

# Session: A21

# Modernizing and Integrating Green Screen (3270) Applications in SOA using WebSphere HATS

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# **Topics**





#### **The Reality of Existing Applications**

- 200 billion lines of COBOL code exist today
- 5 billion lines are added each year
- Similar inventory of RPG and PL/I code
- The typical mainframe customer has:
  - 30M lines of COBOL code
  - Worth \$600M
  - Automating 100,000 business processes
- Banking, Insurance, Government, Manufacturing, Travel and Transportation, Distribution and Retail, Media and Utilities, Healthcare Industries

Consultants estimate it costs 5 times more to rewrite a business function than to reuse existing code

#### IBM

#### **Value of Existing Applications**

 Existing applications are among the most valuable assets a company owns

- Fully functional applications that run the business today
- Significant investments over the years

 Fine-tuned for dependable optimal performance

 Run within fine-tuned reliable, robust, scalable IT infrastructure and platforms

 5X less expensive to reuse existing applications than to write new applications from scratch

 Reusing proven, time-tested applications can result in significantly lower risk and faster time to market





#### **Challenges and Customer Requirements**



- Customers want to improve the appearance of user interfaces to existing applications
  - Reduce learning curve for newer employees
  - Extend existing applications to new units and departments and to new business partners and end-user customers
- Customers want to improve employee productivity by streamlining application flow
  - Automate where appropriate eliminate unnecessary keystrokes and screen navigations
  - Customize access to existing applications for specific set of users

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#### **Challenges and Customer Requirements**

 Customers want to eliminate / reduce administration and maintenance of installed client software to access existing applications

 IBM or 3<sup>rd</sup> party 3270 or 5250 emulation client SW packages

 Make existing applications accessible from anywhere - independent of client HW/SW platform

 Customers want to build unified composite applications that better suit their current business processes

> Combine business logic and data contained in multiple existing applications to a unified application



Customers want to do all this while minimizing changes, leveraging reliability, stability and dependability of existing applications and infrastructures.



#### What is Host Access Transformation Services?

Automatically transforms 3270 & 5250 green screen JK Enterprises applications into HTML interfaces **E**xtends terminal applications as Web Services Low skills requirement PF1 PF1 PF7 PF1 **R**ules-based, highly customizable Iterative, eclipse-based development environment Web Service Interface WebSphere. software



#### **Host Access Transformation Services**





# WebSphere Based Architecture

#### **IBM** Rational Software Development Platform Tool

HATS Toolkit is an Eclipse plug-in to the IBM Rational Software Development Platform Tool

Wizard-based

Creates HATS applications



#### WebSphere Application Server and WebSphere Portal Server

HATS leverages WebSphere Application Server (WAS) or WebSphere Portal Server at runtime HATS Toolkit creates J2EE .war and .ear files for deployment HATS runtime is contained in the HATS application





#### **HATS** Tasks

- Using the HATS Toolkit, developers build J2EE Web applications.
- **HATS/WebSphere administrator deploys the applications to** WebSphere Application Server **or** WebSphere Portal Server.
- Using a Web browser, users access these applications with a URL.
- HATS, using the rules defined by the developer, transforms the screens into HTML, fills in data on the user's behalf, or automates navigation through the application.
- HATS/WebSphere administrator monitors the HATS application





# **Improve Navigation & Productivity**

#### Macros & Global Variables

- Skip unneccesary screens; combine screens; split screens, enter data on behalf of the end user
- Store end user input as global variables; prefill text entry fields
- Help Improve User Interface with Screen Customization
  - Drag and drop HATS components from the palette onto your Web page
  - Add buttons, hot links, drop-down menus, valid value lists,
  - Modify graphics, fonts, colors, and layout
- Add business logic
- Local print support
- Native keyboard support
- Security HTTPs, SSL
- Supports iterative development
  - Fully functional HATS application on the web quickly
  - Use Default Transformation Rules
  - Customize Transformation rules iteratively





#### **Increase Productivity – Reduce Training Costs**

- Increases productivity and reduces training costs as it extends host applications to the widest possible audience...
  - by delivering HTML to Web browsers,
  - improving work flow from multiple applications,
  - and presenting host screens as familiar Web pages.
- Build applications that look and behave like the original green screen application OR build applications that dramatically enhance the application!





#### **Recent Customer Example**

Green Screen navigation: -24 screens -98 key strokes After HATS Customization: –10 HTML pages –41 key strokes

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### **Traditional Green Screen**

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#### **Transformation Using Default Rules**



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#### **HATS Minor Modifications**



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#### **Achieving a Green Screen Look with HATS**

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- HATS supports host colors and extended field attributes, including:
  - Numeric only, alphabetic only, signed numeric, reverse image, column separator, underline, and blink fields
- Supports automatic field advance
- Field exit, plus, minus support (5250 only)
  - Improvements have been made in HATS 6.0.3 and 6.0.4
- Host keypad and OIA can be displayed (and positioned anywhere)
- Native keyboard support (i.e. pressing F12 in the browser sends F12 to the host application).



#### Achieving a Modern Web Look with HATS

- Individual screens can be customized with a rich set of user controls, including:
  - Popup lists, drop-downs, checkboxes, lists, radio buttons, calendar popups, graphs, etc.
- Information from the host screen can be suppressed on the Web page and a screen can be split up over multiple Web pages.
- Functions / actions can be restricted.
- Information can be displayed and organized in tabs.
- One customized Web page can be applied to more than 1 host screen!



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#### **HATS Customized Transformation**



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#### **Integration with WebSphere Portal**

- Automatically generates portlets for use with
   WebSphere Portal
- HATS supports:
  - Click-to-Action
  - Cooperative Portlets
  - Credential Vault
  - Single Sign-On
- HATS is ideal for use with portals because screens can be customized to reduce the amount of data displayed
  Multiple HATS portlets can be added to the same page.





# HATS Single Sign-On Support

- HATS supports Single Sign-On, which allows users to logon to multiple host systems while presenting credentials only once
- Increased Productivity
  - Credentials requested only once
  - >No need to administer and maintain multiple logon identities
  - ➢ Reduced password-related support calls
- Secure
  - Works in conjunction with existing network security applications, such as Tivoli Access Manager or Portal Security
  - Retrieves network security credentials and maps to host credentials

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#### **HATS Application**



#### **Typical Questions**



- 1. <u>Question</u>: How much time does it take to get a HATS application up and numing? <u>Answer</u>: Only minutes to create and deploy an application that will transform ALL greens screen on-the-fly.
- 2. Question: What happens it change my green screen application? <u>Answer</u>: If using default rendering, HATS picks up the change automatically and transforms the screen. In other scenarios, depending on the type of change and how the application was customized, further modifications may need to be made to the HATS application.
- 3. Question: Do I need to import DDS or BMS maps? Answer: No
- 4. <u>Question: Do I have to customize every screen?</u> <u>Answer</u>: No, only customize the screens / sets of screens needed default rendering handles the rest.
- 5. <u>Question</u>: What skills are required to develop with HATS? <u>Answer</u>: Basic IDE skills, unless you need to do advanced integration. HTML skills are recommended for doing more advanced Web development.



# Programmatic Integration: SOA and Web Services



# **Application to Application Integration**

- Integrate terminal applications with J2EE applications
- Create reusable components:
  - Encapsulate screen navigations (macros) that define a terminal application business process in a standard JavaBean
  - HATS Integration Object (IO)
  - Supports session priming and pooling
  - "Chain" IOs for interactive flow through terminal application
- Using HATS toolkit:
  - "Wrap" one or more IOs in a Web service
  - Create HATS EJB projects and EJB Access Beans (EJB client)
- Using Rational Software Development Platform, use IO(s) in:
  - Web services
  - EJBs
  - Servlets
- Access IO remotely via .NET or Java Application client



#### **Application Server**

#### TEM

### **Flexible business requires flexible IT - SOA**





#### **Service Oriented Architecture (SOA) Definitions**

#### What is a service?

#### A repeatable business task

 – e.g., check customer credit; open new account

#### What is a Service Oriented Architecture (SOA)

An IT **architectural style** that supports integrating your business as linked services



- Model your business processes
- Build or re-use existing assets into business-level, looselycouple IT components based on open standards
- Assemble your IT services
- Deploy, monitor, and manage your system



#### How HATS Fits into the SOA World

- HATS provides the tools to develop industry standard Web services that can drive existing terminal applications.
  - Existing processes can be broken down and exposed as reusable components in a larger SOA environment.
- The process for building Web services using HATS is straightforward:
  - Identify the process to expose
  - Identify the flow of screens
  - Identify the required inputs
  - Identify the required outputs
- HATS does not require modification to your existing applications.



#### Concepts





#### **Integration w/ WebSphere Process Server**





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#### How It Works - A simple example (cont.)





# What's New in HATS V6?



#### **Goals for HATS 6.0**

#### Improve developer ease-of-use.

- Improve speed and ease of screen customization.
- Provide debug tools to enhance macro development experience
- Maintain currency with other WebSphere software
  - WebSphere Application Server v5.1.x, v6.0.x
  - WebSphere Portal Server v5.0, v5.0.2.x



#### **Transformation Creation and Editing Improvements**

- HATS Components available in the Palette view
- Pre-fill transformations with default rendering
- Free layout mode in Page Designer
- Use of Properties View for modification of components, widgets and text replacement
- Apply style sheets in Design view





#### **Host Terminal Preview**

- Provides screen previewing from within the Host Terminal.
   This enables a developer to quickly see how a particular screen will be transformed when running on the server.
- Screen recognition is performed (using the screen customizations defined in the project) and the associated transformation is applied.
- Preview area is read-only (cannot navigate the host terminal).



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#### **Macro Stepping**



#### Step Into

- Allows stepping from action to action inside of a screen.
- To use, press F5 or click

#### Step Over

- Allows stepping from screen to screen (all actions encountered along the way are executed).
- To use, press F6 or click
- Step Return
  - Allows you to finish playing the actions under a screen and go to the next screen.
  - To use, press F7 or click
- Step Resume
- Plays the rest of the macro from the current point.



#### **Regular Expression Text Replacement**

- Regular expression support in HATS allows a developer to describe a string (or set of strings) based on a pattern.
- Example:



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Select a screen:		
C Use the host terminal screen		
<ul> <li>Use a previously captured screen</li> </ul>		
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My Company Want a fast car with style? Introd with the new LS2 V8 engine that mak * 0 to 60 in 4.2 seconds with * 6.0 liter V8 produces 400 hp Base Price	<pre><back nrxt=""> Finish ucing the sixth-generation Corvette es this year's model even faster. a top speed of 186 mph and 400 lb-ft of torque MSRP Invoice \$43,710 \$38,246</back></pre>	Cancel
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# **Text Replacement- Insert Button/Link**

© Add Text Replacement	Demo - Microsoft Internet Explorer     File Edt. View Favorites Tools Help
Select the text to replace or type it below.	😮 Back 🔹 🛞 - 🖹 😰 🟠 🔎 Search 👷 Favorites 🛞 Media 🥝 🔗 - 🌺 🔟 - 🛄
	My Company
Replace: More   Case sensitive   Regular expression   With:   Text or HTML (hic   OK   Cancel   Insert   Insert	Edit Library List       Mr/Company Home     Type new/changed information, press Enter.       Page     Sequence     Sequence     Sequence       Mr/Company Map     Number     Library     Number       Mr/Company Map     Number     Library     Number       Mr/Company     0     150     300       Jobs at Mr     10     SARPLE     160     310       Company     20     UTLB     170     320       Mr/Company     30     OPEL     180     330       Mr/Dompany     30     OPEL     180     330       Mr/Dompany     30     OPEL     180     330       Mr/Dompany     30     OPEL     180     360       Mr/Dompany     40     OTER     360     0       Mr/Dompany     40     OPEL     370     0       Mr/Dompany     50     APPCTL21     200     360     0       Mr/Doduct     70     APPERC21     230
OK Cancel	Disconnect         F3=Exit         F5=Refresh         F12=Cancel           Turn Keyboard Off         6          07/004



#### **Identified Next Screens**

# Improves Performance

cicsa	Next Screen	1
	Identify the probable peyt screep to occur after this screep. Add screeps to this list and use	the Lin a
main (default)	modify the order in which your screen customizations are compared.	cho op da
		-
DFHEC3549	Name Add	
	SignonToCics_WEL Remove	-
SignonToCics_WEL	M DFHEC3549	
Green Captures		3
	Up	
DFHEC3549		
SignonToCics	Down	
Macros		
cicsa		
🦓 cicsa_WEL		
Web Content	-	1
Transformations		- 1
		5
	If next screen is not in the above list	
Handlers	Search application event priority list	1
		1
E-Ca credentialvault	and the second sec	<
Getcredentials		1
	Overview Screen Recognition Criteria Actions Text Replacement Next Screen Source	



#### **5250 Limited ENPTUI support**

- **Push Buttons**
- Check Boxes
- Radio Buttons
- Single Selection Listbox
- Multiple Selection Listbox
- Popup Window
- Menu Bar
- Pull Down Menus





#### **HTTP Compression Support**

HATS compression support:

- Significantly reduces the number of bytes sent over the network (see the next slide for more details). Example: Without compression, typical page sizes were 30-60K, after compression page sizes are ~ 2-3K.
- Improves response time
- Supported on WebSphere Application Server 5.1 and WebSphere Application Server 6.0. Not supported when running in WebSphere Portal Server. Requires a browser that supports GZIP compression (all supported HATS browsers, with the exception of IE 5.2.3 on Mac, support GZIP).
- By HATS supporting compression out of the box, compression does not need to be configured or enabled on the HTTP server.

Introduced in HATS 6.0.2



#### **Compression Before and After**



_	-			
			1 1	
_	-			
		-		

#### **Team Functions Exposed**

- Team functions are now exposed on the HATS Project view context menu. This enables HATS projects and artifacts to be easily shared with a supported repository (such as CVS or ClearCase).
- Note: Team functions are only displayed if the project has already been shared. You will need to use the Team menu from the Navigator view to share the HATS project before team functions will be displayed in the HATS Project view.

Introduced in HATS 6.0.4





#### **Debug and Profile on Server**

- Debug and Profile on Server are now exposed in the HATS Project view context menu (these functions have been available, but were not as easily accessible in previous versions of HATS).
- Both functions are provided by the Rational Software Development Platform.
- Debug on server allows you to step through Java code (such as HATS business logic) as the HATS application is running on the application server.

Profile on server allows you to pinpoint the operations that take the most time, and helps you to easily identify repetitive execution behavior and to eliminate redundancy. It is useful for performance analysis and for gaining a deeper understanding of your application.

 These functions can be accessed by right-clicking a project or artifact from the HATS Project view or by selecting the HATS menu.

> Run on Server... Bebug on Server...



#### **Supported Platforms**

#### Server

- z/OS, i5/OS, Linux, Linux for zSeries, Linux for iSeries, Linux for pSeries, AIX, Windows 2003, Windows 2000, Windows XP, Solaris, HP Unix
- WebSphere Application Server V5.1.x or V6.0.x

#### Studio

- Windows 2000, XP, or 2003
- IBM Software Development Platform V6
  - RWD
  - RAD
  - RSA
  - WDz
  - WDSC and WDSC Advanced
  - WID
- WebSphere Portal Server 5.0.2.x or 5.1.x



# Case Study: Amica Insurance

#### **Recommended Skills**



The HATS Studio is an integrated environment for building HATS applications – as with all tools, skills are developed over time. Ease-of-use has been a driving design goal since the first release (and was the theme for HATS version 6).

- HATS does not require Java skills. However, they can be leveraged for advanced integration (e.g. interacting with a database using JDBC) or when writing custom components and widgets.
- Although HATS is integrated into the WYSIWYG Rational Studio Page Designer (HTML editor) tool, HTML / Web skills are recommended when doing advanced customization.
- The good news : the skills required for advanced HATS development are <u>reusable</u> because HATS utilizes industry standard technologies (J2EE, Java, JSP, JavaScript, XML, HTML, CSS, etc).



#### **Summary of HATS Features and Value Propositions**

- Host screens are converted to GUIs on the fly, in real time
- Improved navigation of host application
- Zero footprint on the desktop
- Combine screens and data from multiple applications
- Eliminates need to customize every screen
- Generate Web services from host transactions
- Exploits security & scalability of WebSphere
   Application Server and WebSphere Portal
- Extensible through IBM Rational Software Development Platform
- Supports iterative development





# **Resources – Comprehensive HATS Demo CD**

#### To request a Demo CD

Send an email to <u>wsnfr@us.ibm.com</u>. In your email, include the name of the CD (HATS V6 Demonstration), how many CDs are needed, the type of CD (customer or business partner), the mailing address, and your phone number.

#### Development Assistance

Participate in WebSphere HATS development lab advocacy program. Development resource assigned for consultation. Contact Pratik Nanavati, pratik@us.ibm.com.



# **Other Online Resources**

IBM WebSphere Host Integration Solution Product Page

- http://www-306.ibm.com/software/webservers/hostintegration/
- Demos
  - http://websphere.dfw.ibm.com/atdemo/
- Webinars
  - http://www-306.ibm.com/software/webservers/hats/webinars/index.html
- Library, Brochures, Presentations, Redbooks
  - http://www-306.ibm.com/software/webservers/hats/library.html
- Education
  - http://www-306.ibm.com/software/webservers/hats/education.html
- Services
  - http://www-306.ibm.com/software/webservers/hats/services.html
- Trial Code
  - http://www14.software.ibm.com/webapp/download/product.jsp?s=p&id=GMDL-5BJRPP
- Customer Comments
  - http://www-306.ibm.com/software/webservers/hi\_customers/
- Business Partners
  - http://www-306.ibm.com/software/webservers/hi\_partners/



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