Introducing New Skills to System z for Operations and Application Development

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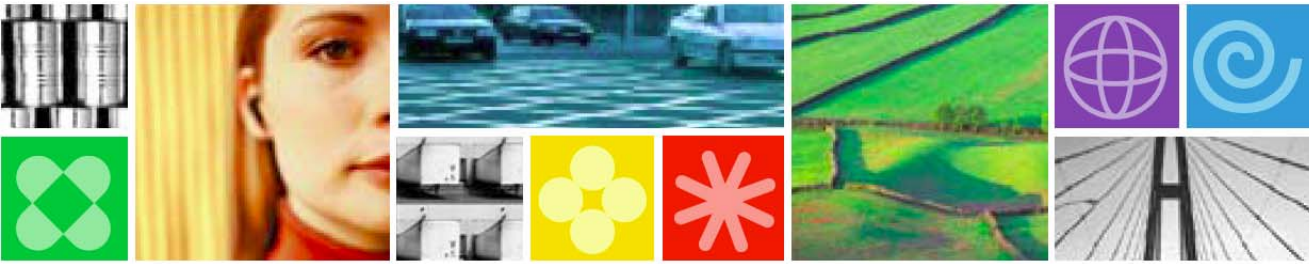
- SWG Competitive Project Office

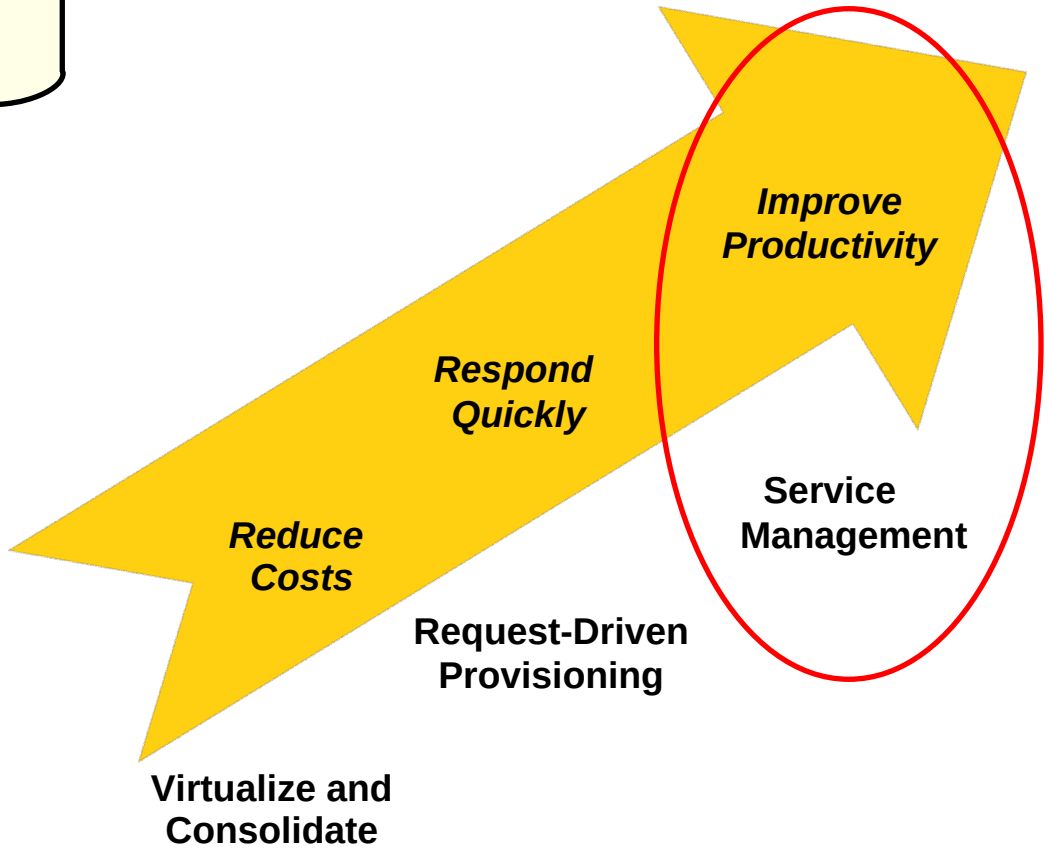


Dynamic Infrastructure For A Smarter Planet

My cost of labor is very high!

Service Oriented Finance Data Center Manager

Let's Focus



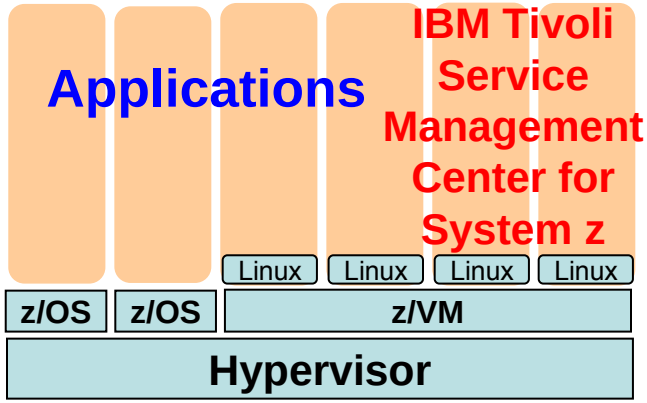
Data Centers Need A Service Management Hub To Meet Service Levels And Reduce Costs

Visibility	Control	Automation
See issues end-to-end in business context	**Standardize IT processes and provide self-service**	**Automate repeating tasks to simplify**
Respond faster and make better decisions	***Improve quality and reduce mistakes***	***Lower costs and build agility***

Solution: ***IBM Tivoli Service Management Center for System z***

Mainframe As A Service Management Hub

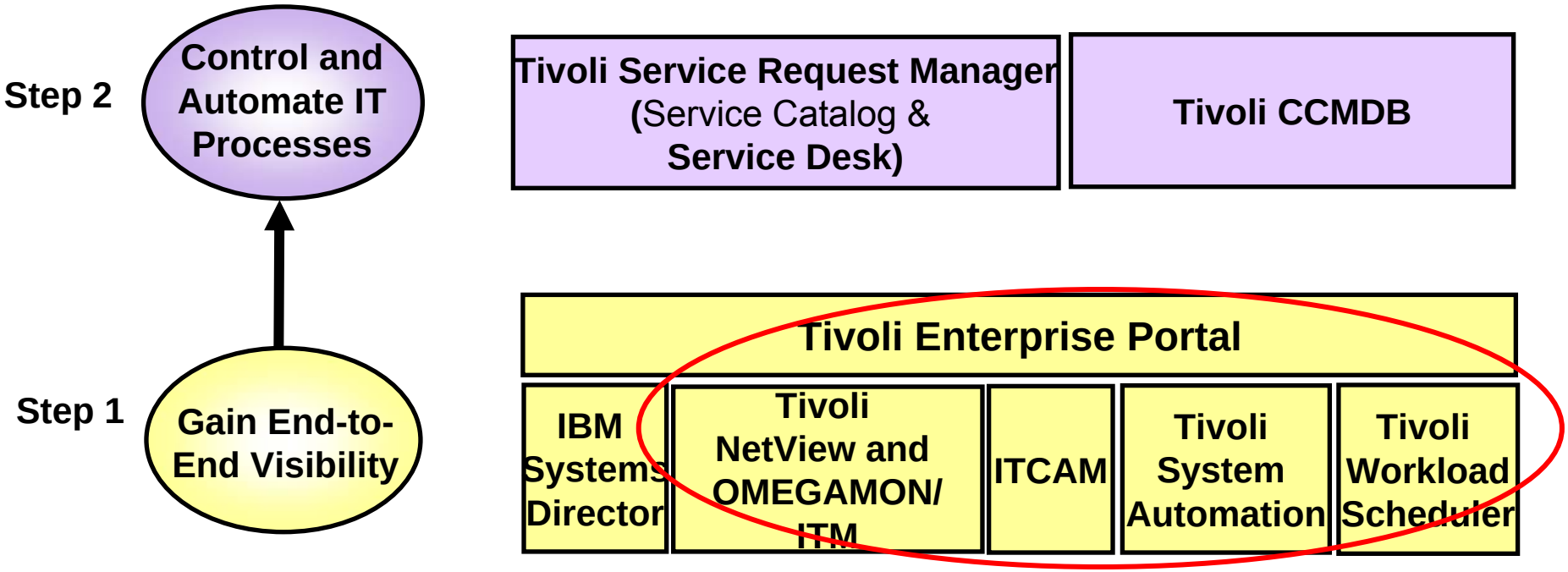
- Consolidate management on the mainframe
  - Service Management hub on Linux on z
  - z/OS supported as a managed system
- Manage the Dynamic Infrastructure
  - Best practices
  - Productivity
  - Lowest Cost



Applications

Systems Management

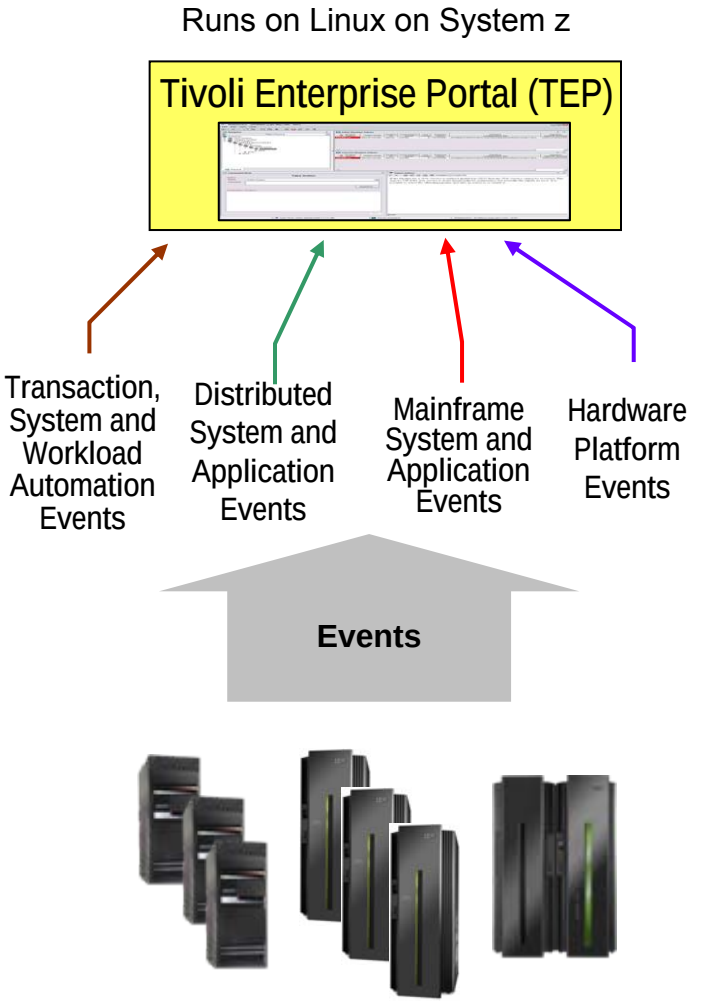
A Step By Step Approach To Implementing Tivoli Service Management Center For System z



Visibility… Control… Automation

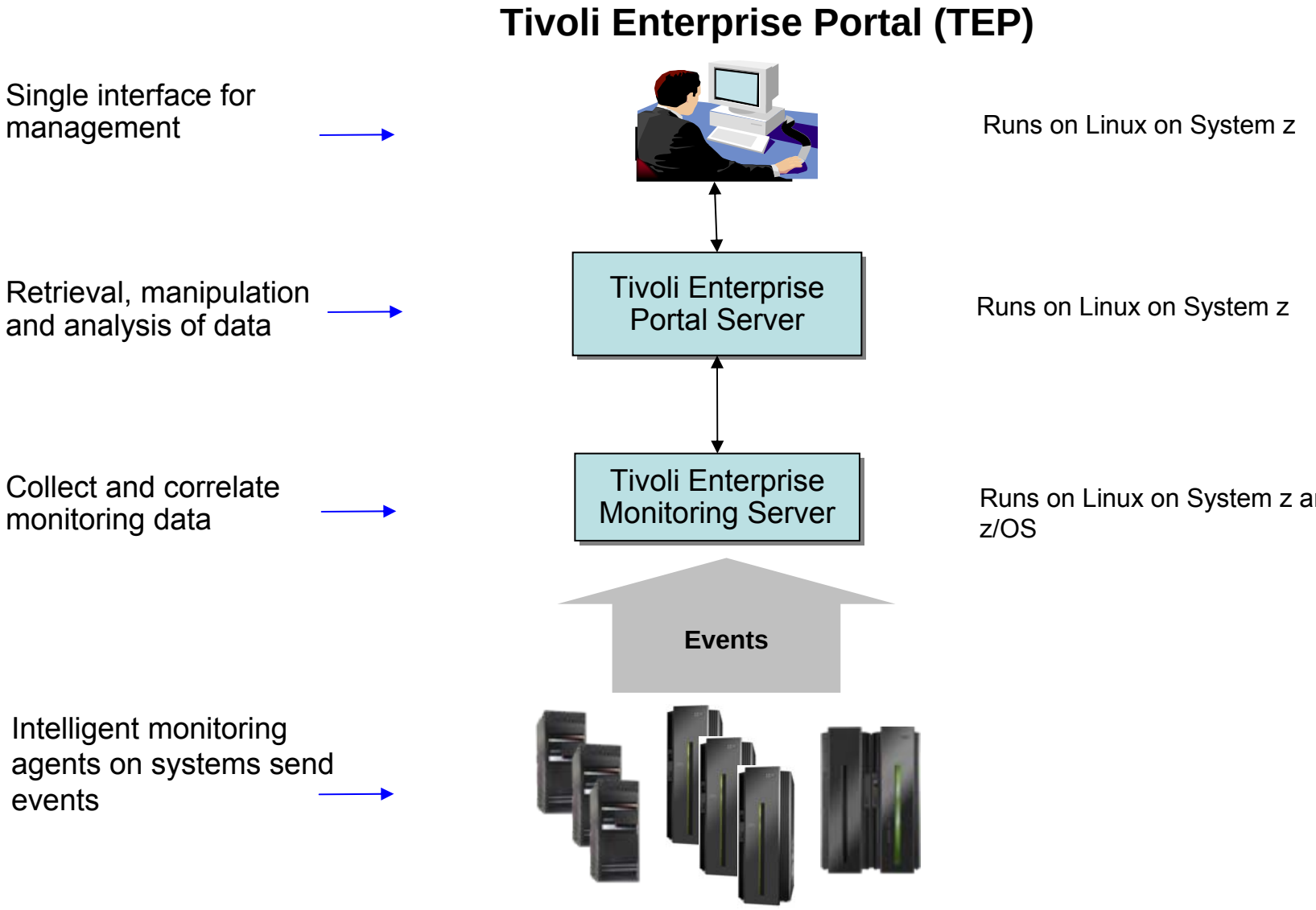
Tivoli Enterprise Portal (TEP) – A Common Monitoring Dashboard On System z

- Resource status/health from various event sources:
  - Hardware events from **IBM Director**
  - Mainframe events from **Tivoli OMEGAMON**
  - Distributed events from **Tivoli Monitoring (ITM)**
  - Transaction events from **Tivoli Composite Application Manager (ITCAM)**
  - System automation events from **Tivoli System Automation (TSA)**
  - Batch workload events from **Tivoli Workload Scheduler (TWS)**
  - Events from 3rd party monitors
- Detect incidents with *situations*
  - Out-of-the-box supplied *situations* include combination of metrics and thresholds
  - Built-in situation editor allows to customize
- *Expert advice* helps obtain detailed explanation and recommendation for resolution
- *Take action* to automatically resolve recurring problems with existing or customized scripts



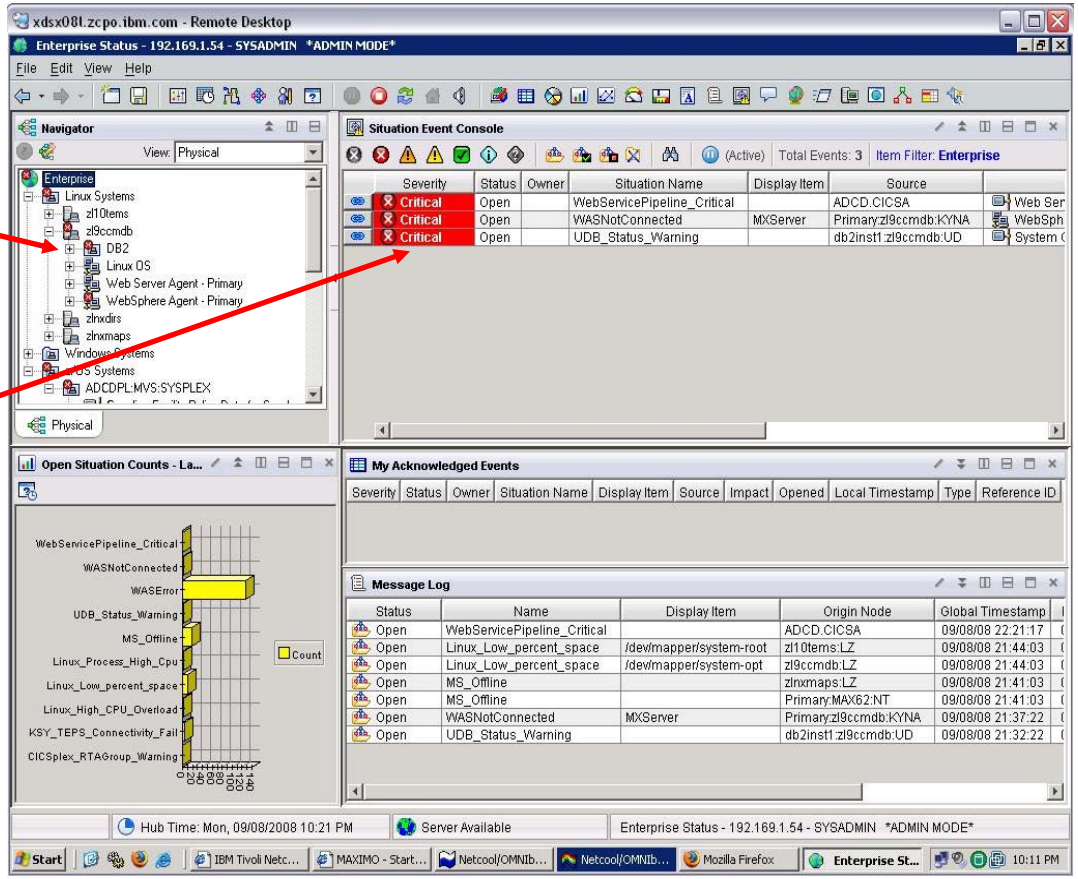
Visibility to What's Going On

End-To-End Visibility With Intelligent Monitoring



DEMO: Tivoli Enterprise Portal (TEP)

- Monitor resources end-to-end with workspaces
- *Situations* triggered by problems, for example:
  - CICS application not responding
  - DB2 application has issues



A Dynamic Role-based Portal for End-to-End Monitoring!

Tivoli NetView And Tivoli OMEGAMON XE – Monitor Mainframe Resources

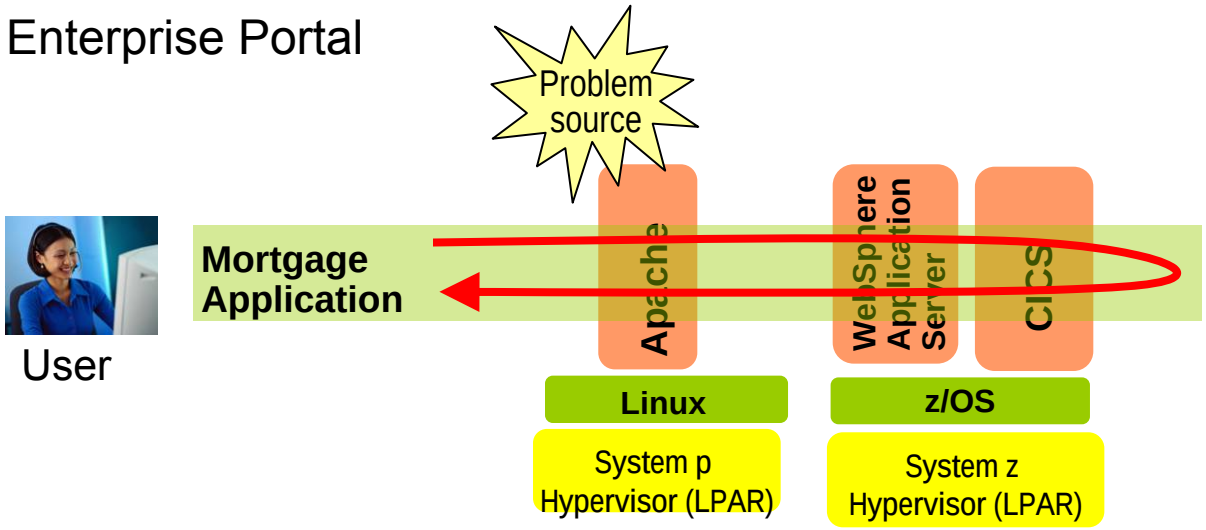
- Tivoli NetView and Tivoli OMEGAMON XE agents for mainframe servers
  - *NetView on z/OS* – monitor and control TCP/IP and SNA networks to help maintain high availability
  - *OMEGAMON XE on z/OS* – monitor key resources such as CPU, LPARs, I/O, network, enqueue, paging, zIIP, zAAP, Cryptoprocessors
  - *OMEGAMON XE on z/VM and Linux* – monitor z/VM and Linux usage of resources such as CPU, network, storage
  - *OMEGAMON XE for Mainframe Networks* – collect data and diagnose network performance issues across z/OS systems
  - *OMEGAMON XE for DB2 PM/PE on z/OS* – monitor performance of DB2 in a z/OS environment
  - *OMEGAMON XE for IMS on z/OS* – manage IMS systems
  - *OMEGMAON XE for CICS on z/OS* – manage CICS systems

Tivoli Monitoring – Monitor Distributed Resources

- Tivoli Monitoring agents for distributed servers
  - *Monitoring* (base) – monitor system resources such as CPU, I/O, network
  - *Monitoring for Database* – monitor availability and performance of distributed databases such as DB2, Oracle, Microsoft SQL Server
  - *Monitoring for Business Integration* – manage IBM WebSphere MQ, WebSphere MQ Integrator, WebSphere MQ Workflow and IBM WebSphere Interchange Server
  - *Monitoring for Applications* – monitor SAP
  - *Monitoring for Messaging and Collaboration* – monitor Lotus Domino

Tivoli Composite Application Manager (ITCAM) – End-To-End Transaction And SOA Management

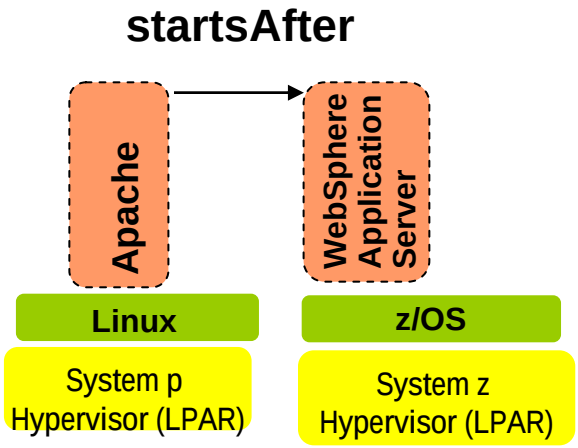
- Tracks transaction performance end-to-end across multiple physical and/or virtual systems to isolate bottlenecks quickly
  - Isolate source of performance problem across web servers, WebSphere and WebLogic application servers, CICS, IMS and DB2 subsystems, as well as ERP environments
- Monitors and performs simple control of message traffic between Web services in the SOA environment
  - Filter messages based on user-configurable criteria
- Sends events to Tivoli Enterprise Portal



Visibility to Track End-To-End Transactions

Tivoli System Automation (TSA) – Automate System Operations

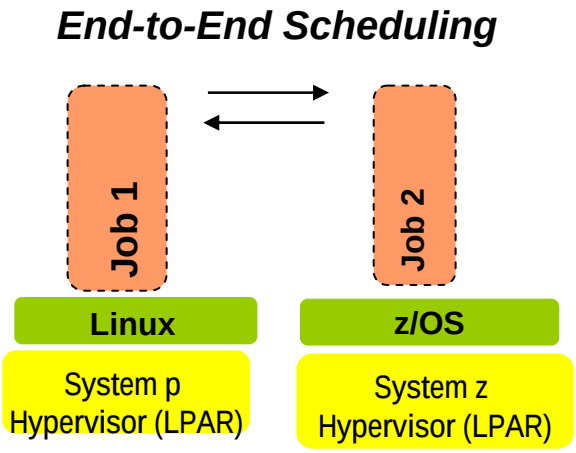
- Automate operations on hardware, I/O and applications
- No Scripts, policy-based automation
- Can manage relationship between resources and grouping of resources to automate at application level
- Includes out-of-the-box automation modules for middleware such as IMS, CICS, DB2, mySAP, WebSphere
- Can enable end-to-end application startup and shutdown across System z and distributed platforms
- Sends events to Tivoli Enterprise Portal



Automate Routine Operations

Tivoli Workload Scheduler (TWS) – Batch Workload Automation

- Enables planning for hundreds of thousands of jobs, resolves interdependencies, launches and tracks each job
- Powerful calendar-based and event-based scheduling capabilities
- Automatic recovery of jobs
- Workload Manager (WLM) integration to optimize resource utilization and favor late critical jobs
- Provides a single point of control for System z workloads or enterprise-wide workloads in end-to-end environments
- Sends events to Tivoli Enterprise Portal



Automate Job Scheduling

Control And Automate IT Processes

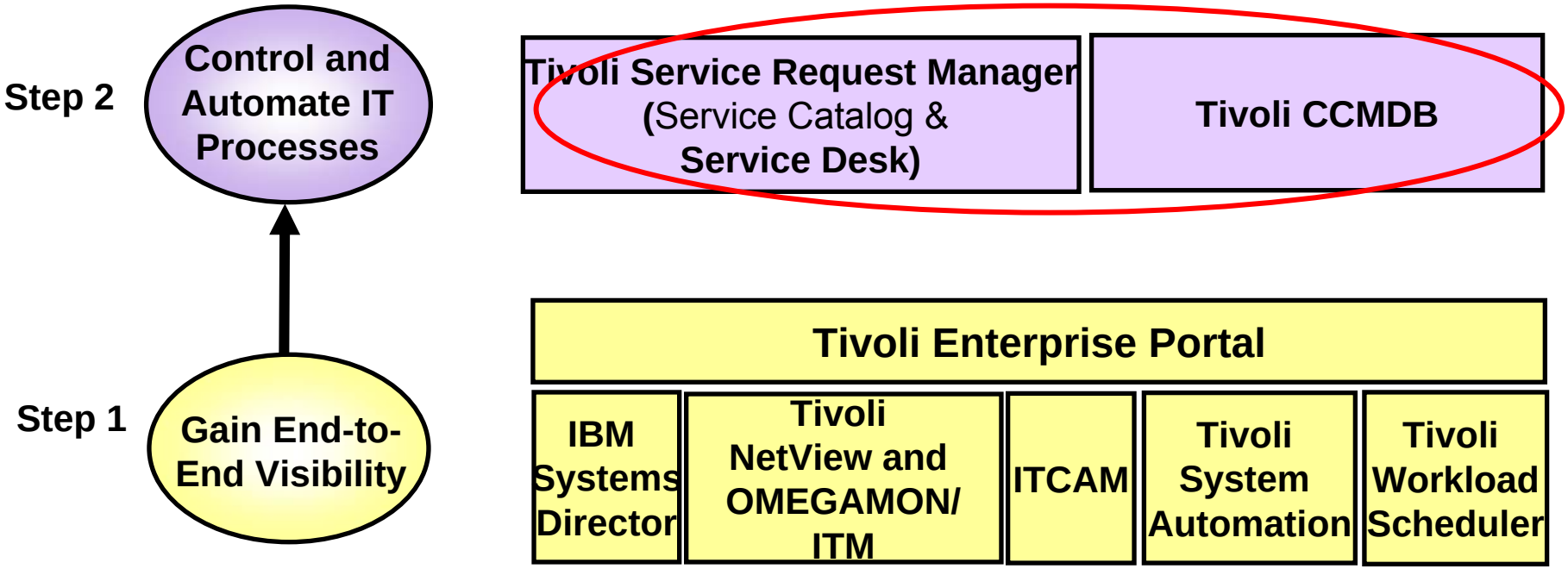
One of my key staff members is leaving.

My new employees don't have the experience to handle problems when they come up.

Data Center Manager

New Employee

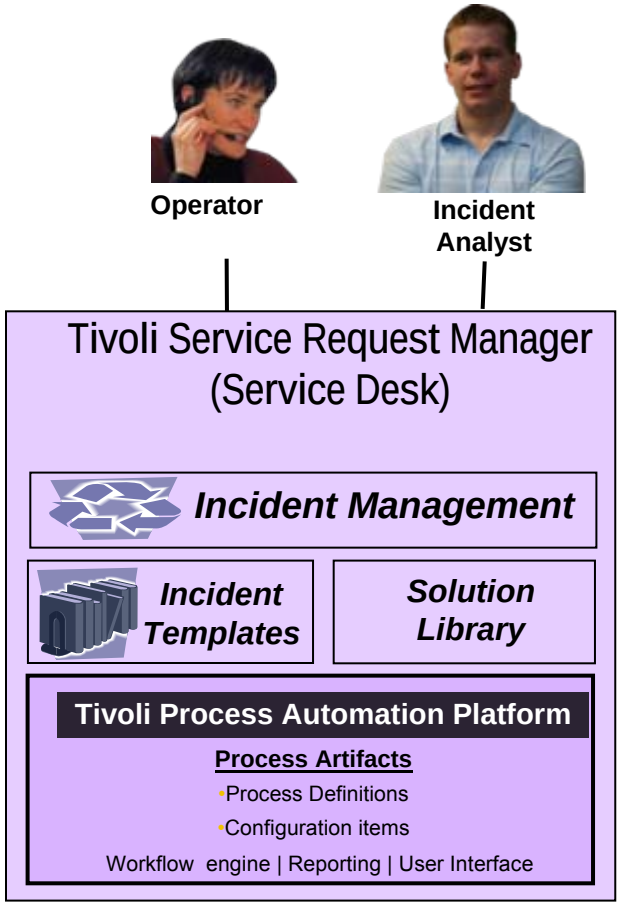
A Step By Step Approach To Implementing Tivoli Service Management Center For System z



Visibility… Control… Automation

Tivoli Service Request Manager (Service Desk) – Control Incident Management Process

- Central point to control service requests for help, information and service
- Create incident templates for common service desk calls and library of reusable solutions
  - Use templates to quickly create tickets
  - View updates and search library for solutions
- Automate incident management process
- Built on the common Tivoli Process Automation Platform to enable integration with other processes via common UI, common workflow engine, common database

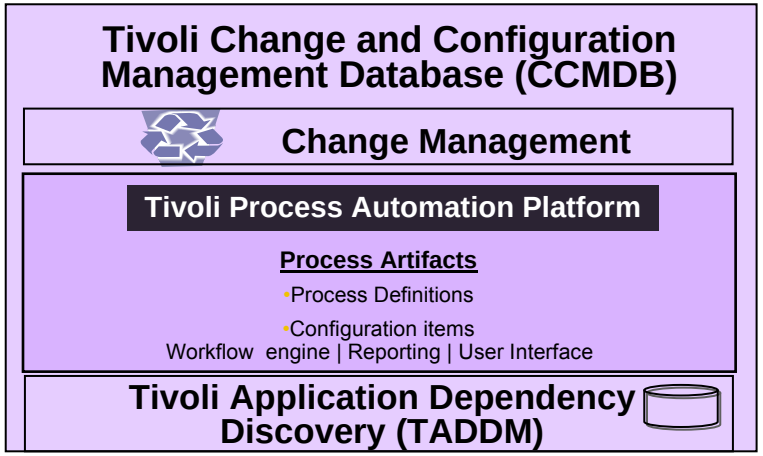


Runs on Linux on System z

Capture and Execute Best Practices

Tivoli Change And Configuration Management Database (CCMDB) – Discover And Manage Changes

- Discover assets and keep track of changes
  - Discovery library adapter for z/OS
  - 200 out-of-the-box sensors discover distributed resources
- Automated dependency mapping via application descriptors
  - Capture information about modules in business applications via descriptors
- Leverages common Tivoli Process Automation Platform to enable integration of change process with other processes
  - Common UI
  - Common workflow engine
  - Common database



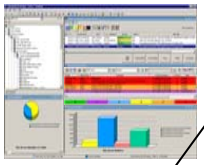
Out-of-the-box Automated Discovery

Auto Discover New Assets

Tivoli CCMDB – Control And Automate Change Management Process

- Associate change window with configuration items (managed assets)
  - Check for schedule conflicts
  - Prevent changes from occurring outside defined window
- Identify the impact of implementing a change
  - Identify and record impacted configuration items using discovered relationship data
  - Subject Matter Experts can document assessment results
  - Get Approvals from all stakeholders before implementing change
- Out-of-the-box best practices and customizable change management process

Mainframe As A Service Management Hub With Tivoli Service Management Center For System z



Applications

Agents

Agents

IBM Tivoli Service Management Center for System z

Tivoli Enterprise Portal

Tivoli Workload Scheduler
Tivoli System Automation
ITCAM
Tivoli NetView and
OMEGAMON/ITM

IBM Systems Director

Tivoli Service Request Manager (Service Desk and Service Catalog)

Tivoli CCMDB

Linux | Linux | Linux | Linux

z/OS | z/OS | z/VM

Hypervisor

Management Focal Point

System Management Software Costs Less On A Consolidated zLinux Platform

Here are more cost savings…

It costs less to install system management software on zLinux than it does to install comparable software in the unconsolidated environment

IBM

Tivoli Or CA Solution Used To Manage 100 Distributed Linux Servers

WAS/DB2

100 Servers (200 PVU or Quad-core for each server)

3 authorized administrator licenses; 8 concurrent administrator licenses*

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

OR

CA CMDB

CA Change Manager

CA Service Desk

CA Unicenter (WebSphere, DB2)

Tivoli software total (5 yr): $1,567,960

CA software total (5 yr): $4,883,993

*Customer case used as a basis – 1 authorized user per 40 servers , 1 concurrent user per 13 servers

Tivoli Or CA Software (Distributed) Pricing

Parts	1st Year	2nd- 5th Year Maintenance
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$50,000	$40,000
Tivoli CCMDB (authorized user)	$3,150	$2520
Tivoli CCMDB (concurrent user)	$21,040	$16,800
TSRM (authorized user)	$8,250	$6,600
TSRM (concurrent user)	$55,040	$44,160
ITCAM for Applications (PVU)	$650,000	$520,000
TOTAL	$871,080	$696,880

Parts	1st Year	2nd- 5th Year Maintenance
CA CMDB	$50,000	$40,000
CA CMDB Agent	$100,000	$80,000
CA Change Manager	$10,000	$8,000
CA Change Manager (user)	$5385	$4,308
CA Service Desk (user)	$38,500	$30,800
CA Unicenter (WebSphere, DB2)	$2,509,400	$2,007,600
TOTAL	$2,713,285	$2,170,708

5 year Tivoli Total: $1,567,960

5 year CA Total: $4,883,993

Tivoli Solution Used to Manage 100 Distributed Linux Servers w/TSA & TWS

WAS/DB2

100 Servers (200 PVU or Quad-core for each server)

3 authorized administrator licenses; 8 concurrent administrator licenses*

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

Tivoli System Automation

Tivoli Workload Scheduler

Tivoli software total (5 yr): $3,793,960

Parts	1st Year	2nd- 5th Year Maintenance
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$50,000	$40,000
Tivoli CCMDB (authorized user)	$3,150	$2,520
Tivoli CCMDB (concurrent user)	$21,040	$16,800
TSRM (authorized user)	$8,250	$6,600
TSRM (concurrent user)	$55,040	$44,160
ITCAM for Applications (PVU)	$650,000	$520,000
Tivoli System Automation (PVU)	$660,000	$528,000
Tivoli Workload Scheduler (PVU)	$576,000	$462,000
TOTAL	$2,107,080	$1,686,880

*Customer case used as a basis – 1 authorized user per 40 servers , 1 concurrent user per 13 servers

Tivoli Solution Used To Manage Consolidated Environment On VMware

WAS/DB2

13 physical servers to consolidate (400 PVU or 8-core for each server)

1 authorized administrator licenses; 1 concurrent administrator licenses*

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

Tivoli System Automation

Tivoli Workload Scheduler

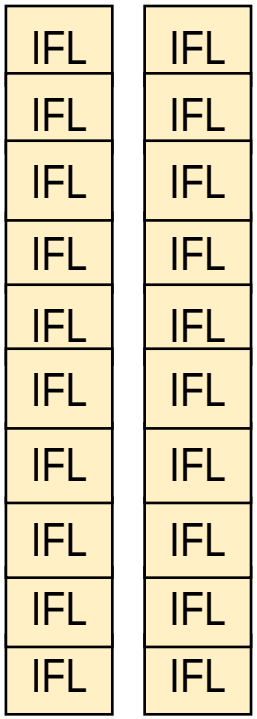
Tivoli software total (5 yr): $1,086,160

Parts	1st Year	2nd- 5th Year Maintenance
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$6,500	$5,200
Tivoli CCMDB (authorized user)	$1,050	$840
Tivoli CCMDB (concurrent user)	$5,260	$4,200
TSRM (authorized user)	$2,750	$2,200
TSRM (concurrent user)	$13,760	$11,040
ITCAM for Applications (PVU)	$169,000	$135,200
Tivoli System Automation (PVU)	$149,760	$120,120
Tivoli Workload Scheduler (PVU)	$171,600	$137,280
TOTAL	$603,280	$482,880

*Customer case used as a basis – 1 authorized user per 40 servers , 1 concurrent user per 13 servers

Tivoli Solution On zLinux Used To Manage Consolidated Environment On zLinux

WAS/DB2



20 IFL on System z EC to consolidate on System z (120 PVU each)

1 authorized administrator license; 2 concurrent administrator license

manage

Tivoli CCMDB

Tivoli Service Request Manager

ITCAM for Applications

Tivoli System Automation

Tivoli Workload Scheduler

5 year Tivoli software total on System z: $617,020

Parts	1st Year	2nd- 5th Year (Maint)
Tivoli CCMDB (base)	$83,600	$66,800
Tivoli CCMDB (VU)	$10,000	$8,000
Tivoli CCMDB (authorized user)	$1,050	$840
Tivoli CCMDB (concurrent user)	$5,260	$4,200
TSRM (authorized user)	$2,750	$2,200
TSRM (concurrent user)	$13,760	$11,040
ITCAM for Applications (PVU)	$78,000	$62,400
Tivoli System Automation (PVU)	$69,120	$55,440
Tivoli Workload Scheduler (PVU)	$79,200	$63,360
TOTAL	$342,740	$274,280

Better Application Lifecycle Management (ALM) Across The Enterprise

My development teams support a variety of platforms that our applications span, especially System z. I need ALM tools that support *ALL* my platforms

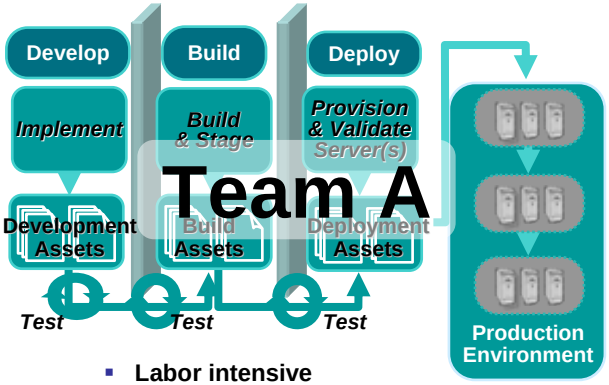
Service Oriented Finance Development Manager

You can break down developer silos and close gaps between tiers with the Rational Change and Release Management tools

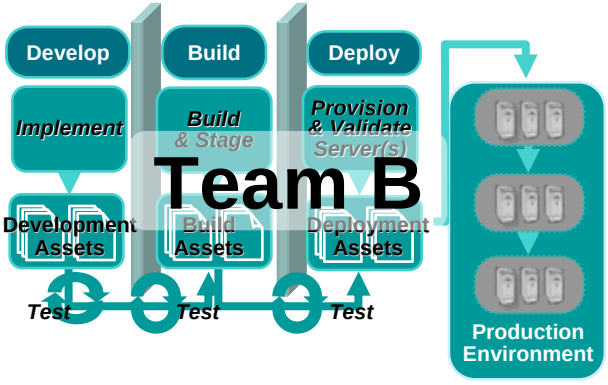
IBM

Change & Release Management Challenges

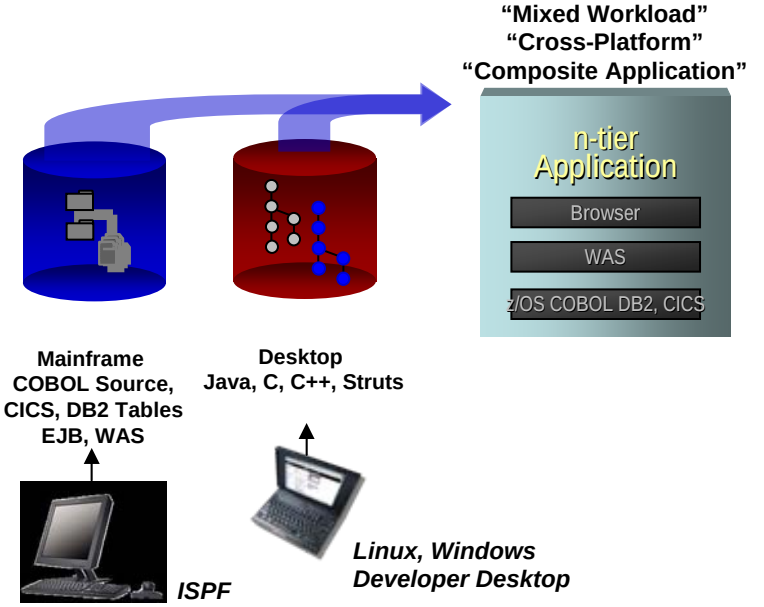
- Each team works separately
  - Difficult to track migrations and builds
  - No shared processes, artifacts or controls
  - “Over the wall” communication



- Labor intensive
- Error prone handoffs

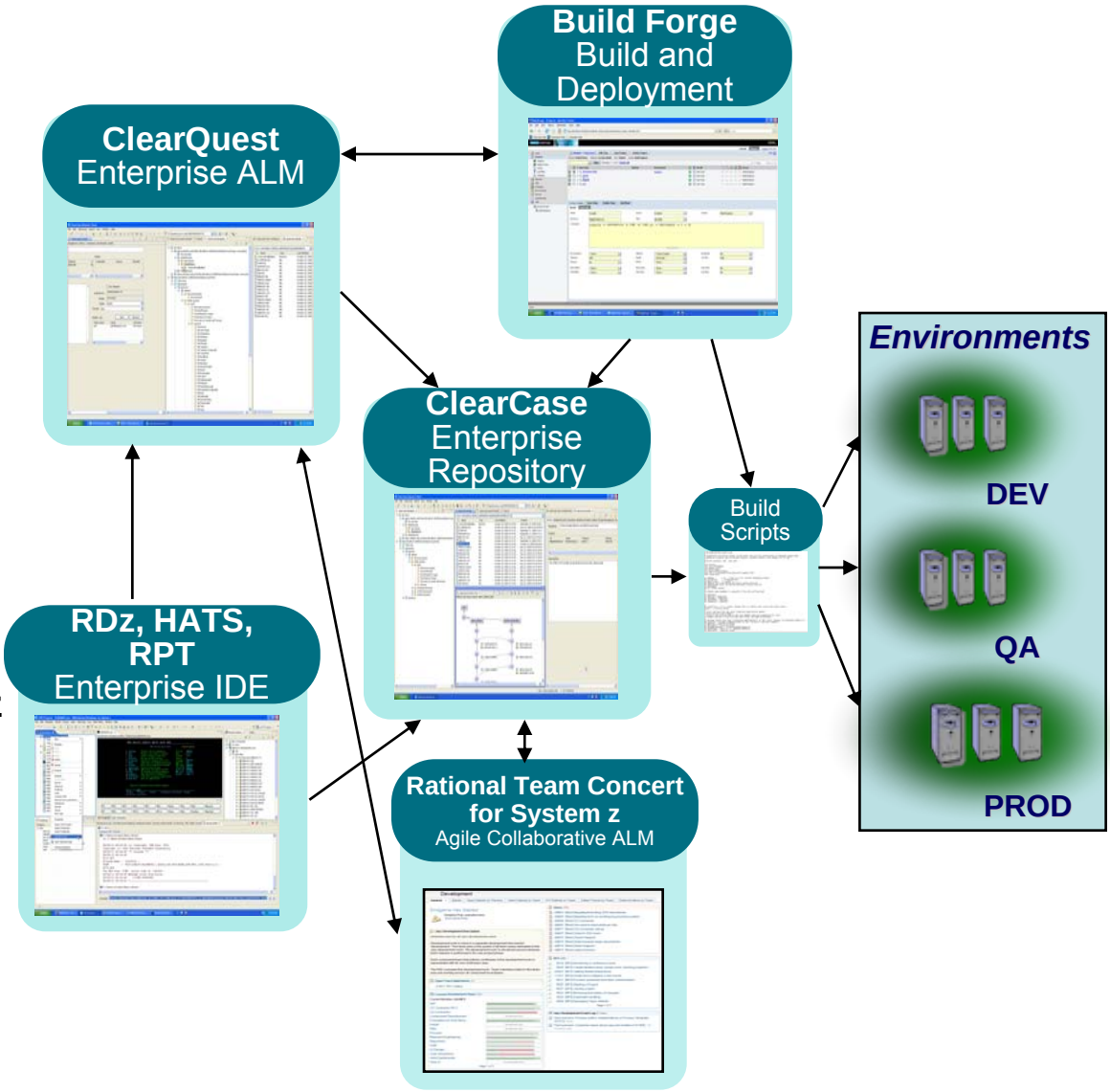


- Mixed platforms/inconsistent functions
  - Parallel activities (new development, maintenance)
  - Inconsistent user interface & processes
  - Manual, heterogeneous build/deploy
  - Uncoordinated promotions & backout

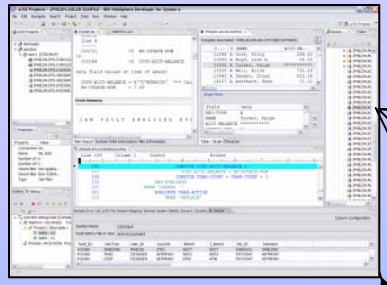


IBM Rational Change and Release Management for System z Tools Address These Challenges

- **Rational ClearQuest**
  - **Manages the activities** of software delivery for any size team
    - Customizable, automated workflows
- **Rational ClearCase**
  - Enterprise repository to **manage the artifacts** of software delivery
    - Wide-range of cross-platform support
- **Rational Build Forge**
  - **Manages build** and **deployment** across the enterprise
    - Automate & standardize software assembly processes
- **Rational Team Concert for System z**
  - Agile, strategic collaborative ALM for small/medium teams
    - Leverage your existing investments in the three tools above
- **Eclipse-based Enterprise IDE**
  - Integrated clients for all the development tools you need



The Enterprise Environment



Eclipse-based
IBM Client
Windows & Linux

RAD
RDz
HATS
RPT
WTE
and standalone clients

Clear Quest

Build Forge

Unix, Windows & Intel Linux

BF Agent

Clear Case

Unix, Windows & Intel Linux

Clear Case

Linux on System z

z/OS Build

ISPF Client

IBM PD Tools

BF Agent

RDz Connectors

z/OS

Streamline Development With A Common Software Delivery Tool Set

My development teams work across platforms. I need to *save money* with a single integrated set of software tools

Service Oriented Finance Development Manager

Rational tools have a common look and feel to enable all team members to collaborate with a single strategic platform. Let's see how

IBM

Use Tools To Quickly Reuse, Modernize And Test Code To Extend What You Already Have

Budgets are tight. I need tools that let me easily reuse, modernize and *extend* what I've got now using my existing staff

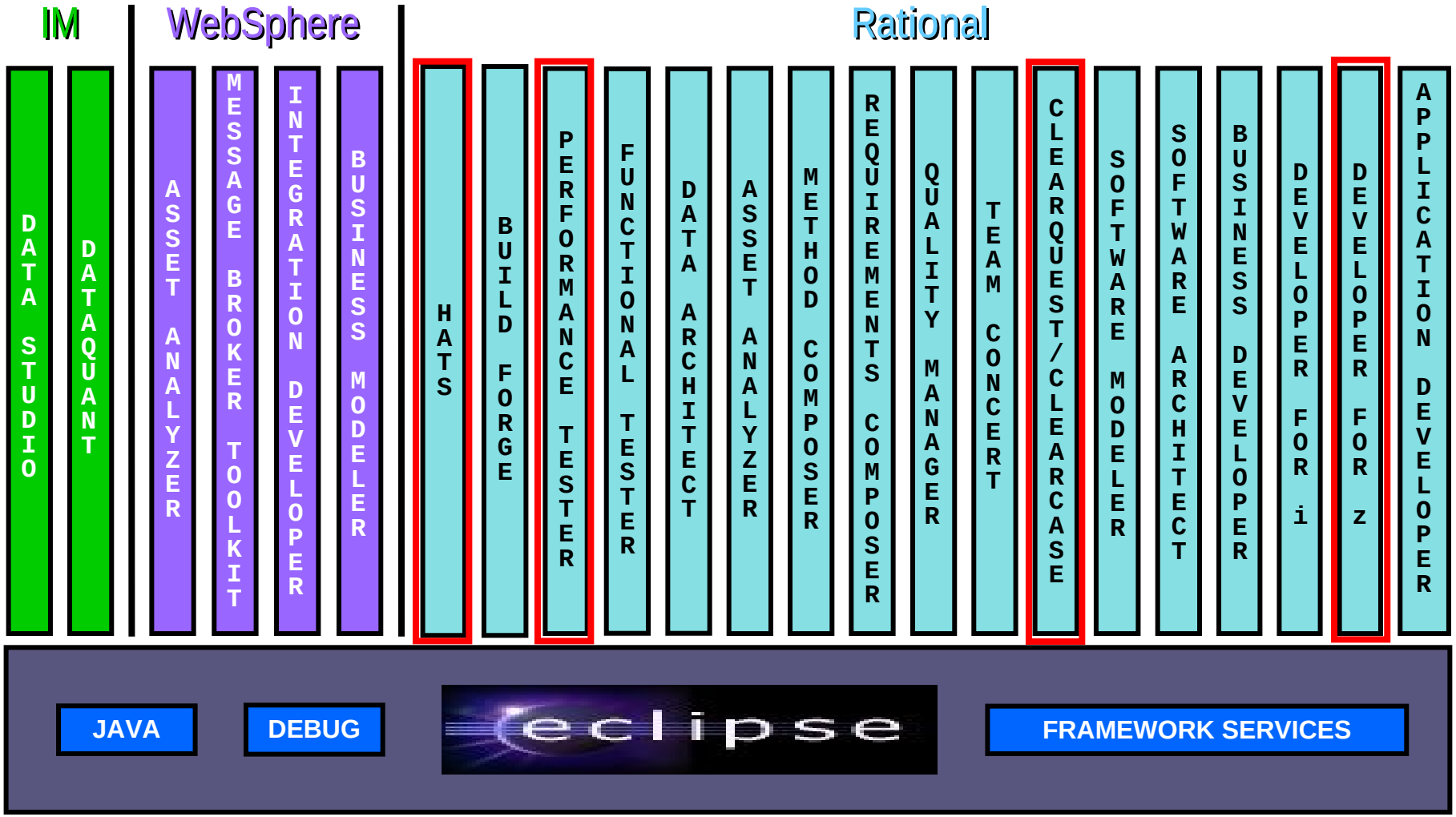
Service Oriented Finance Data Center Manager

Let's see how easy it is to *transform your 3270 green screens* to make them available from a Web browser for quick ROI

IBM

The IBM Software Delivery Tools Are Built On Eclipse

A common platform provides a *common Look and Feel* for *All* tools



A *subset* of tools is shown

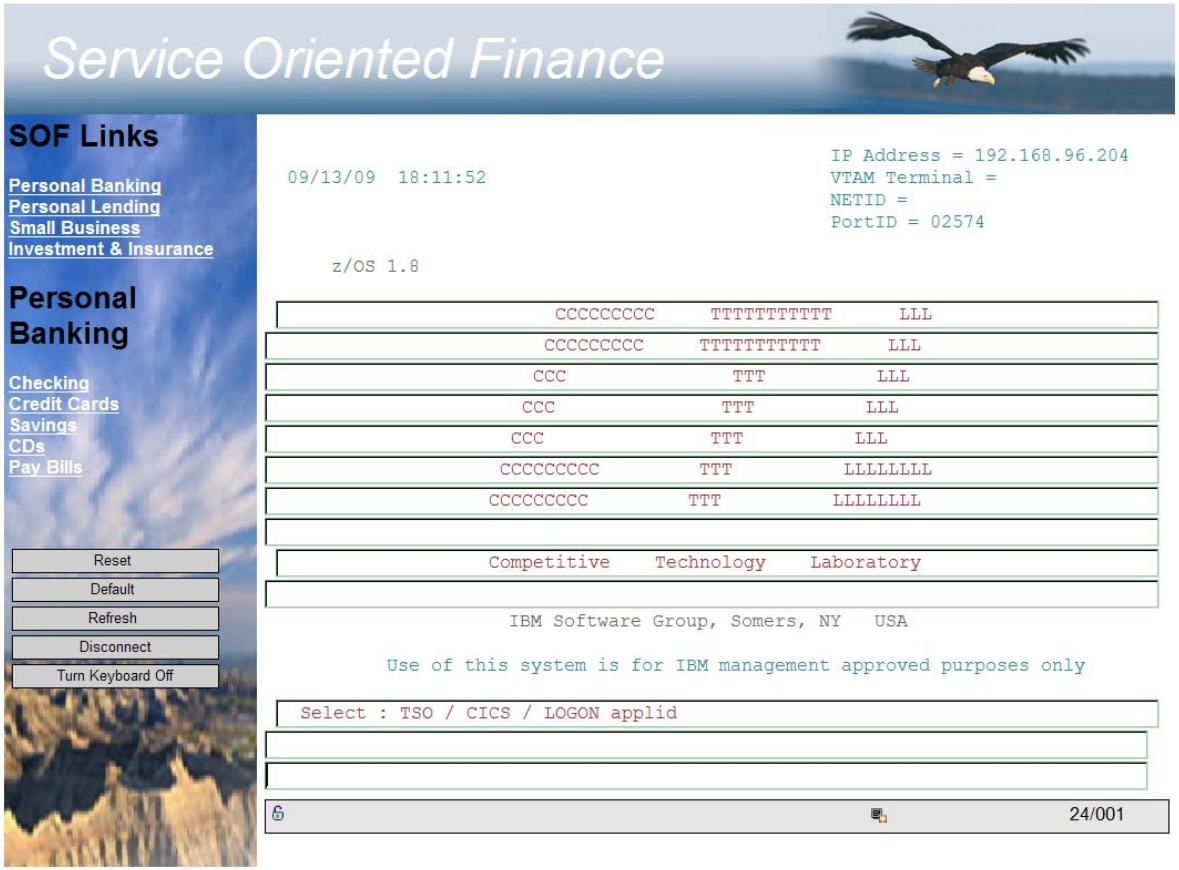
Extend Existing Applications With Minimal Cost Using HATS – *Host Access Transformation Services*

What can you do with HATS?

- Quickly and easily create Web, portal, mobile or rich client applications from your green-screen applications
  - Without programming
  - Low skills requirement
  - Transformation “on the fly”
  - Iterative development process
  - Highly customizable
- Reuse your existing assets
  - As Web services, in an SOA
- Create work flow from multiple apps
- Integrate with other Web, portal, and rich client applications

DEMO: HATS Green Screen Transformation

Let's look at the GUI development tooling and then see how easy it is to use HATS to take a green screen app and transform it into a Web application



There Are Efficient Ways To Extend Other Mainframe Assets As Web Services

Generate Web services code from proven assets to keep risk low in a Service-Oriented Architecture

- CICS Web services
- IMS Web services
- Java Web services
- CICS Service Flow Modeler
  - Supports CICS Service Flow Feature
  - Wizards to build service flows out of your existing COMMAREA-, WSDL-, and Terminal-based CICS applications
  - Then expose flows as Web services
- And more…

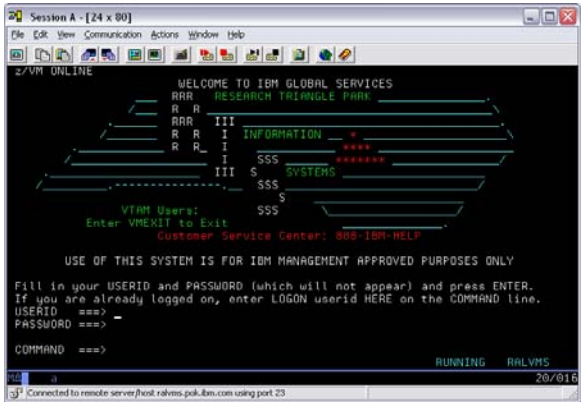
Testing Tools Are Built On The Same Platform – *Rational Functional Tester*

- Also Eclipse-based
- Use Rational Functional Tester
  - Record/Enhance/Execute scripts on Windows/Linux
  - Functional test any .NET, Web, or Java application (z or non-z)

.NET, Browser, Java UI

- Use Rational Functional Tester Extension for Terminal-based Applications
  - Record/Enhance/Execute scripts on Windows
  - Functional test System z terminal based applications

System z Terminal UI



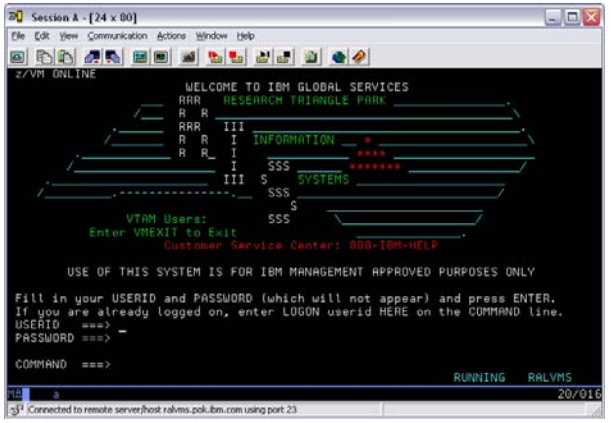
Rational Performance Tester And Workload Simulator

- Use Rational Performance Tester for z/OS
  - Develop scripts on Windows or Linux
  - Execute scripts on z/OS
  - Performance test any Web application (z or non-z)

Any Web Application

- Use IBM Workload Simulator for z/OS and OS/390
  - Develop scripts on z/OS
  - Execute scripts on z/OS
  - Performance test any System z terminal application

System z Terminal Application



Remove Barriers Between Mainframe And Non-Mainframe Programming

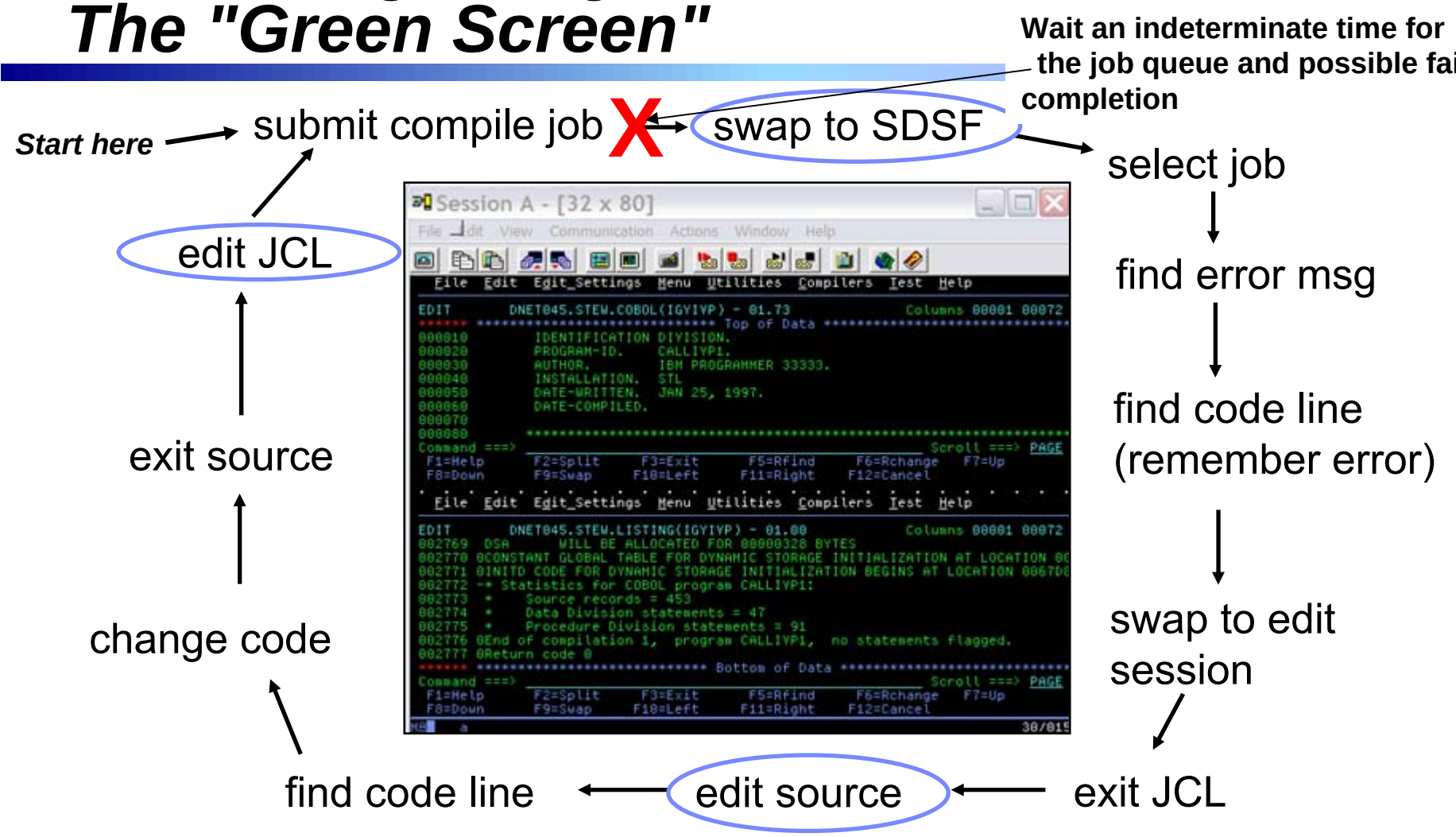
I need my mainframe programmers and distributed developers to use the same tools so they can help each other

Service Oriented Finance Development Manager

The Rational tools enable end-to-end development and debugging helping to make all developers more efficient

IBM

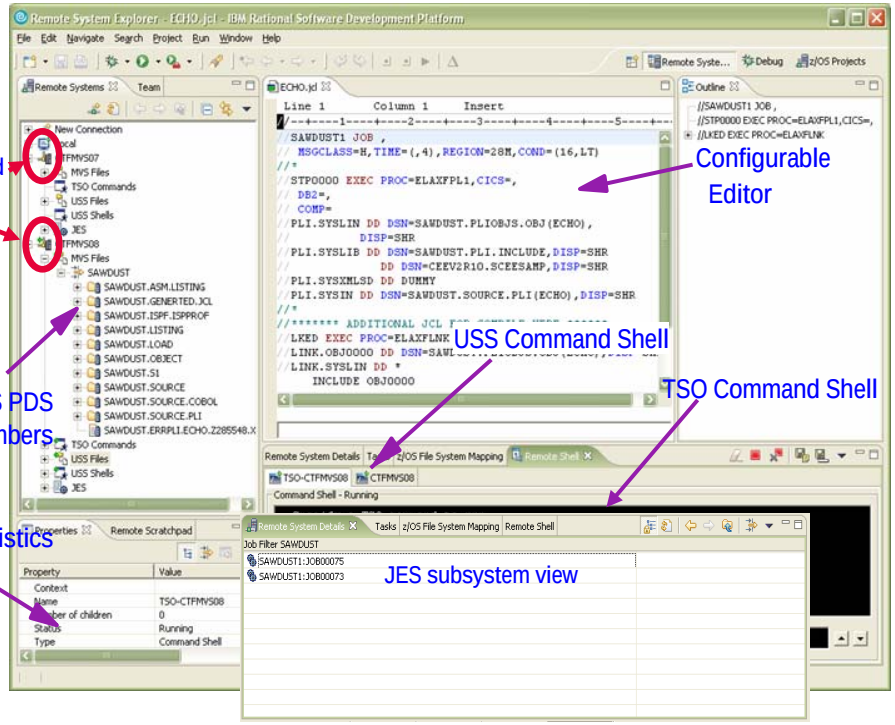
In The Beginning, There Was ISPF
The "Green Screen"

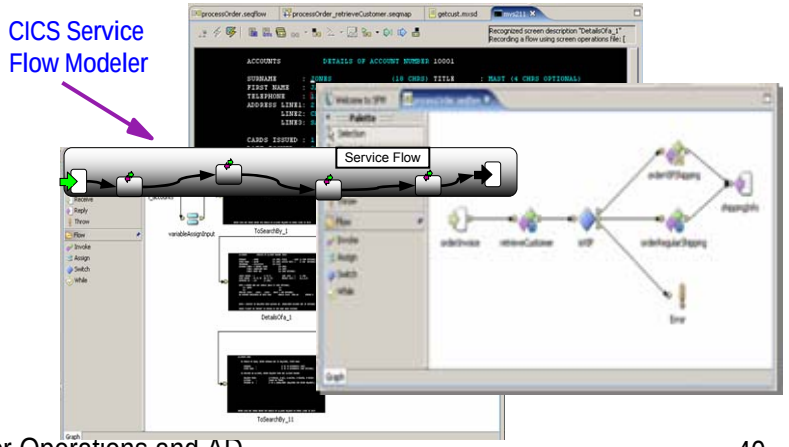


- Programmer goes through a sequence of screens in order to get the job done
  - ISPF 3.4 listings, job listings, SDSF outputs, etc.
- Programmer is constantly flipping back and forth between these ISPF screens

Instead Use *Rational Developer for System z* To Work With Mainframe Assets Using A Modern Workstation-based Tool

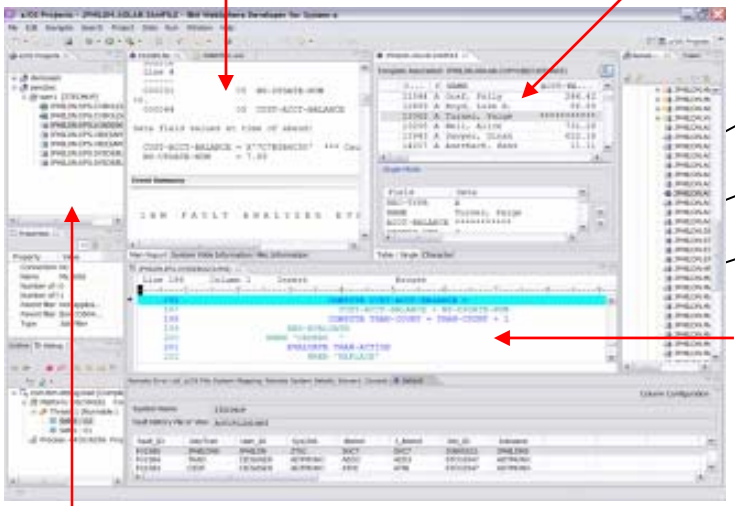
- **What is RDz?**
  - Eclipse-based IDE speeding modern mainframe application development
  - One IDE for mainframe and non-mainframe
- **RDz supports Enterprise Modernization**
  - Support for COBOL, PL/I, C, C++, HLASM, Java, EGL and Web services
  - Supports new and existing runtimes
    - CICS, IMS, Batch, USS, DB2, WAS
  - Interactive access to z/OS for
    - Development, debug, job generation, submission, monitoring, command execution
- **RDz supports SOA**
  - Enables CICS and IMS applications for Web services and SOA
  - Supports for JEE, JCA, XML, Web services



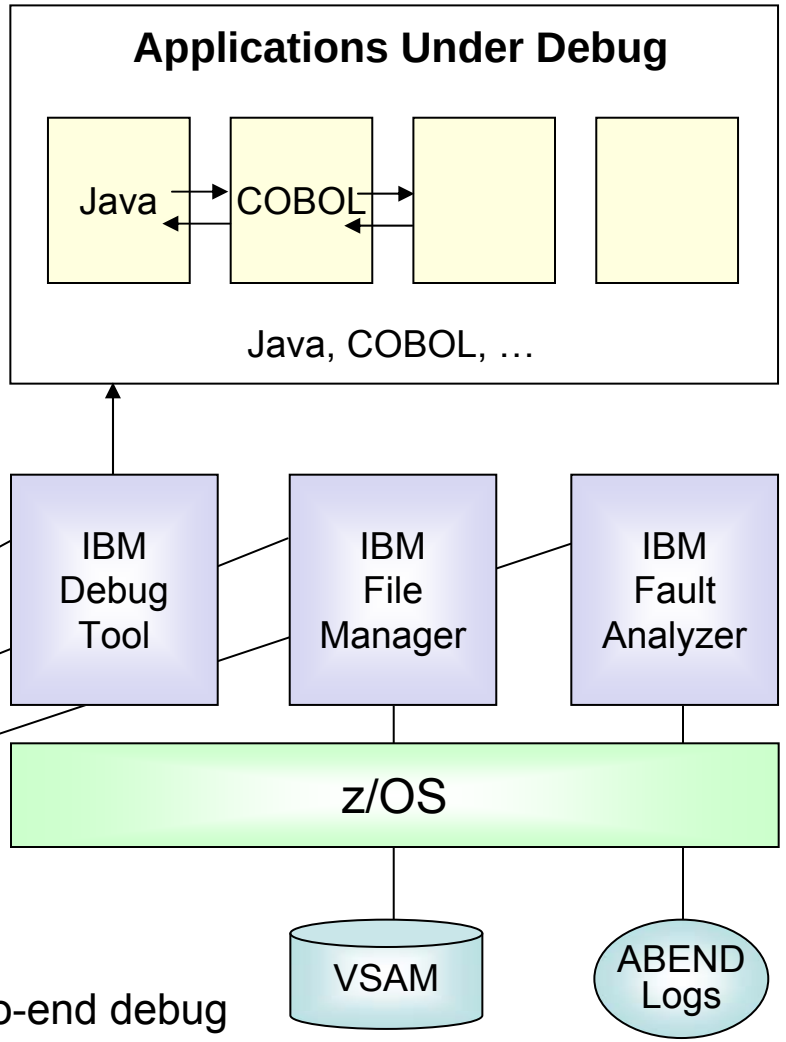


Interactive Problem Determination: RDz Integrates With Host-based PD Tools

- RDz works with IBM PD Tools on the host
- RDz accesses the PD Tools as you would see it on the green screen and exposes / enhances it through the Windows client
- RDz facilitates easy access to all three tools at the same time for an integrated desktop development experience

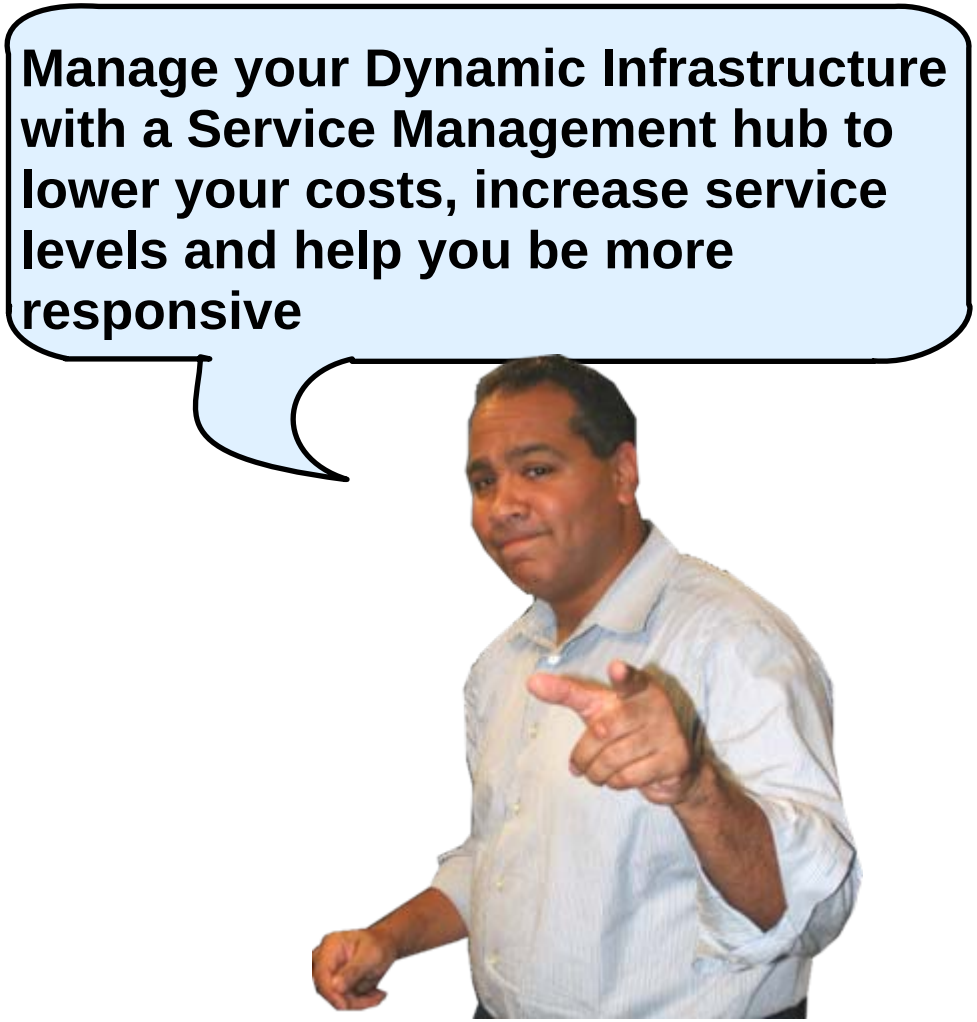


RDz Workstation



- End-to-end debug
- Edit VSAM data
- Find and fix ABENDs, analyze logs

Summary


Manage your Dynamic Infrastructure with a Service Management hub to lower your costs, increase service levels and help you be more responsive
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