OW2 Consortium

Bull

Architect of an Open World™

The JOnAS OW2 Java EE Framework

Mission critical and ambient computing applications support

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LIBERATE IT

JOnAS

Java EE 5 certified !

- Long running work (JOnAS 5 started in 2003)
- First certified open source AS with fully OSGi architecture
  - 130 bundles, 50 services
- Main components in JOnAS 5.1 version
  - OSGi framework : Apache Felix 1.4.1 + iPOJO 1.2.0
  - Servlet 2.5 : Apache Tomcat 6.0.18
  - JAX-WS 2.0 : Apache CXF 2.0.9
  - EJB 3.0 : EasyBeans 1.1.0
  - JPA 1.0 : EclipseLink 1.0.1

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JOnAS World

- Open Source
  - International users and developers community
  - LGPL

- Three main OW2 projects
  - JOnAS: Java EE Application Server
  - EasyBeans: EJB3 container
  - JASMINe: Intelligent Administration of SOA platforms

- And other ones
  - JOTM, CAROL, CMI, SHELBIE

http:// [jonas | easybeans | jasmine].ow2.org
http:// [carol | cmi | jotm | shelbie].ow2.org

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JOnAS development community

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- Leader
- Support and services offer (Libre Energie)

France Telecom

- Intensive operational use of JOnAS
- Contribution on administration and versioning

Peking University, CVICSE

- Clustering, web services

INRIA

- Advanced administration

UJF

- OSGi

UNIFOR

- Clustering

SERLI

- Izpack installer, administration

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Evolution of Application Server Usage

- Ubiquitous Applications, Ambient Computing
  - Computers, small, resource-constrained electronic devices
- Examples:
  - health care (sensor and personal communication devices), mobile, home, public services
  - M2M, Home Automation and RFID-based applications…
  - Telco and Internet mixed applications ->convergence between IMS, Web and Media service technologies

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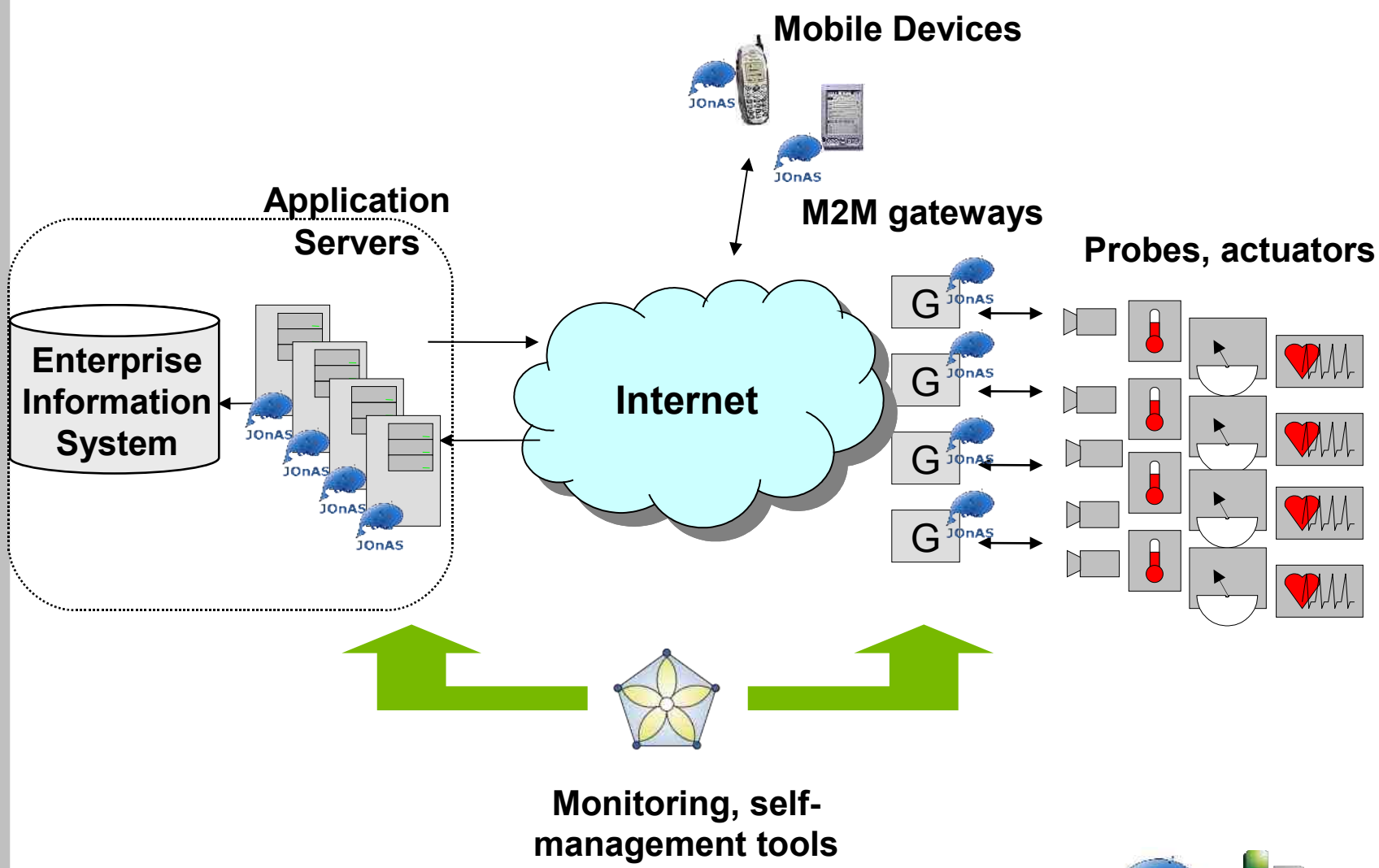
Evolution of Application Server Scope



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New Requirements

- Dynamic & Autonomic service-oriented platform
- Embedded system domain
- Inter-domain interoperability
- Support flexibly adaptable distributed applications
- And still
  - Modularity, Flexibility & Extensibility
  - Technical services
    - Transaction, persistence, security, messaging, ...
  - Service continuity & high availability
  - Scalability
  - Administration & monitoring capabilities
  - Development tools

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How JOnAS fits with these requirements ?

- Non-stop self-healing application server for mission critical applications, suitable for ambient computing

- Based on
  - Java EE-compliant **JOnAS** OSGi-based application server
  - **JASMINe** administration environment
  - EJB3-compliant **EasyBeans** lightweight container

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JOnAS: Java EE application server

- Java EE 5 certified
- Provides technical services
  - Webcontainer with Tomcat/Jetty
  - EJB3/JPA Persistence EasyBeans, EclipseLink/Hibernate)
  - Transaction with JOTM
  - Security
  - WebService with CXF/Axis2
  - Messaging with JORAM
  - ...
- JonasAdmin console

Benefits
Technical services
Interoperability
Administration capabilities

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OSGi architecture: common runtime

- Bridge the gap between the different parts of new generation applications : servers, edge, premise, devices
- Common paradigm
- Lightweight
- Remote management

Benefits
Eases skills mngt
Embeddable

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OSGi architecture: mastering the complexity

- Bundles
  - Solves libraries conflicts issues
  - Hides implementation classes
- Dynamic reconfiguration
- Eases application update
- Pluggability for easier integration with existing software

Benefits
Modularity
Flexibility
Extensibility

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OSGi architecture: SOA

- Service oriented model for loosely coupling
  - Contract
  - publish/find/invoke
- Autonomic service dependency management
- Late binding for service morphing (context aware application)
- Service life cycle management at runtime
  - install/start/stop/uninstall

Benefits
Flexibility
Highly dynamic
Autonomic
Adaptable application

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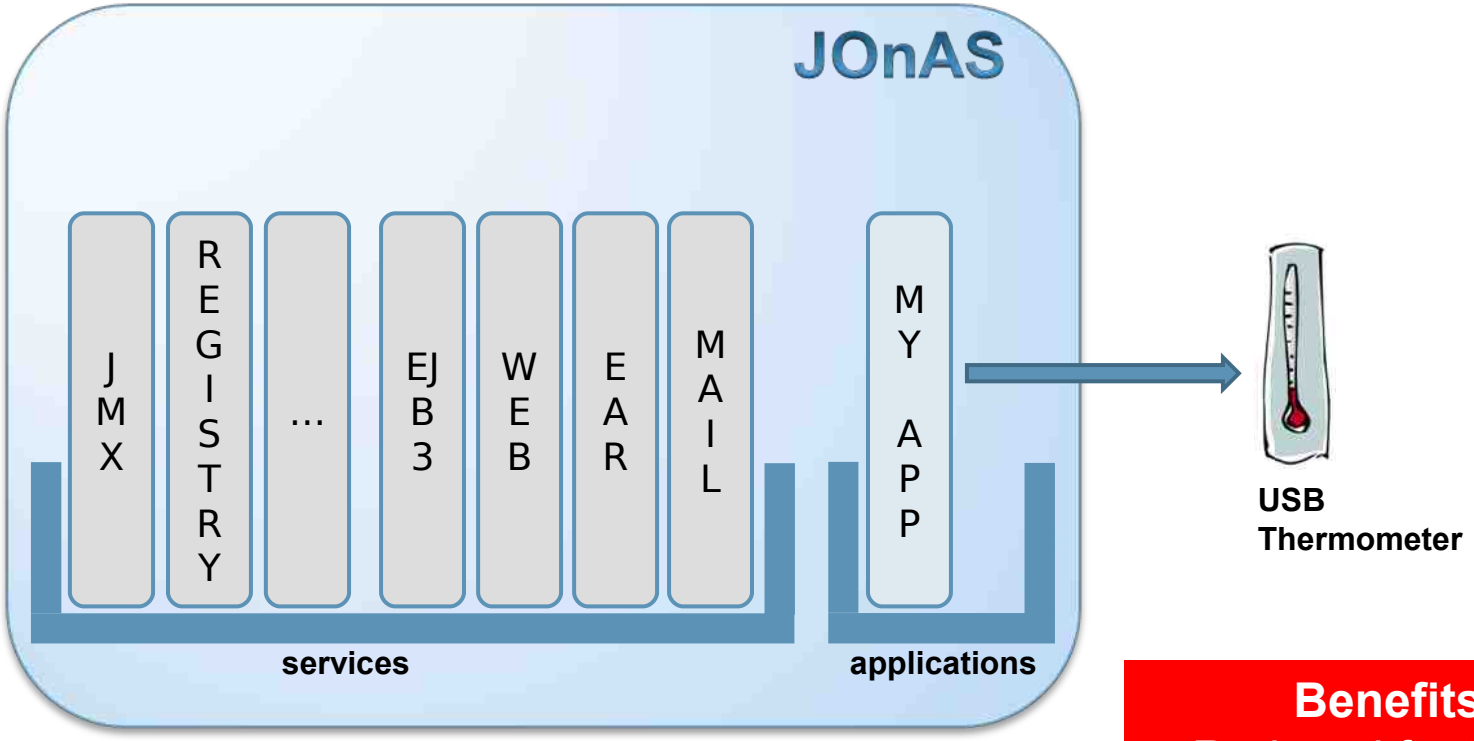
OSGi architecture: elastic platform

- *On-demand service loading/unloading regarding the application requirements*



Benefits
Reduced foot print
Scalability
Autonomic

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EasyBeans: bridge Java EE™/ OSGi™

- Bidirectionnal gateway between Java EE ™ and OSGi™ world
  - EJB ™ 3.0 can use the BundleContext
    - Listen to OSGi™ events (framework, bundle, service)
    - Access to OSGi™ services

```
/*
* Bundle context that will be injected by the EZB container.
*/
@OSGiResource
BundleContext bundleContext = null;
```

  - EJB ™ 3.0 supports OSGi service injection
  - Exposes EJB3 business interfaces as OSGi services
    - Transparent access to EJB3 from OSGi applications
  - Java EE technical services accessible to OSGi application

Benefits
Interoperability

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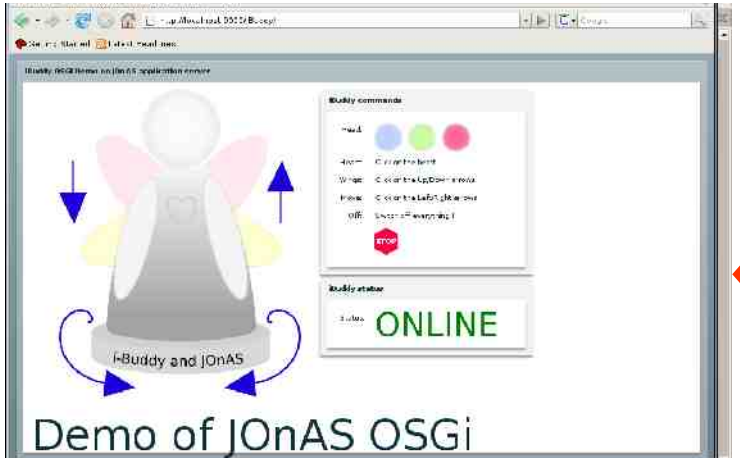
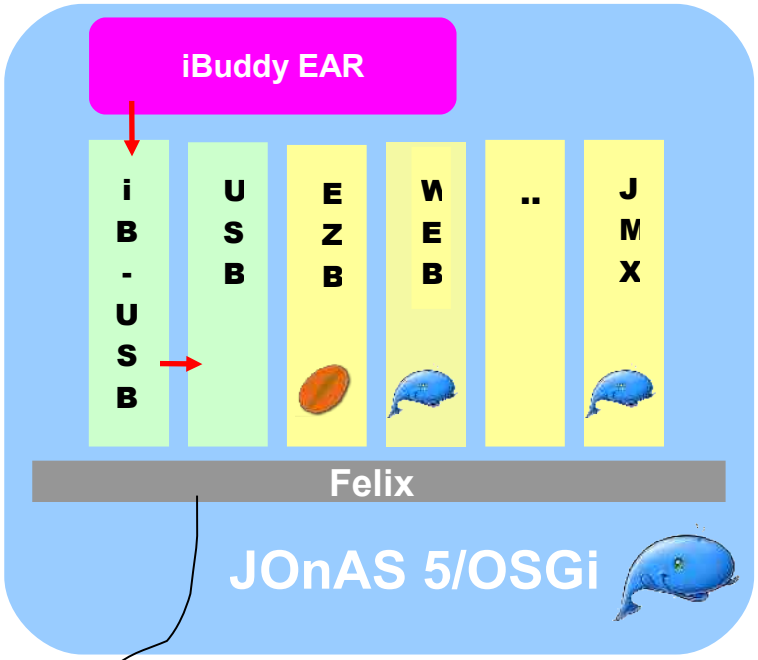
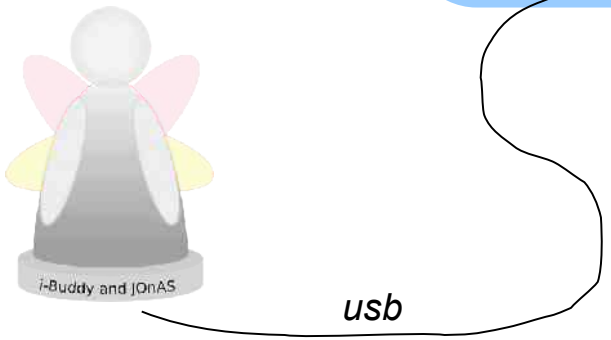
Inter-domain interoperability use case







Embedded domain:

- Home automation / M2M
- RFID
- Sensors
- SOHO servers
- Video Games

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JOnAS/JASMINe: application upgrade

- Critical application with quick evolution cycle needs to do version upgrade without interruption of service / user sessions loss / over sizing the system
- Smooth & transparent migration
  - JOnAS Versioning service
    - Several versions of a same application co-running in a same JOnAS instance
    - Configurable request routing policy toward versions
    - Available for WebApp Tomcat, EJB2/EJB3
  - JASMINe JADORT Orchestration tool
    - Centralize upgrade from a single console (flex)
    - Provides log/rollback/error management features

Benefits
Service continuity
Reduced admin costs

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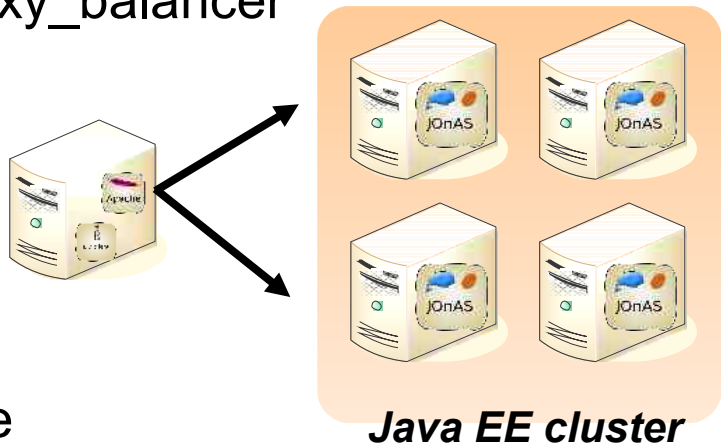
JOnAS: dynamic clustering

- Load-balancing and fail-over
  - Web application with mod_jk/mod_proxy_balancer
  - EJB2/EJB3 application with CMIv2
- Replication
  - Web application with tomcat
  - EJB2/EJB3 replication with HA Service
- Easy of use
  - Zeroconf at the client side
  - Control from the server side



Benefits
Scalability
High availability

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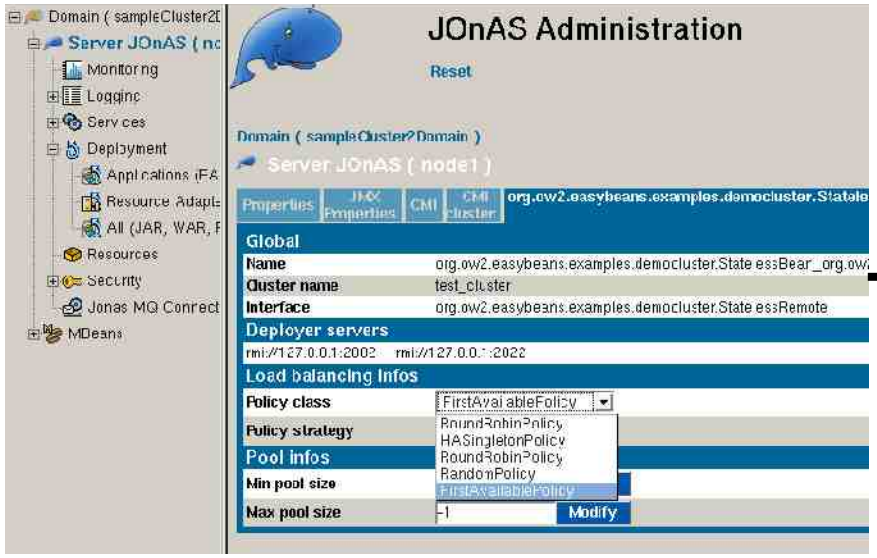
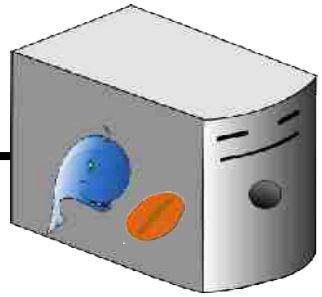
JOnAS: clustering management

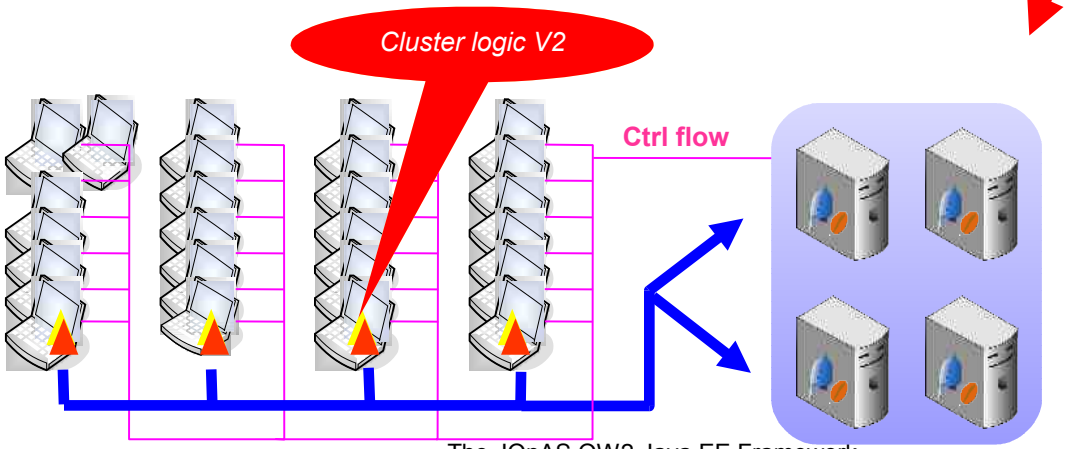
Easy Clustering: management of LB policy



Master node



Update Cluster logic



Benefits
Highly dynamic

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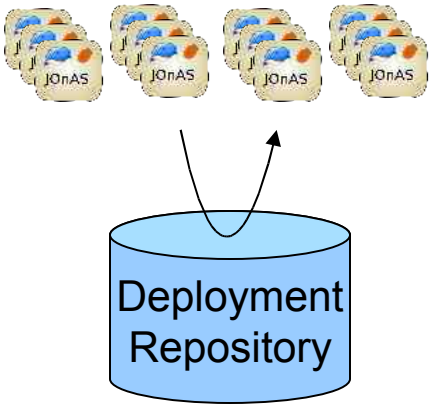
JOnAS deployment plan

- Goals
  - Get applications from remote repositories
    - Url, Maven, OBR
  - Schedule the applications startup



- XML file description
  - Repositories
  - Applications components

Benefits
Scalability
EoD

- Use case
  - Clustering or large scale deployment
  - Applications dependencies management (startup)
  - Continuous integration

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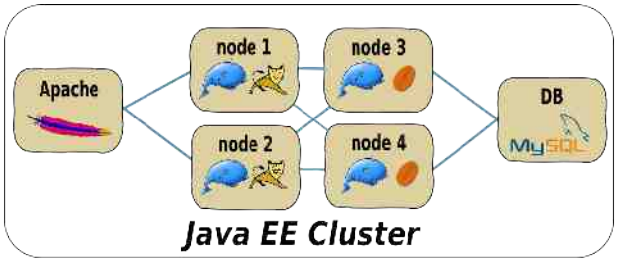
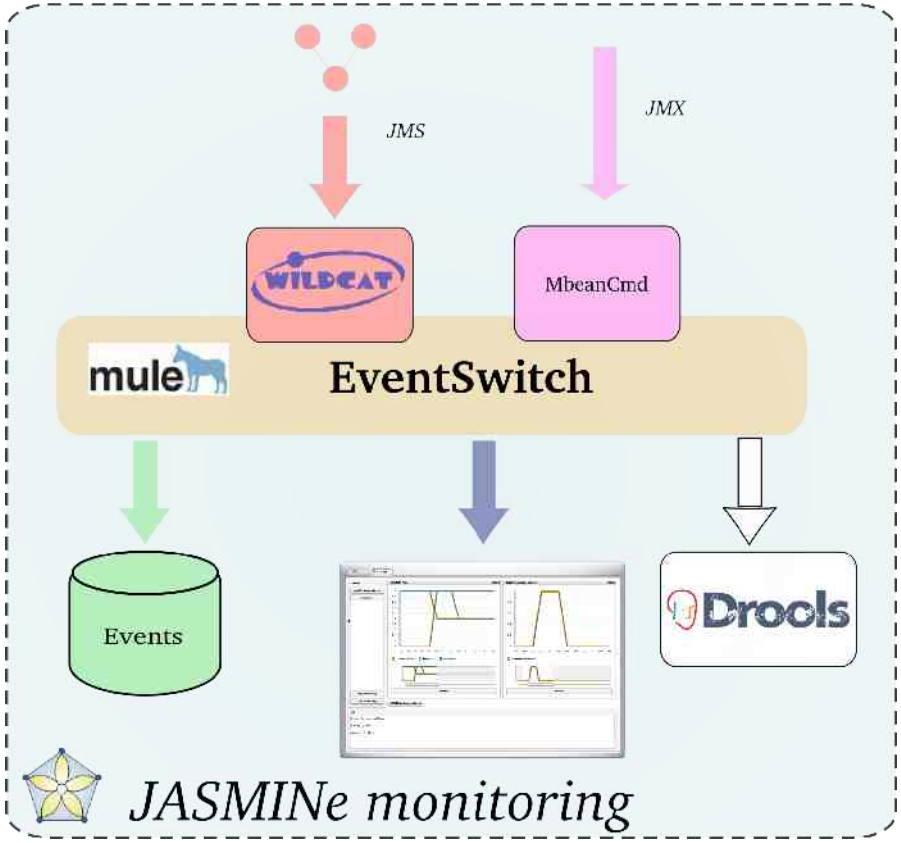
JASMINe Monitoring





- Probes (JMX, OS)
- Distributed mediation layer
- Error detection with rules engine
- EoS console (flex)

Benefits
Governance
Reactivity
Reduced admin costs

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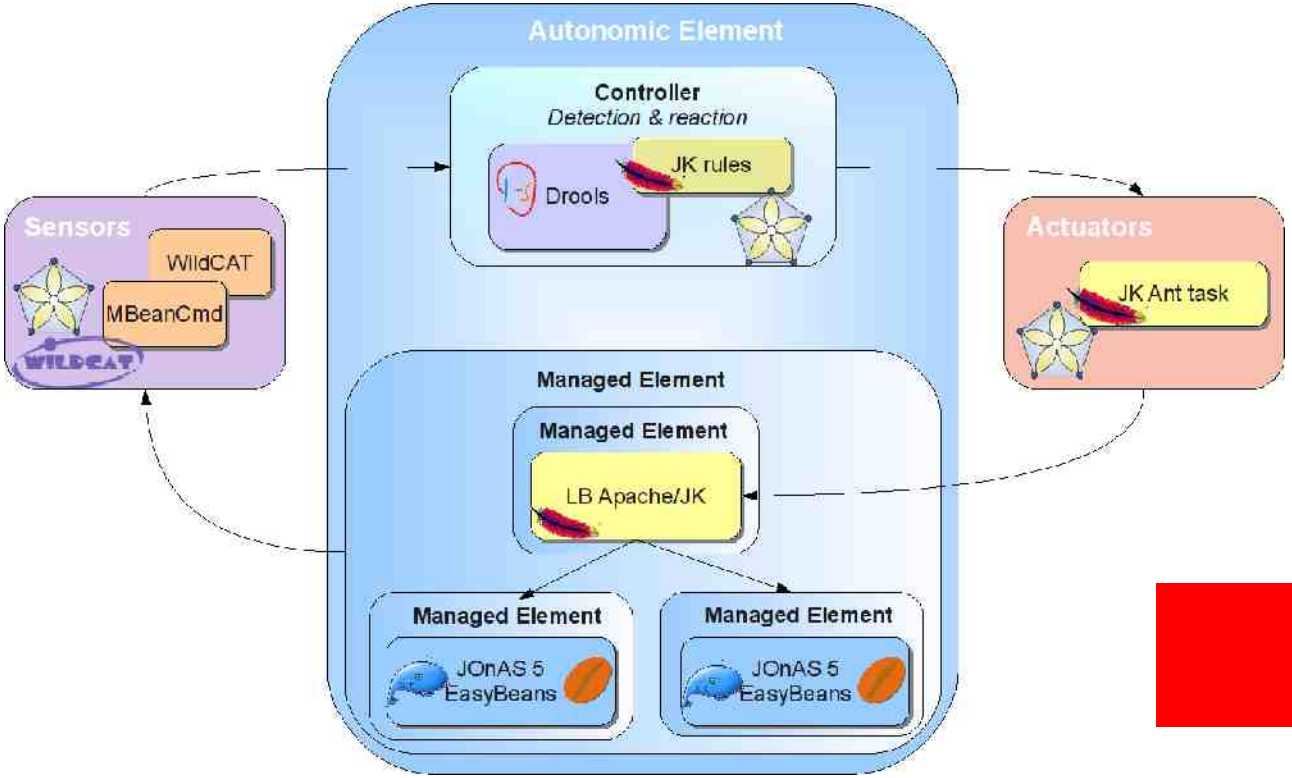
JASMINe Self-management (soon)

- Self-healing
- Self-optimization



Benefits
Autonomic

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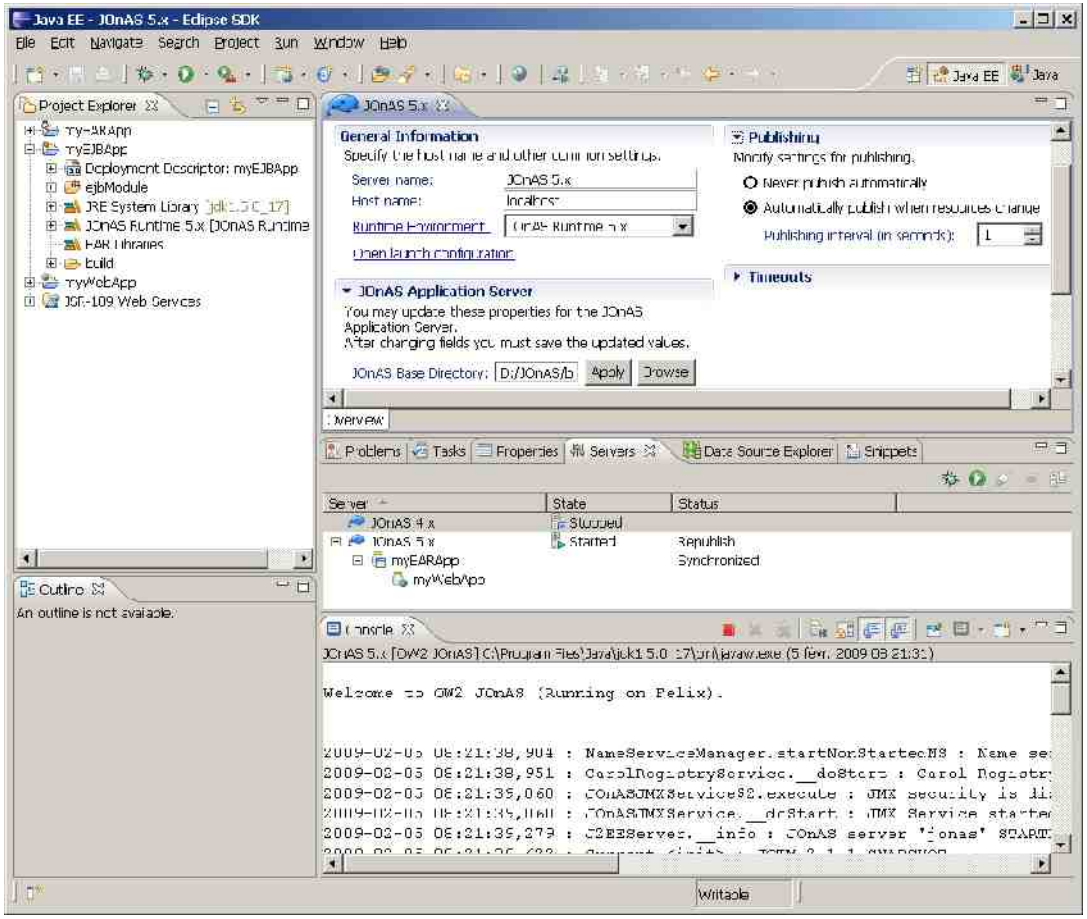
JOnAS development

- Eclipse JOPE plugin
  - WTP based
- Cargo support
- Hot redeploy



Benefits
EoD

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Try it !

jonas.ow2.org
easybeans.ow2.org
jasmine.ow2.org

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Thank you for your attention

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