

Design and Implementation of SANs

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SAN Definition?

A SAN is a high-speed, high-bandwidth storage network that logically connects storage to servers. SAN topologies (switched fabric or arbitrated loops) extend the concepts offered by traditional server/storage connections and deliver more flexibility, availability, integrated management and performance. SANs are the first IT solutions to offer the assurance that all systems can access any information in the enterprise at any time.

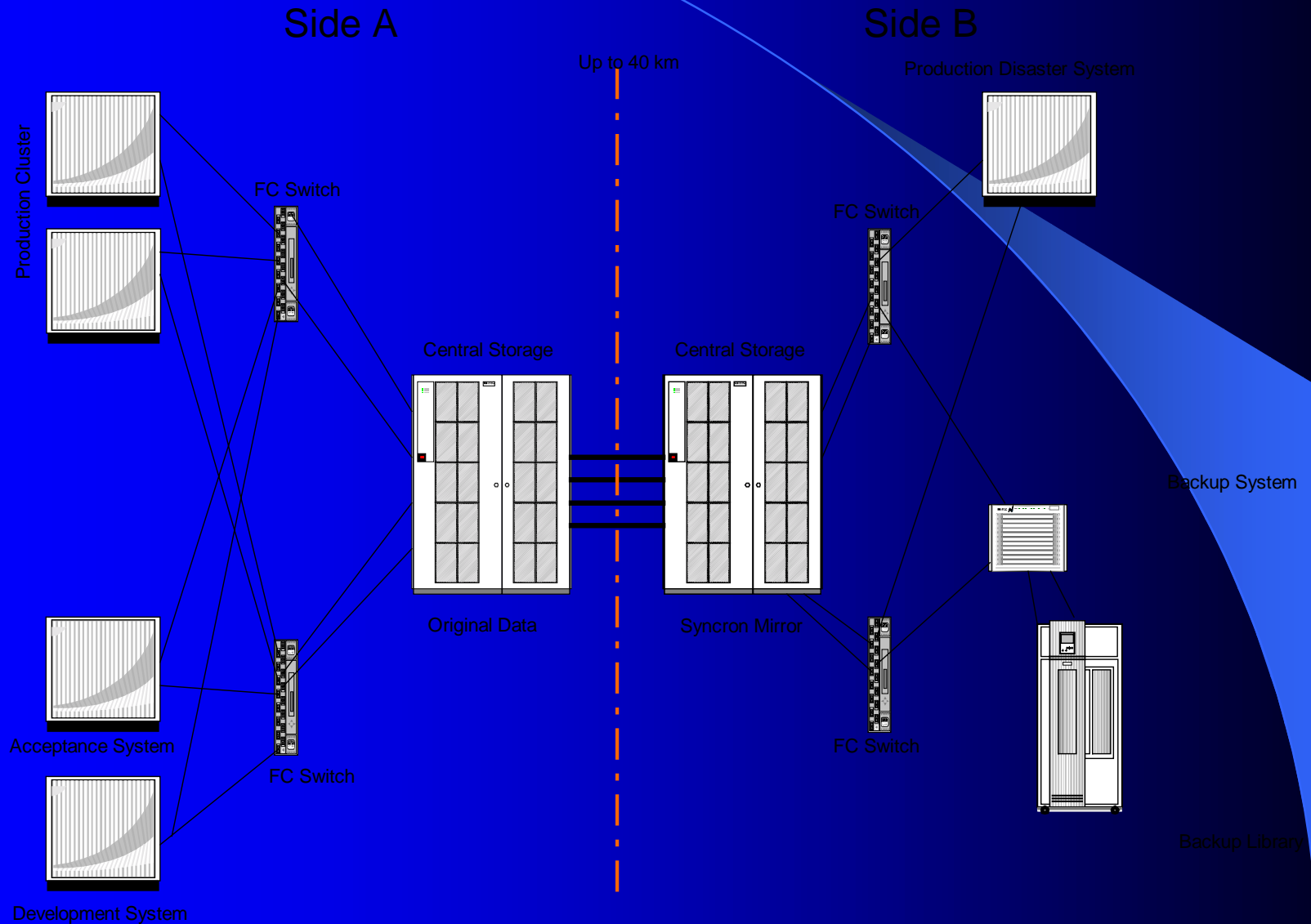
Benefits from a SAN

- Fast (100 MB/sec)
- Reliable
- Highly scalable

What SAN is

- Storage lives behind the server, not on the LAN
- Multiple servers can share multiple storage devices

SAN Example



What is SAN not!

- Embedded storage is not a SAN
- Directly attached storage is not a SAN
- Direct attached shared storage is not a SAN
- Network attached storage is not a SAN

Why SAN help your business

- Capacity – You can grow your disk capacity when you need
- Reliability – The better solution for disaster scenarios than previous storage strategie.
- Costs – SAN can be mainted, manages and expanded with relative rease by fewer people than required by non-SAN sides.

Used devices

- XP512
- EMC 3930
- Brocade Silkworm
- FC Tachyon Lite Cards

MC/Service Guard

If there are any hosts or disk storage devices configured with Fibre Channel switches, but are not configured in the cluster, then these must be configured in a different zone than the devices and hosts that are in the cluster. If nodes belonging to different clusters are connected to the same switch, each cluster must be configured into a different zone. To do so otherwise may allow nodes outside the cluster to initialize or write to the cluster disk devices, causing severe data corruption.

Planning

- A planning document is the blueprint for SAN success.
- Ask yourself and answer the following questions.

Planning questions

- Current configuration.
 - What have i now.
 - What can i use in a SAN?
- Cuurent needs.
 - What is working well in my current configuration.
 - Whats my problems with current config. (e.g. performance, connectivity)

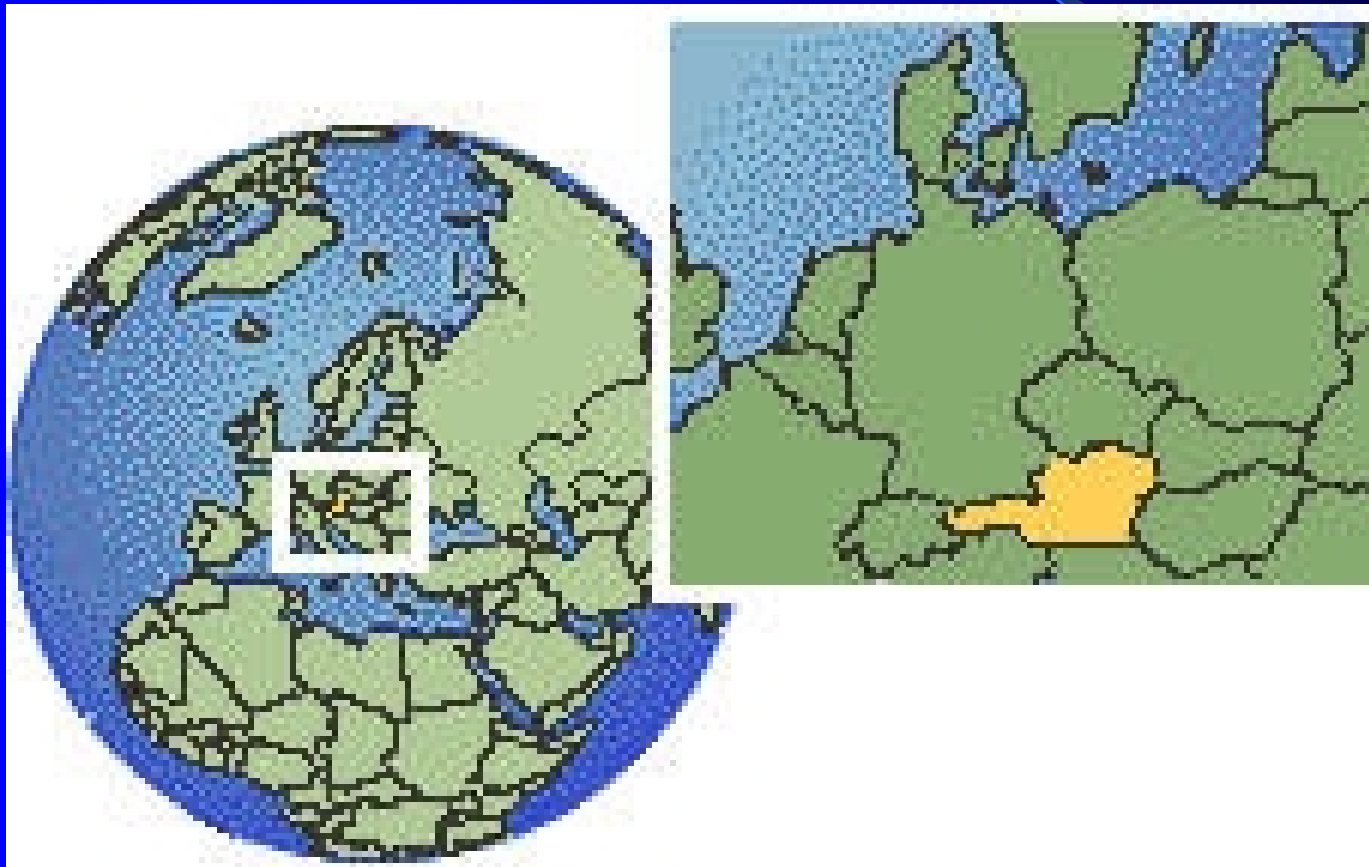
Planning questions (cont.)

- Future needs.
 - What are my plans for server, storage... Grow.
- Storage grow.
 - How fast is storage now growing.
 - When will i run out?
 - What estimate rate for the future grow.
- Budget.
 - What does new quipment cost

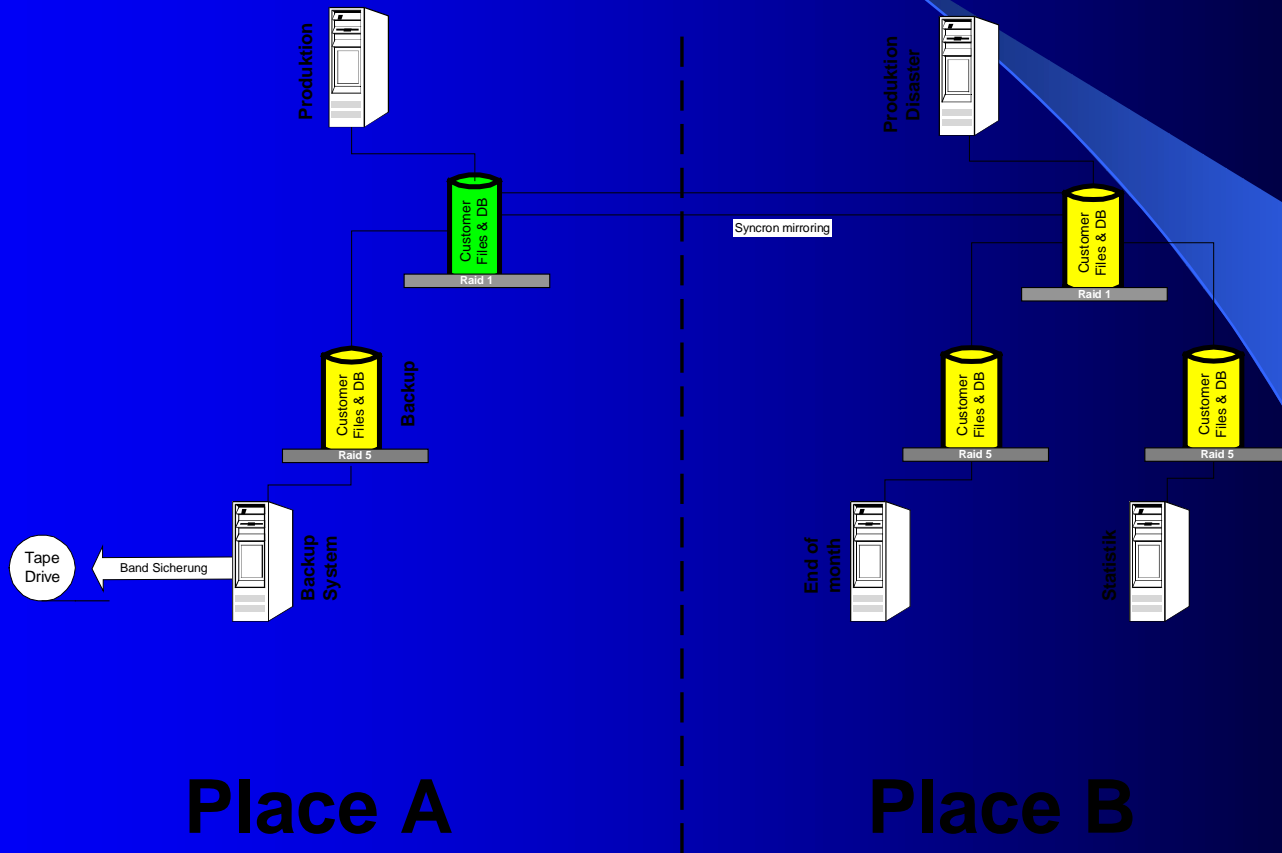
Planning questions (cont.)

- Topology.
 - What will the SAN look like?
 - What does it get me?
 - What about cabling runs?
- Management.
 - How will I monitor and manage the SAN?
 - How will I tune performance?
- Intangibles.
 - Will I be able to do more with greater ease?
 - Will I be able to manage storage with fewer worries?

Case study from Austria



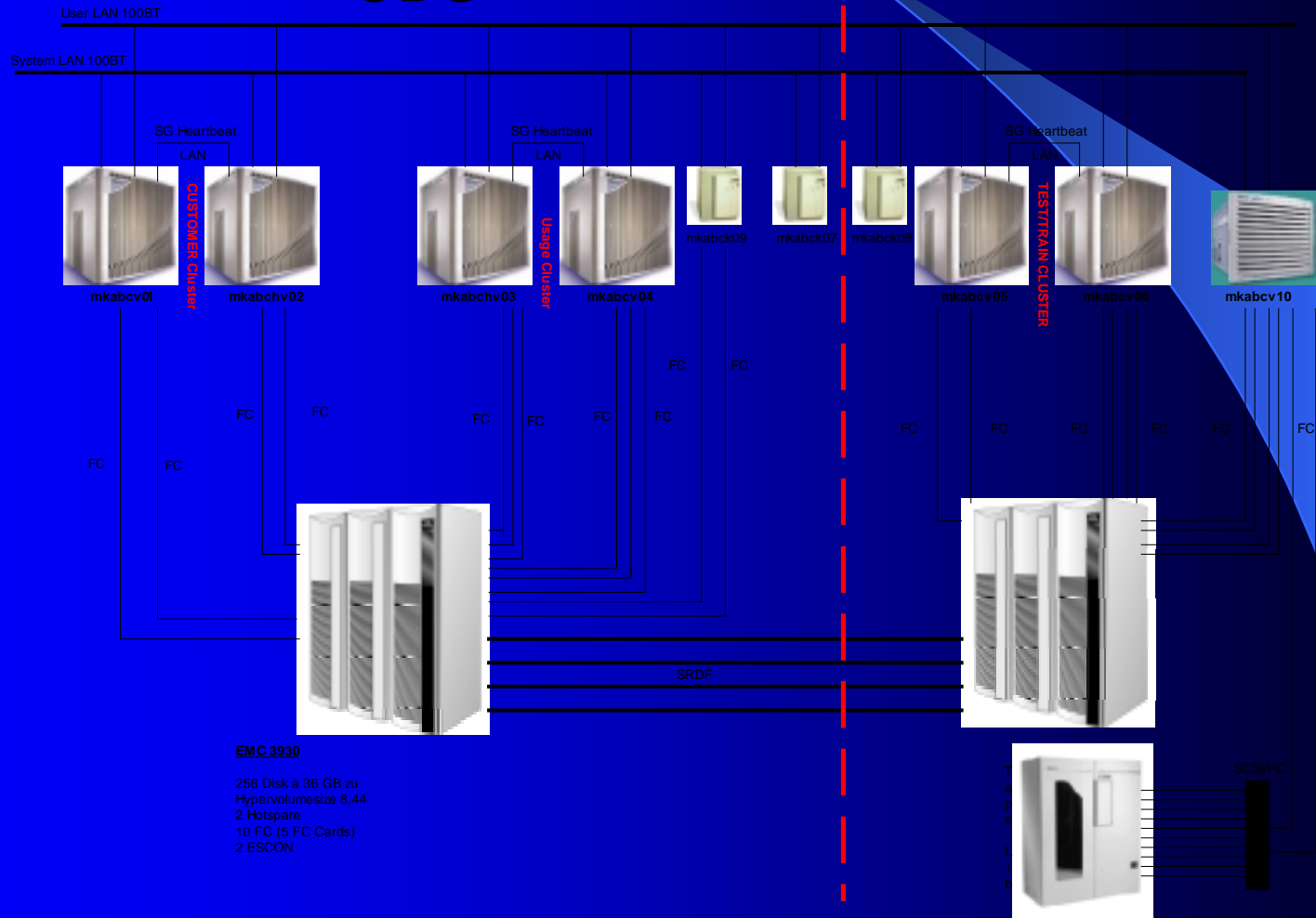
General data protection



Before SAN

ODS

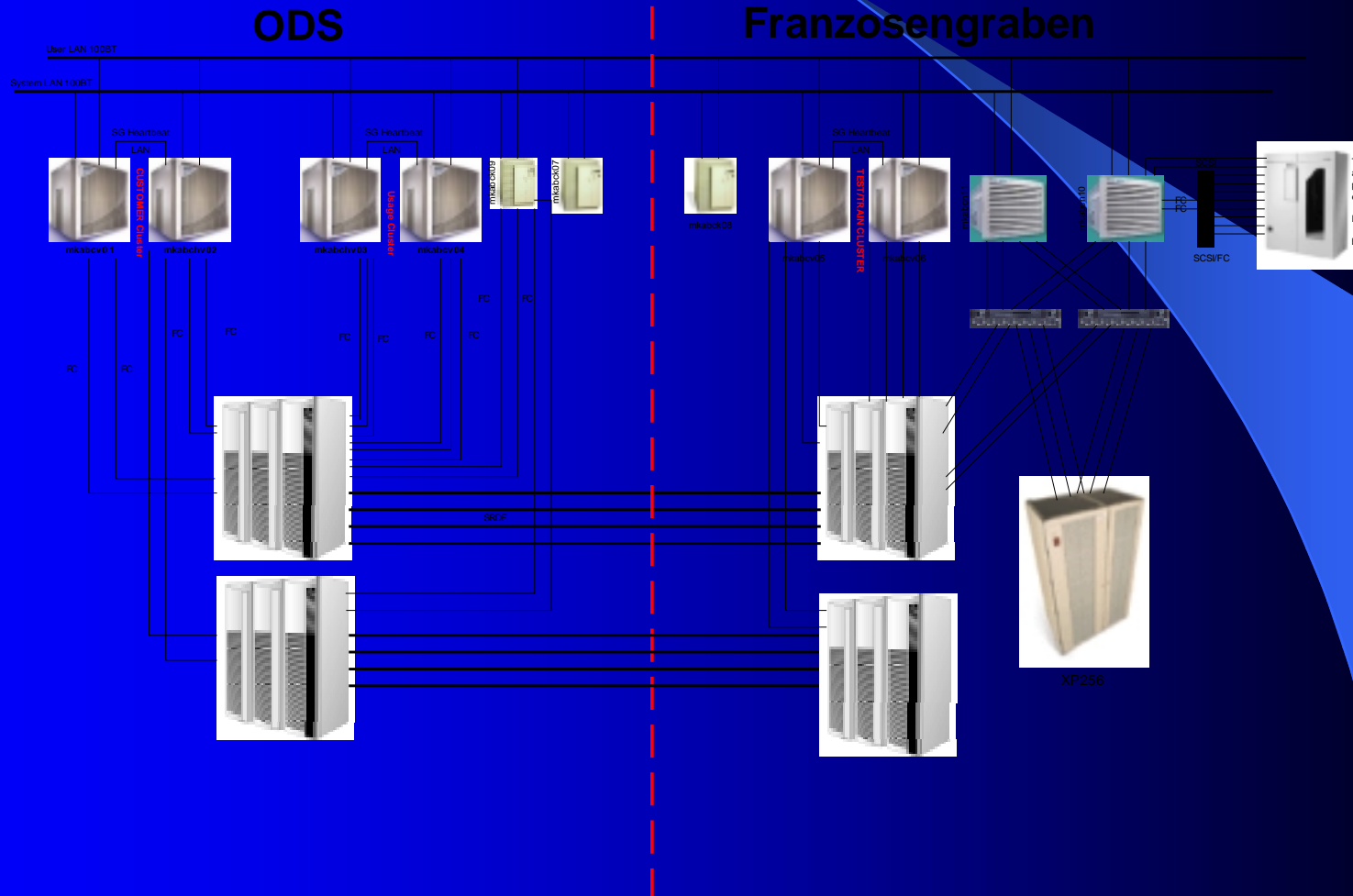
HP



Before SAN

- Only one storage box.
- About 2 TB data.
- Backup over BCV (EMC)
- Enough direct connections to EMC
- Enough capacity for growing

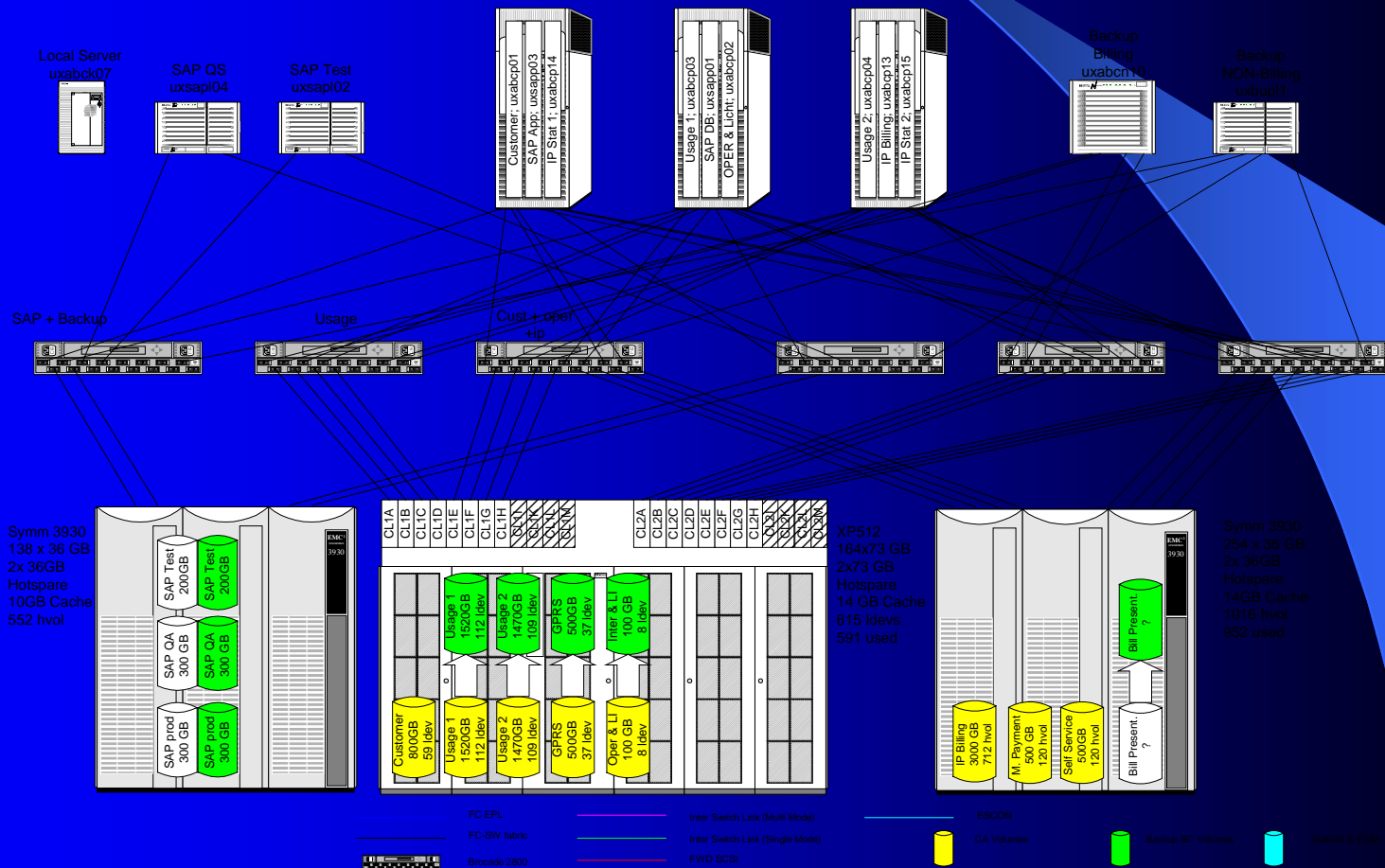
Disaster side with part. SAN



Next step

- New application.
- More space needed.
- BCV split between 2 boxes not supported
- Storage per application
- Many space unused!!!!
- Hard to manage
- SAN only between EMC and XP on disaster side for data copy each month

With SAN (main datacenter)

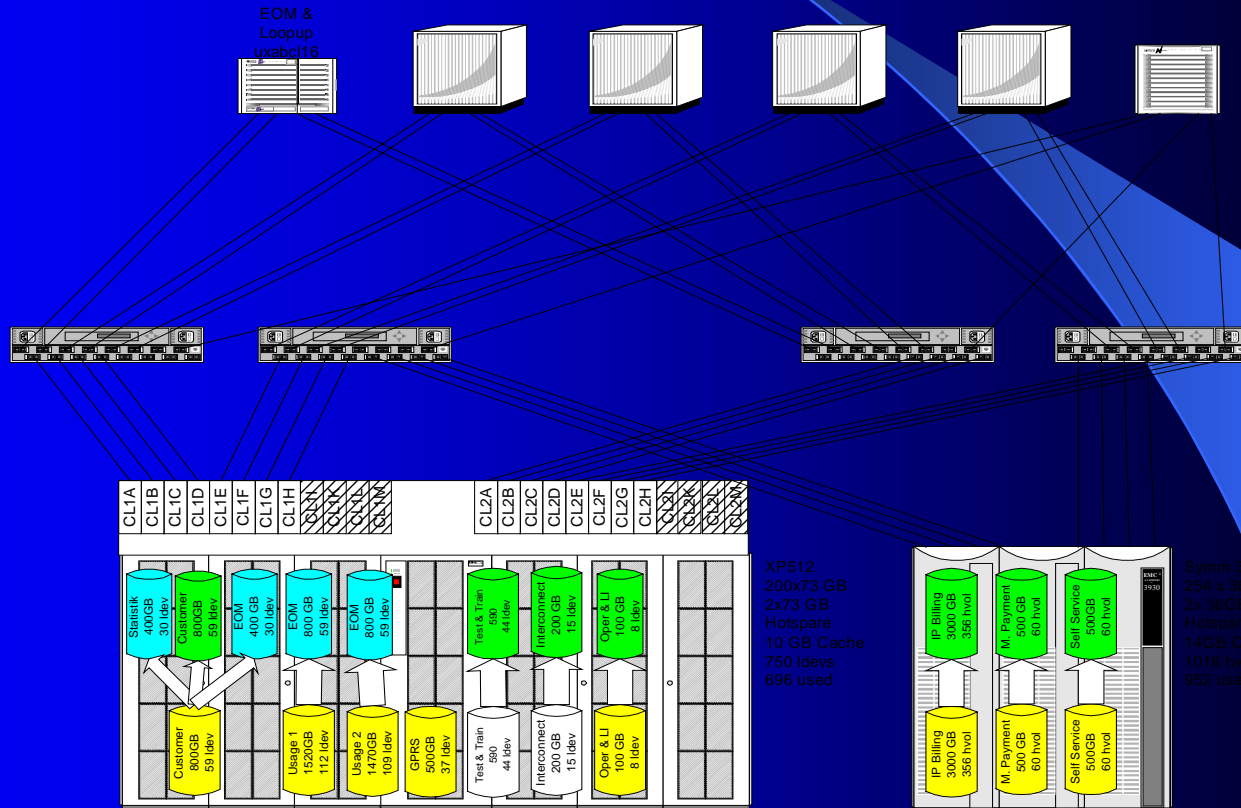


With SAN (disaster datacenter)

Local Server



EOM & Loopup
px200c116



XP512
200x73 GB
2x73 GB
Hotspare
10 GB Cache
750 Idevs
696 used

Symm 3930
254 x 36 GB
2x 36GB
Hotspare
14GB Cache
1016 hvol
952 used

FC EPL

FC-SW fabric

Brocade 2800

Inter Switch Link (Multi Mode)

Inter Switch Link (Single Mode)

FWD SCSI

ESCON

CA Volumes

Backup BC Volumes

Storages & EOM

With SAN

- Put your empty space where it need
- Everyone can access data.
- Copys between boxes is no problem.
- Single point of administration
- Automatic performance loading within a box
- More effeciente management
- Easy backup

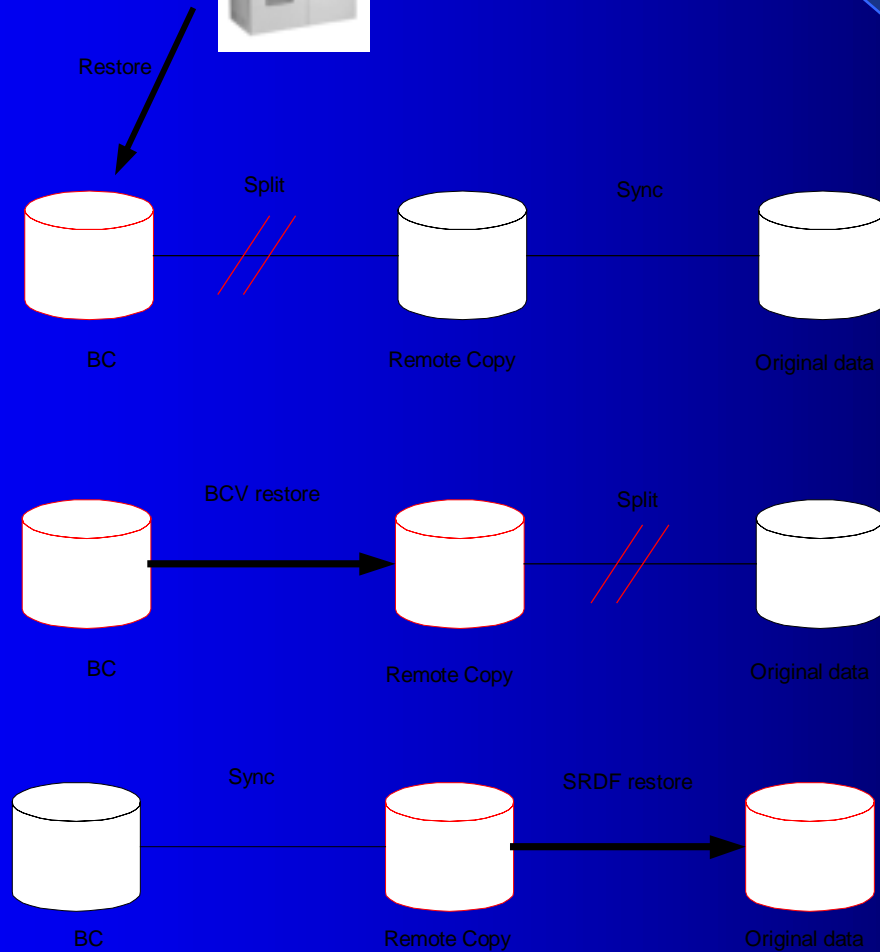
Minding must be change

- Dont think in storage boxes. Think in LUNS
- With SAN you have disk pools
- Dividide your Administration into OS and SAN admins.
- The OS admin need storage and the SAN admin assign storage where it need.
- NEVER MIND WHERE YOUR STORAGE IS PHYSICAL RESISDENT.

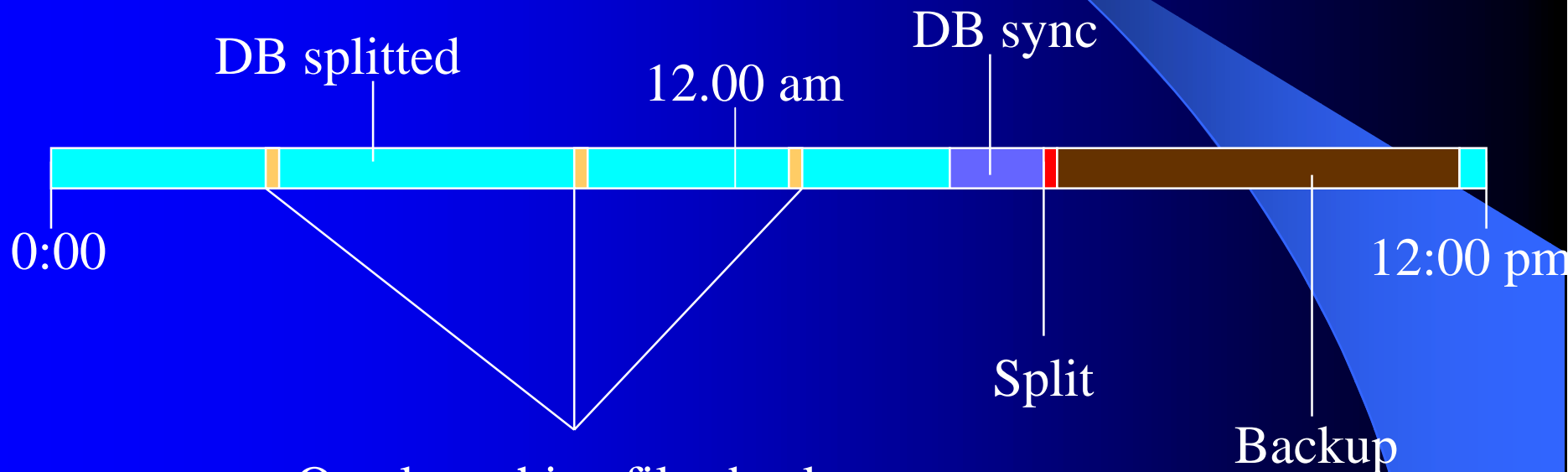
Backup strategy must change

- If possible make BC backups.
- Dedicated backup server, because with 100MB/sec possible transfer rate per channel you need a strong system.
- Be sure you have a tested cookbook for restore. It's more complex than a restore direct to the filesystem.

Restore steps



Backup example with BC



Oracle archive files backup
from primary node.