



Eclipse Rich Client Platform

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<http://eclipse.org/evangelism>

The Eclipse Foundation

Agenda



- What is Eclipse?
- What is a Rich Client?
- What is Eclipse Rich Client Platform?
- Wrap-up



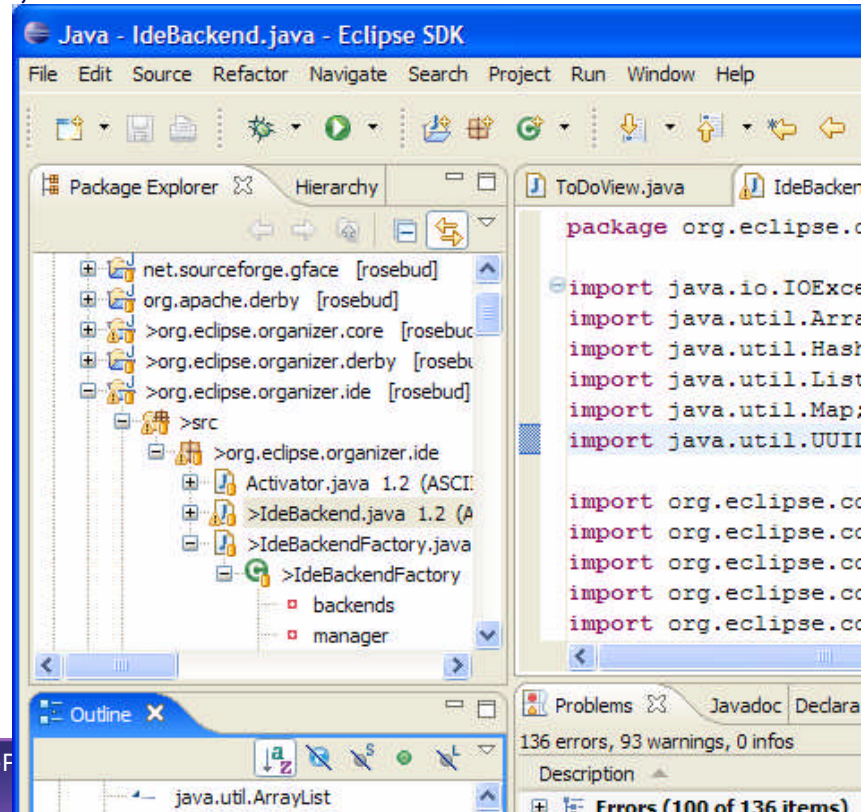
What is Eclipse?

July 4, 2006

Eclipse is a Java IDE



- Widely regarded as **the** Java development environment
- With all the bells and whistles...
 - Language-aware editors, views, ...
 - Refactoring support
 - Integrated unit testing and debugging
 - Incremental compilation and build
 - Team development support
 - Out of the box support for CVS
 - ...



Eclipse is an IDE Framework

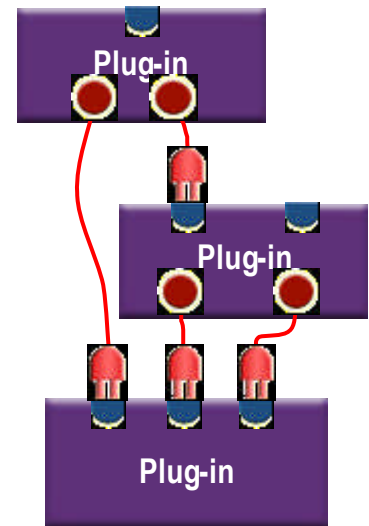


- Eclipse + JDT = Java IDE
 - First class framework for Java
 - Language aware editor
 - Incremental build
 - Integrated debugging
- Eclipse + CDT = C/C++ IDE
 - First class framework for C/C++
 - Language aware editor
 - Refactoring, search
- Eclipse + PHP = PHP IDE
- Eclipse + JDT + CDT + PHP = Java, C/C++, PHP IDE
- ...

Eclipse is a Tools Framework



- Extensibility through OSGi implementation
 - Plug-ins make Eclipse whatever you need it to be
- Focus on developing a universal platform of frameworks and exemplary tools
- Tools extend the Eclipse platform using plug-ins
 - Business Intelligence and Reporting Tools (BIRT)
 - Eclipse Communications Framework (ECF)
 - Web Tools Project (WTP)
 - Eclipse Modelling Framework (EMF)
 - Graphical Editing Framework (GEF)
 - Test and Performance Tooling Project (TPTP)



Eclipse is a Application Framework



- Remove the IDE elements, Java language support, team development support, ... and you're left with a pretty comprehensive general application framework
 - Support for multiple platforms
 - Linux, Windows, Mac OSX, UNIX, embedded
 - Rich widget set, graphics
 - Native-OS integration (drag and drop, OLE/XPCOM integration)
- A platform for rich clients
- Some examples of this later...

Eclipse is an Open Source Project



- Ten (10) top level projects
 - The Eclipse Project
 - Tools
 - Web Tools Platform
 - Test & Performance Tools Platform
 - Business Intelligence and Reporting Tools
 - Eclipse Modeling Project
 - Data Tools Platform
 - Device Software Development Platform
 - SOA Tools Platform
 - Technology (Incubators)
- Dozens of sub projects

Eclipse is an Open Source Community



- All Eclipse projects are available for free download
 - No registration, no tracking, no sales calls, ...
- Contributors number in the hundreds
- Hundreds of plug-ins provided by commercial companies, organizations, and individuals
- Enthusiastic blogger community
 - www.planeteclipse.org
- Numerous Eclipse portals, etc...
 - EclipseZone (<http://eclipsezone.com>)
 - EclipseWiki (<http://eclipsewiki.editme.com>)
 - Eclipse Plug-in Central (<http://eclipseplugincentral.com>)
 - Others (<http://eclipse.org/community>)

Eclipse is an Eco-System



- Eclipse is focused on nurturing the eco-system to complement, and enhance the Eclipse Platform
- 137 members, including major Java, Linux and Embedded vendors
 - BEA, Borland, Computer Associates, IBM, Nokia, Intel, Wind River, Zend, ...
- Dozens of open source projects
- 50 million download requests to date

Eclipse is a Foundation



- The Eclipse Foundation
 - Was created to manage and direct the ongoing development of the Eclipse open source software project
 - Is responsible for providing IT infrastructure required by development teams
- Independent not-for-profit Foundation formed in 2004



Eclipse is all these things...



- A Java IDE
- An IDE Framework
- A Tools Framework
- An Application Framework
- An Open Source Enabler
- A community
- An eco-system
- A foundation

“Callisto” Release Train



- Ten (10) projects released simultaneously on June 30, 2006
 - Business Intelligence and Reporting Tools (BIRT) Project
 - C/C++ IDE (CDT)
 - Data Tools Platform (DTP)
 - Eclipse Modeling Framework (EMF)
 - Graphical Editing Framework (GEF)
 - Graphical Modeling Framework (GMF)
 - Eclipse Project
 - Eclipse Test and Performance Tools Platform Project (TPTP)
 - Eclipse Web Tools Platform Project (WTP)
 - Visual Editor (VE)
- Improve the cohesion across projects and developer teams
- Unified update site
- Not a “one step” installer

“Oh release train sounding louder
Glide on the release train
Come on now release train
Yes, release train holy roller”





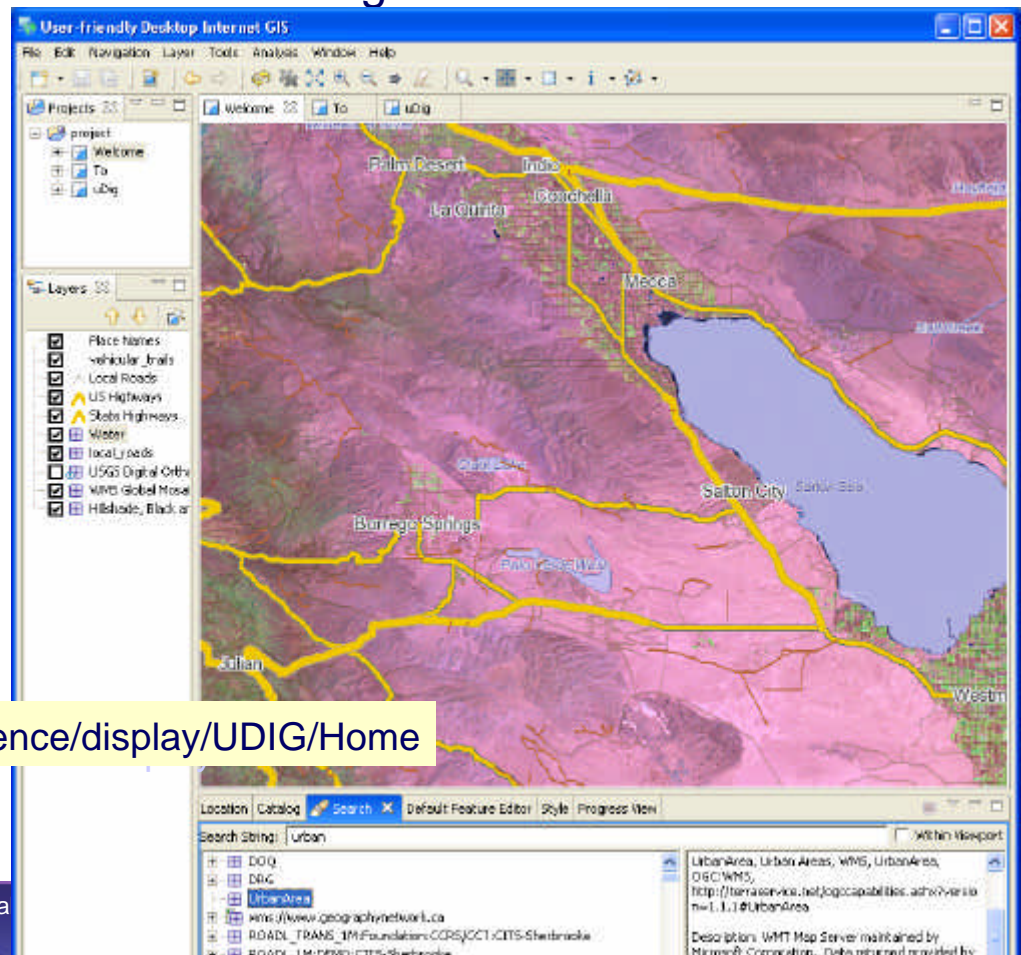
What is a Rich Client?

July 4, 2006

What is a Rich Client?



- An application that uses the windowing and GUI features of the operating system
 - Native widgets
 - Drag & drop
 - Integration with platform component model
 - Much, much, more...



<http://udig.refractory.net/confluence/display/UDIG/Home>

Example: Plum Canary - Chirp



Chirp

File Edit View Window Help

New Task Auto View View Delete Update Print Sync Project Info

Search

All / In / Out

All tasks (9)
In (0)
Out (4)

Projects

Administrative (1)
Application deployment (1)
Application Release 2 (1)
Exercise (1)

Views

High priority (2)

Date Filter

March 2005
S M T W T F S
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31

Tasks

Task Name	Status	Assignee	ETA	% complete	Last update	Assignor	Pr
<input type="checkbox"/> Return PC for repair	GREEN	it@plumcanary.com	03/21/2005	70	03/24/2005	jimmy.jones@myco	Ac
<input type="checkbox"/> Buy more resources at virtual web hosting ...	RED	jason@argonauts...	03/23/2005	60	03/24/2005	jimmy.jones@myco	Ac
<input type="checkbox"/> Get ready for vacation	YELLOW	jimmy.jones@myco...	03/21/2005	40	03/24/2005	jimmy.jones@myco	Pe
<input type="checkbox"/> New product summary text	GREEN	sally.smith@myco...	03/21/2005	30	03/24/2005	thompson@cool-gr	Mi
<input type="checkbox"/> Write new product PDF file for download	GREEN	jimmy.jones@myco...	03/21/2005	0	03/21/2005	thompson@cool-gr	Mi
<input type="checkbox"/> Register to run Boston marathon	GREEN	jimmy.jones@myco...	03/21/2005	0	03/21/2005	jimmy.jones@myco	E
<input type="checkbox"/> Execute contract with graphic designer	RED	jason.johnson@my...	03/31/2005	0	03/21/2005	jimmy.jones@myco	Mi
<input type="checkbox"/> Get samples of stock art for new project	GREEN	thompson@cool-g...	03/21/2005	0	03/21/2005	jimmy.jones@myco	Mi
<input type="checkbox"/> Write up revised first-launch tasks for R2	YELLOW		03/23/2005	0	03/21/2005	thompson@cool-gr	Ac

Click here to create new task

Task Name: Register to run Boston marathon

Assignee: jimmy.jones@myco.com

Issues & blockers:

Current status: GREEN Risk: Low Priority: 5 - Normal

Due on: 03/21/2005 ETA: % complete: 0

Task description: Be sure to send in time from the Bay State Marathon in Lowell showing qualifying pace.

jimmy.jones@myco.com

<http://www.eclipse.org/community/casestudies/plumcanary.pdf>

Example: iMedic



Sachentscheidung - 00/2425-0/2004 - iMEDIC OpenIT

Datum: 12.09.2004 bis 12.10.2004

Filter anwenden

Schlüsselwort	Datum	Typ	Nummer	Art	Jahr	Summe	IMP	Autor	Status
1	12.10.2004		2425-0	00	2004	30.524,00 €	OO	Sigmund Organizer	D/Co
Drucker	11.10.2004		2417-0	ME DIC	2004	163.160,64 €	OO	Sigmund Organizer	Desk
PCs	11.10.2004		2418-0	ME DIC	2004	33.513,56 €	OO	Sigmund Organizer	Desk
Laptops	11.10.2004		2419-0						
adobe/pdf	11.10.2004		2420-0						
adobe/ai	11.10.2004		2422-0						
Flachbildschirme	11.10.2004		2424-0						
Drucker und Software	26.01.2004		2017-0						
Drucker und Monitore	26.01.2004		2018-0						
APC	28.01.2004		2021-0						
Drucker für 10-6.12 / ...	05.02.2004		2028-0						
Software und Peripherie	25.02.2004		2075-0						
Drucker / Monitor / Periph.	25.02.2004		2074-0						
Drucker	03.03.2004		2083-0						
Monitor	18.03.2004		2118-0						
Peripherie	22.03.2004		2075-1						
Drucker / Software	07.04.2004		2154-0						
Peripherie	13.05.2004		2217-0						
Monitor	28.05.2004		2233-0						
Software	22.07.2004		2295-0						
APC	09.08.2004		2249-0						
Notebook / Drucker	25.08.2004		2340-0						
APC	18.03.2004		2119-0						
Drucker	29.03.2004		2141-0						
APC und Drucker	17.06.2004		2270-0						
APC	16.07.2004		2319-0						
Dienstleistung	20.07.2004		2325-0						
Monitor	09.08.2004		2357-0						
Monitor	16.08.2004		2363-0						
APC Monitor + Periph.	15.09.2004		2362-0						
APC Monitor	05.09.2004		2363-0						

Sigmund Organizer

Sachentscheidung - Amt/6-0/2004, Umsetzung GR Drs: 666 - iMEDIC OpenIT

Datum: 12.09.2004 bis 12.10.2004

Filter anwenden

Produkte

Produktauswahl

Produkt/Dienstleistung	Einzelpreis	Menge	Gesamtpreis
Deskjet 6112 ink, Druckerlabel	222,00 €	1,00	222,00 €
Iyama HP 703 UT	222,00 €	4,00	888,00 €
SQL 2000 Server Enterprise Edition deutsch, Lizenz [810-90632]	5.555,00 €	3,00	16.665,00 €
W 612 DTH	1.111,00 €	2,00	2.222,00 €
PSC erste Batterie für E700 / 4xxx	33,00 €	1,00	33,00 €

Summe

Zwischensumme: 20.030,00 €

zzgl. gesetzliche MwSt. 16%: 3.204,00 €

Gesamtsumme: 23.234,00 €

Organisator org

Produkt/Dienstleistung

Preis

W 612 DTH 1.111,00 €

PSC erste Batterie für E700 / 4xxx 33,00 €

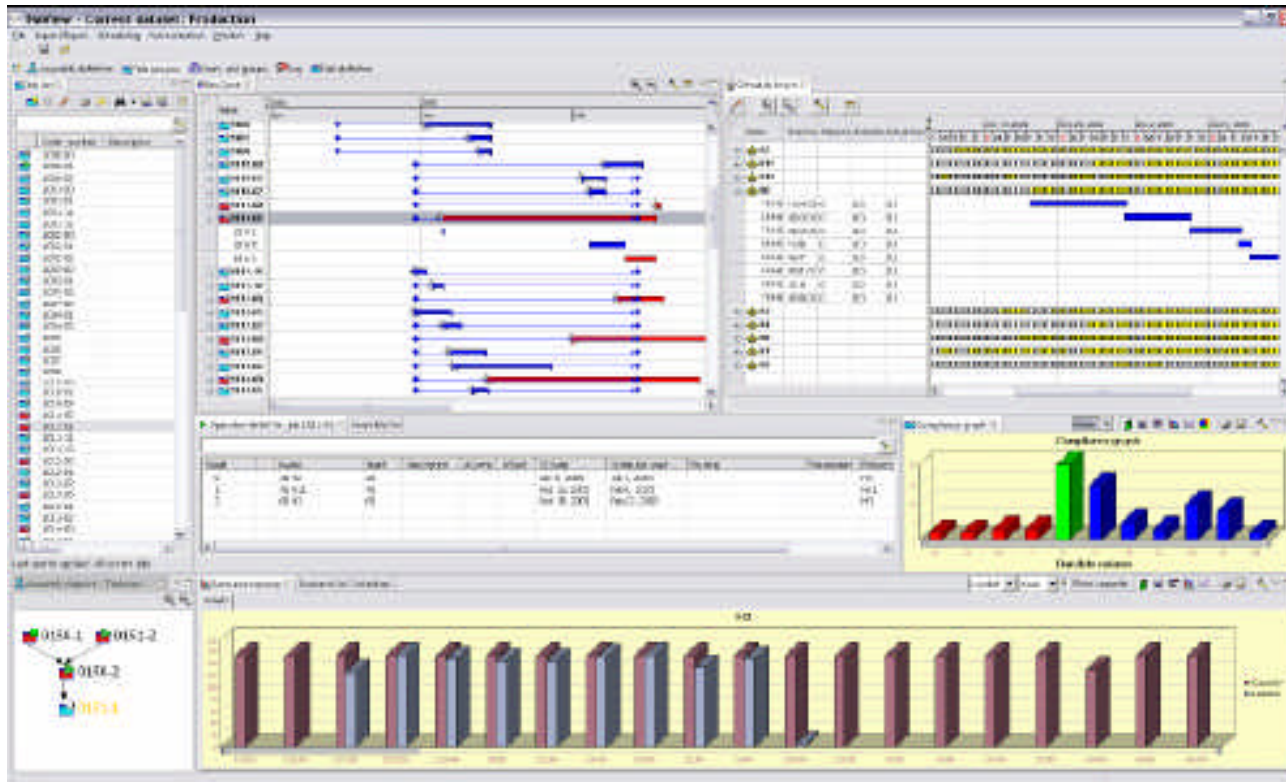
SQL 2000 Server Enterprise Edition d... 5.555,00 €

Deskjet 6112 ink, Druckerlabel 222,00 €

Iyama HP 703 UT 222,00 €

<http://www.eclipse.org/community/casestudies/imedic.pdf>

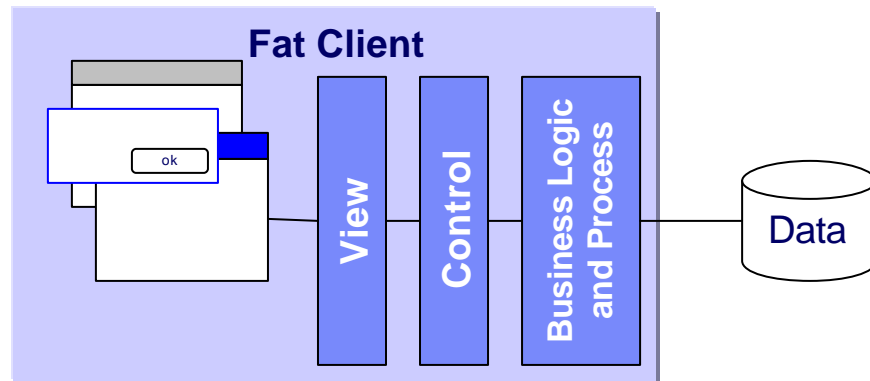
Example: RSS Solutions



<http://www.eclipse.org/community/casestudies/RSSfinal.pdf>

Evolution of the Client: Fat Client

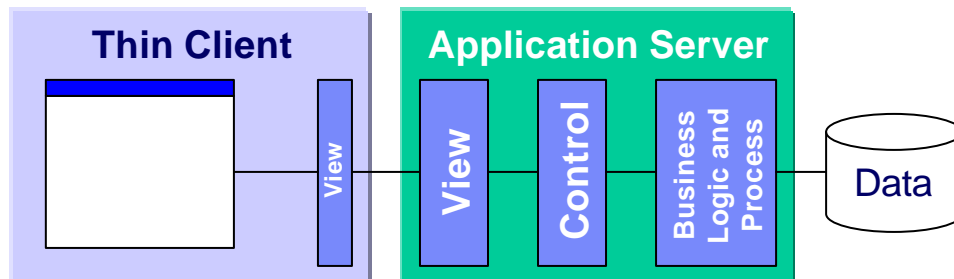
- All application logic on the client
- Rich user experience
- Platform dependent
- Monolithic application
- Relatively difficult to update



Evolution of the Client: Thin Client



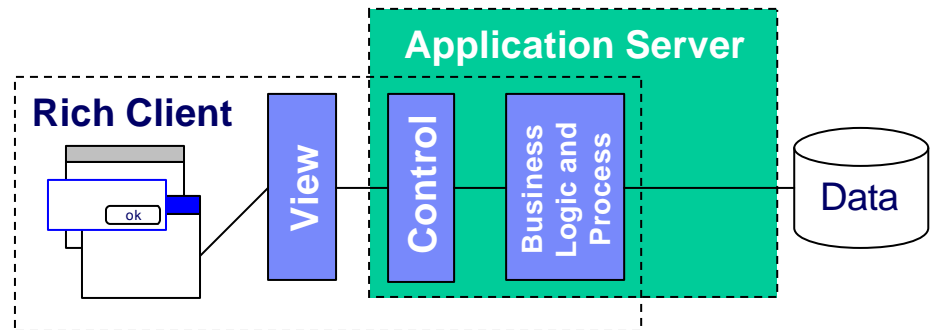
- All application logic on the server
- Massively concurrent application
- Client platform independent
 - Clients run in browser
- Very simplistic user experience
- Relatively easy to update



Evolution of the Client: Rich Client



- Rich user experience
- Typically (though not necessarily) a client for some backend service
- Platform independent
 - Runs with little or no modification on multiple platforms and devices
- Component model
- Integrated update mechanism
- Extensible



Rich or Thin Clients?



- Thin client
 - Casual users don't want to install software
 - Online banking, auction browsing
- Rich client
 - Power users demand responsive, rich, powerful user interfaces
 - Teller, bank manager, power auctioneer

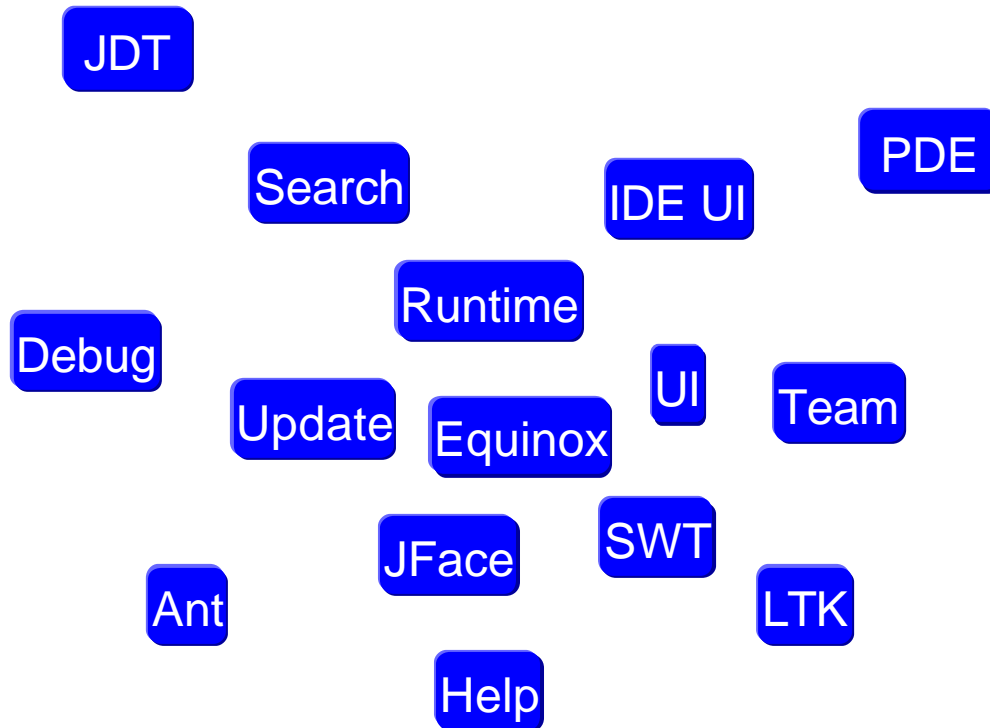
**I like all my clients
to be rich!**





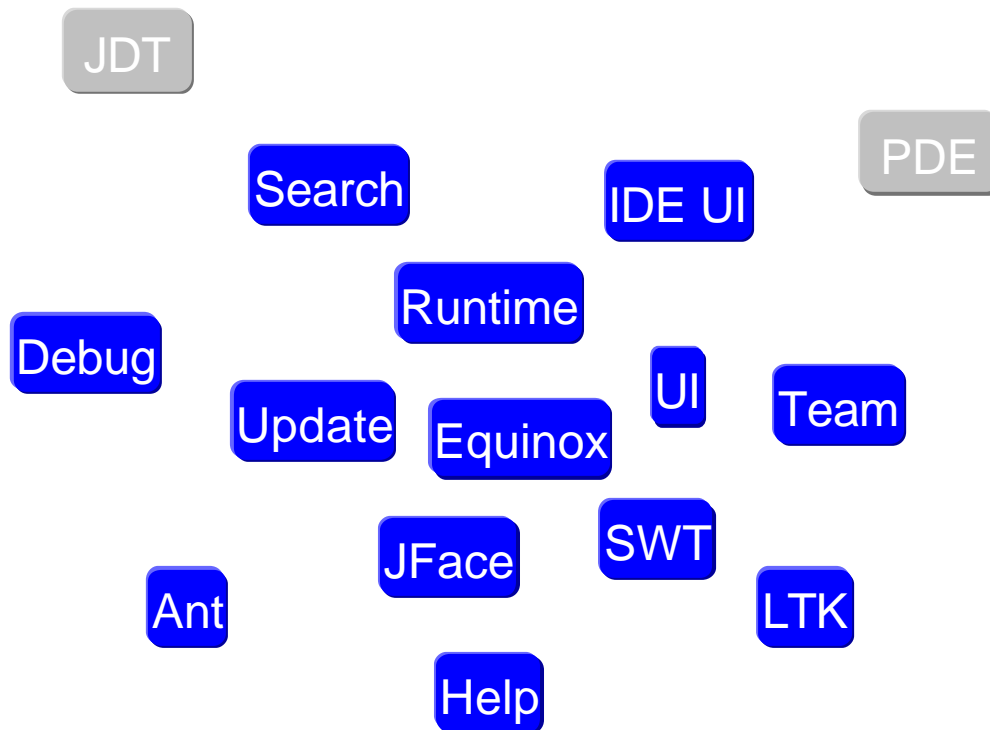
What is Eclipse Rich Client Platform?

Eclipse Rich Client Platform? (1/3)



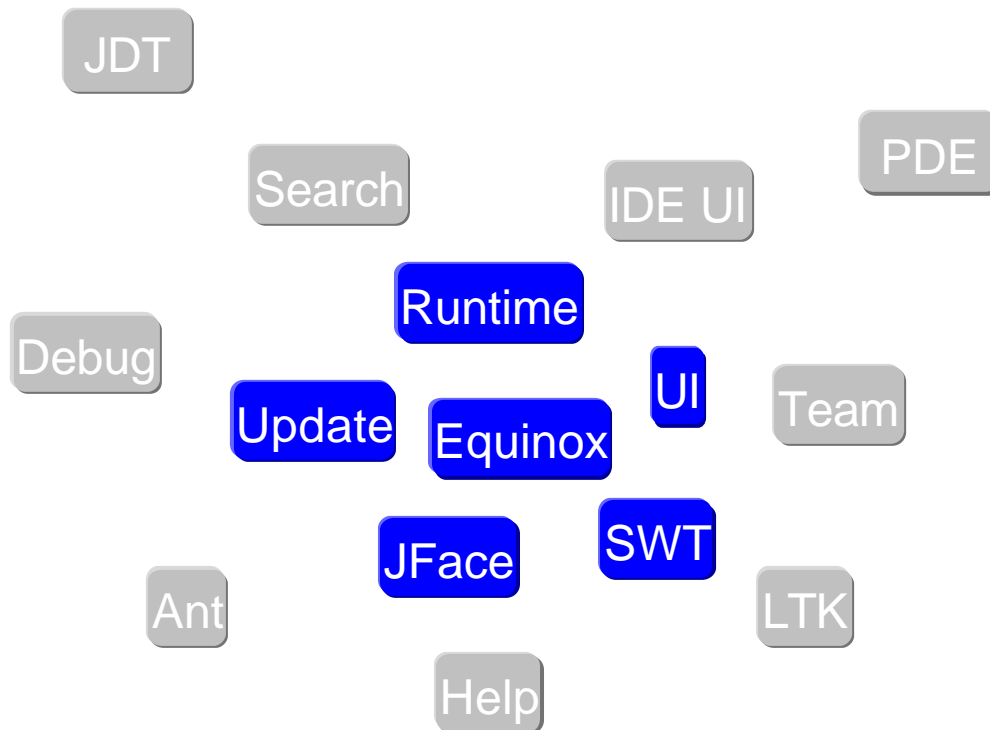
Eclipse SDK/Java IDE

Eclipse Rich Client Platform? (2/3)



Eclipse IDE

Eclipse Rich Client Platform? (3/3)

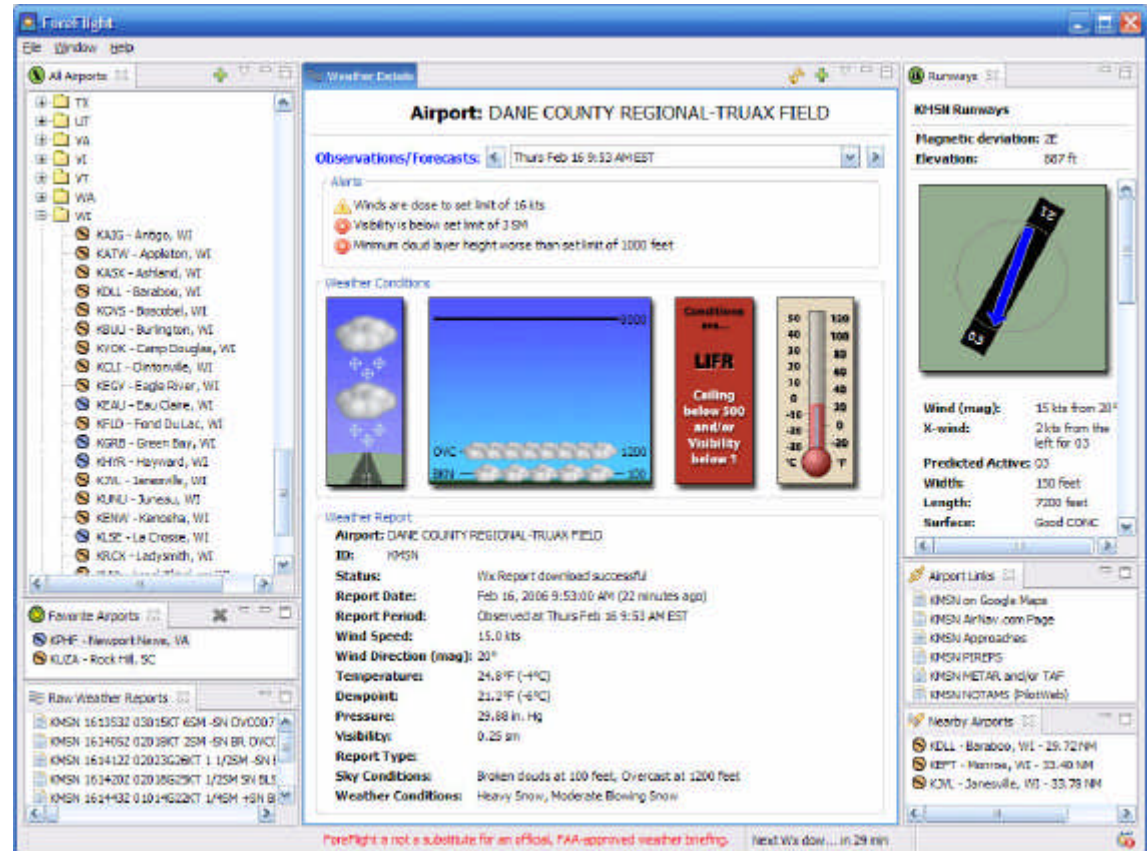


Eclipse Rich Client Platform

Example: ForeFlight



- Displays critical information graphically and prominently
- Displays alerts when conditions are near or exceeding the user's preferred limits
- Connects via the web to weather and information services
- Multiple ergonomic views of the weather that affects the go/no-go flight decision



<http://www.foreflight.com/>

Why Use Eclipse Rich Client Platform?

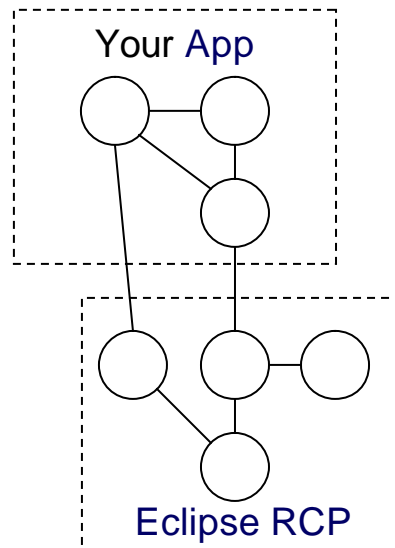


- A consistent and native look and feel across applications and features
- Provides common application services
 - Native look and feel
 - Window management
 - Standardized component model (Equinox)
 - Pervasive extensibility – Extension registry
 - Update Manager
 - Help system
- First-class development tools
- Middleware for building rich client applications!
 - Allows programmers to focus on core application not the plumbing
 - Don't reinvent the wheel

Building Platforms (1/2)



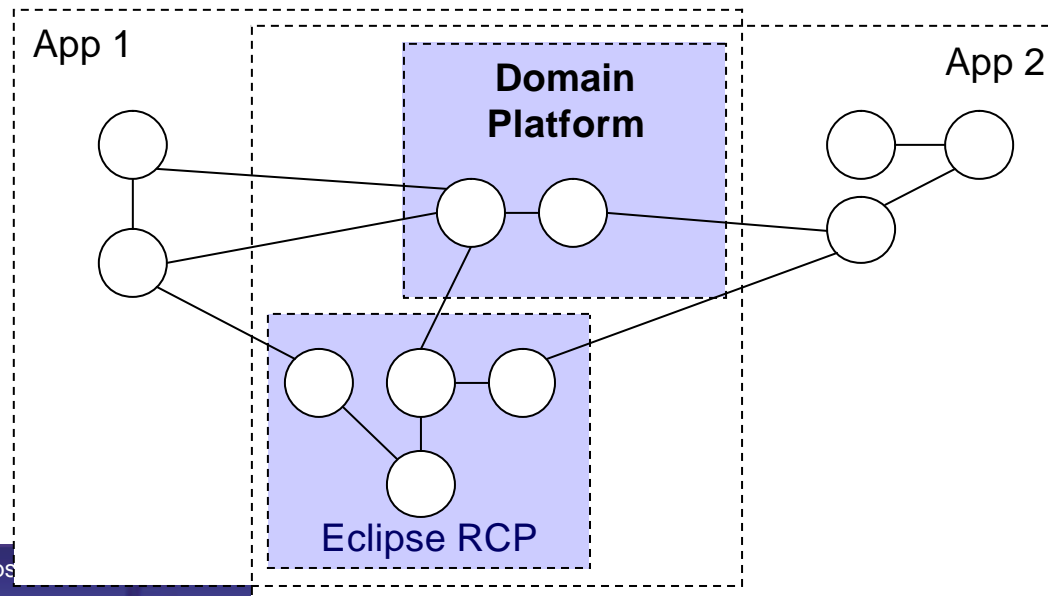
- It all starts with plug-ins
 - Eclipse RCP applications are composed of components that plug into the platform
- When starting development on RCP, it is common to provide a handful of domain-specific components that sit directly on top of RCP



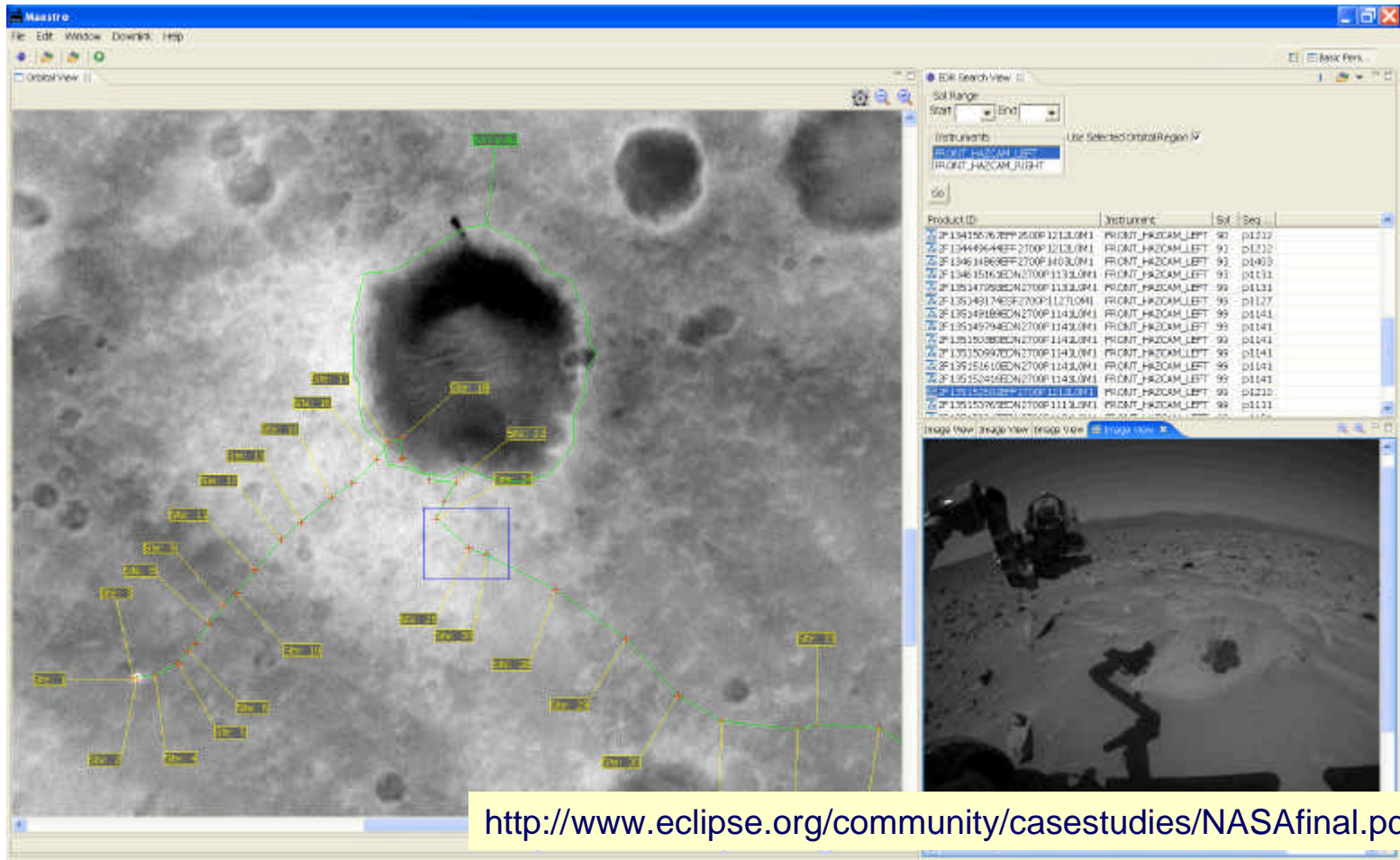
Building Platforms (2/2)



- It's natural for RCP development to spawn one or more “platforms”
 - A custom base for multiple development teams to build their applications upon
 - All of the examples in this presentation all have an underlying domain-specific platform



Example: Maestro – NASA Space Mission Management

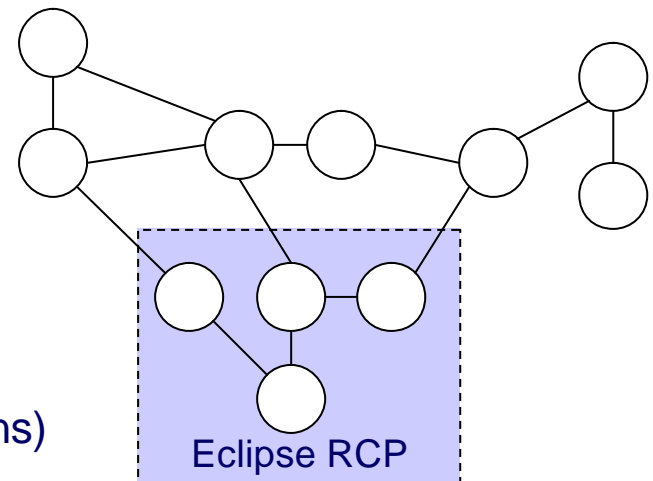


<http://www.eclipse.org/community/casestudies/NASAFinal.pdf>

Equinox (1/2)



- Equinox is the Eclipse component model
 - Based on OSGi R4 specification
 - Standard Java lacks an explicit notion of components
- Components == Bundles == Plug-in
 - Versioned
 - Defined declaratively
 - Dynamically loadable/unloadable
 - Support dynamic update and install
- Explicitly define
 - Dependencies
 - Runtime visibility
 - Interactions (extension points/extensions)



Equinox (2/2)



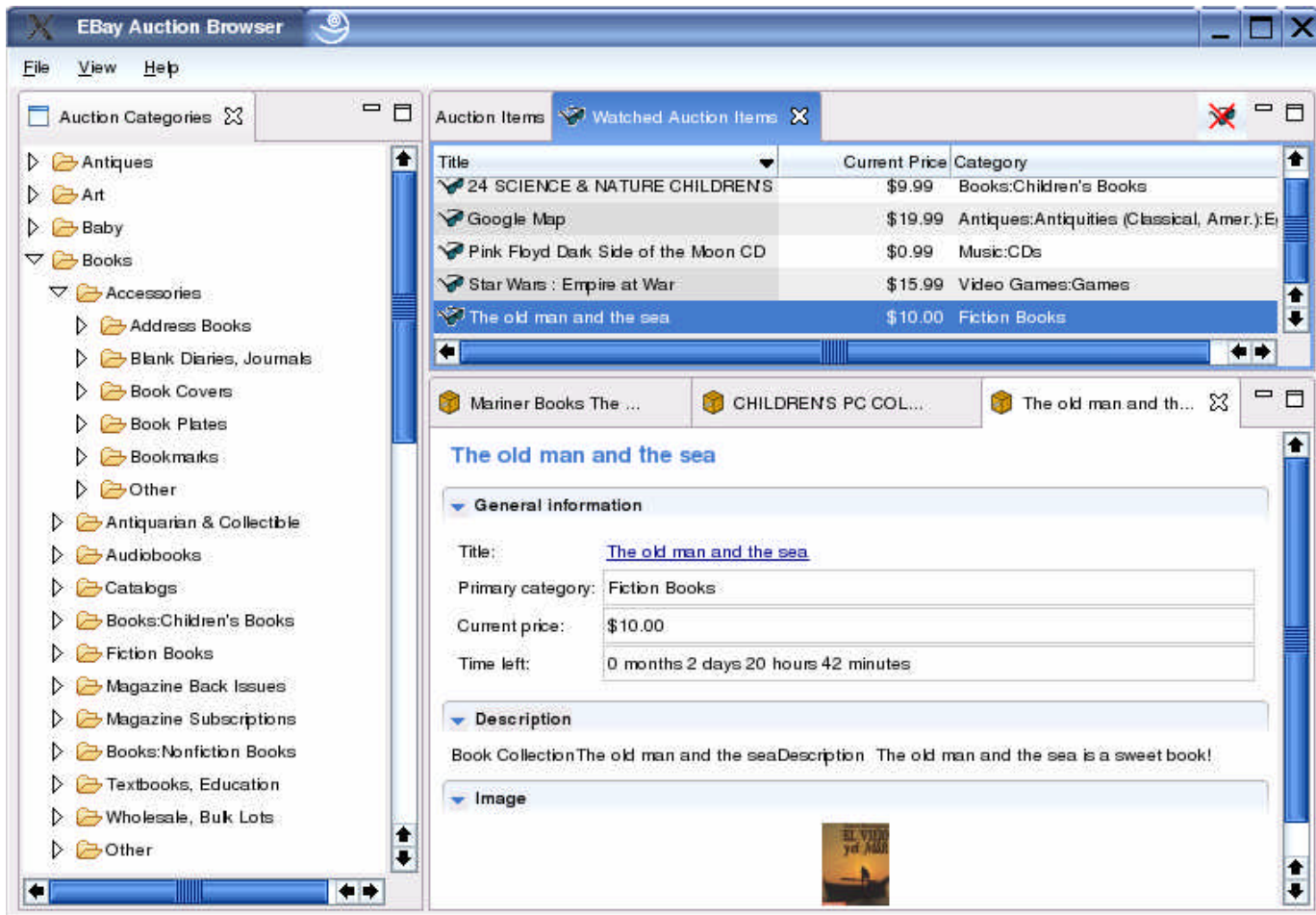
- Components integrate without interfering
 - Required components set explicitly
 - Unrelated components do not have direct access to one-another
- Downstream components can access upstream components through the extension mechanism
 - Downstream component registers (declaratively) an extension point
 - Dependent components register (declaratively) extensions

Eclipse RCP as an Integration Point

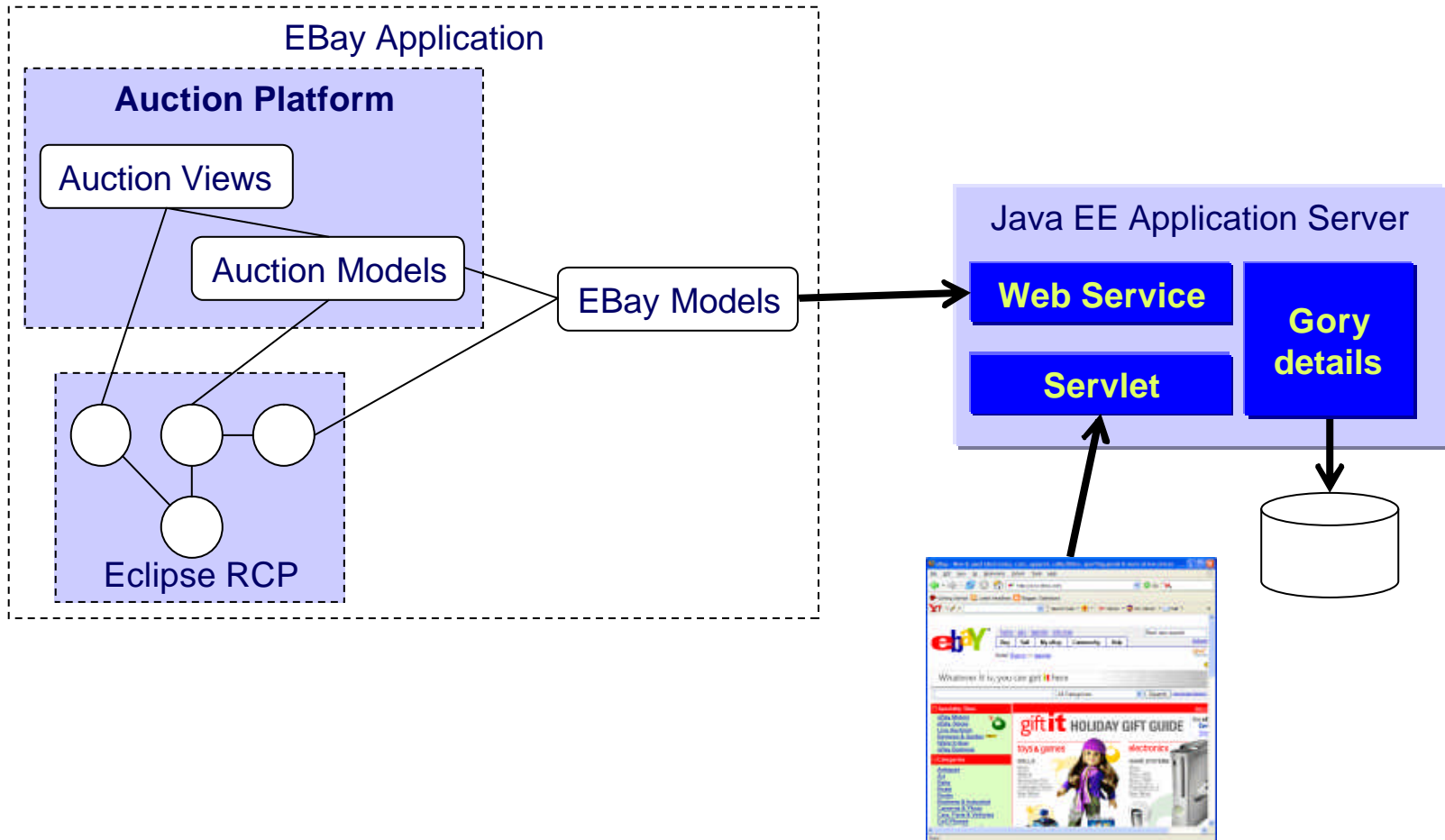


- Integrating completely independent components is easy
 - Views from independent components can easily share the workspace
 - Menus populated by multiple components
- Integrating loosely coupled components requires planning
 - Sharing selection information
 - Drag and drop between views from different components
 - Extension point/extension mechanism for more intimate integration
 - Not artificially restricted in any way: non-gui extension points can be used to provide all types of extensions

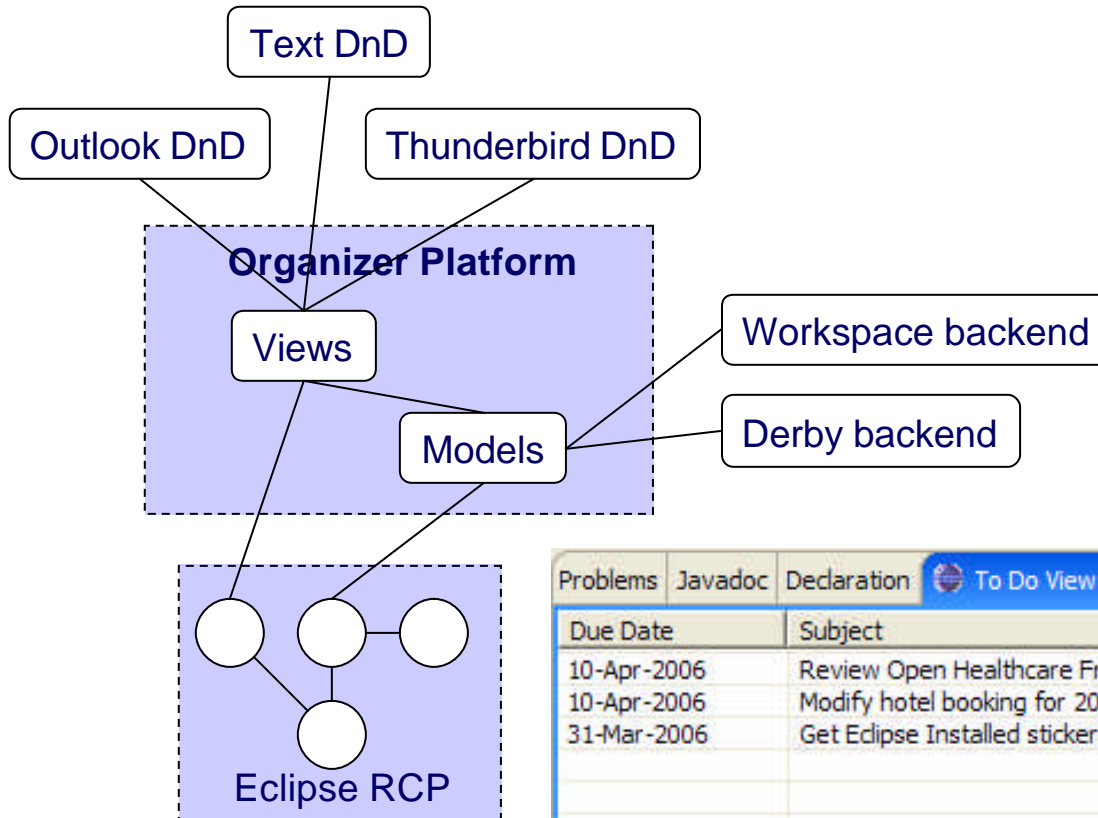
Example: eBay Auction Browser



Overview of the Example



Another Example



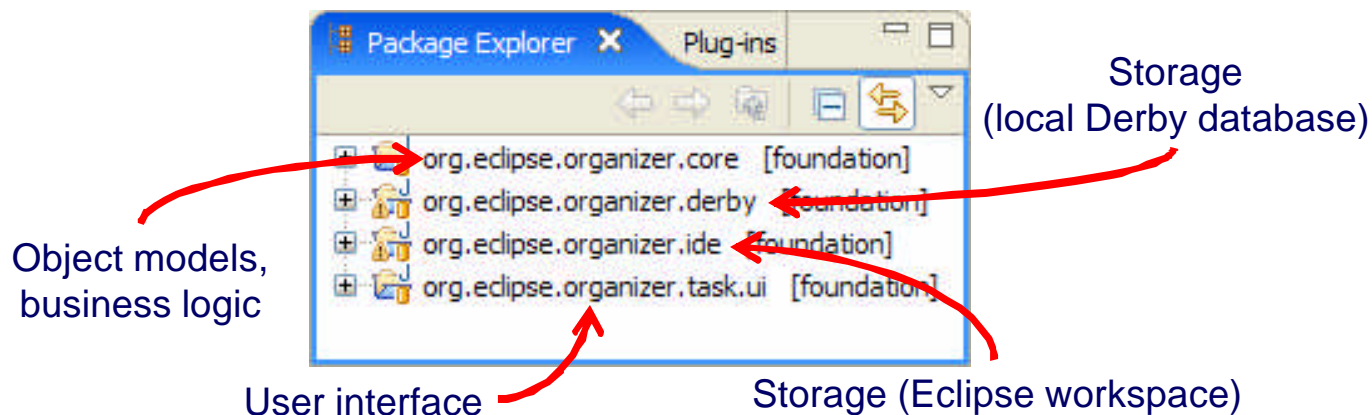
The screenshot shows the Eclipse IDE interface with the "To Do View" window open. The window has a title bar with "To Do View" and a close button. Below the title bar is a toolbar with "New task..." and "Delete" buttons. The main area is a table with the following data:

Due Date	Subject	Com...	
10-Apr-2006	Review Open Healthcare Framework	No	
10-Apr-2006	Modify hotel booking for 2006 JavaOne	No	
31-Mar-2006	Get Eclipse Installed stickers for LinuxWorld	Yes	

RCP Architecture (1/2)



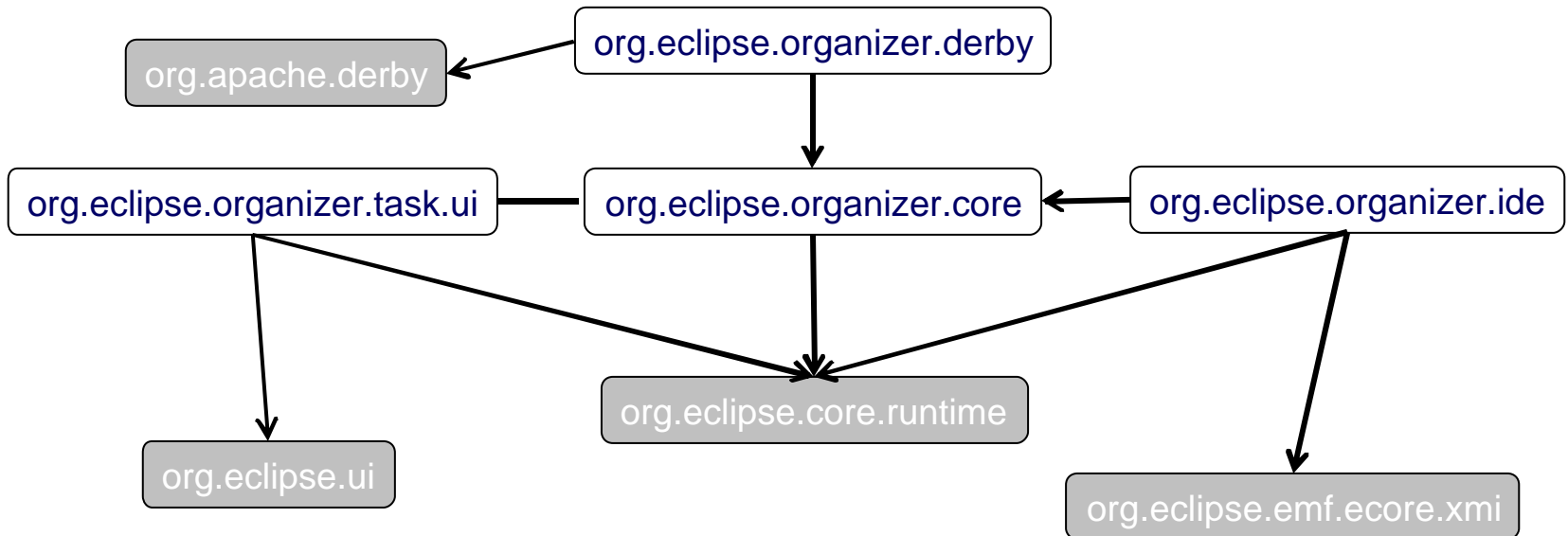
- Classic best-practices apply
 - Layered architecture
 - Organizer layers into components/plug-ins
- Model-view-controller
 - Model: objects representing data or activities
 - View: visualization of the state of the model
 - Controller: mediates between the view and model



RCP Architecture (2/2)



- Explicit dependencies between components
- Explicit visibility to implementation





Wrap up

July 4, 2006

Tools and Frameworks



- Many tools and frameworks available to help you build your application

- Java Development Tools (JDT)
- Plug-in Development Environment (PDE)
- Visual Editor (VE)

... and runtime support...

- Business Intelligence Reporting Tools (BIRT)
- Eclipse Modeling Framework (EMF)
- Graphical Editing Framework (GEF)
- Eclipse Communication Framework (ECF)

... and more!

More information...



- Project web site
 - <http://eclipse.org/rcp>
- Usenet newsgroup
 - <news://news.eclipse.org/eclipse.platform.rcp>
- <http://eclipseplugincentral.com/>

Recommended Reading



- Eclipse Rich Client Platform
 - By Jeff McAffer and Jean-Michel Lemieux
 - Addison-Wesley Professional
 - ISBN: 0321334612
- SWT : The Standard Widget Toolkit, Volume 1
 - By Steve Northover, Mike Wilson
 - Addison-Wesley Professional
 - ISBN: 0321256638
- Contributing to Eclipse: Principles, Patterns, and Plugins
 - By Erich Gamma, Kent Beck
 - Addison-Wesley Professional
 - ISBN: 0321205758

