z/OS Masterclass

Alexander Brown

April 3, 2012

0.1 The New Mainframe

Run as much as possible, as long as possible without disrupting service.
100% CPU all of the time.
Run multiple, but isolated, operating systems concurrently.
Optimized for I/O.
96 Processors (spares, OS and Hardware specific), 3TB memory.
RAS – Reliability, Avilabilty, Serviceability.
z/OS – zero (downtime)/OS.
Software as reliable as customers expect on zOS
Shared Everywhere - Centralised Control.
Goal mode processing - transaction needs to finished within $x$ms - WLM (processer manager).

0.1.1 Batch Job versus Real Time Transactions

Batch – Input data -¿ Application Program -¿ Output.
Real-time – Query -¿ Application Program -¿ Reply.
SNA – System Network Arcitecture (before TCP/IP).
VTAM – Virtual Telecommunications Application ...

0.1.2 Error codes

IWASD - Information, Wearning, Application, ?, Disaster.
...DFH – CICS

0.1.3 Mainframe OSes

z/OS (MVS)

Trimodal - switch between 24, 31 and 64bit.

z/VSE Virtual Storage Extended

Cut down version of z/OS
JCL different.

z/TPF Transaction Processing Factory

Around 50 customers use this. Used to be aircraft control system. Tuned to be ultra-fast.

z/VM

Hypervisor.
Two types:
z/BM – z/OS, etc.
PRISM - Schedule processors and h/w

Two basic components:
Control Program (CP).
Conversational Monitor System (CMS), a single-user OS.
CP creates multiple VMs from real h/w resources.
Appears as if each VM has dedicated use of shared resources.

zLinux

Uses ASCII not EBCDIC.

0.2 Hardware Software and LPARsi (Logical PARtitions)

Devices addressed by device, but today is virtulized.

FIO control layer uses a control file IOCDS that translates physical IO addresses into devce numbers.

ESCON and FICON switch from CP to peripheral devices.

Sysplex are groups of LPARs.

CF (coupling Facility) is a high speed memory area which Sysplexes can share.

Data sets: Lists, Logs and Cache

Share CPUs over LPARs if wanted.

LPARs are an images of an OS, try and share as much as possible.

Controled mostly via HNC.

PR/SM - Hypervisor.

Up to 60(+?) LPARs.

can have a native LAPR on z/OS.

LPARs are inderpendant of each other but resources are shared.

Can run different versions.

0.2.1 Processors

General Central Processor (CP): Standards applications and workloads.

System Assist Processor (SAP): Schedule I/O Operations.

Intergrated Facility for Linx (IFL): Used exclusively by a Linux LPAR/Linux on VM.

zOS Application Assist Processor (zAAP): Provides for Java and XML workload offload.

zOS Intergrated Information Processor (zIIP): Used to optimize certain database worload functions and XML processing.

Intergrated Coupling Facility (ICF): Used exclusively bt the Coupling Facility Control Code (CFCC) providing resource and data sharing.

Spares: Used in the event of a processor failure.

On Demand

CBU – Capacity Back Up
CUoD – On/Off Capacity Upgrade on Demand
SubCapacity Licensing Charges.

0.2.2 Clustering

Has been done for several years. Basic shaing don't usoing DASD.

CTC (channel to channel)/GRS (Global Resource S..) rings. Exclusive Locks and Memory Locks handled by a GRS.

RACF – User permissions and password controller.

0.3 Parallel Sysplex

Tightly oupled LPARs, co-operating.

Coupling Facility and CFCC allows data to be shared between LPARs quickly.

Up to 32 LPARs (8 bytes).

Backwards compatable, so long as no new features are used.