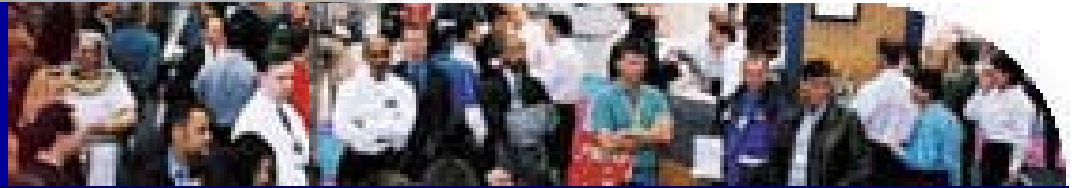




always on



an archival solution in a san environment

august 23, 2001

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hewlett-packard

networked storage solutions

optical jukebox business

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# agenda

- 1 ➤ purpose – define a high availability archive solution
- 2 ➤ components – software, platforms, connectivity, jukebox
- 3 ➤ configurations – software, platform, topology
- 4 ➤ conclusions – questions & answers

## *purpose*

- *scope:*
  - this is a work in progress with all components functional in a “proof of concept” with only certain parts fully certified and supported
  - fibre channel connectivity of archive mo jukeboxes
  - software packages selected as example



## ***purpose***

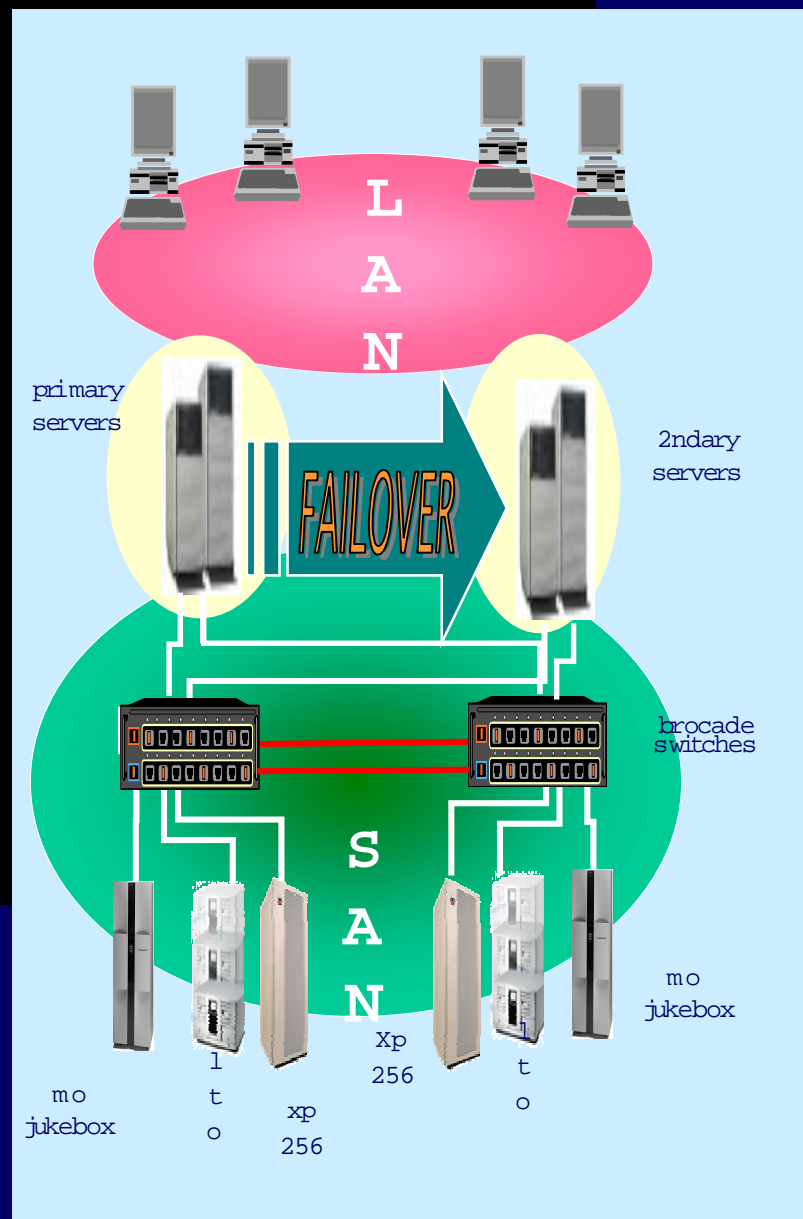
- *goals:*
  - create a high availability data archive solution
  - provide uninterrupted data capture & data access
  - minimize both planned & unplanned downtime
  - allow for future growth & expansion transparently



# *purpose*

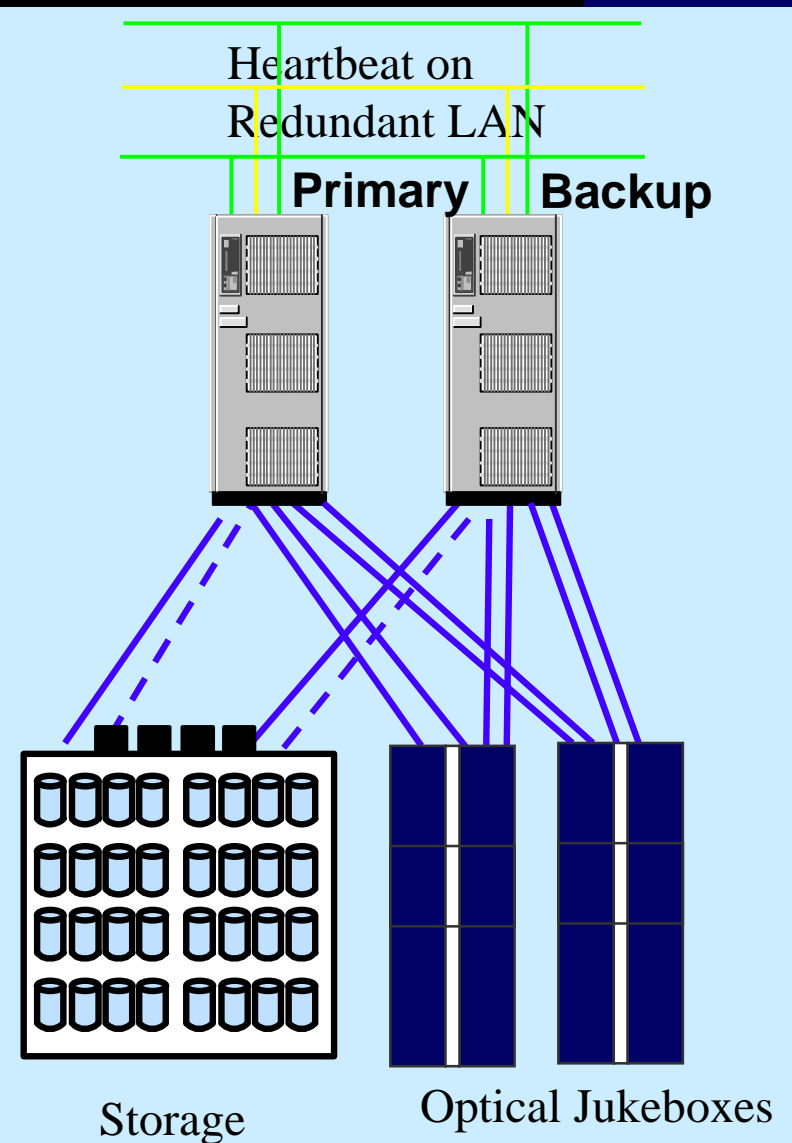
- method:

- application failover with redundant server nodes
- archive device failover with redundant mo jukeboxes



## *purpose*

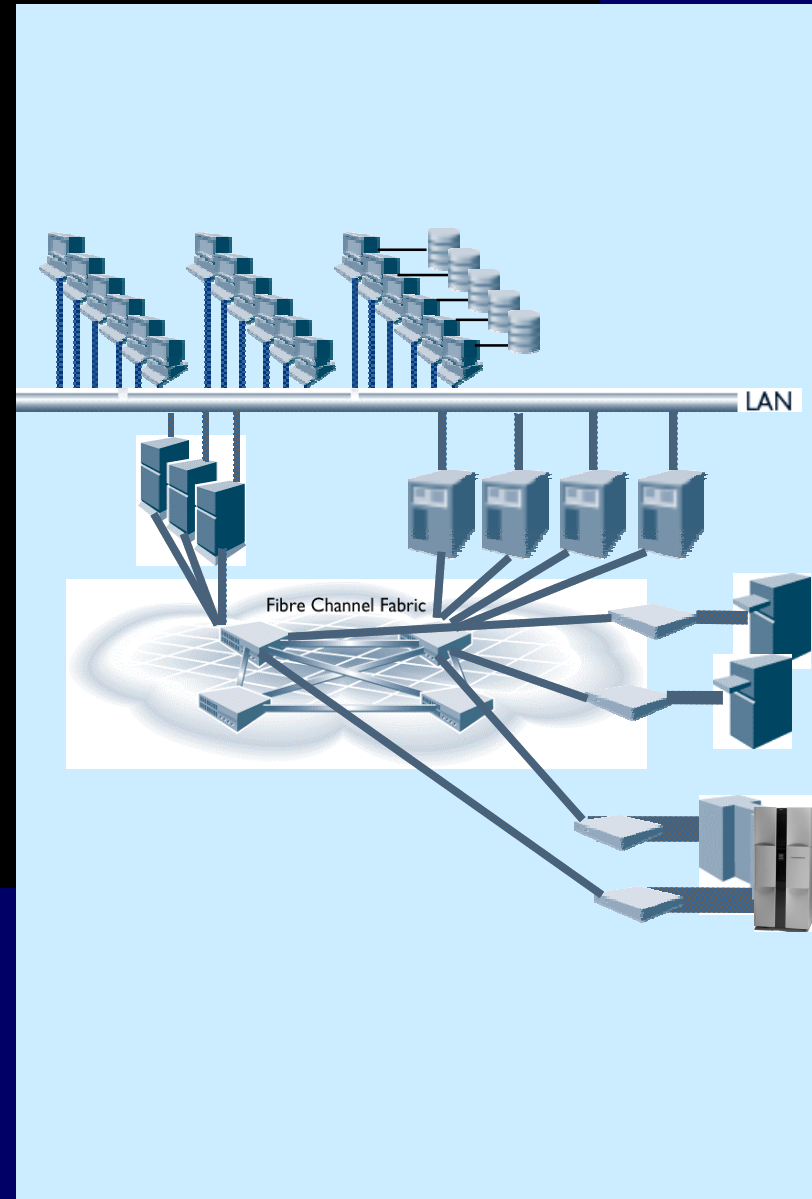
- *problem:*
  - sharing duplicate archive storage units between 2 servers & manage contention
  - isolate faults on failed system
  - allow for "hot" maintenance



# *purpose*

## approach:

- fibre channel san connectivity



# *purpose*

## advantages:

- shared resources
- system isolation
- dedicated bandwidth
- long distance connect
- number of luns
- hot swapping of devices





# ***purpose***

## ***challenges:***

- isolate archive data i/o
- remote secondary system
- luns presented to server
- single volume
- application failover
- no single point of failure

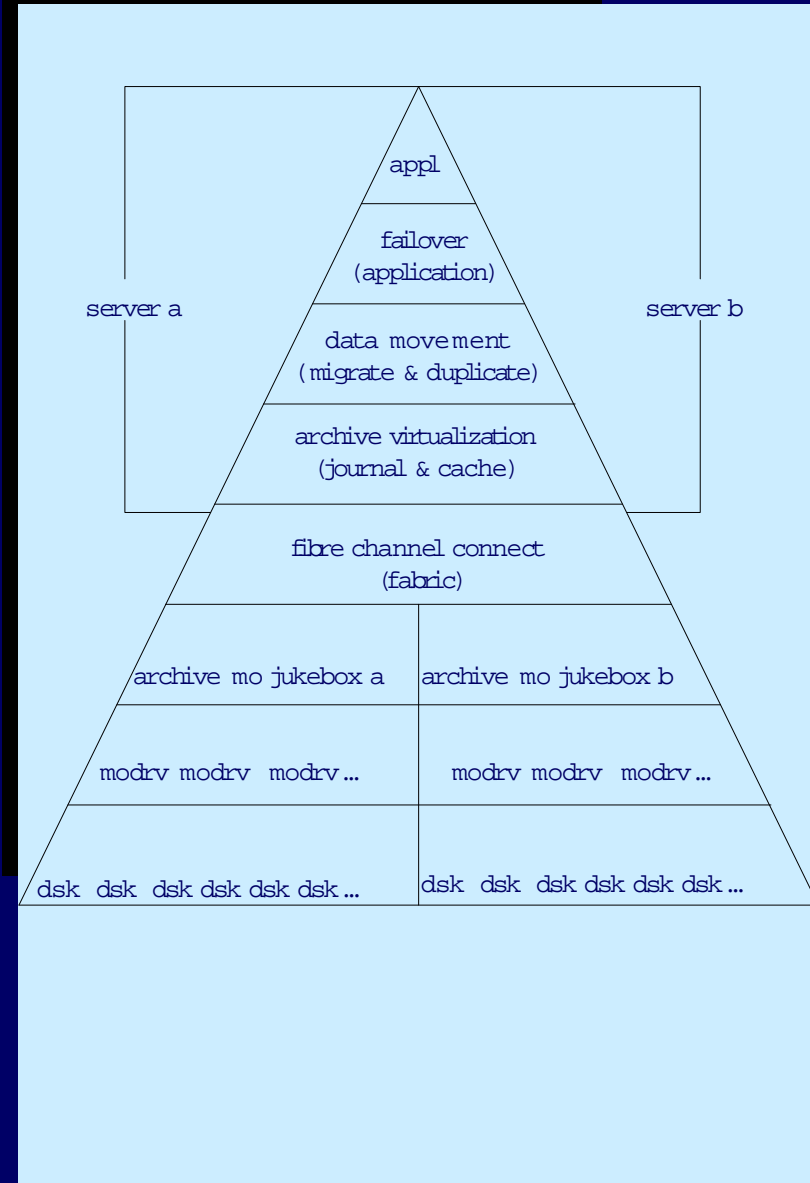


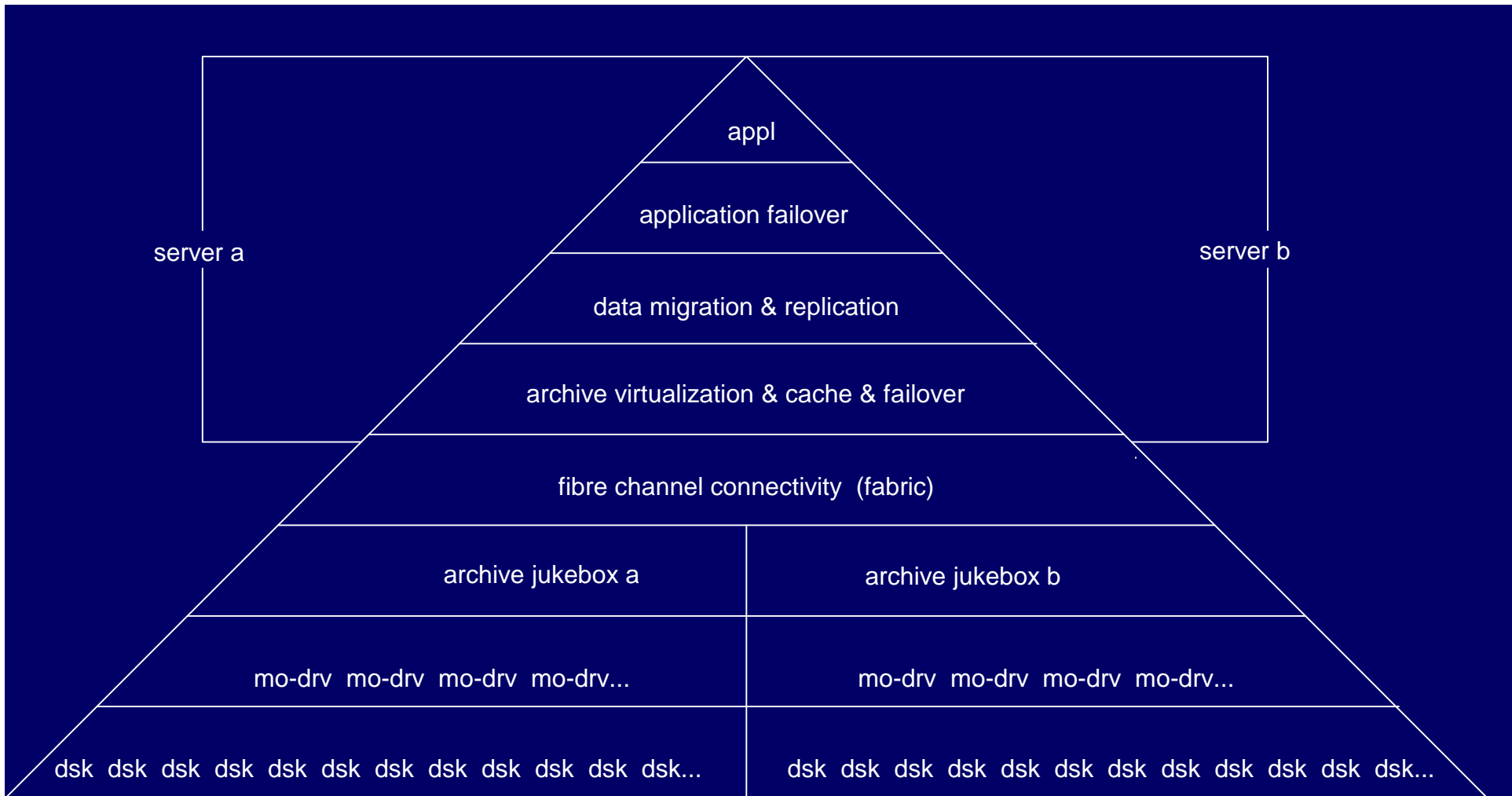
# agenda

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# components

- application
- software
- platform
- fibres channel connect
- archive devices



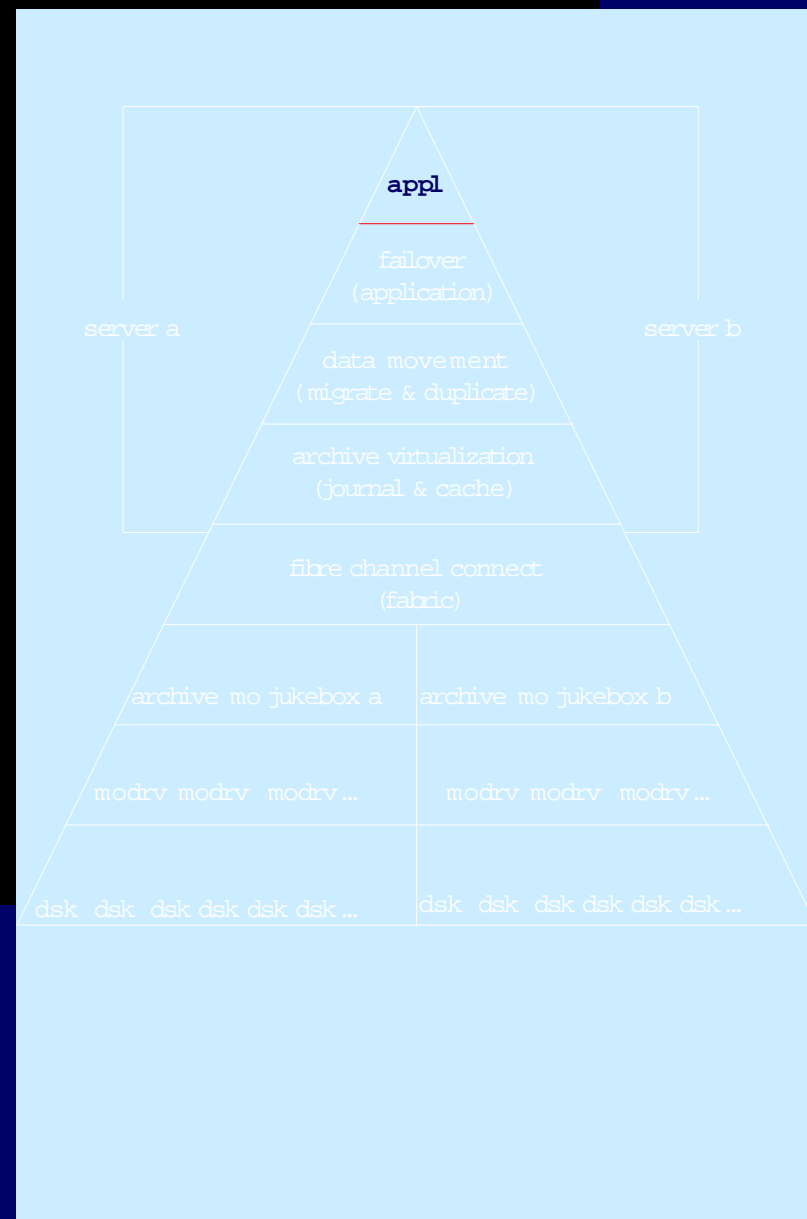


# high availability san

archive san

# components

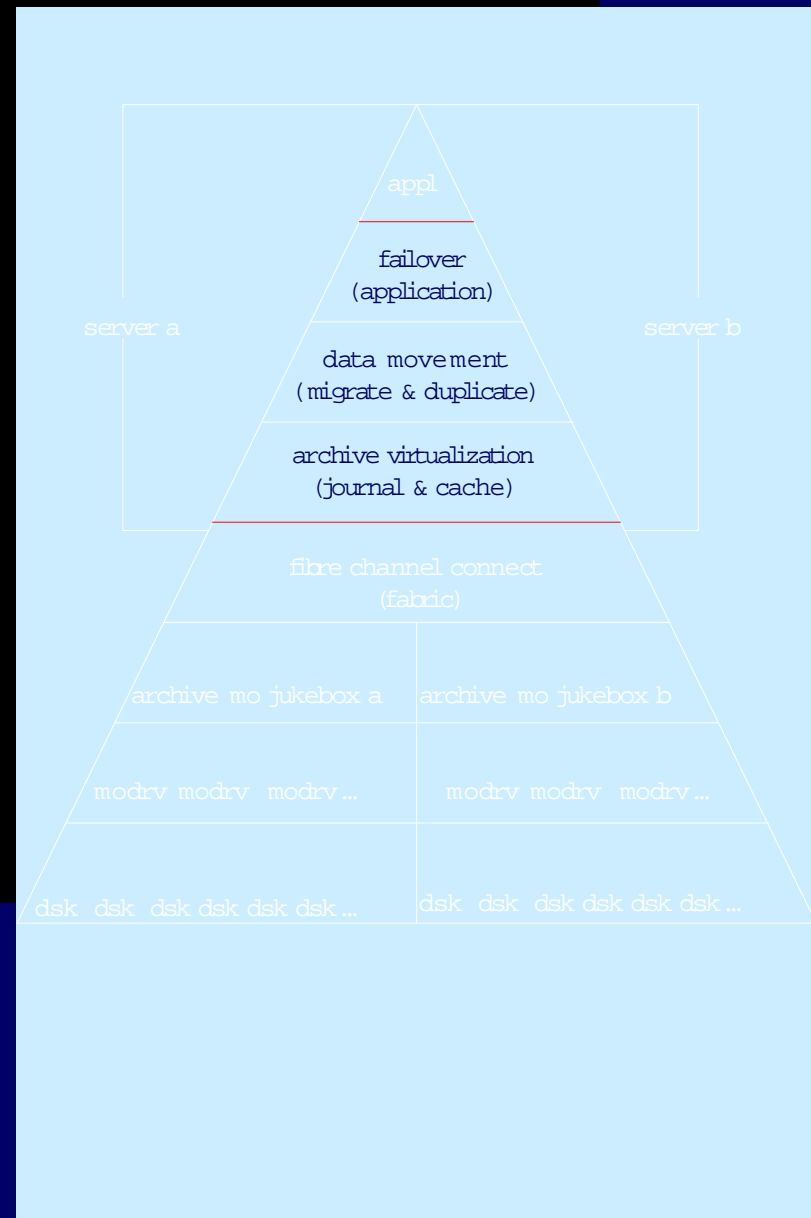
- application:
  - Documentum pdm & Oracle db (no detail)



# components

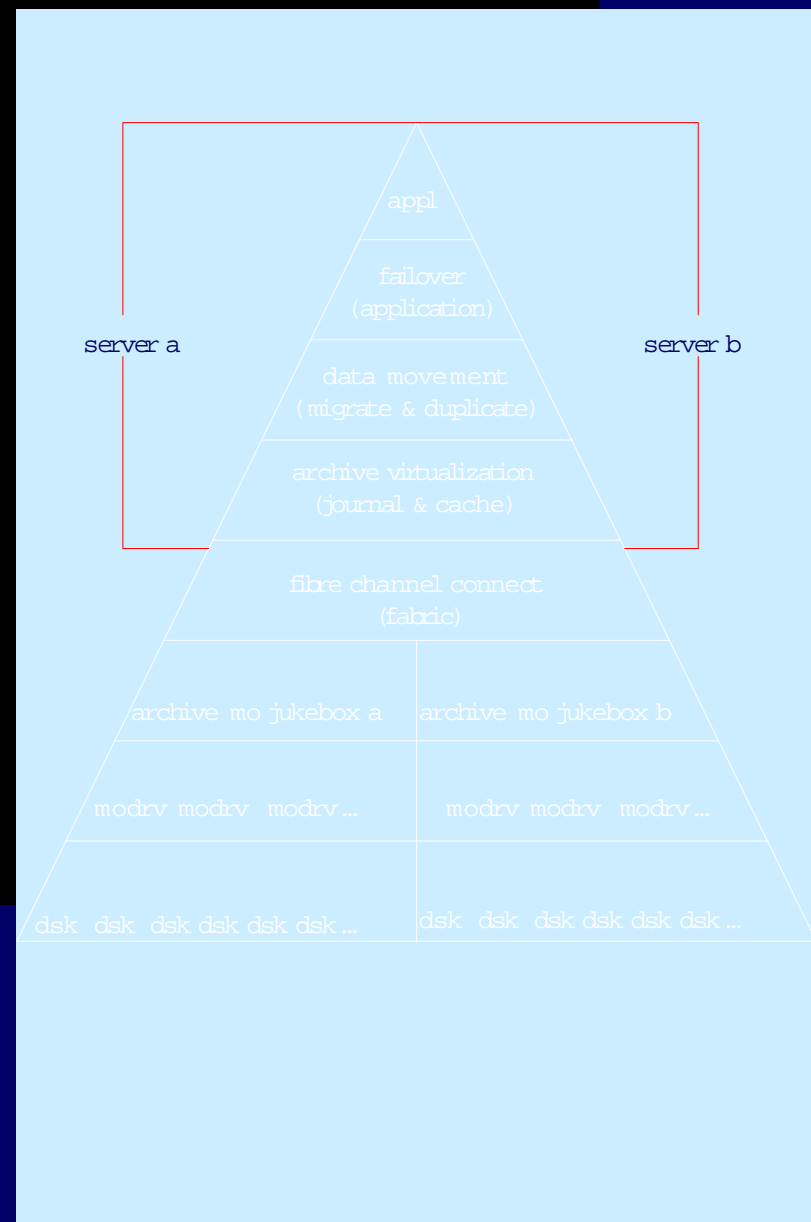
- software:

- mc/service guard – application failover (no detail)
- DataMgr – data migration/replication (no detail)
- AMASS – archive virtualization (media management, journal & caching) & failover



# components

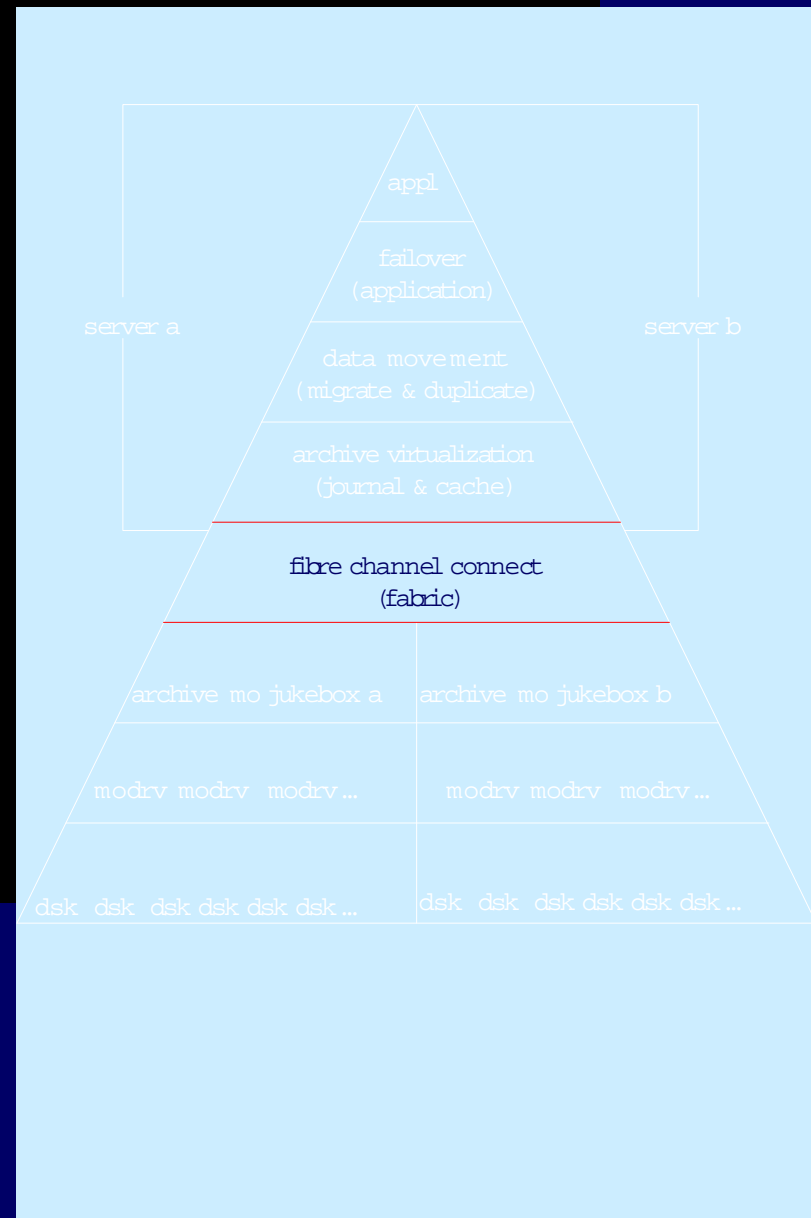
- platform:
  - hp 9000 n-class server (2 servers)
  - hp a5158a tach lite fc hba (2 per server)
  - hp-ux 11.00
  - mass storage & fc patches



# components

- **fc connect:**

- Brocade SilkWorm 2800 fc 16-port switch
- hp a3308a fc router/mux
- hp surestore e bridge fc 2/1 lv
- hp surestore e bridge fc 4/1 Hhv

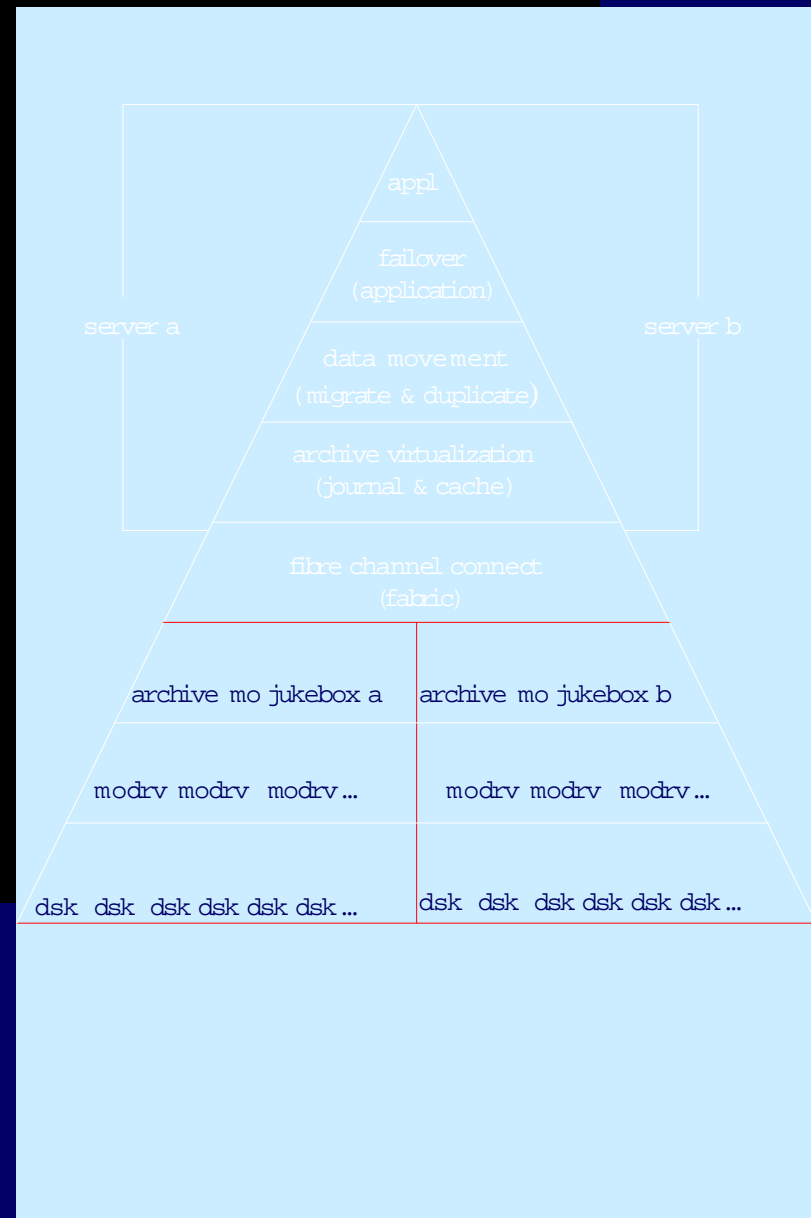




# components

- archive devices:

- hp magneto optical jukebox
- mo drives
- mo media  
(r/w and worm)

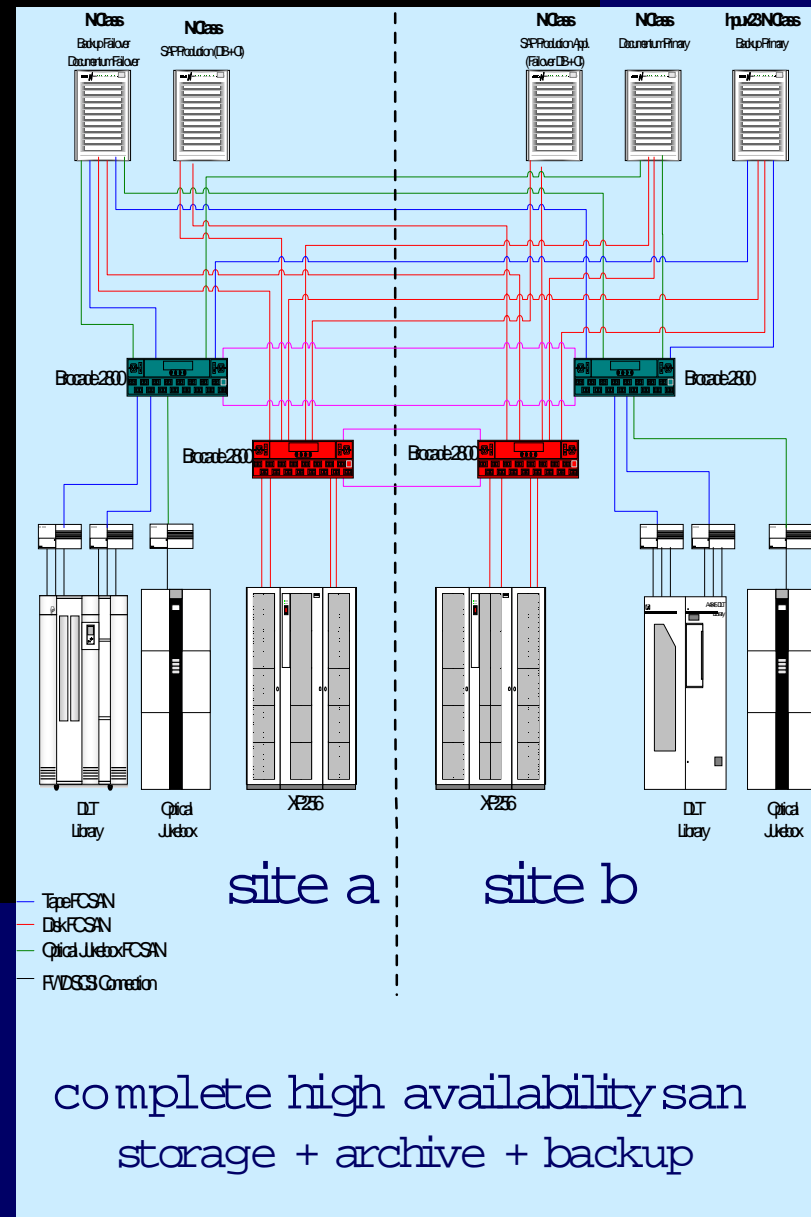


# agenda

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# configurations

- total san:
  - physically separate storage san & archive/backup san with logically separated archive & backup sans on zoned switches
  - fc fabric topology (reduce fc fault propagation)



N-Class  
Backup Failover  
Docum entum Failover

N-Class  
SAP Production (DB + CI)



N-Class  
SAP Production Appl.  
(FailoverDB + CI)

N-Class  
Docum entum Prim ary

hpux23 N-Class  
Backup Prim ary



Brocade 2800



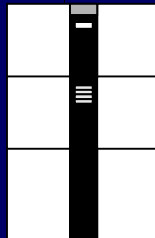
Brocade 2800



Brocade 2800

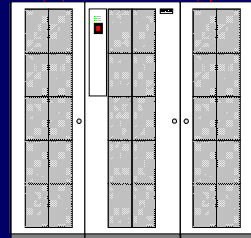


Brocade 2800

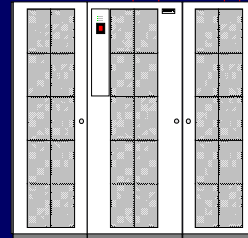


DLT  
Library

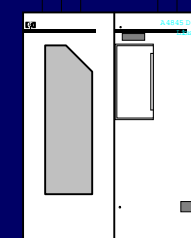
Optical  
Jukebox



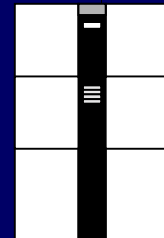
XP256



XP256



DLT  
Library



Optical  
Jukebox

- Tape FC SAN
- Disk FC SAN
- OpticalJukebox FC SAN
- FW D SCSI Connection

site-a

site-b

# complete high availability

## san

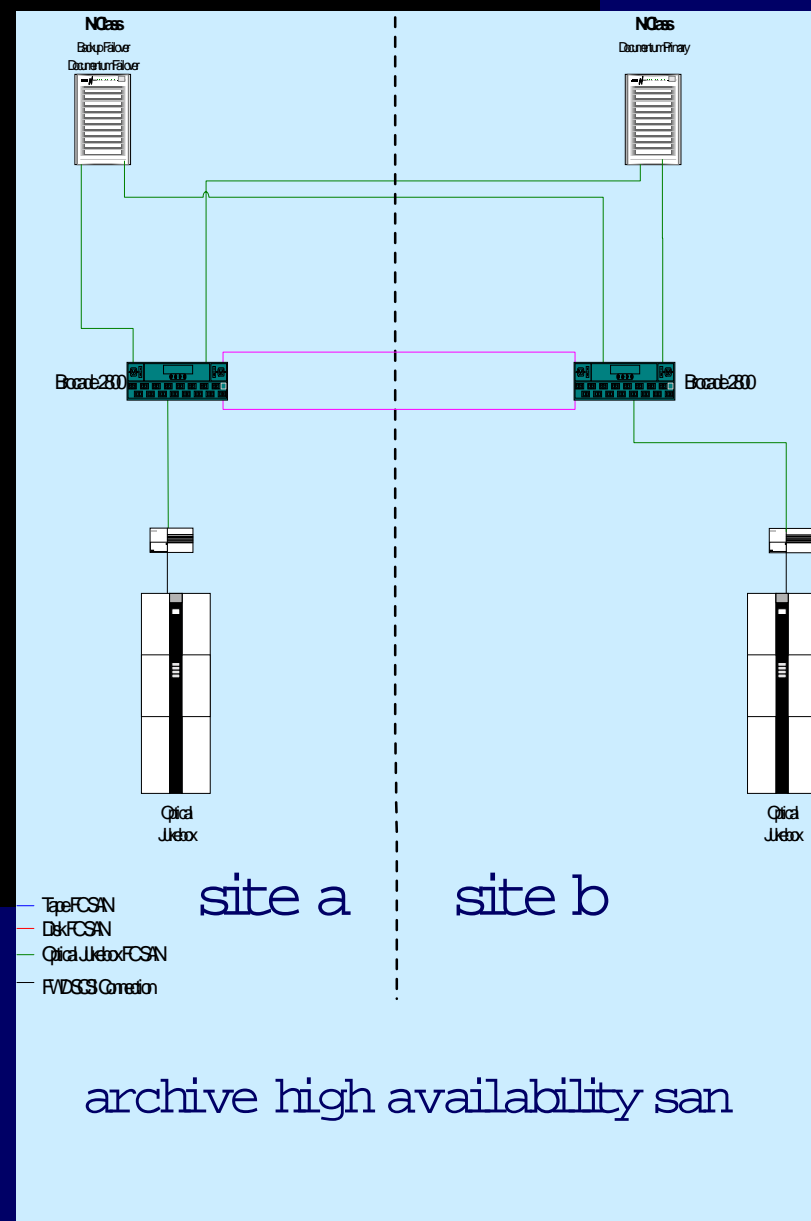
6/27/01

storage & archive & backup sans

20

# configurations

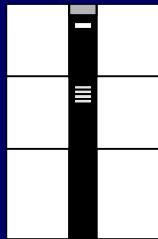
- **archive san:**
  - zoned fabric topology (isolate archive san data i/o & device access security)
  - hosts connected to san via fabric login
  - bridges connected to san switch in a translative mode at the port level
  - redundant cascaded switches



N-Class  
Backup Failover  
Documentum Failover



Brocade 2800

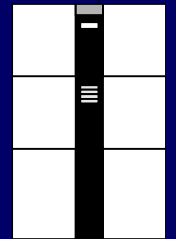


Optical  
Jukebox

N-Class  
Documentum Primary



Brocade 2800



Optical  
Jukebox

- Tape FC SAN
- Disk FC SAN
- Optical Jukebox FC SAN
- F/W D SCS I C onnection

site-a

site-b

# archive high availability san

# configurations

- bridge:

- none needed for a3308a (public loop device)
- scc "fc to scsi mapping" mode for bridge fc 2/1 lv or Bridge fc 4/1 hv (fabric login device)
- bridge presents all devices to servers as luns on same target



# *configurations*

- *jukebox:*
  - split bus for > 6 drives
  - 50-pin single ended connection to bridge fc 2/1 lv
  - 68-pin differential to a3308a or bridge fc 4/1 hv





# *configurations*

- **server:**

- each server has (2) a5158a tach lite fc hba's (fabric login device)
- hp-ux kernel build must include mo, auto changer, mass storage and fc drivers:
  - ✓ fcT1\_fcp
  - ✓ fcT1\_cntfcT1
  - ✓ Fcp
  - ✓ fcpmux

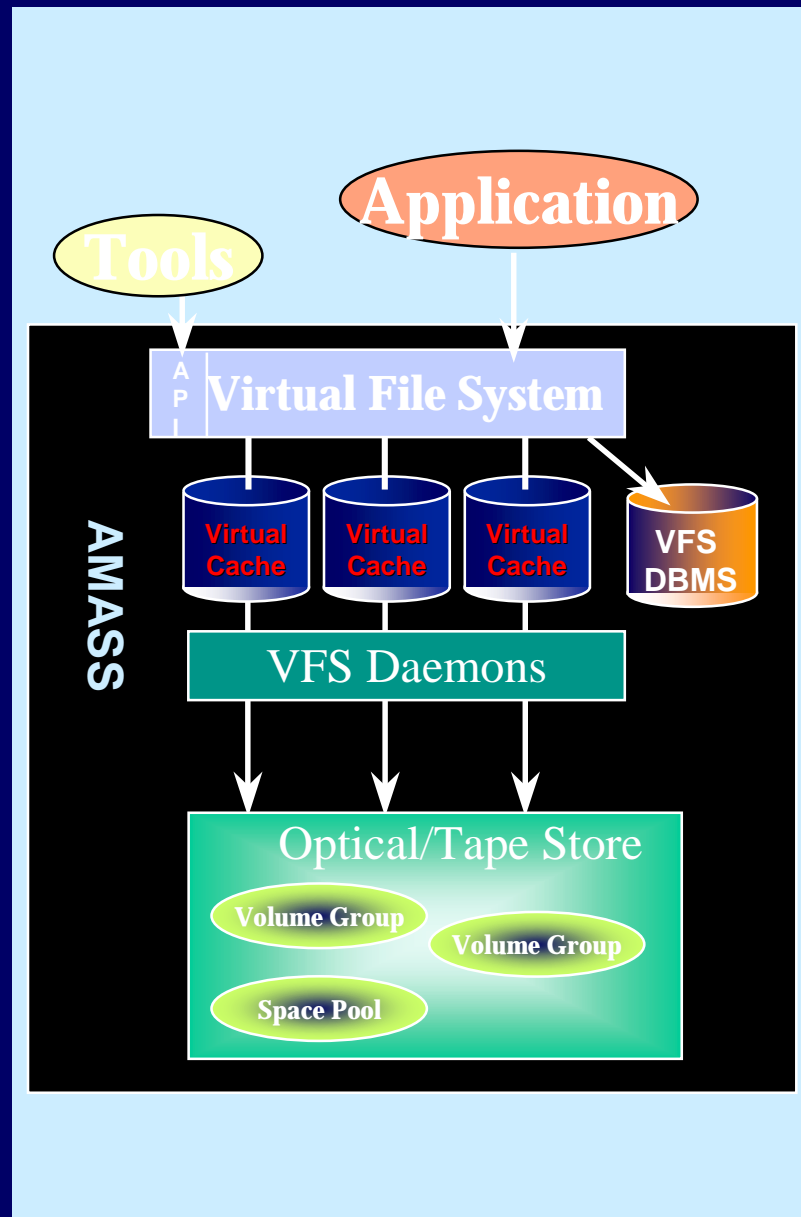


Class	I	H/W Path	Driver	S/W State	H/W Type	Description
disk	11	1/8/0/0.1.23.239.0.2.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c16t2d0		/dev/rdisk/c16t2d0	
disk	12	1/8/0/0.1.23.239.0.3.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c16t3d0		/dev/rdisk/c16t3d0	
disk	13	1/8/0/0.1.23.239.0.4.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c16t4d0		/dev/rdisk/c16t4d0	
disk	14	1/8/0/0.1.23.239.0.5.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c16t5d0		/dev/rdisk/c16t5d0	
autoch	2	1/8/0/0.1.23.239.0.6.0	schgr	CLAIMED	DEVICE	HP C1160J
			/dev/rac/c16t6d0			
ctl	16	1/8/0/0.1.23.239.0.7.0	sctl	CLAIMED	DEVICE	Initiator
			/dev/rscsi/c16t7d0			
disk	7	1/8/0/0.8.0.0.0.2.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c12t2d0		/dev/rdisk/c12t2d0	
disk	8	1/8/0/0.8.0.0.0.3.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c12t3d0		/dev/rdisk/c12t3d0	
disk	9	1/8/0/0.8.0.0.0.4.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c12t4d0		/dev/rdisk/c12t4d0	
disk	10	1/8/0/0.8.0.0.0.5.0	sdisk	CLAIMED	DEVICE	HP C1113J
			/dev/dsk/c12t5d0		/dev/rdisk/c12t5d0	
autoch	1	1/8/0/0.8.0.0.0.6.0	schgr	CLAIMED	DEVICE	HP C1160J
			/dev/rac/c12t6d0			
ctl	12	1/8/0/0.8.0.0.0.7.0	sctl	CLAIMED	DEVICE	Initiator
			/dev/rscsi/c12t7d0			

# configurations

- **AMASS:**

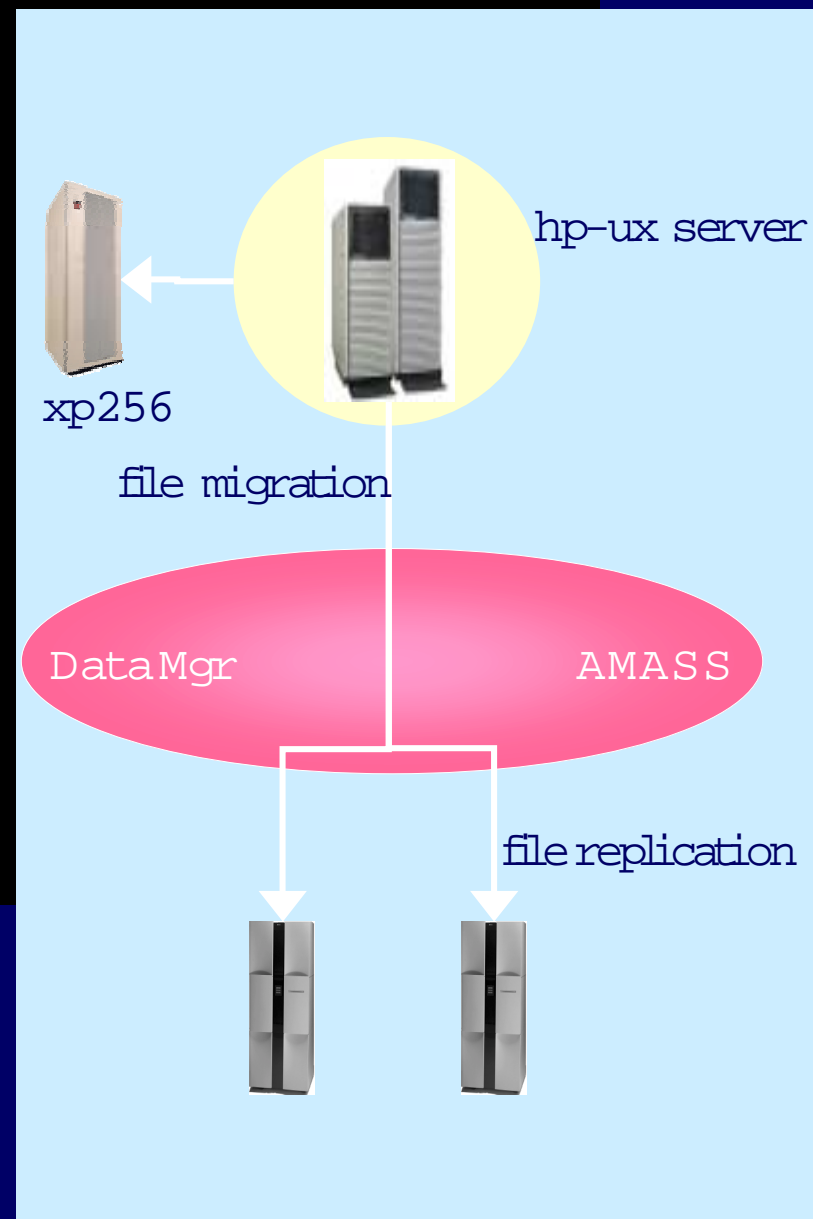
- each jukebox individually virtualized to single volume
- each jukebox has spare media
- each jukebox has a dedicated cache partition on local disk
- AMASS has "failsafe" feature enabled



# configurations

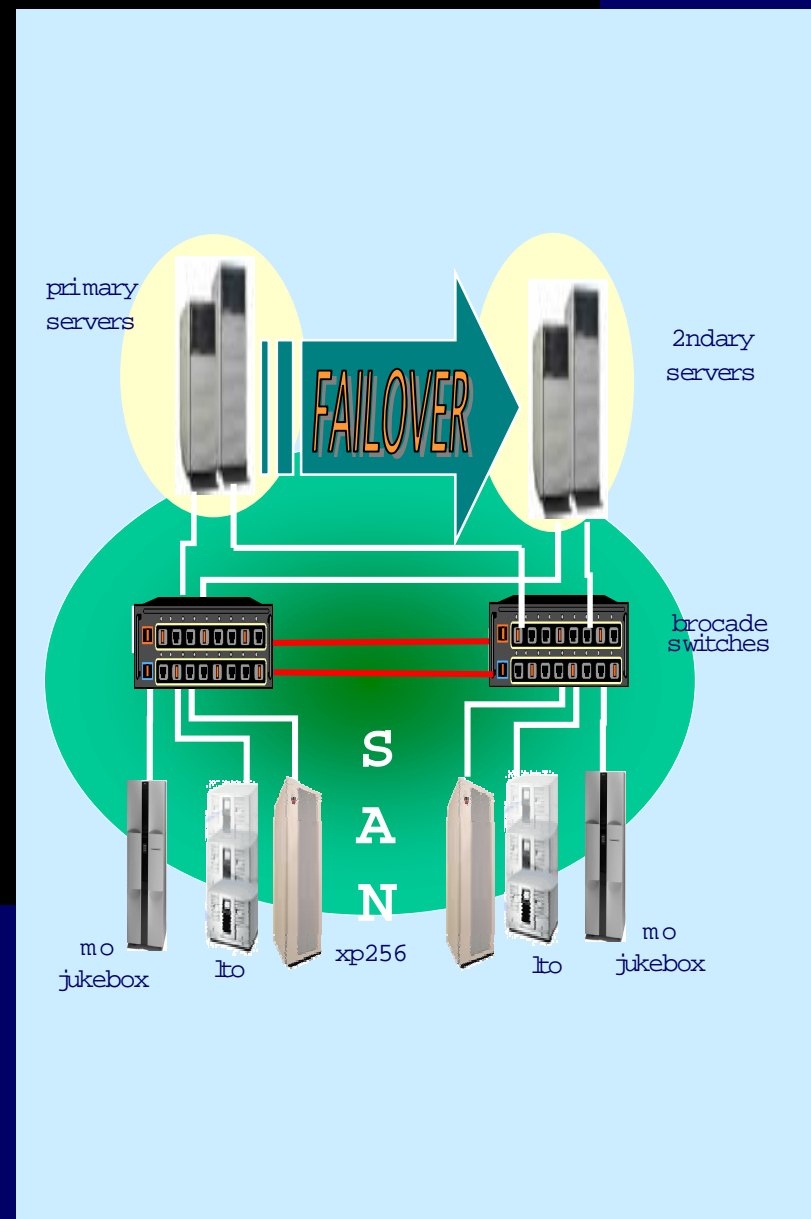
- DataMgr:

- file migration
- file replication



# configurations

- failover:
  - active-standby with automatic failback



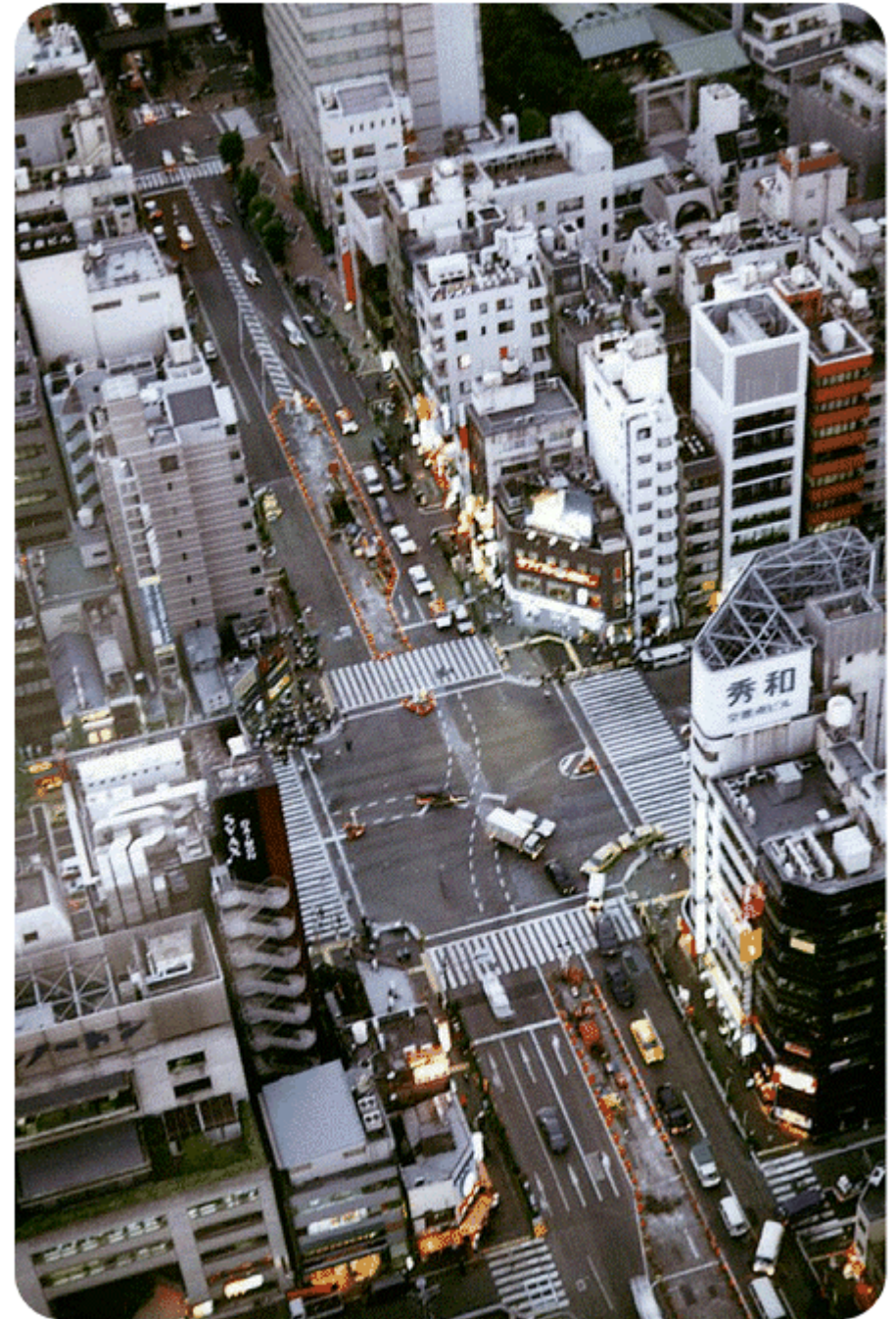
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## *conclusion*

- *reality vs.*  
*concept:*
  - current support
  - future support

6/27/01

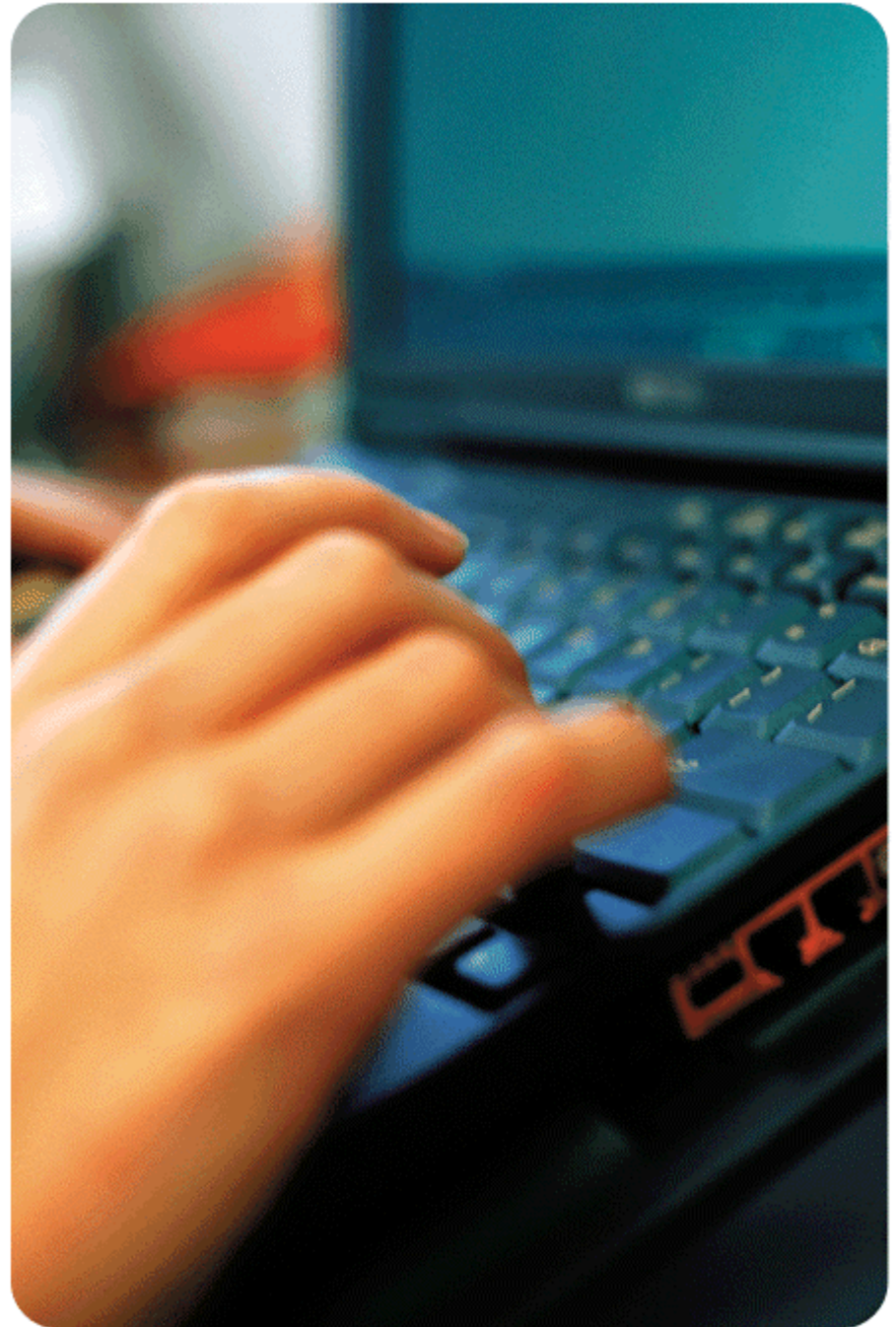


## *conclusion*

- *current support:*

- the fc connectivity of mo jukeboxes point-to-point only
- 2100er bridge (Windows) & a3308a bridge/mux (hp-ux)
- compatibility with applications software
- isolated archive fc i/o traffic

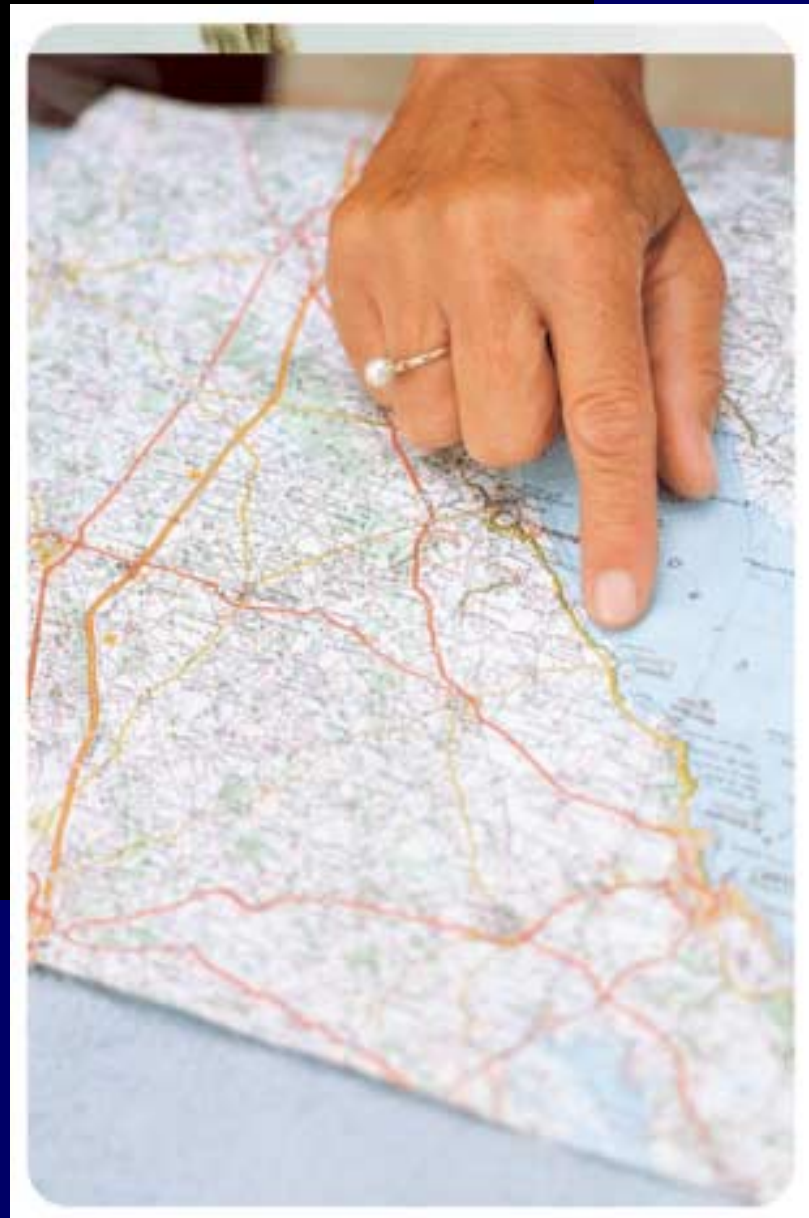
6/27/01





# *conclusion*

- *future support:*
  - the fc fabric connectivity of mo jukeboxes
  - newer hp surestore e bridge fc 2/1 lv & bridge fc 4/1 hv
  - compatibility with mc/sg failover software
  - compatibility with other storage i/o traffic
  - cascaded switches





**i n v e n t**

questions?