

2.– 5. September 2013  
in Nürnberg



# Herbstcampus

Wissenstransfer  
par excellence

## Verflixte(?) Sieben

Ein Blick auf den JBoss AS 7 – von JBoss Modules bis Clustering

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## ▼ Sprecher



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- ▼ **Overview**
- ▼ Architectural & Configuration Concepts
- ▼ Classloading concepts: JBoss Modules
- ▼ Operating modes
- ▼ Clustering and high availability
- ▼ Open Discussion: Migration to JBoss 7

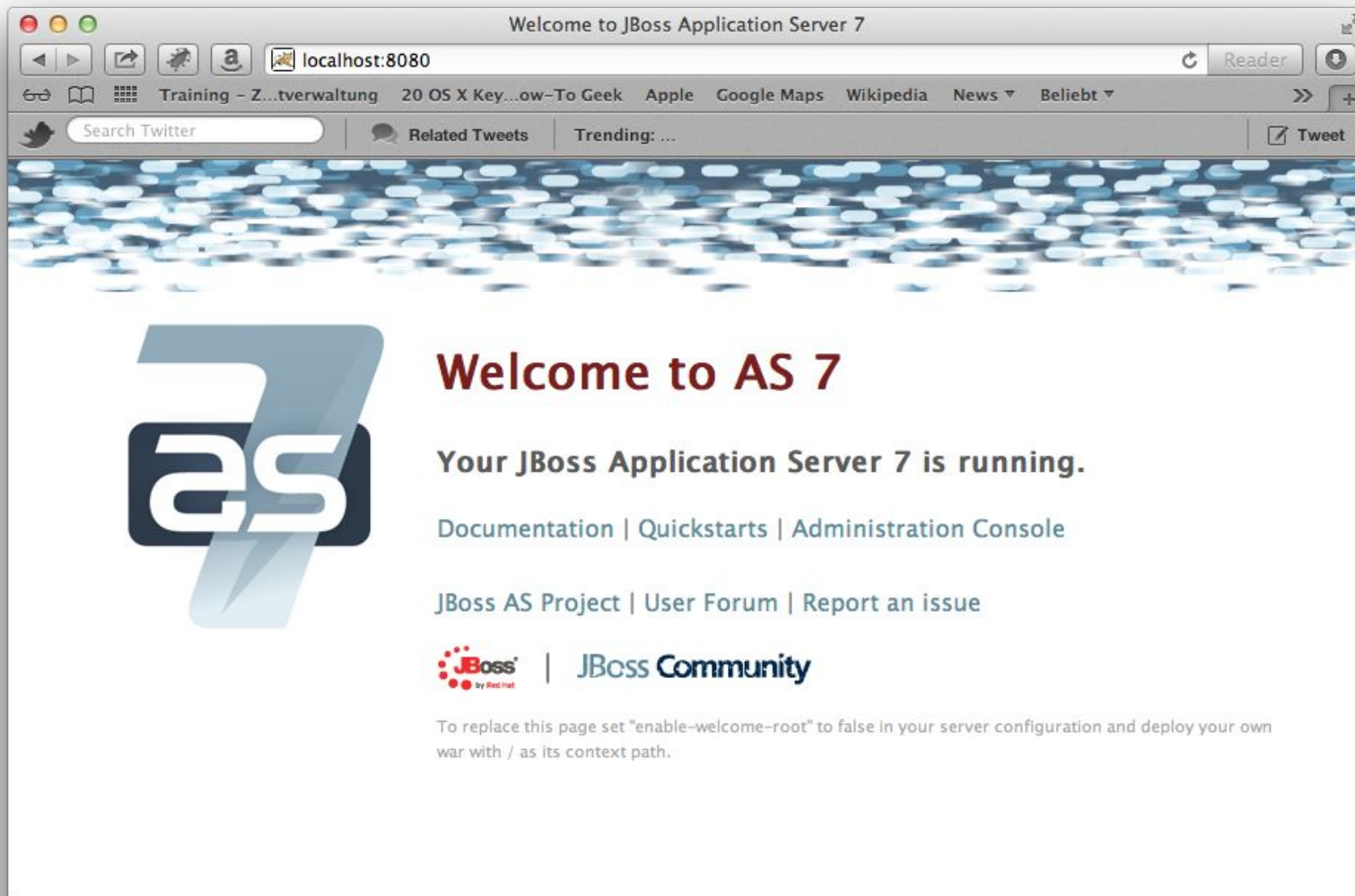
- ▼ JBoss 7
  - ▼ Current version (May 2013):
    - ▼ 7.1.1 (community)
    - ▼ 6.1.0 (EAP)
  - ▼ Full stack JEE Server
    - ▼ JEE 6 Certified
    - ▼ Supports Web and Full JEE Profile
  - ▼ Available Editions
    - ▼ Community
    - ▼ Enterprise Application Plattform (EAP)

# Download and Installation (1/2)

- ▼ Download version of choice from <http://www.jboss.org/jbossas/downloads/>
- ▼ Unpack archive (.zip or .tgz) into desired location
- ▼ Start the server using
  - ▼ `<JBOSS_HOME>/bin/standalone.sh`

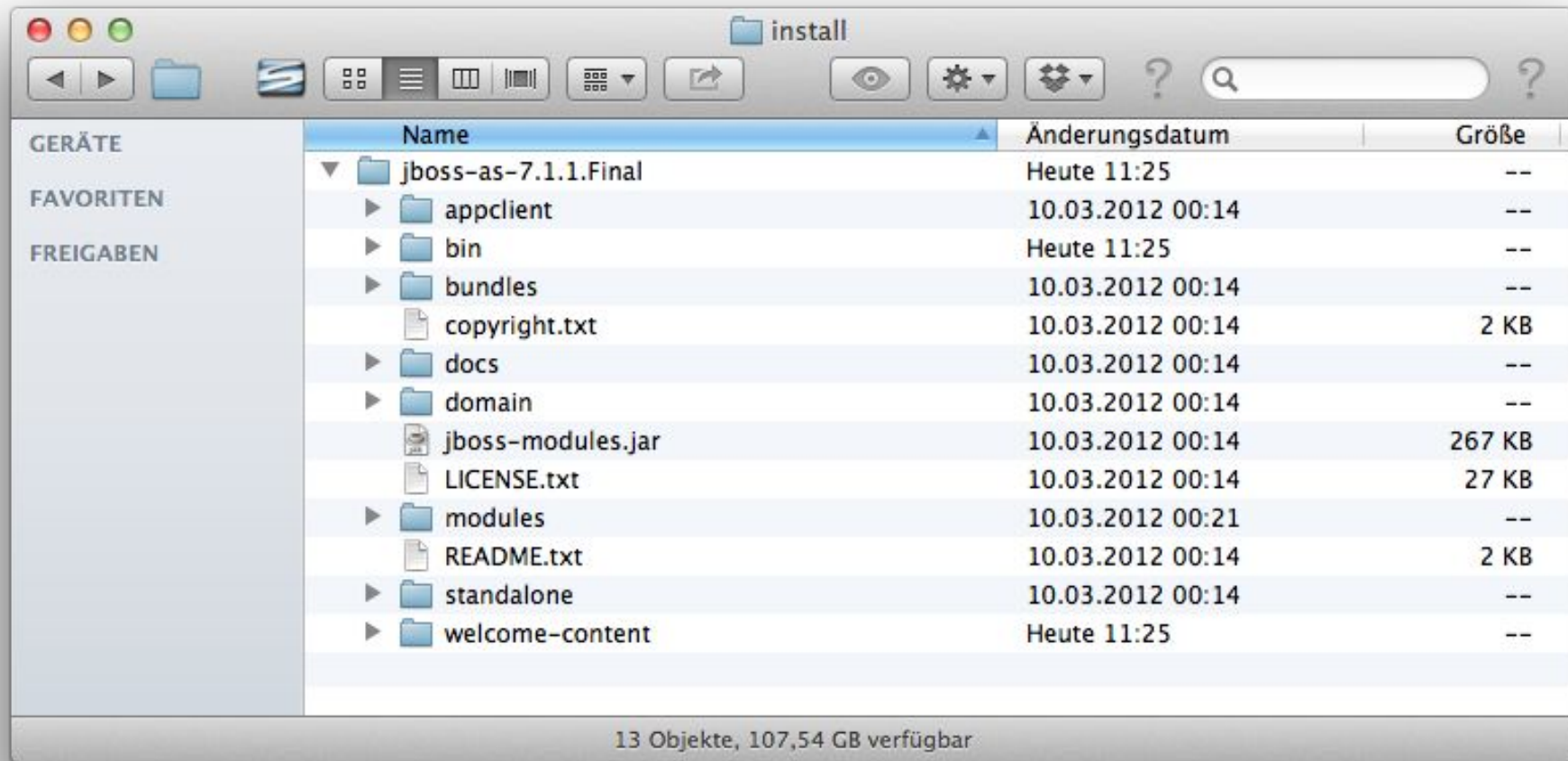
# Download and Installation (2/2)

- Check if server is up at <http://localhost:8080>



# Folder structure

## ▼ The „new“ folder structure

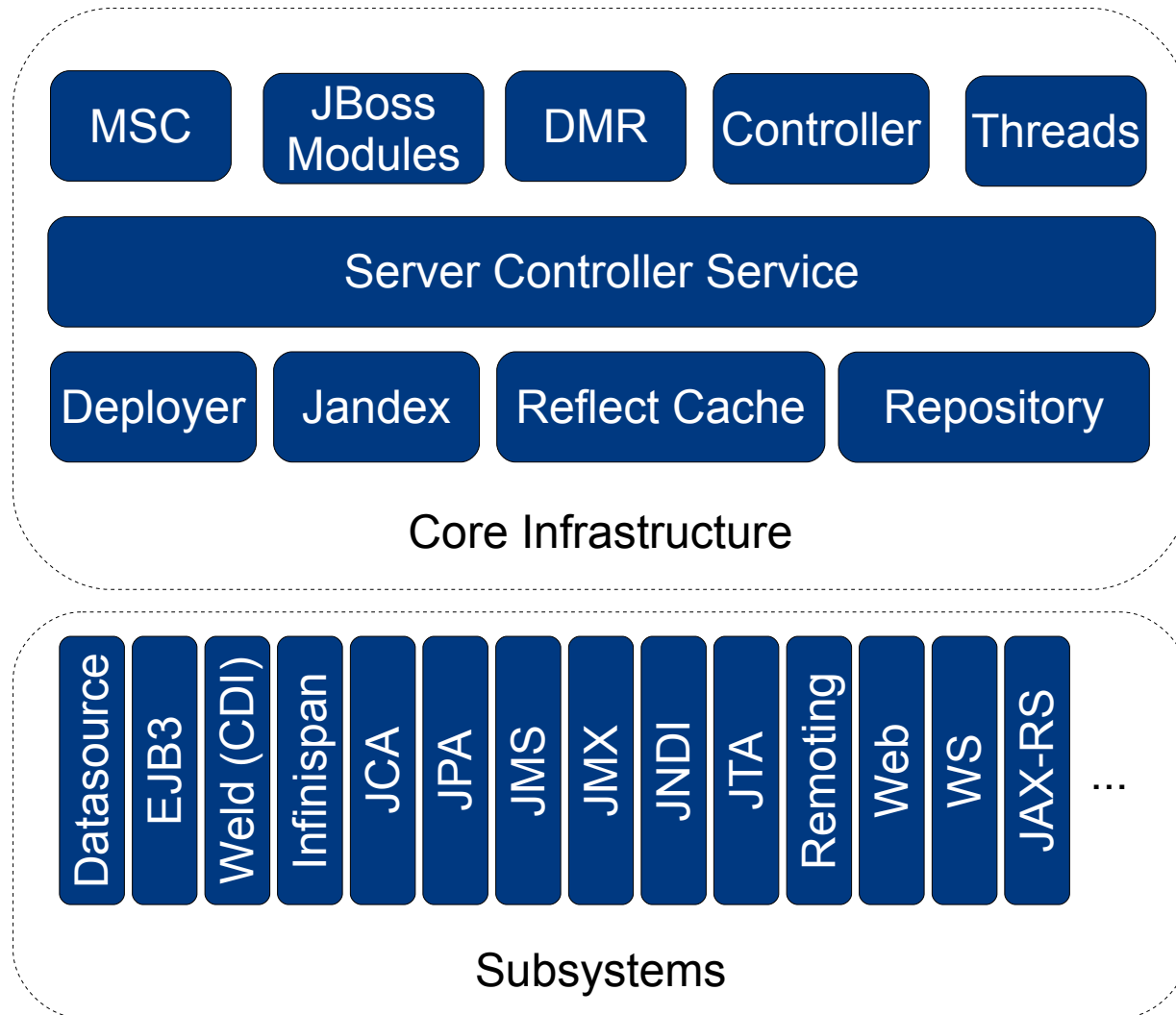


# Agenda

- ▼ Overview
- ▼ **Architectural & Configuration Concepts**
- ▼ Classloading concepts: JBoss Modules
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# Architectural concepts (1/3)



# Architectural Concepts (2/3)

- ▼ Everything is a service!
- ▼ JBoss Modular Service Controller (MSC)
  - ▼ State machine
  - ▼ Starting and stopping services
  - ▼ Calculating (and starting/stopping) dependencies
  - ▼ Configured via one centralized XML file
- ▼ Services are started
  - ▼ Only if needed
  - ▼ In parallel

## ▼ JBoss Modules

- ▼ Modular classloading system
- ▼ Complete isolation
- ▼ Fast resolution
- ▼ Explicit configuration required!

## ▼ Dynamic Model Representation

- ▼ Central Management API
- ▼ All operations use DMR
- ▼ Different transports / data representations possible

- ▼ Capabilities of the core server are enhanced by „Extensions“
  - ▼ Special JBoss modules implementing framework services
    - ▼ EJB3
    - ▼ Transactions
    - ▼ Weld
    - ▼ ...

```
<extensions>
```

```
[...]
```

```
<extension module="org.jboss.as.transactions"/>
```

```
<extension module="org.jboss.as.web" />
```

```
<extension module="org.jboss.as.webservices" />
```

```
<extension module="org.jboss.as.weld" />
```

```
</extensions>
```

# Subsystems & Profiles (1/2)

- ▼ Capabilities added by „Extensions“ are enabled and configured using „Subsystems“
- ▼ Example JavaServlet Container:

```
<subsystem xmlns="urn:jboss:domain:web:1.1"
            default-virtual-server="default-host" native="false">
  <connector name="http" protocol="HTTP/1.1" scheme="http"
            socket-binding="http"/>
  <virtual-server name="default-host" enable-welcome-root="true">
    <alias name="localhost"/>
    <alias name="example.com"/>
  </virtual-server>
</subsystem>
```

# Subsystems & Profiles (2/2)

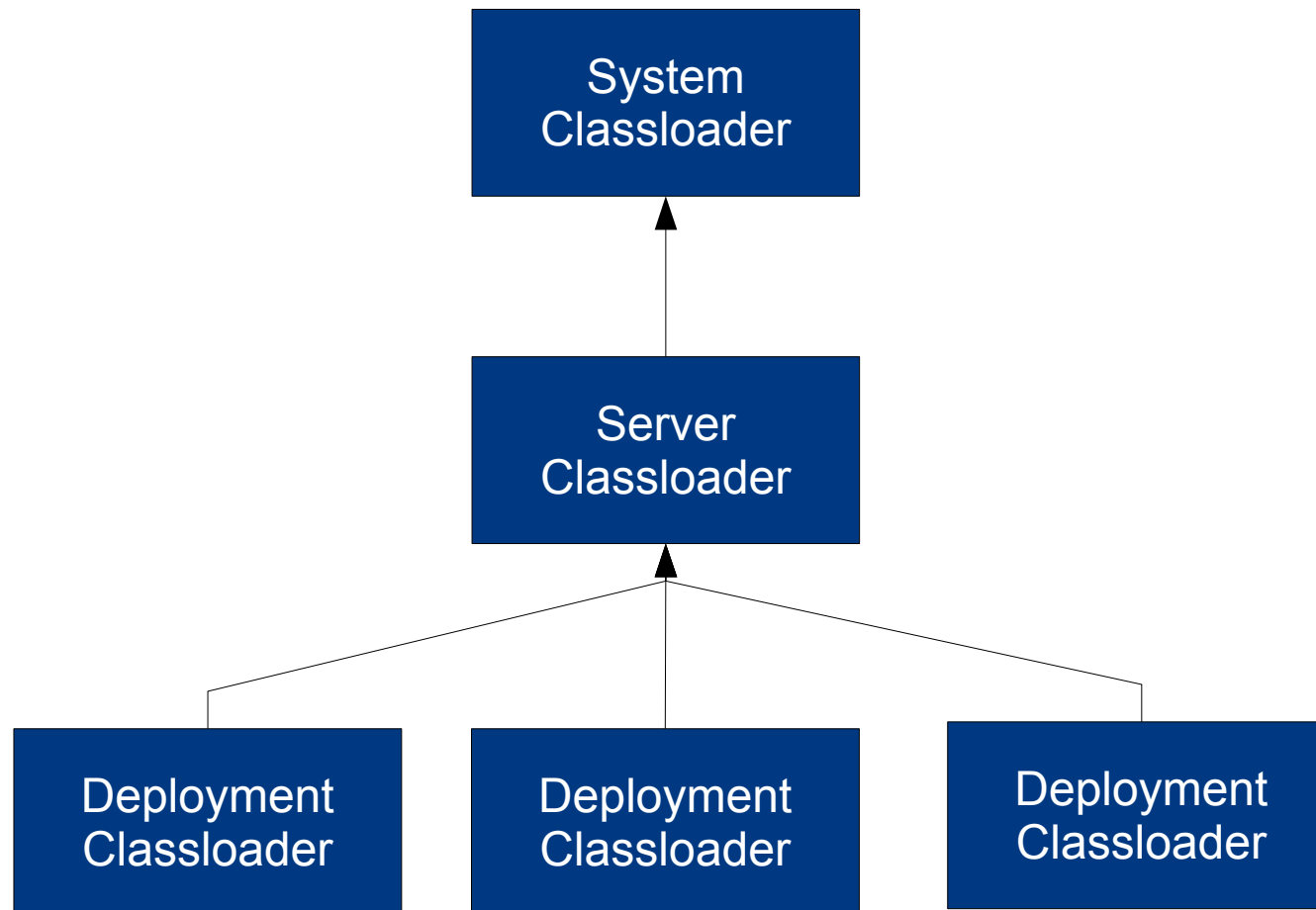
- ▼ „Subsystem“ configurations are group within „Profiles“
  - ▼ Overall server configuration
  - ▼ Active Profile is selected at server startup
  - ▼ Definition differs depending on selected operation mode

```
<profiles>
  <profile name="default">
    <subsystem xmlns="urn:jboss:domain:logging:1.1">
      ...
    </subsystem>
    ...
  </profile>
  ...
</profiles>
```

# Agenda

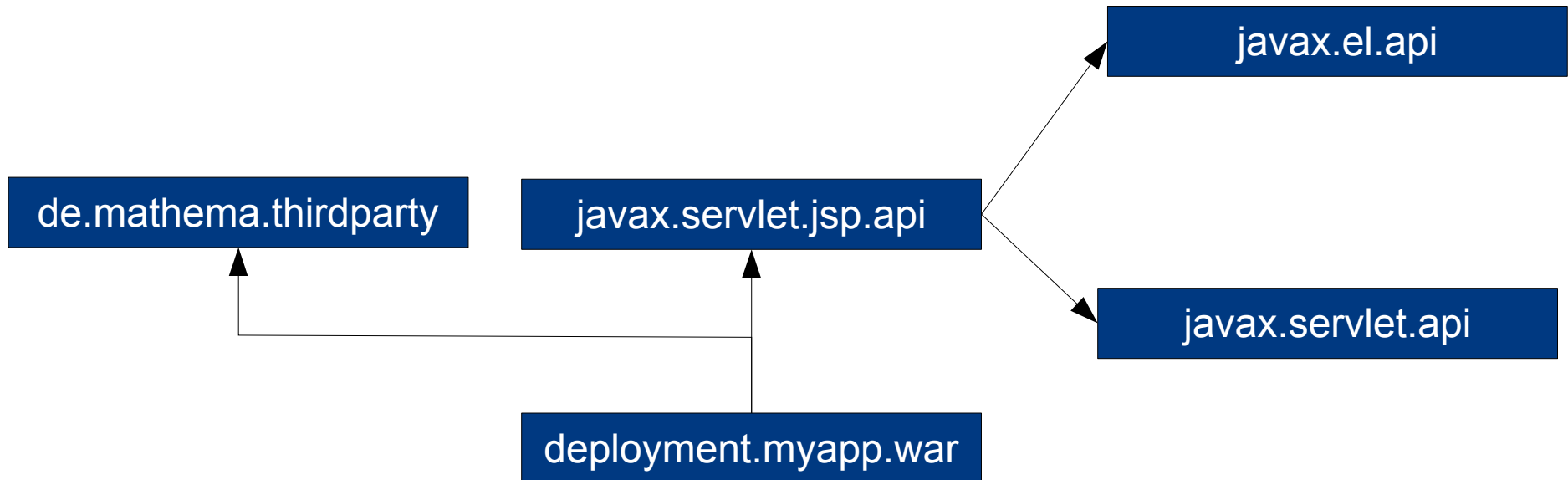
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## ▼ Classloading as you might know it





## ▼ Classloading using JBoss Modules



- ▼ Modular classloading
- ▼ Explicit definition of dependencies and exports
- ▼ Multiple versions of a library can be supported
- ▼ Deployments are added as modules automatically

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# JBoss 7 operating modes

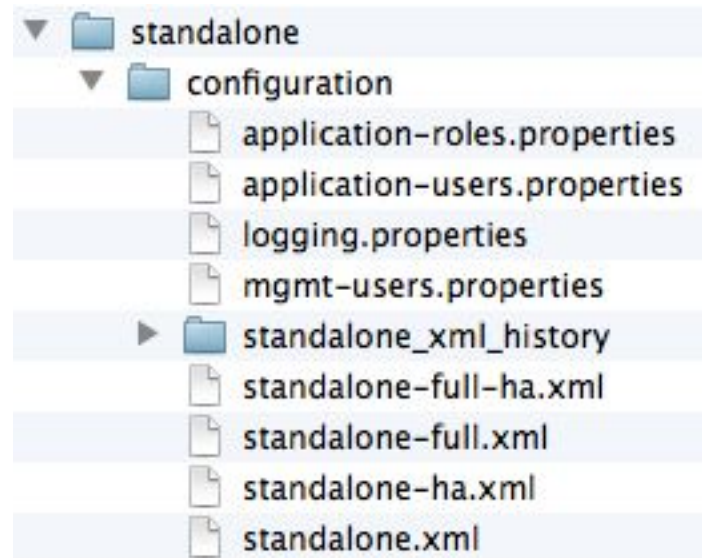
- ▼ JBoss 7 ships with two possible operating modes
  - ▼ Standalone mode
  - ▼ Domain mode
- ▼ Operation mode selection...
  - ▼ ...changes the management of the server(s)
  - ▼ ...has NO impact on the capabilities of the server(s)
    - ▼ HA/LB and operating mode are orthogonal concepts!

# Standalone mode

- ▼ Same approach as in „the old days“ (JBoss 3 – 6)
  - ▼ Started using `<JBOSS_HOME>/bin/standalone.sh`
- ▼ Each server instance...
  - ▼ ...is an independent process
  - ▼ ...is managed on it's own
- ▼ `<JBOSS_HOME>/standalone` holds
  - ▼ Configurations
  - ▼ Persistent data
  - ▼ Log files

# Configuring a standalone instance

- ▼ One configuration file for each profile
  - ▼ Default
  - ▼ Full
  - ▼ ...
- ▼ Stored in <JBOSS\_HOME>/standalone/configuration



# Starting a standalone instance

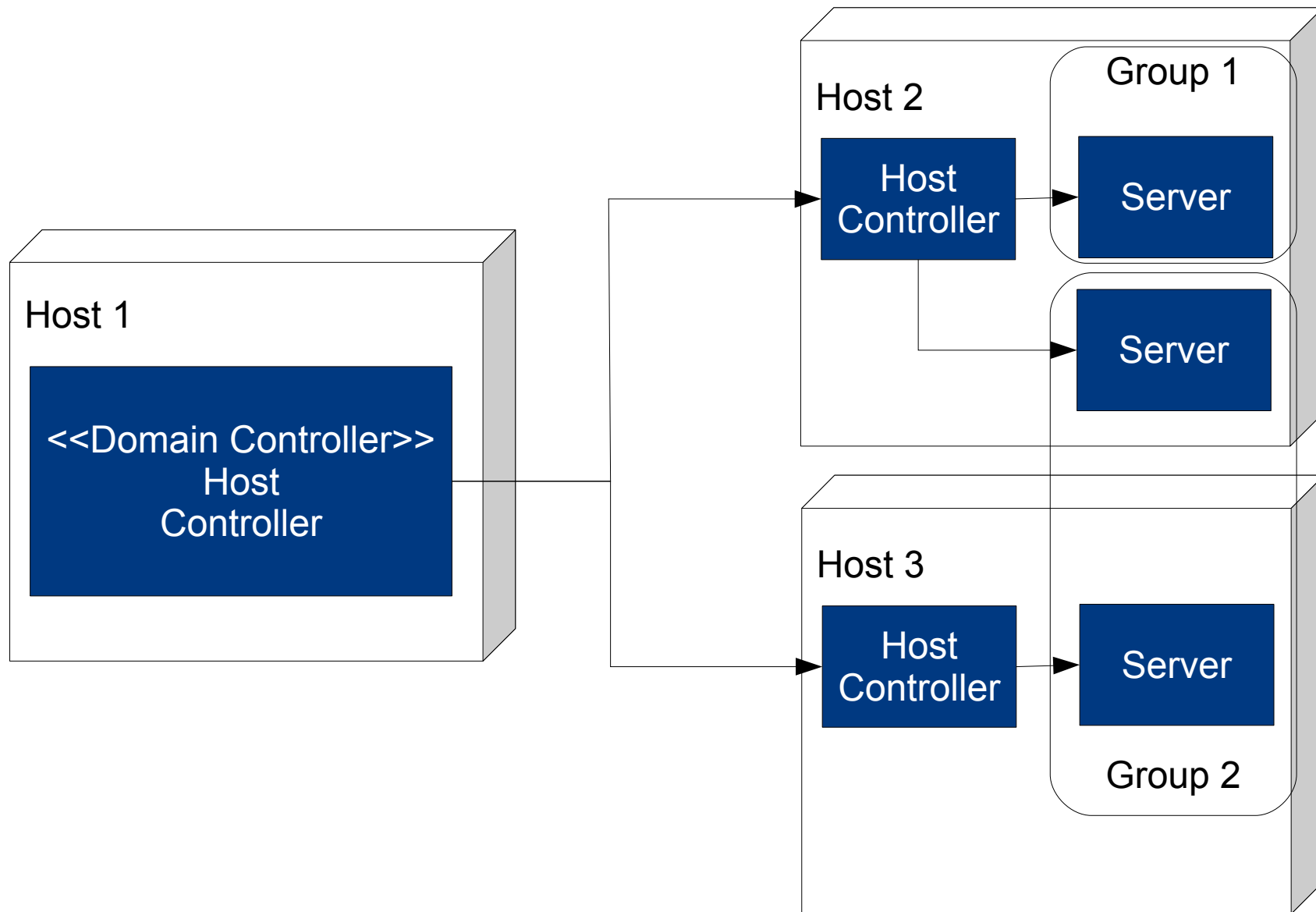
- ▼ Profile of choice is selected at startup time
- ▼ Start standalone with default profile (standalone.xml)
  - ▼ `<JBOSS_HOME>/bin/standalone.sh`
- ▼ Start standalone with full profile
  - ▼ `<JBOSS_HOME>/bin/standalone.sh -c standalone-full.xml`

# Domain mode (1/2)

- ▼ New operating mode introduced with JBoss 7
  - ▼ Started using `<JBOSS_HOME>/bin/domain.sh`
- ▼ Multiple servers build one domain
  - ▼ Organized in server groups
  - ▼ Managed indirectly via a centralized domain controller
  - ▼ Sharing all the same configuration
- ▼ `<JBOSS_HOME>/domain` holds
  - ▼ Configurations
  - ▼ Persistent data
  - ▼ Servers
  - ▼ Log files

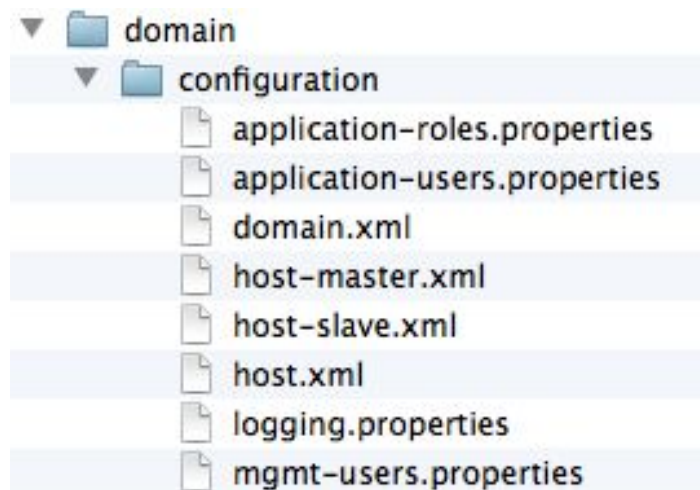


# Domain mode (2/2)



# Configuring a domain

- ▼ Different configuration files for
  - ▼ Host controller
  - ▼ Domain controller (i.e. server configuration)
- ▼ Stored in `<JBOSS_HOME>/domain/configuration`



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# The three levels of failover

## ▼ Single node

- ▼ If the node fails, no further calls are possible
- ▼ Non persistent data is lost if a node goes down

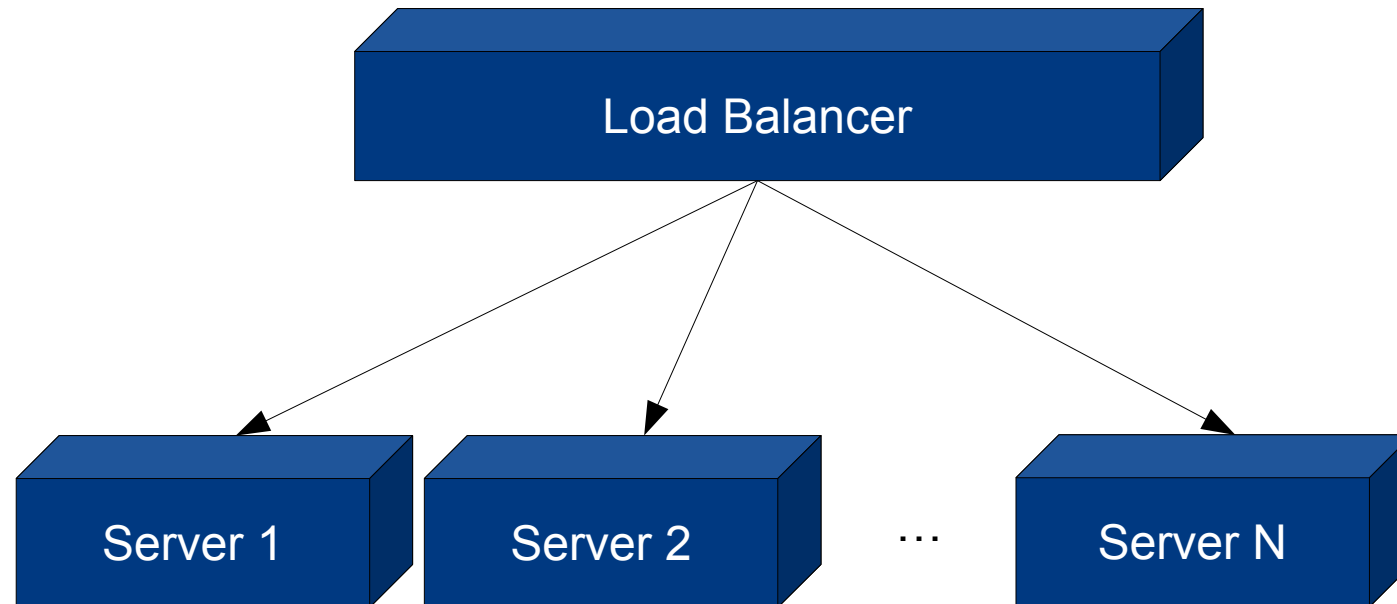
## ▼ Load balancing

- ▼ If the node fails, further calls go to another node
- ▼ Non persistent data is lost if a node goes down

## ▼ State replication (aka. Clustering)

- ▼ If the node fails, further calls go to another node
- ▼ Non persistent data is available at the other node

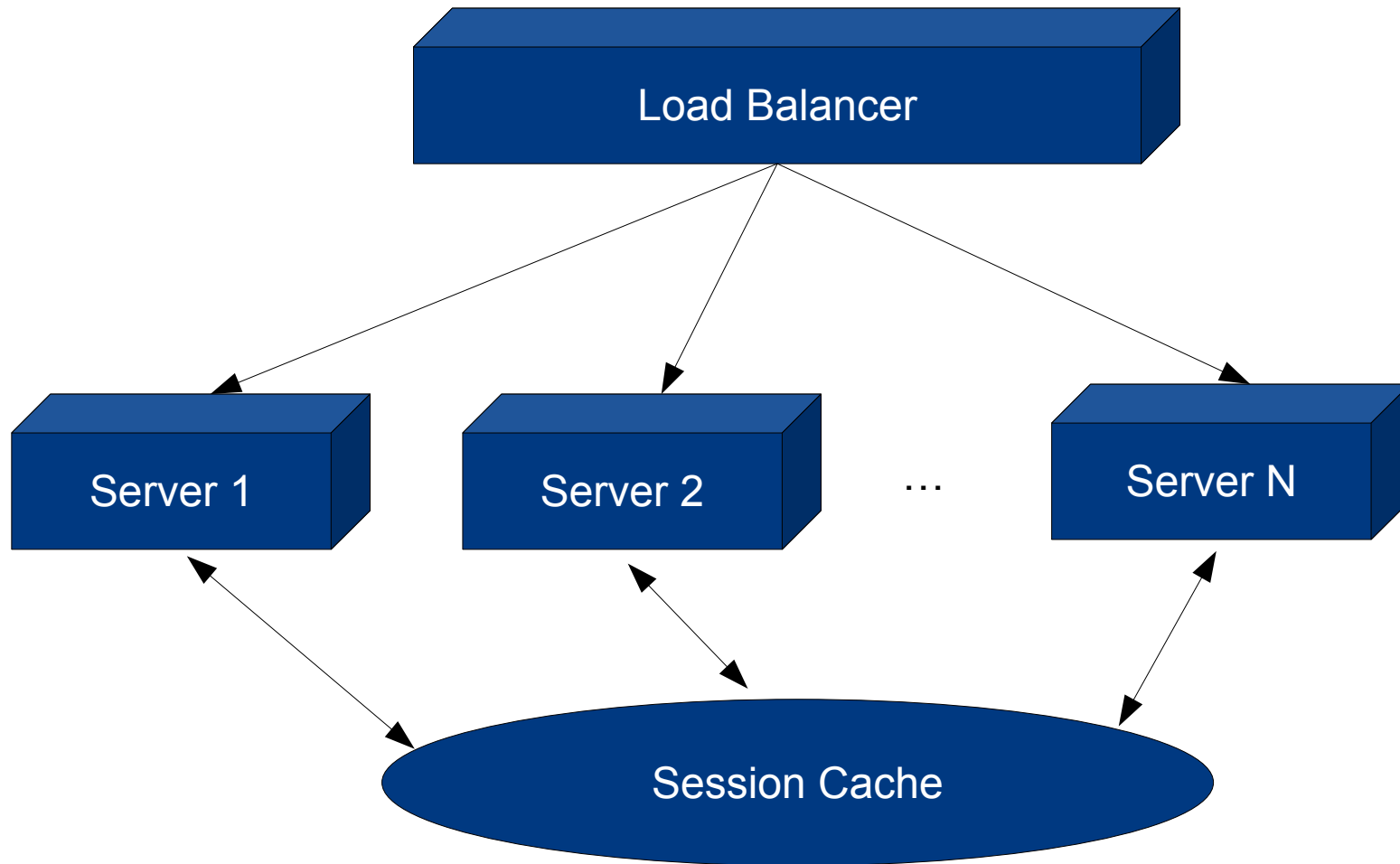
# Load balancing (1/2)



# Load balancing (2/2)

- ▼ Easy to implement
- ▼ Multiple strategies to implement the load balancer
  - ▼ Apache Webserver (http/https)
  - ▼ Cluster-aware stubs (IIOP/JNP)
  - ▼ HW load balancing (TCP/IP)
- ▼ If a node goes down, the other nodes take the load
  - ▼ No system failure
  - ▼ But: Non persistent data is lost!

# Clustering (1/2)



# Clustering (2/2)

- ▼ More complex setup
- ▼ Multiple strategies to implement the load balancer
  - ▼ Apache Webserver (http/https)
  - ▼ Cluster-aware stubs (IIOP/JNP)
  - ▼ HW load balancing (TCP/IP)
- ▼ Shared cache implementation exchangeable
- ▼ If a node goes down, the other nodes take the load and the data
  - ▼ No system failure
  - ▼ No data loss



## mod\_cluster vs. mod\_jk

- ▼ Dynamic configuration of httpd workers
- ▼ Server-side load balance factor calculation
- ▼ Fine grained web-app lifecycle control
- ▼ AJP is optional
- ▼ But: May conflict with mod\_proxy!

## ▼ Configure remote access (*jboss-ejb-client.properties*)

```
endpoint.name=client-endpoint
```

```
remote.connectionprovider.create.options.org.xnio.Options.SSL_ENABLED=false
```

```
remote.connections=node1, node2
```

```
remote.connection.node1.host=192.168.56.1
```

```
remote.connection.node1.port = 4697
```

```
remote.connection.node1.connect.options.org.xnio.Options.SASL_POLICY_NOANONYMOUS=true
```

```
remote.connection.node1.username=app
```

```
remote.connection.node1.password=jboss
```

```
...
```

```
remote.clusters=ejb
```

```
remote.cluster.ejb.connect.options.org.xnio.Options.SASL_POLICY_NOANONYMOUS=false
```

```
remote.cluster.ejb.connect.options.org.xnio.Options.SSL_ENABLED=false
```

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# Migration tasks

- ▼ Move your libraries into modules
- ▼ Check your deployments
  - ▼ Module dependencies
  - ▼ JBoss specific descriptors
- ▼ Transfer your configuration details
  - ▼ User Realms
  - ▼ Logging
  - ▼ ...
- ▼ Change configuration of your RMI clients

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Vielen Dank!

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