The Equinox Universal Runtime

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How the talk is organized

- Short Introduction
- “Past, Present and Future”

Back to OSGi and Equinox
- A Short Introduction

What is OSGi?

- **OSGi: A dynamic module system for Java**

- OSGi Alliance
  - Provides specification of OSGi
  - Founded in March 1999
- Module Layer
  - Modules + Dynamic
  - Versioning
- Service Layer
  - Dynamic Cooperation between Modules
- A number of concrete service specs

What is Equinox?

- OSGi implementation of the Eclipse project
  - OSGi R4.1 reference implementation
  - Base runtime technology for Eclipse SDK

- Sub-project of Eclipse top-level project
  - Drives Equinox implementation
  - Implements optional OSGi specs (e.g. Declarative Services)
  - Provides additional bundles (e.g. Extension Registry, web support)
  - Researches new capabilities within an incubator (like security, aspect weaving, management, provisioning, etc.)

The Past

Where does OSGi come from?

- ”Open Systems Gateway Initiative”

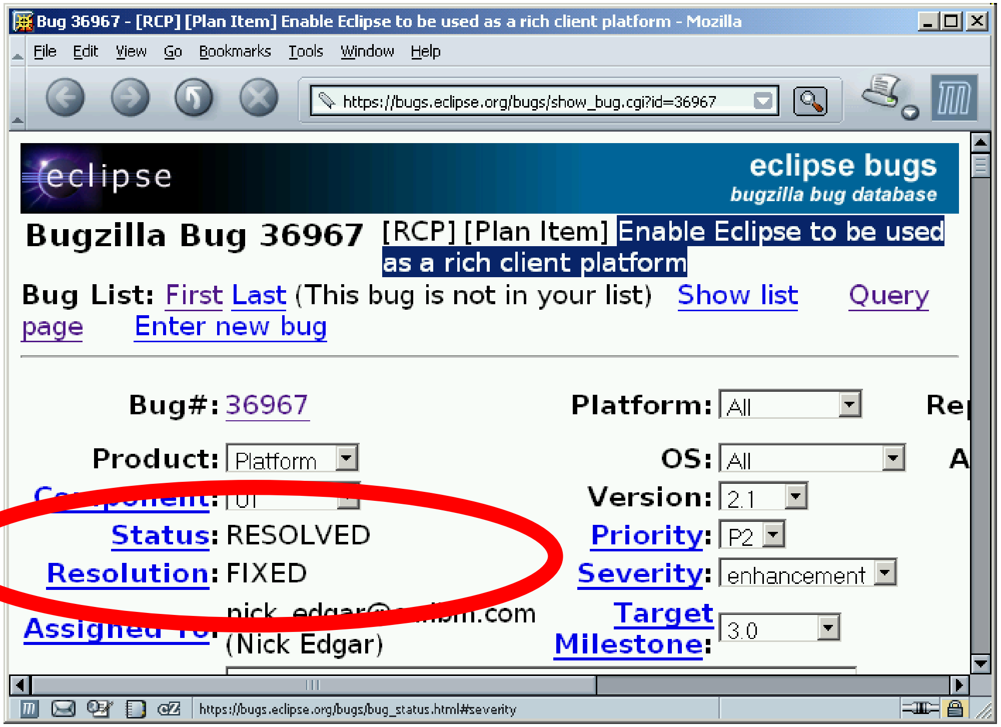
- Mostly embedded stuff for home automation and car systems
- Mostly invisible for the masses for years

Where does Equinox come from?

- Eclipse 2.1 (back in 2003) had a self-implemented plugin system
- This plugin system should improve for Eclipse 3.0 (June 2004)
  - Technology incubator project created called Equinox
  - Decision made towards OSGi
- SMF (Service Management Framework)
  - IBMs implementation of early OSGi specs as base
  - Reworked, rewritten, improved, open-sourced within Equinox incubator project
  - Became base of Eclipse 3.0

The next step: Eclipse Rich Client Platform

- RCP Bug
- Resolved with Eclipse 3.0



Bug 36967 - [RCP] [Plan Item] Enable Eclipse to be used as a rich client platform - Mozilla

https://bugs.eclipse.org/bugs/show_bug.cgi?id=36967

Bugzilla Bug 36967 [RCP] [Plan Item] Enable Eclipse to be used as a rich client platform

Bug List: First Last (This bug is not in your list) Show list Query page Enter new bug

Bug#: 36967 **Platform:** All **Re**

Product: Platform **OS:** All **A**

Component: UI **Version:** 2.1

Status: RESOLVED **Priority:** P2

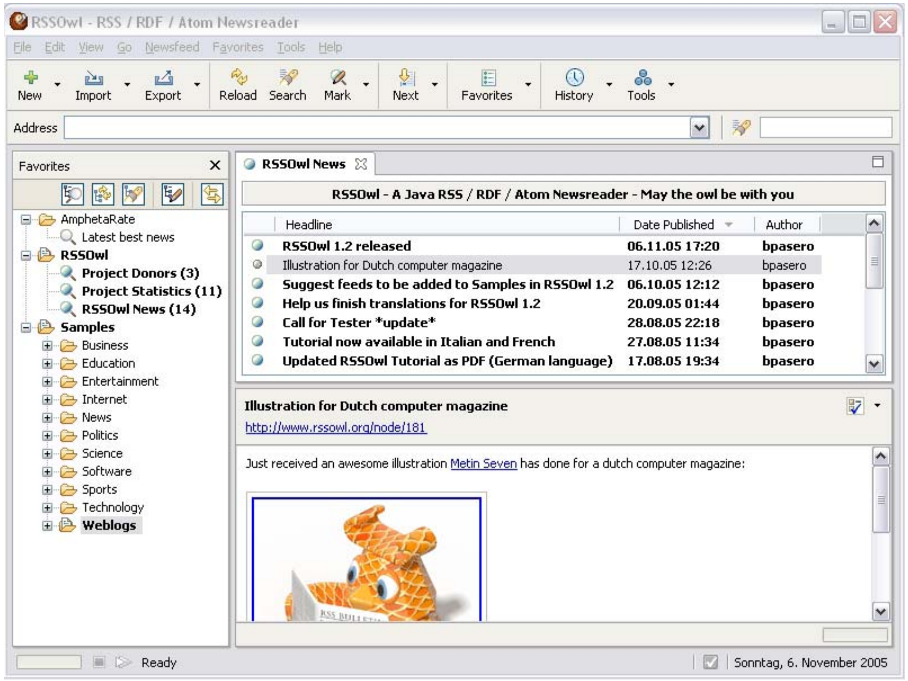
Resolution: FIXED **Severity:** enhancement

Assigned To: nick_edgar@[illegible]ibm.com (Nick Edgar) **Target Milestone:** 3.0

https://bugs.eclipse.org/bugs/bug_status.html#severity

Rich Client Platform explained

- RCP = Equinox + UI-Frameworks
  - Equinox OSGi
  - SWT / JFace
  - Generic Workbench
  - Optional components
    - Update
    - Help
    - …


RSSOwl - RSS / RDF / Atom Newsreader
File Edit View Go Newsfeed Favorites Tools Help
New
Import
Export
Reload
Search
Mark
Next
Favorites
History
Tools
Address
Favorites

- AmphetaRate
  - Latest best news
- **RSSOwl**
  - **Project Donors (3)**
  - **Project Statistics (11)**
  - **RSSOwl News (14)**
- **Samples**
  - Business
  - Education
  - Entertainment
  - Internet
  - News
  - Politics
  - Science
  - Software
  - Sports
  - Technology
  - **Weblogs**

RSSOwl News

RSSOwl - A Java RSS / RDF / Atom Newsreader - May the owl be with you

Headline	Date Published	Author
RSSOwl 1.2 released	**06.11.05 17:20**	**bpasero**
Illustration for Dutch computer magazine	17.10.05 12:26	bpasero
Suggest feeds to be added to Samples in RSSOwl 1.2	**06.10.05 12:12**	**bpasero**
Help us finish translations for RSSOwl 1.2	**20.09.05 01:44**	**bpasero**
Call for Tester *update*	**28.08.05 22:18**	**bpasero**
Tutorial now available in Italian and French	**27.08.05 11:34**	**bpasero**
Updated RSSOwl Tutorial as PDF (German language)	**17.08.05 19:34**	**bpasero**

Illustration for Dutch computer magazine

http://www.rssowl.org/node/181

Just received an awesome illustration Metin Seven has done for a dutch computer magazine:

Ready

Sonntag, 6. November 2005

Benefits

- Eclipse SDK
  - Uses a standard runtime technology called OSGi
  - Got more flexible and dynamic
- Rich Client Platform
  - Extracted best practices, patterns and code from SDK
  - Solid base for fast rich client development
  - Developers began to adopt OSGi for general application development

⇨ **Better modularity**

The Present

What is OSGi today?

- OSGi™ – Trademark
- **“A dynamic module system for Java”**

- SDA India: **“Top 5 Java Technologies to Learn in 2008”**
- SD Times: **“… quite a contender of the title most important technology of the decade”**

- Different implementations available
  - Open Source: Apache Felix, Knopferfish, ProSyst, Equinox, …
  - Commercial: ProSyst, …

RCP today

- Used by large companies
  - IBM Lotus / IBM Rational
  - Daimler
  - NASA
  - Allianz
  - …
- Well established platform

OSGi as base platform

- Platform for general Java development
  - Swing apps
  - Batch apps
  - Web apps
  - Back-end systems

- They all benefit from greatly **modularity**, **dynamic components** and **services**

Spring Dynamic Modules

- Other technologies start to embrace OSGi

- E.g. Spring Dynamic Modules for OSGi
  - Connects Spring with OSGi
  - Keep the simple POJO programming model
  - Benefit from the features of OSGi
  - Ease OSGi development
  - Runs on different OSGi implementations
  - http://www.springframework.org/osgi

Server-side OSGi

- OSGi conquers the development of server-side applications
  - Web apps as a set of OSGi bundles
  - Modularity and extensibility for web apps
  - Back-end systems using OSGi

- Examples:
  - Jazz Team Server runs on Equinox
  - Adobe Version Cue
  - …

Server-side technologies

- Already used possibilities together with Equinox:
  - GWT
  - other AJAX frameworks (like Dojo)
  - Apache Struts
  - Spring WebMVC
  - Spring Remoting
  - Servlets, JSPs, TagLibs
  - …

OSGi as an standard for Application server

- App server vendors adopt OSGi

- WebSphere 6.1 runs on top of Equinox
- BEA and JBoss adopt OSGi in their kernel implementations
- Suns Glassfish runs on OSGi

Benefits

- Well established
  - Good documentation
  - Tutorials, screencasts
  - Experience reports

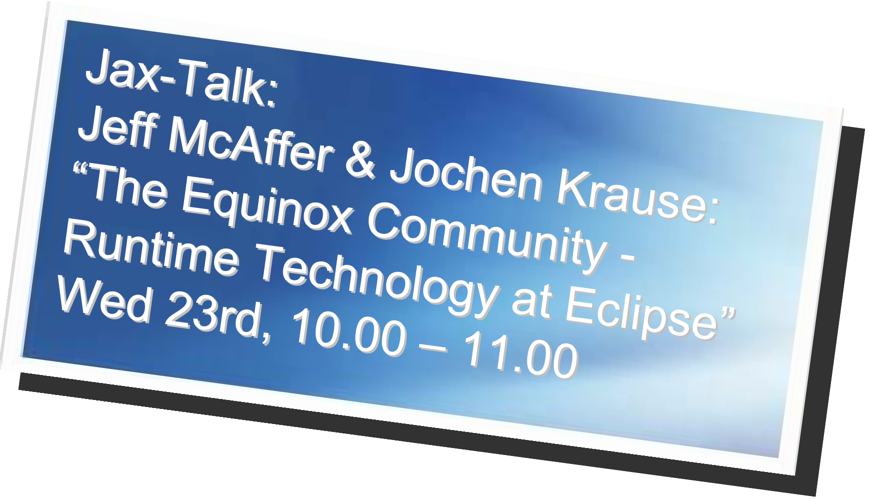
- Easier to ”sell” to management
  - ... because it‘s an app-server standard
  - … because Spring leverages it

- Server-Side

The Future

Eclipse RT

- Eclipse Runtime: New Toplevel-Project
- http://www.eclipse.org/proposals/rt/
- *… dedicated to supporting and enhancing these efforts and providing a generic, extensible, standards-based runtime platform.*
- *Sub-Projects:*
  - *Equinox*
  - *RAP*
  - *Swordfish*
  - *EclipseLink*
  - *ECF*
  - *Riena*



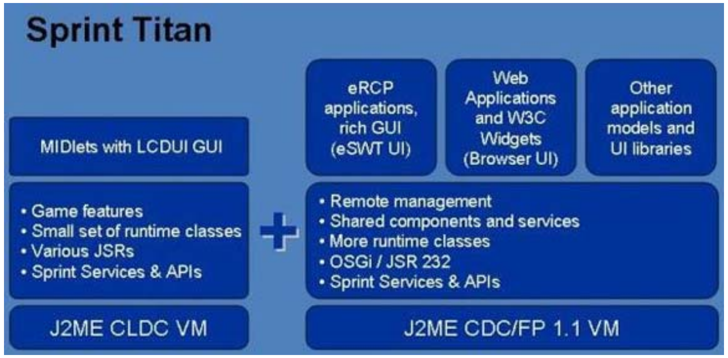
Jax-Talk:
Jeff McAffer & Jochen Krause:
“The Equinox Community - Runtime Technology at Eclipse”
Wed 23rd, 10.00 – 11.00

What’s next for OSGi?

- Enterprise Expert Group:
  - Distributed OSGi
  - Component model (towards Spring Dynamic Modules)
- Back to embedded ;-)
  - Mobile specification update
  - Vehicle specification update
  - Residential specification
- Core updates
  - Classloading enhancements, bundle tracker, ds update, and some more…

Cell Phones including OSGi

- Titan platform from Sprint
  - A new OSGi based platform for phone application



Sprint Titan

MIDlets with LCDUI GUI

- Game features
- Small set of runtime classes
- Various JSRs
- Sprint Services & APIs

J2ME CLDC VM

+

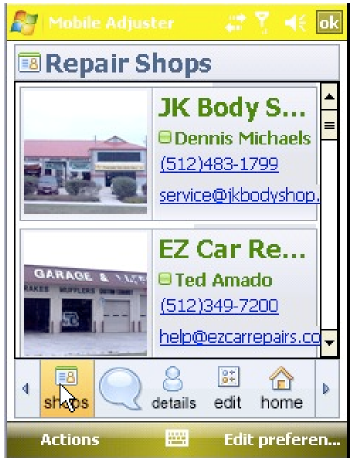
eRCP applications, rich GUI (eSWT UI)

Web Applications and W3C Widgets (Browser UI)

Other application models and UI libraries

- Remote management
- Shared components and services
- More runtime classes
- OSGi / JSR 232
- Sprint Services & APIs

J2ME CDC/FP 1.1 VM



Repair Shops

JK Body S...
Dennis Michaels
(512)483-1799
service@jkbodyshop.

EZ Car Re...
Ted Amado
(512)349-7200
help@ezcarrepairs.co

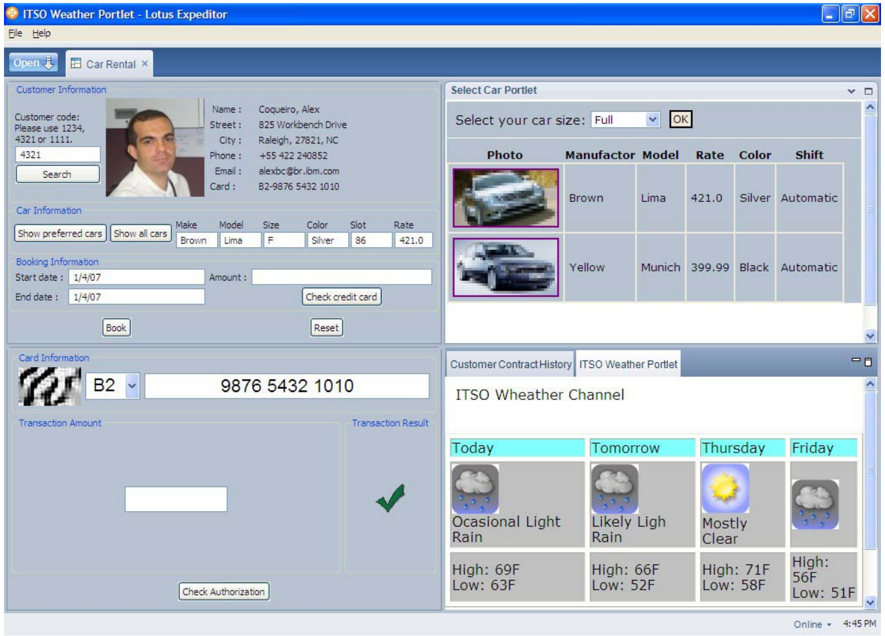
- Nokia E90 with eRCP
- ~100 millions of phones running OSGi

Embedded SWT, RCP

- Embedded version of the popular Eclipse RCP
  - Reduced to fit on a embedded device
- Uses CDC/Foundation profile as execution environment
- Uses eSWT
  - Large set of available widgets
- eRCP applications are OSGi Bundles
- Deployable to a range of devices
  - Support for Win32, Windows Mobile, WinCE, Nokia S60
  - Desktops, handhelds, cell phones
  - Future support for GTK and Qte

Lotus Expeditor

- Universal desktop client integration framework
- "Business mashup"
- Many supported clients:
  - Rich clients (RCP)
  - Webservices, Portlets, Browser (OSGi)
  - Mobile (eRCP)
  - …



ITSO Weather Portlet - Lotus Expeditor

Customer Information

Customer code: Please use 1234, 4321 or 1111.

4321

Name : Coqueiro, Alex
Street : 825 Workbench Drive
City : Raleigh, 27821, NC
Phone : +55 422 240852
Email : alexbc@br.ibm.com
Card : B2-9876 5432 1010

Car Information

Make	Model	Size	Color	Slot	Rate
Brown	Lima	F	Silver	86	421.0

Booking Information

Start date : 1/4/07
End date : 1/4/07
Amount :

Card Information

B2 9876 5432 1010

Transaction Amount

Transaction Result

Select Car Portlet

Select your car size: Full

Photo	Manufactor	Model	Rate	Color	Shift
	Brown	Lima	421.0	Silver	Automatic
	Yellow	Munich	399.99	Black	Automatic

ITSO Wheather Channel

Today	Tomorrow	Thursday	Friday
Ocasional Light Rain	Likely Ligh Rain	Mostly Clear	
High: 69F Low: 63F	High: 66F Low: 52F	High: 71F Low: 58F	High: 56F Low: 51F

JSR 291

- “Dynamic Component Support for Java™ SE”

- Many discussions with regards to:
  - JSR 277: “Java™ Module System”
  - JSR 294: “Improved Modularity Support in the Java™ Programming Language” (superpackages)

- Read more:
  - http://www.osgi.org/blog/

Eclipse 3.4

- P2:
  - New provisioning system for Eclipse/OSGi
  - http://www.eclipse.org/equinox/incubator/provisioning/
  - Features
    - Everything (like eclipse.exe) can be updated
    - Easy manual updates (dropins)
    - Manage from within or from outside
    - Discovery and resolution of depencies
    - Very extensible
- ”Minor” enhancements
  - PDE
  - JDT

JAX-Talk: Jeff McAffer
“Equinox p2: Next generation provisioning”
Wed 23rd, 17.15 – 18.15

Eclipse 4

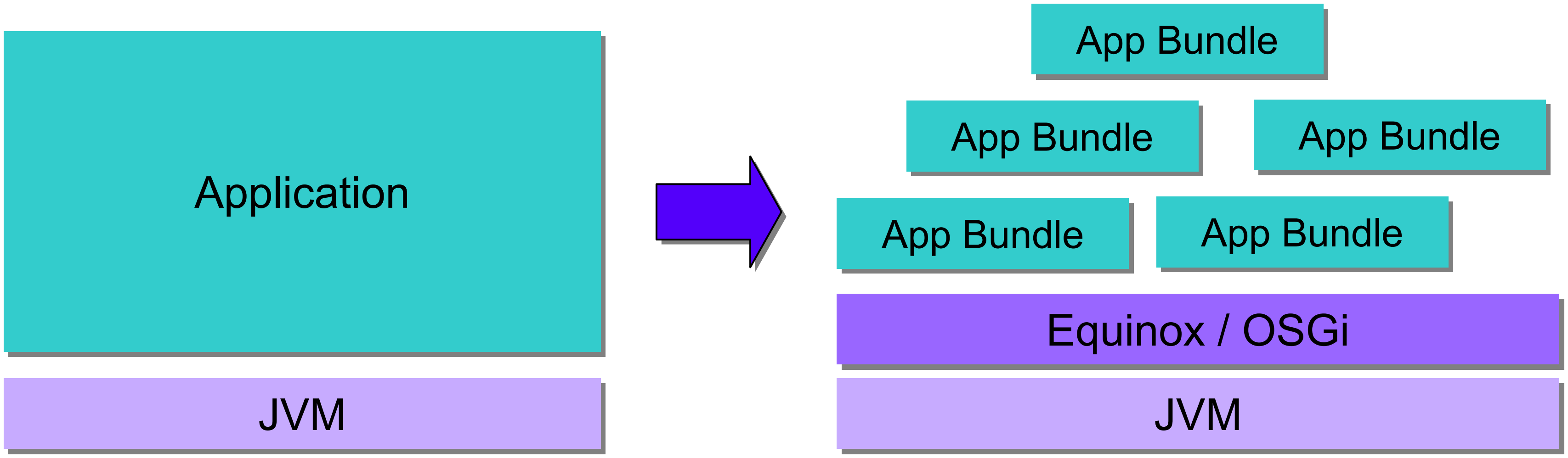
- Early prototypes explore rich UIs for the web
  - E.g. cross-compiled SWT widgets for Adobe Flex
  - Similar stuff

- Planning and project setup starts now
  - Call for participation!!!

- What does it mean for OSGi or Equinox?
  - Unifying Extension-Points, OSGi-Services, Declarative Services, Spring-Beans, iPojo …

Benefits: A general purpose runtime

- Equinox is a general-purpose runtime
  - The base layer on top of the JVM for all kinds of applications



Benefits: Component model

- Structure applications into components
- Including dependency management and versioning
- Natural step beyond packages

- One component model across all execution environments
  - Share programming models among environments
  - Share bundles among environments

Benefits: Easy to use

- OSGi and Equinox is easy to use
  - No real magic
  - *(except from libs not playing well within OSGi)*

- First-class tooling available
  - Eclipse PDE
  - In the early stages: IntelliJ IDEA plug-in called *Osmorc*
  - *bndtool* to bundle-lize existing JARs

- With Spring Dynamic Modules maybe even easier too use

Starting points

- Articles, Podcasts, Screencasts
  http://www.eclipse.org/resources
- Equinox-Screencasts
  http://live.eclipse.org/category/132
- Equinox
  http://www.eclipse.org/equinox/documents/

New OSGi book

Gerd Wütherich · Nils Hartmann
Bernd Kolb · Matthias Lübken
Die OSGi Service Platform
Eine Einführung mit Eclipse Equinox
→ Mit einem Geleitwort von Peter Kriens, OSGi Technical Director
dpunkt.verlag

- Die OSGi Service Platform
  Eine Einführung mit Eclipse Equinox

  Gerd Wütherich, Nils Hartmann,
  Bernd Kolb, Matthias Lübken

Thank you for your attention!

Q&A

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