

The SAP Eclipse Story (continued)



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November 2008

THE BEST-RUN BUSINESSES RUN SAP



One year ago: Eclipse Summit Europe 2007



The SAP Eclipse Story



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10/11/2007



THE BEST-RUN BUSINESSES RUN SAP



Agenda



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

Agenda



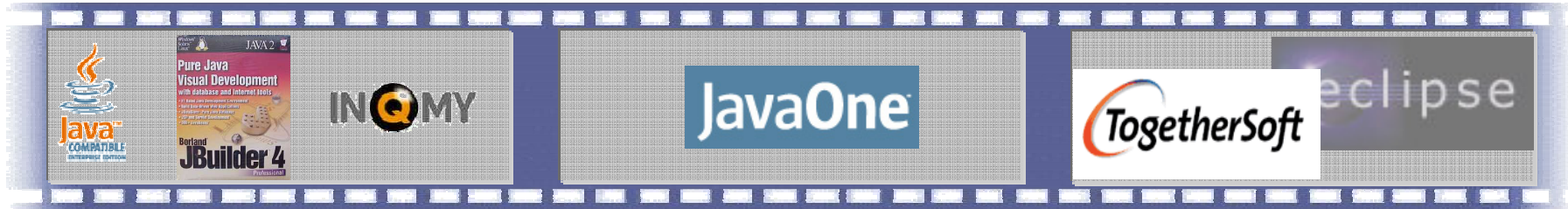
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2000 - 2002

2000

2001

2002



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
- 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
- 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

Environment

- 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
- 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

2003 - 2005

2003

2004

2005



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

- 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

Environment

- SAP Web AS 6.30
- Full J2EE 1.3 support
- Web Service support
- SAP Web AS 6.40 shipped as part of NetWeaver 7.0
- Modeling Infrastructure (MOIN) research project triggered
 - Based on MOF 1.4
 - Eclipse and server as target platforms

2006 – A major change of direction

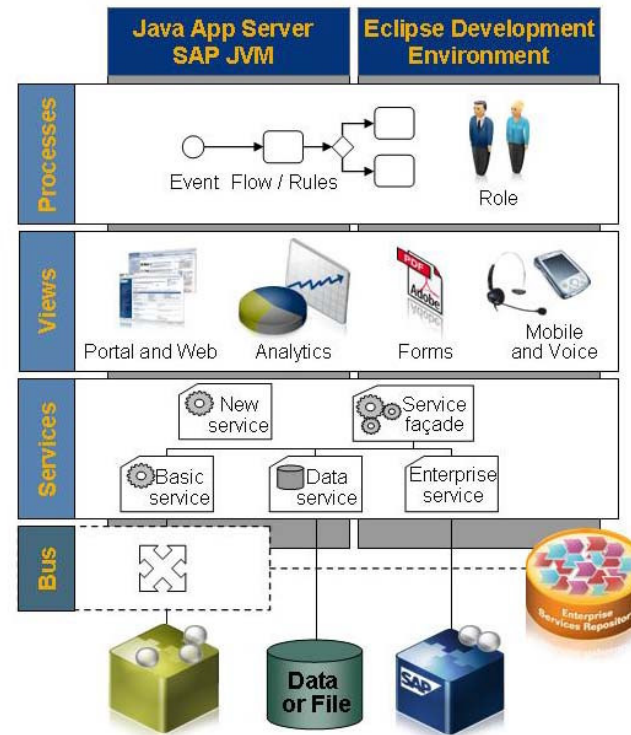
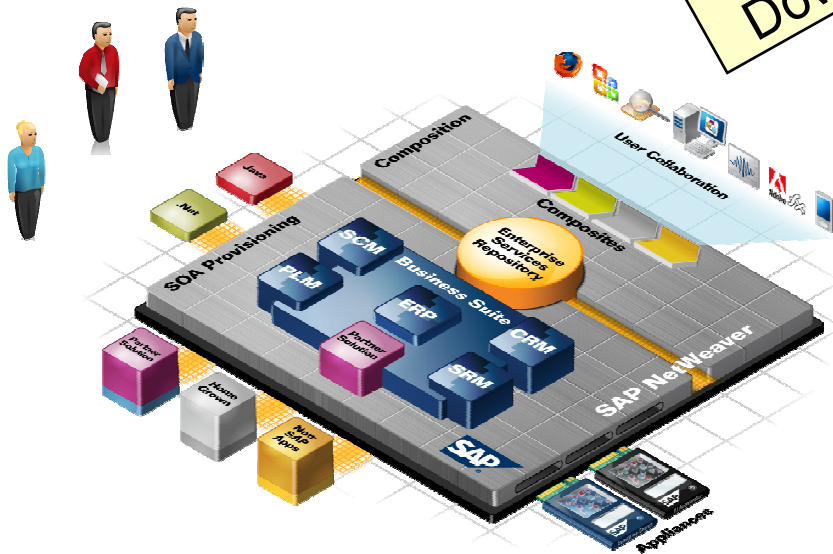


SAP NetWeaver Composition Environment (CE)

- Integration Platform on top of existing (SAP or non-SAP) services
- Pure Java stack
- Addresses customers, partners, ISVs
- Based on open standards and de-facto standards (e.g. Eclipse)
- Focus on: lean Consumption, model-driven development, coupling

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

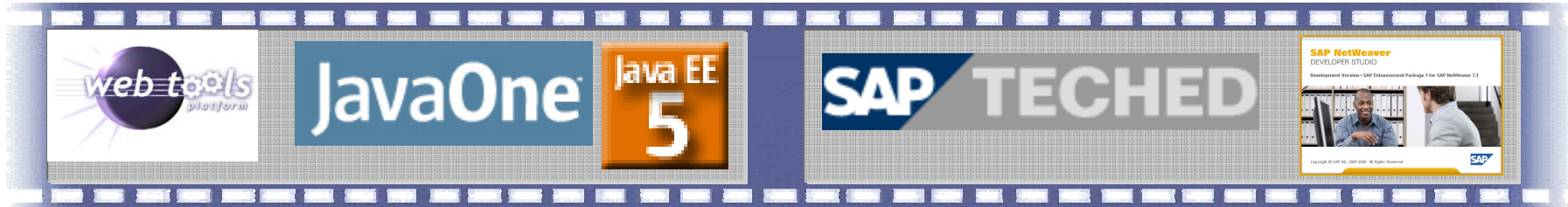
For the first time, the Java development environment is on an equal footing with the runtime



2006 - 2007

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

- SAP signs Eclipse Committer Agreement
- Contributions to WTP – first SAP committer
- IDE as major part of SAP NetWeaver CE ships on Eclipse 3.3, WTP 2.0
- Update Sites on SDN, Service Marketplace, locally at customer sites
- Donation of Memory Analyzer
- Presented on SAP TechEd

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 subcommittee at SPEC

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SAP & Eclipse today – The Product



The screenshot displays the SAP NetWeaver Developer Studio interface, which is an Eclipse-based IDE. It shows a multi-tiered architecture for a composite application. The main workspace contains a process flow diagram with components like 'ClaimsUI', 'ClaimsService', and 'CustomerBasicDataByIDQueryResponse_In'. A 'Check Results of' dialog is open, showing a table of source and target objects and their messages. Below this, a 'Mappings' dialog shows the detailed message flow between the 'ClaimsUI' component and the 'CustomerBasicDataByIDQueryResponse' object.

Source Object	Operation Name	Target Object	Message
ClaimsUI [Web Dynpro Compon...	Request_CustomerBasicD...	CustomerBasicDataByIDQuery...	Signature of method "Customer...

Using Object: ClaimsUI [Web Dynpro Component]		Used Object: CustomerBasicDataByIDQueryRespor	
input	CustomerBasicDataByIDQuery_Sync - Custom...	input	CustomerBasicDataByIDQuery_sync -
input	CustomerBasicDataSelectionByID - /wsdl:defin...	input	CustomerBasicDataSelectionByID
input	CustomerID - PartyID →	input	CustomerID - com.sap.xi.appl
output	CustomerBasicDataByIDResponse_Sync - Custom...	output	CustomerBasicDataByIDResponse_sy
output	Customer - /wsdl:definitions/wsdl:types/xsd:s	output	Customer - com.sap.xi.appl.se.gk
output	BasicData - /wsdl:definitions/wsdl:types/xs	output	ID - PartyID →
output	ID - PartyID →	output	Log - Log →
output	Log - Log →	output	Item - LogItem[] →
output	Item - LogItem[] →	output	BusinessDocumentProcessingResultCode -
output	BusinessDocumentProcessingResultCode -	output	MaximumLogItemSeverityCode - java.lang
output	MaximumLogItemSeverityCode - java.lang	output	Exception00 - /wsdl:definitions/wsdl:types/xsd:scl
output	Exception00 - /wsdl:definitions/wsdl:types/xsd:scl	output	Standard - ExchangeFaultData
output	Standard - ExchangeFaultData		

SAP & Eclipse today – The involvement



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](#).

Company	Active Committers	Inactive Committers	Total Committers	Percent Active	Commits (2000)	Lines of Code (2000)	Approx. LOC per Commit
IBM	168 (28.92%)	154 (36.67%)	322 (32.17%)	52.17%	470,379 (42.84%)	13,169,886 (38.07%)	28
individual	139 (23.92%)	148 (35.24%)	287 (28.67%)	48.43%	221,290 (20.15%)	6,245,719 (18.06%)	28
STAROrganization	1 (0.17%)	0 (0%)	1 (0.1%)	100%	25,354 (2.31%)	3,210,478 (9.28%)	127
ActuateCorporation	30 (5.16%)	22 (5.24%)	52 (5.19%)	57.69%	28,355 (2.58%)	2,100,657 (6.07%)	74
BorlandSoftwareCorp.	12 (2.07%)	0 (0%)	12 (1.2%)	100%	36,451 (3.32%)	1,579,182 (4.57%)	43
itemisAG	5 (0.86%)	0 (0%)	5 (0.5%)	100%	27,028 (2.46%)	1,299,268 (3.76%)	46
Oracle	36 (6.2%)	3 (0.71%)	39 (3.9%)	92.31%	65,990 (6.01%)	1,117,290 (3.23%)	17
SerenaSoftwareInc.	3 (0.52%)	0 (0%)	3 (0.3%)	100%	4,723 (0.43%)	794,062 (2.3%)	168
OBEO	8 (1.38%)	0 (0%)	8 (0.8%)	100%	27,863 (2.54%)	730,843 (2.11%)	26
ZendTechnologies	9 (1.55%)	3 (0.71%)	12 (1.2%)	75%	11,042 (1.01%)	548,487 (1.59%)	50
KestralComputingPLformerlyJivaMe	3 (0.52%)	0 (0%)	3 (0.3%)	100%	10,092 (0.92%)	504,042 (1.46%)	50
Innoopract	10 (1.72%)	1 (0.24%)	11 (1.1%)	90.91%	15,051 (1.37%)	498,343 (1.44%)	33
EclipseFoundation	12 (2.07%)	0 (0%)	12 (1.2%)	100%	9,318 (0.85%)	468,982 (1.36%)	50
Code9	2 (0.34%)	0 (0%)	2 (0.2%)	100%	9,698 (0.88%)	328,652 (0.95%)	34
TasktopTechnologies	3 (0.52%)	0 (0%)	3 (0.3%)	100%	21,797 (1.99%)	322,729 (0.93%)	15
Sybase	9 (1.55%)	0 (0%)	9 (0.9%)	100%	4,411 (0.4%)	231,685 (0.67%)	53
compeopleAG	8 (1.38%)	0 (0%)	8 (0.8%)	100%	15,858 (1.44%)	190,831 (0.55%)	12
Thales	1 (0.17%)	0 (0%)	1 (0.1%)	100%	6,024 (0.55%)	184,916 (0.53%)	31
CiscoSystemsInc.	6 (1.03%)	1 (0.24%)	7 (0.7%)	85.71%	16,908 (1.54%)	180,219 (0.52%)	11
RedHatInc.	6 (1.03%)	2 (0.48%)	8 (0.8%)	75%	6,728 (0.61%)	168,410 (0.49%)	25
WindRiver	11 (1.89%)	0 (0%)	11 (1.1%)	100%	9,779 (0.89%)	157,689 (0.46%)	16
IntelCorporation	6 (1.03%)	4 (0.95%)	10 (1%)	60%	3,717 (0.34%)	100,339 (0.29%)	27
EmbarcaderoTechnologiesInc.	4 (0.69%)	0 (0%)	4 (0.4%)	100%	2,130 (0.19%)	91,988 (0.27%)	43
Motorola	7 (1.2%)	0 (0%)	7 (0.7%)	100%	4,843 (0.44%)	56,869 (0.16%)	12
Versant	1 (0.17%)	1 (0.24%)	2 (0.2%)	50%	928 (0.08%)	40,474 (0.12%)	44
SAPAG	8 (1.38%)	0 (0%)	8 (0.8%)	100%	4,456 (0.41%)	40,411 (0.12%)	9
FujitsuLimited	2 (0.34%)	2 (0.48%)	4 (0.4%)	50%	509 (0.05%)	37,992 (0.11%)	75
EricssonAB	2 (0.34%)	1 (0.24%)	3 (0.3%)	66.67%	1,306 (0.12%)	32,747 (0.09%)	25
CAInc.	5 (0.86%)	0 (0%)	5 (0.5%)	100%	3,358 (0.31%)	18,661 (0.05%)	6
AnywareTechnologies	3 (0.52%)	0 (0%)	3 (0.3%)	100%	1,662 (0.15%)	17,703 (0.05%)	11

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

- SAP: no contributions (until 2007)
- Eclipse: no influence without contributions
- Results:
 - Parallel development (MOIN / MOIN2)
 - 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
- Document for Architecture Council „Top 10 recommendations“ in preparation

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Roadmap SAP NetWeaver

SAP NetWeaver CE 7.2: RTC in 2009

Some IDE-relevant enhancements:



Development environment for composite applications

Composite process flexibility with full lifecycle support

Support customer-specific extensions for Business Logic and UI

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

- Graphical, BPMN based process composition with

Enhanced business process management and business process modeling capabilities
Built-in extensibility support

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

Service Adaptation for Web Services and SAP Remote Function Calls

Ganymede, WTP 3.0

- Composite Designer

- Functional Enhancements in Service Adaptation
- Translation support
- Development tool integration
- Logistics enhancement

composite product (e.g. installer, update manager)

More features integrated into Composite Designer

Unified search and browsing capabilities for SAP's Enterprise Services

Integrative

Productivity

- Eclipse, WTP adoption
- Integrated profiling capabilities
- Improved Supportability (logging, tracing, debugging)
- Ajax Functions in WebDynpro

- Enhanced support for error diagnostic
- Java and WS* standards
- Full Eclipse adoption
- Richer and more flexible editor in WebDynpro for Java and VC
- Increased Developer Productivity

configuration for composite-management
ization

WS* standards
composites

2008

2009

Beyond

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 ...



OSGi Capabilities

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

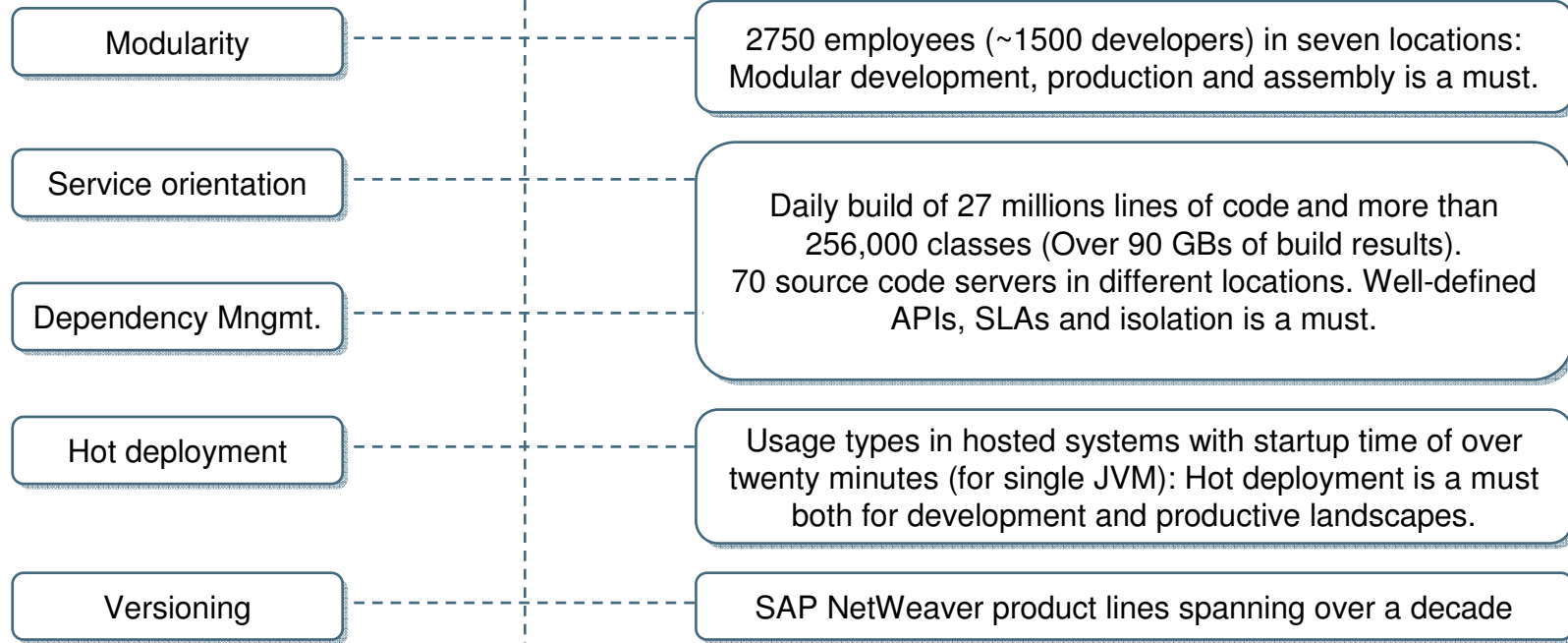
Kirk Knoernschild (Burton Group)
at Eclipse Members Meeting
October 27, 2008

...within a single JVM

SAP NetWeaver Development and OSGi



SAP NetWeaver Development



OSGi

- Re-enforcing modularization paradigms
- Will become modern enabler of SAP's modularization capabilities

SAP Java Application Server and OSGi



SAP NetWeaver Server runtime

- ~ 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

OSGi

- 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?

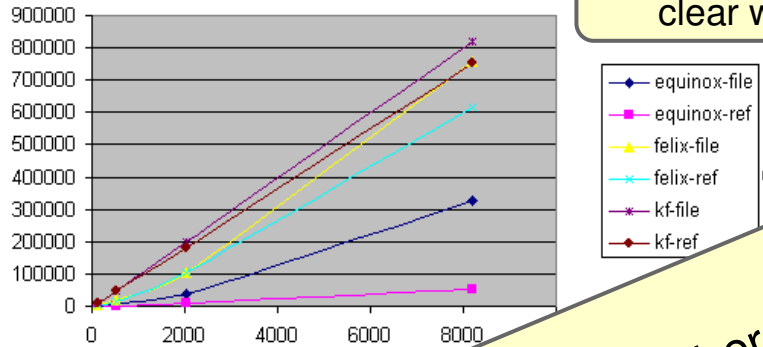
September 2007: SAP announced that the next-generation Java server will be based on OSGi technology

Which implementation?

Some measurement results



Install + Startup time for 8192 bundles

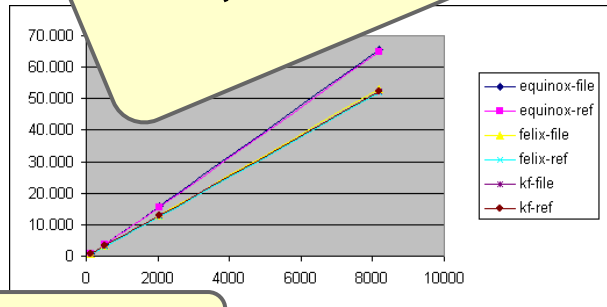


Equinox is the clear winner

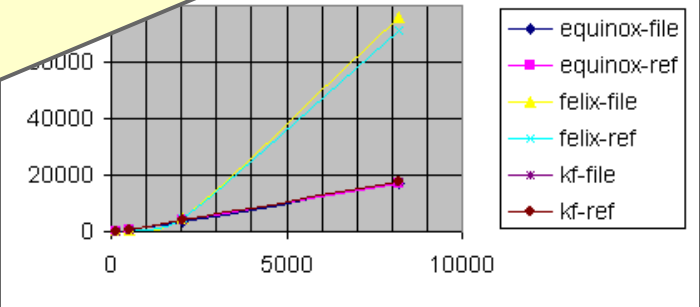
No „official“ benchmark numbers

Equinox and kf are the winners

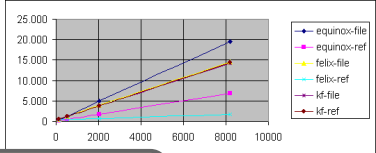
Memory for 8192 bundles



Equinox is not so good



Disk size for 8192 bundles



Equinox is good but felix is better

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**
- **Blog: <https://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/wlg/12018>**

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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

SAP:

<http://www.sap.com>

SAP Developer Network:

<http://www.sdn.sap.com>

Server / Equinox Blog:

<https://www.sdn.sap.com/irj/scn/weblogs?blog=/pub/wlg/12018>

Thank you!



First level

- Second level
 - Third level
 - Fourth level
 - Fifth level

Definition and halftone values of colors



RGB 4/53/123	RGB 240/171/0	RGB 204/204/204	RGB 153/153/153	RGB 102/102/102	Primary colors 100%
--------------	---------------	-----------------	-----------------	-----------------	-------------------------------

RGB 68/105/125	RGB 21/101/112	RGB 85/118/48	RGB 119/74/57	RGB 100/68/89	Secondary colors 100%
RGB 96/127/143	RGB 98/146/147	RGB 110/138/79	RGB 140/101/87	RGB 123/96/114	
RGB 125/150/164	RGB 127/166/167	RGB 136/160/111	RGB 161/129/118	RGB 147/125/139	70%
RGB 152/173/183	RGB 154/185/185	RGB 162/180/141	RGB 181/156/147	RGB 170/152/164	55%
RGB 180/195/203	RGB 181/204/204	RGB 187/200/172	RGB 201/183/176	RGB 193/180/189	40%

100%	RGB 73/108/96	RGB 129/110/44	RGB 132/76/84	
85%	RGB 101/129/120	RGB 148/132/75	RGB 150/103/110	
70%	RGB 129/152/144	RGB 167/154/108	RGB 169/130/136	
55%	RGB 156/174/168	RGB 186/176/139	RGB 188/157/162	
40%	RGB 183/196/191	RGB 205/197/171	RGB 206/183/187	RGB 158/48/57
				Tertiary color

Grid



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