



JBoss Application Server 7

Emanuel Muckenhuber

emanuel@redhat.com

AS7 Key features

- Fast and lightweight
- Modularity
- Unified, user configuration
- Multi-node (domain) management
- Multiple consistent management interfaces

What about Java EE?

- **AS 6.0** (Dec 2010)
 - Java EE6 (web profile)
- **AS 7.0** (Jul 2011)
 - Java EE6 (web profile)
- **AS 7.1** (Dec 2011)
 - Java EE6 (full profile)

JBoss Application Server 7

AS 7 != AS 6 +1

more a **revolution** than evolution

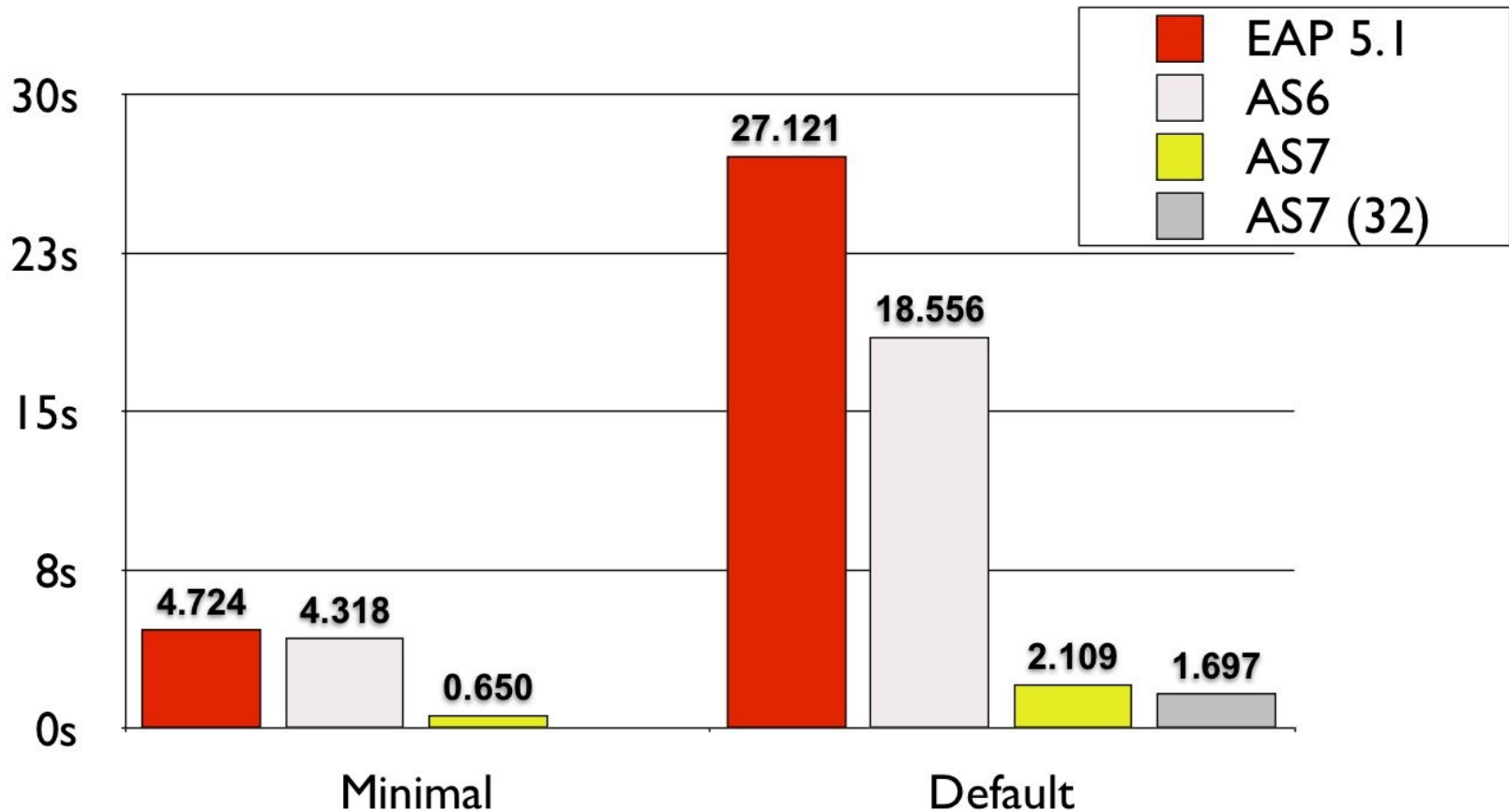
AS7 Architecture

- Redesigned from scratch with focus on
 - **Performance**
 - **Modularity**
 - **Configuration**
 - **Management**

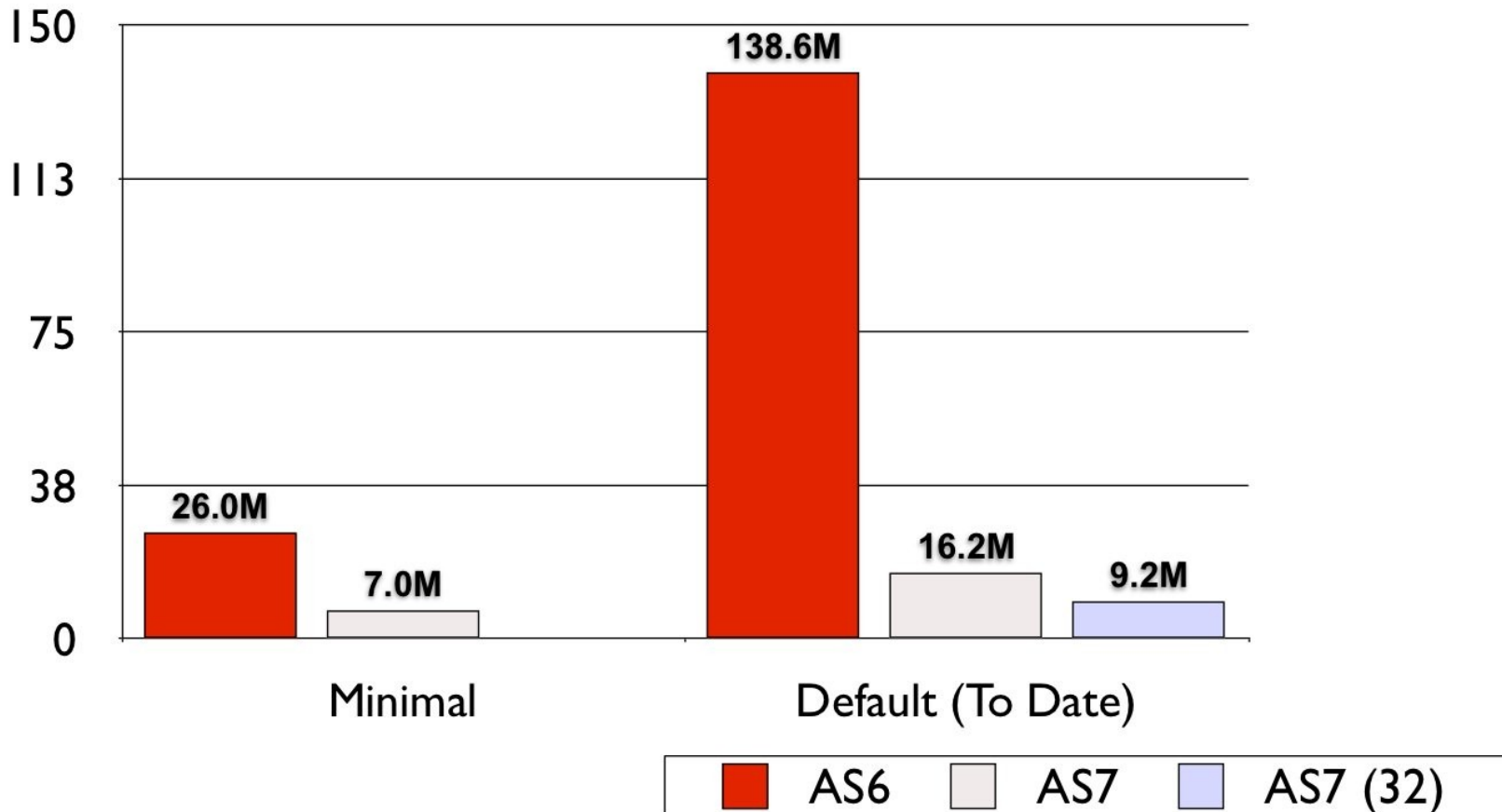
Performance

- **Concurrent** dependency management
 - Services and deployments
- Leverages MSC (Modular Service Container)
 - Small
 - highly-concurrent
 - scalable state-machine

Boot time results



Memory consumption



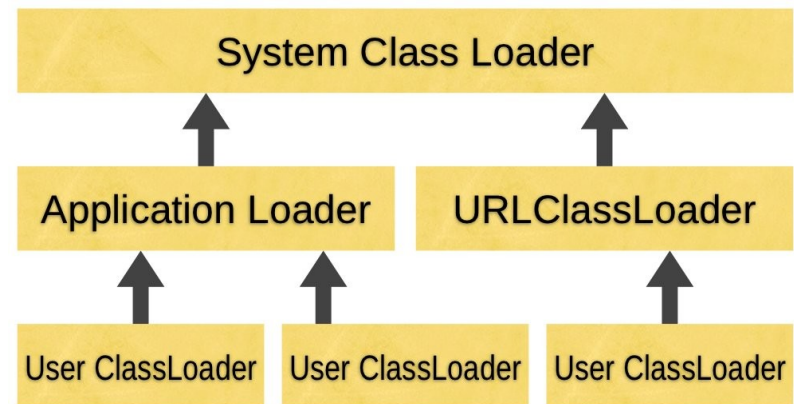
Modularity

- Classloading
 - Share common classes
 - Isolation (public vs. private)
- Extensibility
 - Don't duplicate .jars
 - Only load needed classes

Modular Classloading (I)

Standard Java Model

- hierarchical classloading model a.k.a. “parent-child delegation”
- Lead to monolithic, class loaders containing everything
- “big ball of mud”



Modular classloading (II)

- Peer to peer classloading model
- **Every module is isolated from every other module**
- **Explicit** inter-module dependencies
- Not a container like OSGI, more like a thin bootstrap wrapper

module.xml

```
<module xmlns="urn:jboss:module:1.0" name="example.featureX">
  <main-class name="example.featureX.Main" />
  <resources>
    <resource-root path="featureX.jar" />
  </resources>
  <dependencies>
    <module name="example.featureX.api" export="true"/>
    <module name="javax.api"/>
    <module name="org.jboss.logging"/>
  </dependencies>
</module>
```

User oriented configuration

- **Separation** of configuration, binaries and wiring
- **Centralized** in a few files
- **Unification** of common configuration
 - socket-bindings, paths, system-properties

Simplified configuration

```
<bean name="TransactionManager"
class="com.arjuna.ats.jbossatx.jta.TransactionManagerService">
  <annotation>@org.jboss.aop.microcontainer.aspects.jmx.JMX
(name="jboss:service=TransactionManager",
exposedInterface=com.arjuna.ats.jbossatx.jta.TransactionManagerServiceMBean.class,
registerDirectly=true)</annotation>
  <annotation>@org.jboss.managed.api.annotation.ManagementObject
(name="TransactionManager", componentType=@org.jboss.managed.api.annotation.ManagementComponent(type = "MBean", subtype =
"JTA"), targetInterface=com.arjuna.ats.jbossatx.jta.TransactionManagerServiceMBean.class)
  </annotation>

  <property name="transactionTimeout">300</property>
  <property name="objectStoreDir">${jboss.server.data.dir}/tx-object-store</property>
```

```
<subsystem xmlns="urn:jboss:domain:transactions:1.0">
  <recovery-environment socket-binding="txn-recovery-environment"
    status-socket-binding="txn-status-manager"/>
  <core-environment socket-binding="txn-socket-process-id"/>
</subsystem>
```

Two Operational Modes (I)

- **Standalone**
 - “traditional” single JVM server
 - Management facilities IN-VM
 - Configuration via standalone.xml
- **Managed Domain**



Standalone.xml (I)

```
<server xmlns="urn:jboss:domain:1.1">
  ....
  <interfaces>
    <interface name="public">
      <inet-address value="192.168.0.1" />
    </interface>
  </interfaces>
  <socket-binding-group default-interface="public">
    <socket-binding name="http" port="8080" />
  </socket-binding-group>
</server>
```


Standalone.xml (II)

```
<server xmlns="urn:jboss:domain:1.1">
  <extensions />
  <profile >
    <subsystem ... />
  </profile>

  <interfaces />
  <paths />
  <socket-binding-group />
  <system-properties />
  <deployments />
</server>
```



Extensions

- **Load additional capabilities** into the AS
 - Separate from deployment
 - Reference a module
 - Declared as part of the configuration

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

Subsystems

- **THE** extensibility point for AS
 - Registers all required services and deployers
 - Defines management model and operations
 - Provides a specific xml configuration schema

Subsystems (II)

```
<extension module="org.jboss.as.web" />
...
<subsystem xmlns="urn:jboss:domain:web:1.0">
    <connector name="http" protocol="HTTP/1.1"
                socket-binding="http" />
    <virtual-server name="example" >
        <alias name="example.com" />
    </virtual-server>
</subsystem>
```

Profile

- Collection of functionality / capabilities a server or group of servers runs
 - Single profile for standalone
 - Multiple profiles in domain
 - web, messaging, datagrid, EE

Two Operational Modes (II)

- **Managed Domain**
 - Manage **heterogeneous** multi-server environments
 - from a single point
 - Multiple servers **managed as a group**

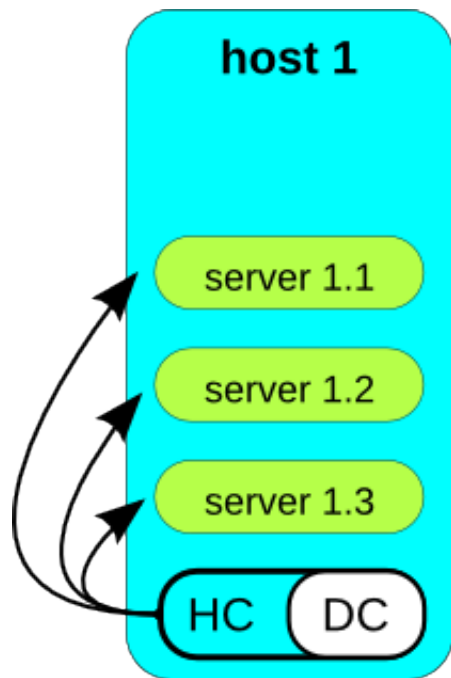
Managed Domain Terms

- Domain
- (Master) DomainController
- HostController
- Server
- ServerGroup
- Cluster

Domain Configuration

- **domain.xml**
 - Primary domain configuration
 - Represents the current state
- **host.xml**
 - Environment / Host specific configuration

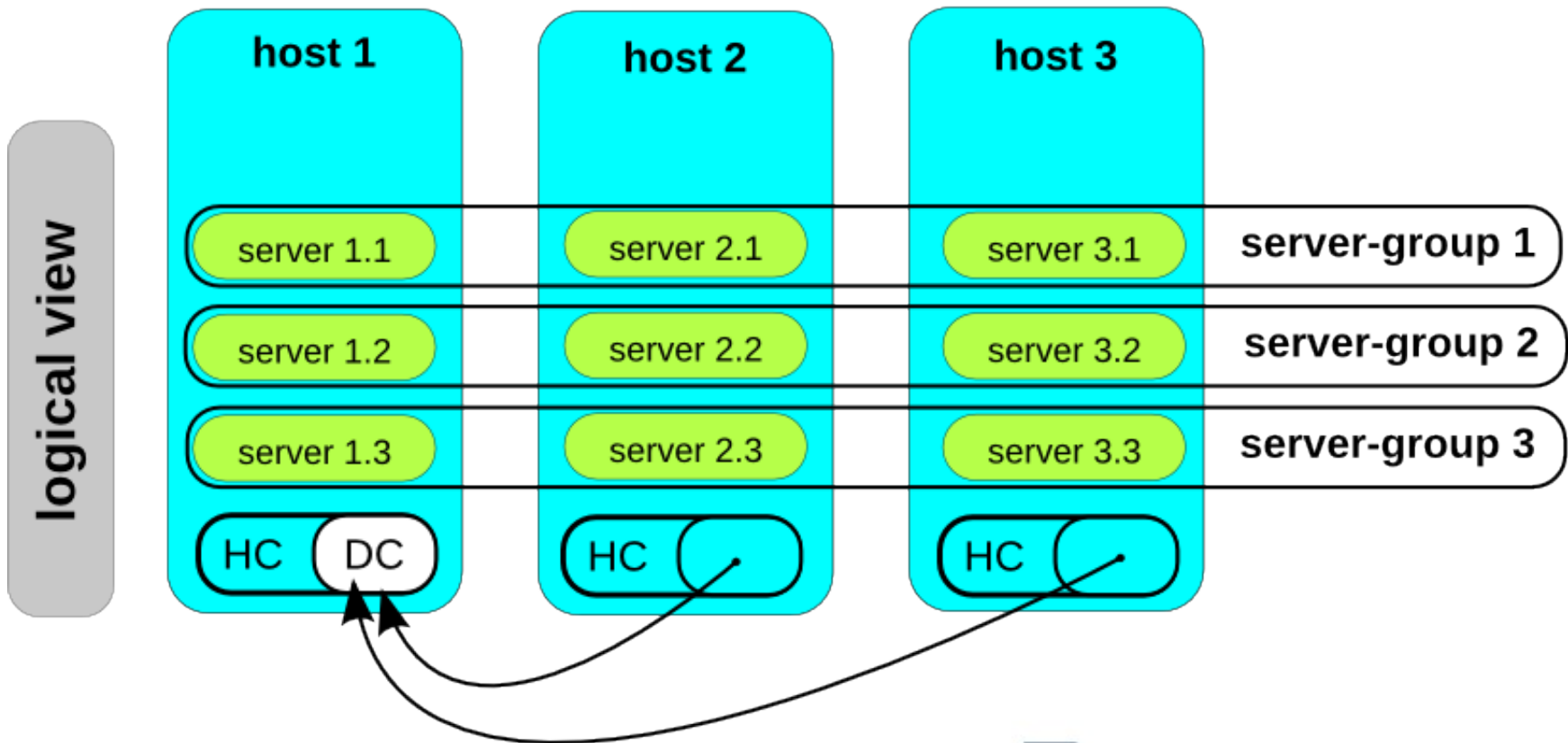
Managed Domain (II)



- Servers defined **per host**
- Managed by the HostController
- **Retrieves configuration** from the domain

Managed Domain (III)

physical topology



Management API

- Based on a **detyper** model
 - Everything is described as a simple type

```
"connector" => {  
  "http" => {  
    "enabled" => true,  
    "protocol" => "HTTP/1.1",  
    "scheme" => "http",  
    "secure" => false,  
    "socket-binding" => "http"  }}  
}
```

Management API (II)

- Stable and complete API
 - Configuration and runtime view
- Interaction with the model only through **management operations**
- Supports multiple clients
 - CLI, HTTP, Java API, Console

Demos

- Manage a standalone server via CLI
- Domain management with the web console

Current state

- **AS 7.0.2** (Sep 2011)
 - New Architecture
 - Domain & Standalone
 - EE 6 web profile certified

Current State (II)

- **AS 7.0.2**
 - Separate “everything” distribution
 - All of the above
 - Contains EE6 full profile work in progress
 - Not certified

Current state (III)

- Hibernate (3 & 4)
- Infinispan
- JGroups
- HornetQ
- OSGI
- JBoss transactions
- Apache CFX
- RESTEasy
- JBoss Web
- Mod_cluster
- Weld
- Mojarra
- ...

Roadmap

- **AS 7.1** (Dec 2011)
 - Full EE 6 profile
 - Additional management operations
 - Graceful shutdown
- **EAP 6.0** (Q1 2012)
 - Fully supported, certified Application platform

Resources

- Documentation

- <http://www.jboss.org/as7>
- <https://docs.jboss.org/author/display/AS7/Documentation>

- Download

- <http://www.jboss.org/jbossas/downloads>

- Issue tracker

- <https://issues.jboss.org/browse/AS7>

- User forums

- http://community.jboss.org/community/jbossas/as7_users

Q&A