



High-end Storage for the Data Center Integration and Management by BS2000

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**Online
Storage from
Fujitsu**

**Online
Storage at
BS2000**

**Integration
with
SHC-OSD**

**Outlook &
Conclusion**

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Requirements for Online Storage

**Data growth and
storage consolidation**



Server virtualization

**High Availability &
Disaster recovery**



**Dynamic IT
and Cloud**



**ETERNUS DX – Online Storage Systems from Fujitsu with
leading state-of-the-art technology serving highest requirements**

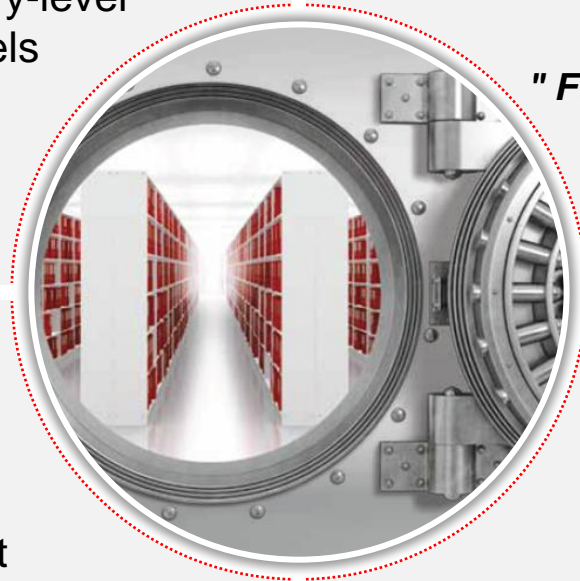
Comprehensive family of disk storage systems

- Ranging from affordable entry-level up to large data center models

Now available globally – serving local, regional and global companies as core storage systems

" Fujitsu is gaining increased traction with its ETERNUS disk storage systems, particularly in EMEA and Japan "

Gartner-Press Release June 8th, 2011



Mature in development

- 40 years history in storage development
- No 1 in the Japanese market (Q1/11, IDC)
- No 1 in quality (Nikkei Magazine survey))

1,000 developers provide state-of-the art functionality making ETERNUS a competitive alternative to HDS, EMC, HP, Oracle, IBM ...



ETERNUS DX – the challenger in leading disk systems



■ Mainframe Quality DNA

- ETERNUS DX is originated in the mainframe environment
- The ETERNUS DX engineering follows the same development and quality ensuring processes as the mainframe team
- Japanese engineering culture is leading in the world regarding quality
- Fujitsu is one of the very few vendors with 40 years of storage experience

■ Why this is important

- Central data management must not compromise quality
- Mainframe type development and service processes allow fast help in crisis situations

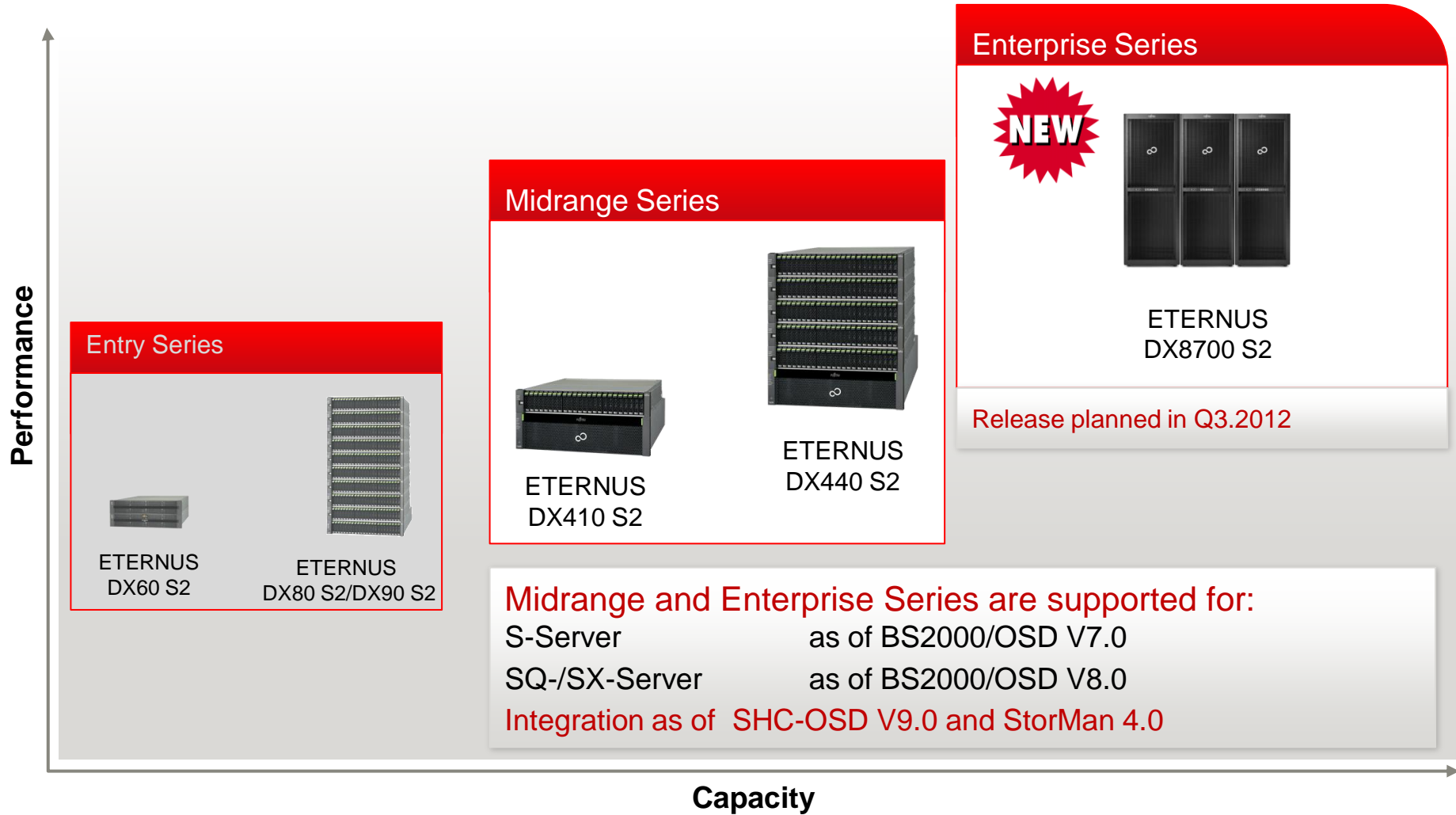
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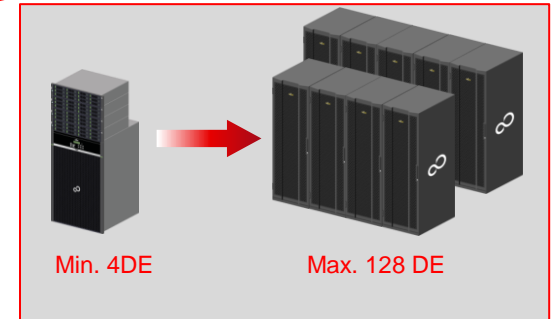
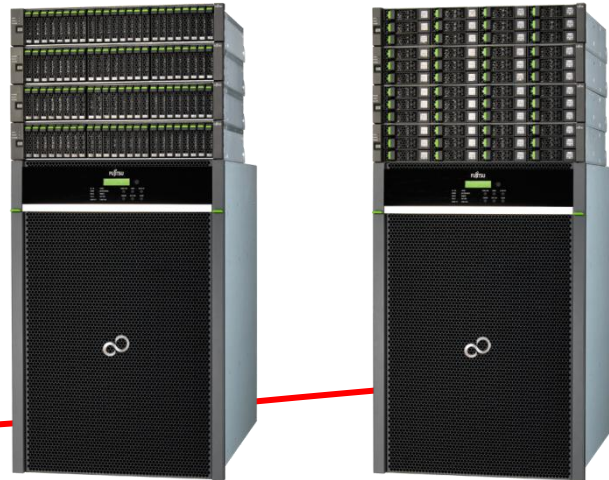
ETERNUS DX product family at BS2000



- ▶ Seamless, consistent and modular product family
- Compatible building blocks, one unified management

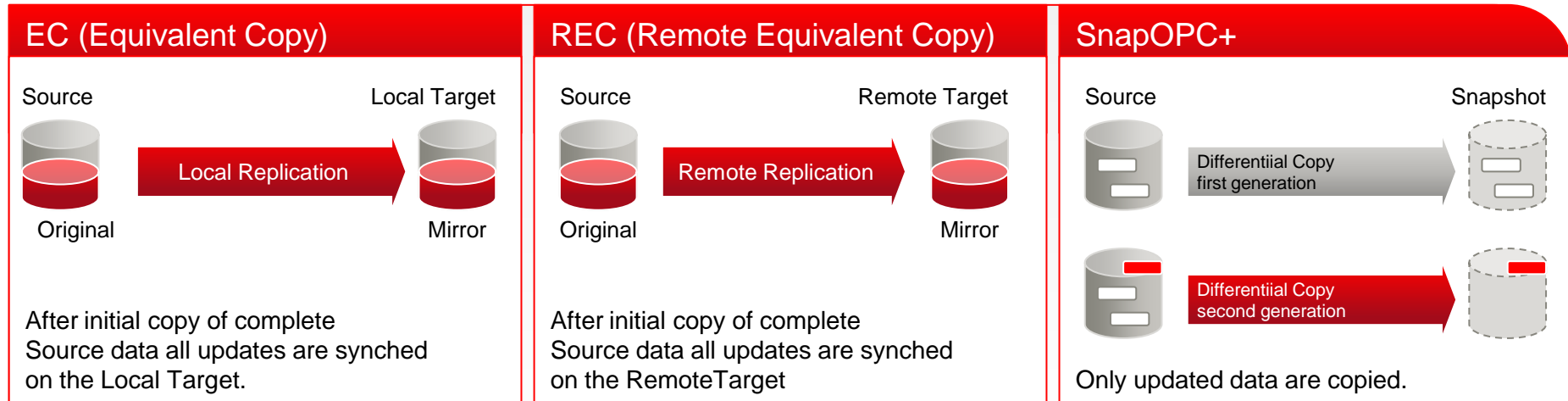
The new High-end System

19" Rack mountable modules



BS2000/OSD and SHC-OSD Support in Q3.2012
as of SHC-OSD V9.0 based on StorMan V4.0 and SMI-S

		DX8700 S2	Anmerkungen
Maximum drive number		3,072	with 2.5" drives
Maximum storage capacity (Physical)	SAS	2764.8 [TB]	with 2.5" SAS 900GB drives
	Nearline SAS	4608.0 [TB]	with 3.5" Nearline SAS 3TB drives
Maximum cache capacity		768 [GB]	
Host interfaces (Port number per device)		FC 2/4/8G (128port) iSCSI 1G (64port) iSCSI 10G (64port) FCoE 10G (64port)	



- e.g.for backup scenarios, High Availability- and Disaster Recovery configurations
- the selection for BS2000 integration with SHC-OSD follows customer use cases

EC

- Copies complete data from the Source.
- Consistent copies for parallel usage are becoming available after suspending the replication.
- Suitable for parallel processing on live data, backup, data migration or tests.

REC

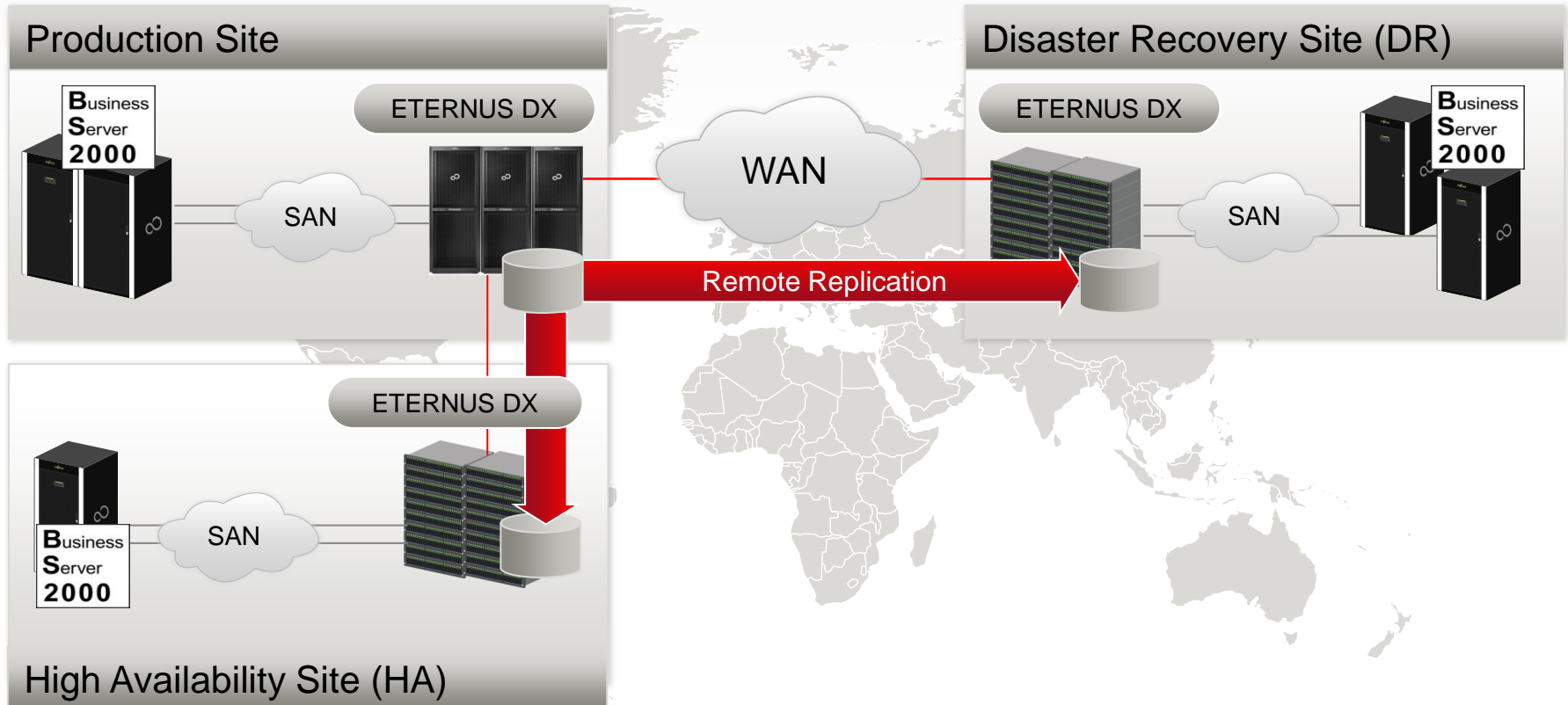
- Copies complete data from the Source.
- Consistent copies on a second Site/System are becoming available after suspending the replication.
- Suitable for HA and DR configurations and remote backup.

SnapOPC+

- Copies only deltas between Source and Snapshot with significant reduction of the required capacity.
- Enabled for parallel management of multiple Snapshot generations.
- Suitable for online backup and multiple backup generations.

High flexibility for HA / DR

- The consequences of a storage system failure or a complete site failure caused by a disaster may have devastating impact on a company or organization
- Remote Copies of enterprise data are critical for the business continuity of any organization after a disaster
- ETERNUS DX enables very flexible and global usage of storage resources based on remote data replication to multiple sites.



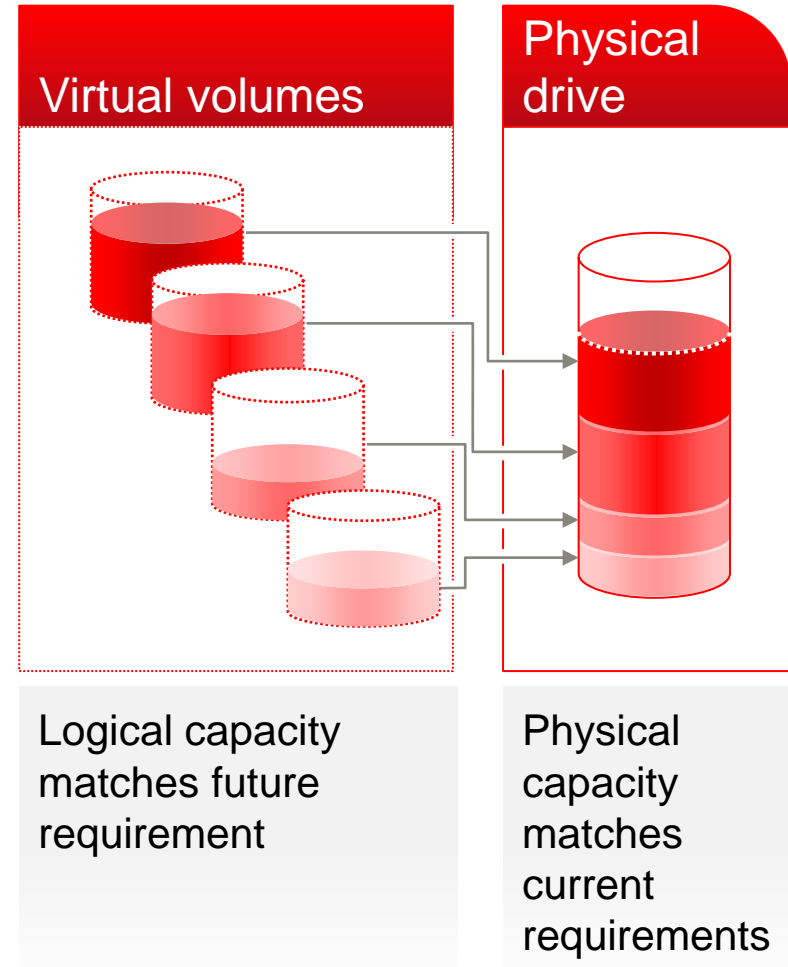
Thin provision for better capacity usage

The challenge

- More storage capacity is reserved for applications than initially needed
- Consequences: more and more buffer for data growth
- In consolidated environments this leads to big upfront investments in capacity

The solution: **Thin provisioning**

- ETERNUS DX assigns virtual storage capacity
- The "real" storage is pooled for actual usage



Invest in additional when you really need it

Automated Storage Tiering (AST)

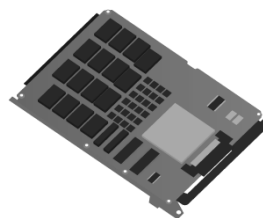
The challenge

- In consolidated storage systems there are different applications having different requirements

The solution: **Automatic tiering**

- ETERNUS DX allows to mix different disk types in one system
- With policy based, automated tiering the assignment of disk types can be changed during operation
- Allows to provide always the right service level in terms of speed, capacity and costs

ETERNUS DX



SSD

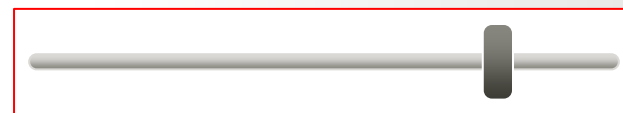


SAS

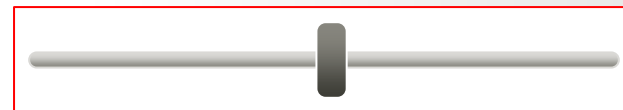


NL-SAS

Performance



Capacity



Cost



Automated balancing of speed, capacity and costs

New Symmetrix VMAX Family at BS2000

Qualification for the BS2000/OSD Server Portfolio: S- and SQ-Server

Symmetrix VMAX 20K and VMAX 40K with Enginuity 5876

- S-Server as of BS2000/OSD V7.0
- SQ--Server as of BS2000/OSD V8.0
- Integration with SHC-OSD V9.0 and SYMAPI V7.4

Enginuity 5876 already part of development and QA test configurations

Performance

VMAX 10K



former VMAXe
1 - 4 Engines

VMAX 20K



former Symmetrix VMAX
1 - 8 Engines

VMAX 40K



1 - 8 Engines

Capacity

Announcement at EMC World, Mai 2012

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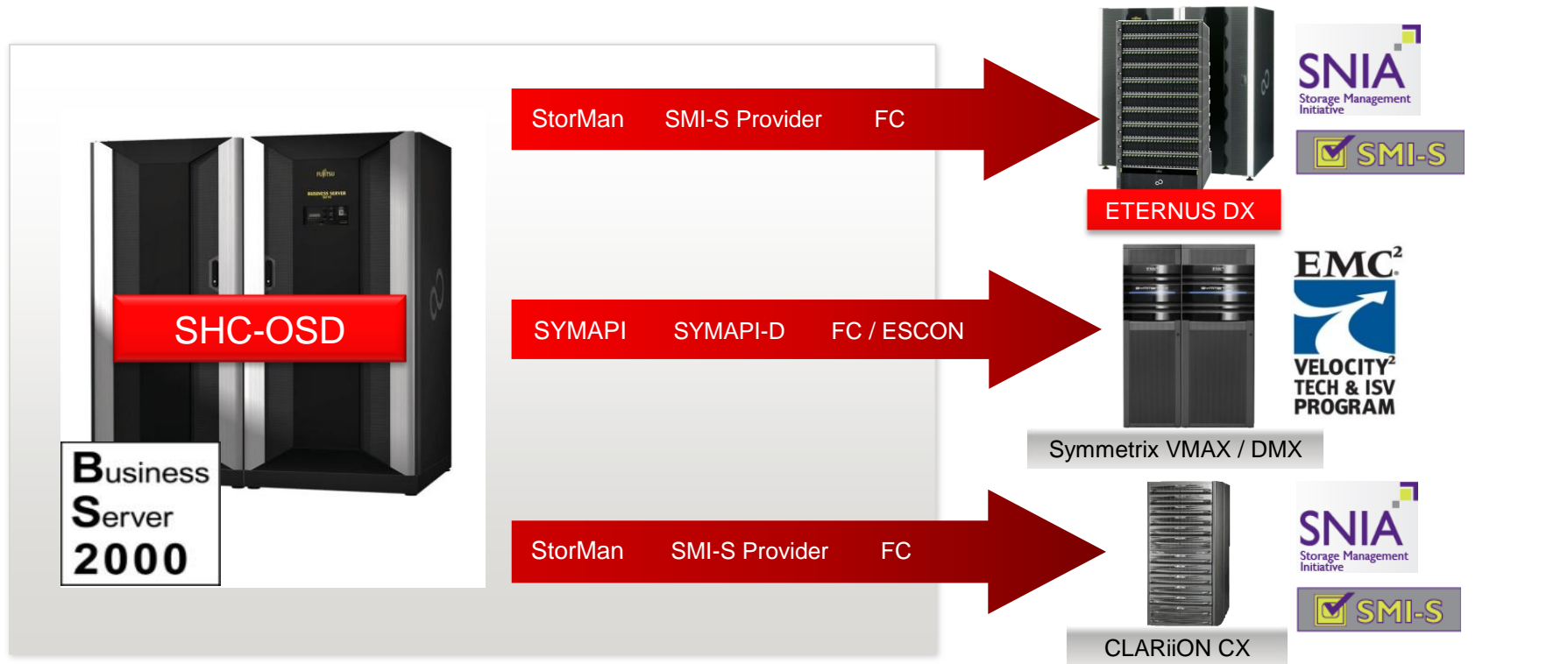
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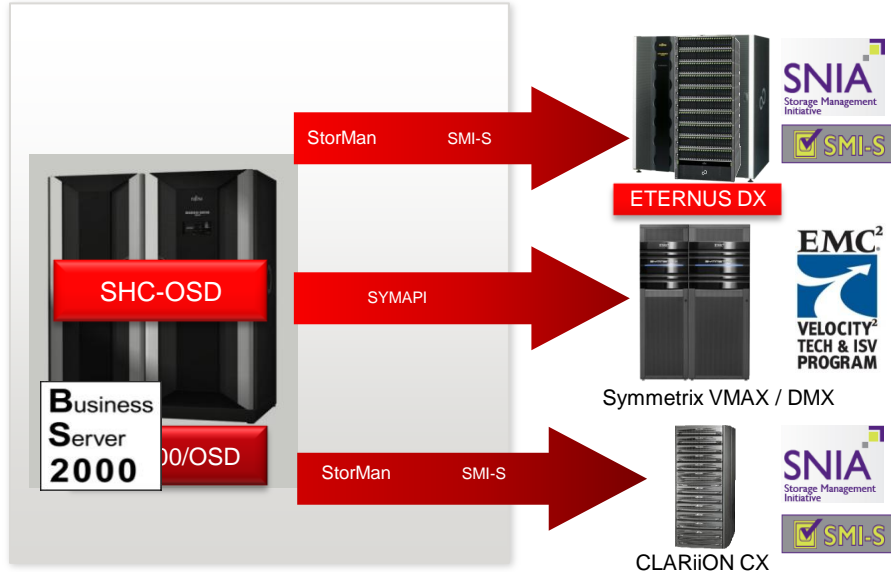
SHC-OSD = **Storage** Host Component ...

... provides a uniform and centralized Storage Management in BS2000



- SHC-OSD V9.0 supports the complete Online Storage Portfolio on BS2000 Servers
 - bundled with StorMan V4.0 and SYMAPI V7.3
 - Focus: ETERNUS DX Product Family
 - Current Models and Features of Symmetrix VMAX and DMX-4
 - Maintenance Releases planned to support new Storage Models

Online Storage Integration in BS2000/OSD



Maximum Continuity & Compatibility

- Mapping storage system resources to BS2000 resources (Pubsets, MNS,...)
- Integration of storage functions as BS2000/OSD commands
- Utilization and extension of the proven SHC-OSD / STORMAN architecture:
- Support automation in the Data Center
- Integration with BS2000 components (e.g.. HSMS/CCOPY)

Features

- **Information**
 - Global information about the Storage System
 - Volume configuration and attributes
- **Event Monitoring via BS2000 console**
- **Local Replication**
 - Local, volume based internal replication in the storage system
 - SHC-OSD mapping to Clones and Snaps
- **Remote Replication**
 - Volume based replication between one or multiples storage systems or sites
 - SHC-OSD mapping to REMOTE-COPY
- **Combination of local and remote Replication (e.g. concurrent, cascaded, ...)**
- **StorMan functions**
 - HA Package Storage (HAPST) for SQ210
 - Performance Monitoring with openSM2 V9.1

EC (Equivalent Copy)



Nach initialer Kopie aller Quelldaten werden alle weiteren Änderungen am lokalen Spiegel mitgeführt.

- Internal replication within the ETERNUS DX
- Complete copy of the data, available after completion of an initial copy process
- Original and Clone are any volumes of same size
- Only updated data (delta) are copied after resuming the replication
- Maximum of 32 Clones for each volume

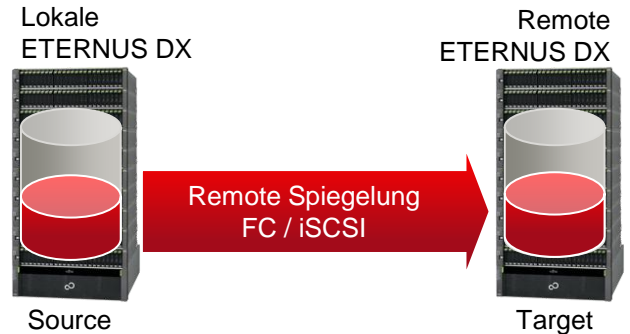
SHC-OSD Base Integration

- Mapped to the existing SHC-OSD commands for CLONE management
- Cycle for the daily CLONE automation in the data center
- Consistent Split feature for BS2000 Shared Pubsets
- Integrated Pubset renaming for CLONE usage in the same BS2000 session

Integration into BS2000

- Integration into backup products: HSMS/CCOPY, FDDRL
- Integration with database products (e.g. SESAM, UDS, ORACLE) possible

REC (Remote Equivalent Copy)



Nach initialer Kopie aller Quelldaten werden alle weiteren Änderungen am entfernten Spiegel mitgeführt.

- Synchronous Replication between ETERNUS DX systems and/or sites
- Dynamic management of the remote mirror pairs
- Complete copy of the data, available after completion of an initial copy process
- Source and Target are any volumes of same size
- Only updated data (delta) are copied after resuming the replication
- Maximum of 32 Targets for each Source volume

SHC-OSD Base Integration

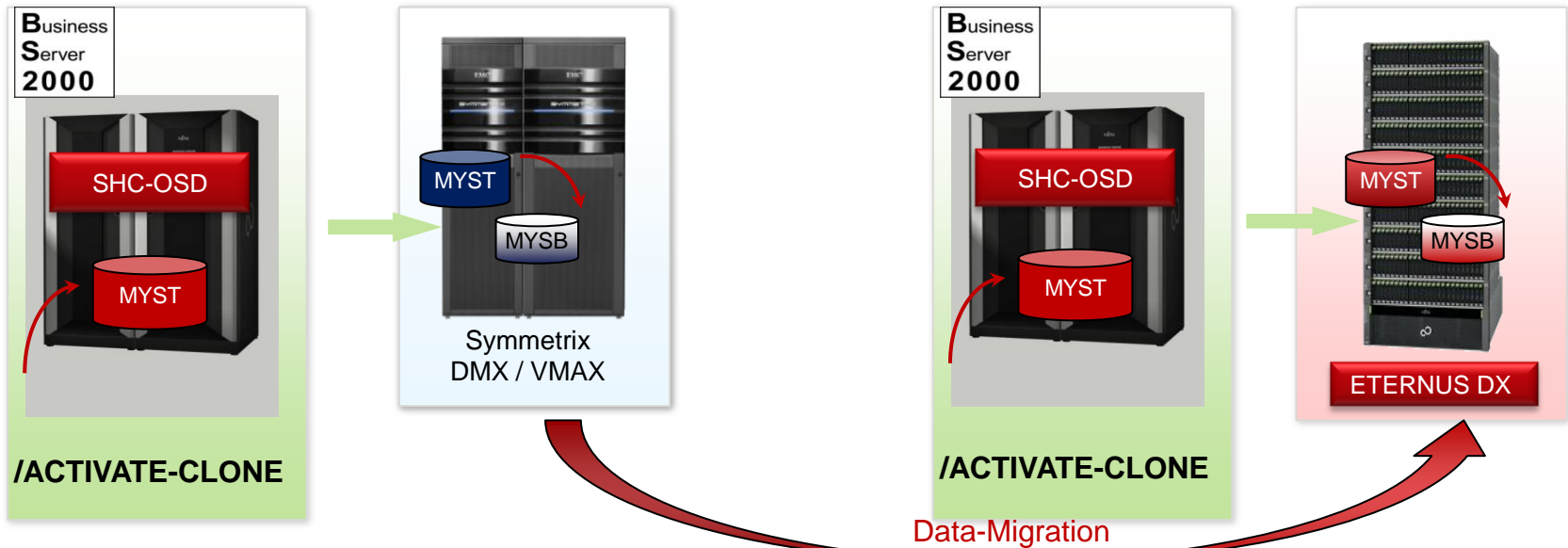
- Mapped to the existing SHC-OSD commands for REMOTE-COPY
- Support for Concurrent, Cascaded and Switched Remote-Copy
- Support of combined EC- und REC-configurations

Integration into BS2000

- Implementations of Disaster Recovery Concepts for BS2000

Storage Management from BS2000

Scenario: Storage management continuity after storage system migration



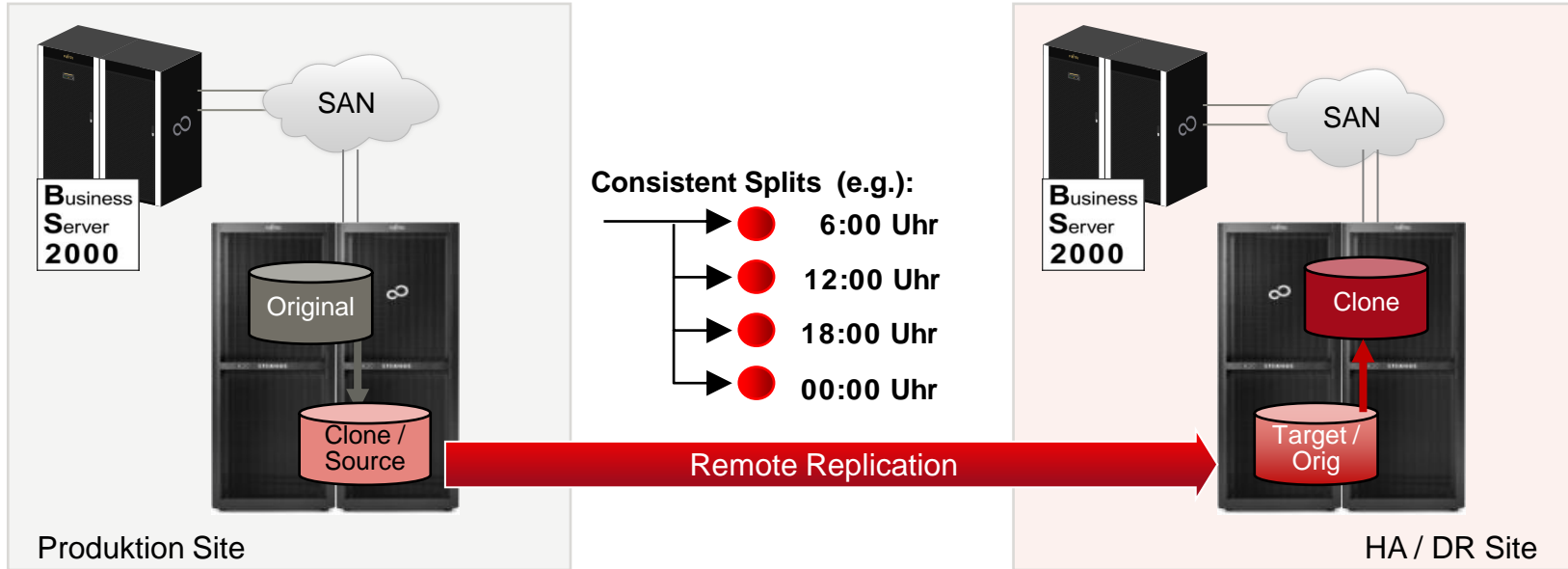
Example: Local replication (CLONEs), e.g. used for the daily backup

- Changing the storage system always goes together with migration of the data
- SHC-OSD provides continuity and portability of storage management in BS2000 e.g. for
 - Backup scenarios based on local replication
 - Periodical preparation of consistent standby pubsets
 - Support of HA und DR scenarios based on remote replication

Result: Legacy integration solutions are widely independent of the storage system

Scenario:

Consistent data copies are maintained automatically on a remote site



- No or only short interruption of the application to create a point of data consistency
- Based on a combined configuration of local replication with remote replication:
 - Local Clones are saving the consistent data at predefined points in time
 - Local Clones are transferred to remote Targets, in parallel to the resumed application
 - Consistent data on additional Clones of the remote targets are available online
- Flexible usage based on dynamic management by SHC-OSD for BS2000 pubsets

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Strategy: Continuation of the optimal and compatible integration of storage systems in BS2000/OSD


ETERNUS DX Product Family

- Innovation by support and qualification of new HW models, FW and SMI-S versions in BS2000 and SHC-OSD
- SHC-OSD V10.0 / StorMan V5.0 (planned for Q4.2012) comes up with new Features as:
 - Integration of SnapOPC+ to support Snapshots in SHC-OSD and SnapSets in BS2000 (as of BS2000/OSD V9.0)
 - Thin Provisioning
 - Data-Mobility configurations
 - ,ease of use' improvements by ,out-of-band' management via SMI-S
- Continuous integration of new features with upcoming SHC-OSD versions, e.g. asynchronous REC, ...

EMC Symmetrix VMAX Family

- Support and qualification of new HW models, Enginuity and SYMAPI versions in BS2000 and SHC-OSD
- Integration of new, innovative features with SHC-OSD selected according to customer demand and use cases

- Fujitsu's long-term strategy consists of the optimal, compatible support and integration of high-end storage systems in BS2000 in mainframe quality
- With ETERNUS DX and EMC Symmetrix VMAX the most innovative and powerful storage system are supported and integrated for BS2000 Mainframes. They are representing the most relevant storage systems for our BS2000 customer base.
- ETERNUS DX is a proven and mature storage system product family with a completely innovated model range
 - Now globally available, with a fast growing customer base including BS2000
 - The results of a long-term product strategy, based on the high quality culture of 1.000 developers, are a seamless family concept, leading performance, stable operation and flexible scalability.
- Storage integration in BS2000 ist based on the product SHC-OSD
 - Tailored for the needs of BS2000 administrators for storage management and process automation
 - based on stable global standards of the storage industry for (SMI-S)



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