The Eclipse Way

Szymon Brandys Pawel Pogorzelski Tomasz Zarna

Platform Workspace Team
IBM Poland

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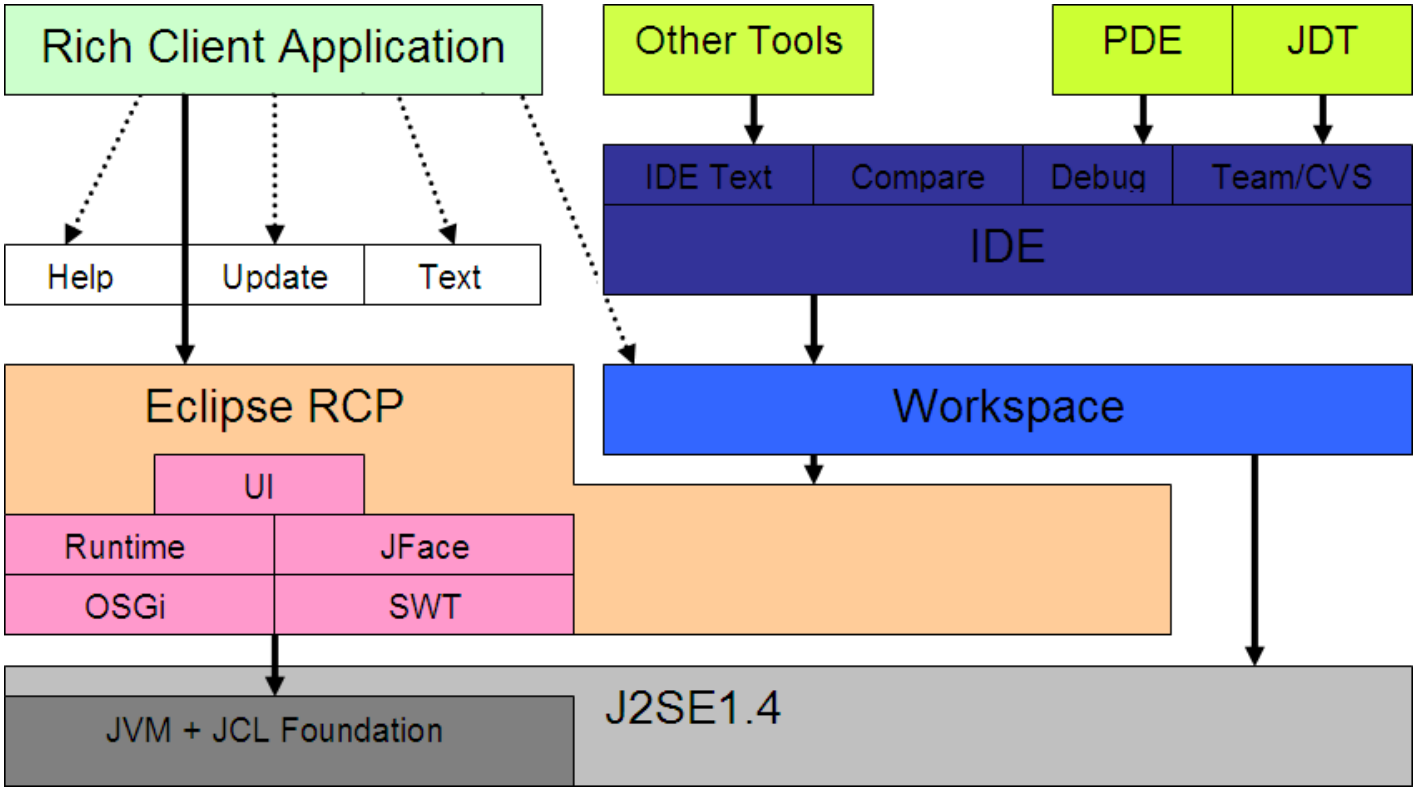
Agenda

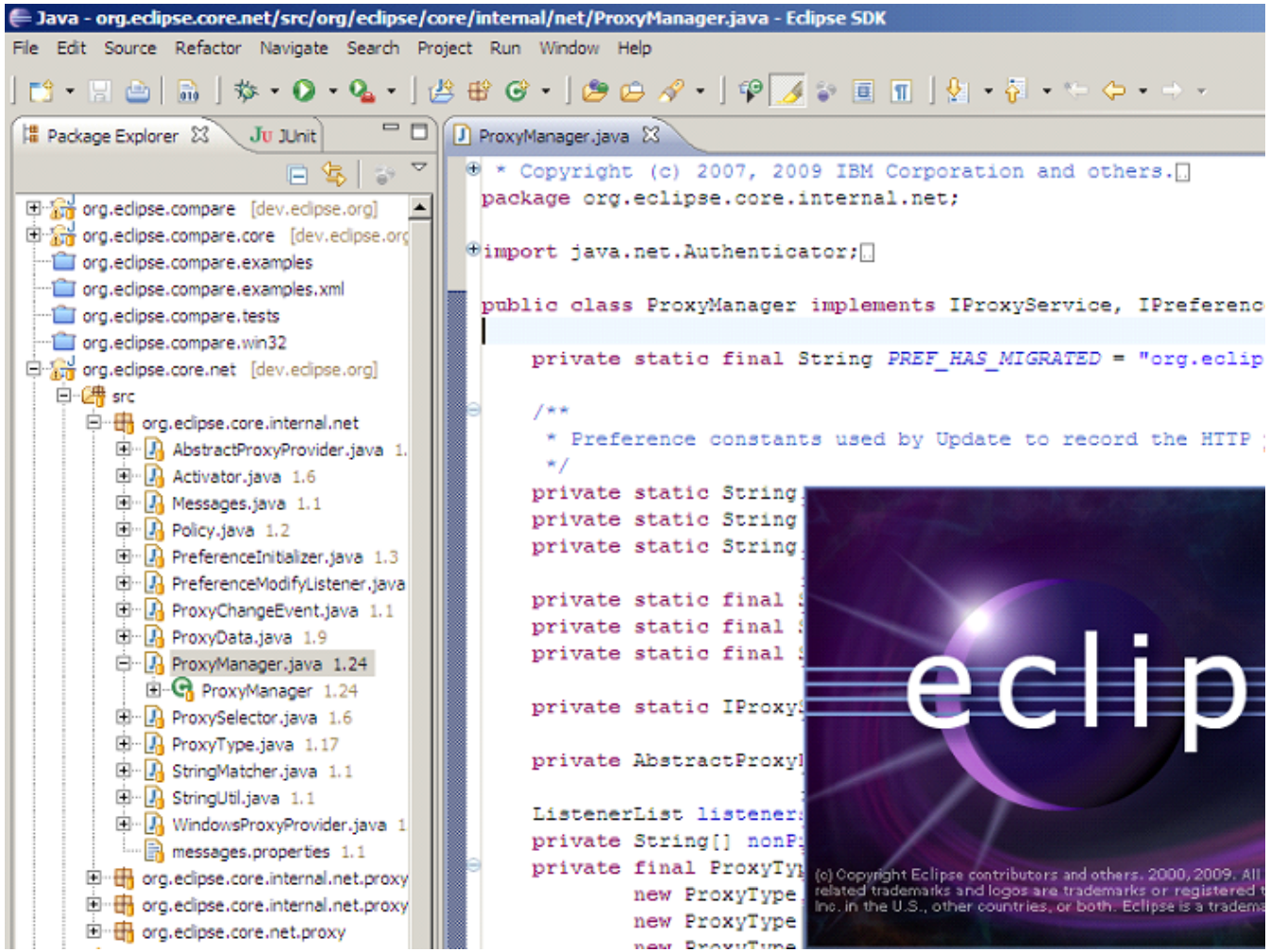
How We Got Here

- Java strategic technology for IBM
- Need to compete with MS VS and other Java IDE
- Created in 1998 by IBM/OTI teams responsible for VisualAge product family
- In 2001 given opened to open source to increase exposure and accelerate adoption
- In 2004 Eclipse Foundation was created
- Eclipse already well regarded tooling platform
- In mid 2004 Eclipse 3.0 ships, now based on OSGi
- Eclipse becomes more and more an RCP platform
- Thousands of Eclipse based products on the market, from ST to fully loaded IDEs

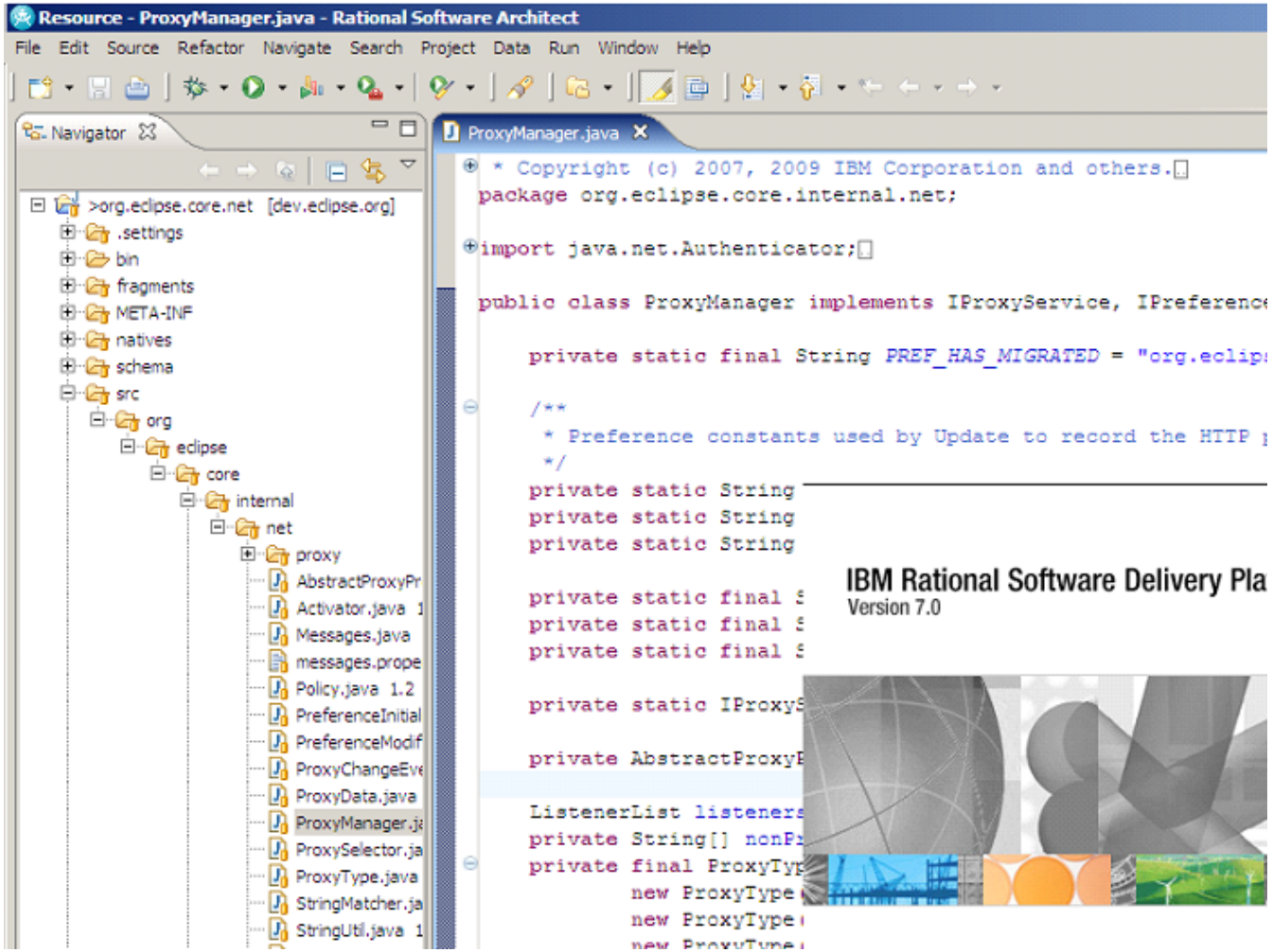
Eclipse Architecture



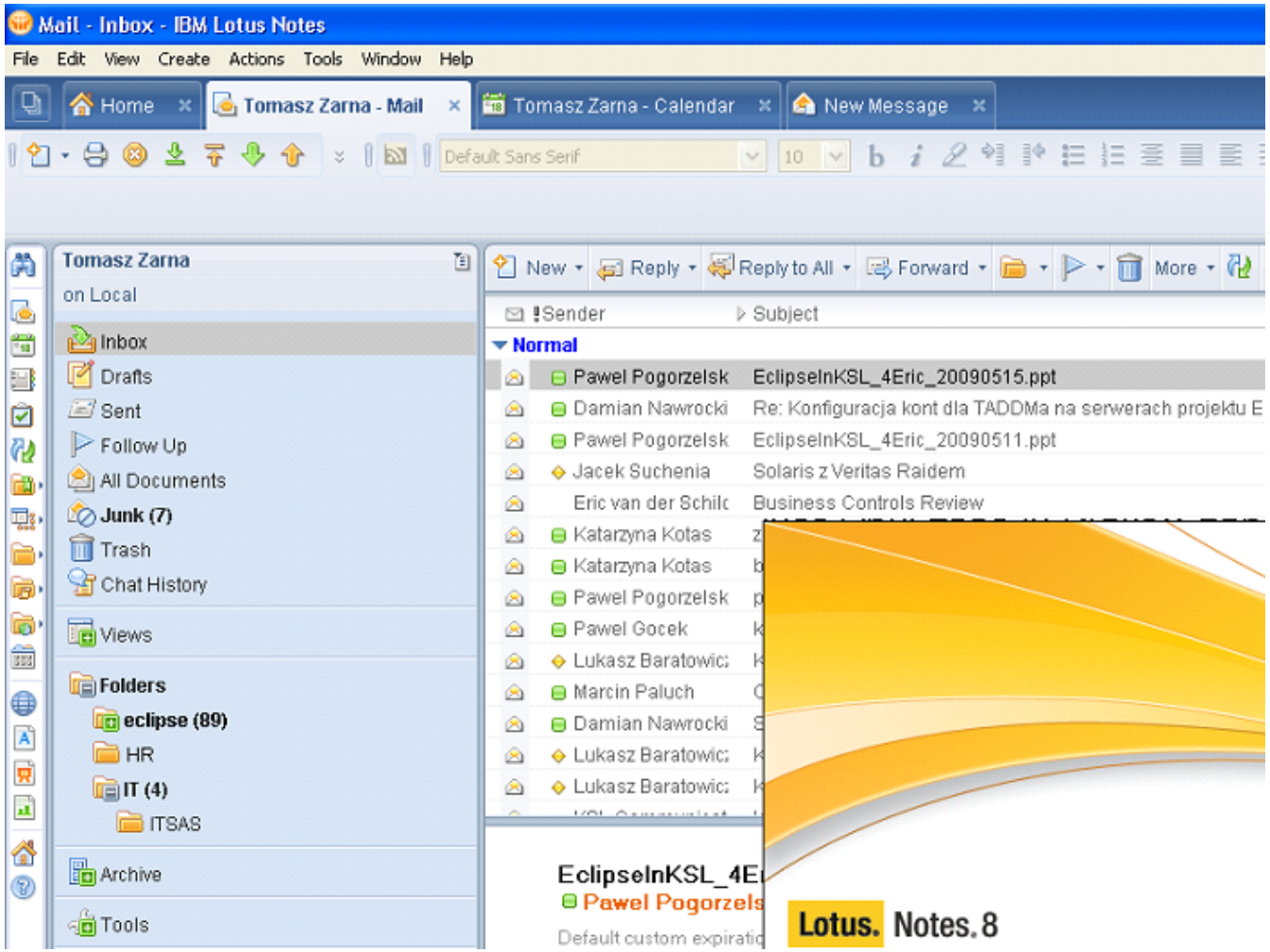
Eclipse 3.5



IBM Rational Software Architect 7.0.0



IBM Lotus Notes 8



Tivoli® Common Agent Services

```
berenss:/opt/tivoli/ep/runtime/agent # ./agentcli.sh deployer list bundles state
Active  System Bundle
Active  initial@reference:file:plugins/org.eclipse.core.runtime_3.1.2.jar/
Active  initial@reference:file:plugins/org.eclipse.update.configurator_3.1.0.jar/
Active  initial@reference:file:plugins/com.ibm.pvc.wct.platform.autostart_6.1.0.0-20060201.jar/
Active  update@plugins/org.eclipse.core.runtime.compatibility_3.1.0.jar
Active  update@plugins/org.eclipse.osgi.services_3.1.2.jar
Active  update@plugins/org.eclipse.osgi.util_3.1.1.jar
Installed       update@plugins/org.eclipse.update.core.win32_3.1.0.jar
Resolved        update@plugins/org.eclipse.update.core_3.1.1.jar
Active  update@../../agent/subagents/eclipse/plugins/CDSAxis.jar
Active  update@../../agent/subagents/eclipse/plugins/CDSClientAPIBundle.jar
Active  update@../../agent/subagents/eclipse/plugins/CDSDepotServer.jar
Active  update@../../agent/subagents/eclipse/plugins/COP-CommonAgent-TPM.jar
Active  update@../../agent/subagents/eclipse/plugins/CitScannerAgent_linux.jar
Active  update@../../agent/subagents/eclipse/plugins/EventAdmin.jar
Active  update@../../agent/subagents/eclipse/plugins/SCMCollectorAgent_linux.jar
Active  update@../../agent/subagents/eclipse/plugins/TPMAgentExt.jar
```


Keeping It Big

How can you build something that can last 10 years and be:

- Industry leading
- Extendable
- Constantly evolving

Well, you need to have those:

- Modularity
- Scalability
- Stable APIs

JVM Classloading

Application wide classpath

```
java -classpath
./a-1.5.0.jar:./b.jar:./c.jar:./a-2.1.0.jar./bin:
com.vendor.App
```

- Not possible to use the same library in two versions
- Classnames conflicts
- All entries has to be searched which results in performance hit
- No need to declare dependencies explicitly

OSGi

Classes and charts aren't enough, you need components. OSGi provide those in form of bundles:

- Explicit dependencies managment
  - `Import-Package: org.osgi.framework; version=1.2`
  - `Export-Package: org.osgi.service.cm; version="1.2.1"`
- No sea of classes, no exhibitionism

Application wide classpath

Modularity that OSGi gives enables evolution.

Declarative extensions

Extension points are the places where you expect functionality to be extended. **Extensions** are features that plug-in into extension points.

- Simple and powerful
- Don't load code until it is needed
- Explicit points where you can plug-in

Lazy loading

Lazy loading given by Extension Registry gives **scalability**.

Stable APIs

Stable APIs are critical to sustain growth. Clients can add features instead of updating to new API. So, it has to be:

- Consistent and wise
- Any decision made today will impact where you can go tommorow

API compatibility is a huge commitment so we take a defensive approach:

- Don’t add until there is at least one client
- Exhibit less rather then more
- Expose more if needed

API Tension

API needs iteration and clients to work. But we need to have stable APIs for widespread adoption. So, we:

- Develop API and client at the same time
- Don't commit API before it's time
- API changes within release to accomodate new requirements and experience

It also gives us early feedback on API violation. Just because it works doesn't mean it's API compliant.

API Layers

What if we want add new, more feature rich mechanizm?

1. Add a new functionality
2. An API layer that maps the old API to new implementation
3. Remove the old implementation
4. Deprecate the old API
5. After a few years we might drop it

Binary compatibility

We tend to have more than stable API. Binary compatibility is what matters since users will not rebuild a plug-in.

API Tools

API Baseline defines the state you want to compare your development against. Tools check:

- Usage problems
- Binary compatibility
- Bundle version numbers
- Maintanance tag @since

Other tags:

- @noimplement
- @noinstantiate
- @noextend

Known problems can be marked appropriately and filtered.

Integration

Tools make API violations are perceived as natural as language constraints.

Planning

- Comminity input
- Discuss propositions on bug reports
- Committed, proposed items
- We drop items to maintain schedule

Continous Integration

- Releases - e.g. R3.4; stable, tested, lack the lates features
- Stable - e.g. 3.5RC4; latest features, valuable and timely feedback
- Integration Builds - e.g. I20090611-1540, run weekly
- Nightly Builds - e.g. N20090426-1232; often major problems, useful to Eclipse Project developers

Always beta

We work on nightly builds so we try to keep them running.

Milestones

- There is 7 milesontes, each takes 6 weeks
- Shipping is hard, that's why we do it 7 times a release
- Customers can rebase more frequently
- Plan, develop, test, release, retrospective
- We play all the roles
- New and Noteworthy
  - Feed the community
  - Make people move to milestone builds
  - Fewer completed than more in progress

The Convergence Process

- M6 - API freeze
- M7 - feature freeze
- RC1 - another commiter, PMC for API changes
- RC2 - two commiters
- RC3 - two commiters, compoment lead
- RC4 - two compoment leads, any lead can veto

Commiting Into RCs

Release Candidates time is when you never want to have a buildbrake.

Community

- Inital investment
- Community grows and becomes self supporting, we don't have to grow
- Early feedback
- Open technical discussions, even more important than open bugs
- Transparency, good for distributed teams
- The village effect

