CICS and the Web: Web-enable your CICS Applications

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Session Agenda

- CICS e-business Strategy
- Which web-enabling option?
  - Server considerations
  - Application Interfaces
- Web-enabling options
  - CICS Web Support
  - Web Bridge (CWS with 3270 Bridge)
  - CICS Transaction Gateway
  - CICS Native IIOP and EJB Support
- Summary
CICS e-Business Strategy

- Allow our customers to grow their business by
  - Multiplying the return on investment
  - Extending use of existing applications
  - Exploiting appropriate new technologies

- Transform CICS into a powerful application server by
  - Providing evolutionary path to e-business
  - Making it easy to write new e-business applications
CICS e-business Strategy

- Extending existing investments
  - Objectives
    - Open up existing CICS applications to new opportunities
    - Access from HTML, Java, GUI desktops
  - Business benefits
    - Fast, low cost, low risk
    - You can do it now, tools available

- CICS and WebSphere
  - Best intersection point between worlds of the existing and the new
CICS web-enabling strategy

- Enable Web Browsers to invoke CICS applications
- Use standard HTTP and IIOP protocols
- Support both gateways and native access to CICS
- Enable Java as programming environment
Factors to Consider

- **General**
  - Corporate Internet strategy
  - Cost: long and short term
  - 2 tier or 3 tier
  - Capacity and scalability
  - Response time
  - Reliability and availability
  - Security
  - Skills and resources
  - Implementation effort
  - Users: Internal or public
  - Administration

- **Server Platform**
  - Non z/OS web server
    - CICS Transaction Gateway
    - CICS IIOP/EJB Support
  - z/OS web server
    - CICS Transaction Gateway
    - CICS Web Support
    - CICS IIOP/EJB Support
  - Direct connection
    - CICS Web Support
    - CICS IIOP/EJB Support
Factors to Consider

- **CICS Application Interfaces**
  - **COMMAREA (LINK/DPL/ECI/EXCI)**
    - CICS Web Support (CWS)
    - CICS Transaction Gateway
  - **3270 (BMS or data stream)**
    - CICS Transaction Gateway
    - Web Bridge (CWS with 3270 Bridge)
    - CICS Link Bridge
    - WebSphere Host Integration Products
      - *Host On-Demand*
      - *Host Publisher*
  - **Object (CORBA or EJB)**
    - CICS Native IIOP Interface
    - CICS EJB Support
Commarea-based applications

- Recommended model for CICS application development
- Linkable program modules
  - Enabled for ECI, EXCI, RPC, CWS, etc.
- Business logic only
  - Separation of presentation and business logic
  - Positions application for use from varying environments
- Web-enabling passes COMMAREA inputs and outputs
  - ECIRequest with CICS Transaction Gateway
    - ECIInteractionSpec using J2EE Connectors
  - CICS Web Support
3270-based applications

- 3270 applications require a terminal (principal facility)
- BMS or Terminal Control
- Web-enabling must provide terminal emulation
  - EPIRequest classes and EPI beans with CICS Transaction Gateway
  - Web Bridge (CWS with 3270 Bridge)
  - WebSphere Host Integration Products
    - Host On-Demand
    - Host Publisher
Object-based applications

- **CORBA IDL**
  - Standards defined by Object Management Group
- **Enterprise JavaBeans**
  - Java2 Standards
- **Remote method invocation**
  - CICS Java applications
  - 'Wrapper' applications
- **JCICS class library for access to CICS resources**
- **Web-enabling using IIOP transport**
  - CICS native IIOP interface
  - RMI/IIOP to Enterprise JavaBeans
CICS Web Support

- Allows a standard Web Browser to invoke a CICS application program
  - The standard HTTP protocol is used
- Direct network connection
  - No intermediate gateways or servers
    - Optional interface through IBM HTTP Server with supplied ICAPI DLL module
- Output management
  - HTML Template Manager and DOCUMENT API
    - Merge fixed and variable parts of response document
  - Output in HTML, XML, or other formats
Why use CICS Web Support?

- Gives direct access to Web Browsers
  - using HTTP for connectivity
  - using HTML as the presentation
- Provides 2-tier model with no gateways
- Allows writing new web applications using CICS skills
  - samples and aids provide for ease of use
- Provides access to existing applications
  - Commarea-based applications
  - With the Web Bridge, 3270-based BMS and TC applications
CICS Web Support request flow

Analyzer is mandatory but User Replaceable
Decode & Encode are optional

Analyzer
Decode
User Program
Encode
3270 Bridge

- Function provided by CICS TS 1.2 and above
- **Bridge exit program**
  - creates 3270-like environment for user application
  - intercepts BMS and TC requests
- **Bridge monitor program**
  - interfaces with external communication and message formats
  - starts user application running under bridge exit program
- **Supplied bridge programs**
  - Web bridge (object only) - both exit & monitor
  - MQ bridge (object only) - both exit & monitor
  - Bridge sample (DFH0CBRE, source) - exit only
CICS Web Support with Web Bridge

TCP/IP

z/OS

CICS TS 1.3+

CSOL

CWXN

CWXN

CWXN

Analyzer

Decode

DFHWBLT

3270 Transaction

DFHWBTTA

Encode

START
CICS Transaction Gateway

- Java programs using CICS client protocols
  - Applets or servlets
  - JGATE class library
    - ECIRequest and EPIRequest
  - Java beans for ECI and EPI
  - CCF and J2EE Connector Architecture
    - Extensions built on CTG client classes

- Terminal servlet
  - Dynamic conversion of 3270 to HTML
  - Customizable presentation
  - HTML templates

- C, C++, Visual Basic programs using CICS client protocols
  - Allows integration from non-Java web servers
CICS Transaction Gateway

Platforms
- AIX
- OS/2
- Windows NT/2000
- Sun Solaris
- HP-UX
- Linux/390
• Same Java code as non-OS/390 platforms
• Runs as separate region or integrated into WebSphere Application Server
• Connects to CICS via EXCI
  – Therefore, only ECIRequests handled
  – Error returned for EPIRequest usage
  – Call Bridge module for 3270 applications
IBM Host Integration Products

- **Java access to 3270 applications**
- **Host on Demand**
  - Supplied Applets
    - Terminal emulation via telnet server
    - Terminal emulation via CICS Transaction Gateway
  - Screen Customizer
    - Separate product
    - Additional applet classes to modify appearance
- **Host Publisher**
  - Runs as servlet to generate HTML output
- **Class Library**
  - Write your own 3270 terminal emulators
  - Applets
  - Servlets
CICS Native IIOP Interface

- **Object client access to CICS applications**
  - Applets, servlets, Enterprise JavaBeans
  - CORBA-compliant clients
  - IDL, ORB, RMI

- **TCP/IP connectivity**
  - Internet Inter-ORB Protocol, IIOP
  - CICS listener
  - SSL available

- **CICS applications**
  - CORBA-conforming Java (HPJ-compiled)
    - CICS TS 1.3
  - Enterprise JavaBeans
    - CICS TS 2.2
  - Java in CICS can LINK to non-Java programs
CICS as an EJB Server

- CICS provides partial support for V1.1 of the Enterprise JavaBeans specification
- CICS provides a run-time environment where requests for EJB services are mapped to existing or enhanced CICS services
- Enterprise beans can give Java clients access to existing CICS applications and data
  - JCICS API
  - CICS Connector for Java
- Install enterprise beans into CICS via deployment
  - Use the WebSphere Application Assembly Tool
- As usual, enterprise beans execute in a Java Virtual Machine (JVM)
  - CICS will manage JVMs along with other system resources
Other options

If your application needs are not met by the recommended solutions, CICS supports a wide range of connectivity options:

- **CICS Family**
  - ECI, EPI, EXCI, FEPI

- **Messaging**
  - MQSeries

- **TCP/IP Interfaces**
  - RPC - DCE/RPC and ONC/RPC
  - Sockets

- **Terminal Interfaces**
  - 3270 terminal emulators, HLLAPI

- **Peer-to-Peer**
  - APPC, LU6.2
Planning Information

• Redbooks
  – CICS TG V3.1: The WebSphere Connector for CICS, SG24-6133
  – Java Connectors for CICS: Featuring the J2EE Connector Architecture, SG24-6401
  – CICS TS 1.3 Web Support and 3270 Bridge, SG24-5480
  – CICS TS for VSE: CICS Web Support, SG24-5997
  – Revealed: Architecting Web Access to CICS, SG24-5466
  – Securing Web Access to CICS, SG24-5756
  – A Performance Study of Web Access to CICS, SG24-5748
  – Workload Management for Web Access to CICS, SG24-6115
  – Enterprise JavaBeans for z/OS and OS/390: CICS TS V2.2, SG24-6284
Summary

• CICS provides strategic solutions for easy access to CICS applications from web browsers.
  – Choice of 3-tier or 2-tier
  – Choice of programming environment
  – Solutions for any application type

• CICS has connectivity options which allow use of any web server and web application programming model.