

Enterprise Server Technologies

Steve Ware, UF CNS

KnowIT Summit

Tues. May 23, 2006, 10:30am

UF Hilton Conference Center

Gainesville, FL

<http://nersp.cns.ufl.edu/~sftware/knowit/pres06.pdf>

(Last Updated: 05-15-2006)

Session Abstract

In this session, the speaker will discuss enterprise server technologies, with an emphasis on IBM mainframe server technologies, including the IBM Customer Information Control System (CICS) application server.

The speaker is a University of Florida (UF) graduate, with over 25 years of IT experience, and is currently employed at UF Computing & Networking Services (CNS) as a Coordinator, Computer Systems Control.

Disclaimer

Standard disclaimers apply. Any opinions expressed are the opinion of the speaker only. Any mentioned brand names, trademarks, registered trademarks, service marks, etc., are the exclusive property of their owners. No warranties are either expressed or implied, your mileage may vary, etc.

The intent of this session is to attempt to be informative, possibly have a little fun, and to take a (sometimes) light-hearted look at important subject matter.

Agenda/Topics

- Introduction
- Mainframe Enterprise Servers
- CICS Enterprise Application Servers
- Enterprise Application Development
- IT Staffing and Training
- System and Vendor Support
- Summary and Q&A
- Appendix and Additional Information
- Abbreviations (and a bit of Glossary)

Introduction

- UF CNS, University of Florida Computing & Networking Services, formerly known as NERDC, is the primary data center at the Gainesville, FL campus.
- Currently utilizing an IBM eServer zSeries z800 2066-002 with 16GB, running z/OS 1.6 and 1.7, CICS TS 2.3 and 3.1, DB2 7.1, RACF, JES2, etc.
- We're considered a "Classic CICS" site.
(Legacy = "It Works!")
- Web access to CICS is currently via the CICS Socket Interface, in use since ~1997.

Mainframe Enterprise Servers

- What is a mainframe?
- An enterprise class of modern, flexible, scalable, and resilient computing servers.
- MTBF measured in decades vs MTBF in years.
- Renowned for very high availability, reliability and serviceability (RAS).
- The current UF CNS mainframe has had 100% scheduled availability. (Same with prior IBM mainframes for over a decade - 100% scheduled availability.)

Mainframe Enterprise Servers

- Sometimes referred to as the "zero downtime", "five nines", and/or "a to z" enterprise servers.
- New mainframes recently announced by IBM, including System z9 BC (Business Class) and System z9 EC (Enterprise Class).
- Newest systems can have many processors, including general processors, ICFs, IFLs, zAAPs, and zIIPs. All are 64-bit enabled, and some support up to 60 LPARs.
- The UF CNS IBM z800 currently has 3 LPARs configured, with 2 out of 5 processors enabled for the z/OS workload (one is a "hot" spare).

Mainframe Enterprise Servers

- TCO, TCU, oh my! Follow (count) the money, add it up, do all the math. At UF (and the SUS of FL), we've seen IT costs skyrocket, due to what some deem "false economies" of ERP "solutions".
- How much does the additional power, cooling, and floor space for rows and rows of racks really cost? (Do you even have enough floor space?)
- How much does the additional networking infrastructure really cost?
- How many FTEs of support staff/system administrators are required to support an ever-growing number of rack servers?

Mainframe Enterprise Servers

- A recent IBM Mainstream E-News note said: "Shifting workloads back to the mainframe - Running your important workloads on the mainframe has always been a smart idea. No other technology manages those initiatives more efficiently or with the availability and security of the System z platform. With recent advancements, such as the IBM zIIP processor, you can now shift your workloads back to the mainframe to gain these unmatched benefits - and lower the total cost of ownership."

Mainframe Enterprise Servers

- Lots of Operating System (OS) choices, including z/OS (the "zero" downtime OS), z/OS.e (entry level), z/VM, TPF, z/VSE, and of course, Linux.
- Renowned for very high data I/O throughput.
- Very capable in supporting all workloads, including interactive and batch. A very mature z/OS workload manager (WLM) manages varying workloads very efficiently.
- Sub-second response time and very high transaction rates (with CICS), even from the web!

Mainframe Enterprise Servers

- World renowned system security and cryptography.
- Virtualization, via z/VM and PR/SM, has about a 30 year head start over VMware and other virtualization technologies.
- z/OS Unix is X/Open and Posix compliant. z/OS Unix was formerly known as MVS Open Edition and z/OS Unix System Services (USS).
- Extensive auditability and accountability via CMF/RMF/SMF, with lots of granularity.
- Debugging and diagnosis is second to none.

CICS Enterprise Application Servers

- IBM Customer Information Control System, CICS ("kicks"), is considered an application server, an on-line transaction processing (OLTP) system, a middleware/integration product, and much more.
- CICS has enterprise caliber support for modern technologies such as Web Services, SOA, XML, Java, JVMs, EJBs, C++, etc.
- CICS also has extensive support for "classic" technologies such as sockets, C, Enterprise COBOL, REXX, Assembler, and Basic Mapping Support (BMS) for 3270-type devices.

CICS Enterprise Application Servers

- The CICS design philosophy has always centered around renowned capability, exceptional performance, and very high availability.
- CICS continues to be enhanced, and IBM has already discussed the next release of CICS, after the current release, CICS TS 3.1.
- Recent enhancements include increased ease of integration for Web Services and SOA with enhanced CICS WEB and DOCUMENT APIs, and enhanced SSL/TLS security.

CICS Enterprise Application Servers

- Recent CICS application transformation enhancements include "Channels and Containers", and OTE (Open Transaction Environment) performance improvements.
- IBM has also recently improved CICS systems management in the CPSM (CICSplex System Manager) component.

CICS Enterprise Application Servers

- Application development and debugging is easy, with supplied terminal and non-terminal enhanced debugging facilities. UF CNS currently also provides the CA-InterTest for CICS "Interactive Testing and Debugging" tool.
- CICS application and system information is very intuitive and comprehensive in the IBM supplied "CICS Information Center" (Eclipse based), with both task and reference based documentation. Prior format BookManager "softcopy publications" and search tools are also still provided.

CICS Enterprise Application Servers

- Expansive API (Application Programming Interface), SPI (System Programming Interface), and XPI (eXit Programming Interface).
- The CICS API helps isolate the CICS application programmer from operating system details, allowing the developer to focus on application development and business solutions.
- The CICS SPI and XPI allow the CICS system administrator/programmer to enhance and expand upon the delivered CICS capabilities.

CICS Enterprise Application Servers

Major CICS applications hosted at UF CNS include:

- UF ISIS (Integrated Student Information System), built with EAGLE (Enhanced Application Generation Language for the Enterprise).
- State-wide FACTS, Florida Academic Counseling and Tracking for Students.
- WebLUIS (Web Library User Information System) built by FCLA, the Florida Center for Library Automation.
- UNF (University of North Florida) student and administrative applications.

Application Development

- At UF CNS, we support our CICS application development groups with CICS development, test and quality assurance (QA) regions.
- Almost all CICS system and application changes can be done dynamically.
- Local and vendor supplied tools are available for CICS debugging, monitoring, and application enhancement.

Application Development

- Lots of enterprise application development tools are available.
- At UF, web-based EAGLE is being utilized, via a WUI, or Web User Interface.
- "Classic" development with a CHUI (CHaracter User Interface) such as TSO/ISPF is also a viable option. Unix users still use a command prompt, too. Scripting is an example where a CHUI still shines.

Application Development

- Eclipse based application development tools are also available.
- IBM Rational Developer is a recent example of an Eclipse based application development tool.
- IBM also has WebSphere Developer for zSeries.
- Sun NetBeans.
- How about other, such as "home grown"? EAGLE has already been mentioned, but owning the source code to your core business applications is "priceless".
- FedEx may use Peoplesoft for HR, but their tracking system is most definitely "home grown".

Summary

- Computing pioneer Seymour Cray once said, "What would you rather have to plow a field - two strong oxen or 1,024 chickens?"
- We have 2 processors enabled in our mainframe, which has simultaneously run all of UF and UNF financial and student administration, all of the State of Florida universities LUIS (Library User Information System) and FACTS (Florida Academic Tracking for Students). Compare and contrast this to non-mainframe "solutions".

Summary

- The mainframe and CICS are modern and mature.
- CICS is a true software star - "billions and billions of transactions processed daily".
- Do all of the math when making enterprise computing decisions, because you will probably find that the mainframe with CICS delivers the best computing value.

Summary (cont.)

- UF continues to **exploit** the many inherent **advantages** of **CICS**, **z/OS**, and the **mainframe**.
- Students especially like the **sub-second response time**, even from the **web**! Faculty and staff also appreciate this good response time, but they might be a bit more patient than the students ;-).
- Personally, some business relationships are based upon whether or not the business utilizes a mainframe. Ask, and let the business know what your preferences are!

Summary (cont.)

- I really like things that work, and **work well** - like **CICS** and the **mainframe** (ok, **Linux**, too ;-).
- IT work should be productive, enjoyable, and **fun**. Ok, it doesn't always work out that way! My experience is that working with CICS and the mainframe, from a Linux workstation, is productive, enjoyable, and yes, even fun (most of the time ;-).
- The **future** looks very **bright** for CICS and the mainframe! (Sunglasses are optional ;-)
- Thanks! Questions? Comments?

Appendix and Additional Info.

- The University of Florida (UF):
<http://www.ufl.edu/>
- UF Computing & Networking Services:
<http://www.cns.ufl.edu/>
- CICS at UF:
<http://cics.ufl.edu/>
- EAGLE at UF:
<http://eagle.ufl.edu/>

Appendix (cont.)

- IBM Mainframe Servers - zSeries and System z9:
<http://www.ibm.com/zseries>
<http://www-03.ibm.com/servers/eserver/zseries/>
- IBM zSeries FAQs:
<http://www03.ibm.com/servers/eserver/zseries/faq/>
- IBM Mainframe Charter:
http://www-03.ibm.com/servers/eserver/zseries/faq/pdf/mainframe_charter_faq.pdf

Appendix (cont.)

- IBM CICS (Customer Information Control System):

<http://www.ibm.com/cics>

<http://www-306.ibm.com/software/htp/cics/>

- IBM CICS Transaction Server - Features and benefits:

<http://www-306.ibm.com/software/htp/cics/tserver/features.html>

- IBM CICS Portfolio Brochure (G224-7571-00):

<http://service.boulder.ibm.com/software/htp/cics/pdf/CICSfam-G224-7571-005-br0113.pdf>