M.I.B.

Men In Backup

Presenter:

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What is this presentation about?

- TSM Client Backup Europe offers IBMers the ability to backup their business critical files from their workstation to an online TSM backup server. TSM Client Backup Europe consists of a desktop client application and a network attached TSM server where predefined set of files are stored. It was designed to backup primary workstations within IBM. After the initial set-up a daily (incremental) backup of all new and revised data is performed automatically.

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  - **Medieval times**
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- **TOP10**

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- **Advantages and disadvantages**

- **Managing the environment**

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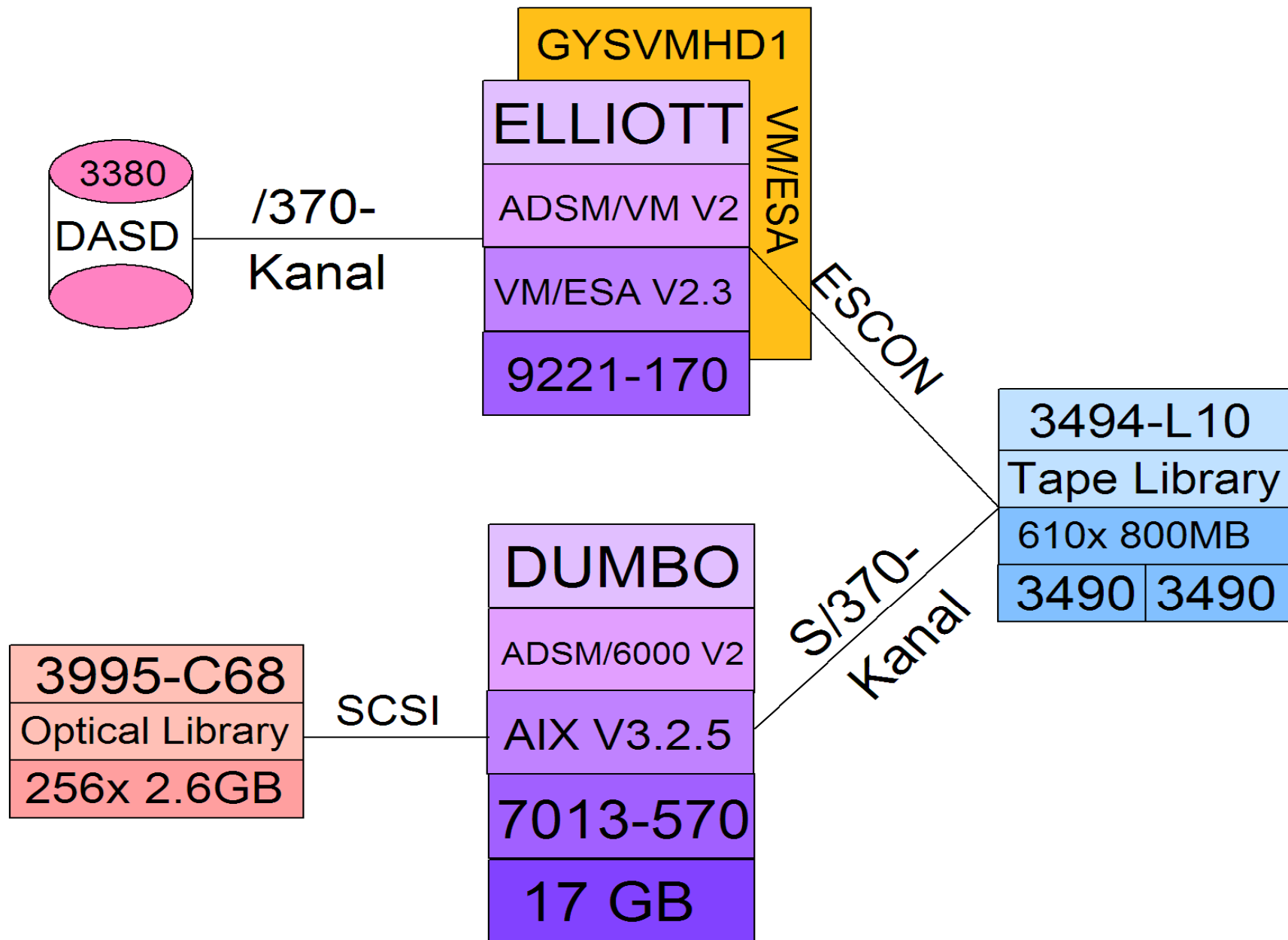
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Ancient times (1993-2000)

- **1993-1997**
  - Mid 1993: IBM developed „WDSF" - Workstation Data Save Facility in Heidelberg, Germany
    - Testing started to backup local personal workstations to VM/ESA system
    - VM/ESA host systems with user data was backed up by BARS/VM to disk, migrated to tapes at night

  - Q3 1993: TWS – Total Workstation Solution, Heidelberg, Germany
    - Migrate data to Windows workstations and RS/6000 servers
    - Need for a backup for both type of data, workstations and servers
    - ADSM – AdStar Distributed Storage Manager to use, IBM sold this solution to AdStar

  - In some years (till 1997)
    - Further investigations to backup RS/6000 servers and personal workstations, furthermore how to implement automations in the solution
    - Migration of ADSM/VM server to RS/6000 (AIX)
    - Library dedication between RS/6000 and VM/ESA

  - 1997: migration from ADSM/VM V1 to ADSM/VM V2
    - Utilizing optical libraries in 1997/10

Ancient times (1993-2000) – Hardware layout in 1997

GYSVMHD1

ELLIOTT

ADSM/VM V2

VM/ESA V2.3

9221-170

VM/ESA

3380

DASD

/370-Kanal

ESCON

3494-L10

Tape Library

610x 800MB

| 3490 | 3490 |

S/370-Kanal

DUMBO

ADSM/6000 V2

AIX V3.2.5

7013-570

17 GB

3995-C68

Optical Library

256x 2.6GB

SCSI

Ancient times (1993-2000)

- **1997-1999**
  - Separated VM/ESA system from backup tasks, moved ADSM to 2x RS/6000 (server to server connection), HW layout changed

| 3494-L10 |
| Tape Library |
| 610x 10GB |
| 3590 | 3590 |

SCSI — SCSI

DUMBO	ADSM Server-to-Server (TCP/IP)	MUSHU
ADSM/6000 V3		ADSM/6000 V3
AIX V4.x		AIX V4.x
7025-F50		7025-F50
47.5 GB		47.5 GB

| 3995-C68 |
| Optical Library |
| 256x 2.6 GB |

SCSI

| 3995-C68 |
| Optical Library |
| 256x 5.2 GB |

SCSI — SCSI

| 7133-D40 |
| SSA-Plattenrack |
| 16x 18GB |

| 3390-DASD RAMAC- | /370-Kanal | GYSVMHD1 / VM/ESA V2.3 / 9221-170 | ESCON | 3490 Cartridge mit Autoloader |

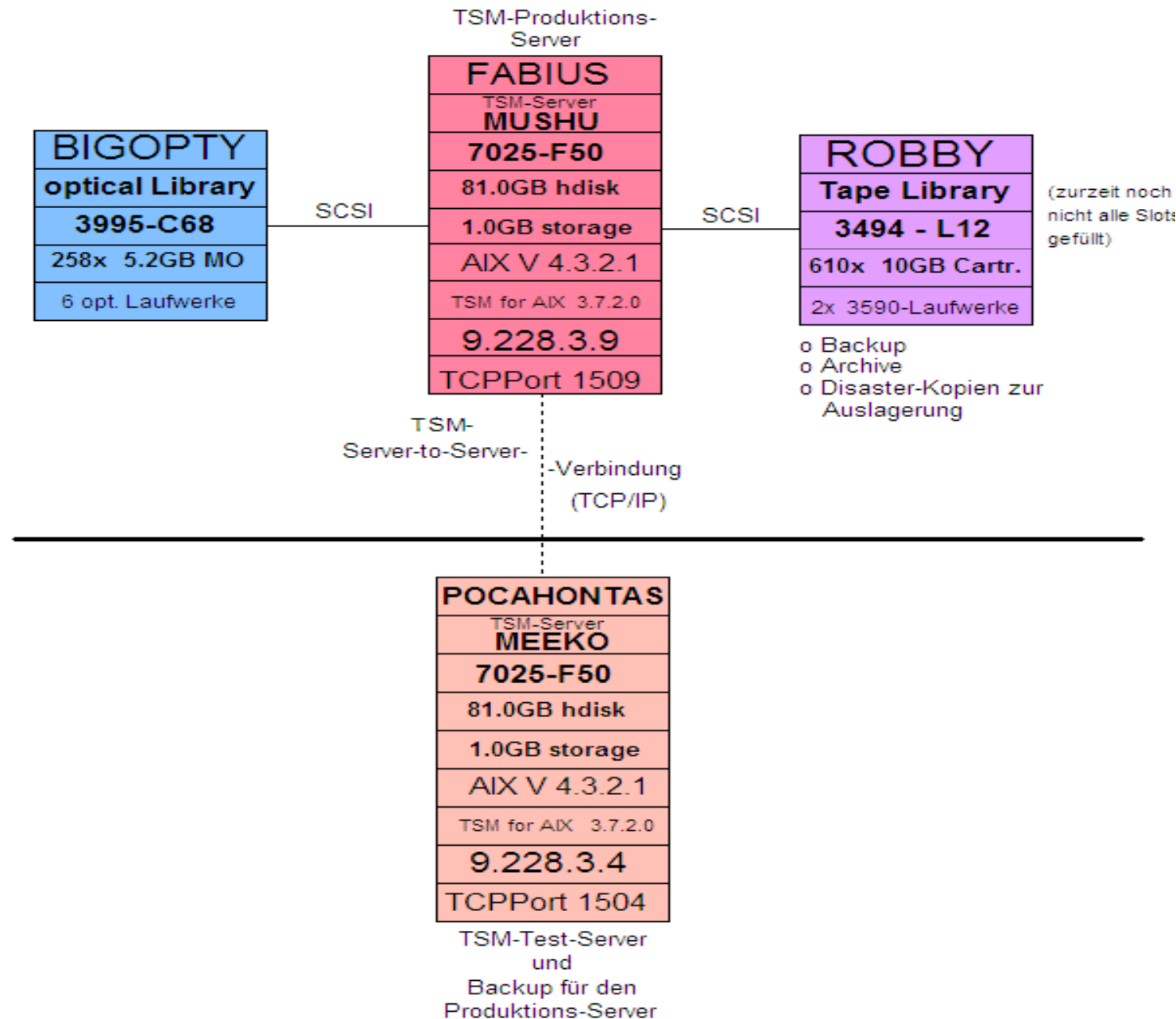M.I.B – Men in Backup

Ancient times (1993-2000)

- **1999-2000**
  - TWS project ended in 1999, but ADSM backup service was kept alive in Heidelberg

  - Migration to from ADSM to TSM V3.7.2.0 (ADSM has been bought back from AdStar by IBM)

  - HW layout changed again

Ancient times (1993-2000) – Hardware layout in 2000

TSM-Produktions-Server

FABIUS

TSM-Server **MUSHU**
7025-F50
81.0GB hdisk
1.0GB storage
AIX V 4.3.2.1
TSM for AIX 3.7.2.0
9.228.3.9
TCPPort 1509

BIGOPTY

optical Library
3995-C68
258x 5.2GB MO
6 opt. Laufwerke

SCSI

SCSI

ROBBY

Tape Library
3494 - L12
610x 10GB Cartr.
2x 3590-Laufwerke

(zurzeit noch nicht alle Slots gefüllt)

o Backup
o Archive
o Disaster-Kopien zur Auslagerung

TSM-Server-to-Server- -Verbindung (TCP/IP)

POCAHONTAS

TSM-Server **MEEKO**
7025-F50
81.0GB hdisk
1.0GB storage
AIX V 4.3.2.1
TSM for AIX 3.7.2.0
9.228.3.4
TCPPort 1504

TSM-Test-Server und Backup für den Produktions-Server

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Ancient times (1993-2000)

~300 clients (servers and workstations altogether) utilizing this solution, ~1.5TB data backed up by them
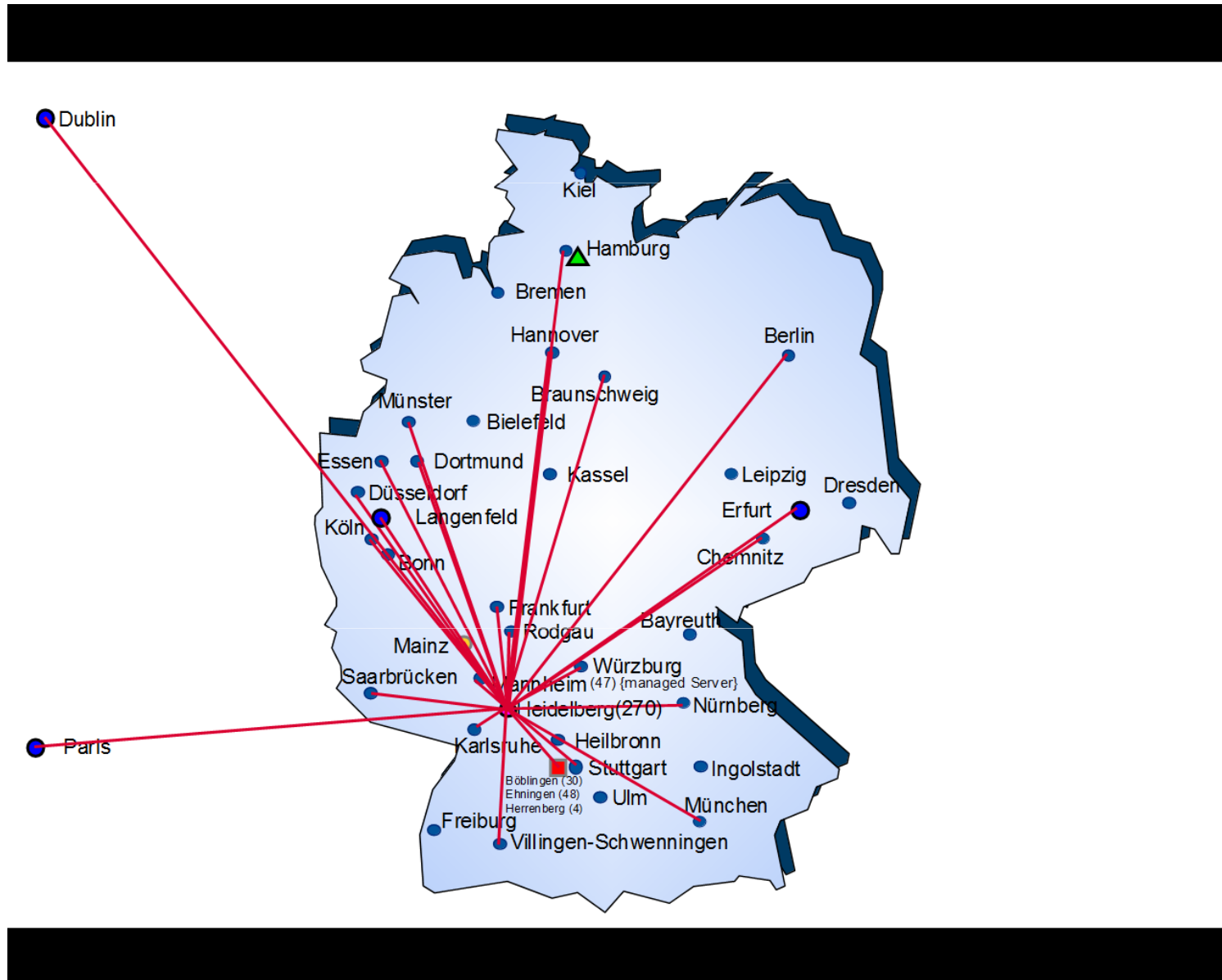
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Medieval times (2001-2006)

- **2001**

  - As existing solution in place became more and more famous, discussions regarding a general workstation backup started in Germany due to slow backups to Heidelberg from other locations

  - CentralRegion project initiative, first backup server deployed in Stuttgart, first official remote location Dortmund backing up to Heidelberg TSM server

  - For larger IBM locations local backup servers have been deployed
    - Infrastructure at each location: RS/6000, optical libraries, tape libraries
    - All servers were centrally managed from ConfigManager in Heidelberg

  - As this CR solution seemed to be the way to follow, migration of clients from old infrastructure in Heidelberg/Mannheim started to CR solution

  - Service extended to other countries:
    - Austria, Wien
    - Czech Republic, Prague
    - Local TSM solution in Switzerland, Zürich migrated to CR solution

Medieval times (2001-2006)

- **Other locations where solution has been established**
  - Hungary - Budapest, Slovakia - Bratislava in 2002
  - Poland – Warsaw in 2003
  - Several locations in Switzerland in 2004
  - Czech Republic – Brno, Russia – Moscow in 2006

Month / Year

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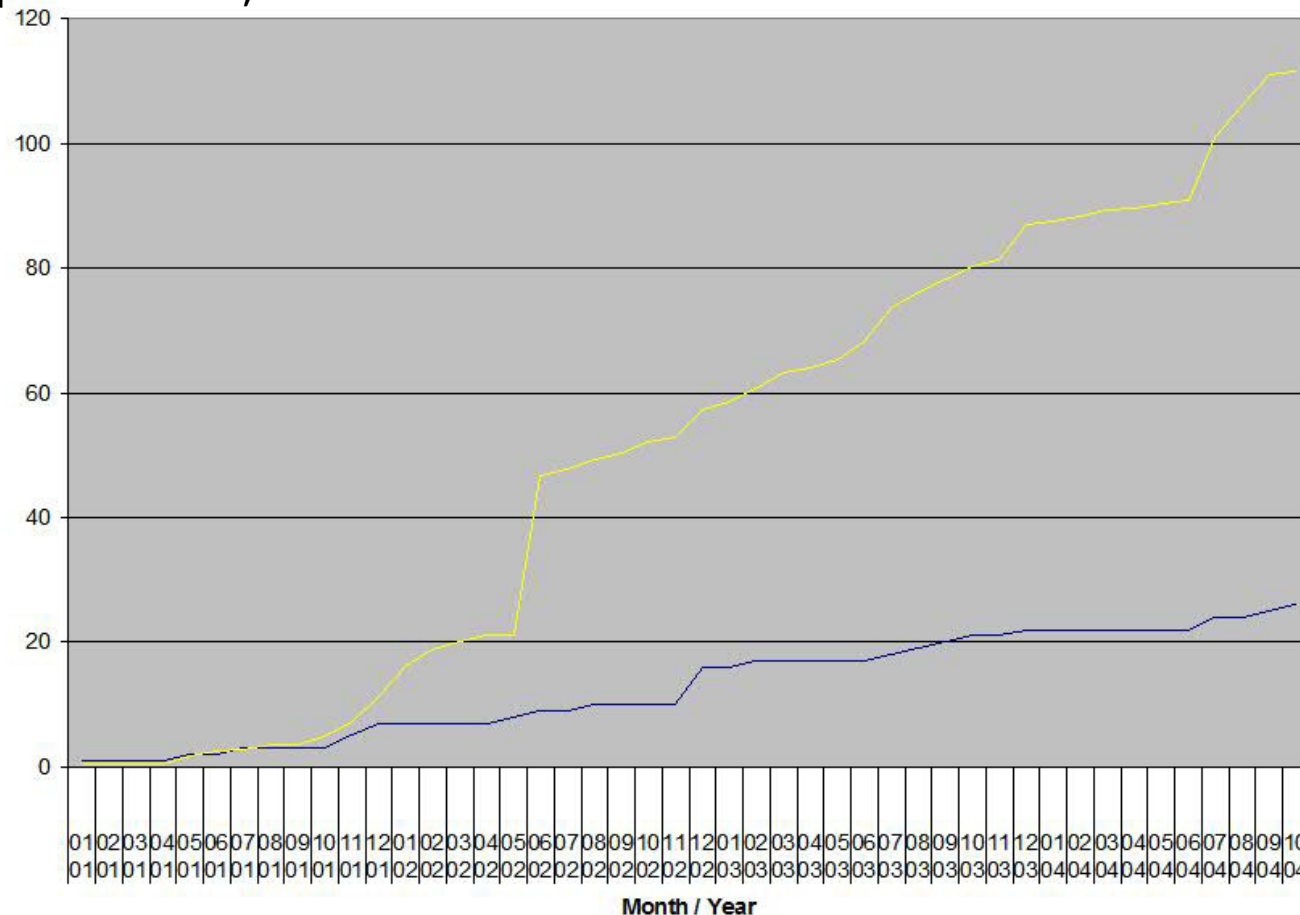
Medieval times (2001-2006)

- **2003-2006**
  - EMEA backup project launched (based on CR solution): one backup server in each country, all country locations are backing up to that one.

  - Total available space at this time: ~350TB

  - In 2004, merging CR and EMEA solution initiated, this consolidation took several years to complete. Most challenging problem: each solution has its own include/exclude definitions, EMEA was more restrictive

  - Migration from TSM V4.1.5.0 to TSM V5.2.2.0

  - Mid 2006 – Hungarian team in support of these servers

Statistics – 2001-2007

Year (end)	No. clients	No. locations	No. servers
2001	2186	12	15
2002	5736	17	17
2003	8588	22	24
2004	9923	24	27
2005 (CR)	10566	25	26
2005 (EMEA)	2624	7 Countries	10
2006 (CR)	11190	26	27
2006 (EMEA)	4976	7 Countries	10
2007 (CR)	11687	26	28
2007 (EMEA)	5784	7 Countries	10

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Recent times (2007- up till now)

- **2007-2008**
  - Migrate servers from TSM 5.2 to TSM 5.4

  - Finalize website for the user community (general information, availability in locations, help, FAQ, hints and tips, solution for some problems)

  - More and more locations joining to the service (more users and new servers)

- **2009-2010**
  - Tape encryption implementation in all server locations (LTO4 tapes in each library)
    - all data migrated to LTO4 cartridges

  - Migration from TSM V5.4 to TSM5.5

Recent times (2007- up till now)

- **2011-2012**
  - Consolidation of CR and EMEA solution has been finalized

  - Solution deployed in 10 more countries/locations

  - Plans to migrate TSM servers from TSM5.5 to TSM6.x

- **2013**
  - Migration from TSM5.5 to TSM6.3, from LTO4 to LTO5 where possible/required

  - All support for CB is in SFV

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Architecture overview – 2013

Network

SAN40B

DS5020

HMC

Link aggregation (802.3ad)

Primary

Backup

Power720

*VIOs in larger environments

TS3310

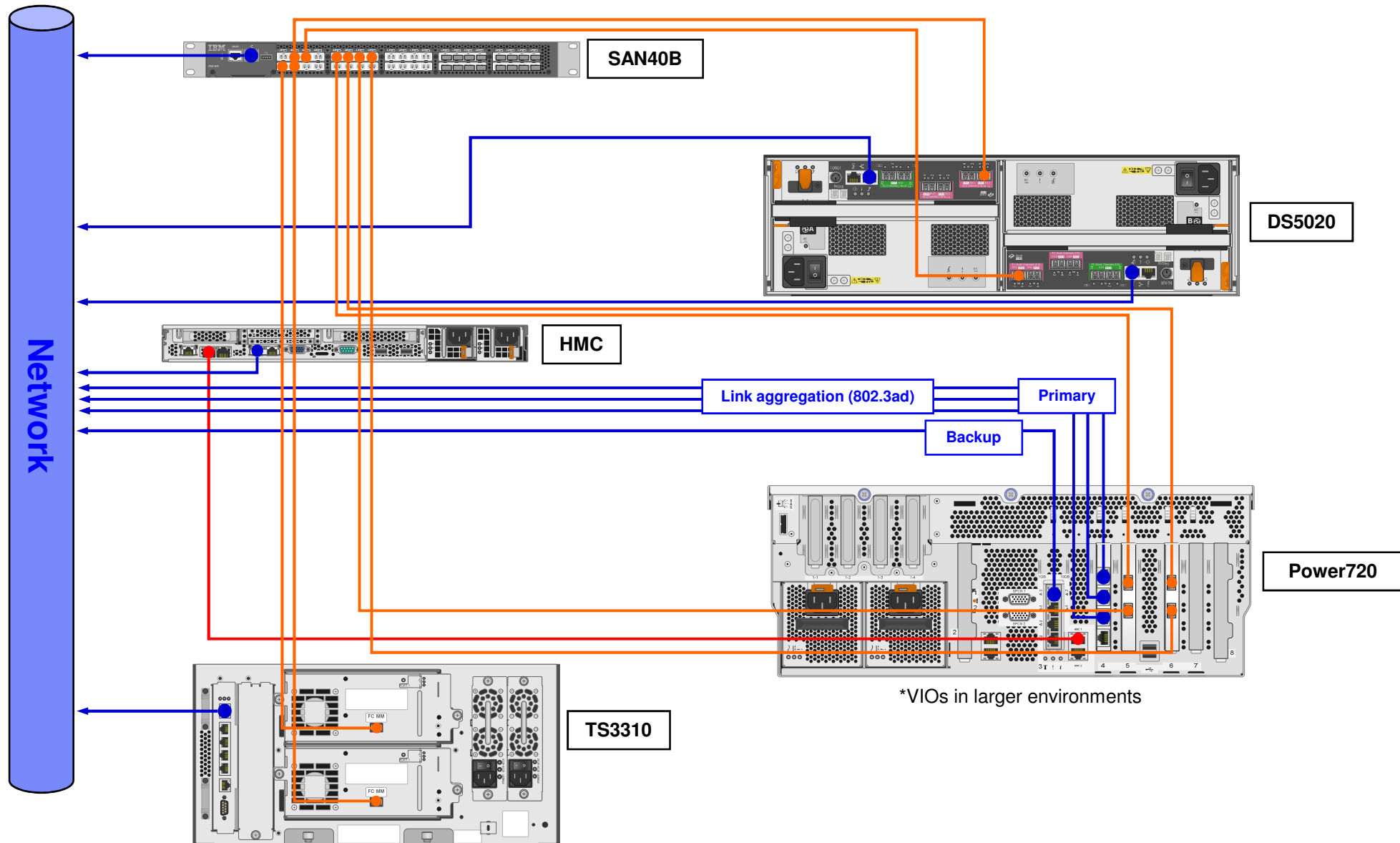FC MM

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TOP10 – Largest ATL – TS3500

All Frames ⇕ Inventory/Audit

All Frames

Total storage slots	3429
LTO Licensed Capacity	3429
LTO Unlicensed Capacity	0
Total empty storage slots	679
Offline storage slots	0
Accessors	2
Total I/O slots	16
Empty I/O slots	16
Total LTO data cartridges	2761
LTO Ultrium-1	0
LTO Ultrium-2	0
LTO Ultrium-3	0
LTO Ultrium-4	2761
LTO Ultrium-5	0
LTO Ultrium Not Labeled	0
Cleaning cartridges	4
Drives	108
Node cards	14
Total frames	11
Active frames	9
Service bays	2

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TOP10

- **Libraries, libvolumes**
  - Total amount of tape libraries supported: 47
  - Total amount of tape libraries in Client Backup: 38
  - Total amount of libvolumes in all supported ATLs: ~7500
  - Total amount of libvolumes used by Client Backup: ~4800

- **Storage**
  - Total amount of disk subsystems supported: 72   No. Of disks: ~3000   Total disk capacity: ~500 TB
  - Total amount of disk subsystems in Client Backup: 29 No. Of disks: ~700   Total disk capacity: ~150 TB
  - Total amount of tape storage: ~6 PB
  - Total amount of tape storage used by Client Backup: ~4 PB

- **Servers, clients, locations**
  - Amount of nodes registered: ~31000
  - Amount of servers: ~70
  - Number of locations: 35
  - Largest location: 11 + libmanager
    - ~5500 clients registered

- **Largest SAN environment**
  - 2x fabric, each fabric has 8 switches currently

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Europe locations

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Middle East locations

Africa locations

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Advantages and disadvantages

Advantages	Disadvantages
Standard/centralized solution (same layout/configuration everywhere)	Rollout of new features/changes in service to ~30000 users (what to include/exclude, different user needs in different areas/countries)
Due to reoccurring problems, resolution of issues can be faster	Migration to new hardware/OS/TSM is time consuming
All support for storage devices/TSM servers in one team (SAN, TSM, DS, ATL)	Cannot avoid automations/developments in such a big environment
Configuration changes in service can be distributed from management server/configmanager easily	

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Managing the environment

- **SAN switches**
  - Web interface / CLI

- **Tape libraries**
  - Web interface (website developed)

- **Disk subsystems**
  - IBM DS Storage manager 10

- **TSM servers**
  - CLI (dsmadmc)
  - Management server/configuration manager (s2s connection to client servers)
    - RPFiles of all servers are collected here
    - Profiles for admin IDs, scripts, mgmtclasses, servergroups, client optionsets, country specifications
    - Notify subscribers – in case there are global changes in service
  - Monitoring tool developed by Misel Juhasz