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SHARE

CICS Transaction Server V5.1 – User Experience Panel

Steve Ware, UF

Session 12416, SHARE 120
04FEB2013 (Mon.), 4:30pm
San Francisco Hilton
Plaza A, Lobby Level

http://steveware.net/share120/s12416sfw.pdf (Updated: 30JAN2013)

SHARE in San Francisco 2013

Abstract

A panel of customers who are running IBM CICS Transaction Server V5.1 (CICS TS 5.1) will discuss their experiences in migrating to and using CICS TS 5.1. IBM will also discuss some experiences with the CICS beta(s) and other customers who are running CICS TS 5.1. Come and hear the story from those who have been there, done that.

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Agenda/Topics

- Introduction
- New CICS version “Opportunities”
- Why participate in a CICS Beta?
- Why migrate from CICS TS 4.2 to 5.1?
- ISV Program Products and Early Support Issues
- CICS TS 5.1 Installation/Migration Considerations
- Summary and Q&A
- Appendix and Additional Information

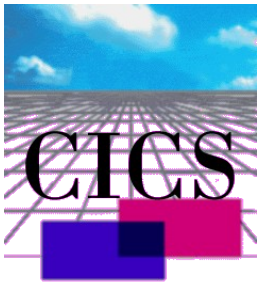
Introduction (cont.)

- Founded in **1853**, became the **University of Florida** in **1905**. (East Florida Seminary -> Florida Agricultural College -> University of Florida)
- **UF** is a member of the **AAU**, the Association of American Universities.
- **UF** is one of the top five **largest** universities in the U.S., public or private.
- **~50K enrolled** and **~250K alumni.**

Introduction

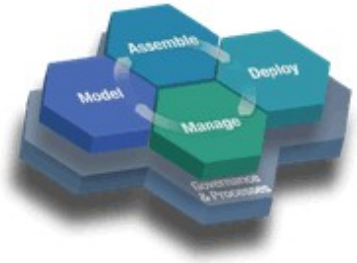
- UF **CNS**, University of Florida Computing & Networking Services (formerly known as **NERDC**), runs the primary UF networking and data centers in Gainesville, FL
- Currently utilizing an IBM DS8800 and z114 2818-M05 Q02/S02 with 32GB and a zIIP, running **z/OS** 1.13 (with zAAP on zIIP enabled), **CICS** TS 5.1 and 4.2, **DB2** 10, **RACF**, **JES2**, etc.
- 3 LPARs - 1 internal "sysprog sandbox", 1 test "alternate", and 1 production or "primary"
- IBM z114 + DS8800:

Introduction (cont.)



- We're considered a "**Classic**" CICS site. ("**Legacy = It Works!**")
- Web access to CICS is via the **CICS Socket Interface**, in use at our site since ~1997.
- Currently, up to **~90%** of local CICS tasks utilize **sockets**.
- All locally developed CICS applications are **Assembler** and/or **COBOL**. We have ~8K CICS application load modules, and ~32 have CICS sockets API (for file/data transfer, email, web enablement, etc.).
- Several internal CICS applications written in **C/C++** and **REXX**. **Java** has only been IVP tested, but with our z114 and z/OS zAAP on zIIP, we're looking at exploiting Java, and/or PHP, and/or Groovy and/or ??? in CICS in the future.

Introduction (cont.)



- Are we now considered a **Nouveau** CICS site?
- CICS Web Services (WS) in production since Sept. 2006
- 11 CICS WS in production (all using HTTP transport protocol)
  - 5 CICS Provider WS
  - 6 CICS Requester WS
- CICS WS technology has been rock solid and a good performer at our site
- IBM supplied CICS WS assistant tooling has met all of our needs so far
  - Eclipse Web Services Explorer has also been utilized for testing
- Conforms to open standards such as HTTP 1.1, SOAP 1.2 and 1.2, WSDL 1.1 and 2.0
  - Ensures maximum interoperabilty
  - UF utilizes MS BizTalk as a messaging hub

Introduction (cont.)

- We have 9 CICS regions configured and run ~400K production transactions/weekday and ~1.1M on peak load days (start of academic semester term)
- 2 internal test/sandbox, 2 development/test, 3 test/QA/staging, and 2 production CICS regions currently configured
- By 28JAN2013, 6 out of our 9 configured CICS regions were running the CICS TS 5.1 GA code
- Due to the UF academic schedule, the remaining regions will be converted to CICS TS 5.1 in the very near future

Introduction (cont.)

- We anticipate 100% (or very near 100%) scheduled availability with CICS TS 5.1, and exceptional performance, especially coupled with our phenomenal IBM z114 (with a zIIP) and DS8800
- We plan on performing extensive load testing with LoadRunner and CICS TS V5.1 vs V4.2 scenarios (as we did with CICS TS V4.1 vs V4.2)
  - Schedule dependent upon application developers/analysts, load test team members and academic schedule timing
- IBM says:
  - Performance considerations
    - Performance information is available in the Performance Guide (SC34-2864), from general availability. In addition, at a later date, a performance report will be available on request from your IBM representative.

Introduction (cont.)

- CICS Transaction Server for z/OS V5.1 (CICS TS 5.1) was announced October 3, 2012 (ENUS212-325.PDF)
- CICS TS 5.1 was Generally Available (GA) on December 14, 2012
- Over 100 customer and user group requirements satisfied
- Participation in SHARE and the CICS beta(s) helps expedite CICS requirements processing and prioritization

Introduction (cont.)

- UF was invited to participate in the IBM CICS TS 5.1 "Managed" (vs "Open") Beta in October, 2011
- z/OS V1.12 was minimum OS level at Beta start, with z/OS V1.13 the minimum at GA
- Downloaded first code drop ("Beta #1") on November 10, 2011
- “Odd” numbered and GM (Gold Master) code drops (iterations) to CICS customers, with all code drops to CICS ISVs in this Beta

Introduction (cont.)

- CICS TS 5.1 Managed Beta time line:
  - Beta #1 November 2011
  - Beta #2 February 2012 (ISVs)
  - Beta #3 March 2012
  - Beta #4 May 2012 (ISVs)
  - Beta #5 July 2012 (expire date 31JAN2013 - “Open Beta”)
  - Beta #6 September 2012 (ISVs)
  - Beta #7 October 2012 (Open Beta Refresh)
  - GM November 2012 “Gold Master”
  - 0680 (GA) December 14, 2012
- How does one know which code drop is installed and/or executing? ;-)

New CICS Version “Opportunities”

- What's New? IBM says:
  - “CICS® Transaction Server for z/OS®, Version 5 Release 1 delivers a set of new and enhanced capabilities in a way that positions CICS users for the next era in technology, moving them towards a service delivery platform for cloud computing.”
  - “CICS TS V5.1 satisfies over one hundred customer requirements that help solve the two most pressing challenges that companies face today; driving operational efficiencies, while increasing service agility.”

New CICS Version "Opportunities" (cont.)

- Financial
  - State of Florida budget
  - University of Florida budget
  - Price increase (9% at our site)
- Political
  - Continued push to migrate off of the mainframe ("eliminate costly mainframe technologies")
- Resources
  - Time (keeps on slipping, slipping, slipping, into the future)
    - Other "projects" such as password phrases, CBU, etc.
  - People
    - Retirement(s), etc.

New CICS Version "Opportunities" (cont.)

- CICS TS V5.1 order justification (upgrade/migration) letter
  - Recommendation to management to continue to invest in our core UF Student Application server/transaction processing infrastructure – CICS!
  - Maintain currency
    - CICS TS V4.2 EoS 3rd Quarter 2017 per IBM
  - New dynamic CICS SVC update (DFHCSVCU utility)
  - New PERFORM SSL REFRESH command
  - New threadsafe enhancements
    - Includes CICS Transient Data (TD)

New CICS Version "Opportunities" (cont.)

- CICS TS V5.1 order justification (upgrade/migration) letter
  - New application policy management
    - Send a message, and/or abend, and/or invoke non-intrusive CICS event(s)
    - Possible local use case scenarios discussed
- Collateral (attachments)
  - CICS TS V5.1 Announcement Letter
  - CICS TS V5.1 Presentation Slides
  - CICS TS V5.1 Software Price Quote from IBM System z Software Business Partner

New CICS Version “Opportunities” (cont.)

- IBM CICS TS V5.1 and prior provide 32-bit CICS Information Center downloads for Windows and Linux
  - New Slackware Linux 14.0 installs “pure” 64-bit w/o 32-bit support (but available if needed/desired)
    - Workaround in CICS TS V5.1 Information Center home:
      - mv jre jre.000
      - ln -s /usr/lib64/java jre
    - sfw@sfw-x220:~/cics/cicsts51/ga/ic$ java -version

      java version "1.7.0_11"

      Java(TM) SE Runtime Environment (build 1.7.0_11-b21)

      Java HotSpot(TM) 64-Bit Server VM (build 23.6-b04, mixed mode)

New CICS Version “Opportunities” (cont.)

- IBM CICS TS V5.1 and prior provide 32-bit CICS Explorer (and Explorer SDK) downloads for Windows and Linux
  - New Slackware Linux 14.0 installs “pure” 64-bit w/o 32-bit support (but available if needed/desired)
    - Workaround is to only run CICS Explorer SDK V5.1 in Eclipse for Linux
      - http://ibm.com/cics/explorer -> download ->

        “You want to upgrade to CICS Explorer V5 SDK”

        1. In your Eclipse IDE2 add URL
           http://public.dhe.ibm.com/software/htp/cics/updates/
           portfolio/5.1/5.1.0/ to
           Window > Preferences > Install/Update > Available Software Sites
        2. Update your installation using Help > Check for updates

Why participate in a CICS beta?

- Interested in new CICS TS V5.1 features/function/exploitation:
  - Greater Capacity
  - Managed Operations
  - Increased Availability
  - Deeper Insight
  - First-class Applications/Platforms
  - Modern Interfaces
  - Foundational Enhancements

Why participate in a CICS beta? (cont.)

- According to IBM, the objectives of the managed beta program are:
  - To give IBM Customers early access to the new function in CICS TS V5.1 and associated CICS Tools products
  - To enable customers to prepare CICS to work with complimentary products (ISVs) for "day one" support of CICS TS V5.1 at its general availability
  - To assist Marketing and Strategy in satisfying customer requirements
  - To ensure that the code functions as designed and developed
  - To validate the ease of use of the documentation and Help
  - To enable customers to provide direct input to development, marketing, and sales on current features, deployability and performance
  - To test the code in various and unique development environments
  - To assist with validation of the product's General Availability (GA) readiness
  - To identify early adopter reference accounts willing to speak to press and analysts

Why participate in a CICS beta? (cont.)

- Win-win knowledge transfer for IBM and Customers:
  - “Fun?”, but lots of hard work for IBM, ISVs and customers
  - Customers learn details about CICS and new release
  - IBM learns details about customer needs and future requirements
  - Future release enhancements discussed and prioritized
  - CICS bugs and/or customer errors quickly resolved
  - Beta process enhancements discussed and prioritized
  - Encourage balance between "Classic" CICS and "New" CICS
  - Encourage ISVs to have products ready at CICS GA

Why participate in a CICS beta? (cont.)

- CICS Managed Betas very modern and efficient:
  - Web-based IBM and customer discussion forum (195 threads and 715 posts as of 18JAN2013)
  - Web-based education (travel not required, but Hursley is a very nice place to visit ;-)
  - Internet downloads for everything - CICS code, CICS Information Center, CICS Explorer, etc.
  - Iterative/agile development process is excellent
  - Quick and easy CICS SMP/E installation procedures, especially with the IBM provided DFHISTAR (CICS Installation Start) tool

Why participate in a CICS beta? (cont.)

- Provide current and modern CICS mainframe environment at UF:
  - Attempt to never say never to customer needs and requirements
  - SOA/Web Services becoming more important at UF
  - Showcase benefits of CICS and the Mainframe
  - Very easy/trivial migration from CICS TS 4.2 to 5.1, especially after installing CICS TS 5.1 six times ;-)
  - All existing local applications are running unchanged in CICS TS 5.1
  - All CICS URMs, exits, etc., were rebuilt as with all new CICS version/release installs

Why migrate from CICS TS 4.2 to 5.1?

- Interested in new CICS TS V5.1 features/function/exploitation:
  - Greater Capacity
    - Greater use of 64-bit storage and reduced usage of 24-bit storage
    - Greater application parallelism – threadsafe API and SPI extensions
    - Greater system parallelism through optimized Task Control Block (TCB) usage
    - Greater Java performance improvements from 64-bit Java support
    - Greater access to 64-bit application storage when using Assembler programs – AMODE(64) – non-LE Assembler only

Why migrate from CICS TS 4.2 to 5.1? (cont.)

- Interested in new CICS TS V5.1 features/function/exploitation:
  - Increased Availability
    - Upgrade CICS versions and releases without a reIPL with new DFHCSVCU utility for DFHCSVC
    - New PERFORM SSL REBUILD command to refresh SSL certs without a CICS restart
    - IPIC connections up and running during periods of inactivity
    - Best practices reflected with updated and simplified defaults

Why migrate from CICS TS 4.2 to 5.1? (cont.)

- Interested in new CICS TS V5.1 features/function/exploitation:
  - Managed Operations
    - Ability to control critical resource thresholds with policies
      - Data access – SQL or files
      - Storage
      - CPU
      - Manage with messages, abends, or event creation
    - CICS bundles that contain policies can be packaged into application bundles
    - Various deployment and scope scenarios

Why migrate from CICS TS 4.2 to 5.1? (cont.)

- Interested in new CICS TS V5.1 features/function/exploitation:
  - Deeper Insight
    - Auditing of SPI commands (system configuration changes)
    - Cipher suites used for SSL connections in performance data
    - Calculate the actual and potential use of System z specialty engines such as zIIP and/or zAAP (or zAAP on zIIP)
      - Requires fix for z/OS 1.13 APAR OA38409 and IBM System z9 or later
  - And of course, lots more!

ISV Program Products and Early Support Issues

- IBM Tivoli OMEGAMON for CICS development had latest CICS iteration toleration code within days of new CICS beta iterations and generally available toleration code in the standard IBM SMP/E maintenance stream even before CICS TS 5.1 GA
  - We're running OMEGAMON XE for CICS on z/OS V420 ("Classic" interface)
  - A “Migration Contributor” - Thanks!
- CA InterTest for CICS development had code packaging issues and we were unable to test before CICS TS 5.1 GA
  - Code was made available the week of GA
  - Used extensively by our local CICS application developers

ISV Program Products and Early Support Issues - What issues? (cont.)

- We have a CICS command level based product that has never had CICS release migration issues, and again, none with this release
- We're RACF, and had no ESM related issues ;-)
- As usual, be sure to check with all of your CICS ISVs

Migration Considerations

- Order/installation considerations:
  - Ordered on 02JAN2012 via IBM ShopzSeries, ~09:00
  - Specified "Internet Delivery" – CBPDO
    - Included routing to our IBM System z Business Partner
    - Included our UF IBM System z Purchase Order #
      - New version – Purchase Order info. required
  - Available for download 03JAN2013, ~15:16
  - Took under 3 hours from “secure” download to first local internal region running CICS TS 5.1 GA
  - Used DFHISTAR type install, with SMP/E RECEIVE FROMNETWORK
  - Easiest/smoothest CICS install ever!

Migration Considerations (cont.)

- Regarding “Took under 3 hours from “secure” download to first local internal region running CICS TS 5.1 GA”:
  - Have a good plan, and execute it well!
  - z/OS (MVS) and related intergration work done in advance:
    - prefix.PARMLIB updates for a new CICS
    - authorized libraries, etc.
    - zFS datasets built and mounted to z/OS Unix
    - RACF profiles updated in advance
    - Dataset naming conventions/disk space ready, etc.
  - CICS TS V5.1 Program Directory and Information Center review
  - Beta installation practice helps make perfect!

Migration Considerations

- Order/installation considerations:
  - “Secure” download considerations
    - IBM ShopzSeries service and product orders now include two SMP/E RFN (Receive From Network) job JCL samples:
      - RFNJOB.TXT
      - RFNJOBS.TXT <--- secure/TLS
    - However, default is:
      - SECURE_CTRLCONN CLEAR ; Commands may be clear (unencrypted).
    - Changed it to:
      - SECURE_CTRLCONN PRIVATE ; Commands must be encrypted.
    - RFNJOBS.TXT also has:
      - SECURE_DATACONN PRIVATE ; Payload must be encrypted.

Migration Considerations (cont.)

CICS TS 5.1 Order Details:

SOFTWARE
Site ID: ##########
Customer No.: ##########
IBM Order No: ##########

BOX: 0 of 0

Type	Program	Mat. ID	Title		Qty
Supply	5751CS3	5751CS3	MVS Custom-Built PDO (CBPDO)		1
Supply	5751CS3	5751CS3	MVS Custom-Built PDO (CBPDO)		1
Supply	5751CS3	S00WNBB	MVS CBPDO - CICS Subsystem v1.01.00,ENU,	0100	1
Supply	5751CS3	S0175VX	CICS TS for z/OS v05.01.00,MUL,CST3590-1	0100	1

Process Date: 2013-01-03

Migration Considerations (cont.)

CICS TS 5.1 Order Details:

Software Order

Ref. No.	Description		Qty.
	Electronically delivered media		
564612	CB ELC ORDER ITEM		
	Electronically delivered publications		
GI13-0594-00	CICS TS for z/OS V5.1 Program Directory	Mat.S0175VX	
GI13-3302-00	CICS TS for z/OS V5.1 Info Center Flyer	Mat.S0175VX	
GI13-3303-00	CICS TS for z/OS V5.1 Tech Serv Flyer	Mat.S0175VX	
GI13-3304-00	Integ Sol for Sys z Devt Solution Brief	Mat.S0175VX	
GC34-2919-00	CICS TS for z/OS V5.1 LPS CD	Mat.S0175VX	
	Total electronically delivered media:		1
	Total electronically delivered publications:		5

Migration Considerations (cont.)

- Review CICS TS 5.1 Information Center -> Upgrading -> Upgrading from Version 4 Release 2 (or 4.1 or 3.2 or prior CICS Information Center(s))
- z/OS 1.13 is minimum required for CICS TS 5.1
- Java 7 (64-bit) required for CICS TS 5.1 - note that our CICS TS 4.2 regions run with Java 6 (64-bit) - requires 2 Java installs/paths in z/OS Unix
- MEMLIMIT=6G is minimum requirement (was 4G in 4.2)
  - JOB statement or EXEC statement for CICS (DFHSIP)
  - z/OS PARMLIB SMFPRMxx or system default
  - z/OS IEFUSI exit

Migration Considerations (cont.)

Review SIT changes, noted in the CICS Information Center:

CICS Transaction Server for z/OS, Version 5.1 > Upgrading > Upgrading from Version 4 Release 2 > Changes to CICS externals > Changes to system initialization parameters

- New SIT parameters:
  - RACFSYNC={YES|NO}
    - The RACFSYNC system initialization parameter specifies whether CICS listens for type 71 ENF events.
  - SECVFYFREQ={NEVER|USRDELAY}
    - The SECVFYFREQ system initialization parameter specifies whether or not CICS makes a full verification request at least once a day for each user ID that is used to log on to the CICS region.

Migration Considerations (cont.)

Review SIT changes:

- Changed SIT parameters (with lots of new defaults!):
  - AKPFREQ={4000|number}
  - AUTORESETTIME={IMMEDIATE|NO|YES}
  - EDSALIM={800M|number}
  - ICVTSD={0|number}
  - MXT={500|number}
  - PRTYAGE={1000|value}
  - SPCTRxx={(1,2)|(1[,2][,3][,4])|ALL|OFF}
  - STATINT={010000|hhmmss }
  - STATRCD={OFF|ON}
  - STNTRxx={1|(1[,2][,3][,4])|ALL|OFF}

Migration Considerations (cont.)

Review SIT changes:

- Changed SIT parameters (continued):
  - TBEXITS=([name1][,name2][,name3][,name4][,name5][,name6])
  - TCTUALOC={BELOW|ANY}
  - TRANISO={NO|YES}
  - TRTRANSZ={1024|number-of-kilobytes}

Migration Considerations (cont.)

Review SIT changes:

- Obsolete SIT parameters:
  - EJBROLEPRFX
  - IIOPLISTENER
  - JVMCCSIZE
  - JVMCCSTART
  - JVMLEVEL0TRACE
  - JVMLEVEL1TRACE
  - JVMLEVEL2TRACE
  - JVMUSERTRACE
  - MAXJVMTCBS
  - MAXOPENTCBS
  - MAXXPTCBS
  - TDSUBTASK
  - XEJB

Migration Considerations (cont.)

Specific 4.2 to 5.1 considerations:

- We run all 4.2 and 5.1 regions with a single 5.1 CSD, and maintain the CSD from a 5.1 region and/or 5.1 DFHCSDUP (starting with the GM or "Gold Master" 5.1 code)
- Our current CSD migration strategy is simply
  - IDCAMS backup (DELETE/DEFINE/REPRO) 5.1 DFHCSD
  - IDCAMS DELETE/DEFINE 5.1 DFHCSD
  - IDCAMS REPRO 4.2 DFHCSD into 5.1 DFHCSD
  - DFHCSDUP UPGRADE REPLACE 5.1 DFHCSD
  - Note: RDO compatibility group DFHCOMPF required in 5.1 CSD for 4.2 regions

Migration Considerations (cont.)

Specific 4.2 to 5.1 considerations:

- Built new CICS TS 4.2 DFHGCD, DFHLCD, DFHLRQ, DFHHTML, DFHBRNSF, DFHPIDIR, and FILEA datasets.
- Reused CICS TS 4.2 DFHAUXT, DFHDMP, DFHTEMP, and DFHINTRA datasets.
- A recommendation is that all new datasets be utilized for all new CICS releases, if possible.
- A recommendation is that SIT override START=INITIAL be utilized if/when switching back and forth between CICS releases during testing.

Migration Considerations (cont.)

Specific 4.2 to 5.1 considerations:

- RACF (ESM) changes for new Category 1 (never associated with a terminal), Category 2 (initiated by a terminal user), and Category 3 (exempt from security check)
- See "Security for CICS-supplied transactions" in the CICS Information Center, and review prefix.SDFHSAMP members DFH$CAT1 and DFH$CAT2
- Standard migration considerations - will need review and/or customization by the z/OS and/or CICS RACF (ESM) security administrator(s)

Migration Considerations (cont.)

CICS TS 5.1 FMIDs, COMPIDs, and RETAIN Releases:

From the CICS TS 5.1 December 2012 Program Directory GI13-0594-00:

FMID	COMPID	Component Name	RETAIN Release
HCI6800	5655Y0400	CICS TS Base	800
JCI6801	5655Y0400	COBOL Language Parts	801
JCI6802	5655Y0400	PL/I Language Parts	802
JCI6803	5655Y0400	C Language Parts	803
JCI680D	5655Y0400	Java	80D
JCI680L	5655Y0400	WAS Liberty Profile Web feature	80L
JCI680M	5655Y0400	CICSPlex System Manager	80M
JCI680W	5655Y0400	WS-Security	80W
HCIZ300	5655M1502	Service Flow Runtime	300
H0B5110	565508700	CICS REXX Runtime Facility	110
H0B7110	565508600	CICS REXX Development System	110
H0Z2110	565511200	CICS REXX Common for CICS/ESA	110
		CICS Explorer Feature	

Migration Considerations (cont.)

PSP (Preventive Service Planning) UPGRADE CICSTS51:

UPGRADE	SUBSET	Description
CICSTS51	HCI6800	CICS TS Base
	JCI6801	COBOL Language Parts
	JCI6802	PL/I Language Parts
	JCI6803	C Language Parts
	JCI680D	Java
	JCI680L	WAS Liberty Profile Web feature
	JCI680M	CICSPlex System Manager
	JCI680W	WS-Security
	HCIZ300	CICS Service Flow Runtime
	H0B5110	CICS REXX Runtime Facility
	H0B7110	CICS REXX Development System
	H0Z2110	CICS REXX Common for CICS/ESA

Migration Considerations (cont.)

- OMEGAMON toleration support for CICS TS 5.1:
https://www-01.ibm.com/support/docview.wss?uid=swg1OA40817
  - CICS/TS 5.1 TOLERATION SUPORT
  - Also see OA40818 and especially OA41081
- CA-InterTest for CICS support information:
https://support.ca.com/irj/portal/anonymous/solndtls?aparNo=GI93444&os=OS&actionID=3

*Support for CTS 5.1 is provided with the following Maintenance:

* CICS68

*CBA8568 RO53337 CBA8500 RO53331

*CSA8568 RO53357 CSA8500 RO53351

*CLQ8568 RO53350

*CBQ8568 RO53344 CBQ8500 RO53338

Summary

- DFHSI1517 - Control is being given to CICS!
- Participation in CICS TS 5.1 "Managed Beta" a great experience
  - Lots of work, but very educational and rewarding - very highly recommended
- With CICS TS we've enjoyed 99.999% ("five nines") scheduled availability. Same for z/OS - more of the same for our IBM System z and prior zSeries hardware
- Migration to CICS TS 5.1 from 4.2 very quick and easy

Appendix and Additional Information

- IBM Software -> Host Transaction Processing -> CICS (Customer Information Control System):
  - *http://www.ibm.com/cics*
- CICS TS 5.1 Information Center (select Library from above, or):
  - *https://publib.boulder.ibm.com/infocenter/cicsts/v5r1/index.jsp*
- IBM CICS Beta and Early Test Programs:
  - *http://www-01.ibm.com/software/htp/cics/betas.html*
    Note: For the most current plan, schedule, any questions or concerns, please contact the CICS ETP team at cicsetp@us.ibm.com for ISVs, or cicsep@uk.ibm.com for customers and customer beta info.
- IBM "software early programs" (formerly BetaWorks and formerly Product Information Center):
  - *https://www.ibm.com/software/productintro/*

Appendix and Additional Information (cont.)

- University of Florida (UF):
  - *http://www.ufl.edu/*
- UF CNS:
  - *http://www.cns.ufl.edu/*
- CICS at UF:
  - *http://cics.ufl.edu/*

Presentation Information

- The **Slackware Linux** Project:
  http://www.slackware.com/
- **OpenOffice.org** "Impress":
  http://www.openoffice.org/
  (File -> Export as PDF)
- **Lenovo** X220 Ultraportable:
  http://www.lenovo.com/

OpenOffice.org