



Building enterprise applications using GlassFish

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Antonio Goncalves

- Software Architect
- Former BEA Consultant
 - Experience with Application Servers
- Java EE 5 author (in French)
- Java EE 6 author (in English)
- JCP Expert Member
 - Java EE 6, EJB 3.1, JPA 2.0
- Co-creator, co-leader of the Paris JUG



Agenda

- What is GlassFish ?
- Install & Deploy
- Administer, Test & Supervise
- Cluster
- GlassFish V3
- Summary
- Q&A

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GlassFish



- Application Server
- Reference Implementation
 - Java EE 5 & Java EE 6
 - Included in Java EE 5 SDK
- Open Source
 - CDDL & GPLv2 licence
 - Sources, mailing list, documentation, roadmap, bugs...
 - Code contribution Sun, Oracle...

GlassFish

- Production ready
- Commercial version
 - Support, training, consulting
 - ~~– Sun Java System Application Server 9.1~~
 - Sun GlassFish Enterprise Server

Features

- Java EE 5 compliant
- Clustering, load-balancing
- HA – High Availability
- Administration
 - Graphic, command line
- Monitor applications
 - Resources, Call-flow, web service testing...
- Update centre

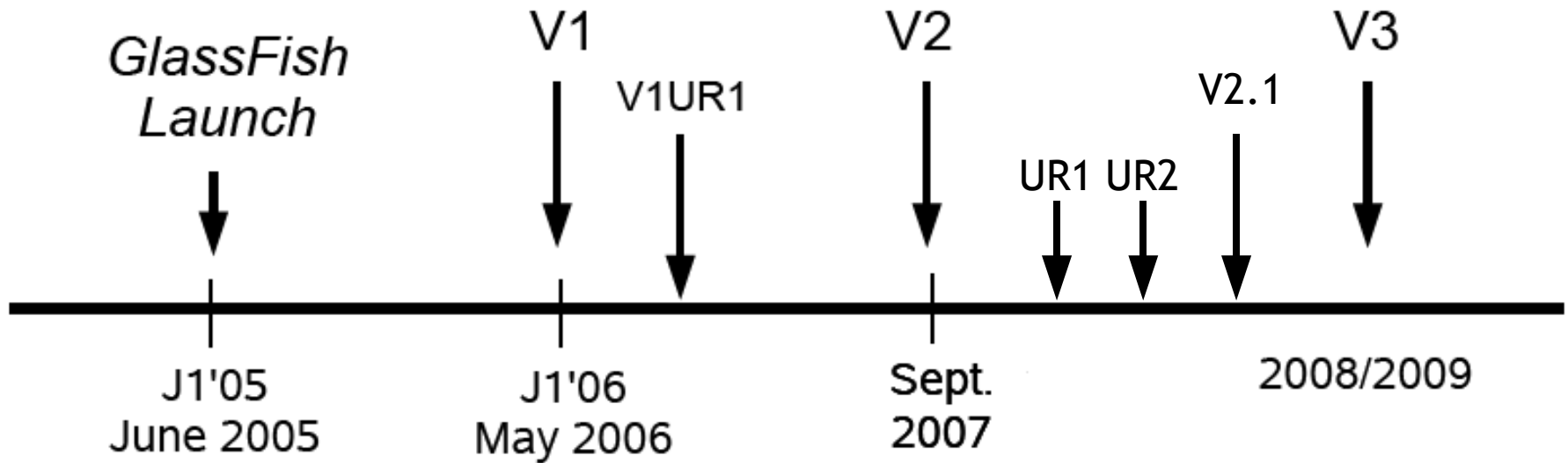


Where is GlassFish ?

Java EE 5 RI

+Cluster

Java EE 6 RI
Modularity



Architecture

- Grizzly (HTTP server)
 - Non blocking IO, supports comet
- Web Container
- EJB Container
- JMS MQ
- TopLink Essentials (JPA); Derby
- Metro (WebService stack)
- Open ESB (JBI), Open SSO

Distributions and Tools

- Distributions
 - Windows
 - Solaris
 - Linux
 - MacOS
- Tools
 - IntelliJ Idea
 - NetBeans
 - (My)Eclipse

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What Do I Need To Start ?

- Not much
 - JDK 5 or 6
 - GlassFish
 - Ant (optional, bundled with GF)
- Quick Start
 - <http://glassfish.dev.java.net/downloads/quickstart>



Demo

Install GlassFish
&
Deploy a simple application

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Administer GlassFish

- Centralized point of administration
- Admin Console
 - Graphical user interface (GUI)
- `asadmin` utility
 - Comprehensive command-line interface (CLI)

Configure, Monitor and Test

- Configure Resources
 - JDBC, Pools, JMS, Threads...
- Generate reports
- Per-service monitoring level
- Test page for web services
 - A test harness is automatically generated for a deployed web service
 - JAX-WS web services only

Monitoring Capabilities

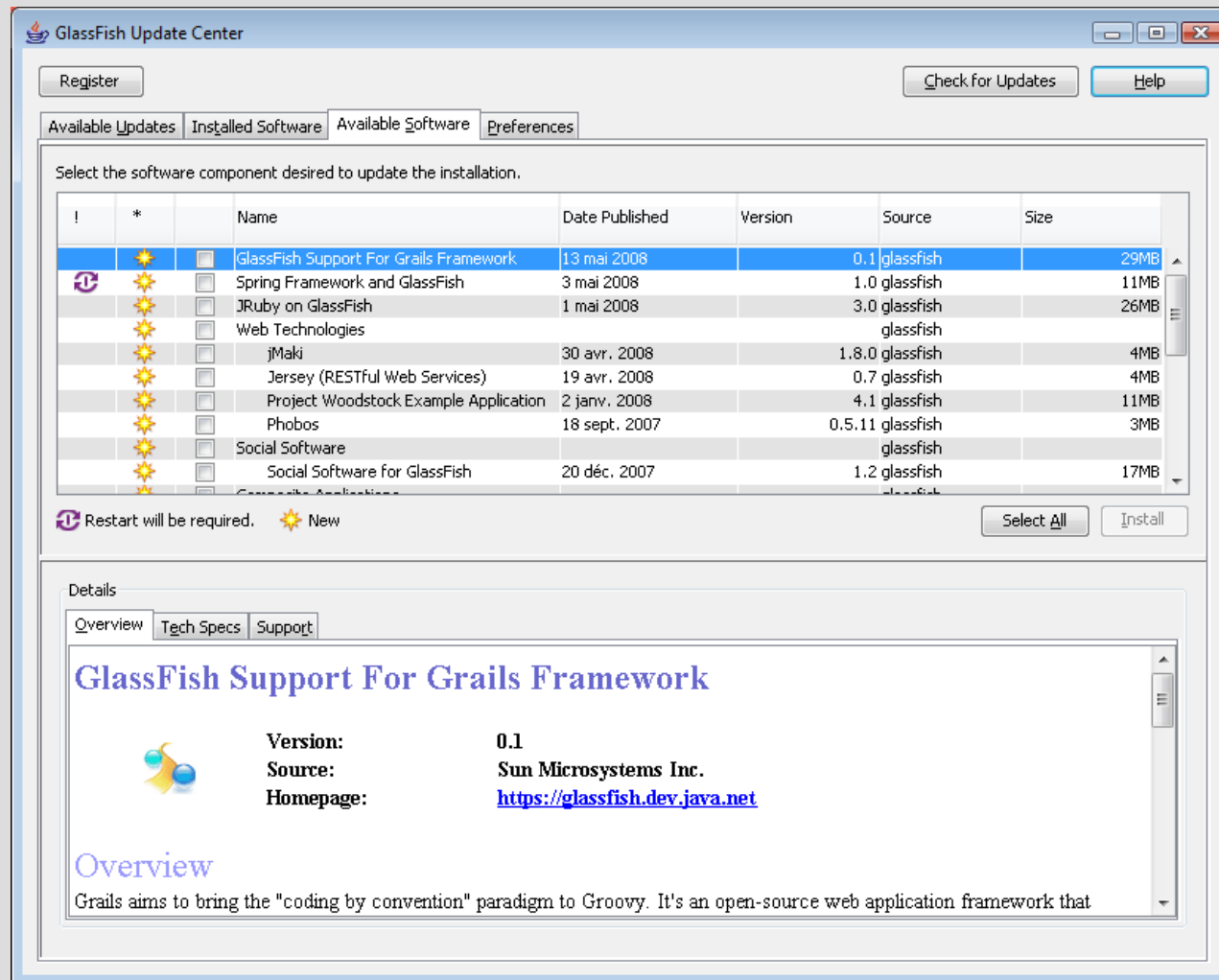
- Monitor the runtime state of various components and services
- Three monitoring levels
 - OFF, LOW, and HIGH
- Support for CLI and GUI monitoring
- Java Management Extension (JMX)

Objects That Can Be Monitored

Component/Service	Monitor Level	Objects that can be Monitored
JVM	OFF/LOW/HIGH	JVM
HTTP service	LOW/HIGH	All HTTP listeners and virtual servers
Transaction service	LOW/HIGH	Any transaction subsystem
JMS/Connector service	LOW/HIGH	Any JMS/Connector subsystem
Object Request Broker (ORB) service	LOW/HIGH	The system ORB used by the Application Server core and its connection managers
Web container	LOW/HIGH	All deployed servlets, session size
EJB container	LOW	All deployed EJBs, EJB pools, EJB caches
	HIGH	EJB business methods
JDBC connection pool	LOW/HIGH	All JDBC connection pools
Thread pool	LOW/HIGH	All thread pools

Update Center

- Enables installation of additional components





Demo

Administer, test & monitor
a Java EE 5 application

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Profiles

- Profiles determine the capabilities of the Application Server
- Out of the box support for several profiles
 - Developer : default
 - Cluster : Developer + clustering capabilities
 - Enterprise : Cluster + HADB & Network Security Services (NSS) keystore

Profiles

	Developer	Cluster	Enterprise
Security KeyStore	JKS	JKS	NSS
Security Manager	Disabled	Disabled	Enabled
JVM™ software	Client	Client	JDK™
HTTP access log	Disabled	Disabled	Enabled
GMS Heartbeat	Disabled	Enabled	Enabled
Cluster creation	Not Allowed	Allowed	Allowed
Session Repl.	Not Allowed	Allowed	Allowed

JKS : Java Key Store

NSS : Network Security Services

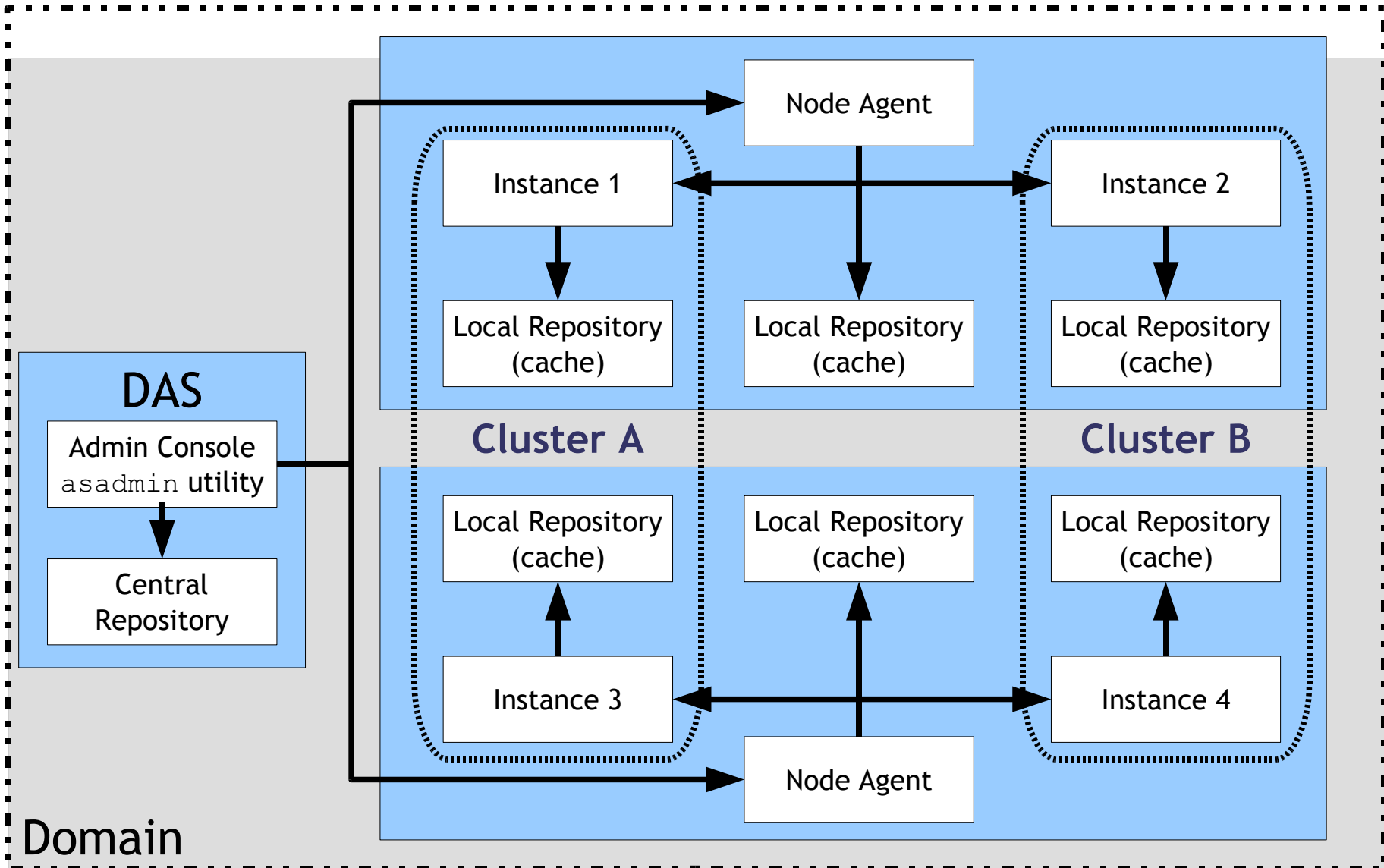
Cluster

- Fail over
- In memory state replication
 - HTTP Session, Stateful bean
 - container state (timers...)
- Load balancing
- Dynamic clustering

Cluster components

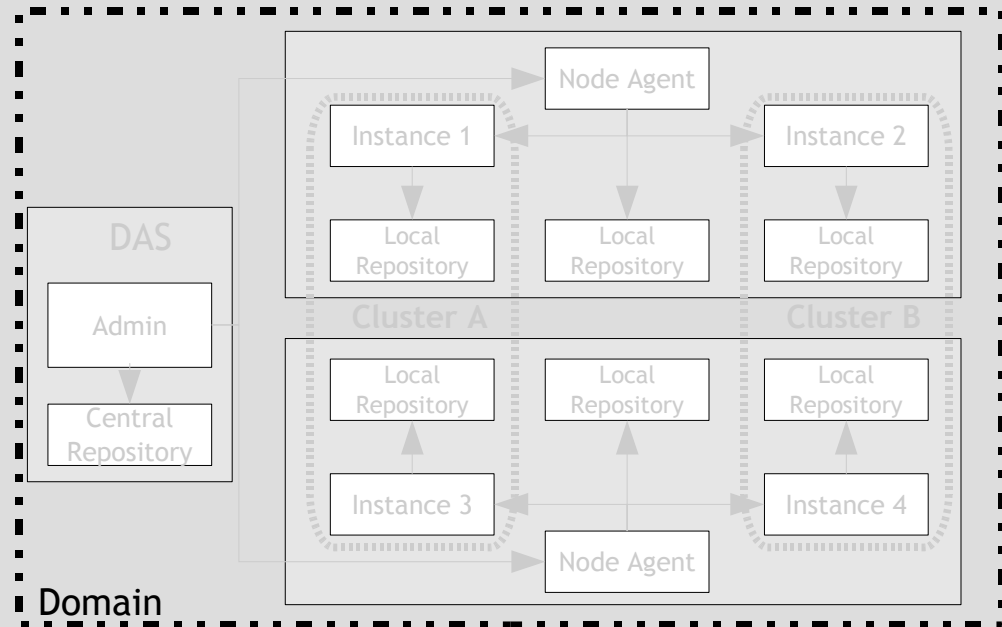
- Domain
- Domain Administration Server (DAS)
- Server instance
- Node agent
- Cluster
- Central repository
- Local repository cache

Cluster components



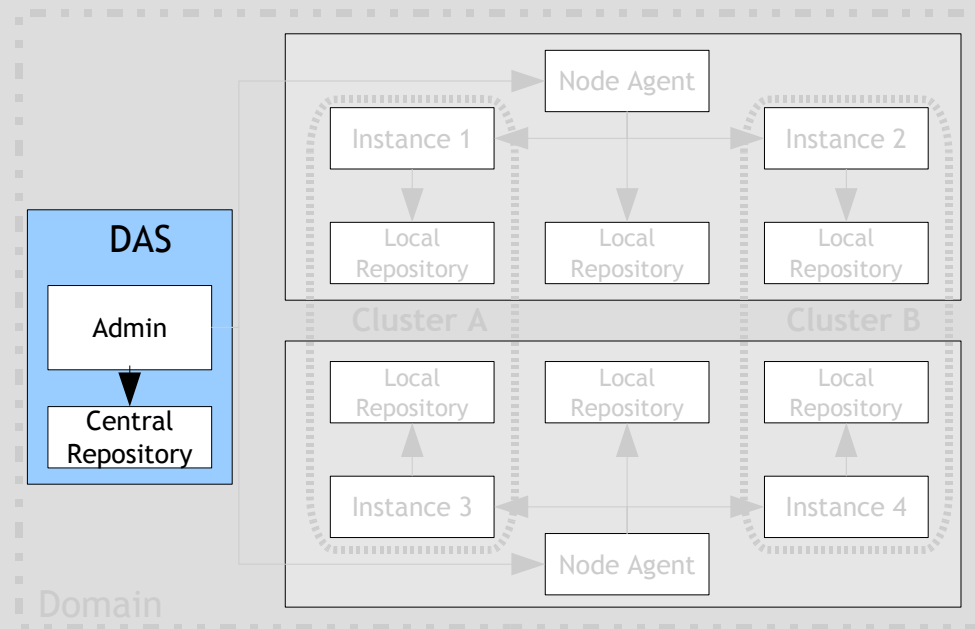
Domain

- Zero or more server instances and clusters
- Provides a common administration point
- Has its own configuration, log files, and application deployment



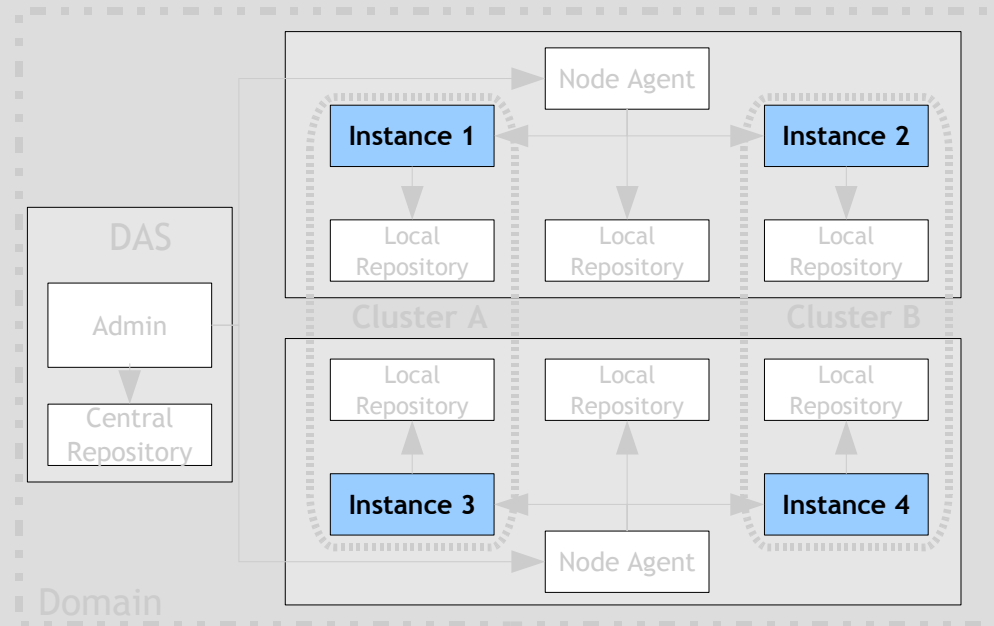
Domain Administration Server (DAS)

- Fully functional Server instance that facilitates domain administration
- Hosts the administrative applications
- Manages server instances in a domain
- Authenticates the administrator



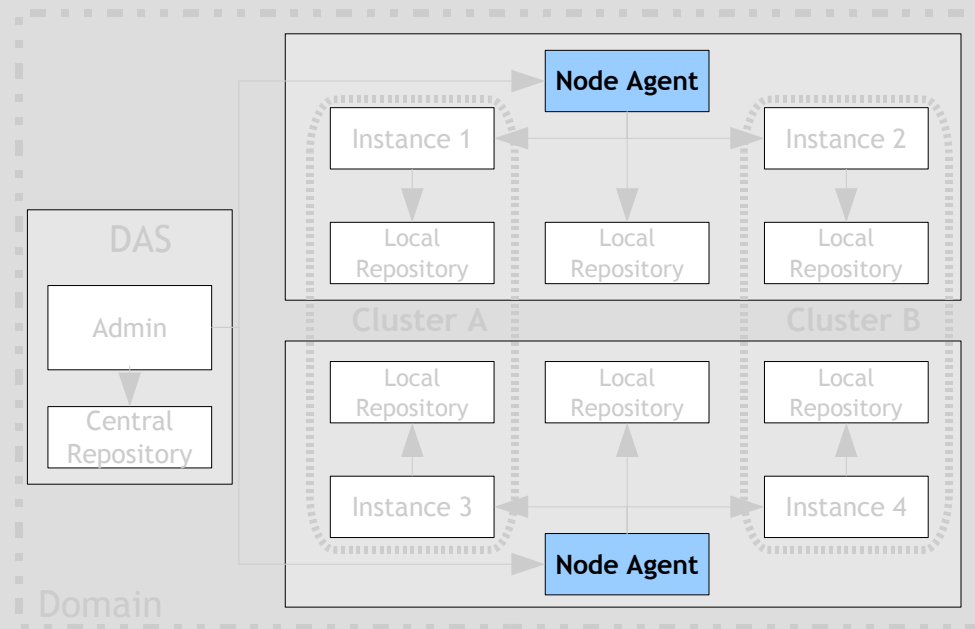
Server Instance

- Single Java EE compatible application server
 - Web & EJB Containers
- Runs on one JVM
- Hosts applications



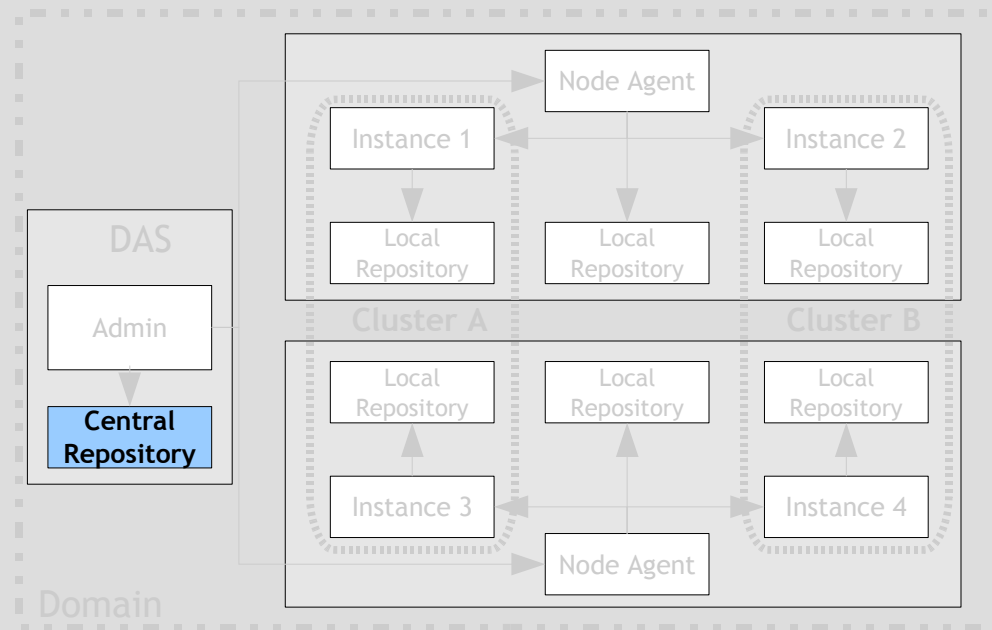
Node Agent

- Lightweight process running on every machine that hosts server instances
- Starts, stops, creates, and deletes server instances as instructed by DAS
- Restarts failed server instances
- Synchronizes configuration repository of each server with DAS



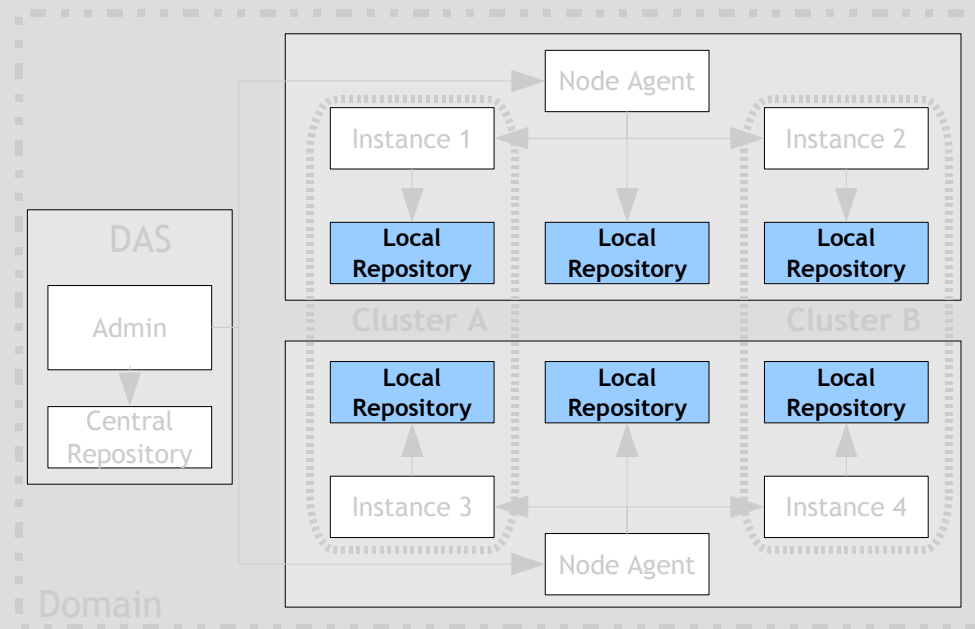
Central Repository

- Stores all domain-related configuration information
- Maintained on the file system and written to only by DAS
- Enables easy backup and restore operation of domain configuration

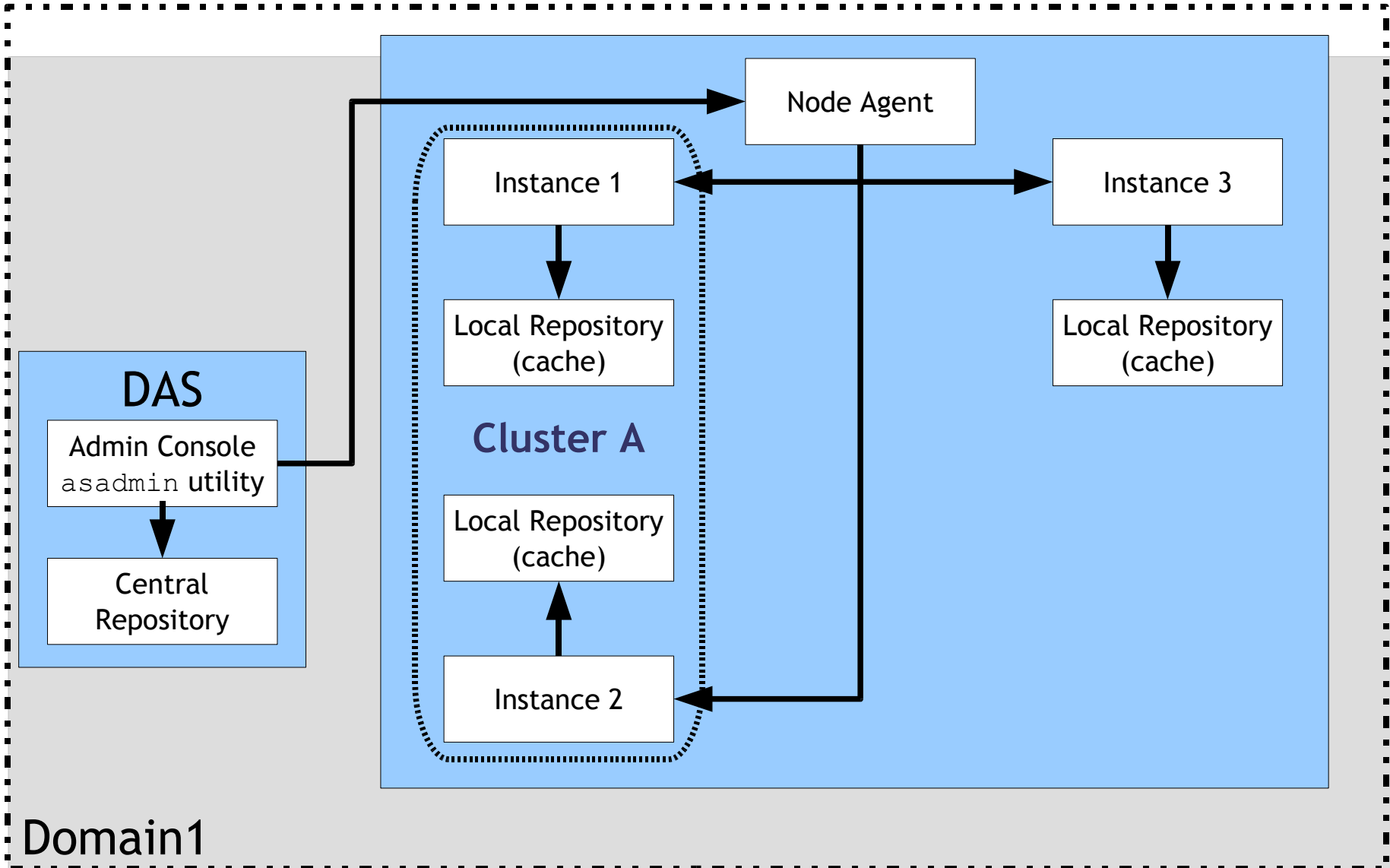


Local Repository

- Local copy of the central repository for each server instance and node agent
- Configuration information is still accessible to server instance in the absence of DAS
- Synchronized with the central repository



Demo





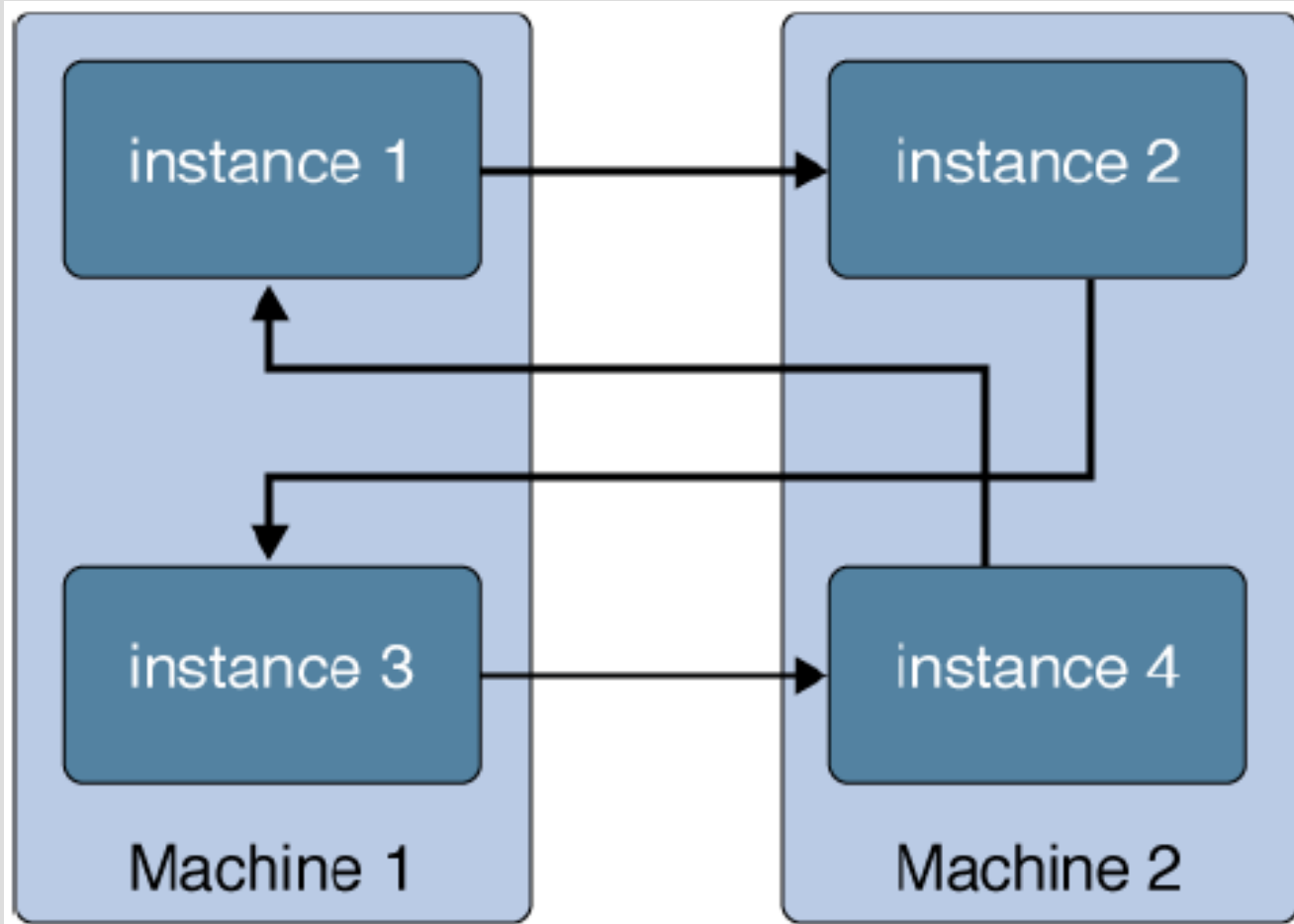
Demo

Create a cluster

Memory Replication

- In memory state replication
 - HTTP Session, Stateful bean
 - Container state (timers...)
- Provides failover for the web tier and EJB tier
- Replicates session state from each instance to a backup instance.
- Each backup store the replicated data in-memory

Memory Replication Ring Topology



HADB – Enterprise Profile

- Database management system
- Stores the following data:
 - HTTP session
 - Stateful session bean
 - JMS message
- Supports up to 99.999% service and data availability
- State is persisted in database
 - Overkill for some applications

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GlassFish V3

- HK2 : Hundred Kilobytes Kernel
- Small & fast startup (<1 second)
- Modular, several containers
 - Web, EJB
 - JRuby, PHP, JavaScript
 - It's not a Java EE 6 container, it's a container that also does Java EE 6
- Java EE 6 & Java EE 6 profiles
- OSGi Felix

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Summary

- GlassFish V1 is the RI for Java EE 5
- GlassFish V2 is production ready
 - Administer, monitor
 - Cluster, HA
 - Not just to play with Java EE 5 !
 - Proven solution
- GlassFish V3
 - Modular
 - Fast
 - Many containers



Questions