

A Survey of Mainframe Operating Systems - Similarities and Differences

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Abstract

The zseries processors support several different mainframe operating systems.

The training required to become a mainframe software professional includes several different combinations of disciplines.

What are the disciplines that each system has in common and what separates each system's required study from each other?

Supported Operating Systems

- z/OS
- z/VM
- z/VSE
- Linux for zSeries
- zTPF

Career Opportunities

- System Support Engineer
- Application Programmer
- Hardware Engineer
- Security Administrator
- Data Base Administrator
- Product Developer
- Network Support Technician
- Web Site Developer
- And many specialized positions



Architecture

- Processing Units (CP, SAP, zIIP, zAAP, IFL, ICF)
- I/O Control & Configuration
- Interrupt scheme
- Cross-memory operations
- PR/SM and LPARs
- HMC & SE
- Channel subsystem
- SVC Structure
- DASD structure
- PAV (z/OS, z/VSE)



Architecture - continued

- Channel-to-Channel connections
- Recovery – ACR
- Parallel Sysplex - z/OS, z/VM (simulated for z/OS)
- IRD – managed CPUs and channels
- CoD & CBU
- Customer-Initiated Upgrade
- SIE

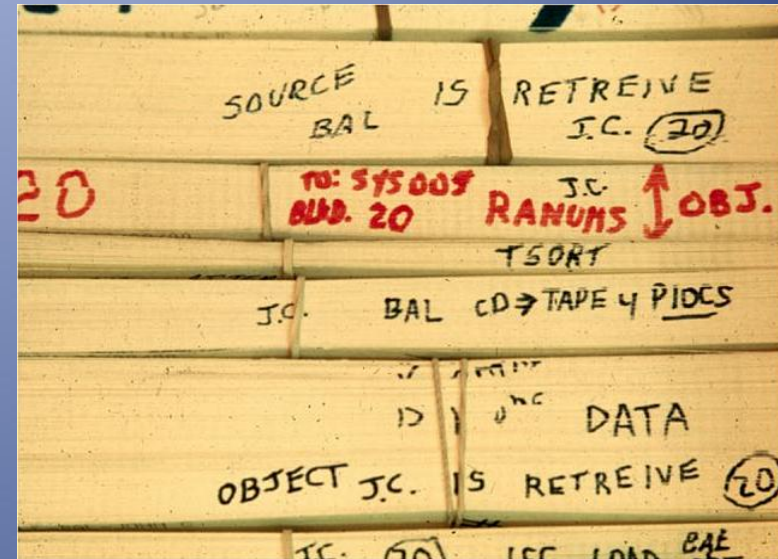


Virtualization

- PR/SM & LPARS
 - Hipersockets (z/OS, z/VM, z/VSE, Linux for zSeries)
 - CF links (z/OS)
- z/VM & virtual machines
 - CMS
 - Minidisks
 - Linux Fast Path (z/VSE and z/linux under z/VM = virtual Hipersocket)
- Virtual storage & paging
 - Large Page Frames = 1M (z/OS, z/VSE)

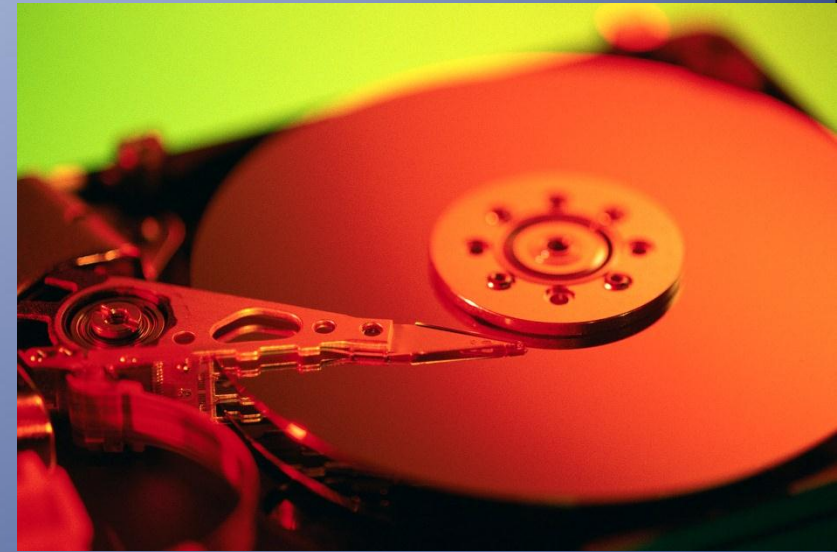
Languages

- REXX (z/VM, z/OS, z/VSE, Linux for zSeries)
- LE (z/OS, z/VSE, z/VM)
- JCL (z/VSE, z/OS) syntax differences
- Scripting languages (USS in z/OS, Linux for zSeries)
- COBOL (all but zTPF)
- PL/1 (all but zTPF)
- C, C++ (z/VM, z/OS, z/VSE, Linux for zSeries)
- Assembler (all but zTPF)



Disk Data

- Flashcopy (z/VM, z/OS, z/VSE)
- PPRC (z/VM, z/OS, z/VSE)
- XRC (z/VM, z/OS, z/VSE)
- PAV (z/VM, z/OS, z/VSE)
- ECKD DASD (all)
- Linux file system (z/OS, Linux for zSeries)
- VTOCS & Catalogs (z/OS, z/VSE)



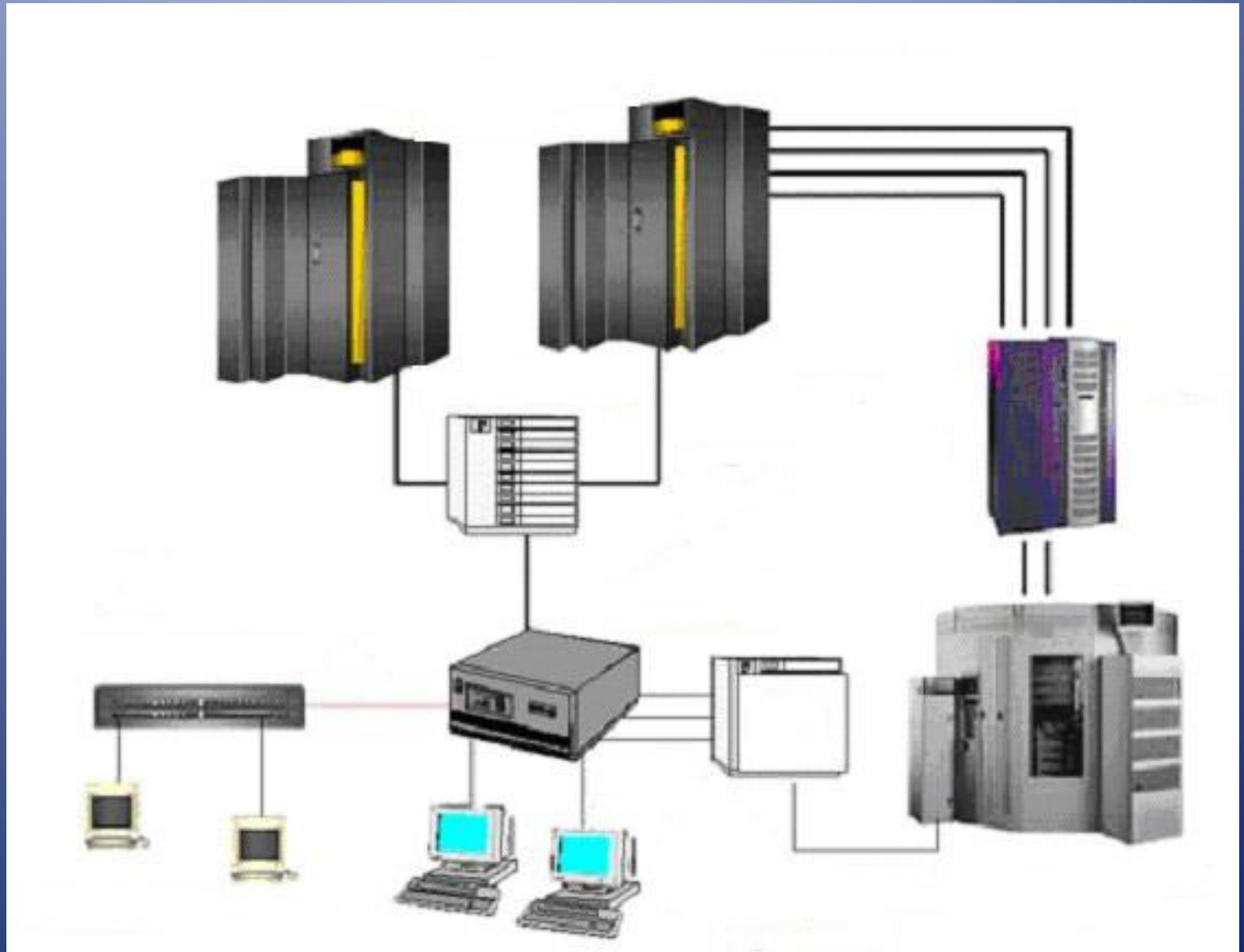
Data Base

- DB2 – relational data base
 - SQL (all)
- IMS – hierarchical data base
 - DL/1 support (CICS in z/VSE)
 - Full IMS Online & batch (z/OS)
- VSAM (z/OS, z/VSE)



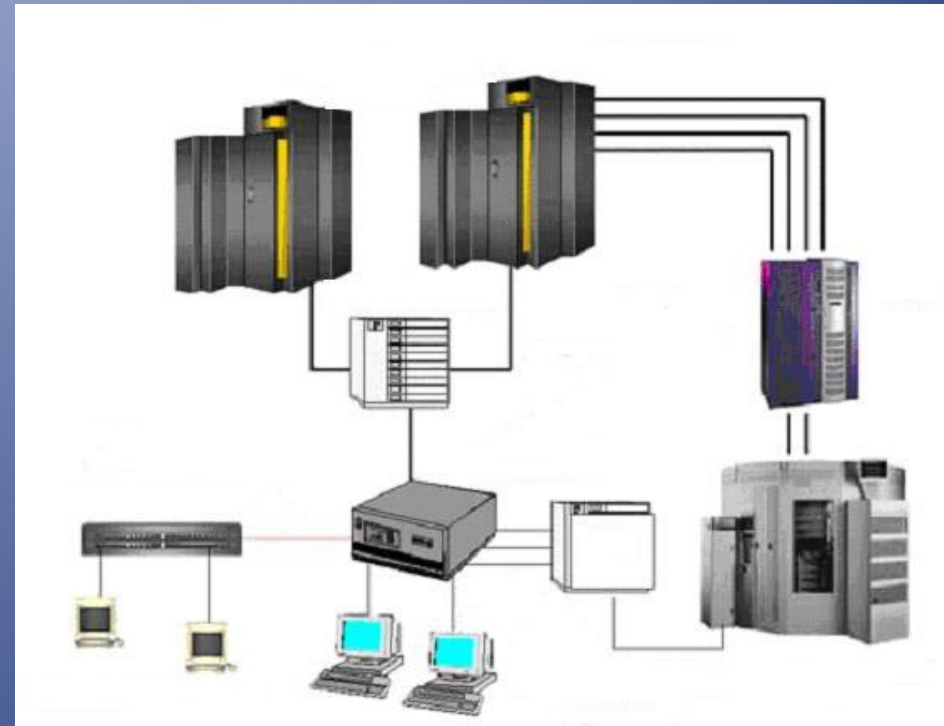
Transaction Processing

- CICS
 - z/OS
 - z/VSE
- IMS
 - z/OS
- z/TPF



Networking

- TCP/IP (all)
- RSCS (z/VM)
- SNA (z/OS, z/VSE, z/VM)
- Web server (z/OS, z/VSE, z/VM, Linux for zSeries)
- Websphere (z/OS, z/VSE, z/VM, Linux for zSeries)
- MQ (z/OS, z/VSE)



Security

- RACF (z/OS, z/VM)
 - BSM (z/VSE) – RACF-like
 - Linux for zSeries exploits z/VM RACF
- SSL (all)
- LDAP (all)
- BSM for MQ (z/VSE)
- Encryption (z/OS, z/VSE, z/VM, Linux for zSeries)



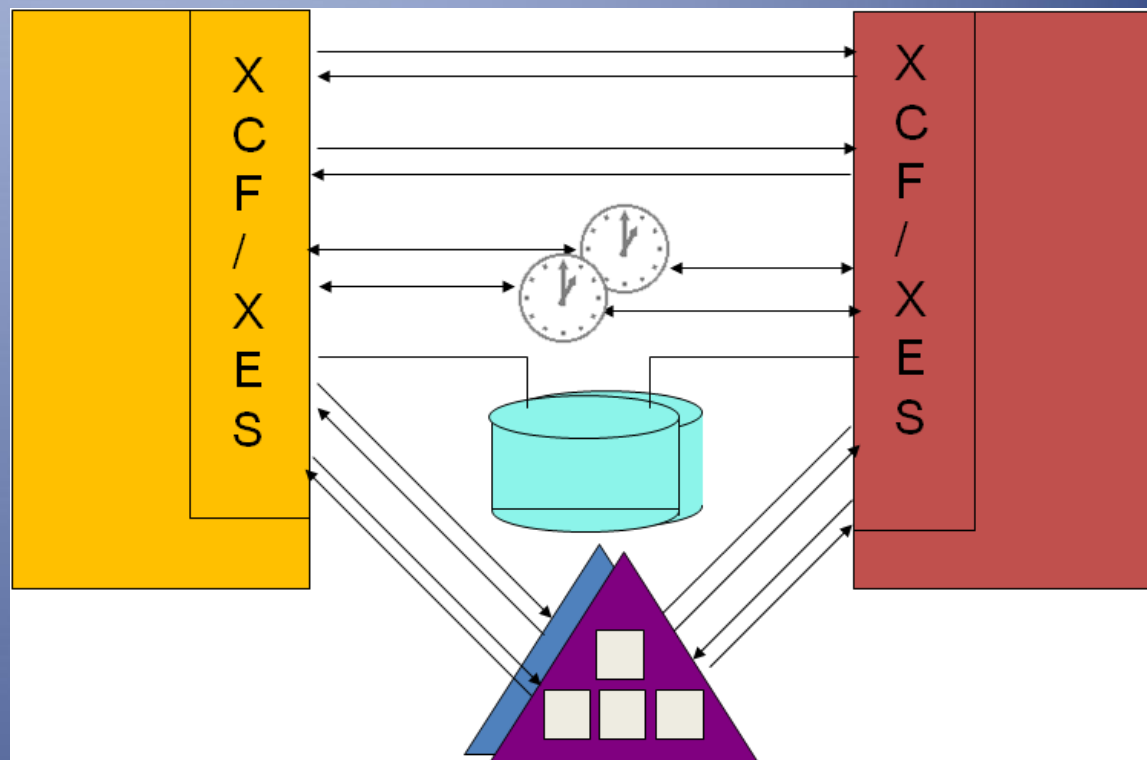
Batch

- JES2 (z/OS)
- JES3 (z/OS)
- POWER (z/VSE)
- NJE (z/OS, z/VSE, z/VM)



Unique to One System

- Parallel Sysplex (z/OS)
 - ARM, SFM, CFRM
 - “High Availability” applications
- CMS (z/VM)



z/TPF

- Highly efficient transaction system
- No batch
- No development environment
 - Uses z/OS as “support environment”
- Assembler & C programs
- Debugger (RSE)
- Internet Mail Server (SMTP, POP, IMAP)
- SNA, TCP/IP, OpenLDAP, SOAP, SSL, Web server
- MySQL server

Common Threads

- Hardware Architecture
- Networking
- Security
- Languages
- Database (especially DB2)
- Monitors