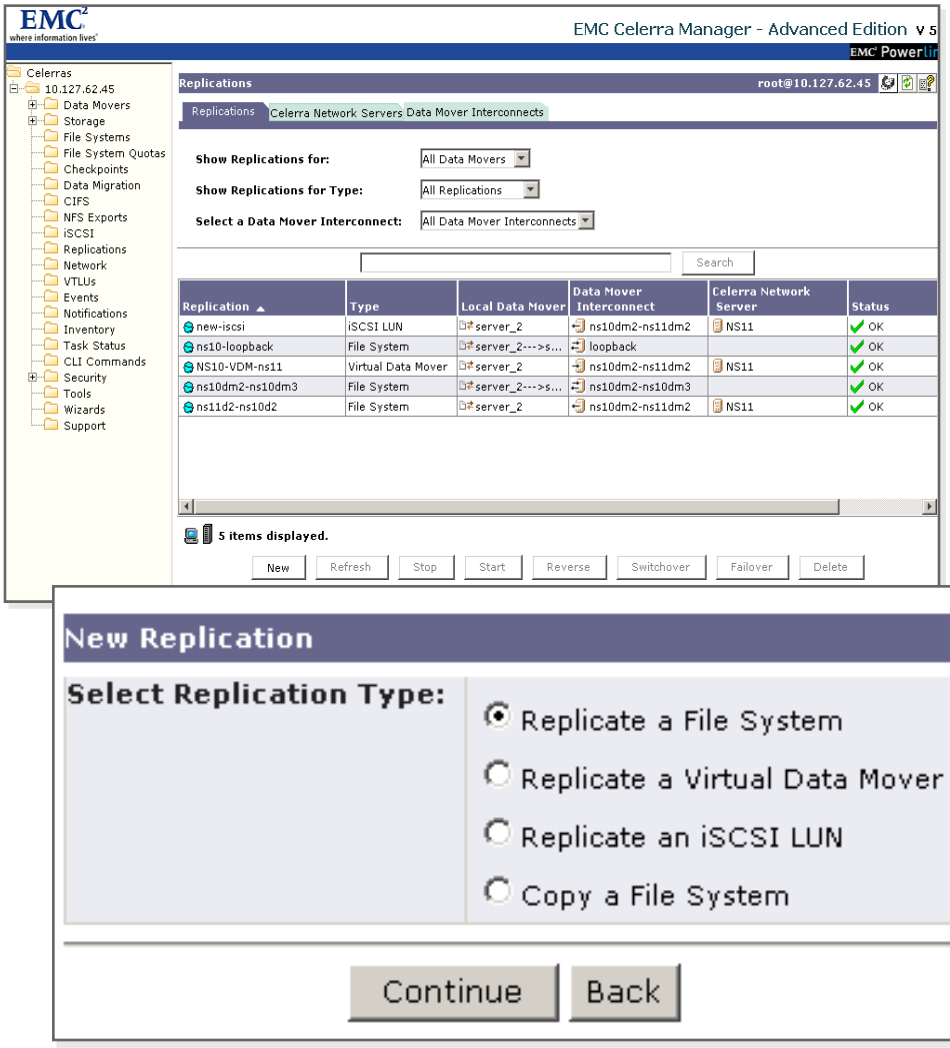
- Used for content distribution, backup and application testing
- One-time copy also an option

Virtual Data Movers (VDM)

- Recreates a CIFS environment at a remote location
- Replicates CIFS server data, audit logs, and local groups

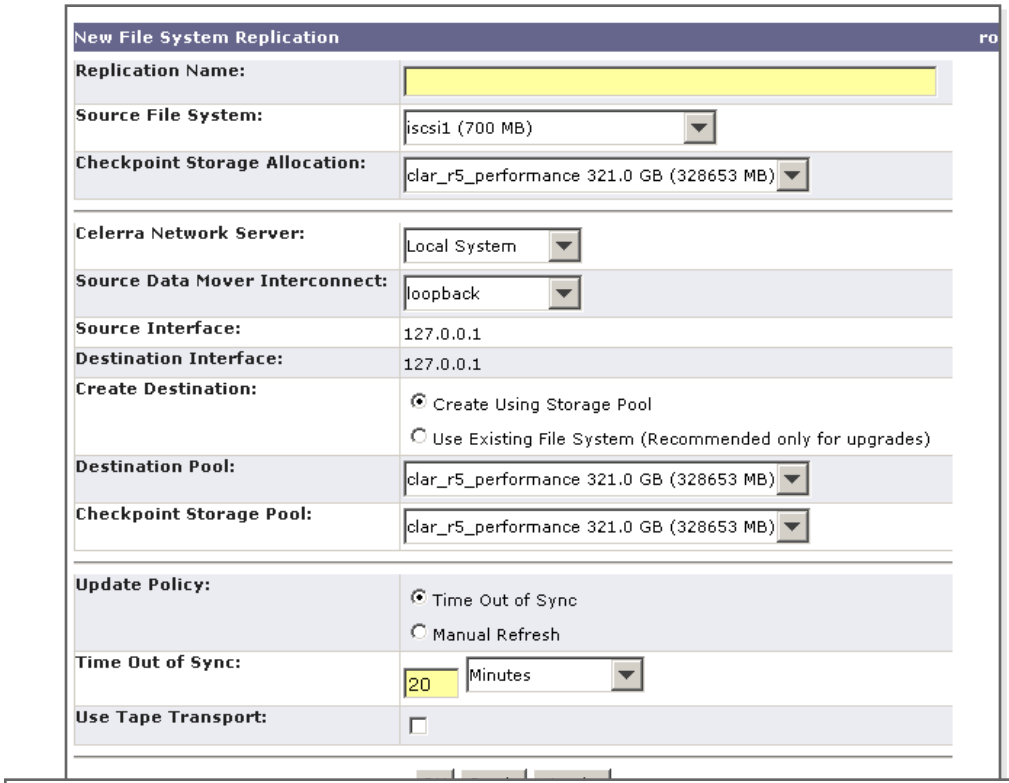
iSCSI LUNs

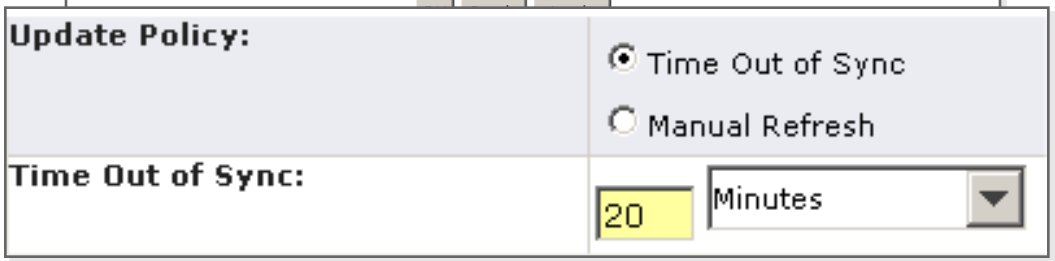
- Replicates an iSCSI LUN without host interaction or management



Defining Replication Parameters

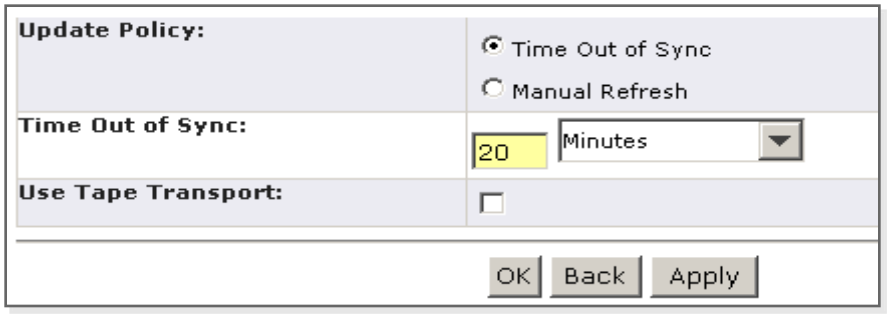
- Source
- Destination
- Interconnect
- Update policy
- Initial synch





Directly Specify Recovery Point Objective (RPO)

Initial Synchronization



Copy over the network

- Simple but network intensive

Copy via tape

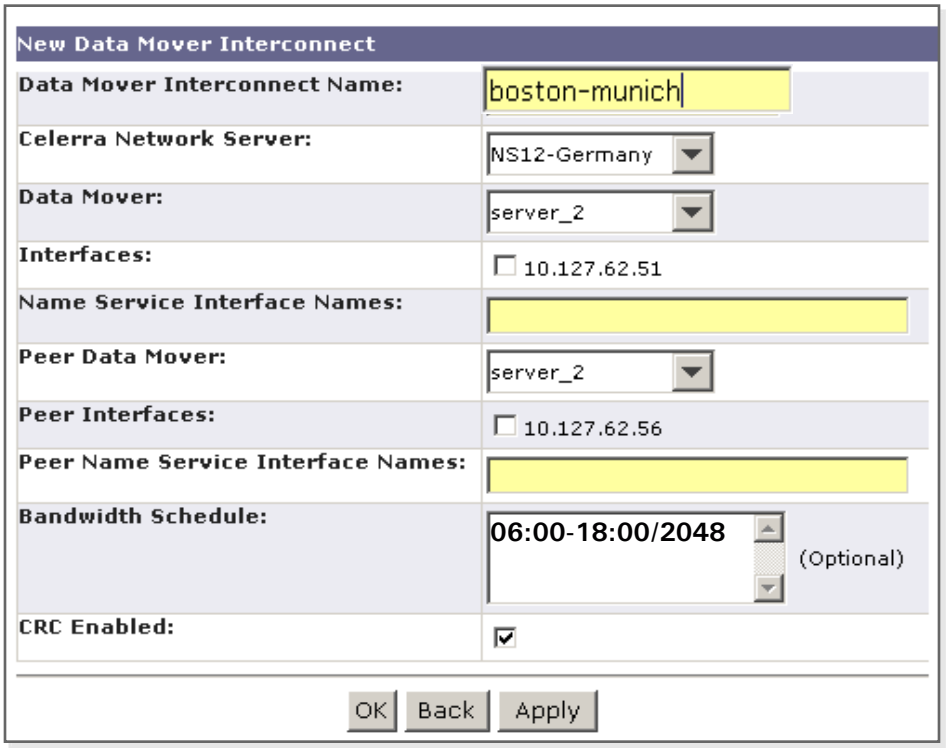
- File systems or VDMs
- Uses NDMP backups, which are transported to remote site and restored
- Meta data describing the state of the image and its associated snap is maintained within the backup

Copy via a swing box

- Replication session is established with an additional Celerra at the primary location
- Additional Celerra shipped to remote location and synchronized with target Celerra
- Replication session established between primary and remote sites

Creating the Interconnect

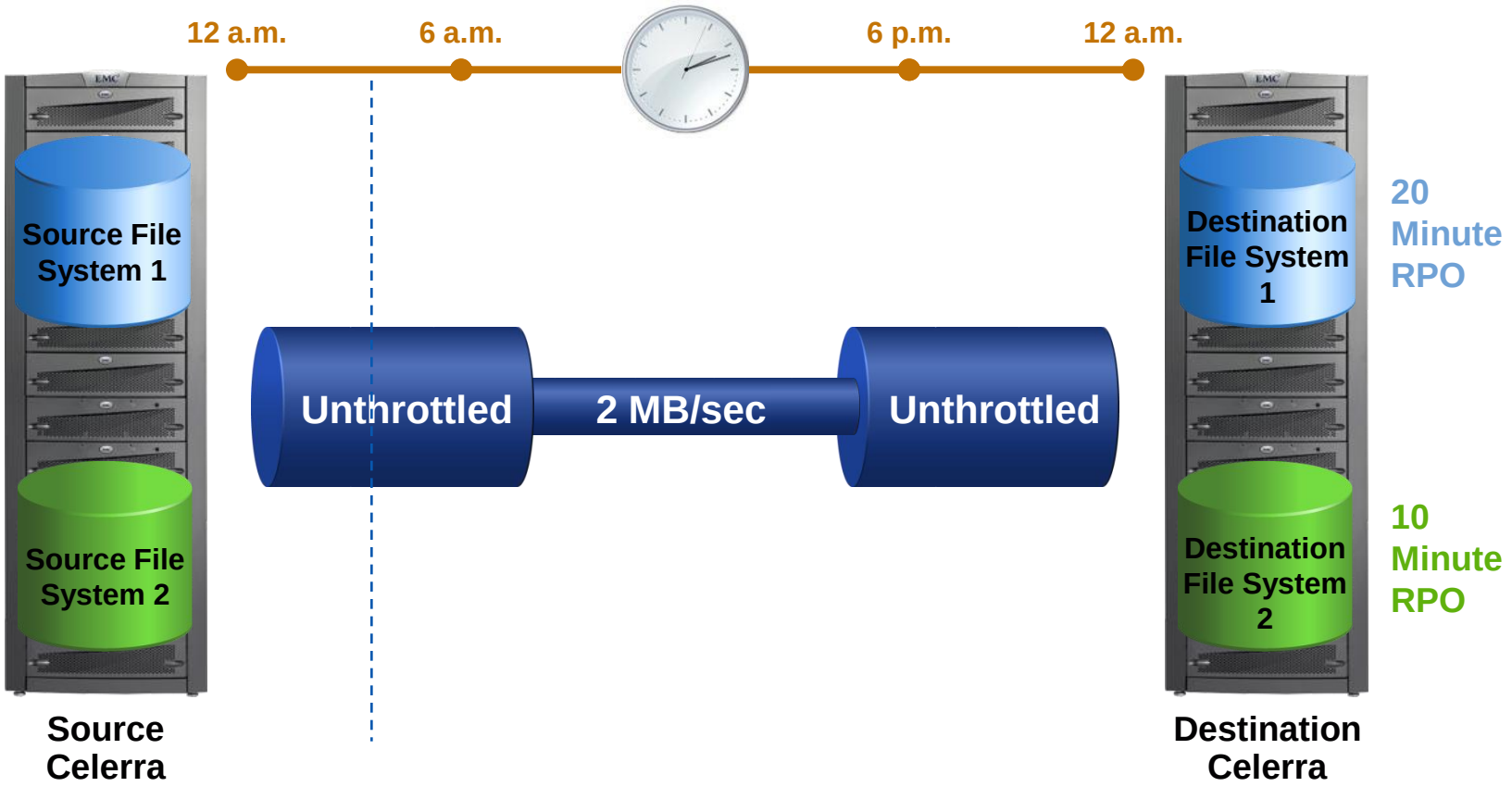
- Source
- Destination
- Interfaces
- Bandwidth



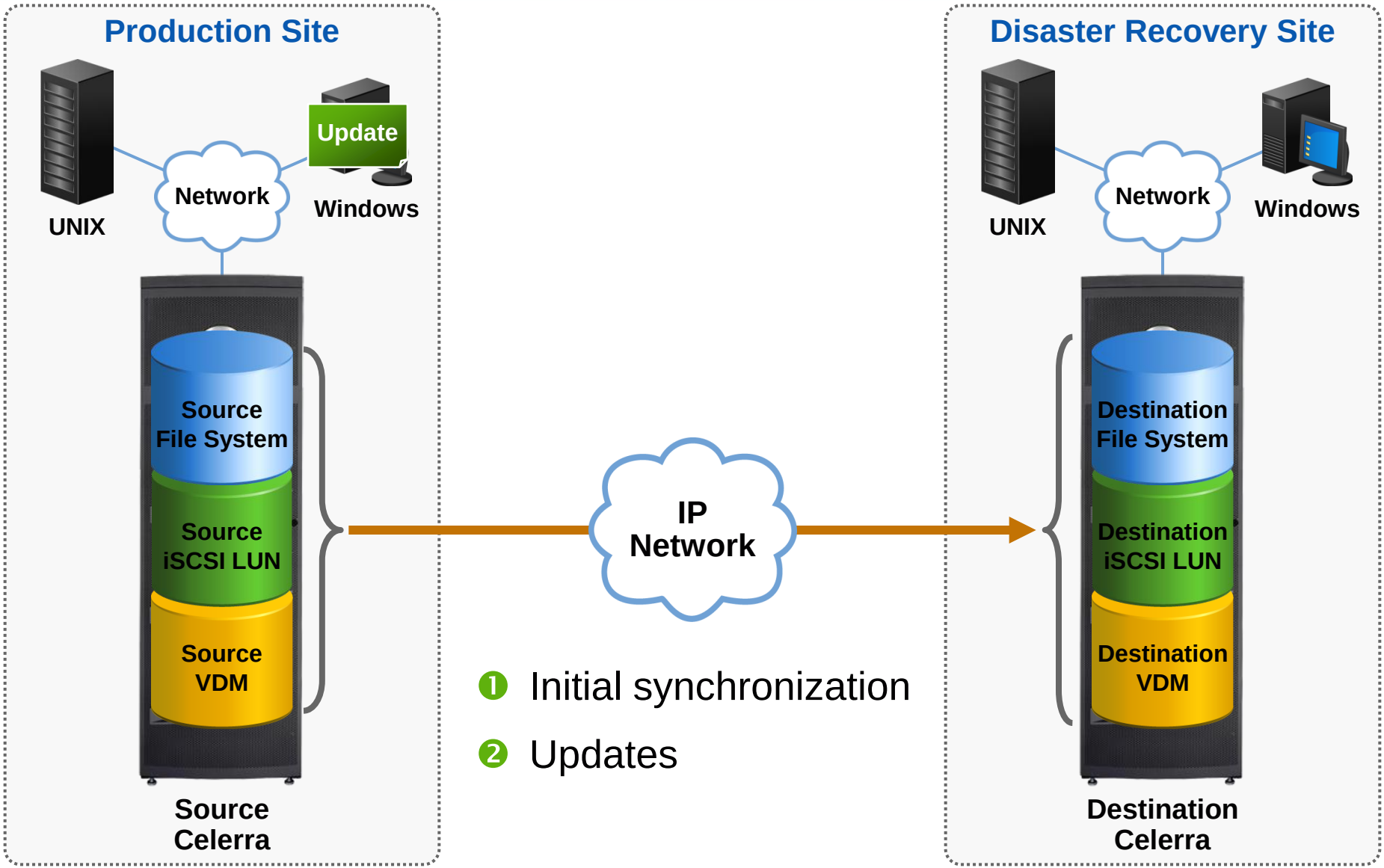
Optionally specify bandwidth schedule

Celerra Replicator Automated Service Levels

1. Administrator sets RPO (time-out-of-sync)
2. Administrator optionally specifies bandwidth usage
3. System dynamically schedules updates to meet the service levels



Celerra Replicator in Action



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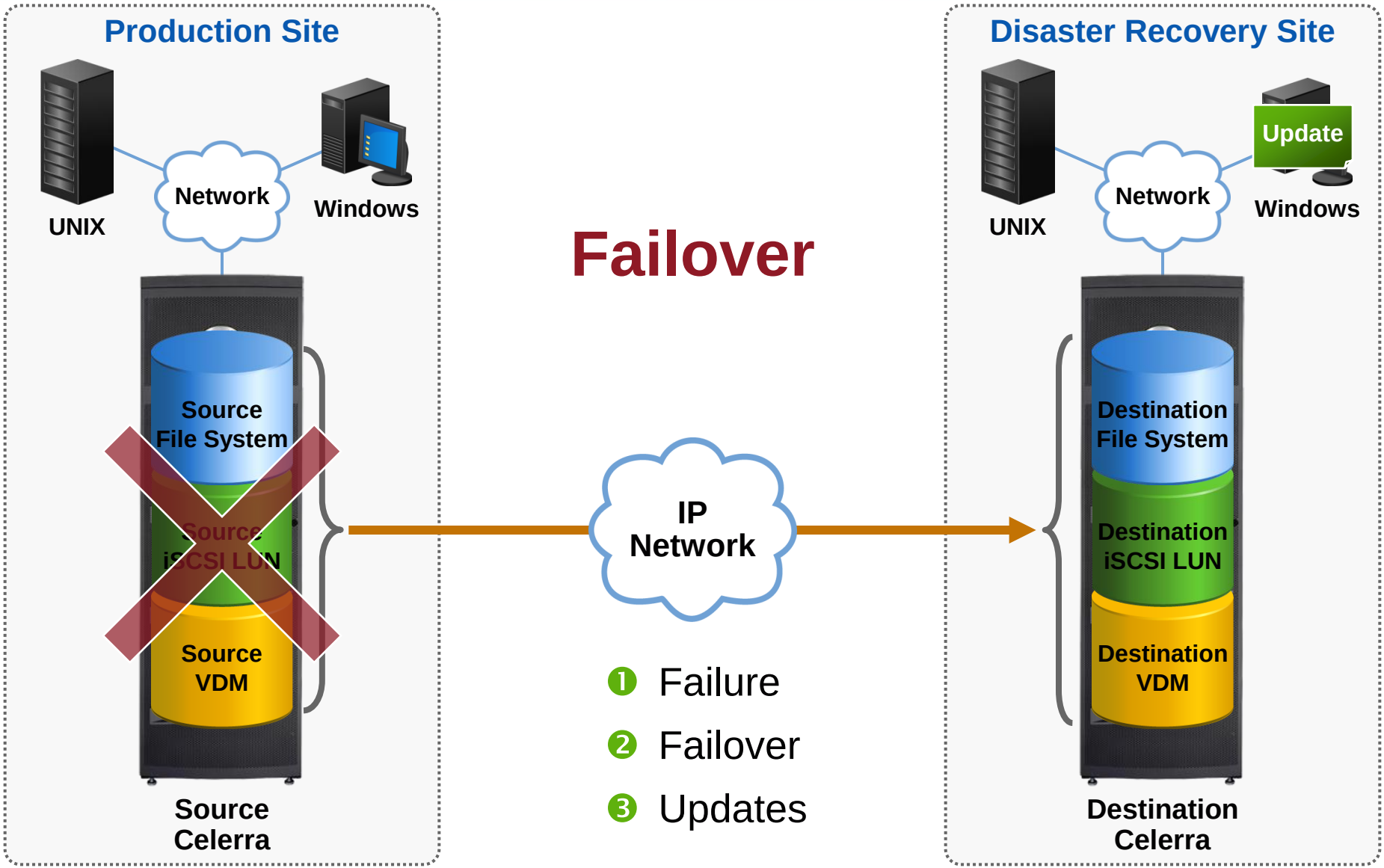
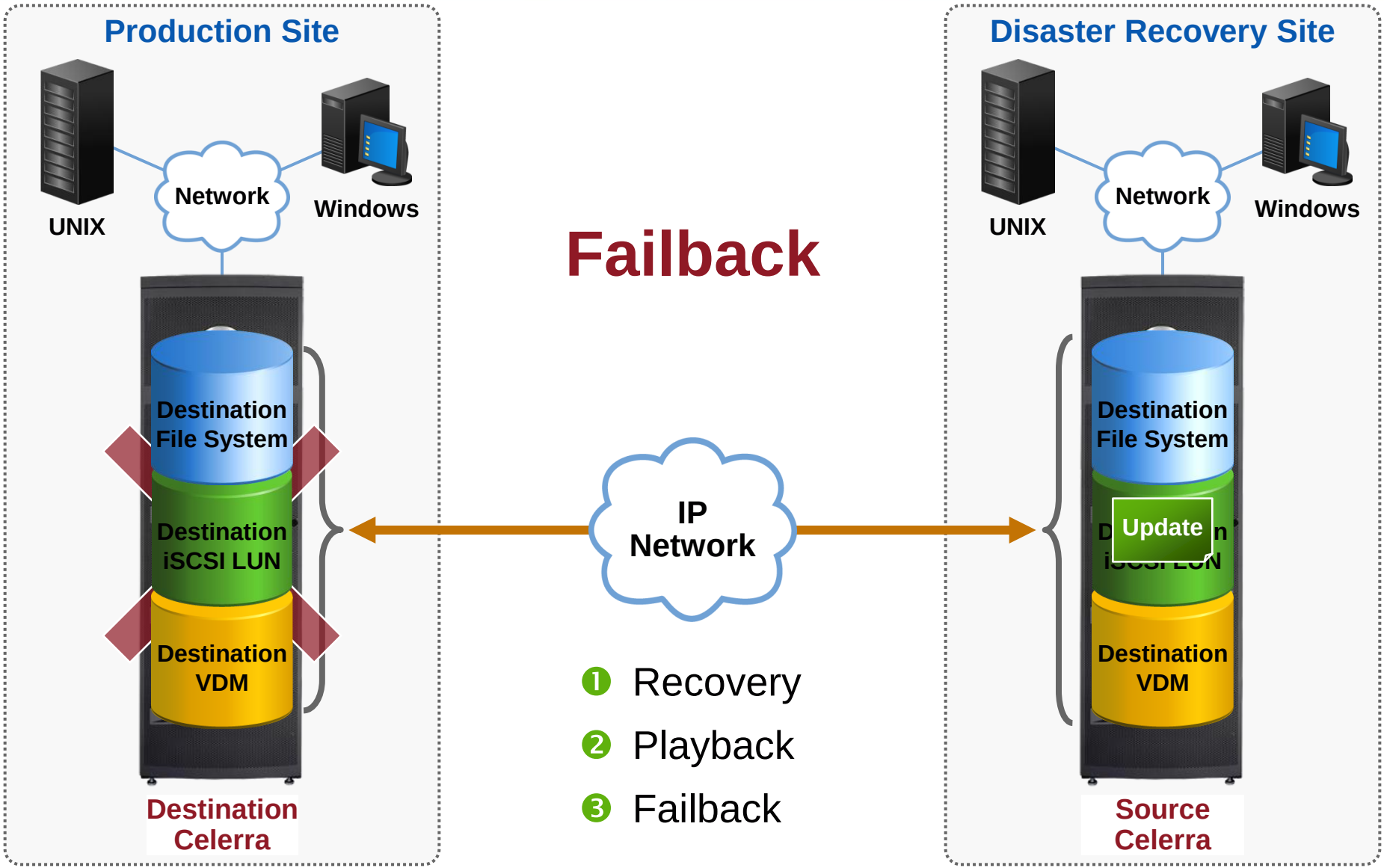


Celerra Replicator in Action



Celerra Replicator Use Cases

Disaster recovery

- Duplicate copy of data at a remote location
- Cascading for multiple sites
- VMware Site Recovery Manager

Content distribution

- Easily replicate data to multiple locations

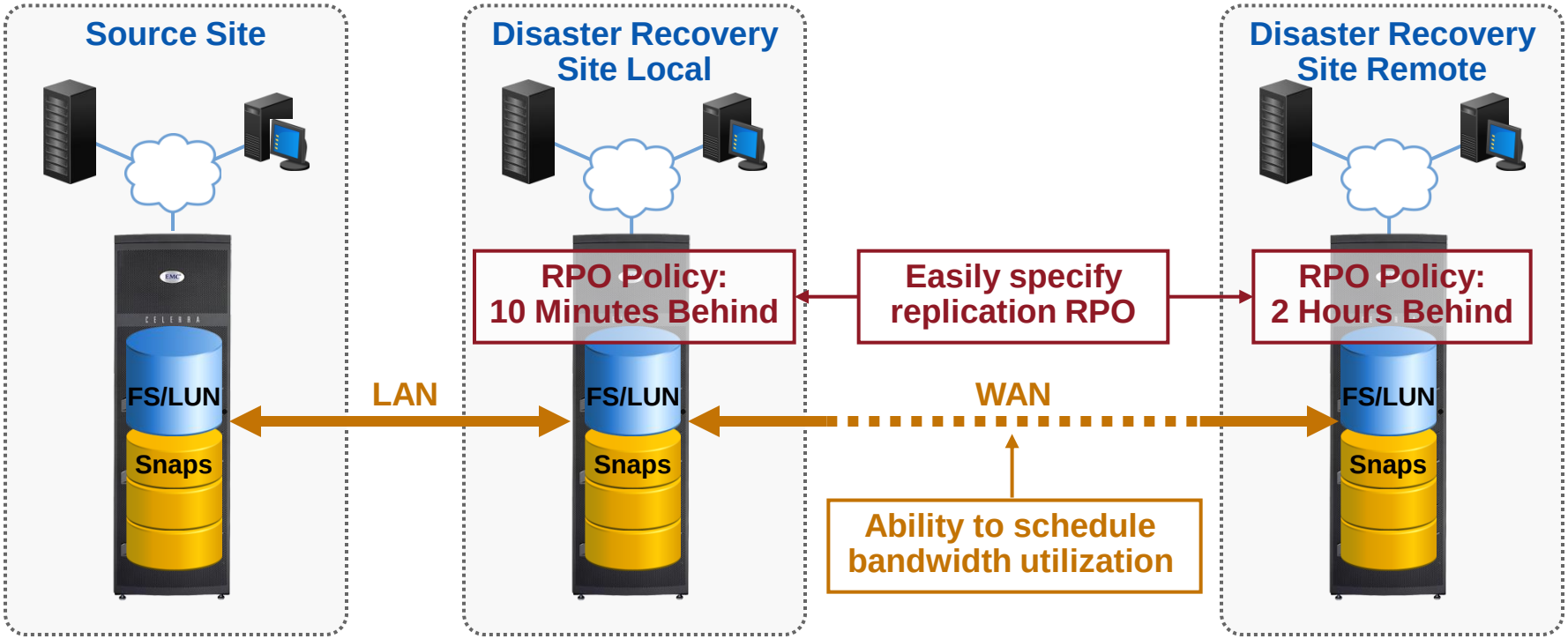
Backup, testing, decision support

- Local and/or remote replicas
- Copy of data used for backups
- Copy of a database used for data mining
- Copy of data used to test software upgrades

Data center migrations

- Move data off one site to a new location

Disaster Recovery Use Case



Specify RPO Requirements for replication updates across multiple locations

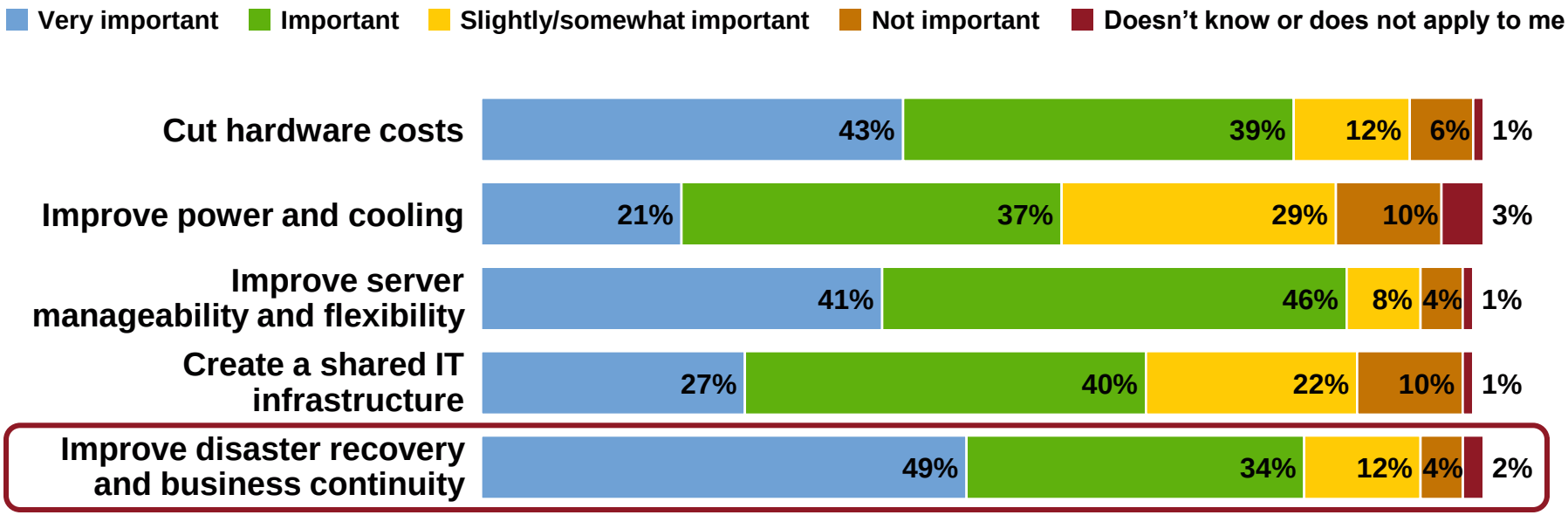
QoS policies optimize LAN/WAN bandwidth utilization during updates

If any site is lost, a reconnection can be made between the surviving sites

Can now recover from the loss of any two sites

Market Dynamics—
Disaster Recovery is a Top VMware Requirement

"How important are the following motivations for adopting server virtualization?"



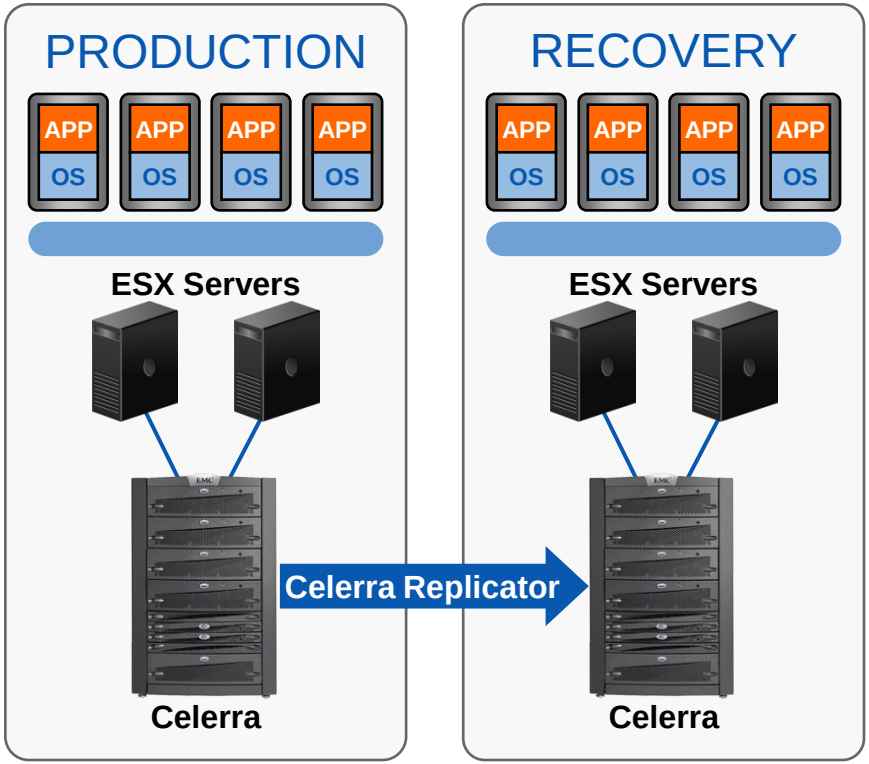
Base: 197 server decision-makers at North American and European enterprises that are interested in, are implementing in the next 12 months, or have already implemented server virtualization for x86 servers (percentages may not total 100 because of rounding)

Source: Enterprise and SMB Hardware Survey, North America and Europe, Q3 2007; Forrester Research, Inc.

VMware Disaster Recovery

Celerra and VMware Site Recovery Manager (SRM) Integration

- Celerra Replicator controlled by VMware SRM
- Define Celerra and VMware business continuity/disaster recovery workflows for discovery, testing, and failover
- Simplifies and automates disaster recovery
- Make disaster recovery a property of the virtual machine (VM)
- Provides central management of recovery plans from VirtualCenter
- Turns manual recovery processes into automated recovery plans



Makes disaster recovery rapid, reliable, manageable, affordable

Content Distribution Use Case

Easily Replicate Data to Multiple Locations

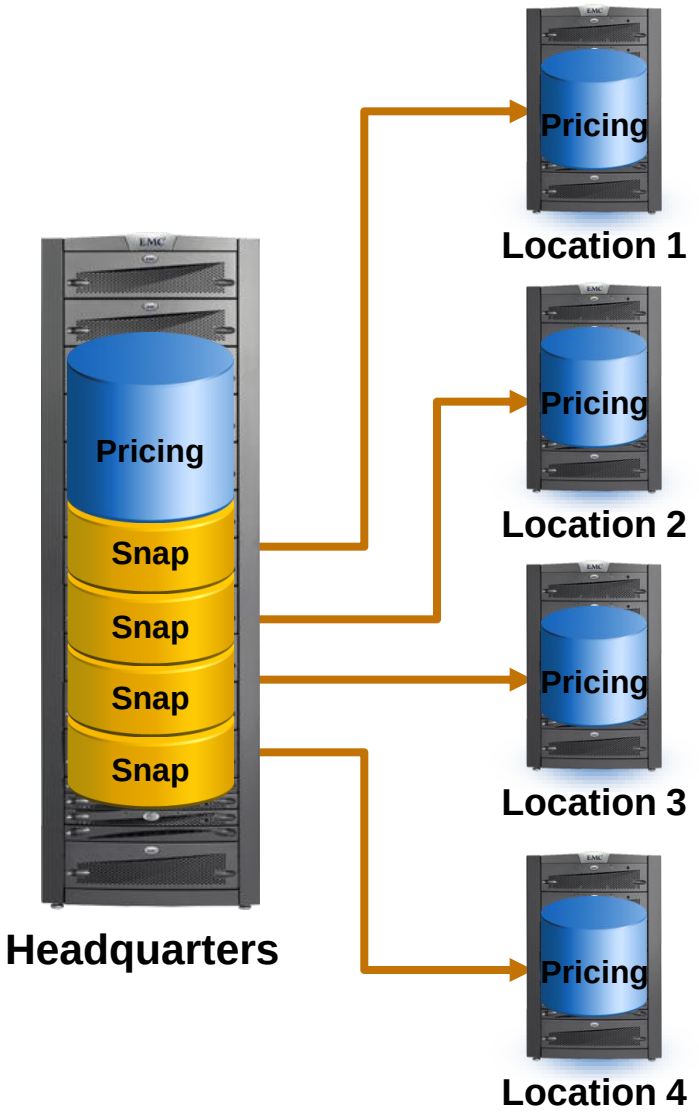
Supports up to four remote sites

Efficiently copy data from corporate data center to branch offices

Provide more timely access to information

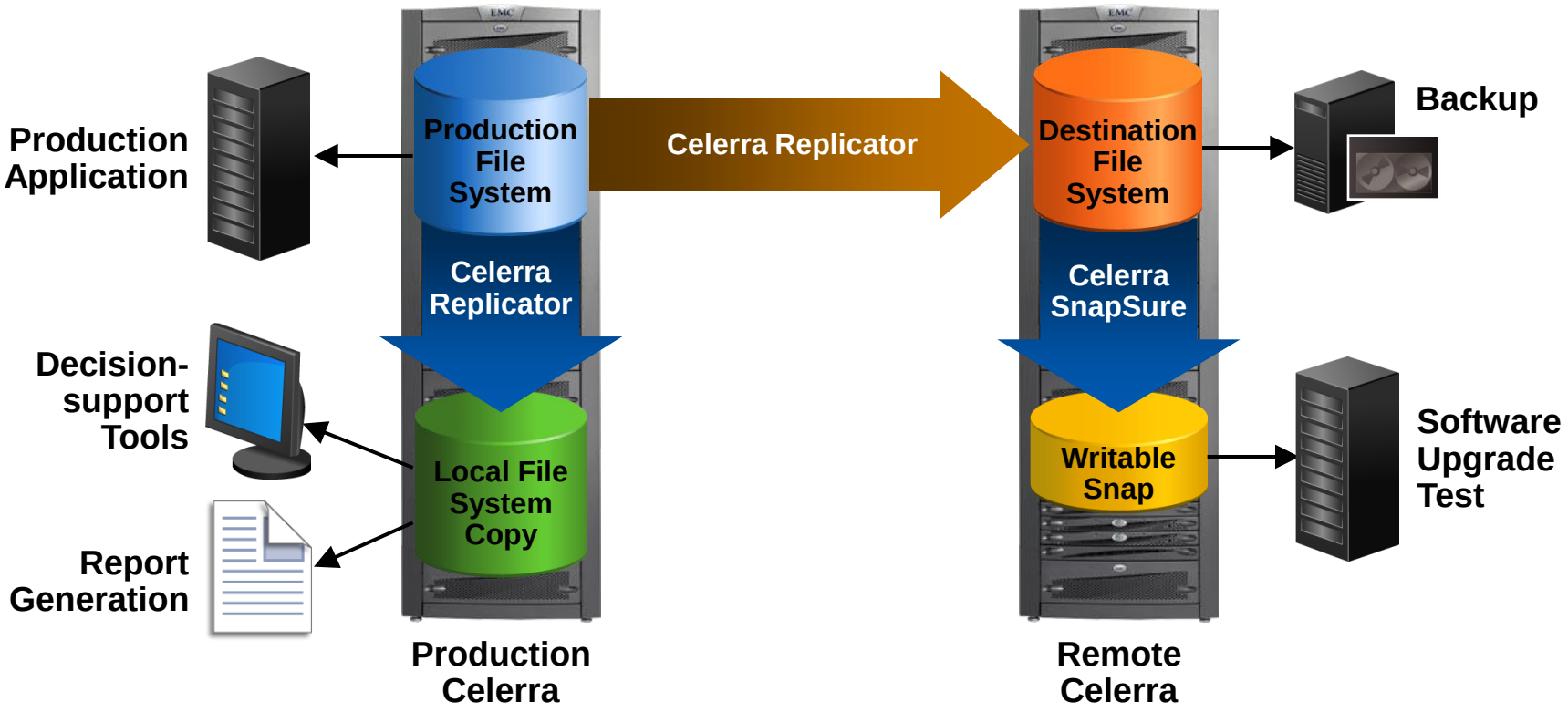
Leverage data for:

- Optimized local access
- Test and development
- Backups



Backup/Testing/Decision Support Use Case

Use Case: Replicate to Avoid Affecting the Production Application



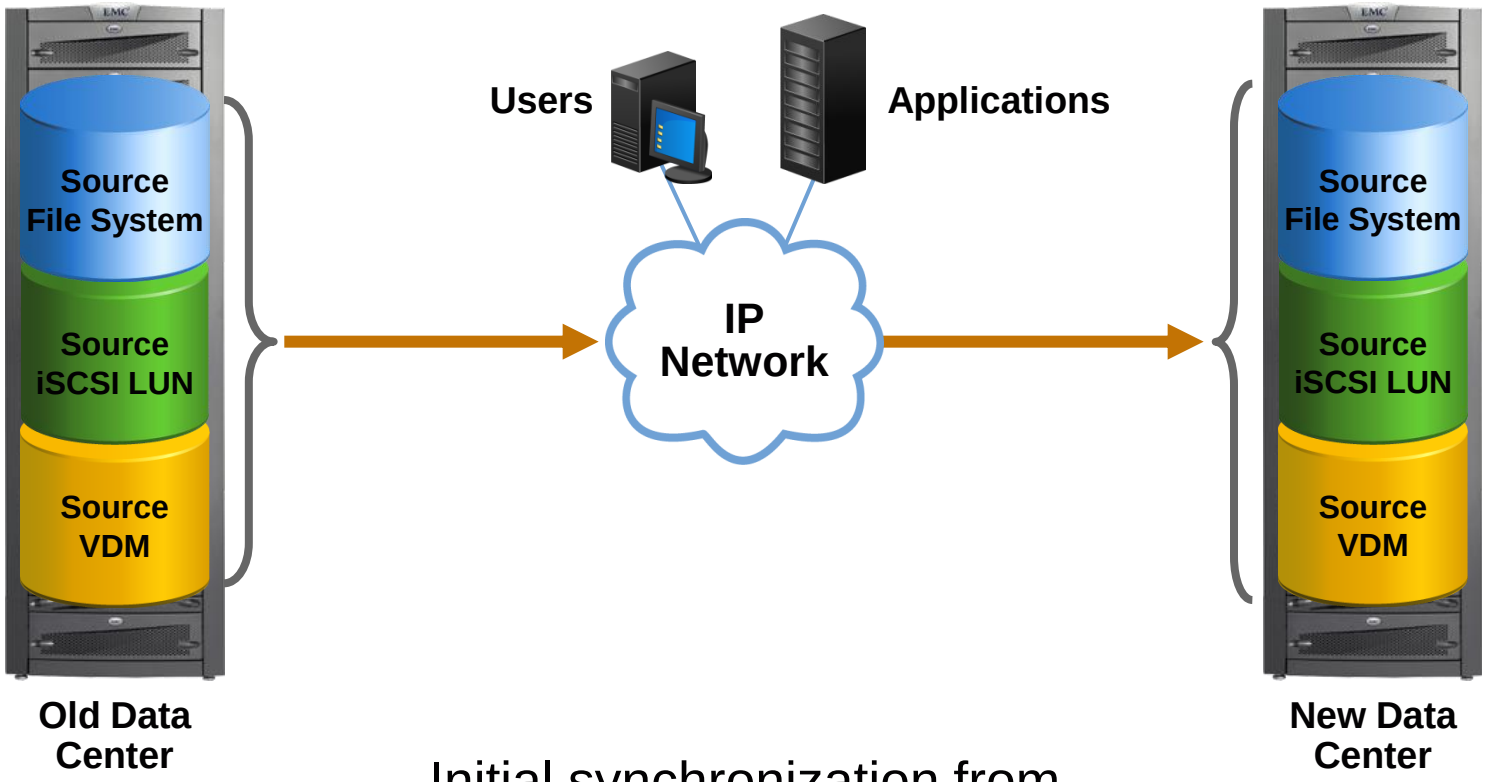
Local copy for data mining

Remote copy for backup

Writable snap for testing

Data Center Migrations Use Case

Use Case: Replicate to Quickly Migrate Operations without Any Data Loss



Initial synchronization from old to new data center

Online switch-over

Celerra Replicator Benefits

EMC² where information lives

Protection/recovery

- Multi-Site disaster recovery

Simplicity

- Directly specify replication service levels

Lower TCO

- Affordable IP-based replication

Access and availability

- Disk-based recovery

Investment protection

- Utilize replicas for backup, decision support and testing

Celerra Replicator delivers advanced IP storage protection

EMC Celerra Family

Number One in NAS Revenue Share*

No-compromise availability
- Integrated advanced clustering, managed as a single device

Advanced functionality at no extra cost
- Most comprehensive suite of built-in features

Price/performance leadership
- Across full line of integrated and gateway IP platforms

Up to 30 times the file system performance
- Patented Celerra Multi-Path File System combines Fibre Channel/iSCSI with file serving to deliver accelerated performance for clients

Advanced ILM for IP storage
- Full integration with EMC's newest technologies allows you to actively manage information through its lifecycle

*IDC, Q3 2008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