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IBM WebSphere Studio Enterprise Developer V5.0

Developing z/OS Solutions

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Agenda

- z/OS Application Development

- Benefits

- A look at the z/OS Application Development environment
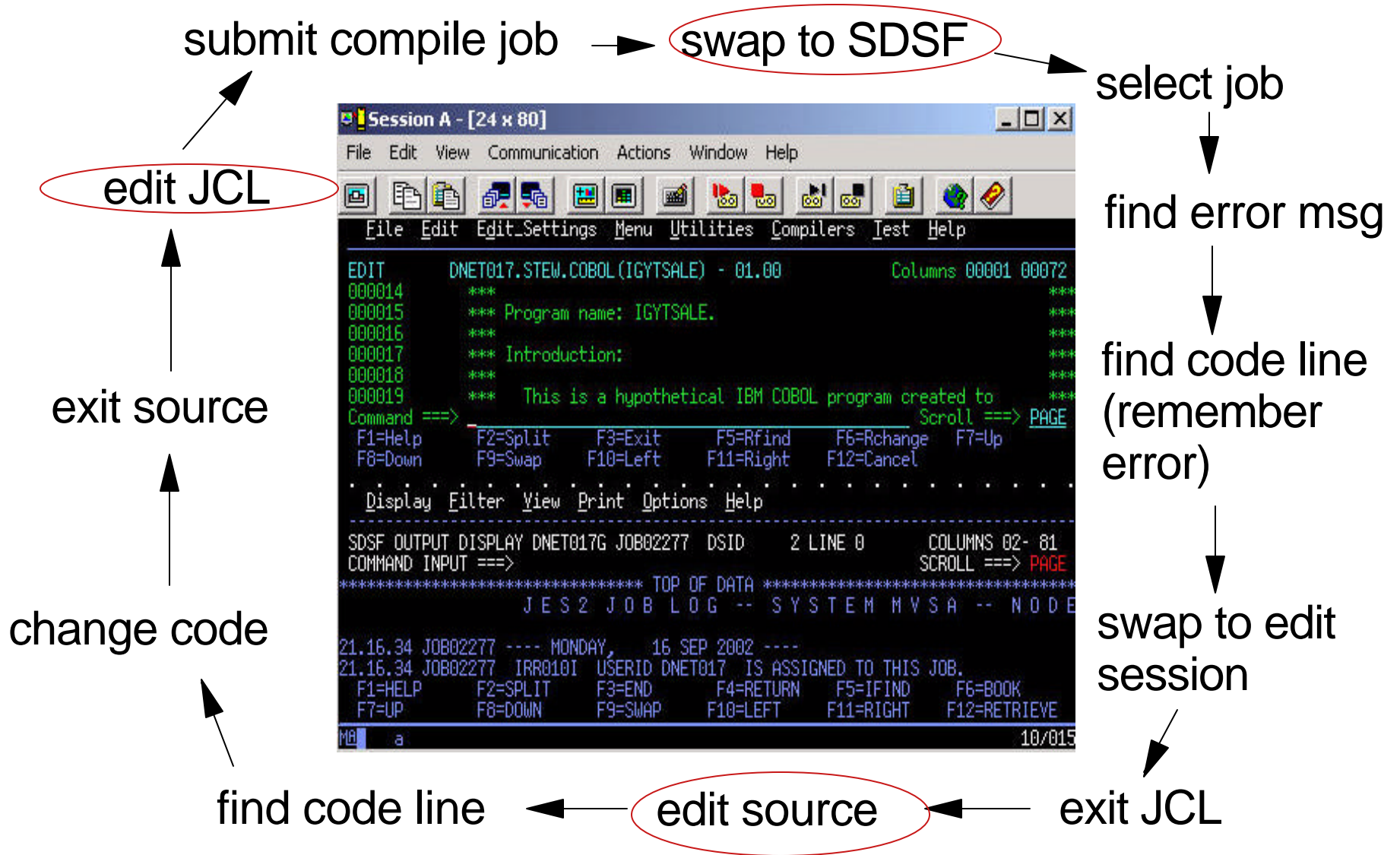
- Summary

z/OS Application Development Tools

- Interactive, workstation-based environment
  - ► Faster development with less errors
  - ► Host offload of development CPU cycles

- Local edit/compile/debug on the workstation
  - ► Language sensitive
    - – ASM, COBOL, or PL/I applications

- Remote edit/compile/debug on the mainframe
  - ► CICS and IMS

- Prepare output on the mainframe
  - ► JCL generation, editing, submission
  - ► TSO command execution
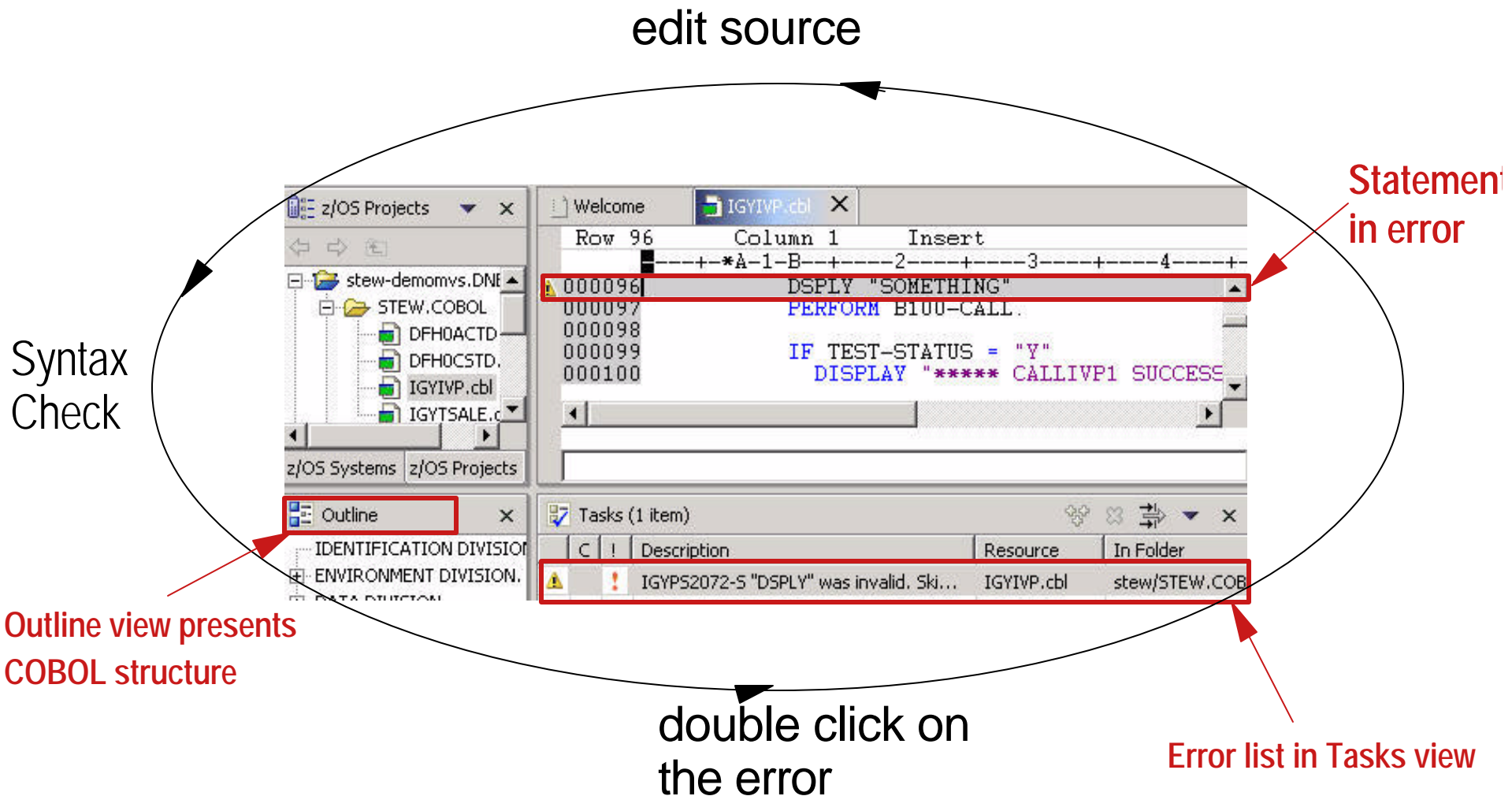 - ► Job Monitoring

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Benefits of z/OS Application Development

- Utilizes Workbench features/tools to support COBOL, PL/I, Assembler development for the z/OS platform

  ▶ Simplifies development process

  ▶ Provides consistent development environment

- Provides development support for traditional runtimes
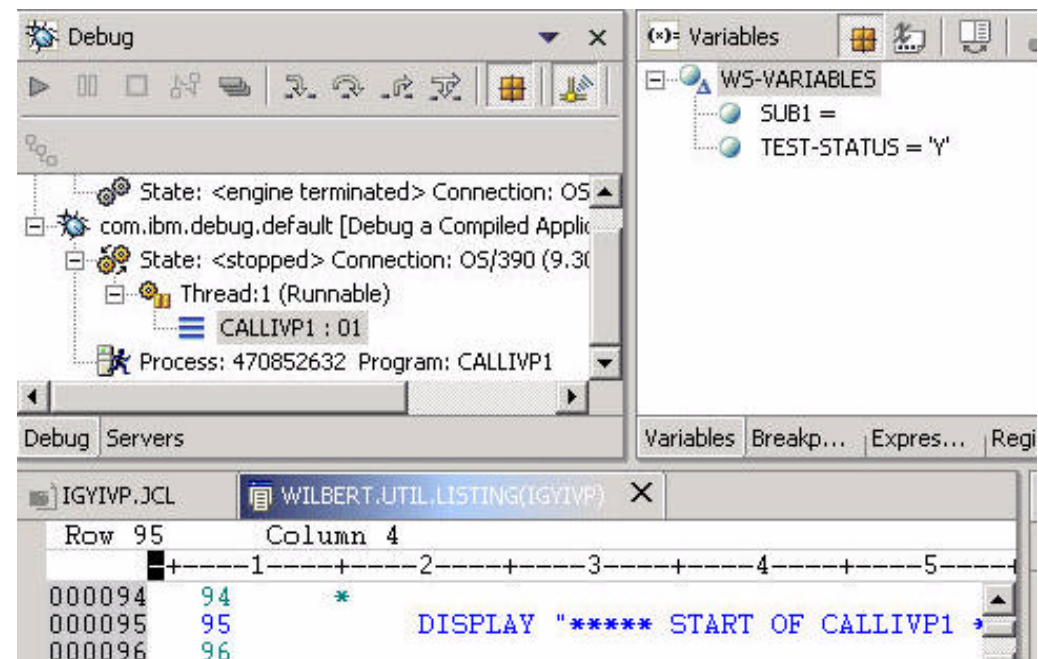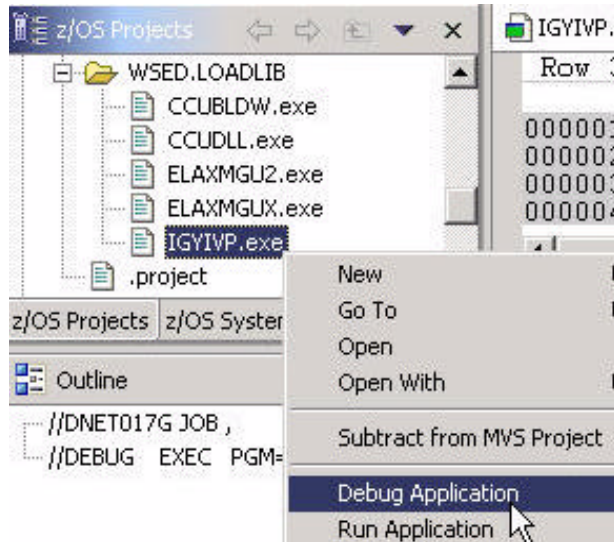
  ▶ CICS, IMS, DB2, batch

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ISPF based development - Old

submit compile job → swap to SDSF → select job

edit JCL

exit source

change code

find code line

edit source

exit JCL

swap to edit session

find code line (remember error)

find error msg

WebSphere Studio Workbench - New

edit source

Syntax
Check

Statement
in error

Outline view presents
COBOL structure

double click on
the error

Error list in Tasks view

Benefit: Simplified development for COBOL and PL/I on a common development environment

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WebSphere Studio Workbench - New ...

Same Debug Perspective

Benefit: Consistent debugging environment for COBOL, PL/I, Java

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z/OS Systems Perspective

Directory definitions

z/OS Systems

Directories available

Mapping o z/OS datasets

Organizing Source - Projects

- **MVS Project**
  - ► Collection of z/OS PDS[E]s, Member Files and Sequential Files
  - ► Mapped to Workstation as "Local" Folders and Files
  - ► MVS Project resides on System.Directory
  - ► Add to Project
  - ► Subtract from Project

- **Local Project**
  - ► Collection of Workstation Folders and Files

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Editors

- **JLPEX (default)**
  - ▶ Embedded
  - ▶ z/OS Systems and z/OS Projects
  - ▶ Language sensitive Highlighting
  - ▶ Outline View (COBOL, PL/I, JCL, ASM)
  - ▶ Extensible

- **LPEX**
  - ▶ Launched
  - ▶ z/OS Systems and z/OS Projects (Navigators)
  - ▶ Language sensitive Highlighting
  - ▶ Outline View (COBOL, PL/I, JCL, ASM)
  - ▶ Macro Support

- Syntax checking

z/OS Projects Perspective

MVS Project

MVS Directory

Outline view

JLPEX editor

z/OS Job Monitor view

z/OS Commands view

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Build Support

- Automated build based on build plans (XML)
- Automatic transfer to target machine
- Run build commands on target machine

Build Servers

Workstation Client

Java

EGL

Build Plan (XML)

Cobol

Source

WSED Build Command Processor

Build command

Build command

Build command

TCP/IP Socket → Win

TCP/IP Socket → USS

TCP/IP Socket → TSO
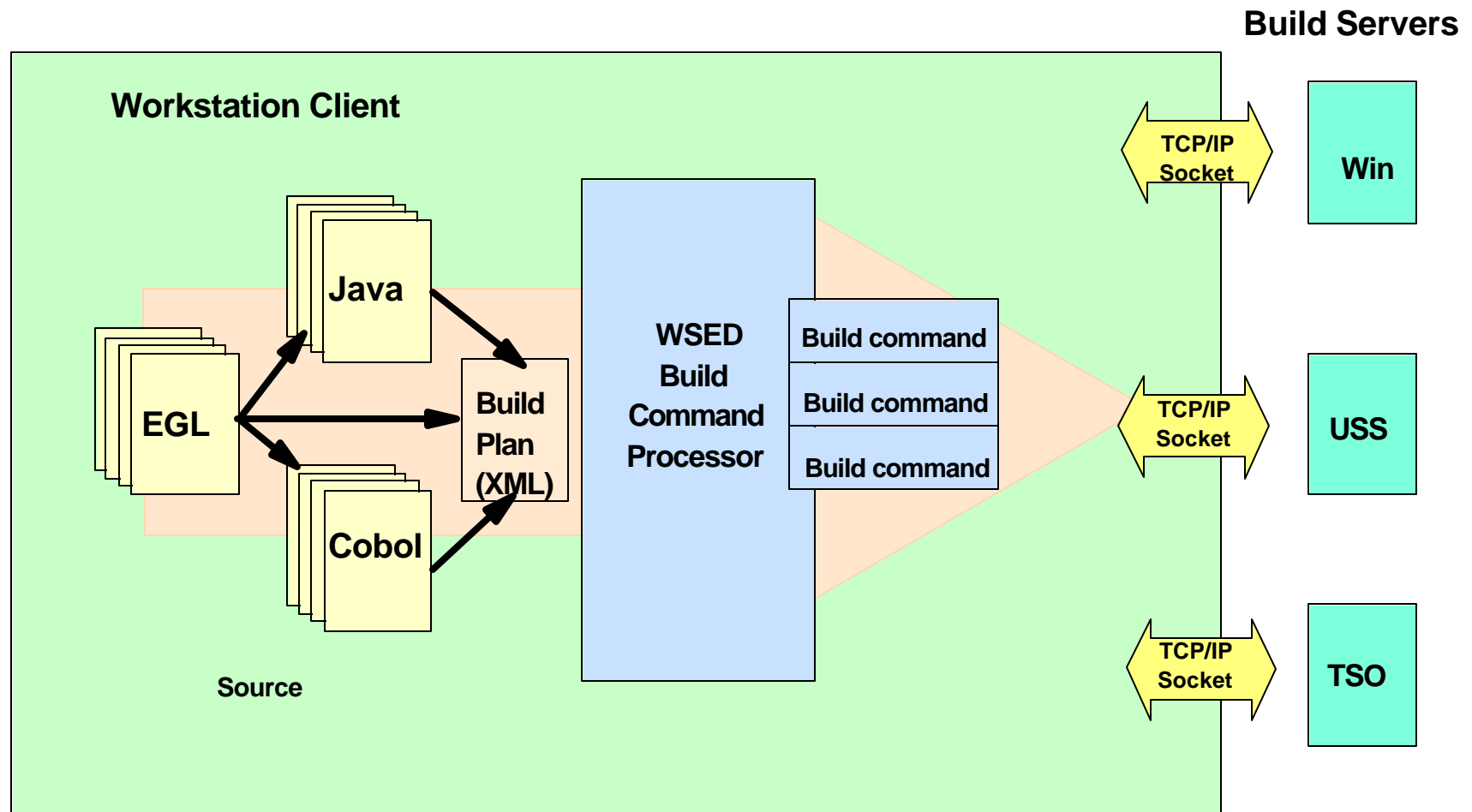
Build Support

- **Local Compile for local projects**
  - ▶ Project Level
  - ▶ File/Program Level

- **Remote Compile**
  - ▶ Project level
  - ▶ JCL Generation
    - – File/Program level
    - – Folder Level

- **Compile/link parameters set with preferences/properties**
  - ▶ Workspace
  - ▶ Folder
  - ▶ Program

JCL Generation and Submission

JCL generated

Benefit: Developers focused on business logic and not on writing JCL

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Monitoring Job Output / Issuing Commands

Benefit: Developers do not have to continually switch between systems

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Debug Support

- Local Debug
  - ▶ TSO type
  - ▶ Batch
  - ▶ CICS (using VA CICS)

- Remote Debug
  - ▶ CICS
  - ▶ IMS
  - ▶ Batch
  - ▶ TSO

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WebSphere Studio Workbench - New ...

Same Debug Perspective

Benefit: Consistent debugging environment for COBOL, PL/I, Java

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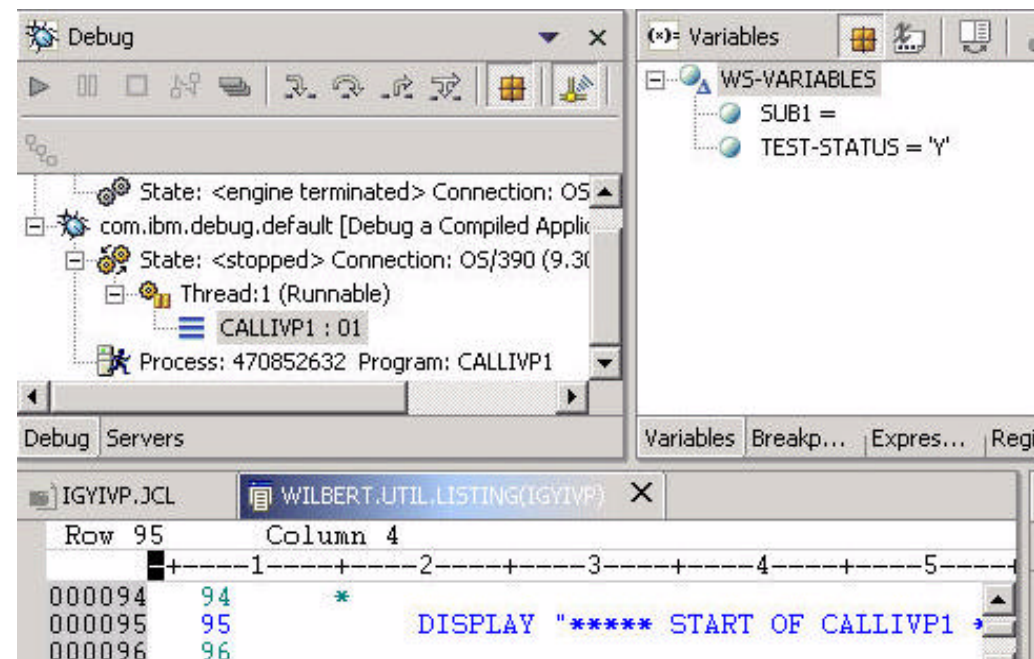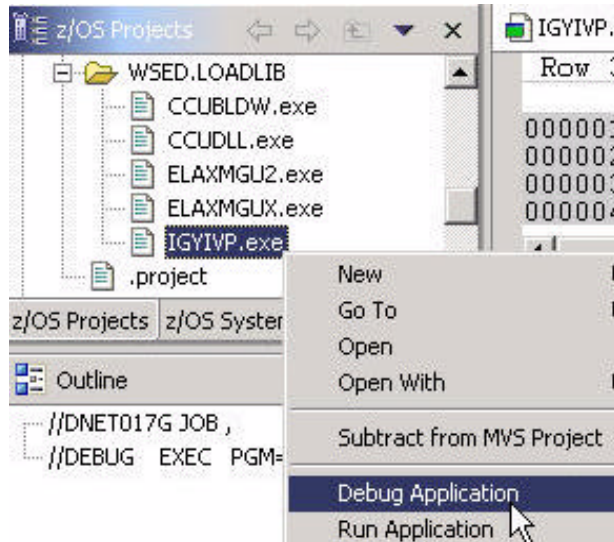
SCLM Support

- Uses VCM adapter
- Access to SCLM services on z/OS
  - ▶ Connect to SCLM repository
  - ▶ View a list of projects
  - ▶ List project members
  - ▶ Execute SCLM actions
- Check-in/check-out support
  - ▶ TEMP WORK AREA
- No SCLM administrative functions
  - ▶ Create SCLM project
  - ▶ Delete SCLM project
- No automatic synchronization
  - ▶ Manual refresh

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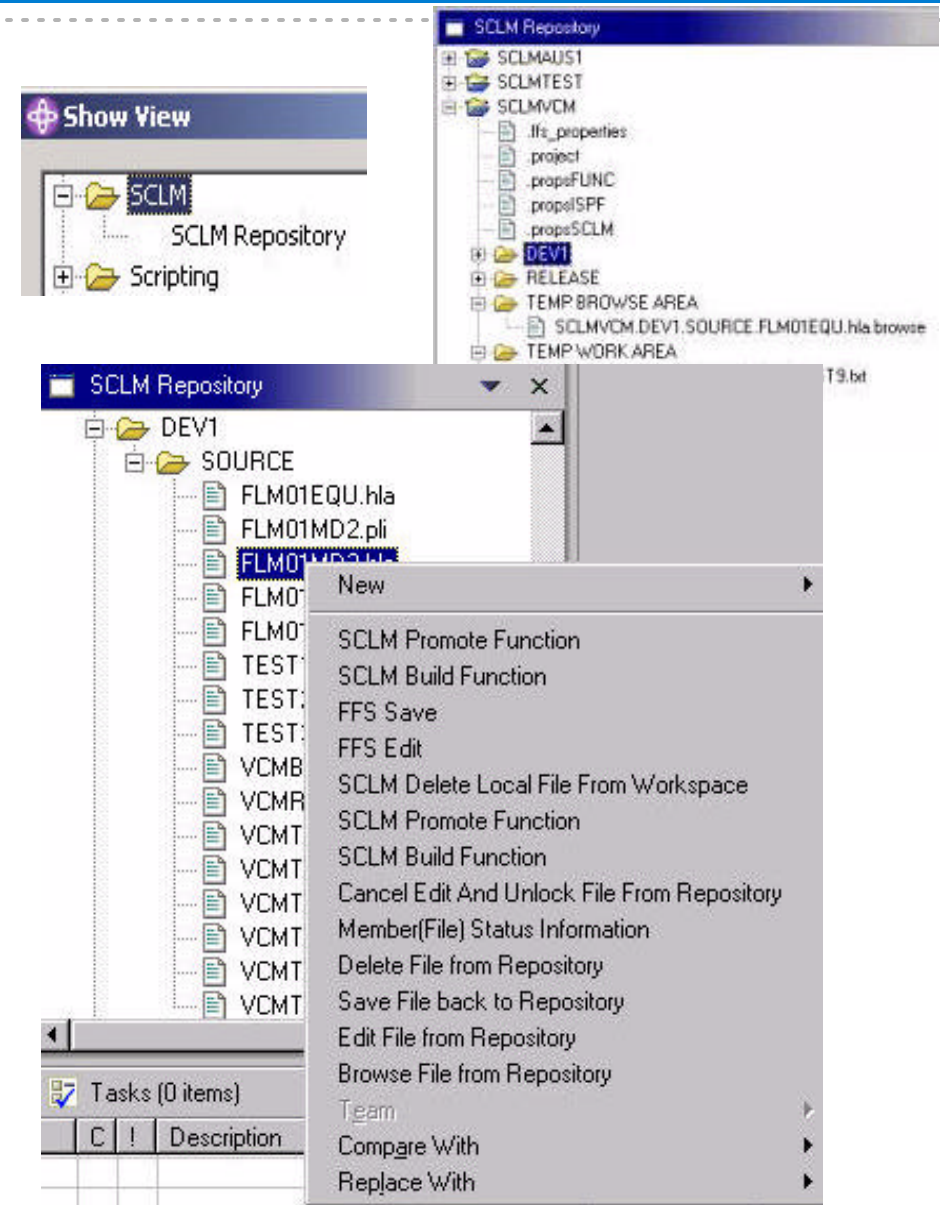
Development environment architecture

z/OS or OS/390

Error Feedback

Compiler

Build Server

IBM HTTP Server

USS

Foreign File System Server

JES

Job Monitor server

Subsystem: CICS, DB2, IMS.......

Language Environment

Debug Tool

APPC

Remote Commands server (IGYFSERV)

TCP/IP

Windows NT/ 2000 / XP

TCP/IP

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Microsoft Loopback Adapter

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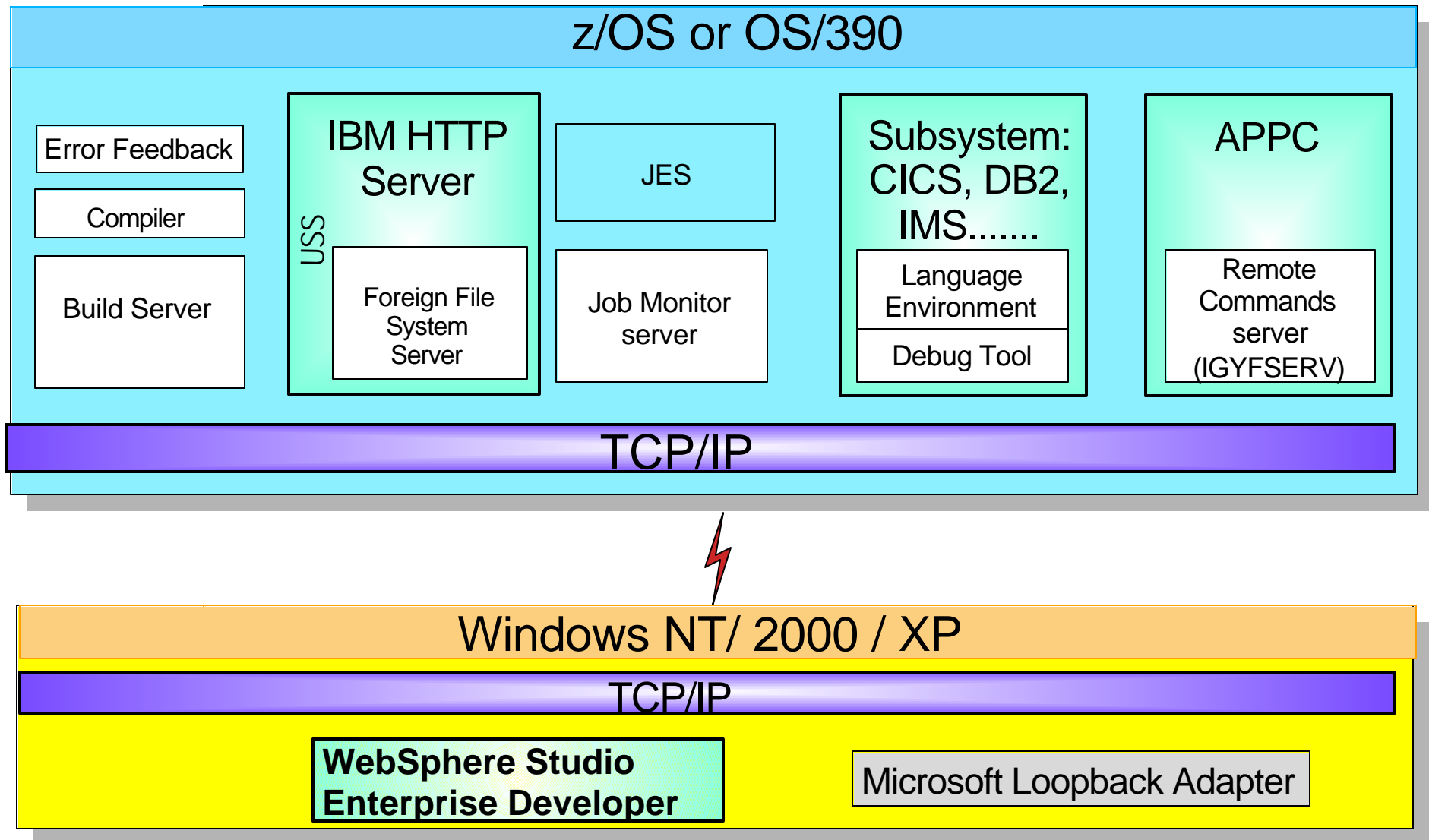
Summary

- Increases programmer productivity
  - ▶ Simplified development process
  - ▶ Unified development environment

- Reduces Total Cost of Ownership (TCO) by adopting a consistent development environment for the enterprise
  - ▶ Single development environment to manage and deploy vs. multiple
  - ▶ Simplified training requirements

- Facilitates the building and testing of z/OS applications by providing development support for traditional runtimes like CICS, IMS, DB2, and batch

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z/OS Application Development

Backup charts

z/OS Application Development

Software prerequisites

Workstation Prerequisites

- Install and configure Microsoft Loopback Adapter
- Install the z/OS Application Development Tools on disk 2 of WebSphere Studio Enterprise Developer
- Modify HOSTS file (Windows 2000 only)

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z/OS Prereq. Software List

- IBM HTTP Server
- JES PTF to enable job monitor support
- Language Environment PTFs to enable z/OS IDE support
- IBM Enterprise COBOL for z/OS and OS/390
- IBM Enterprise PL/I for z/OS and OS/390
- IBM Debug Tool for z/OS and OS/390
- IBM Foreign File System Server
- IBM Job Monitor Server
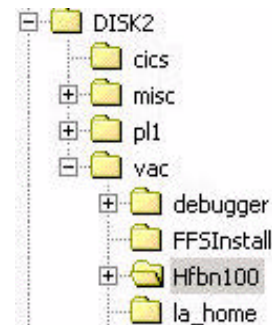
Host Software Install Steps

- Make sure required software and service updates installed
  - ▶ TCP/IP
  - ▶ Language Environment
  - ▶ IBM HTTP Server
  - ▶ RACF or equivalent
  - ▶ IBM Enterprise COBOL
  - ▶ IBM Debug Tool
- Install foreign file system server and job monitor server
- Configure the IBM HTTP Server
- Configure the software that comes with WebSphere Studio Enterprise Developer for the host to support remote edit-compile-debug
  - ▶ Foreign file system server
  - ▶ Job monitor server

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Host Software Install Steps ...

- Install and configure the TSO command server to support issuing TSO commands from the workstation
- Configure Debug Tool for remote debugging under CICS
- Test the connections

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Troubleshooting

- Ensure connectivity to host systems
  - ▶ Can you ping the host?
  - ▶ Can you access the web server?
    - – http://hostsys:port/
  - ▶ Can you open the web page for the host FFS system?
    - – http://hostsys:port/FFDS
  - ▶ Are you using the right ports for the web and job monitor?
    - – default is 80 and 6715 respectively

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