

Pittsburgh, PA

Enterprise Server Farm Design

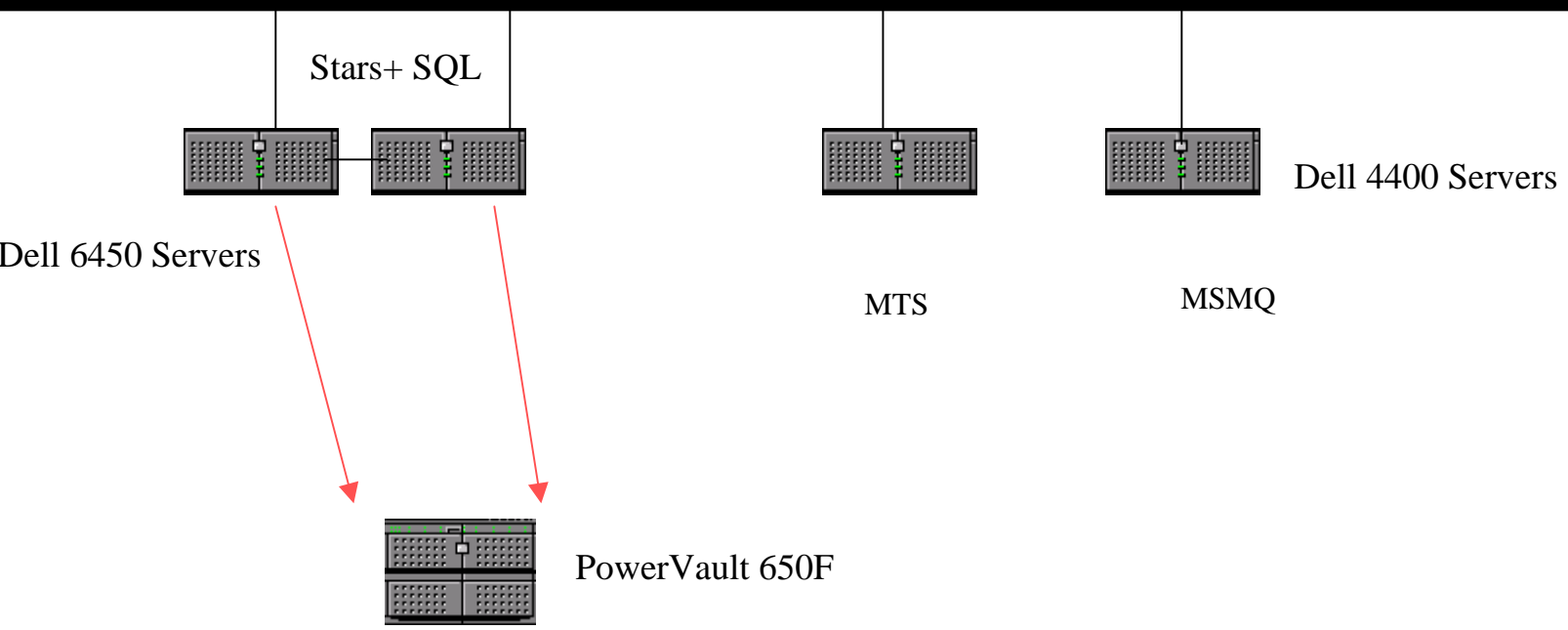
12-15-00

Server Farm  
Stage 1 - Existing  
Stars System

# Server Farm Stage 1 (Existing as of Dec.14, 2000)

**Stars**

**Stars**



# Server Farm Stage 2

PeopleSoft (HR, Finance, &  
Development) added to Stars System

Implementation February 2001

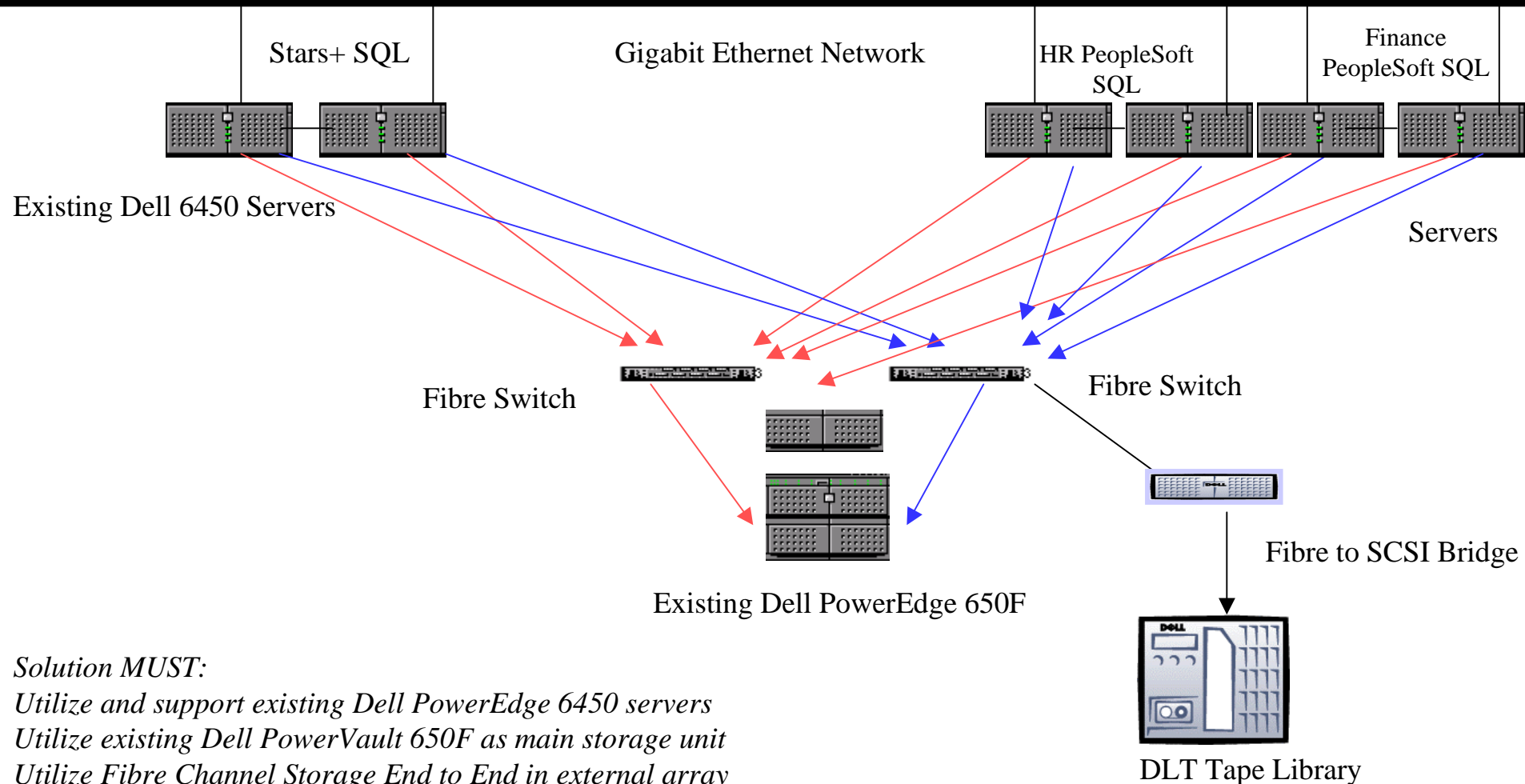
# SAN #1 (Stage 2)

## for SQL Microsoft Clusters Feb. 2001

6 Servers (3 two-node clusters)

**Stars**

**PeopleSoft Tier 3**



*Solution MUST:*

*Utilize and support existing Dell PowerEdge 6450 servers*

*Utilize existing Dell PowerVault 650F as main storage unit*

*Utilize Fibre Channel Storage End to End in external array*

*Utilize Fibre Channel drives in storage array (NOT SCSI drives in array)*

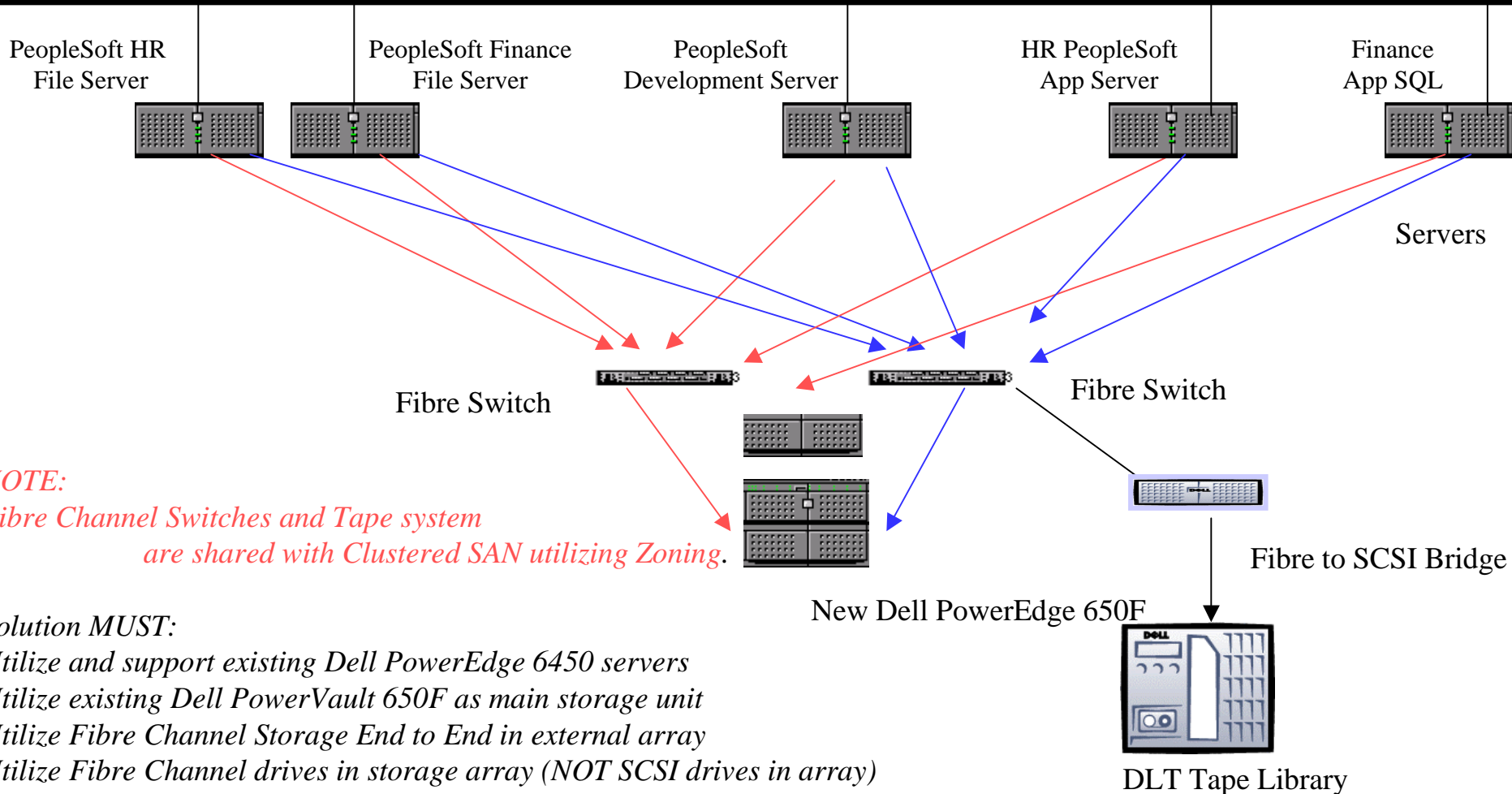
*Utilize Fibre Channel Switches (NOT Hubs)*

*Utilize Fibre Channel HBA's*

# SAN #2 (Stage 2) for PeopleSoft Middleware, File Servers and Development Servers Feb. 2001

## PeopleSoft Tier 1 & 2

Gigabit Ethernet Network



Servers

Fibre Switch

Fibre Switch

New Dell PowerEdge 650F

Fibre to SCSI Bridge

DLT Tape Library

**NOTE:**

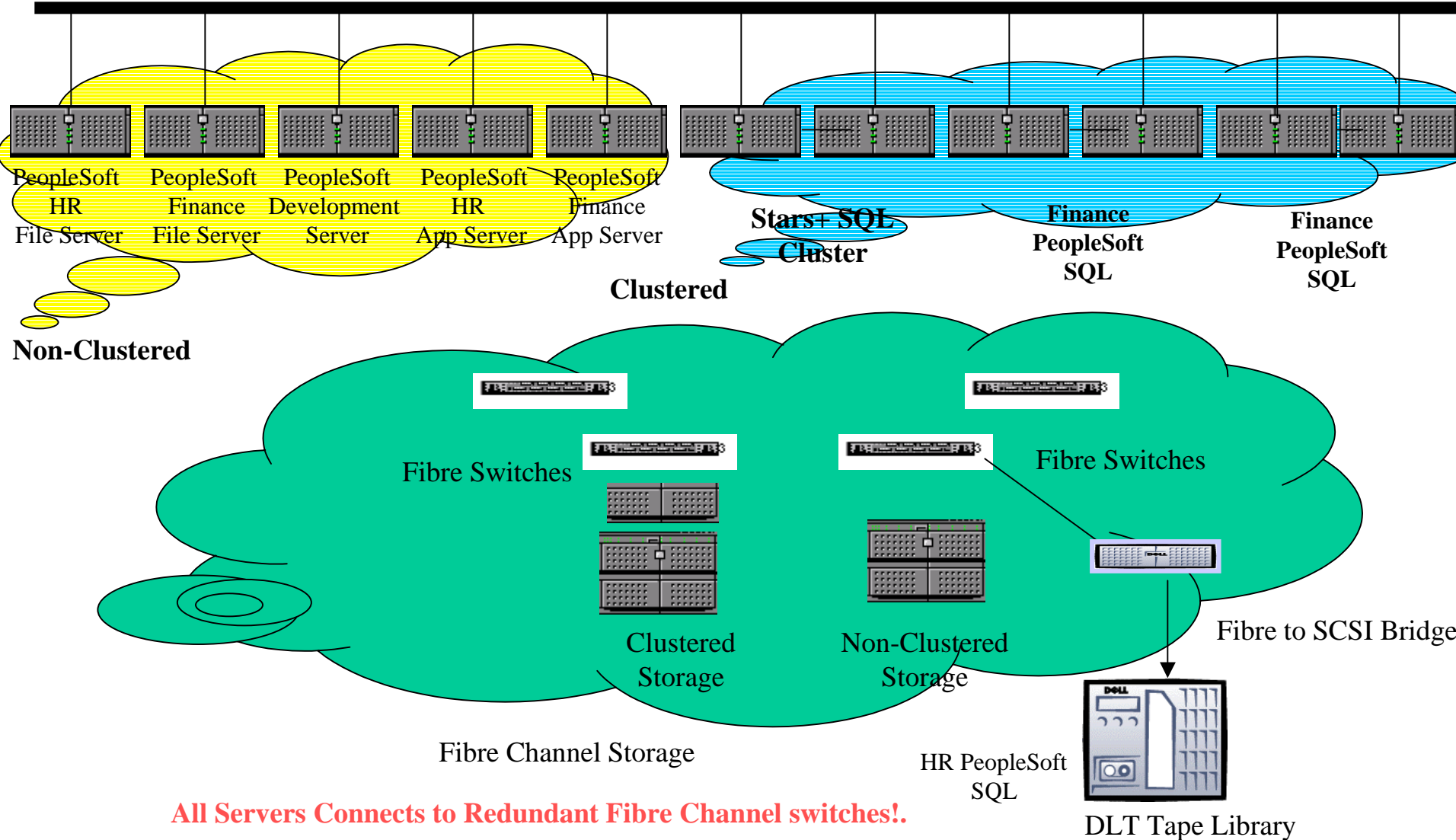
*Fibre Channel Switches and Tape system  
are shared with Clustered SAN utilizing Zoning.*

**Solution MUST:**

- Utilize and support existing Dell PowerEdge 6450 servers*
- Utilize existing Dell PowerVault 650F as main storage unit*
- Utilize Fibre Channel Storage End to End in external array*
- Utilize Fibre Channel drives in storage array (NOT SCSI drives in array)*
- Utilize Fibre Channel Switches (NOT Hubs)*
- Utilize Fibre Channel HBA's*

# Complete Fabric for PeopleSoft 3 Tier and Stars Servers Feb. 2001 (Stage 2)

Gigabit Ethernet Network



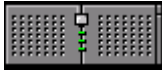
All Servers Connects to Redundant Fibre Channel switches!.

# Pittsburgh New PeopleSoft Servers – Stage 2

11 Servers

## Server Function

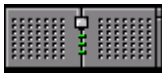
9 x 6450 (XEON)



- 2 x PeopleSoft File Server (HR, Finance)
- 2 x PeopleSoft Middleware (HR, Finance)
- 2 x PeopleSoft SQL Clusters (HR, Finance): 4 servers
- 1 x PeopleSoft Development

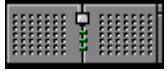
## Pittsburgh Stars SQL Cluster (Existing Servers)

2 x 6450 (XEON)—Existing from Stage 1



# Pittsburgh Storage – Stage 2

## Clustered SAN and Non-Clustered



2 x 16 port Fibre channel Switches (4 ports copper, 12 ports optical)

Optical Cabling for server to fabric connectivity

1 x Tape Library (dual DLT 7000)

1 x SCSI to Fibre channel bridge for tape connectivity

NEW 1 x fibre channel array with 512MB L2 cache on each of 2 storage processors 10 x 36GB 10K drives

NEW 1 x fibre channel array JBOD 10 x 36GB 10K drives

Existing 1 x fibre channel array with 512MB L2 cache on each of 2 storage processors 10 x 18GB 10K drives

*Fabric is zoned to facilitate sharing of fabric (switches) and Tape Library.*

*Fabric supports 11 servers, 2 Fibre Channel arrays (one array with additional Fibre Channel JBOD)*

*6 servers = 3 two-node clusters (STARS, PeopleSoft HR Database, PeopleSoft Finance Database)*

*5 servers = 1 x PeopleSoft HR File Server, 1 x PeopleSoft Finance File Server,*

*1 x PeopleSoft HR App Server, 1 x PeopleSoft Finance App Server,*

*1 x PeopleSoft Development Server*

# Server Farm

## Stage 3

File, Communications, Web and email servers and storage consolidation added to PeopleSoft (HR, Finance, & Development) and Stars System

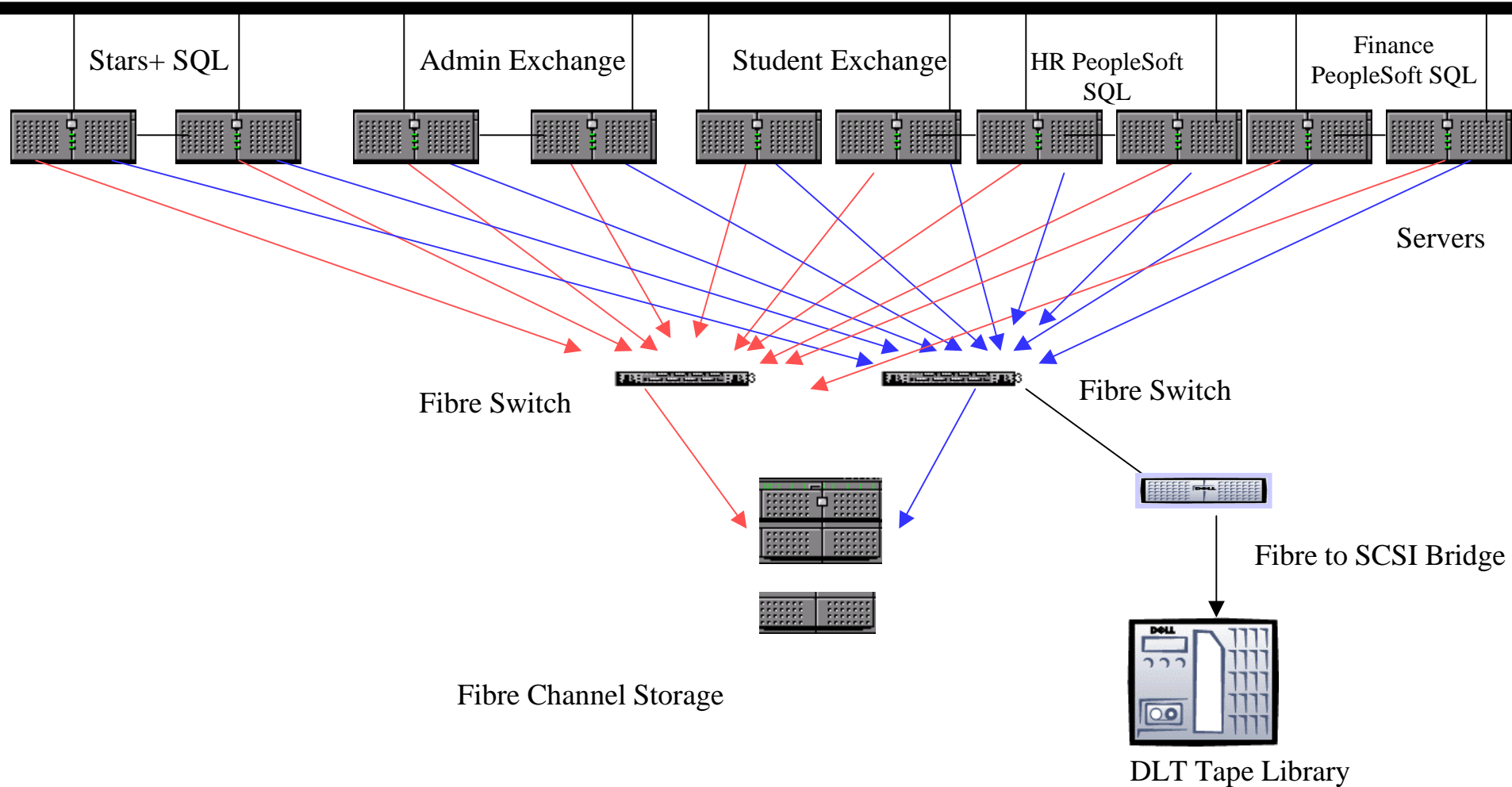
Implementation July 2001

# SAN #1 for Pittsburgh Microsoft Clusters

## Stage 3

10 Servers (5 two-node clusters)

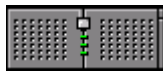
Gigabit Ethernet Network



# SAN #1 for Pittsburgh Server Farm

## Stage 3 - Server Function

9 x 6450 (XEON)



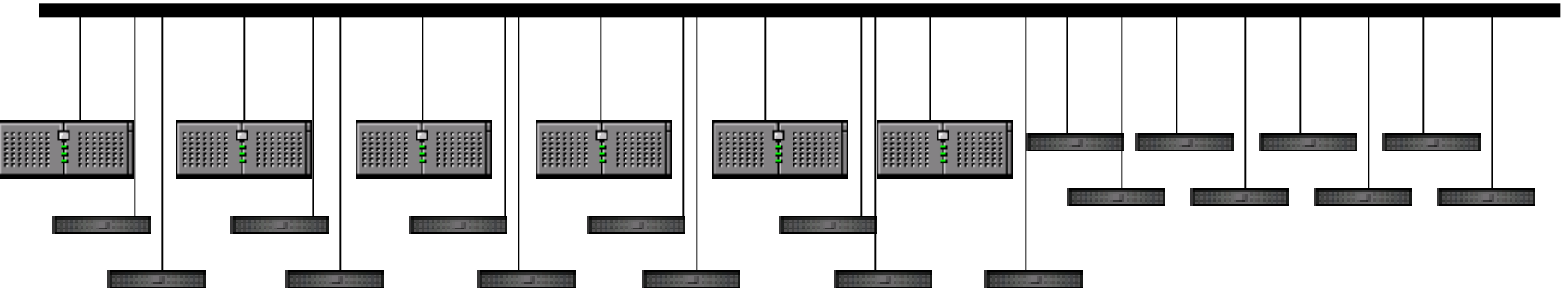
2 x Administrative Exchange

2 x Student Exchange

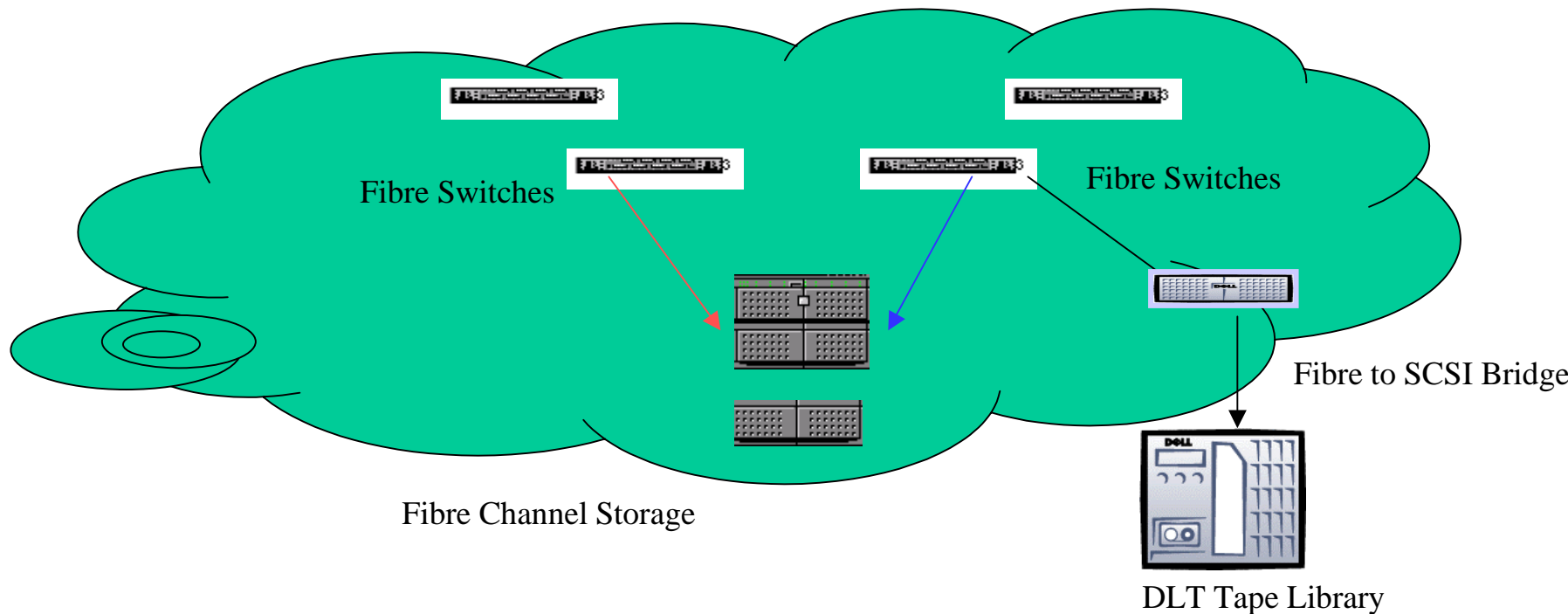
# SAN #2 for Pittsburgh Server Farm – Stage 3

25 Servers

Gigabit Ethernet Network



**All Servers Connects to redundant Fibre Channel switches!.**

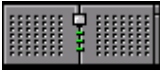


# SAN #2 for Pittsburgh Server Farm – Stage 3

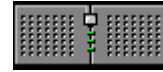
25 Servers

## Server Function

9 x 6450 (XEON)



2 x 4400 (XEON)



### Existing – Stage 1

2 x Stars SQL (one two-node cluster)

### Stage 2

2 x PeopleSoft File Server (HR, Finance)

2 x PeopleSoft Middleware (HR, Finance)

2 x PeopleSoft SQL Clusters (HR, Finance): 4 servers

1 x PeopleSoft Development

### Stage 3

2 x Follette File Servers

### Stage 3

1 x Active Directory Controller (DNS/DHCP)

1 x Main File server

19 x 2450 (P III) – Stage 3



8 x Application Servers

1 x Heat Server (Help Desk)

1 x SASI XP Server

1 x Video Server

1 x Audio Server

1 x Follette Front End Server

1 x Food Services Server

1 x Special Ed Server

1 x Facilities Server

1 x Combo (TLA, Transportation, Security)

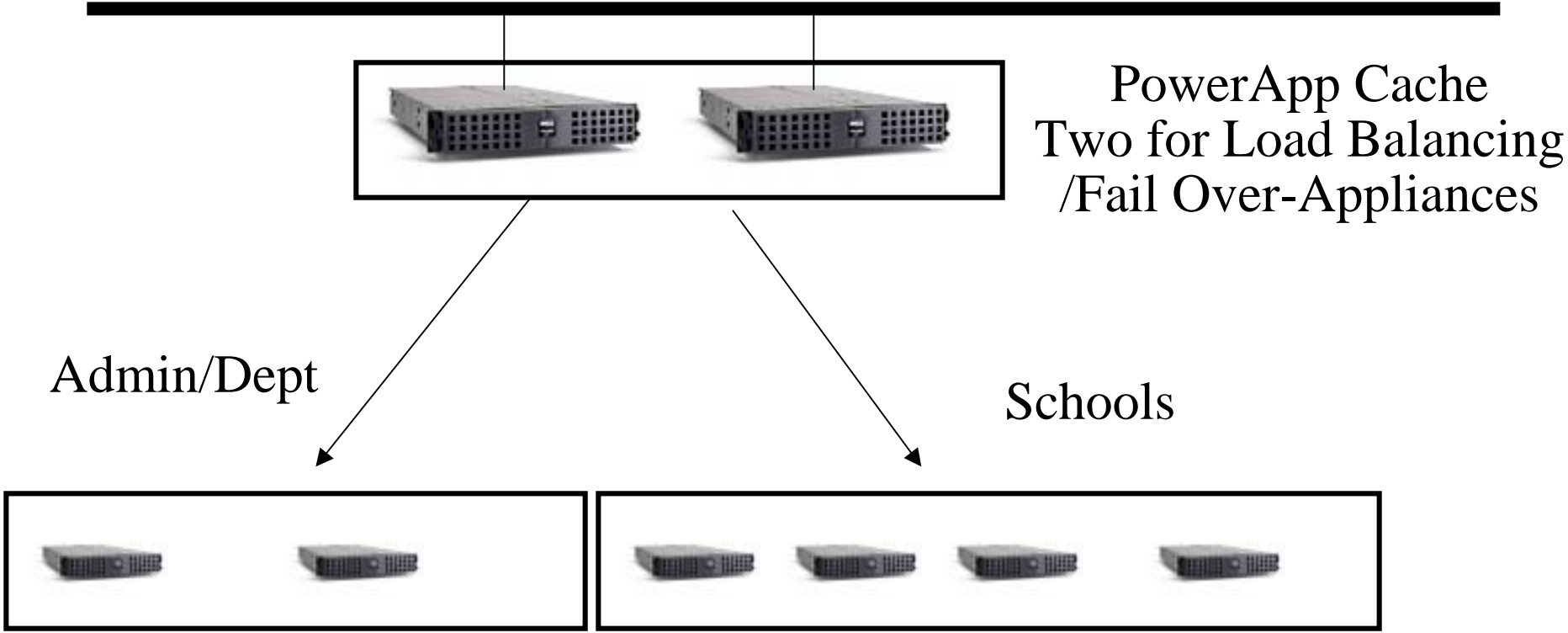
1 x Management server

1 x Communications server

# Pittsburgh Web Farm

*High Availability  
NO Single Point of Failure*

100BaseT Switched Ethernet Network



PowerApp W2K Web Farm WLBS for Load Balancing-Appliances

# Pittsburgh Exchange Architecture



*Two Separate Exchange Clusters:  
Cluster #1 for Admin/Staff  
Cluster #2 for Students  
Keep separate to optimize security.*

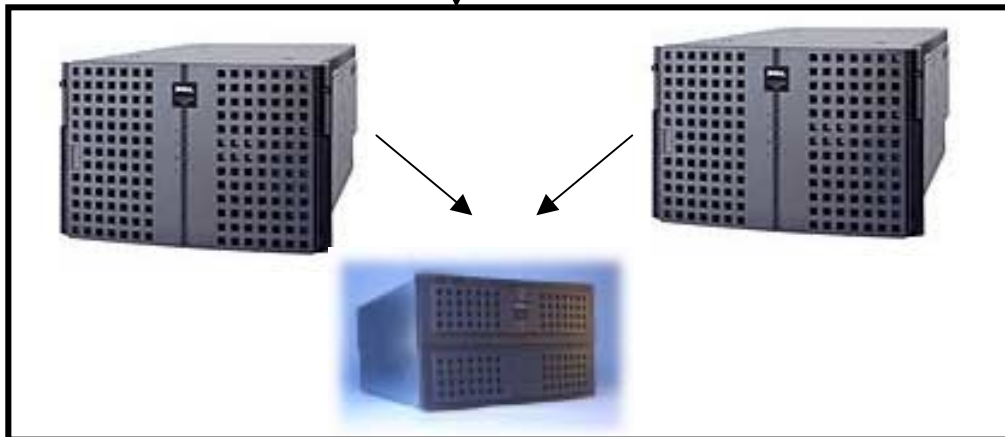


Web Clients



PowerApp Web 100

IIS Outlook Web Access Appliances  
Load Balanced



Exchange 2000 Cluster

6450

Active/Active

Shared Storage in SAN