



**Uni Hamburg – Mainframe Summit
z/OS – The Mainframe Operating**

Part 6 – z/OS Konzepte

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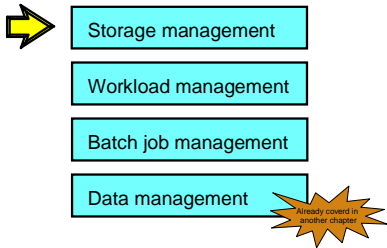
Unit objectives

After completing this unit, you should be able to:

- Explain the different kinds of storage in a z/OS system, their organization, and management
- Describe how batch work is passed to a z/OS system and how it is handled and processed
- Indicate how data and programs are organized and stored in an z/OS environment

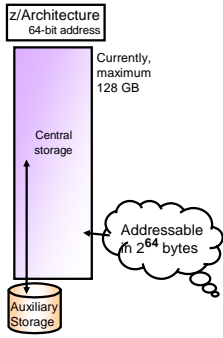
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Storage management



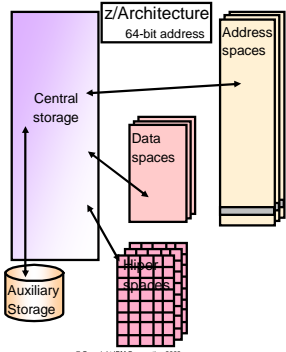
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System z9 and zSeries server storage, real and auxiliary



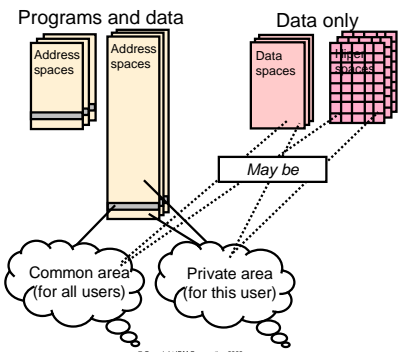
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Virtual storage

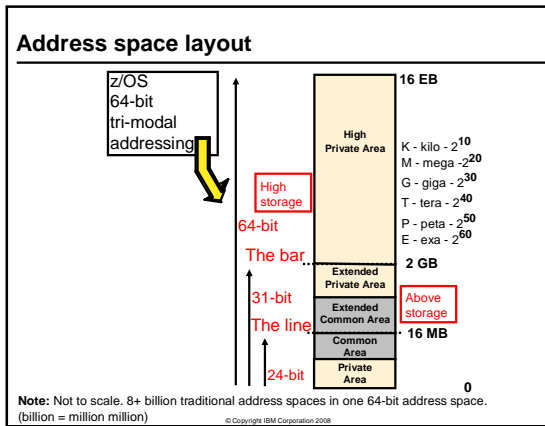


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Virtual storage usage



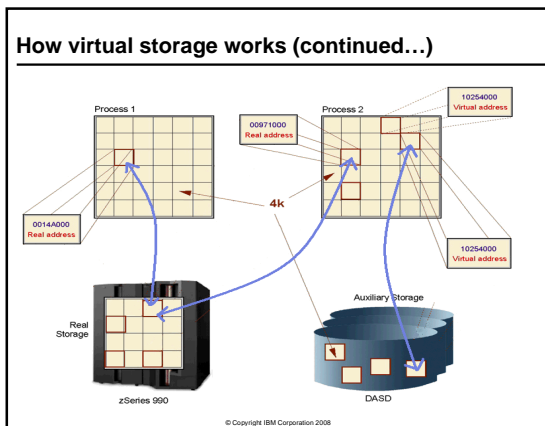
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How virtual storage works

- Virtual storage is divided into 4-kilobyte pages
- Transfer of pages between auxiliary storage and real storage is called paging
- When a requested address is not in real storage, an interruption is signaled and the system brings the required page into real storage
- z/OS uses tables to keep track of pages
 - Dynamic address translation (DAT)
 - Frames, pages, slots are all repositories for a page of information

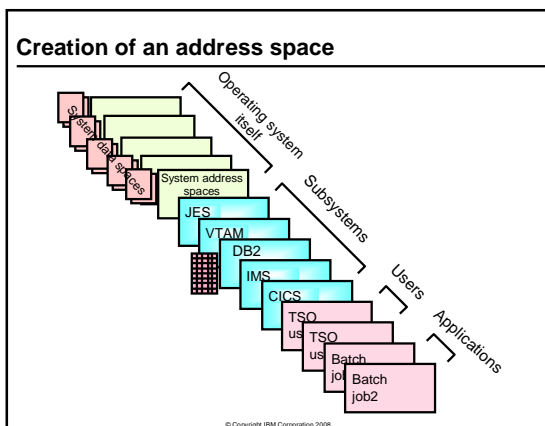
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Paging - Pages, Frames, and Slots

- The pieces of a program executing in virtual storage must be moved between real and auxiliary storage:
 - A block of real storage is a **frame**.
 - A block of virtual storage is a **page**.
 - A block of auxiliary storage is a **slot**.
- A page, a frame, and a slot are all the same size: 4096 bytes (4 kilobytes).
- To the programmer, the entire program appears to occupy contiguous space in real storage at all times.

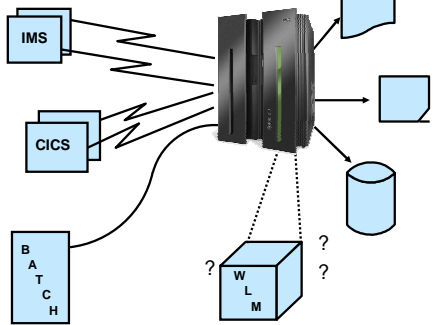
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Workload management

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What is workload management?



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Defining expectations for work

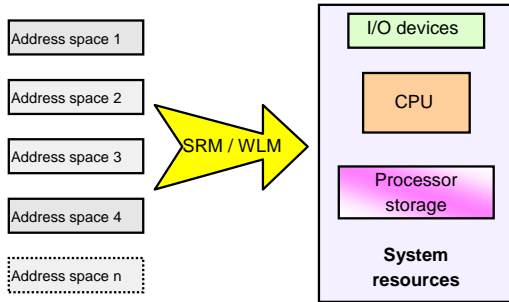
- Payroll batch job
- Internet purchasing transaction
- TSO user
- CICS production transactions
- CICS development transactions
- Other work



- ✓ Define business goals for the work
- ✓ Define importance of achieving the business goals

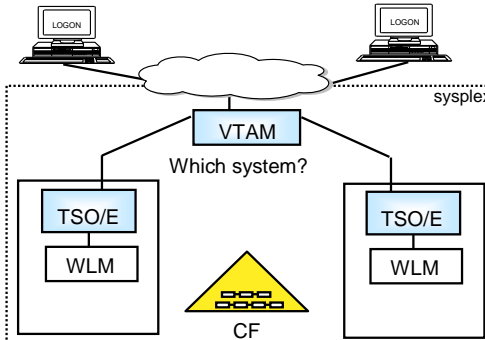
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Resource distribution



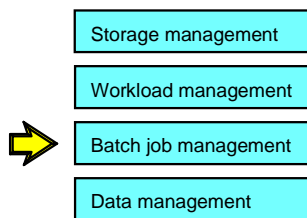
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Workload distribution



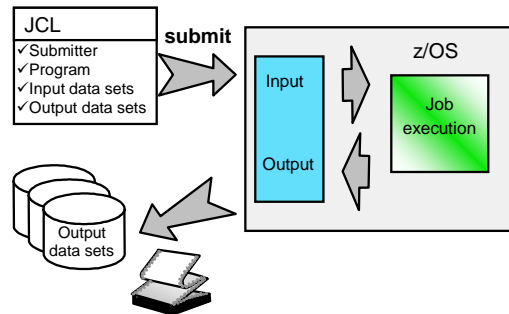
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Batch job management



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Batch work



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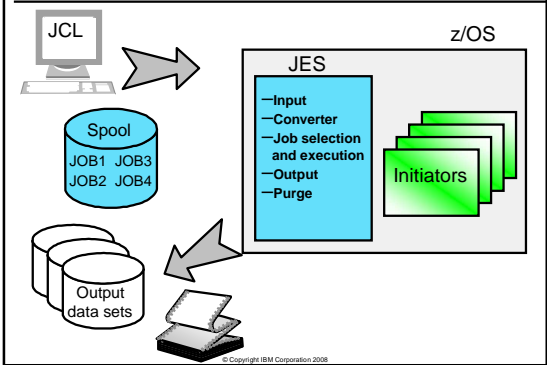
Job control language - An example

```

//IT23482C JOB ACCT,'HASSE TAUBE',REGION=0M,MEMLIMIT=16384P,
//          CLASS=A,MSGCLASS=X,MSGLEVEL=(1,1),NOTIFY=IT23482
/** This step allocates the data set referred to by BACKUPDS DD
//STEP1 EXEC PGM=IEFBFR14
//BACKUPDS DD
DSN=IT23482.RTBF.BACKUP,DISP=(,CATLG),UNIT=SYSDA,
//          SPACE=(TRK,(15,15,20)),LRECL=80
/** This step copies the INPUT DD data set into OUTPUT DD data set
//STEP2 EXEC PGM=IEBCOPY
//INPUT DD DSN=IT23482.RTBF,DISP=SHR
//OUTPUT DD DSN=IT23482.RTBF.BACKUP,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
COPY INDD=INPUT,OUTDD=OUTPUT
SELECT MEMBER=(PAYROLL,EMPLOYEE,MORTGAGE)
/**
    
```

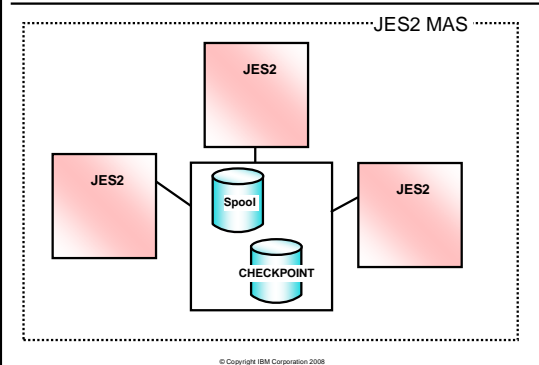
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Job Entry Subsystem (JES)



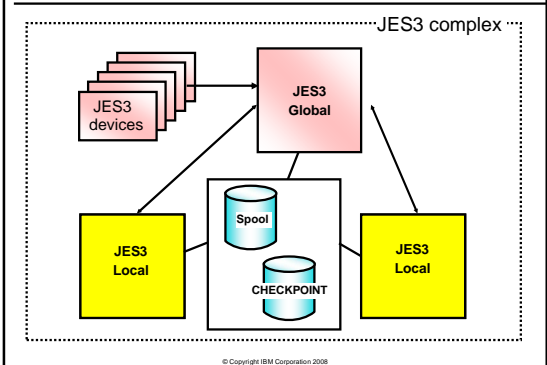
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Job Entry Subsystem 2 (JES2)



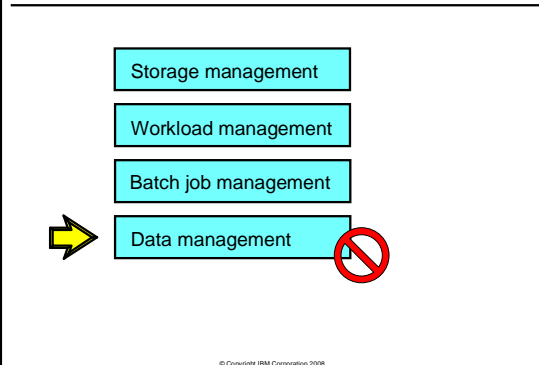
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Job Entry Subsystem 3 (JES3)



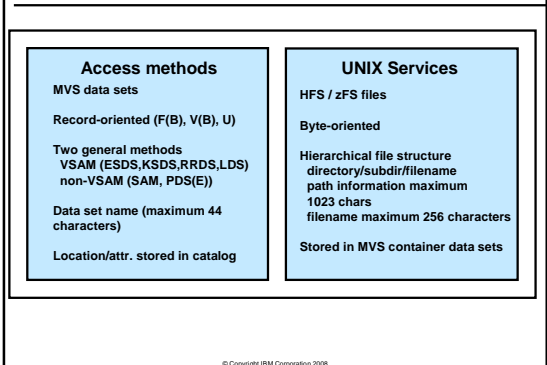
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Data management



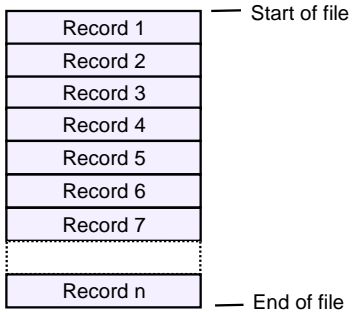
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z/OS data management



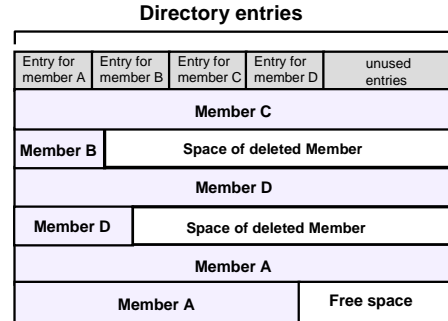
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Layout of a sequential data set



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Layout of a partitioned data set



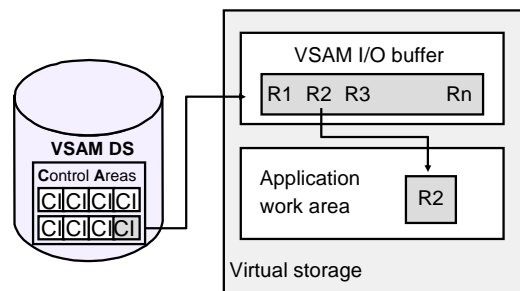
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Partitioned data set extended

Directory entries for Member A, B, C, D	Member C
Member B	Member E
Member D	Member A
Free space of deleted Member	Directory entries for Member E, X
Member D	Member X
Free space	Free space
Free space	Free space

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VSAM data sets

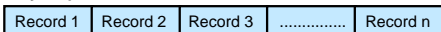


CI Control Interval

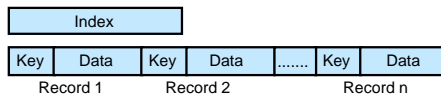
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VSAM data set types

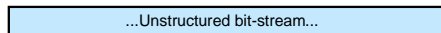
Entry-sequenced data set



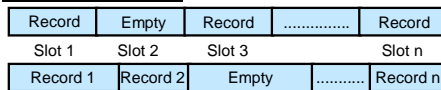
Key-sequenced data set



Linear data set

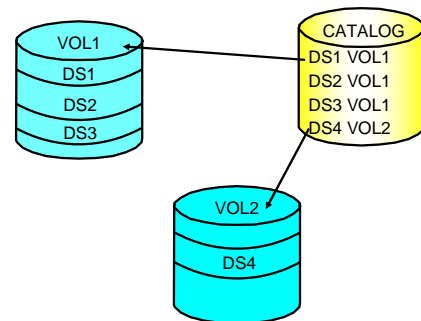


Relative record data set

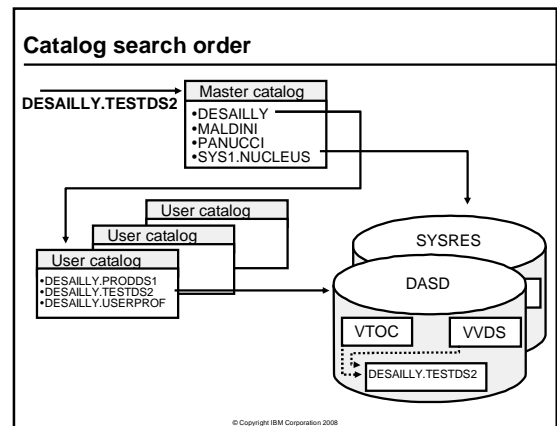
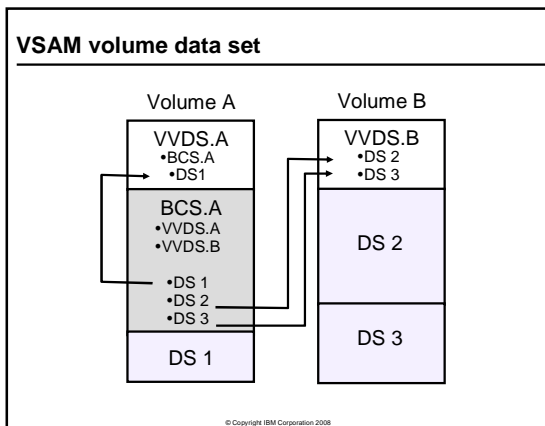
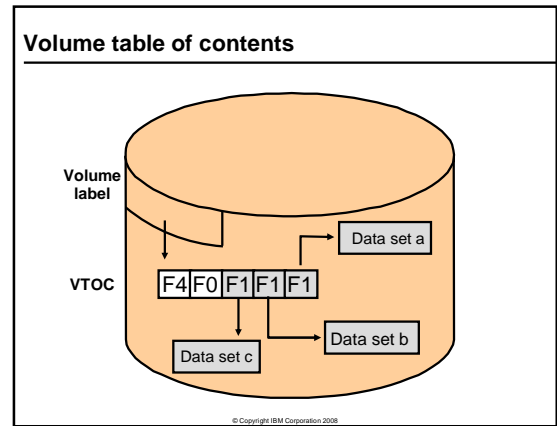
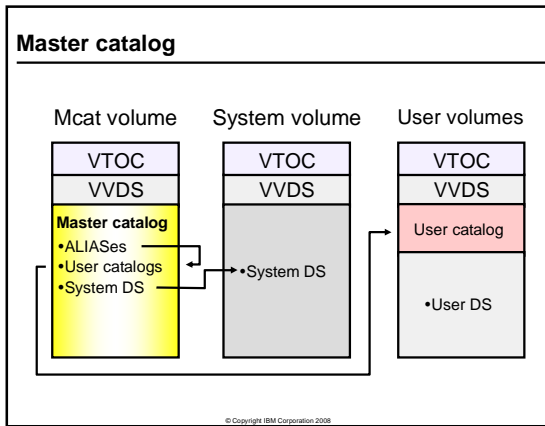


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Locating data sets



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Allocation of data sets (DASD)

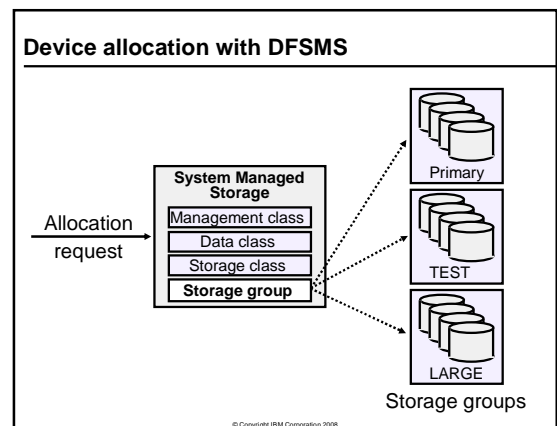
JCL example (DD statement)

```
//OUT DD DSN=USER1.DAILY.DATA,DISP=(NEW,CATLG),
// UNIT=3390,VOL=SER=PROD01,
// SPACE=(TRK,(50,30)),DCB=BLKSIZE=4096,
// EXPDT=2008/180
```

Labels for the JCL statement:

- Storage class:** UNIT=3390
- Data class:** DCB=BLKSIZE=4096
- Management class:** EXPDT=2008/180

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Unit summary

Key points from this unit:

- z/OS supports central, auxiliary, and virtual storage, in 64-bit mode.
- Storage is allocated in 4 KB blocks:
 - [Central storage - frame](#)
 - [Auxiliary storage - slot](#)
 - [Virtual storage - page](#)
- Batch work is defined to the system with JCL and is executed in an initiator address space.
- Data and programs are stored in data sets. Data sets are either VSAM or non-VSAM.

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