Unit 3

- z/OS: Essential Technology of Large Enterprises,
- Introducing IBM Mainframe Operating Systems,
- z/OS - IBM Z Flagship Operating System,
- z/OS Professional Documentation,
- Architecture of IBM Z systems,
- networking, and security aspects.

Why Z Matters

Utilities 

 Retail

 Government

Financial 

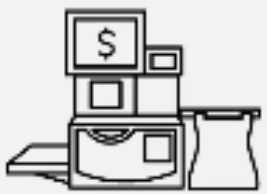
 Healthcare

Travel 

Telecoms 

 Automotive

Weather 



Currency Facts
8% of the money is physical
92% of the money is electronic

https://money.howstuffworks.com/currency6.htm

IBM **Z**

IBM Z Distinctive Strength Large-Scale Transaction Processing

What is inside the IBM Z mainframe?

Customer Usable

- **Processors**
  170 max 5.2 GHz
  CPU, IFL, zIIP, CF
- **Memory (Enabled)**
  32 TB max
  RAIM

System Dedicated

- **Processors**
  36 max 5.2 GHz
  SAPs & Spares
- **Memory (Flexible)**
  24 TB max
  RAIM
- **Cache**
  4 levels

Introduction

- **What is OS?**
- an *operating system* is a collection of programs that manage the internal workings of a computer system
- **What is z/OS**
- z/OS is designed to take advantage of the IBM System z architecture, or z/Architecture, which was introduced in the year 2000. The z in the name was selected because these systems often have zero downtime.
- z/OS is designed to offer a stable, secure, continuously available, and scalable environment for applications running on the mainframe.
- It evolved from an operating system that could process only a single program at a time to an operating system that can handle many thousands of programs and interactive users concurrently.
- Batch OS-> Time Sharing
- The z/OS operating system executes in a processor and resides in processor storage during execution. z/OS is commonly referred to as the system software or base control program (BCP).

Hardware resources used by z/OS

Hardware Master Console
(controls mainframe hardware)

z/OS

Mainframe Computer
(CPU, processor
storage)

Operator Console
(controls z/OS)

Tape Drive

Tape
Cartridge

DASD
Controller

Disk Storage

- Mainframe hardware consists of processors and a multitude of peripheral devices such as disk drives (called direct access storage devices (DASD)), magnetic tape drives, and various types of user consoles;. Tape and DASD are used for system functions and by user programs executed by z/OS.

- Software: The z/OS operating system consists of load modules or *executable code.* During the installation process, the system programmer copies these load modules to *load libraries* (files) residing on DASD volumes.
- Hardware: The system hardware consists of all the channels2, control units3, devices, and processors that constitute a mainframe environment.
- Peripheral devices**:** These devices include tape drives, DASD, and consoles. There are many other types of devices,
- Processor storage**:** Often called real or central storage (or memory), this is where the z/OS operating system executes. Also, all user programs share the use of processor storage with the operating system.

Multiprogramming and multiprocessing

- single-user computer systems.
- the computer systems that z/OS manages are capable of *multiprogramming, or executing many programs concurrently.*
- Multiprogramming allows z/OS to run thousands of programs simultaneously for users who might be working on different projects at different physical locations around the world.
- z/OS can also perform *multiprocessing, which is the simultaneous operation of* two or more processors that share the various hardware resources, such as memory and external disk storage devices.

Overview of z/OS facilities

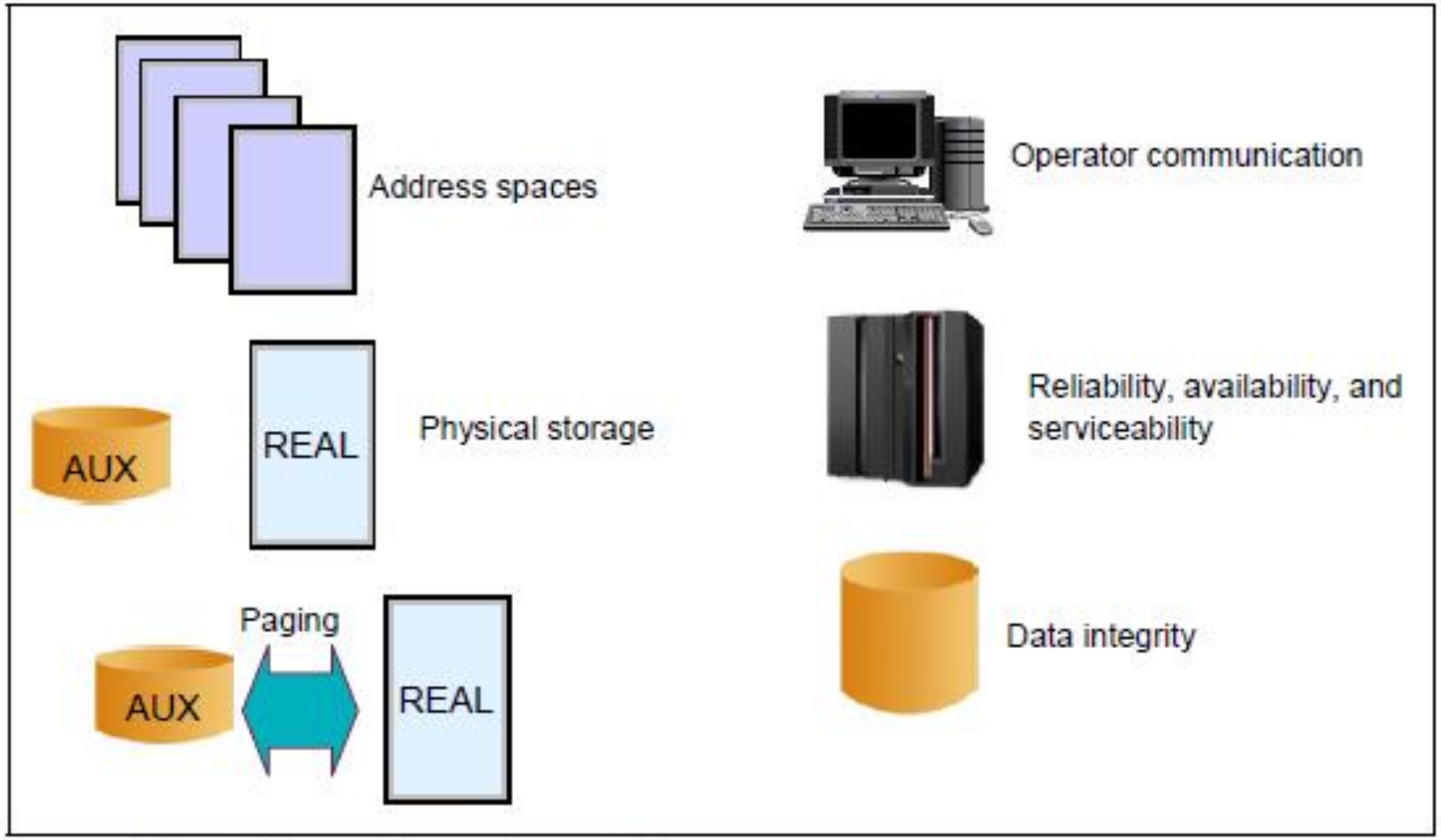


Figure 3-2 z/OS operating environment

Overview of z/OS facilities

- Two types of physical storage are available: central storage and auxiliary storage (AUX). Central storage is also referred to as *real storage or real memory.*

– The Real Storage Manager (RSM) controls the allocation of central

storage during system initialization, and pages in user or system functions during execution.

- – The auxiliary storage manager controls the use of page and swap data sets. z/OS moves programs and data between central storage and auxiliary storage through processes called paging and swapping.
- z/OS dispatches work for execution (not shown in the figure), that is, it selects programs to be run based on priority and the ability to execute and then loads the program and data into central storage. All program instructions and data must be in central storage when executing.
- An extensive set of facilities manages files stored on direct access storage devices (DASDs) or tape cartridges.
- Operators use consoles to start and stop z/OS, enter commands, and manage the operating system.

z/OS, Distinctive Strengths

z/OS is the IBM Z :

- Best operating system for large and mixed workloads
- Continuing compatibility
- Most reliable operating system
- Most secure and trusted operating system
- Most scalable operating system
- Best operating system for unparalleled high availability
- Most feature rich operating system
- Most dynamic and configurable operating system

z/OS, Application Development

Application Development

Integrated Development Environment (IDE)

Highly Customized Documented GUI Procedures
Write, Test, Debug, Maintain, Deploy
Requires Experience with tooling such as IBM IDz

Development Support

Pre IDE Development Environment

Documented Procedures Requiring Experience with:
TN3270, TSO, ISPF, SDSF, JCL

Pre Disk Storage Automation Environment

Advanced JCL

Production Support

IBM **Z**

z/OS, Other Support Roles

Application Development

Development Support

Production Support

Support Roles

- z/OS system programmer (highest)
- CICS system programmer (high w/speciality)
- Database system programmer (high w/speciality)
- Database administrator (high w/speciality)
- Network system programmer (high w/speciality)
- Automation specialist (high w/speciality)
- Production control analyst (high w/speciality)
- Security administrator (high w/speciality)

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