



IBM Software Group

Using SCMs and WebSphere Developer for System z to optimize development

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Rational. software



Agenda

- Introduction
- Software Configuration Management
 - ▶ What is it?
 - ▶ Why should you care?
- What is WebSphere Developer for System z?
- What does the combination of the two have to offer?
 - ▶ SCM support in WebSphere Developer for System z
 - ▶ Customer example
- Summary

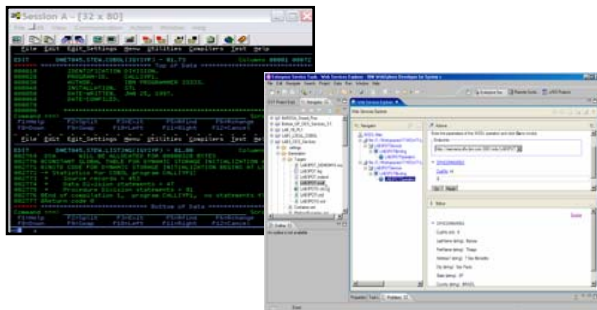


Hardware has been improved.. What about Software?

“More than 50 years ago, IBM launched the 305 RAMAC, the first computer with a hard disk drive (HDD).

The HDD weighed over a ton and stored 5MB of data.”

Makes you appreciate your 4 GB jump drive, doesn't it?

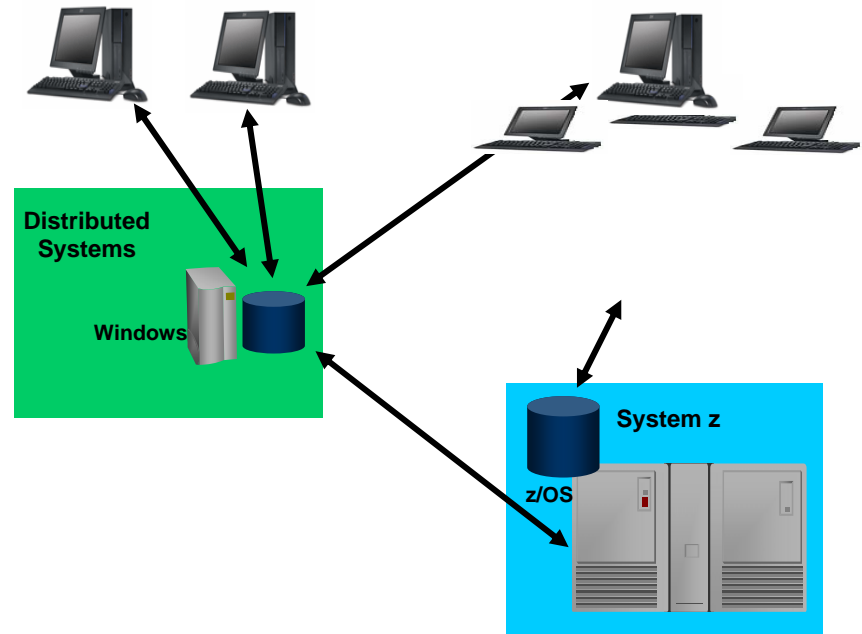


→ Software also needs Improvements....



Reality of today's software environment

- The world of IT is constantly changing and constantly evolving
 - ▶ New technologies
 - ▶ New applications
 - ▶ New platforms
- IT organizations often must manage or support complex, multi-platform applications that span the enterprise, and include everything from a Windows server to the mainframe server



Reality of today's software environment - continued

- Today's IT teams work on complex, multi-tier projects
 - ▶ Teams may be geographically dispersed
- Application development projects that cross different platforms are often written with multiple development tools
- These same projects have different techniques for managing the process of delivering their portion of the application development project.



Reality of today's software environment - continued

- IT Development teams need to do more with less
 - ▶ Less time
 - ▶ Less money
 - ▶ Fewer developers and other resources.
- IT Development teams need to be
 - ▶ more productive
 - ▶ more efficient
 - ▶ deliver applications with more functionality
 - ▶ ensure that these applications comply with existing governance regulations.

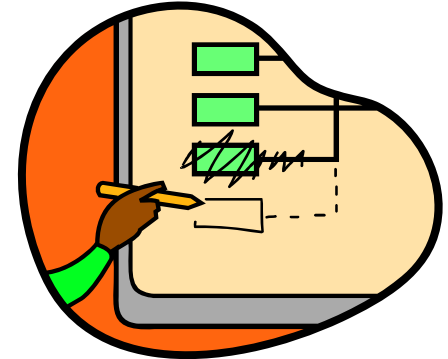


What is Software Configuration Management and why is it important?

- When you develop software, change happens
 - ▶ **Change must be controlled effectively**

- Software configuration management (SCM) is a set of activities that are designed to control change by
 1. **identifying the work products that are likely to change**
 2. **establishing relationships among them**
 3. **defining mechanisms for managing different versions of these work products**
 4. **controlling changes that are imposed**
 5. **auditing and reporting on the changes that are made**

- The purpose of Software Configuration Management is to establish and maintain the integrity of the products of the software project throughout the project's software lifecycle.



“If you don’t know where you are going, you don’t know when you’ve arrived.”



Basic definitions and concepts

- **Version control** – track changes made to an individual file
- **Change or defect tracking** – track changes and change requests
- **Configuration management** - Understand what individual components are used to build an application
- **Build management** – combining all the necessary components for a complete, running application
- **Parallel development** – multiple project teams work on code shared with other projects



The Process of Change

- In the today's dynamic world:
 - ▶ Change is the norm
 - ▶ Rapid, controlled, accurate implementation of change is vital
 - ▶ Failure to implement effective SCM is expensive now, and becoming fatal
- Why do 72%* of software projects miss plan?
- How can you ship the wrong thing?
- What happens when you ship the wrong thing?
- How does this happen?
- What is the result?
- What does this cost?

28%* of software projects are on-time, on budget

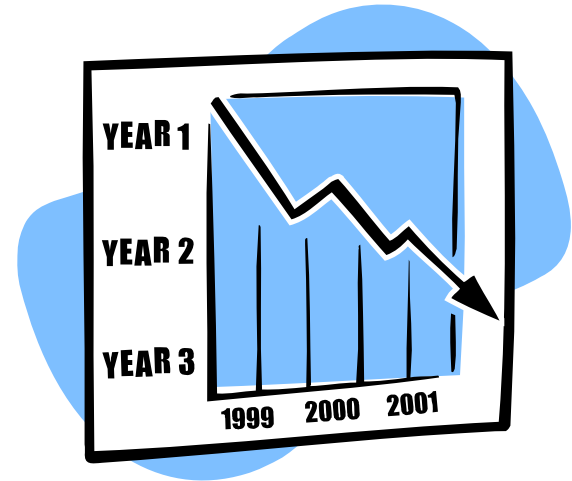
Unrepeatable processes cost!

*Standish Group: CHAOS Report of 2001



The Process of Change

- How can this be prevented?
 - ▶ Employ a proven, repeatable, configurable process
 - ▶ Simplify developer work efforts
 - ▶ Plan for multiple and conflicting tasks
 - ▶ Automate build and promote processes
 - ▶ Maintain accurate records
 - ▶ *Reduce unrepeatable processes!!*
- With an easy-to-use tool that blends into your environment

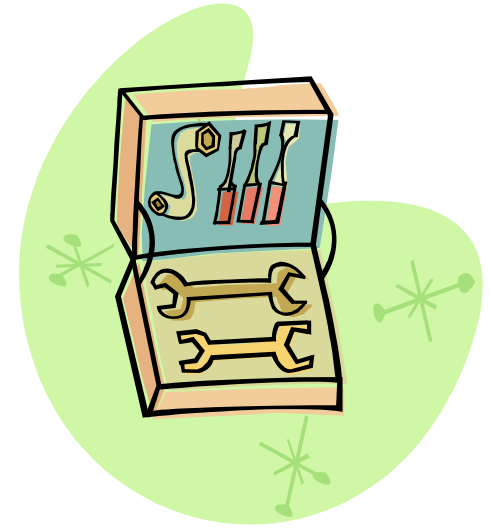


**Reduces unrepeatable builds
and helps reduce costs**



Reality of SCM

- Organizations say they have implemented good configuration management processes because they have a tool like X or whatever.
- When practitioner's are interviewed, it's clear they haven't got a clue and are using the tool in an ad-hoc manner.
- So you may already have an SCM tool implemented and partially or even fully integrated into your development process



Why should you care about good SCM?

- Faster development means faster time to market
- Better quality means reduced time working on fixes rather than enhancements
- Greater reliability translates to more uptime and increased productivity
- The proof? One customer had the following results:
 - ▶ Build/release times were reduced by a factor of eight
 - ▶ Merges, which previously required five hours to complete, were finished in one hour.
 - ▶ “With their new solution, we didn't overlook any files, we didn't miss any changes, and most merges were performed automatically.”
 - ▶ “Our new solution gave us massive performance gains.”



**Good Software
Configuration
Management yields
a positive Return
on Investment**



IBM Rational Software Development Platform

Governance Expertise & Dashboards

Global Development & Delivery

Service management

Process & portfolio management

- Rational® Portfolio Manager
 - Rational Method Composer
 - Rational Team Unifying Platform™
- Best practices content: Rational Unified Process®
Tivoli Unified Process®
Project Portfolio Management*

Change & release management

- Rational RequisitePro®
- **Rational ClearCase®**
- Rational Build Forge®
- Rational ClearQuest®
- Tivoli Provisioning Manager
- Tivoli Intelligent Orchestrator
- **IBM SCLM and SCLM Advanced Edition**

Quality management

- Rational RequisitePro®
- Rational Performance Tester
- Rational Functional Tester
- Rational Manual Tester
- Rational PurifyPlus

Architecture and Construction

- Rational RequisitePro®
- Rational Application Developer
- Rational Systems Developer
- WebSphere Integration Developer
- Rational Data Architect
- Rational Business Developer Extension
- IBM Host Access Transformation Services
- **WebSphere Developer for System z**
- WebSphere® Business Modeler
- Rational Software Architect
- Rational Software Modeler
- Rational Rose® Data Modeler
- WebSphere® Studio Asset Analyzer
- IBM Asset Transformation Workbench

Development productivity

SOA governance & service lifecycle management

Partner ecosystem & open computing

Eclipse™, Linux®, Microsoft® Windows®, UNIX®, IBM z/OS®, IBM i5/OS

Enterprise modernization

Risk & compliance management



IBM WebSphere Developer for System z

Enterprise Service Tools Web Services and XML

- SOA access to CICS V3.2 and IMS V9 COBOL applications
- Bottom-up/Top-down or meet-in-the-middle COBOL to XML mapping support
- Integrated COBOL XML converters, XML schemas, and WSDL generation

DB2 Stored Procedure for COBOL and PL/I

- Create DB2 stored procedures on z/OS in either COBOL or PL/I
- Build and catalog support for the DB2 stored procedure
- Debug z/OS based stored procedures from workstation

Web/J2ee Development

- Create Web Pages / JSF / Struts
- J2ee/Java Development
- JCA Connectors
- Distributed debugger
- Web Services and Test environment



z/OS Application Development

- Connect to z/OS systems
- Work with z/OS resources like COBOL, PL/1 , C, C++, JCL, etc.
- Interact with the Job Entry Subsystem (JES) to submit jobs, monitor jobs, and review job output
- Perform dataset management actions like allocating datasets and migrating datasets
- Perform typical edit, compile, and debug tasks on remote z/OS resources from the workstation

CICS BMS/ IMS MFS Map Support

- Visually create and modify BMS Map sets or IMS/MFS
- Generates JCL
- Work with local or remote maps

Rapid Application Development

- Ability to generate WSDL and CICS Cobol program to access DB2
- CRUD from UML and Database operations
- Can be added to SFM flow

CICS 3 Service Flow Support

- Implements SOA and Web Services
- Service Flow Modeler is a tool to build service flows out of your existing Commarea and Terminal based CICS applications.



WDz z/OS application development features

Statement in error

Edit source

Syntax Check

The screenshot shows the IBM WebSphere Developer for System z IDE. The main editor displays a COBOL program with the following code:

```
000044 PROCEDURE DIVISION.  
000045     DISPLAY "Program CUSVSAM starting...XXX "  
000046     MOVE CUST-NO to YYYY.  
000047     OPEN INPUT POTVSAM-FILE  
000048     IF POTVSAM-STATUS = '00'  
000049         CONTINUE  
000050     ELSE  
000051         DISPLAY 'POTVSAM: FAILURE-OPEN-!!!'  
000052         GOBACK.  
000053     MOVE 1 to W-CUST-NO.  
000054     PERFORM 0100-POTVSAM-READ THRU  
000055         0100-EXIT UNTIL W-CUST-NO = 010.  
000056     CLOSE POTVSAM-FILE.  
000057     GO TO 0150-SECOND-PART.  
000058     0100-POTVSAM-READ.
```

The error list at the bottom shows the following message:

ID	Message
IGYGR1130	IGYGR1130-I "RECORD KEY" or "ALTERNATE KEY""CUST-NO" was not defined as an alphanumeric item.
IGYPS2121	IGYPS2121-S "YYYY" was not defined as a data-name. The statement was discarded.

double click on the error

Outline view presents COBOL structure

Error list in Tasks view



Debugging applications

Change contents, etc..

Breakpoints, watchpoints, Jump to, Run to etc..

Name	Value
POTVSAM-RECORD-REC	
CUST-NO	001
CUST-LN	'Lincoln'
CUST-FN	'Abraham'
CUST-ADDR1	'1234 Independence Wy'
CUST-CITY	'Springfield'
CUST-ST	'IL'
CUST-CTRY	'USA'

```
AM.jcl  EMPOT24.POT.LISTING(CUSVSAM)  8
75      Column 1      Insert      Browse
66          0100-EXIT UNTIL W-CUST-NO = 010.
67          CLOSE POTVSAM-FILE.
68          GO TO 0150-SECOND-PART.
69          0100-POTVSAM-READ.
000070      70          MOVE W-CUST-NO to CUST-NO
000071      71          READ POTVSAM-FILE INTO W-POTVSAM-RECORD  KEY IS CUST-NO
000072      72          INVALID KEY
000073      73          DISPLAY 'KEY ' CUST-NO ' ERROR READING VSAM FILE'
000074      74          GOBACK
000075      75          DISPLAY 'CUST NO: ' W-CUST-NO ' ' W-CUST-FN W-CUST-LN
```

Process: 432091456 Program: CUSVSAM

Note: Requires IBM Debug Tool V7.1

Monitoring job output

Remote System Explorer - EMPOT24.DEMO88.JOB02348.D0000106.? - IBM WebSphere Developer for System z

File Edit Navigate Search Project Data Run Window Help

Remote Systems Team

EMPOT24.DEMO88.JOB02348.D0000106.? x

```

CUST NO: 003 Vicente Fox Calle del Pres
CUST NO: 004 Lula da Silva Palacio do Plau
CUST NO: 005 Winston Churchill 10 Downing Stre
CUST NO: 006 Thiago Barosa 7 Sao Benedito
CUST NO: 007 Daniel Barosa 123 Calle Oro
CUST NO: 008 Megan Page 2 Victory Rd
CUST NO: 009 Rute Santos 3 Sting Blvd
The result is ... 33
Thanks to attending this
BRANCHFLAG GREATER THAN 1
EXECUTED SEEYA PARAGRAPH
EXECUTED SEEYA PARAGRAPH
EXECUTED GOODBYE PARAGRAPH
IG200375 The flow of control in program CUSVSAM proceeded beyond the
From compile unit CUSVSAM at entry point CUSVSAM at stateme
offset +000009F4 at address 19C0193C.
    
```

Remote System Details Tasks z/OS File System Mapping

Job Filter: My Jobs

Name	Job ID	Job Name	Job Entry D...	Job Owner	Return Code	Return Info	System retur...
DEMO88 :JOB02348	JOB02348	DEMO88		EMPOT24	U4038	ABENDED	
DEMO88 :JOB02347	JOB02347	DEMO88	2007/02/23...	EMPOT24	U0000	JCLERROR	

Properties Remote Scratc...

Property	Value
Dataset Name	EMPOT24.DEMO88.JOB...
Date Stamp	
DD Name	SYSOUT
Lines in File	19



Fault Analyzer integration

- Fault Analyzer gathers information about an application and the surrounding environment at the time of the abend
- Integration allows WDz user to access and view Fault Analyzer history files
- Requires Fault Analyzer V7.1

```
File View Services Help
Synopsis
Command ==>
JOBNAME: DNET070A  SYSTEM ABEND: 0C7          DEMOMVS   2006/11/28  20:47:14
Line 1 Col 1 80
Scroll ==> CSR

A system abend 0C7 occurred in module IDISCLBF program IDISCLBF at offset
X'564'.

A program-interruption code 0007 (Data Exception) is associated with this
abend and indicates that:

    A decimal digit or sign was invalid.

The abend was caused by machine instruction F853D100D0F0 (ZERO AND ADD).

Most recently referenced data items:
```

z/OS Projects - F00031.far - IBM WebSphere Developer for System z

z/OS Pr... FA Artif... F1

- FA Artifacts
 - F1
 - History Files
 - PSTRAND.FA.HISTORY
 - PSTRAND.FAE.HISTORY
 - PSTRAND.FAT.HISTORY
 - PSTRAND.FAT2.HISTOF
 - TSOE1
 - History Files
 - PSTRAND.FA.HISTORY

Properties Outline

Property	Value
History File	PSTRAND.FA.HISTORY
System Name	TSOE1

z/OS Projects

- New Connection
- Local
 - APC1
 - FA SubSystem
 - JES
 - MVS Files
 - TSO Commands
 - USS Files
 - USS Shells
 - TSOE1
 - FA SubSystem
 - JES
 - MVS Files
 - TSO Commands
 - USS Files
 - USS Shells
 - F1
 - FA SubSystem

Remote Error List z/OS File System Mapping Remote System Details Default Column Configuration

System Name TSOE1

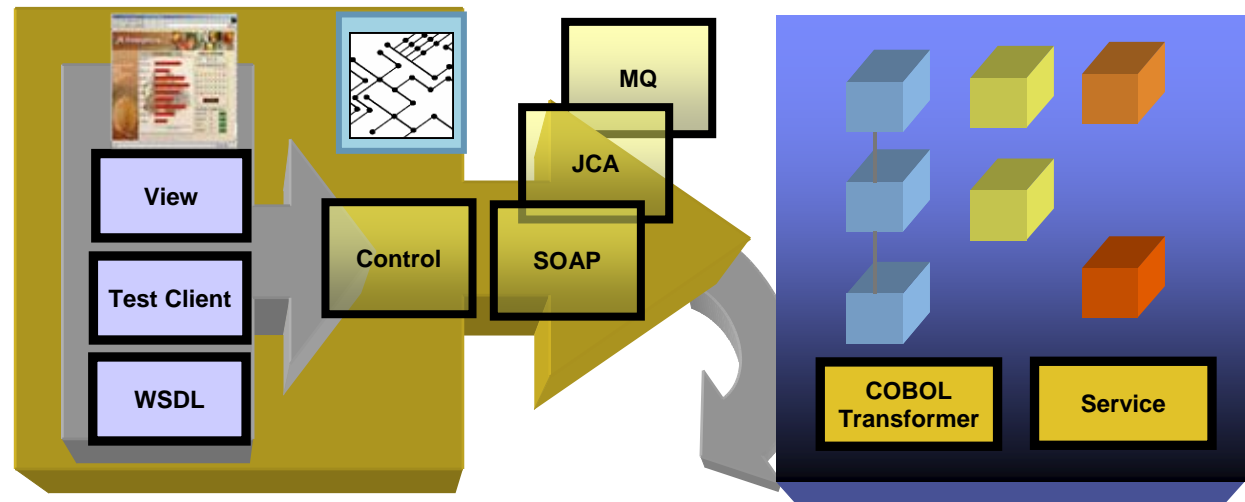
Fault History File or View PSTRAND.FA.HISTORY

Fault_ID	Date	Job/Tran	User_ID	Sys/Job	Abend	I_Abend
F00011	March 12, 2004	WPSBMS	CBPSBMS	C2C2	SEC3	n/a
F00009	March 12, 2004	WPSBMS	CBPSBMS	C2C2	SEC3	n/a
F00012	March 12, 2004	WPSBMS	CBPSBMS	C2C2	SEC3	n/a
IMS00104	October 28, 2003	IMCB0010	BILLLU	MVS2	SOCB	n/a
F00006	August 1, 2003	PSTRAND4	PSTRAND	STLABF1	SOC9	n/a
F00001	June 7, 2003	BILLUIR	PSTRAND	MVS2	SOC9	n/a
F00031	January 11, 2007	COBBLOW	PSTRAND	FAE1	SOC9	SOC9

z/OS Composite Development tools

Transition of Traditional environments to Web and Composite applications

- **SOA / SOAP / XML / Enablement**
- **JCA Support**
- **Service Flow Modeler**
- **HATS**
- **Enterprise Generation Language (EGL) / JSF via Rational Business Developer Extension**
 - ▶ COBOL/CICS generation
 - ▶ Java generation



SCM Options for WDz

- Rational ClearCase
- IBM Software Configuration Library Manager
- Other SCMs
 - ▶ Eclipse plugins
 - ▶ CARMA



IBM Rational ClearCase

ClearCase provides management and control of software development assets

- Provides controlled access to software development assets across the full lifecycle.
- Sophisticated version control, automated workspace management, parallel development support, baseline management, build and release management improves productivity and operational efficiency
- Heterogeneous, cross-platform support for distributed, mainframe (IBM z/OS) and midrange (IBM i5/OS) development enables platform flexibility and enterprise-wide application development
- Security features such as user authentication and audit support help meet internal and external compliance requirements
- Scales from small workgroups to geographically distributed enterprises
- Accessible through local, remote and Web interfaces, and leading IDEs
- Integrates seamlessly with IBM Rational ClearQuest for a comprehensive software change and configuration management solution
- Deep integration with requirements, development, build, test and deployment tools provides a complete end-to-end solution to meet current and future needs



ClearCase Eclipse integration

The image consists of three overlapping screenshots of the Eclipse IDE, demonstrating the integration of IBM ClearCase. Red circles highlight key elements in each screenshot.

- Top Screenshot:** Shows the Eclipse toolbar with the 'Deliver Stream' button (represented by a circular arrow icon) circled in red.
- Middle Screenshot:** Shows the 'ClearCase' menu with 'Deliver Stream...' selected. A red circle highlights this menu item.
- Bottom Screenshot:** Shows a context menu for a project. The 'ClearCase' option is highlighted with a red circle. A sub-menu is visible, showing 'Move Project Into ClearCase...' and 'Add to Source Control...'. Below the menu, a table lists project resources:

Resource	In Folder	Location
is dep...	RMIOrderS...	CDSShop/com/rational/cdsh... line 7 in ...
M] is...	RMIOrderS...	CDSShop/com/rational/cdsh... line 9 in ...
restio...	RMIOrderS...	CDSShop/com/rational/cdsh... line 10 i...
vis de...	RMIOrderS...	CDSShop/com/rational/cdsh... line 10 i...



What is SCLM?

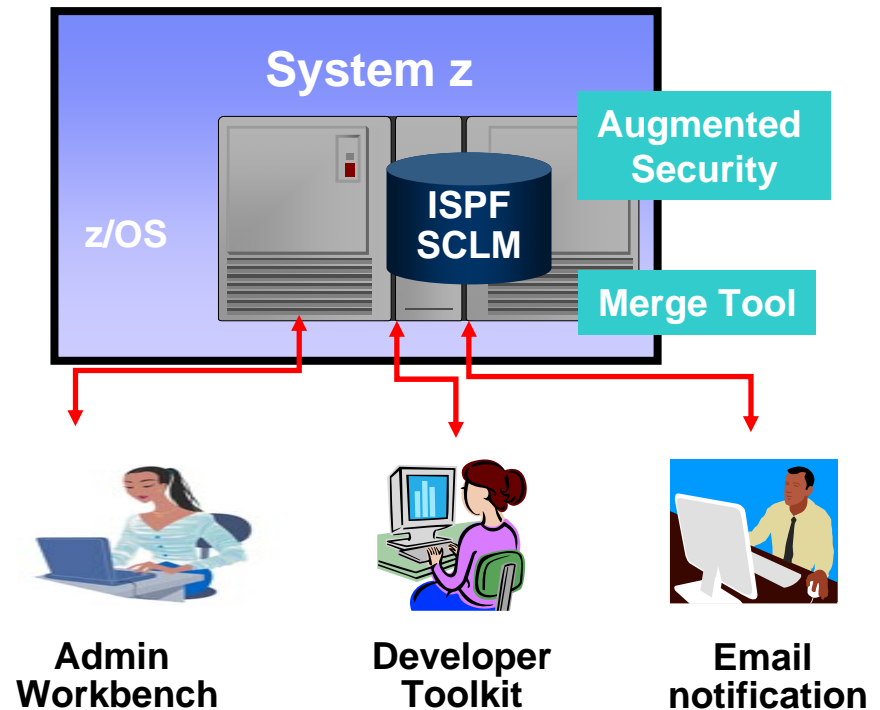
- Did you know that you already have SCLM?
 - ▶ Software Configuration and Library Manager
- It's part of ISPF and it
 - ▶ generates audit trails and provides versioning capability
 - ▶ automatically determines and stores member statistics and include dependencies
 - ▶ uses smart build technology to determine what needs to be recompiled and linked plus where the members are located
 - ▶ controls and enforces object integrity, so that inputs and outputs are in synch and changes don't get lost or overlaid
 - ▶ uses only non-proprietary file structures to store application data and control information



IBM SCLM Advanced Edition

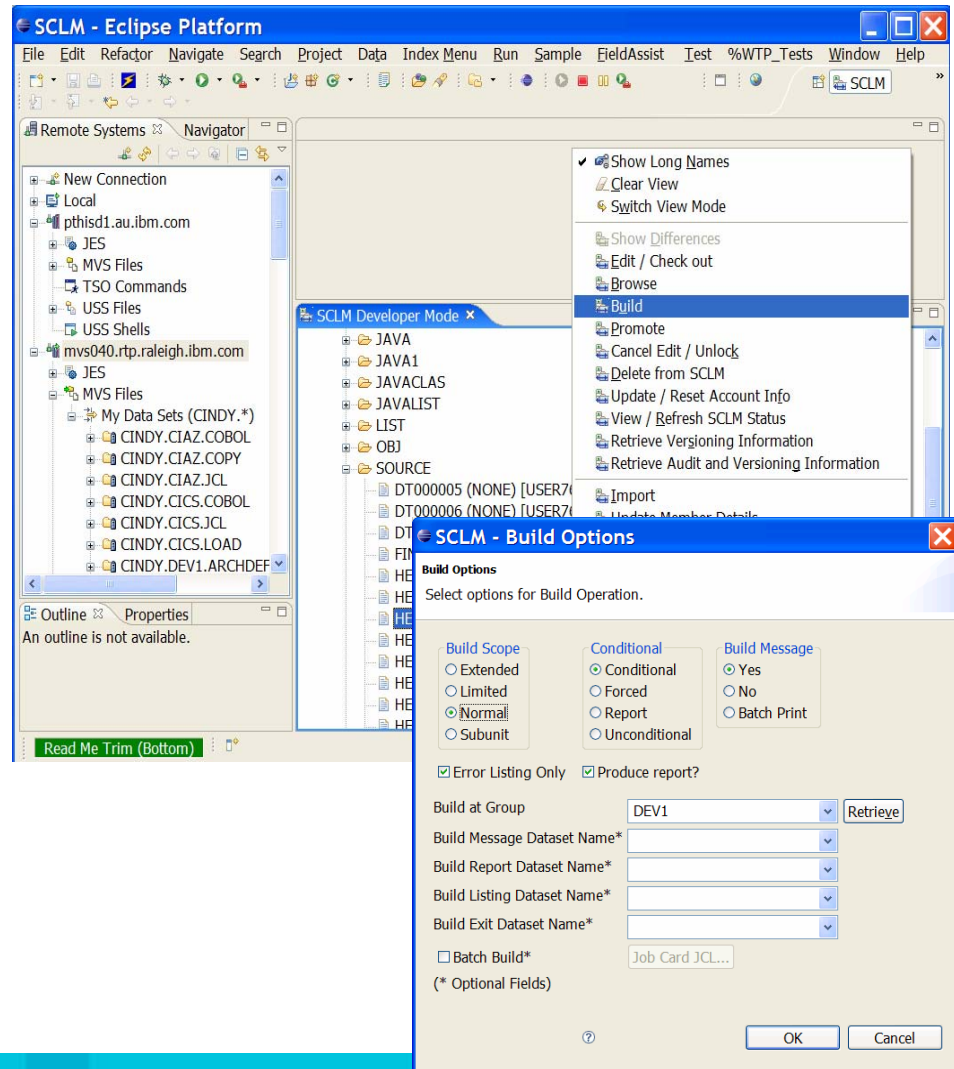
Provides

- ▶ Library and configuration management
- ▶ Package approval processing
- ▶ Granular security controls
- ▶ Easy-to-use three-way merge tool
- ▶ Easy-to-use GUI interface to ease administration tasks
- ▶ Source code management of Eclipse based IDE projects



SCLM Developer Toolkit Integration

- SCLM DT is an Eclipse based tool that extends SCLM services to Eclipse based IDEs, like WDz
- Provides
 - ▶ A transparent IDE-based interface to SCLM
 - ▶ Long file support
 - ▶ A remote portal via SCLM Explorer/Developer view that allows access to other SCLM based products
- Facilitates collaboration between z/OS and non-z/OS developers and the development of composite applications targeted for deployment to WAS/z
- Allows Java/J2EE developers to leverage the security and functionality of SCLM

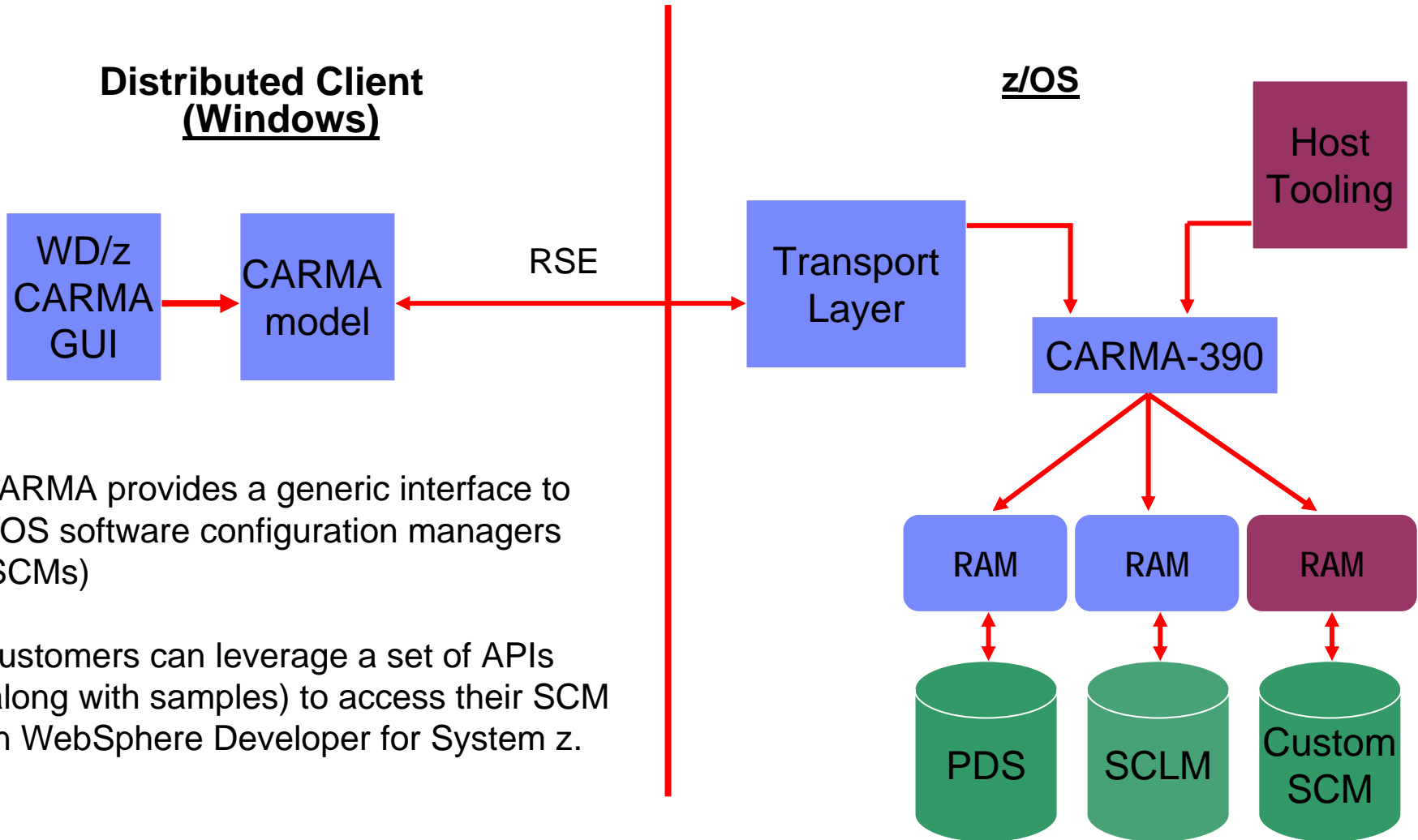


Other vendors provide Eclipse plug-ins for WDz

- Serena Software provides full integration for Serena ChangeMan ZMF with the Eclipse workbench or WebSphere Developer for System z
- Computer Associates provides an Endeavor Eclipse plugin for “native Eclipse” of WebSphere Developer for System z



Common Access Host Repository Manager (CARMA)



CARMA provides a generic interface to z/OS software configuration managers (SCMs)

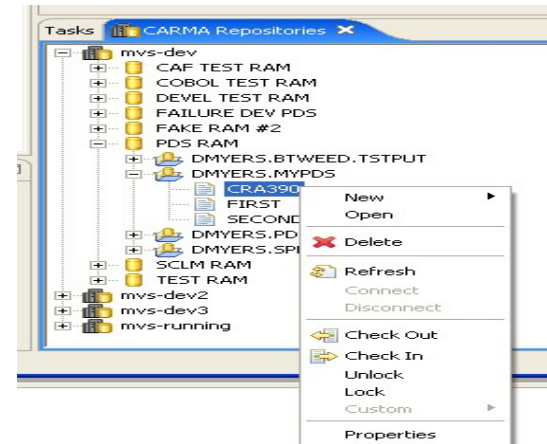
Customers can leverage a set of APIs (along with samples) to access their SCM on WebSphere Developer for System z.

RAM = Repository Access Manager



CARMA: Available Functionality

- Browse
 - ▶ Dynamically access repository contents on the client
 - ▶ Create/Delete SCM members from the client
 - ▶ Restrict the data displayed through RAM-executable filters
- Lock/Unlock
 - ▶ Sends lock/unlock signal to the SCM
- Checkin/Checkout
 - ▶ Sends checkin/checkout signal to the SCM
- Extract/Upload (local and Remote)
 - ▶ Push/Pull file content to/from the SCM and converts the bytes to the appropriate encoding for a local file
 - ▶ Push/Pull file content (bytes) to/from the SCM into a PDS or Sequential file



Customer example - Overview:

- More than three fourths of the developers work on their mainframe applications
- Several different technologies used throughout:
 - ▶ COBOL, CICS, DB2
 - ▶ VA Generator, EGL
 - ▶ Java, JSP
- Tools deployed
 - ▶ IBM Rational ClearCase
 - ▶ IBM WebSphere Developer for System z



A leading retailer of home appliances with more than 500 stores



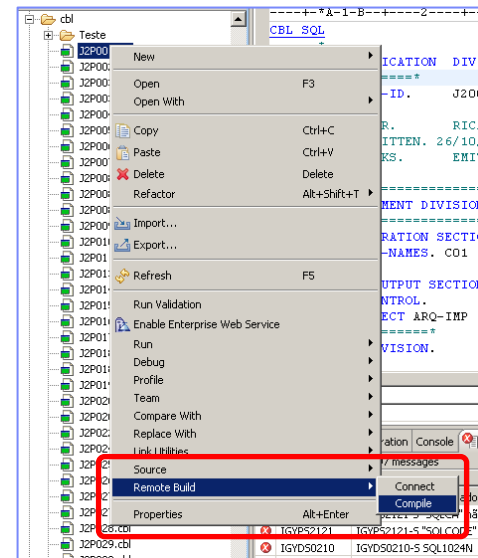
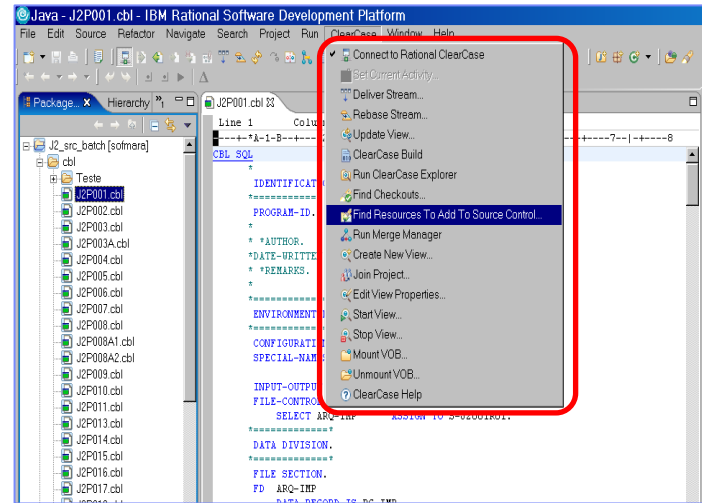
Successes: ClearCase implementation

- ClearCase initially used to control accessory artifacts for the mainframe
 - ▶ Documentation
 - ▶ Forms
 - ▶ Layout files
 - ▶ NO source code
- ClearCase already used in distributed system development
- Second phase: ClearCase adoption for source control
 - ▶ Pilot groups
 - ▶ Integration with z/OS development tools: **WDz**
 - ▶ Leverage of infra-structure already in place
- Successes: Imported the mainframe source code via Perl script and FTP



Integrations: Development tools

- Integration with the development tools used
 - ▶ RAD
 - ▶ RSA
- Integration with WDz
 - ▶ Created customer SCM plugin
 - ▶ A special *plug-in* was developed to enable remote compilation and to invoke the remote compilation tool



Future steps for this WDz and ClearCase user

- Large-scale adoption for mainframe development
- Integration with new development tools (RFT, RPT)
- Requirements management hosted on mainframe



WDz Product Futures

- Support for additional languages, deployment and environments
- SOA Enhancements
- Database Application Generator wizard enhancements
- Greater Asset Analysis integration
- Continued integration with host PD tools
- Greater support for CICS/IMS/DB2 runtimes
- Support for Rational platform initiatives and staying current with dependency code bases
- Product restructuring to achieve greater componentization



These plans are subject to change and do not represent a formal commitment.



For more information

- Whitepapers, datasheets, demos, etc...
 - ▶ WebSphere Developer for System z
 - www.ibm.com/software/awdtools/devzseries
 - ▶ ClearCase
 - www.ibm.com/software/awdtools/clearcase
 - ▶ SCLM Advanced Edition and SCLM Developer Toolkit
 - www.ibm.com/software/awdtools/configmgr



Summary

- Controlling the application development process is growing more important as the development and management of composite applications becomes more complex.
- The integration of WebSphere Developer for System z and configuration management tools such as SCLM Advanced Edition and ClearCase can help you optimize your development process and provides a complete environment for today's composite application development.



Thank
You

The words "Thank You" are rendered in a large, 3D, blocky font. Each letter is filled with a different photograph of a diverse group of people, including men and women of various ethnicities, smiling or looking thoughtfully at the camera. The letters have a slight shadow, giving them a three-dimensional appearance.



Questions

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