

# Eclipse-based Applications: Java on the Desktop Revisited

EclipseCon - Rich Client Platform Track  
Tuesday, February 3<sup>rd</sup>, 3:45pm-4:30pm

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- **Part I – When and Why to Use Eclipse as an Application Framework**
- **Part II – Case Study: Building an Eclipse-based Product**
- **Part III – RCP: A Big Step Forward**
- **Part IV – Questions and Answers**

- **When to Use Thin Clients**
  - **Large, Distributed User Base**
    - No Installation Required
    - Functional Updates are Automatic
  - **No Control Over Runtime Environment**
    - Browsers Run on All Business Platforms
  - **Need High Learnability – No Training Provided**
    - Fill Out Forms, Click Links
    - Singular, Static View of Information
    - Desired Interaction Model Fits Browser Paradigm
    - Applications are for Occasional Use

- **When to Use Rich Clients**
  - **Usability is Key**
    - High-demand Productivity / Data Entry Applications
    - Use Local Caching to Minimize Server Interaction
    - Background Server Operations to Hide Latency
    - Multiple, Simultaneous Views
  - **High Degree of User Acceptance**
    - Behaves Like a Desktop Application (Drag and Drop)
    - Client Has Full Access to All Local Capabilities
  - **Extensibility and Flexibility are Important**
    - Effectively Anything is Possible

- **Current Issues With Desktop Java**
  - **User's Don't Embrace 'Almost Native' UI's**
    - Don't adapt to new UI skins
  - **User Interaction Slower than with Native Apps**
  - **Large Resource Requirements**
  - **Developers Must Build Their Own Infrastructure**
    - Development is Expensive and Time-Consuming
    - Dearth of Well-Supported Java Application Frameworks

- **Advantages of Frameworks**
  - **Accelerate Development**
    - Provides an Implementation of an Architecture
    - Provides Blueprints to Follow
    - Allows Focus on Business Functionality
  - **Decrease Development Costs**
    - Requires a Smaller Team
    - Infrastructure May Be 80% of the Total Effort
  - **Increase Reliability and Maintainability**
    - Facilitates Uniform Development Across the Application
    - Hides Complexity from Developers
    - Decreases the Code You Must Test and Maintain

- **Advantages To Using Eclipse**
  - **Built By Companies With Framework Experience**
  - **Implements a Clear, Cohesive Architecture**
  - **Support For All Major Desktop Platforms**
  - **Native UI Look & Feel**
  - **Good 3rd Party UI Design Tool Support**
  - **Large Set of Standard and Extended Widgets**
  - **Extensive Text Processing Support**
  - **User Configuration and Preferences**
  - **Platform-specific Features (OLE, ActiveX)**
  - **Discovery and Installation of Updates**
  - **Internationalization and Localization**
  - **Integrated Help System**
  - **Books and Training Readily Available**

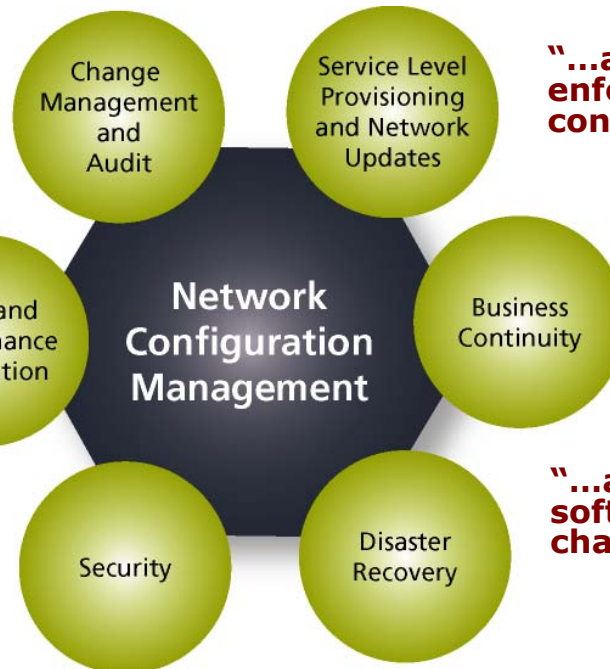
# **Part II**

## **Case Study: Building an Eclipse-based Product**

# AlterPoint Overview

**The leading provider and innovator of Multi-vendor, Network Configuration Management (NCM) solutions**

**"...tracking of who is performing which configuration changes."**



**"...automated workflow enforcing best practice configuration changes."**

**"...rapid identification of an outage caused by an invalid configuration change."**

**"...verification that the appropriate changes were made..."**

**"...association of hardware, software & configuration changes."**

# The Network Engineer's Desktop Today

The screenshot displays a Windows XP desktop environment with several open applications:

- Microsoft Excel - test.xls:** A spreadsheet with columns for IP Address and Hostname (options). The data includes:

IP Address	Hostname (options)
10.10.1.49	VANGUARD 320
10.10.10.1	Cisco 2621-A
10.10.10.12	Cisco 2501-B
10.10.10.13	WellFleet ARN-A
10.10.10.14	F5 - Rio-IP
- Microsoft Internet Explorer:** Displays the title page of "Beginner's Guide to CGI Scripting with Perl". The page content includes:

Contents

  - [Introduction](#)
  - [Running "Hello, world"](#)
  - [Running "Hello, world"](#)
  - [Running a form-to-em...](#)
  - [Running a onesthank...](#)
- Microsoft Telnet Client:** Shows a connection to a remote host. The text displayed is:

```
Welcome to Microsoft Telnet Client
Escape Character is 'CTRL+I'
Microsoft Telnet>
```
- Command Prompt (cmd.exe):** Shows the execution of a ping command to 10.10.10.1. The output is:

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\rshopp>ping 10.10.10.1

Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time=1ms TTL=253
Reply from 10.10.10.1: bytes=32 time=1ms TTL=253
Reply from 10.10.10.1: bytes=32 time=1ms TTL=253
Reply from 10.10.10.1: bytes=32 time=1ms TTL=253

Ping statistics for 10.10.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\Documents and Settings\rshopp>
```

# The Resulting Business Problem

**Manual, unintegrated process for activities like device updates and problem diagnosis**

- **Error-prone**
- **Inefficient**

**Corporate assets are decentralized (scripts, inventory lists, configuration files).**

- **Security risk**
- **Prevents knowledge sharing**

# Initial Goals of the Project

- **Introduce unified platform that integrates the network engineer's tools for managing device configurations.**
- **Automate the network engineer's most common and painful activities – e.g., making changes to devices.**
  - Example – OS upgrade for certain Cisco devices:**
    - Search for all Cisco devices with a specific OS version and add them to target list
    - Automatically check for pre-requisites on target list
    - Execute the OS update
    - View real-time interactive feedback to ensure success of the change
- **Make the platform open and extensible so tools can be easily snapped in.**

# Integrated Network Environment (INE)

The screenshot displays the 'Update for DeviceAuthority' application interface. The main window is titled 'Update for DeviceAuthority - Connected to 10.10.10.1 - Update Module'. It features a menu bar (File, Edit, Navigate, Search, Run, Window, Help) and a toolbar with various icons.

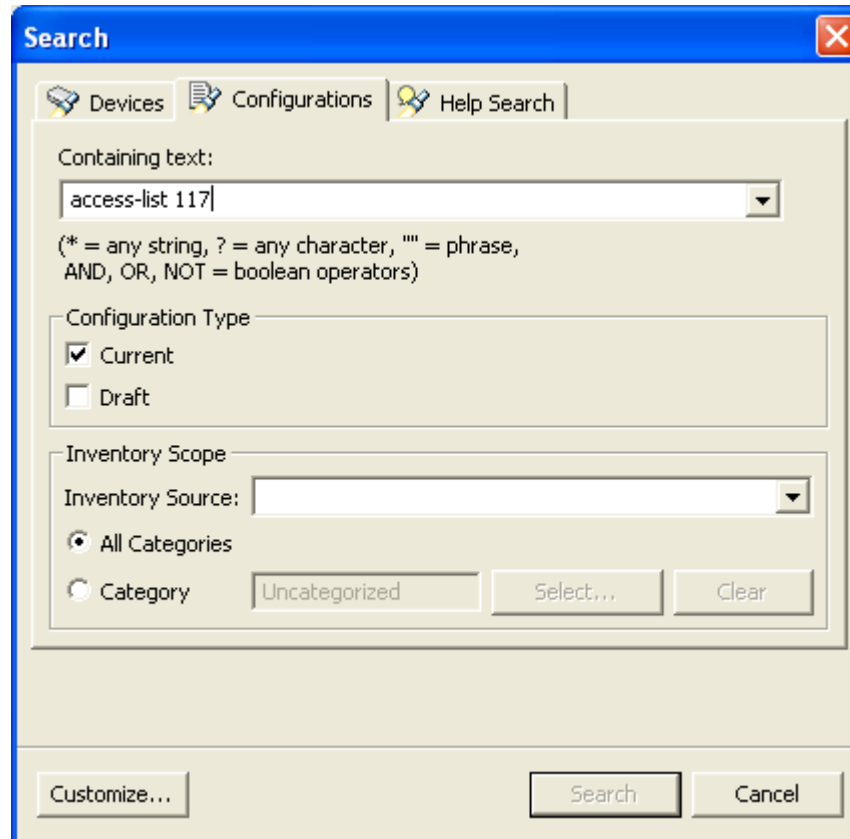
The interface is divided into several panes:

- Inventory Pane (Left):** Shows a hierarchical tree of network devices. The 'New York' folder is expanded, showing a list of IP addresses and device names, such as '10.10.10.1 - TESTENV-2621'. A context menu is open over the selected device, with options like 'Refresh', 'Tools', 'Run', 'Script...', 'Trace Route', 'Ping', and 'NS Lookup'.
- Terminal Pane (Center):** Displays a command-line interface for the selected device. The prompt is 'TESTENV-2621(config)#'. The terminal shows the following configuration commands:

```
!
version 12.3
service timestamps debug uptime
service timestamps log uptime
service password-encryption
!
hostname TESTENV-2621
!
logging buffered 4096 debugging
no logging console
enable secret 5 $1s6FAQ$1udMOM0vdzfyvRvWZQ081
enable password 7 0010161510570A04
!
username testlab privilege 15 password 7 130D1810090510
username wayne password 7 120F001013184D476F
username alterpoint password 7 111918160405041E00
memory-size iomem 15
aaa new-model
!
!
aaa authentication login default group radius local
aaa authorization exec default local
aaa authorization exec NO_AUTHOR none
aaa authorization commands 15 default local
aaa authorization commands 15 NO_AUTHOR none
```
- Configuration Pane (Right):** Shows the running configuration for the device, which matches the terminal output.
- Web Browser Pane (Bottom):** Displays the Cisco Systems website. The address bar shows 'http://www.cisco.com/'. The page content includes a search bar, a 'WELCOME TO CISCO SYSTEMS' heading, and several links for 'Business Industries & Solutions', 'Networking Solutions', 'Products & Services', 'Technologies', 'Ordering', 'Technical Support', 'Learning & Events', 'Partners & Resellers', and 'About Cisco'. There is also a 'Spotlight' section.

The Windows taskbar at the bottom shows the 'start' button, the application name 'Update for DeviceAut...', a 100% CPU usage indicator, and the system clock showing 11:25 AM.

# Configuration Search



The screenshot shows a 'Search' dialog box with a blue title bar and a close button. It features three tabs: 'Devices', 'Configurations', and 'Help Search'. The 'Configurations' tab is active. The dialog contains the following elements:

- Containing text:** A dropdown menu with the text 'access-list 117'.
- Legend:** A text block explaining search syntax: (\* = any string, ? = any character, "" = phrase, AND, OR, NOT = boolean operators).
- Configuration Type:** A section with two checkboxes: 'Current' (checked) and 'Draft' (unchecked).
- Inventory Scope:** A section with an 'Inventory Source' dropdown menu, a radio button for 'All Categories' (selected), and a radio button for 'Category'. Below the 'Category' radio button are three buttons: 'Uncategorized', 'Select...', and 'Clear'.
- Buttons:** At the bottom, there are three buttons: 'Customize...', 'Search', and 'Cancel'.

# Creating a Change Script with AutoSriptor

The screenshot displays the DeviceAuthority Update Module interface, which is connected to the Eclipse Platform. The interface is divided into several sections:

- Inventory:** A tree view on the left showing a list of devices with their IP addresses and names, such as 10.10.10.2 - CS-500 and 10.10.10.23 - Cisco-4000.
- Terminal Window:** A window titled "\*Connected to 10.10.10.23" showing the output of a telnet session. The output includes system boot information, uptime (1 week, 2 days, 23 hours, 30 minutes), and hardware details for a Cisco 4000 processor.
- Code Editor:** A window showing a JavaScript function named `main()` that uses the `Alterpoint` library to interact with the device. The code includes variables for `telnet` and `device`, and a call to `telnet.setInactivityTimeoutSeconds(180);`.
- Search Results:** A window titled "Search ('Configuration [access]' - 4 Occurrences in DA (DeviceAuthority))" showing a list of search results for the specified configuration access.

Property	Value
Backup Status	
Backup	Backup Succ...
Comments	
Enabled For ...	true
Last Accessed	Fri Jan 16 11...
Last Change...	Fri Jan 16 11...
Status	Ready for Ba...
Device	
Administrati...	10.10.10.23

```
function main()
{
  var telnet = Alterpoint.newTelnet();
  var device = Alterpoint.getDevice();

  telnet.setInactivityTimeoutSeconds(180);

  /*
```

Search ("Configuration [access]" - 4 Occurrences in DA (DeviceAuthority))

- 10.10.10.16 Cisco 2621 running operating system version 12.1(17), - startup-config (February 2, 2004 11:15:43 AM CST)
- 10.10.10.23 Cisco 4000 running operating system version 11.2(26d), - startup-config (February 2, 2004 11:14:49 AM CST)
- 10.10.10.35 Nortel 1200 running operating system version 2.1.6.1 - running-config (February 2, 2004 11:15:55 AM CST)
- 10.10.10.9 Cisco 3640 running operating system version 12.2(2)T, - startup-config (February 2, 2004 11:15:35 AM CST)

# Creating an Update Template

**Specify the Update Process and Validation Scripts**  
(Optional) Specify what scripts need to be run before the device updates begin and after they complete. Additionally, specify if notification emails should be sent during the update process.

	Script		On Failure	Notify On Success	Notify On Failure
<b>At the start of the update run:</b>	<input type="text"/>	...	Exit	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Before each device update run:</b>	Ping.js	...	Skip	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>After each device update run:</b>	Backup.js	...	Exit	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>At the end of the update run:</b>	<input type="text"/>	...	Exit	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Summary | Devices | Update Script | Workflow and Validation | Notification | Schedule

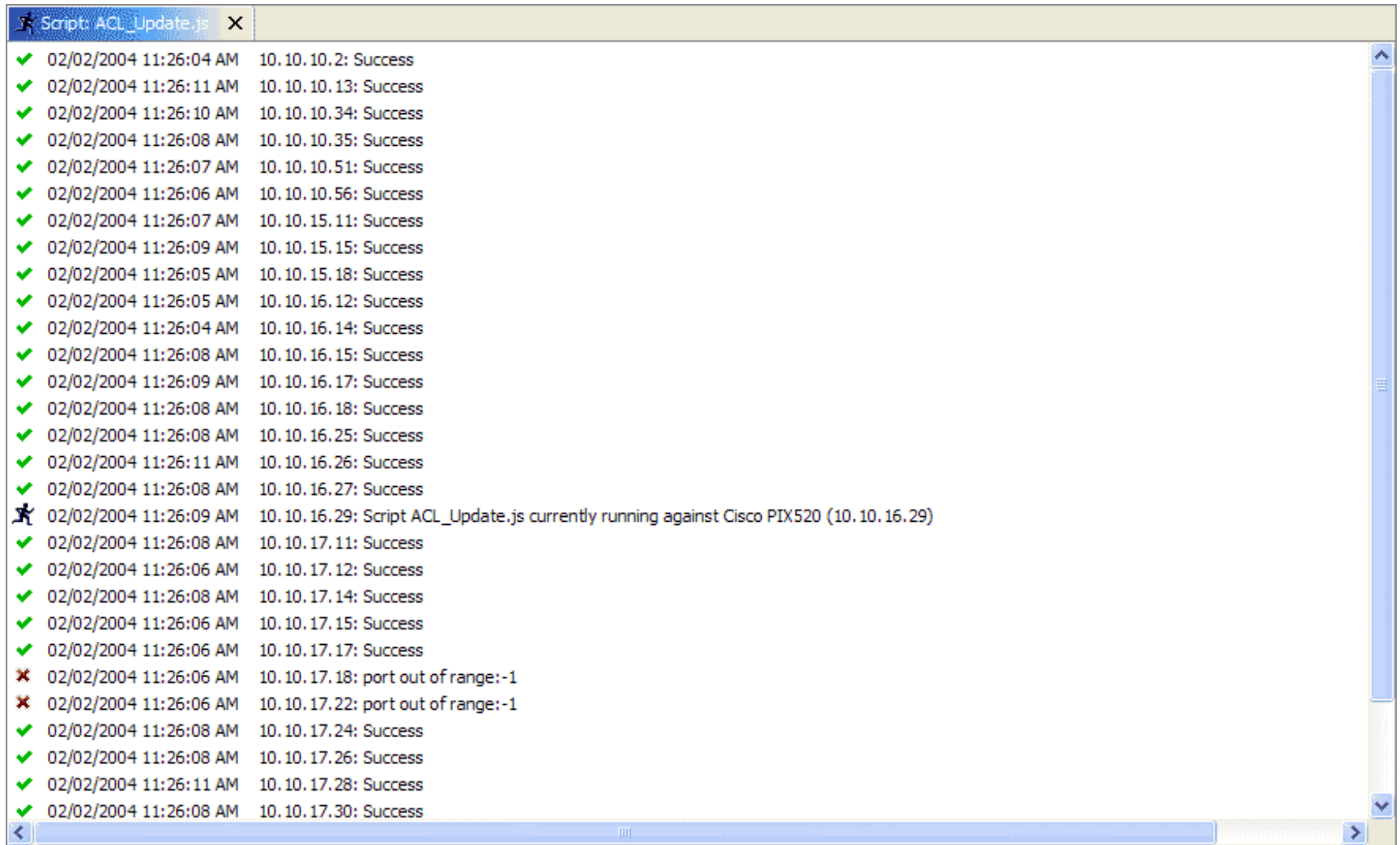
Inventory | Scripts | Updates

Properties

Property	Value
Info	
Created By	Admin
Created On	Sat Dec 27 15:27:06 CST.
Description	This update changes pas.
Modified On	Sat Dec 27 12:45:02 CST.
Modified By	Admin
Name	CatIOS Password Update

Search | Web Browser | Historical Updates

# Real-Time Feedback on Job Results



Icon	Date/Time	IP Address	Status
✓	02/02/2004 11:26:04 AM	10.10.10.2	Success
✓	02/02/2004 11:26:11 AM	10.10.10.13	Success
✓	02/02/2004 11:26:10 AM	10.10.10.34	Success
✓	02/02/2004 11:26:08 AM	10.10.10.35	Success
✓	02/02/2004 11:26:07 AM	10.10.10.51	Success
✓	02/02/2004 11:26:06 AM	10.10.10.56	Success
✓	02/02/2004 11:26:07 AM	10.10.15.11	Success
✓	02/02/2004 11:26:09 AM	10.10.15.15	Success
✓	02/02/2004 11:26:05 AM	10.10.15.18	Success
✓	02/02/2004 11:26:05 AM	10.10.16.12	Success
✓	02/02/2004 11:26:04 AM	10.10.16.14	Success
✓	02/02/2004 11:26:08 AM	10.10.16.15	Success
✓	02/02/2004 11:26:09 AM	10.10.16.17	Success
✓	02/02/2004 11:26:08 AM	10.10.16.18	Success
✓	02/02/2004 11:26:08 AM	10.10.16.25	Success
✓	02/02/2004 11:26:11 AM	10.10.16.26	Success
✓	02/02/2004 11:26:08 AM	10.10.16.27	Success
⚠	02/02/2004 11:26:09 AM	Script ACL_Update.js currently running against Cisco PIX520 (10.10.16.29)	
✓	02/02/2004 11:26:08 AM	10.10.17.11	Success
✓	02/02/2004 11:26:06 AM	10.10.17.12	Success
✓	02/02/2004 11:26:08 AM	10.10.17.14	Success
✓	02/02/2004 11:26:06 AM	10.10.17.15	Success
✓	02/02/2004 11:26:06 AM	10.10.17.17	Success
✗	02/02/2004 11:26:06 AM	10.10.17.18	port out of range:-1
✗	02/02/2004 11:26:06 AM	10.10.17.22	port out of range:-1
✓	02/02/2004 11:26:08 AM	10.10.17.24	Success
✓	02/02/2004 11:26:08 AM	10.10.17.26	Success
✓	02/02/2004 11:26:11 AM	10.10.17.28	Success
✓	02/02/2004 11:26:08 AM	10.10.17.30	Success

# Lessons Learned – What Worked

- **The IDE to INE paradigm.**
- **Extensive functionality: Decorators, contribution model, workspace, search, perspectives, rich-editor support, preferences, property sheets, etc.**
- **Plug-in model for building a platform of integrated tools for the network practitioner.**
- **Usability and responsiveness of native platform widgets.**
- **Multi-platform support.**
- **Partnership with Genuitec.**

# Lessons Learned...Challenges We Faced

- **Platform has strong ties to the file system. Problem for remote Java objects accessed from an app server.**
- **Assumes your building an IDE. Required removal of some base Eclipse plugins (e.g., Build menu)**
- **Significant learning curve due to size of the platform.**
- **Difficulty in testing an integrated set of tools as opposed to a specific application workflow.**
- **Market education – “Why should we used a rich-client (non-web) interface?”**

# Next Steps

## **Add additional applications on top of the platform**

- **Enforcement**
- **Grammar/syntax checking**

## **Extend the ecosystem through integrations with third party solutions**

### **Examples:**

- **Fault/performance monitoring (MIB browsing)**
- **Vulnerability remediation**
- **Configuration analysis (security, routing, etc.)**

## **Integrate with other inventory sources**

# **Part III**

## **RCP: A Big Step Forward**

- **Enhancements Over Eclipse 2.1**
  - **IDE Decoupled from Workbench Platform**
    - No Code Edits to Excise IDE Functionality
    - Still Based On Perspectives, Views, Editors
  - **Enhanced UI Configurability**
    - Policy Support: i.e. Toolbar for Workbench Window?
    - Menu Management is Fully Dynamic
    - More Branding Support
  - **SWT/Swing Interoperability** ([Enhancement #37724](#))
    - Portions in Place, More Coming
  - **Tabular & Tree Data** ([Enhancement #37998](#))
    - Greatly Increased Capacity and Capability
  - **Much More – See the Other RCP Track Presentations**

- **Remaining Challenges**
  - **Eclipse Frameworks are Still Complex**
    - Steep Learning Curve
    - Books, Training, and Consulting are Available
  - **Physical Resource Requirements** ([Enhancement #37723](#))
    - No Support for Editors/Markers on Logical Resources
  - **No Built-in Security Model** ([Enhancement #37692](#))
    - User / Group / Capability Management
    - Hard to Tailor UI Presentation By Role
  - **No SWT Charting Capabilities**
    - But Embedded Browser Can Be Used for Graphics
  - **Work In Progress Until June 2004**

# Part IV

## Questions and Answers

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## References

**[The Case For Using Eclipse Technology in General Purpose Applications, Todd Williams & Marc Erickson, July 2002](#)**