

# Terminology and Concepts

## Running a Simple Job

### Lesson 1:

### Terminology and Concepts

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### JCL: Job Control Language

- JCL: Job Control Language controls the execution of jobs on an IBM mainframe operation.
- It provides instructions to the z/OS operating system for executing a job.

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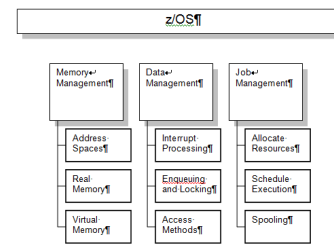
### z/OS Operating System

- The z/OS operating system is a set of programs which controls the activity of the computer.
- Its primary function is to manage the resources of the computer:
  - memory
  - processor time
  - I/O devices, such as printers and disk drives

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### z/OS Operating System



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### z/OS Resource Management

- z/OS has a number of mechanisms by which it manages the computer's resources.
- They include:
  - Task
  - Address Space
  - JES
  - Spool
  - Access Method
  - Dataset

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### Task

- A task is the basic unit of work for the computer.
  - A single program is called a task while it is executing.
  - In JCL, each step of a job corresponds to a task.

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### Address Space

- An address space is an area of virtual storage which contains a program while it executes.
  - Every batch job and TSO user has its own address space.
  - z/OS ensures that the activities in each address space are kept separate from other activities in the system.

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### JES

- The Job Entry Subsystem, JES, is a part or subsystem of z/OS.
- Three JES functions are of interest:
  - Setting up the program in an address space.
  - Controlling slow I/O devices such as printers.
  - Processing all the JCL.

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### JES2 and JES3

- There are two varieties of JES: JES2 and JES3.
  - For the most part, they function similarly.
- Unless otherwise noted, everything that is described applies equally to both JES2 and JES3.

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### JCL Spool

- The spool is a special disk storage area used by JES.
  - It is used to store records to and from slow I/O devices, such as printers.
  - Using the spool enables a program to process more efficiently.
- As JES reads JCL from an internal reader, it stores them on the spool.
  - Later when the program executes, it reads data from the spool as though it were reading from the JCL records.

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### Print Spool

- The spool also provides flexibility for computer operations.
  - Jobs are read and stored on the spool until an address space is available.
  - A program can produce several reports which are kept on the spool.
  - Operators are able to direct the reports to various printers depending on their requirements.

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### Access Method

- An access method is a part of z/OS which controls I/O for faster devices, such as disks and tapes.
  - There are several access methods, one for each type of file organization.
- All access methods perform the same basic function.
  - They take the READ or WRITE statements in a program and issue the appropriate machine commands to read or write to the disk or tape.

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### Dataset

- The dataset is the z/OS unit for storing data.
- Datasets are associated with their physical medium.
  - For instance, it is proper to speak of a disk dataset, a tape dataset, or even a print dataset.
- Programs view datasets as files.
  - A program is not concerned with the physical storage of a dataset.
  - Rather, it looks at the organization of records, such as a sequential file or an indexed file.

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### z/OS Job Processing

- z/OS provides for two types of job processing:
  - Interactive
  - Batch
- Interactive processing is available on demand and provides instantaneous results.
  - The user interacts with program execution by using TSO commands from a terminal.
- Batch processing provides for delayed program execution.
  - This gives the user flexibility in scheduling program execution.
  - It also enables a user to process a number of jobs concurrently.

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### z/OS Job Processing

- JCL statements control batch processing.
- As a job flows through the system, there are four times in which JCL effects the job.
  - Entering the system.
  - Beginning the processing.
  - Ending the processing.
  - Processing the output.

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### Enter the System

- Batch jobs enter the system from a number of input devices.
  - Usually they are read into a spool dataset or submitted from a TSO terminal.
  - No matter where the job originates, JES immediately examines the JCL for syntax errors.
  - If JES finds an error, it flushes the job with a JCL error listing.
  - If there are no errors, JES stores the job on the spool until it is ready to execute.

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### Begin Processing

- The job begins processing when JES finds an available address space.
  - During initiation JES moves the job from the spool into the address space and informs z/OS about the job.
- Once the job has been initiated, z/OS performs allocation processing.
  - During allocation, z/OS locates all the datasets and devices which the job needs in order to execute.

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### Begin Processing

- After allocation, z/OS brings the program into memory and begins execution.
  - If an installation uses JES2, dataset allocation takes place at the beginning of each step.
  - Under JES3, all allocation takes place at the beginning of the job.

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### End Processing

- When the program finishes, z/OS takes over again.
  - During deallocation, z/OS disposes of all the datasets the program used.
  - Based on the JCL, it either saves or deletes the datasets.
  - After deallocation comes termination.
  - The job is taken from the address space in order that JES can use it for the next job.

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### Job Control Language

- JCL is the language that must be used for controlling jobs.
  - As with any language, JCL has its own terminology and syntax.
  - It has a vocabulary of words which have a specific meaning and rules which govern the use of the language.

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