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Implementing A Mainframe Platform From The Ground Up

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SHARE in Anaheim 2012

Agenda

- ❑ Implementing CEC
- ❑ Implementing DASD Environment
- ❑ Implementing TAPE Environment
- ❑ GT-Mainframe Configuration

Before Starting….

I. DON'T FORGET THAT COMPUTERS CAN NOT DO ANYTHING WITHOUT SOMEONE TELLS THEM WHAT TO DO , HOW TO WORK

II. COMPUTERS AND DEVICES DONT KNOW ANYTHING

III. FOR BOTH HW & SW, SOME PEOPLE LIKE YOU CREATED RULES, RULES OF GAMES AND WHAT WE WANT TO DO NOW IS…

TO LEARN THE RULES OF THIS GAME SO THAT WE CAN USE/PROGRAM THEM

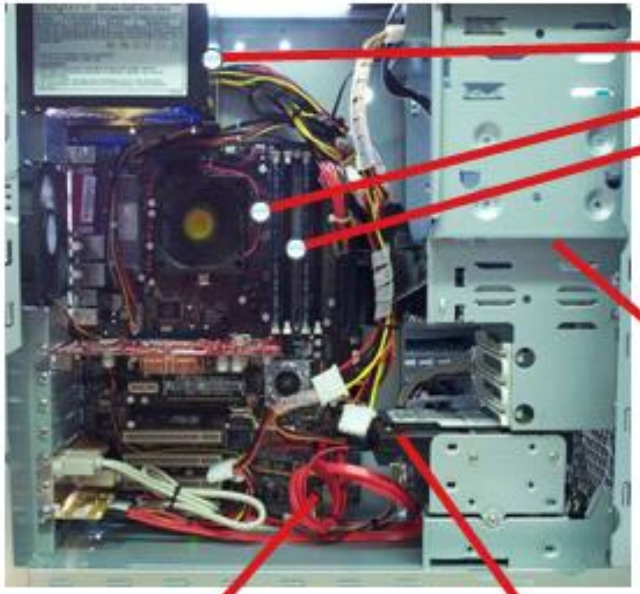
<u>As I mentioned to all my students; Don't just try to learn the rules, but do both ;</u>

1. **Learn both the reasons of why things are invented**
2. **Ask yourself 'how would I have implemented this if I was in charge of inventing it ? '**

That helps you understand much better & use them in advance mode and also gives you a chance to share feedback with experts who actually invented those when chance comes your way….

The Way I see Mainframe

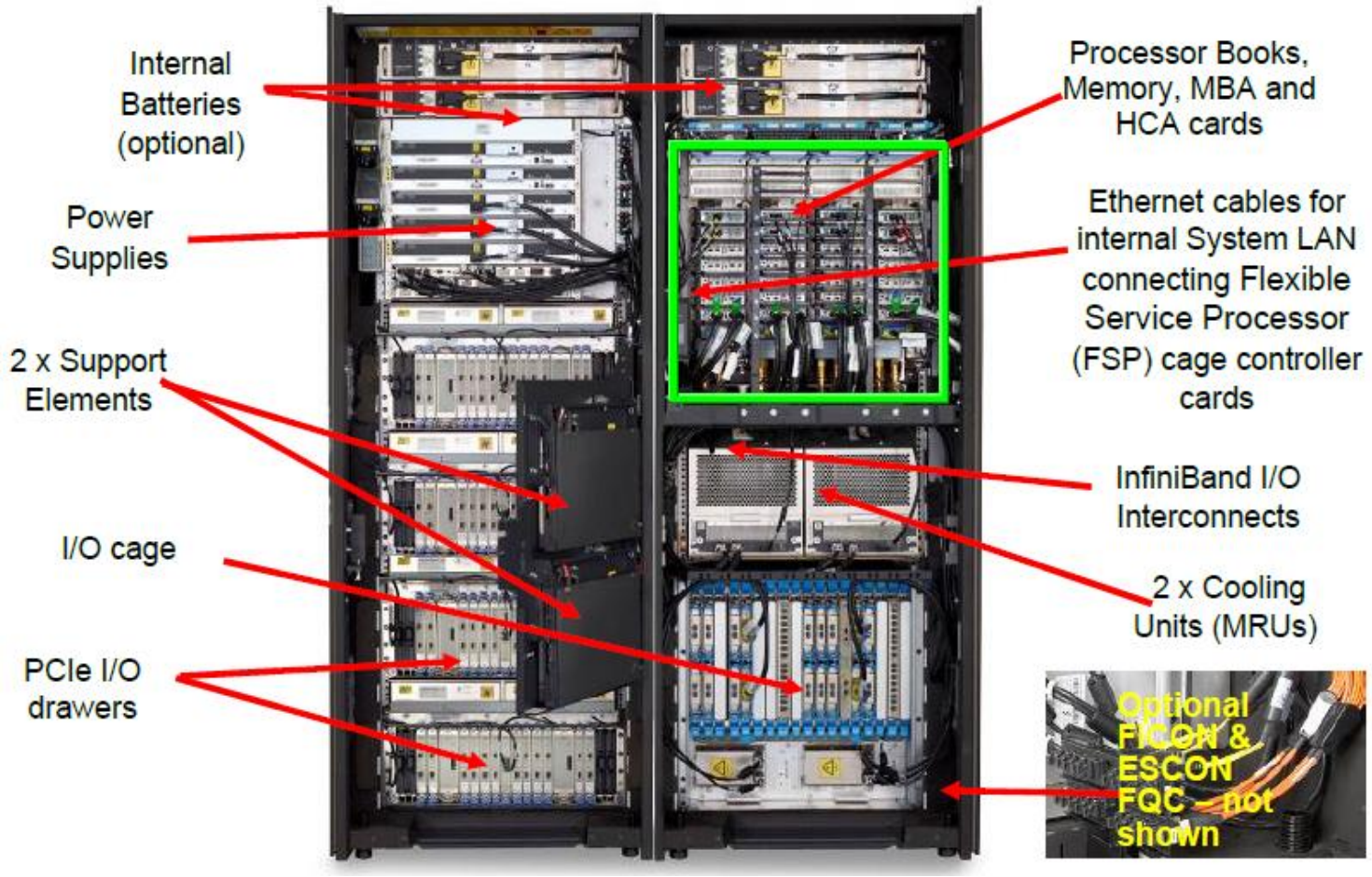
OR



NOTHING IS DIFFERENT OTHER THAN ITS BEING MORE FUN!

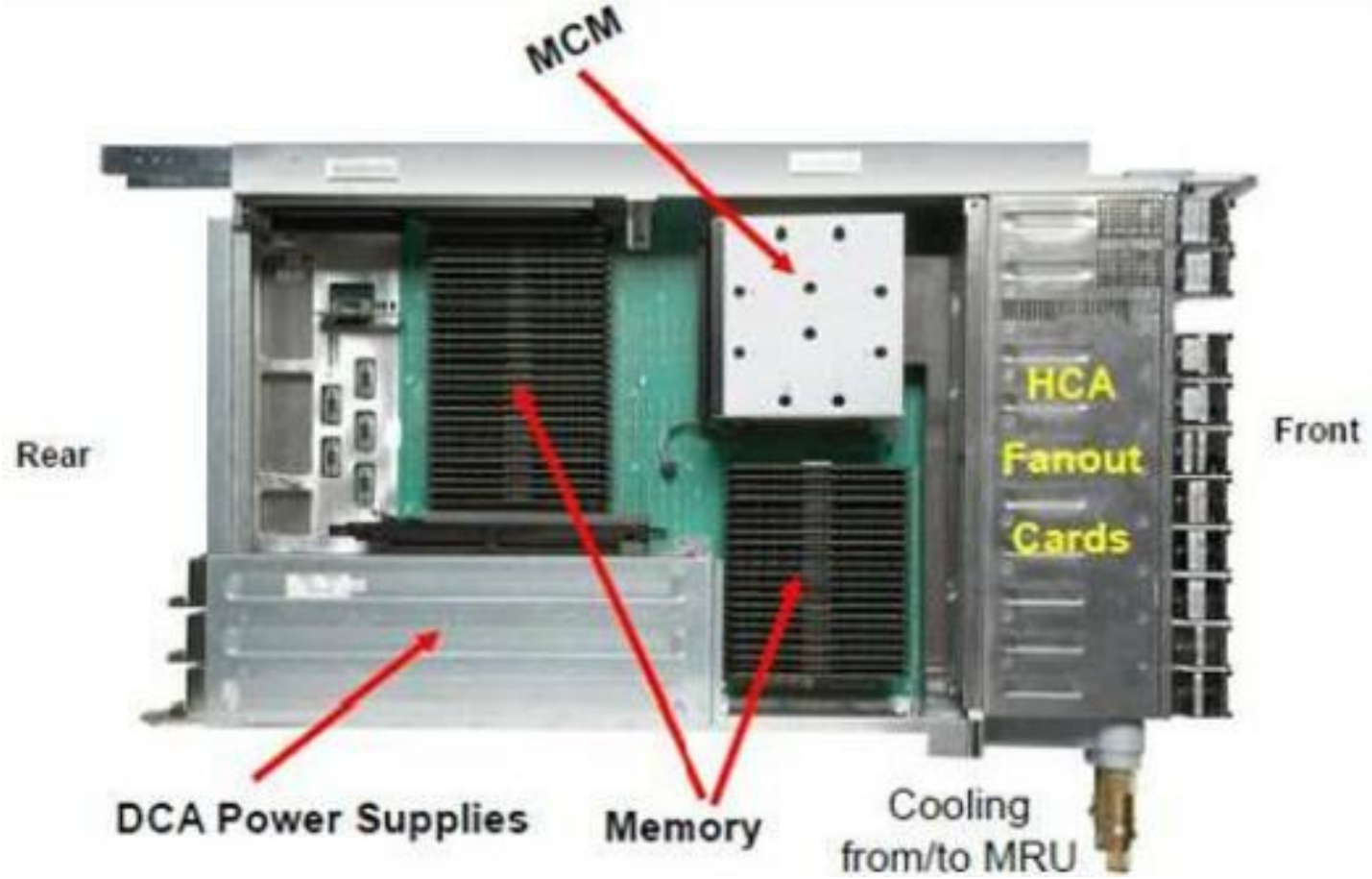
What Will We Implement ?- CEC

What Will We Implement ? - CEC

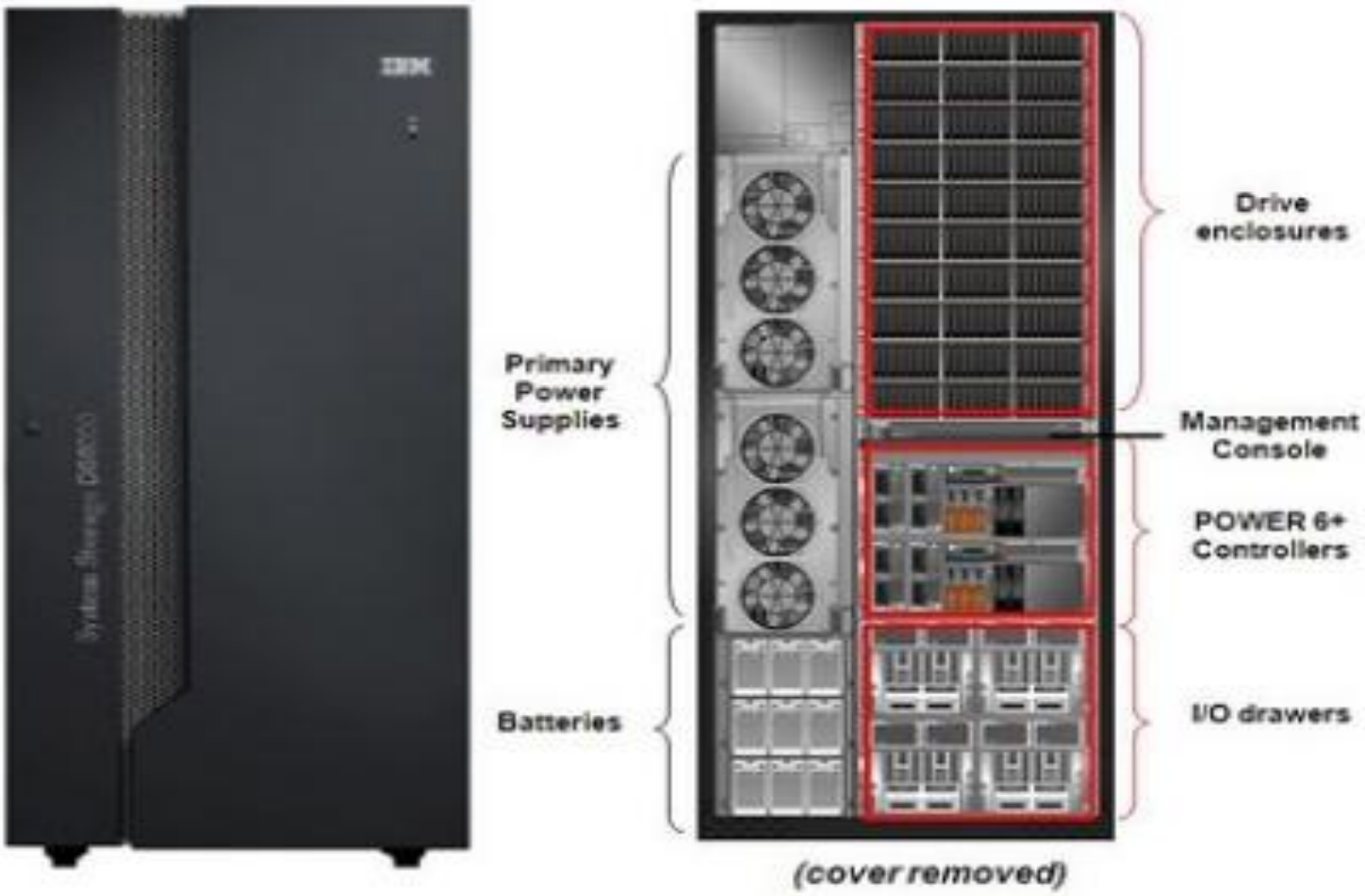


What Will We Implement ? – CEC

Where Is My CPU & Memory ?



What Will We Implement ? – DS8800



What Will We Implement ? – Tape Environment

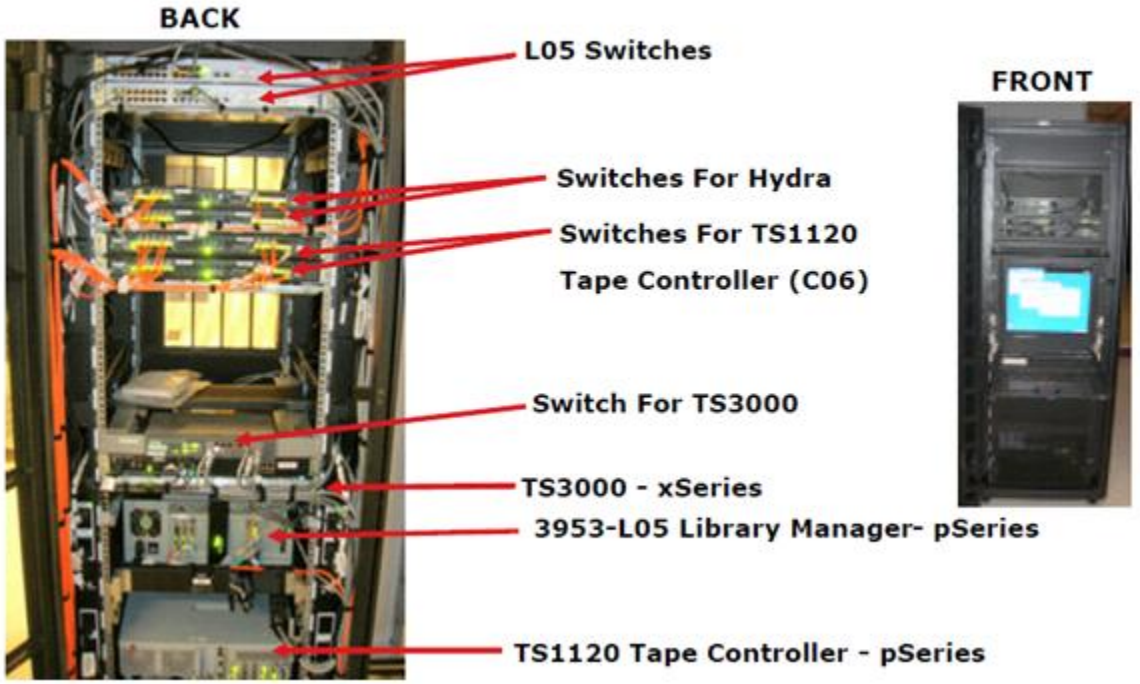
TS7700

TS3500

LM FRAME

What Will We Implement ? – Tape Environment – LM Frame

3953-F05 Frame Overview



What Will We Implement ? – Tape Environment – TS3500

L23 Frame

Inside T3500

Inside TS3500 Robot

L23 + D23 Frames

What Will We Implement ? – Tape Environment – TS1120/30

IBM System Storage TS1120 Tape Drive

→ Product details
→ Browse and buy
→ Request a quote

The IBM System Storage® TS1120 Tape Drive offers a tape solution with high capacity, fast access to data and long-term data retention. It is supported in IBM tape libraries, or frames that support stand-alone installations.

Cartridge capacity [1]	Up to 2.1TB at 3:1 compression
Max. drive data rate:	104 MBps native data rate
Interface	Supports both IBM ESCON® and FICON® attachment. Sharing drives optimizes drive utilization and helps to reduce infrastructure requirements

IBM System Storage TS1130 Tape Drive

→ Product details

The IBM System Storage TS1130 Tape Drive offers a tape solution with high capacity, fast access to data and long-term data retention. It is supported in IBM tape libraries, or frames that support stand-alone installations.

Cartridge capacity	Up to 3 TB at 3:1 compression
Max. drive data rate	160 MBps native data rate
Interface	Supports both IBM ESCON and FICON attachment. Sharing drives optimizes drive utilization

IBM System Storage TS1140 Tape Drive

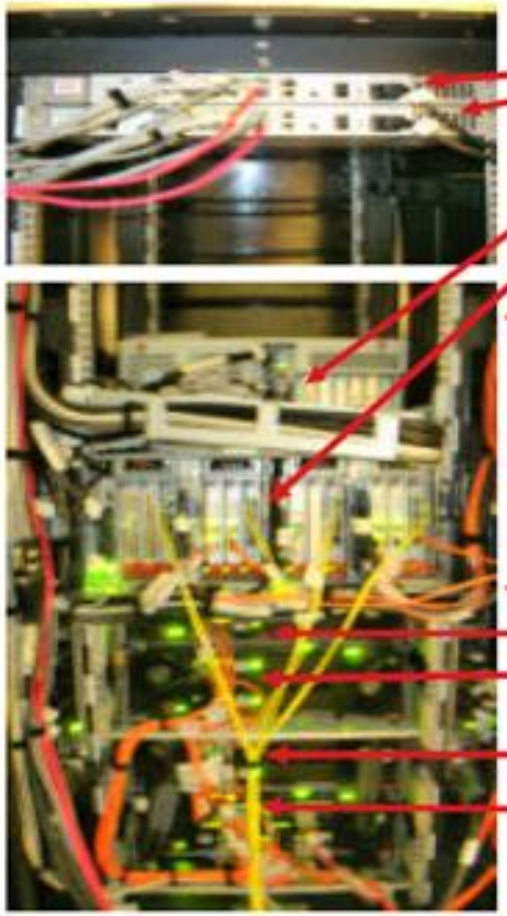
→ Product details

The IBM System Storage® The IBM System Storage® TS1140 Tape Drive offers a tape solution with high capacity, fast access to data and long-term data retention. It is supported in IBM tape libraries, or frames that support stand-alone installations.

Cartridge capacity	4 TBs
Max. drive data rate	250 MBps native data rate
Interface	Supports IBM FICON® attachment. Sharing drives optimizes drive utilization and helps to reduce infrastructure requirements.

What Will We Implement ? – Tape Environment – TS7700

3952-L05 Frame Overview (TS7700 Virtualization Engine)



Cisco Routers

p5 (9131-52A)

1300-001

(Expansion)

3957-V06
(TS7740 Server)

3956-CX6 (Cache Drawers)

3956-CX6 (Cache Drawers)

3956-CX6 (Cache Drawers)

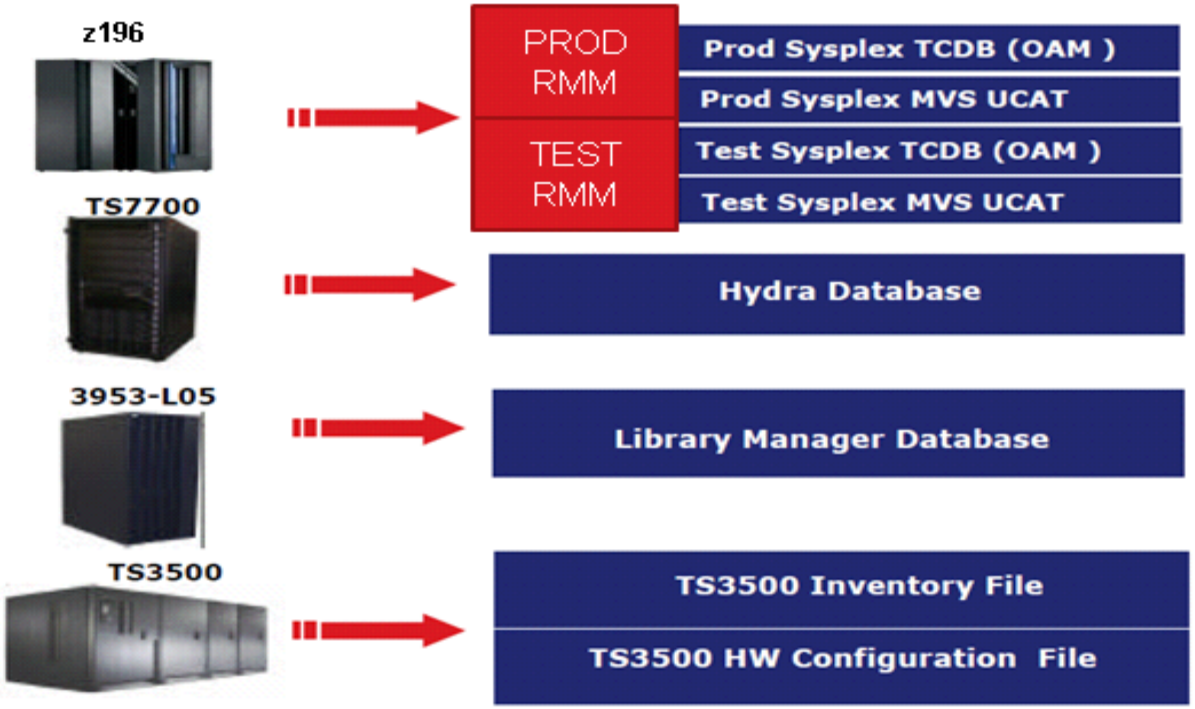
3956-CC6
(TS7740 Cache Controller)

146GB* 64
15K rpm DDMs
(DS6000)
6 TB capacity

FRONT

Raw 9344GB – Usage Cap:6 TB
8 Arrays –Each 8 DDMs
8 RANKs- FB- RAID5(6+P+S)
2 Extent Pools (Each 3092 GB)
1 Device Adapter Pair
2 I/O Adapters

Where is My Data ?



Implementing CEC

1- Order Process

I. Work With IBM About Planning Phase
II. Do Capacity Planning,Use zPCR
III. Agree On License Method
IV. How much CPU
V. How Much Memory
VI. I/O Cards? How Many ? Which Type ?
VII. CPU model ?
VIII. Which Features?
IX. Decide On Whether You Need CBU or Not ?

Implementing CEC

2- Plan For Space/Power While Waiting For Hardware

I. Plan Space Requirements In System Room
II. Plan Power Requirements For Devices
Connect Devices To Two Different UPS
I. Plan For IP Addresses Related To HMC
II. Prepare Network Cabling Between HMCs & SE

Implementing CEC

3- Hardware Received

I. HW CE Starts The Process Of Installation
HW Getting Parts Together ,
HW Power On, Complete Installation process using specific procedure for specific configuration*

II. HMC Network Configuration & Implementation**
III. HW CE Informs That CEC Is Ready To Be Used By Customer

* All Devices Come With Special Installation Procedure Depending On That Specific HW Configuration

** Network internal to SE and HMC & IP address to include them in intranet of your environment (Intranet IP addresses only needed if you decide to use BCPII interface and/or HMC WebInterface)

Implementing CEC

4- IODF Definitions / CHPID Mapping Tool*

I. Prepare Standalone IODF
   Create it using a txt file, upload it to SE,edit it using HMC if needed
II. Use CHPID Mapping Tool

* If there is no Z/OS Platform Usable Before (no driving system), You Need To Create Stand Alone IODF
* You can find CHPID mapping tool in IBM ResourceLink Website

* IOCDS (Version of IODF That Should be Saved In CEC – It is simply a file that definitions located in HSA

Implementing CEC

5- IML CEC Using The StandAlone IOCDS You Have Created

Your LPARs will be Activated
(But for now, there is no device that you can IPL from …)
Control Units Will Be Defined And Devices Will Be Known By HW
By IOCDS Definitions, HW knows which Channel is connected to which device through which channel path

- **Now You need to have a HardDisk that has IPL text ,that you can load OS code**

Implementing CEC

6 – Because there is no z/OS Driving System (according to our senario)
We need to use Standalone SMS mode in HMC to create an IPLable z/OS volume

- **Your z/OS order will include standalobe ICKDSF facility,Standalone DFSMSdss to create volume From your installation DVD. (Check IBM's publications related to standalone SMS usage)**

- **Before continue this process , we need to install a DASD box,format it and make it usable by z/OS….**
- **Oneor two of the device numbers will be used to create driving system's volumes.**
- **So lets continue with Implementing DASD**

7 – Using The Driving System IPLable volume you created in Disk device, IPL driving system and Continue To Install & Customize Actual z/OS Platform

Implementing DS8X (DASD)

1- Plan For New DASD

I. Research On Products & Decide On Model

II. Do Study With Vendor About Configuration

Capacity Of Disk?

Type Of DDM ?

Number Of Host Adapters?

FICON Type ?

Decide On RAID Format Method – RAID 5-RAID10 ?

III. Check ResponseTime /Configuration With Estimation Tools
(Makes sense much more if you are doing a DASD upgrade,
İn which case you know your current performance items.)
There are products in market that does this estimation and help you decide on HW configuration

Implementing DS8X (DASD)

2- Plan For Space/Power While Waiting For Hardware

I. Plan Space Requirements In System Room
II. Plan Power Requirements For Devices
III. Plan For IP Addresses Related To HMC Of DS8000
IV. Prepare Network Cabling To Include Them In Intranet

Implementing DS8X (DASD)

3- HW Received

I. HW CE Finishes Installation. You need to access to Box through your intranet network via IP
II. Using DSCLI, Establish Connection With DS8X
III. Get License Data From Website Using BOX Serial Number
IV. Define /Change User Ids /Passwords
V. Install Licence To Box Using DSCLI Commands.
VI. Define Type Of Host Adapter Ports (FICON,FCP) To DASD Box Using DSCLI Commands
VII. Start Formatting Device Using DSCLI Commands

Implementing DS8X (DASD)

3- Start Formatting DS8X Using DSCLI SW

I. Define Array
II. Define Rank
III. Define Extent Pool
IV. Define LCU
V. Define Devices
VI. Define Alias

Implementing DS8X (DASD)

4- Do IODF Definitions (This has been done during Installation Process Of CEC)

I. **Define Control Units, Channels**
II. **Define Devices**
III. **Activate IODF – This Time Do Stand Alone IODF and IML.**

I. You can check the SHARE Anaheim 2012 session 11491 about which definition is located in which area of HW and SW.
II. You can also see this session if you are interested in understanding the LIFE of an I/O operation.

Implementing Tape Environment

1- Plan For Tape Environment

I. Research on Tape Solution Technologies

II. Decide On What You Need

Native Tape Drive + Virtual Tape Solution

Virtual Tape Solution Only

Native Tape Solution Only

III. Study Configuration With Vendor

Tape Drive Model ?

Number Of Tape Drives ?

Cache Size Of Virtual Tape Solution

Number Of FICON Ports For VTS(TS7700)

Number Of TS3500 Slots

Decide On Cartidge Labels

Each Cartidge has a Label which is 6 characters long

Which Tape cartidge models ?

3592-JA ? 3592-JB? 3592-JC ?

How many cartidges ? Order cartidges

Give Label Ranges to Cartidge Vendor

Implementing Tape Environment

2- HW CE Finishes Installation Procedures For Each Device

Now you can access your devices' webinterfaces using your network….

Implementing Tape Environment

3- Start Doing Definitions Both as HW and SW

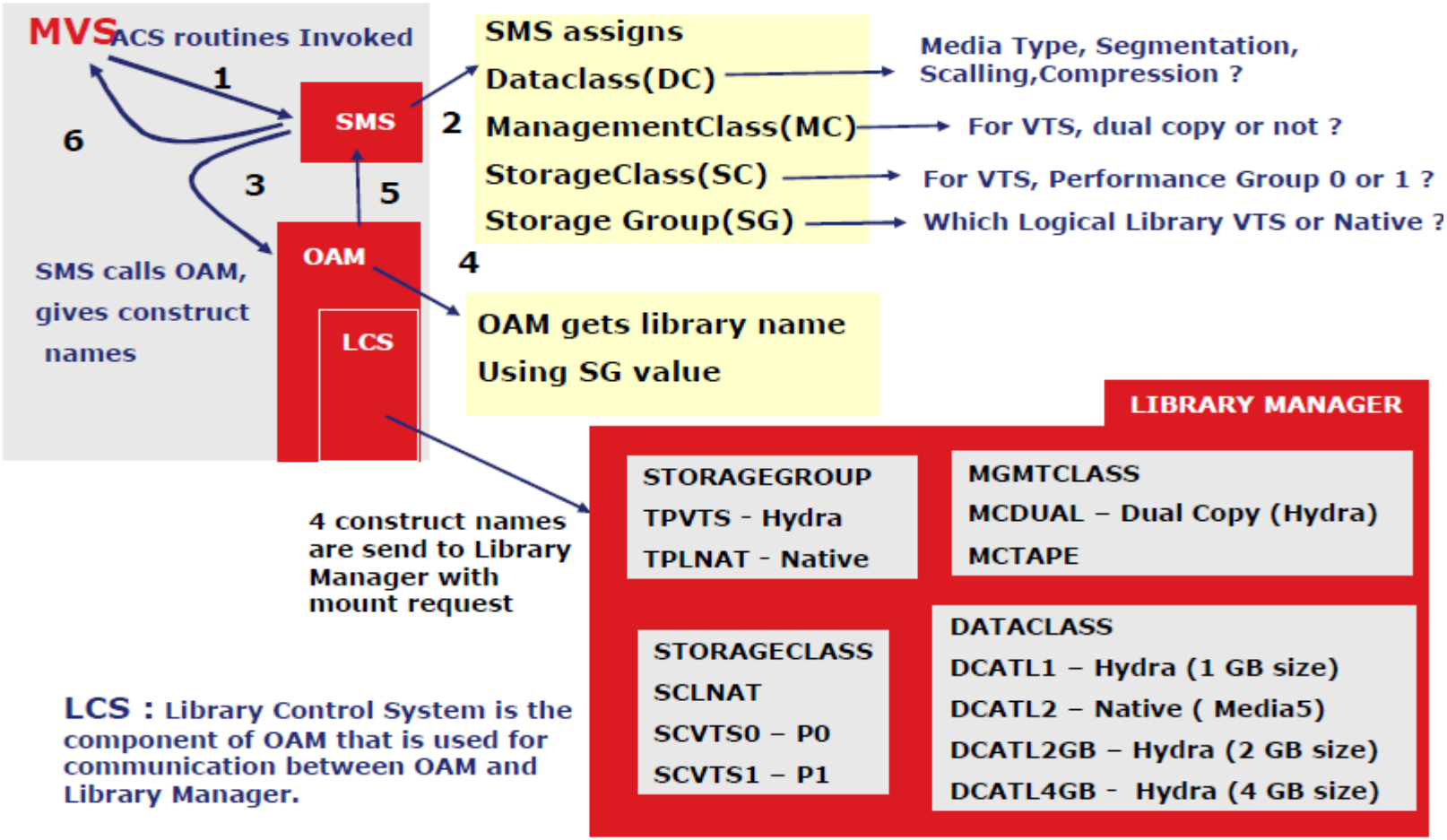
SMS Managed Tape Environment Needs Several SWs in z/OS Platform
- **OAM (SW That is needed to create interface between z/OS and Library)**
- **RMM (Tape Management Product)**
- **SMS (SMS ACS Routines)**

ACS routines are Needed To be updated to give each Tape Dataset
It's identity cards –Dataclass,ManagementClass,StorageClass,StorageGroup)

Assume that VTS has a door and while passing from this door, VTS code checks
Each request's identity cards and manages/does decisions for data
using these definitions…

Implementing Tape Environment

SMS Managed Tape – How Is It Working ?



LCS : Library Control System is the component of OAM that is used for communication between OAM and Library Manager.

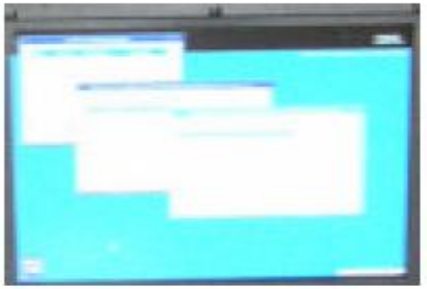
Implementing Tape Environment

IBM Tape Environment Management Interfaces

Library Manager Console

TS3500 Tape Specialist

TS3000 Master Console



TS3500 Operator Panel

Library Manager Web Browser Interface (ETL Specialist)

TS7700 Virtualization Engine Management Interface (MI)

Implementing Tape Environment

3- Start Doing Definitions SW

I. Customize OAM

Define OAM Catalog

Define Libraries To OAM

Modify OAM AS in sys1.proclib ,Add OAM start to SMS start parameters…

II. Define Tape Devices In IODF (Can Be Done in CEC installation)

In IODF,Device Definition Use Library –YES ,Use Library Name

III. Define Tape Datasets' User Catalog

IV. Define Tape Dataset Aliases

V. Define Dataclass,ManagementClass,StorageClass,StorageGroup

VI. Update ACS routines

VII. Change RMM Parmlib To Differentiate TestPlex /Prodplex

Which cartidge ranges owned by which sysplex ?

Which cartidge ranges have which media type,recording format

Define cartidge pools

Define RMM related definitions – VRS etc...

Using DEVSUPXX sys1.parmlib,define category order for each Sysplex,each mediatype different 4 digit category order ,for private and scratch

Implementing Tape Environment

3- Start Doing Definitions -HW

I. Define Logical Libraries Using TS3500 Webinterface One logical library for Native, One logical library for VTS
II. Define Cartidge Ranges For Each Logical Library
III. Do Definitions Using TS7740-VTS WebInterface
IV. Define Dataclasses that match to each z/OS Dataclass
V. Define StorageClass that matches to each z/OS StorageClass
VI. Define ManagementClasses that match to each z/OS MngmtClass
VII. Define Storagegroups that match to each z/OS StorageGroup
VIII. VTS uses the definitions that are done using WebInterface

Dataclass –encryptıon or not,Logical Volume Size
StorageClass – Decide On performance group –PG0-PG1
StorageGroup – Distribute Logical volumes on different real cartidge groups in backend
It is like the usage of z/OS SMS disk storage group
You need to assign each storage group in VTS to a VTS storage pool
These are like 4 identity cards of each tape dataset

Implementing Tape Environment

4- Start OAM AS and Make Libraries Online To z/OS
Using OAM commands, online libraries to z/OS

5- Make Devices Online To z/OS
Using Vary z/OS commands, online tape devices to z/OS

6- Check Drives,z/OS Definitions,HW definitions
Using sample backup jobs for each different environment
Check VTS backups, Check Native Tape Backups
Check All Definitions in z/OS(OAM entry,RMM entry,Catalog entry) for each tape datasets you created and also check definitions of Logical & Physical volumes that your job used in HW part
(TS3500 inventory,TS7700 Database,Library Manager Database)
Using webinterfaces of each device….

This is needed to make sure you did everything correct….

Now You Have

CEC that at least one LPAR is running z/OS
Attached To A DS8X Box
Can Use TS3500,TS7700,Native Tape Drives

GT- MAINFRAME PLATFORM

Who Is Garanti Technology

- A wholly-owned subsidiary of Garanti Bank, the second largest private bank in Turkey owned by Doğuş Group and BBVA.
- One of the largest private internal IT service providers in Turkey
- Most up-to-date IT infrastructure
- Tightly integrated and fully in-house developed, custom-fit IT solutions
- Uninterrupted transaction capability and infrastructure security
- Well-reputed as a company of "firsts"
- Visionary and continuous investment in technology since 90's

Garanti

- Fast decision making and strong communication from top to down
- Centralized management reporting systems, enable management to take timely actions
- Advanced CRM applications
- Paperless banking

Who Is Garanti Technology

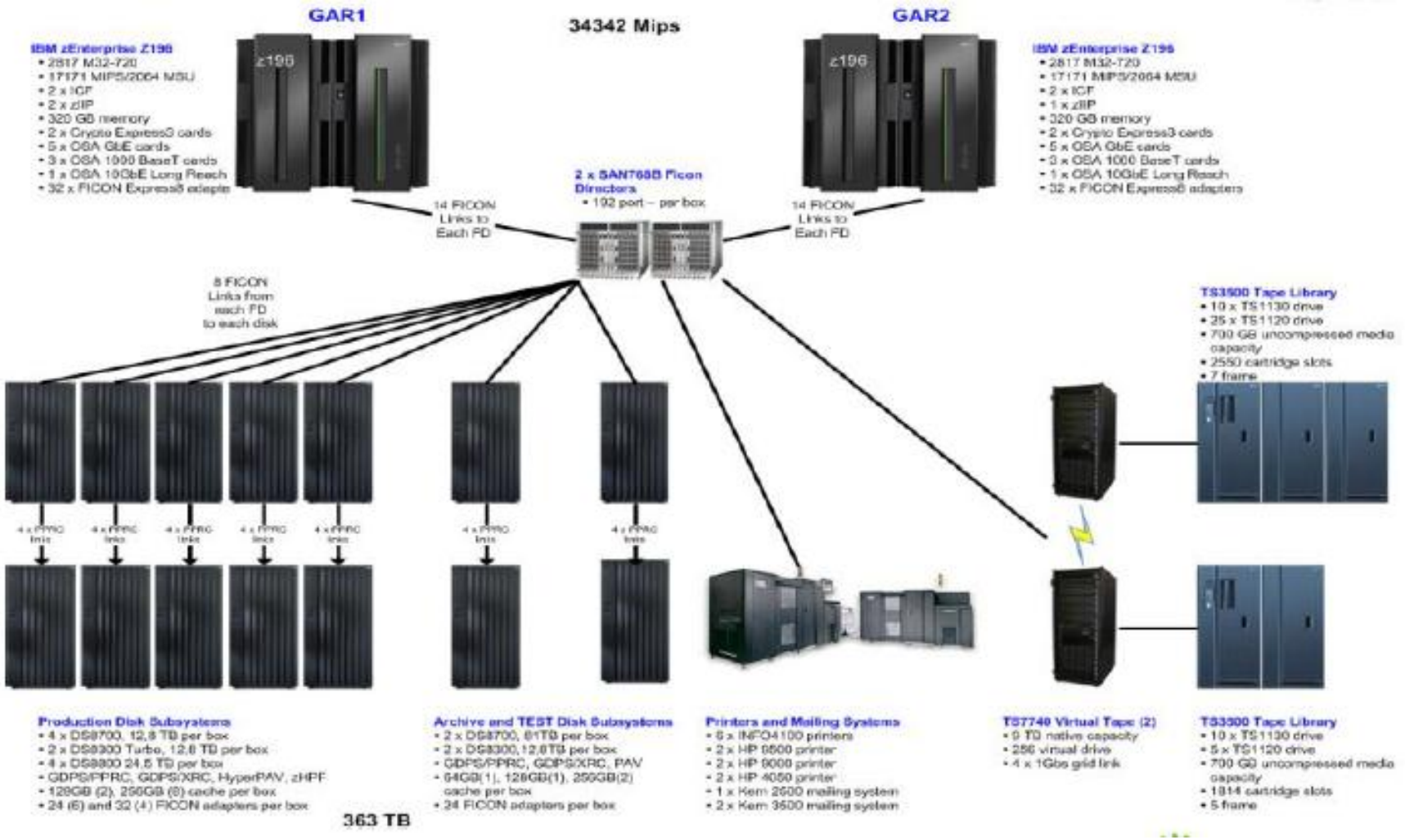
Who Is Garanti Technology

- SHARE

- CMG

- GDPS Design Council
- zBLC

GT- Mainframe Configuration



Resources To Check

- IBM ResourceLink
- IBM Redbooks
- Device SAPR Guides(CEC,DS8X,TS7740,TS1120,TS1130,TS1140,Library Manager)
- Device Installation RoadMap Books
- WSC Technical Papers
- ABCs Of System Programming
- Z/OS Basic Redbook
- IRD Redbook
- z/OS InfoCenter
- TS3500 Infocenter
- TS7700 Infocenter
- SHARE Znextgen And MVS Core , MVS EWCP , MVS Storage Projects Sessions