One year ago: Eclipse Summit Europe 2007

The SAP Eclipse Story

Rainer Ehre, NW C Tools
Malte Kaufmann, NW C Tools
10/11/2007
Agenda

1. Excerpt from SAP’s Eclipse and Java history
2. Where are we today?
3. Some exemplary challenges
4. Outlook
5. Summary
1. Excerpt from SAP’s Eclipse and Java history
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2000 - 2002

**SAP decides to support Java**
- SAP buys the Java application server division of ProSyst → In-Q-My is the first SAP J2EE server
- SAP is already a member of OMG, OASIS, RosettaNet and W3C

**Environment**
- More SAP specific tools push need for Tool platform. Open Tools API not sufficient. Source access needed. Borland negotiations - OEM not an option for SAP
- First evaluations of Eclipse and NetBeans
- First SAP appearance at JavaOne - IDE on JBuilder, In-Q-My server
- Active JCP member
- Shipment SAP Web AS 6.20, supports J2EE 1.2
- SAP becomes JCP EC member
- SAP is founding member of WS-I

**IDE / Eclipse**
- SAP’s choice: Borland’s JBuilder
- Best Java / J2EE IDE, minimal SAP extensions via JBuilder Open Tools API
- 1000 JBuilder licenses for SAP internal use
- Shipment of JBuilder-based tools with SAP Web AS 6.20
- Decision for Eclipse
- Negotiations with IBM (J2EE toolset) failed. Decision for SAP implementation
- Model abstraction layer needed: cooperation with Togethersoft
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### IDE / Eclipse
- First version of SAP NetWeaver Developer Studio (NWDS) on Eclipse 2.1
- J2EE 1.3 / Web Service tooling
- Selena (SAP + TS) modeling layer
- Web Dynpro tools (SAP UI techn.)
- Integration of SAP NetWeaver Development Infrastructure (NWDI)
- Borland takes over Togethersoft

### Environment
- SAP Web AS 6.30
- Full J2EE 1.3 support
- Web Service support

- SAP is Founding Member of new Eclipse Foundation as Strategic Consumer
- Gold Sponsor at the first EclipseCon
- NWDS 7.0 shipped, based on Eclipse 2.1

- Additional SAP features like Composite Application Framework (CAF), WS, Admin tools...
- Eclipse is the accepted Developer Tool Platform in SAP’s Java offering
- First steps towards adoption of WTP

- Modeling Infrastructure (MOIN) research project triggered
  - Based on MOF 1.4
  - Eclipse and server as target platforms
2006 – A major change of direction

SAP NetWeaver Composition Environment (CE)

- Integration Platform on top of existing (SAP or non-SAP) service-enabled backends
- Pure Java stack
- Addresses customers, partners, ISVs
- Based on open standards and de-facto standards (JEE App Server and Eclipse)
- Focus on: lean Consumption, model-driven development, loose coupling

For the first time, the Java design time was put on an equal footing with the runtime

Demos and DVDs (7.1 EhP 1 preview) at the SAP booth
Download: http://www.sdn.sap.com

© SAP 2007 / Page 7
### 2006 - 2007

#### IDE / Eclipse
- IDE becomes part of SAP NetWeaver Composition Environment (CE)
- JavaOne preview: full J2EE 1.4 support (WTP 1.0), limited JEE 5 support by SAP on top of WTP
- Release of full JEE 5 toolset on Callisto / WTP 2.0 as SDN download - first on the market

#### Environment
- JEE5 preview on JavaOne
- IDE and Server
  - Before JEE 5 Spec was final
  - First major vendor certified for JEE 5
- SAP NetWeaver CE 7.1 shipped
- Support for Composite Applications in a SOA environment
- Focus on Standards, Developer Productivity, Lean Consumption
- SAP joins the OSGi Alliance
- SAP is active member of the OSG java subcommitte at SPEC
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SAP & Eclipse today – The Product

~ 150 SAP features, ~ 700 SAP plugins

Eclipse has proven to be an excellent platform.

~ 100,000 downloads of CE, server and NWDS from SDN (all releases)

Some highlights:

- Project Galaxy – Next Generation of BPM from SAP
  - BPMN modeler, built on MOIN

- Business Rules Management (Acquisition of YASU Technologies)
- Composite Designer – making the notion of “Composite Application” (CA) concrete
  - Central entry point for CA Development
  - CA as structuring level above Eclipse project level
  - Graphical layered overview of the components making up the application
  - Consistent navigation paradigm
  - Relations management
  - Integrated lifecycle management support
Company / Project Commit Details

This automatically collected information may not represent true activity and should not be used as sole indicator of individual or project behavior. See the wiki page for known data anomalies. To report issues or request enhancements, see bug 209711.

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WTP
- Three committers
- EJB subproject lead and PMC member
- Appr. 35 – 40 % of contributions to EJB and JEE subprojects in 2008
- Presentation at ESE 2008

Memory Analyzer
- Donated in 2007
- Four committers
- Joint presentation with IBM at ESE 2008
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SAP & Eclipse – a few challenges (exemplary)

**Meritocracy meets defensive Open Source policy**
- SAP: no contributions (until 2007)
- Eclipse: no influence without contribution
- Results:
  - Parallel development (MOIN / EMF)
  - Use of internal APIs

**The Eclipse Business Model**
- „Tooling“ projects are not always successful – remain at „Frameworks and exemplary tools“
- Commoditization of „standard“ tools does not happen (e.g. JEE)

**Distributed development**
- Contributions to NWDS from many locations world-wide, in different layers
- Challenge 1: create a user-friendly homogeneous product
- Challenge 2: introduce a new major Eclipse version

**Quality and Product Readiness**
- Not all projects at the same level as the platform, but coming with simultaneous release – Ganymede SR1 as an example
- Bug fixes sometimes hard or impossible to get (even if fix is attached)

**Concurrency**
- We faced severe deadlock and race conditions
- Caused by „legacy“ code
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**SAP NetWeaver CE 7.2: RTC in 2009**

**Some IDE-relevant enhancements:**

- **Simplified business expert perspective UI generation**
- **Debugging improvements**

**Ganymede, WTP 3.0**

**Service Adaptation for Web Services and SAP Remote Function Calls**

**Support customer-specific extensions for Business Logic and UI**

**More features integrated into Composite Designer**

**Unified search and browsing capabilities for SAP’s Enterprise Services**

- **Enhanced business process management and business process modeling capabilities**
- **Built-in extensibility support**
- **Functional Enhancements in Service Adaptation**
- **Translation support**
- **Development Infrastructure and logistics enhancements**
- **Enhanced supportability and fast error diagnostics**
- **Java and WS* standards**
- **Full Eclipse adoption**
- **Richer and more flexible UI in WebDynpro for Java and VC**
- **Increased Developer Productivity**

**Graphical, BPMN based process composition with integrated business rules**

**Reuse of SOA and composite assets**

**NWDI integration with 3rd party repositories**

**Composite Designer**

**Eclipse, WTP adoption**

**Integrated profiling capabilities**

**Improved Supportability (logging, tracing, debugging)**

**Ajax Functions in WebDynpro**

**Situational composites**

**Extended support of enterprise SOA (state, task, rules, event, and transaction handling)**

**Software logistics for composite product (e.g. installer, update manager)**

**Business configuration for composites**

**Synchronized composite-backend change management**

**Software modularization**

**Java EE 6 and WS* standards**

**SCA adoption for composites**

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IDE outlook – beyond 2009

Further tools harmonization based on Eclipse
- Integrate existing tools into Eclipse
- Challenge: historically grown “diversity” on all levels: Repository, Tool (platform), lifecycle management
- Workbench and RCP

Stronger focus on Open Standards and Eclipse concepts
- Increase consumability and acceptance
- Examples: MOIN / EMF alignment, component model
- SAP extensions as “goodies“ on top

User roles, productivity, complexity reduction
- Drastically reduce complexity – adjust to user role
- Extend model-driven / declarative approach
- Provide more user guidance – template-based development, task orientation, ...
- Support collaboration between roles, e.g. business expert – developer
- If appropriate, active contributions to the underlying Eclipse projects are a serious option

e4?
- We will watch ...
What is OSGi?

Introducing OSGi

OSGi Capabilities

- Modularity
- Versioning
- Hot Deployments
- Service Orientation
- Dependency Management

...within a single JVM

Kirk Knoernschild (Burton Group) at Eclipse Members Meeting
October 27, 2008
SAP NetWeaver Development and OSGi

- **Modularity**: 2750 employees (~1500 developers) in seven locations: Modular development, production and assembly is a must.

- **Service orientation**: Daily build of 27 millions lines of code and more than 256,000 classes (Over 90 GBs of build results). 70 source code servers in different locations. Well-defined APIs, SLAs and isolation is a must.

- **Dependency Mgmt.**: Usage types in hosted systems with startup time of over twenty minutes (for single JVM): Hot deployment is a must both for development and productive landscapes.

- **Hot deployment**: SAP NetWeaver product lines spanning over a decade

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**OSGi**

- Re-enforcing modularization paradigms
- Will become modern enabler of SAP’s modularization capabilities
SAP Java Application Server and OSGi

- ~ 5000 components running on the server - several thousand components managed in single JVM.
- Up to 6 GB heap
- Everything is modularized but:
  - Many component types
  - Various ways to handle dependencies
  - Mixture of standard and proprietary concepts

SAP NetWeaver
Server runtime

- Migrate all existing component models into one standard component model

Expectations
- Better manageability of large number of components
- Standardized dependency management
- Better reuse
- Ability to provide lean subsystems

Challenges
- Large to huge number of components
- Standard components do not come as OSGi bundles – some kind of wrapping needed

Open
- Alignment with JEE 6 Profile approach, SCA?

September 2007: SAP announced that the next-generation Java server will be based on OSGi technology
Which implementation? Some measurement results

Install + Startup time for 8192 bundles

Equinox is the clear winner

Memory for 8192 bundles

Equinox is not so good

Disk size for 8192 bundles

Equinox is good but felix is better

No "official" benchmark numbers

Equinox and kf are the winners

kf: Makewave Knopflerfish
felix: Apache Felix
SAP implementation, 3rd party or Open Source?

- SAP implementation: expensive, re-inventing the wheel
- 3rd-party commercial product: OEM-ing creates undesired vendor dependency
  - Open Source!

Why Equinox?

- Equinox on the server side has already good adoption
- Equinox is the reference implementation of OSGi R4
- **Enterprise Readiness** is absolutely crucial as the component will be the basis of SAP’s Java application server
- The measurements show that all implementations will have to be further improved
- **Equinox showed the best results overall**
  - SAP already uses Equinox as the runtime platform of the Eclipse-based SAP NetWeaver Developer Studio
  - SAP is already a Strategic Member of Eclipse and contributes to two Eclipse projects (WTP, Memory Analyzer)
- **Equinox offers the best conditions for SAP to actively contribute to enterprise readiness features**

- **Decision: Go for Equinox, play an active role**

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The SAP Eclipse Story - Summary

- Excellent Java development environment and best tool platform with huge acceptance and market momentum. The right decision in 2002 😊
- SAP NetWeaver Developer Studio is based on Eclipse. It is THE fundamental Design Time Environment in SAP’s important product SAP NetWeaver Composition Environment (CE)
- SAP is actively contributing to WTP / DTP and donated the Memory Analyzer
- There are challenges but: the importance of Eclipse for SAP is growing
- Eclipse is the platform of choice for future tool consolidation at SAP
- With the decision to build SAP’s next generation Java server on Equinox, Eclipse technology will also reach into the server runtime
- SAP will actively help to ensure that Equinox is a solid basis for a large-scale enterprise server environment
Links

SAP:
http://www.sap.com

SAP Developer Network:
http://www.sdn.sap.com

Server / Equinox Blog:
Thank you!
Title

First level
- Second level
  - Third level
    - Fourth level
    - Fifth level
## Definition and halftone values of colors

### Primary colors

- RGB 100/102/102
- RGB 153/153/153
- RGB 204/204/204
- RGB 240/171/0
- RGB 102/102/102

### Secondary colors

- RGB 4/53/123
- RGB 240/171/0
- RGB 21/101/112
- RGB 85/118/48
- RGB 119/74/57
- RGB 100/68/89

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<th>70%</th>
<th>55%</th>
<th>40%</th>
</tr>
</thead>
<tbody>
<tr>
<td>129/110/44</td>
<td>RGB 110/138/79</td>
<td>RGB 140/101/87</td>
<td>RGB 161/129/118</td>
<td>RGB 181/156/147</td>
<td>RGB 201/183/176</td>
</tr>
<tr>
<td>132/76/84</td>
<td>RGB 152/173/183</td>
<td>RGB 162/180/141</td>
<td>RGB 181/156/147</td>
<td>RGB 201/183/176</td>
<td>RGB 201/183/176</td>
</tr>
</tbody>
</table>

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