



# JBoss EAP 6 설치 및 운영 가이드

Red Hat Korea  
Red Hat Consulting

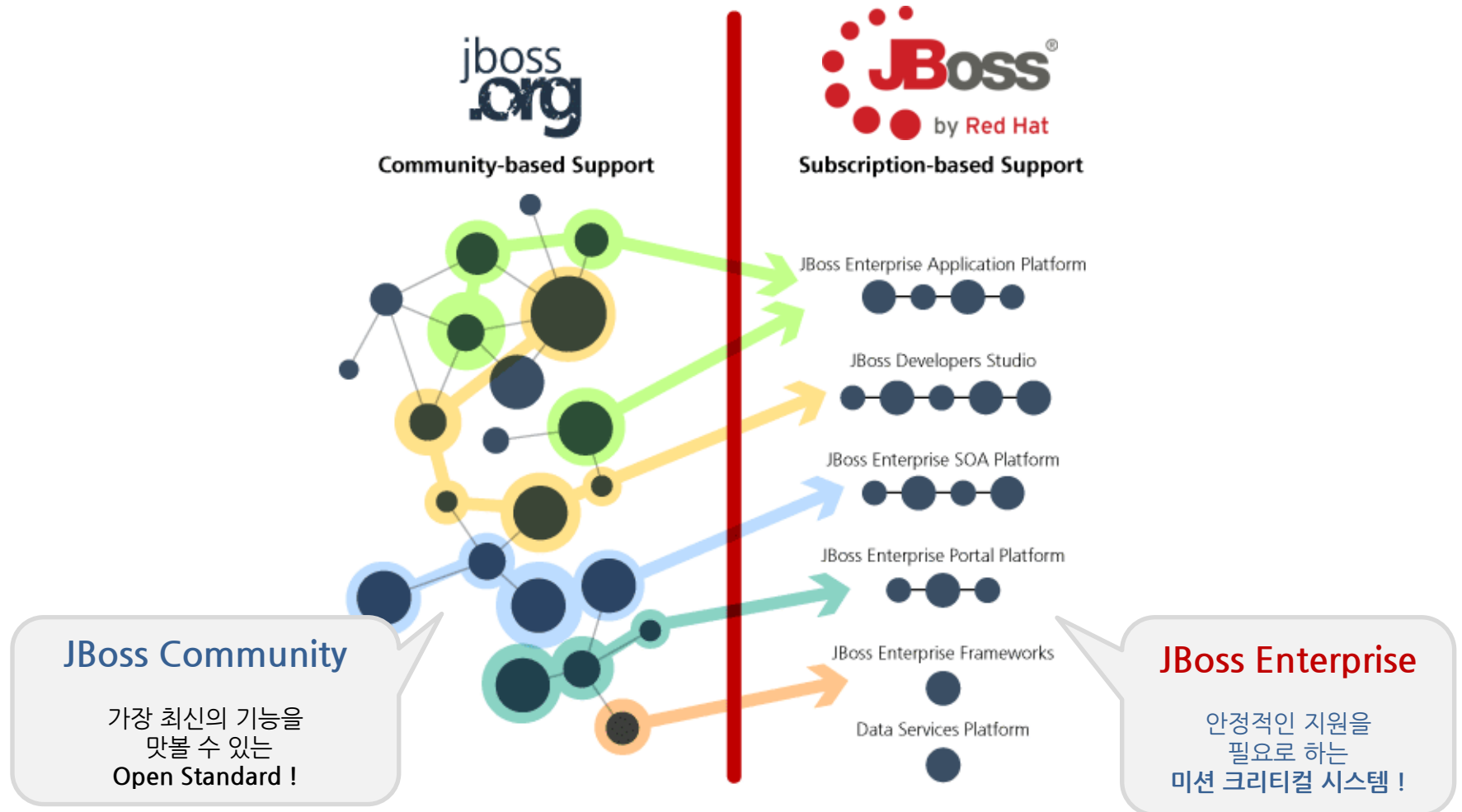
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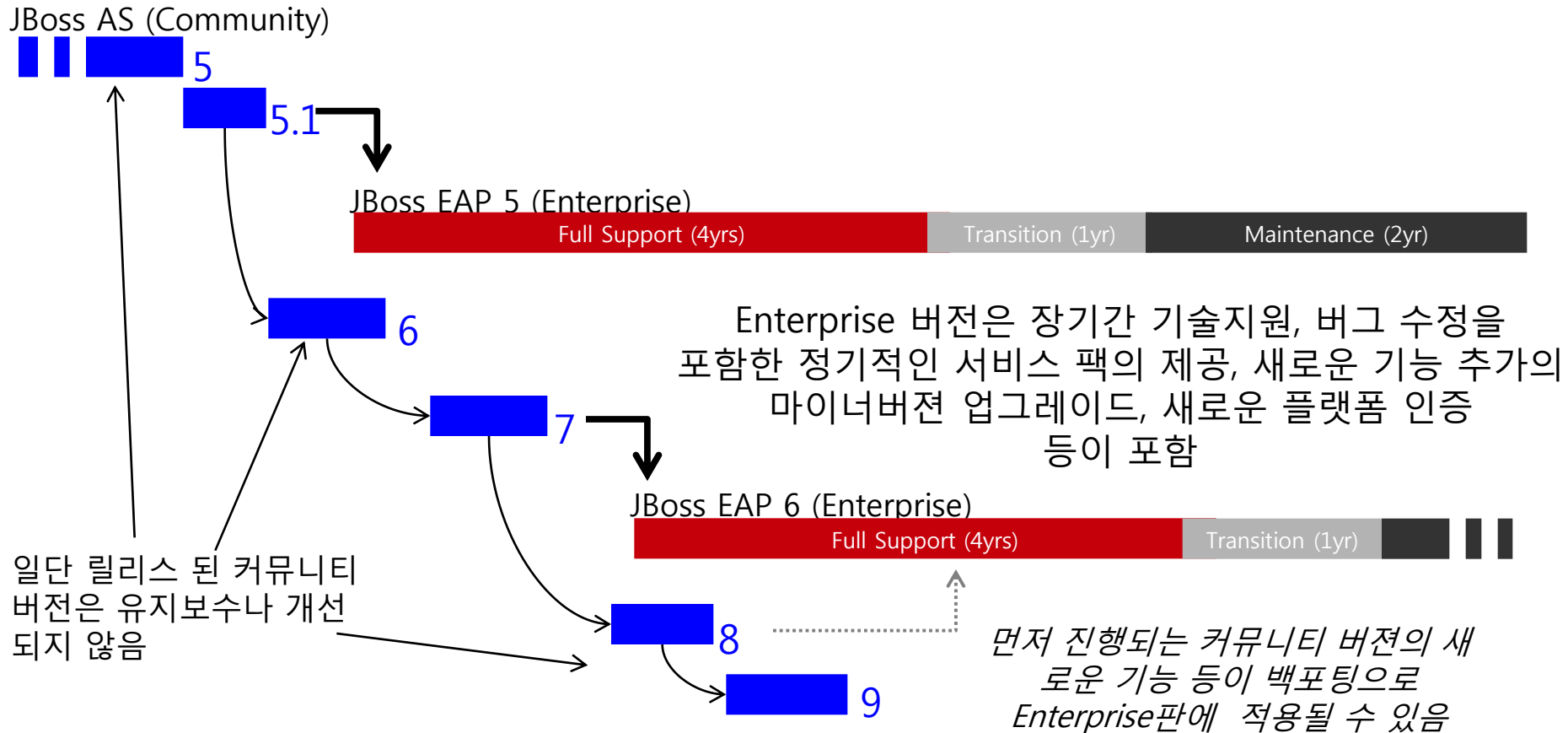


커뮤니티 vs. EAP 버전

# JBoss 제품화 과정

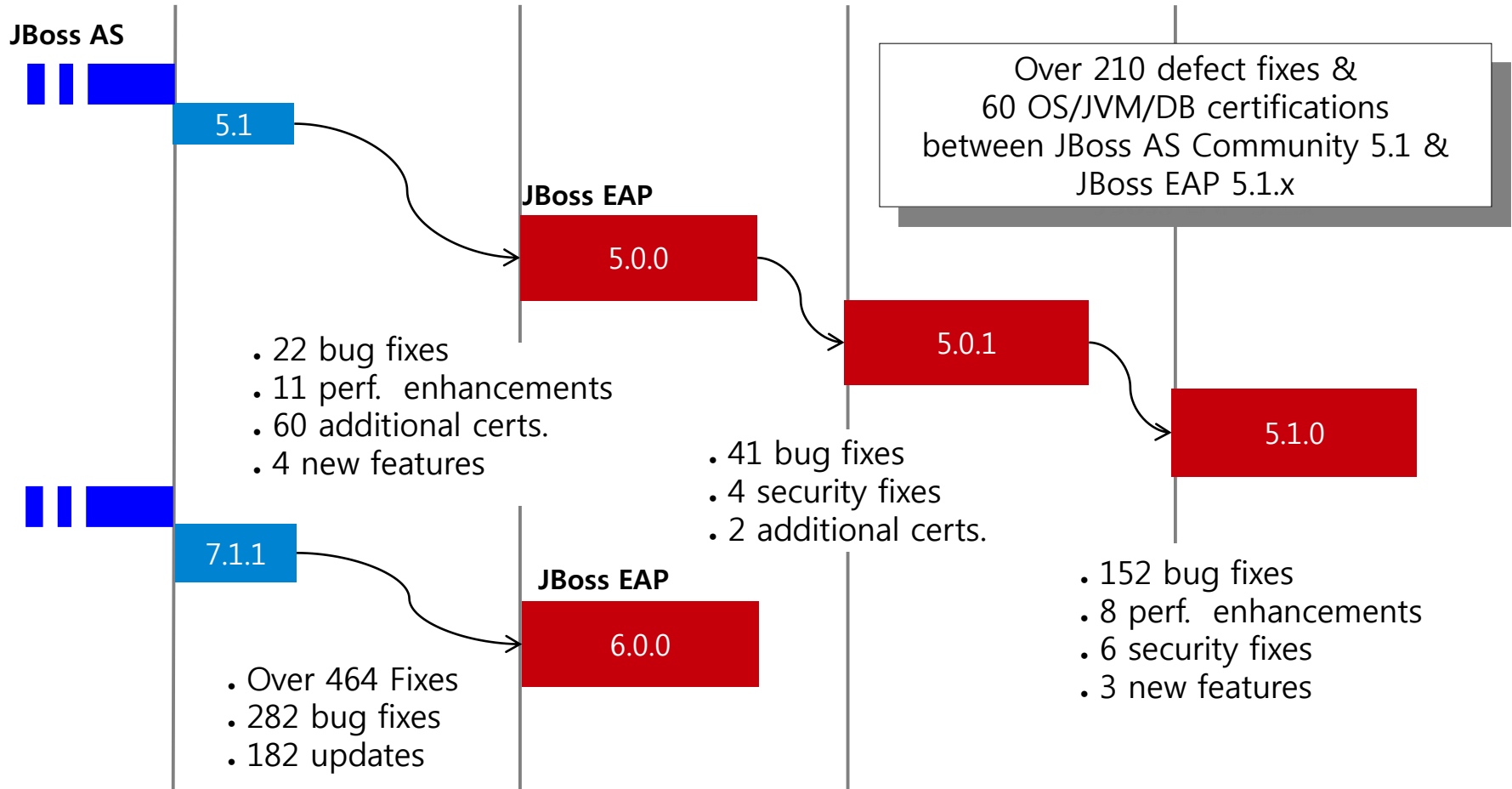


# Community과 Enterprise 버전의 관계



커뮤니티 프로젝트는 최신 기술의 구현을 중심으로 개발되며,  
Enterprise Middleware 는 장기간 기술지원과 안정성을 중시

# JBoss 커뮤니티와 엔터프라이즈 버전의 차이점



**Enterprise Platforms - Performance, Scalability, Security and Quality**

improve over time without compromising long-term compatibility.

# JBoss 다운로드



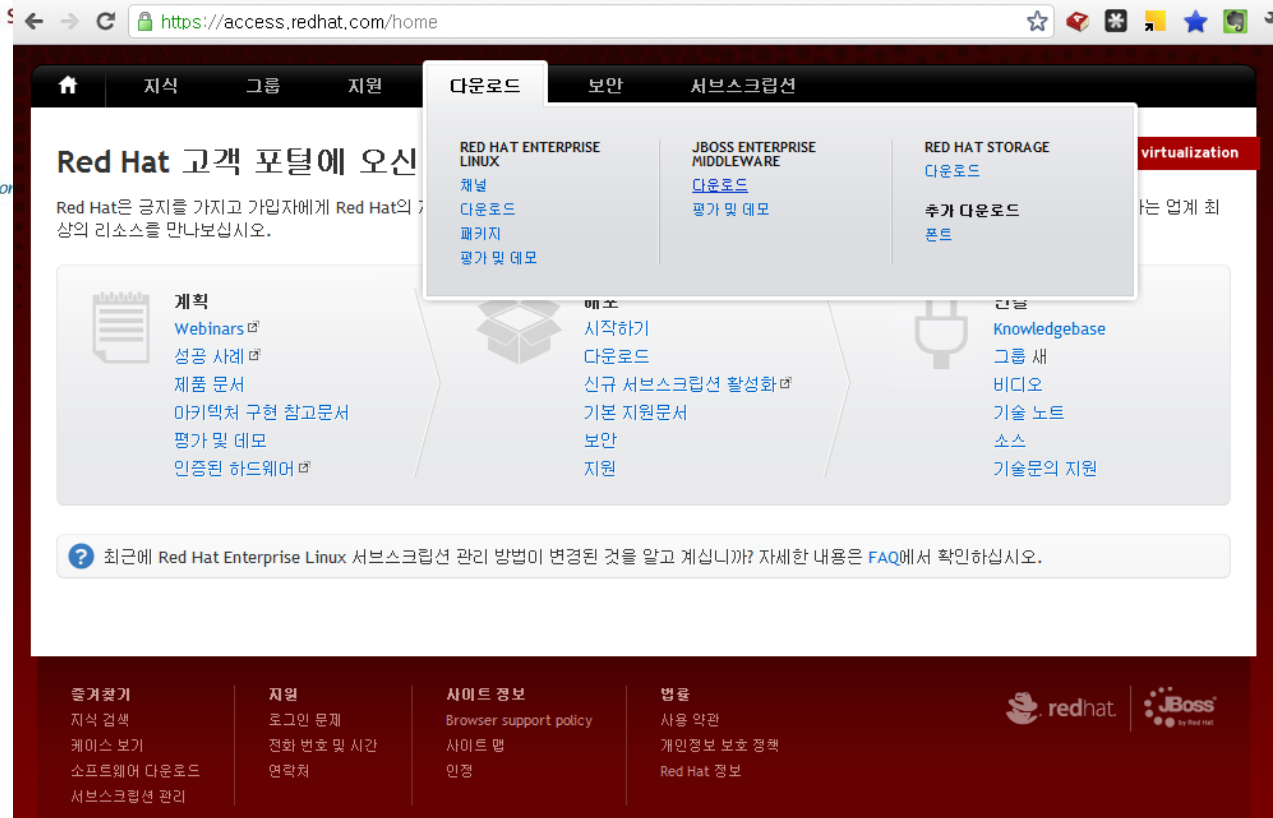
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- Easily Testable
- First class, modern components

 Unparalleled Speed



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최근에 Red Hat Enterprise Linux 서브스크립션 관리 방법이 변경된 것을 알고 계십니까? 자세한 내용은 FAQ에서 확인하십시오.

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법률  
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개인정보 보호 정책  
Red Hat 정보


redhat. JBoss by Red Hat



# JBoss 다운로드


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## Software Downloads

Product: 
Version:

[Releases \(42\)](#)
[Patches \(5\)](#)
[Security Advisories \(0\)](#)

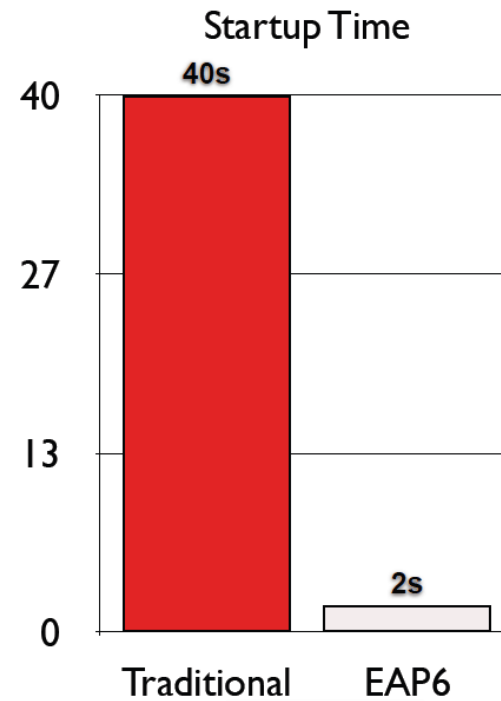
Download File	Release Date	
Application Platform 6.0.0 Apache HTTP Server for Windows Server 2008 x86_64	06/12/2012 09:08 오전 EDT	<a href="#">Download</a>
Application Platform 6.0.0 Apache HTTP Server for Windows Server 2008 i386	06/12/2012 09:08 오전 EDT	<a href="#">Download</a>
Application Platform 6.0.0 Apache HTTP Server for Solaris 10 & 11 SPARC64	06/12/2012 09:08 오전 EDT	<a href="#">Download</a>
Application Platform 6.0.0 Apache HTTP Server for Solaris 10 & 11 x86_64	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
Application Platform 6.0.0 Apache HTTP Server for Solaris 10 & 11 i386	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
Application Platform 6.0.0 Apache HTTP Server for RHEL 6 x86_64	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
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Application Platform 6.0.0 Apache HTTP Server for RHEL 5 x86_64	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
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Application Platform 6.0.0 Native Components for Windows Server 2008 x86_64	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
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Application Platform 6.0.0 Native Components for Solaris 10 & 11 SPARC64	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
Application Platform 6.0.0 Native Components for Solaris 10 & 11 x86_64	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
Application Platform 6.0.0 Native Components for Solaris 10 & 11 i386	06/12/2012 09:07 오전 EDT	<a href="#">Download</a>
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# 제품별 JEE 버전과 Java 버전

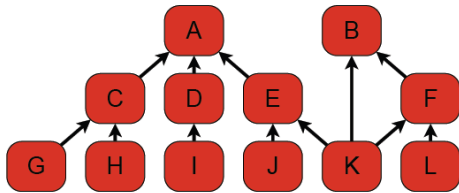
Technology/Specification	JBoss EAP 6	JBoss EAP 5.1	JBoss EAP 4.3
Java EE[JSR-151,244,316]	6.0	5.0	1.4
Java API for XML-based RPC (JAX-RPC) [JSR-101]	1.1	1.1	1.1
SOAP with Attachments API for Java (SAAJ) [JSR-067]	1.3	1.3	1.3
Java Servlet [JSR-154, 315]	3.0	2.5	2.4
JavaServer Faces (JSF) [JSR-252, 314]	2.0	1.2	1.2
JavaServer Pages & Expression Language (JSP) [JSR-245]	2.2	2.1	2.1
Java Transaction API (JTA) [JSR-907]	1.1	1.1	1.0
Java Authorization Contract for Containers (JACC) [JSR-115]	1.3	1.1	1.0
Enterprise JavaBeans with Interceptors 1.1 (EJB) [JSR-153, 220, 318]	3.1	2.1, 3.0	2.1, 3.0
Java EE Connector Architecture [JSR-112, 322]	1.6	1.5	1.5
J2EE Management [JSR-077]	1.1	1.0	1.0
Enterprise Web Services [JSR-109]	1.3	1.2	1.1
Java EE Application Deployment [JSR-088]	1.2	1.2	1.1
JavaMail [JSR-919 ]	1.4	1.4	1.4
Java Message Service (JMS) [JSR-914]	1.1	1.1	1.1
Java Persistence (JPA) [JSR-220, 317]	2.0	1.0	1.0
Web Services Metadata for the Java Platform [JSR-181]	2.0	2.0	2.0
Java API for XML Web Services (JAX-WS) [JSR-224]	2.2	2.1	2.0
Debugging Support for Other Languages [JSR-045]	1.0	1.0	-
Standard Tag Library for JavaServer Pages (JSTL) [JSR-052]	1.2	1.2	1.2
Common Annotations for the Java Platform [JSR-250]	1.1	1.0	1.0
Java Architecture for XML Binding (JAXB) [JSR-222]	2.2	2.0	2.0
Java API for RESTful Web Services (JAX-RS) [JSR-311]	1.1	1.0	-
Java API for XML Registries (JAXR) [JSR-093]	1.0	1.0	1.0
Contexts and Dependency Injection for Java (CDI) [JSR-299]	1.0	-	-
Bean Validation [JSR-303]	1.0	-	-

# JBoss EAP 6 성능



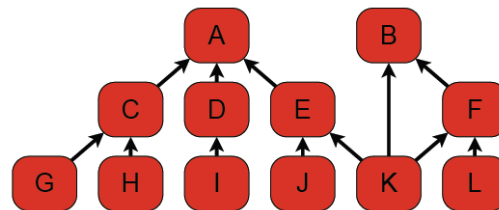
# 성능 개선 - Concurrent DAG

## Serial DAG Execution (Traditional Approach)



CPU Core	CPU Core	CPU Core	CPU Core
A	Zzz	Zzz	Zzz
B	Zzz	Zzz	Zzz
C	Zzz	Zzz	Zzz
D	Zzz	Zzz	Zzz
E	Zzz	Zzz	Zzz
F	Zzz	Zzz	Zzz
G	Zzz	Zzz	Zzz
H	Zzz	Zzz	Zzz
I	Zzz	Zzz	Zzz
J	Zzz	Zzz	Zzz

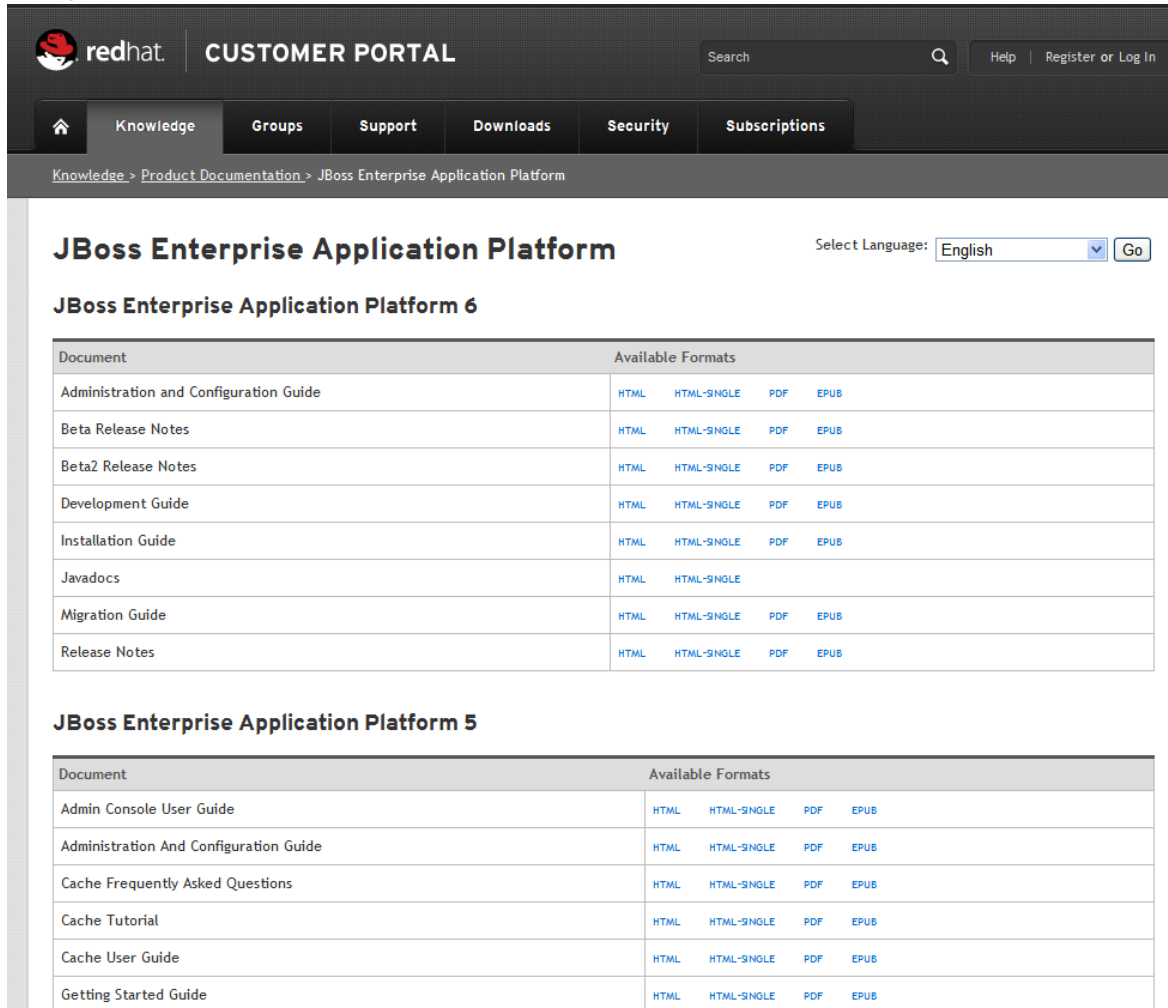
## Concurrent DAG Execution (MSC / EAP Approach)



CPU Core	CPU Core	CPU Core	CPU Core
A	B	Zzz	Zzz
C	D	E	F
G	H	I	J
K	L	Zzz	Zzz

# 제품 문서

- <http://docs.redhat.com>



The screenshot shows the Red Hat Customer Portal interface. At the top, there's a navigation bar with the Red Hat logo, "CUSTOMER PORTAL", a search bar, and links for "Help", "Register or Log In". Below this is a secondary navigation bar with tabs: "Knowledge", "Groups", "Support", "Downloads", "Security", and "Subscriptions". The "Knowledge" tab is selected, leading to a breadcrumb trail: "Knowledge > Product Documentation > JBoss Enterprise Application Platform".

The main content area is titled "JBoss Enterprise Application Platform". To the right of the title is a "Select Language:" dropdown menu set to "English" with a "Go" button. Below the title is a section for "JBoss Enterprise Application Platform 6".

Document	Available Formats
Administration and Configuration Guide	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Beta Release Notes	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Beta2 Release Notes	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Development Guide	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Installation Guide	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Javadocs	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a>
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Release Notes	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>

Below this is a section for "JBoss Enterprise Application Platform 5".

Document	Available Formats
Admin Console User Guide	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Administration And Configuration Guide	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Cache Frequently Asked Questions	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Cache Tutorial	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Cache User Guide	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>
Getting Started Guide	<a href="#">HTML</a> <a href="#">HTML-SINGLE</a> <a href="#">PDF</a> <a href="#">EPUB</a>

제품 설치



# JBoss 설치

- JBoss 설치 방법
  - 1. 압축파일(zip)을 푼다
  - 2. JAVA\_HOME 환경 변수를 설정한다
  - 3. cd jboss-eap-6.0/bin
  - 4. Run! (standalone.sh / domain.sh)

# 주요 디렉토리 구조

## ■ 설치된 주요 디렉토리

### WAS 서버 디렉토리

- /svc/test test 서비스의 메인 디렉토리
- /was/jboss-eap-6.0/jboss-as JBoss WAS가 설치된 디렉토리
- /domains WAS 인스턴스가 위치할 디렉토리

### WEB서버 디렉토리

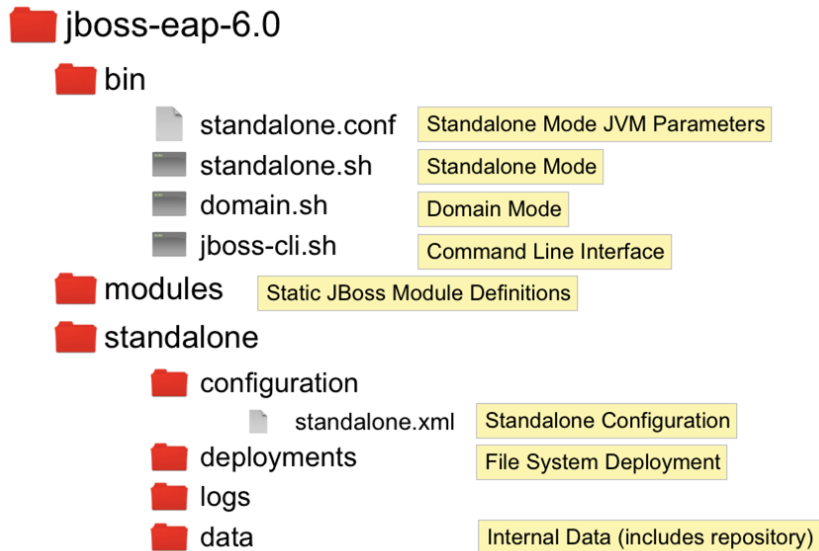
- /etc/httpd
- 아파치 웹서버가 설치된 디렉토리



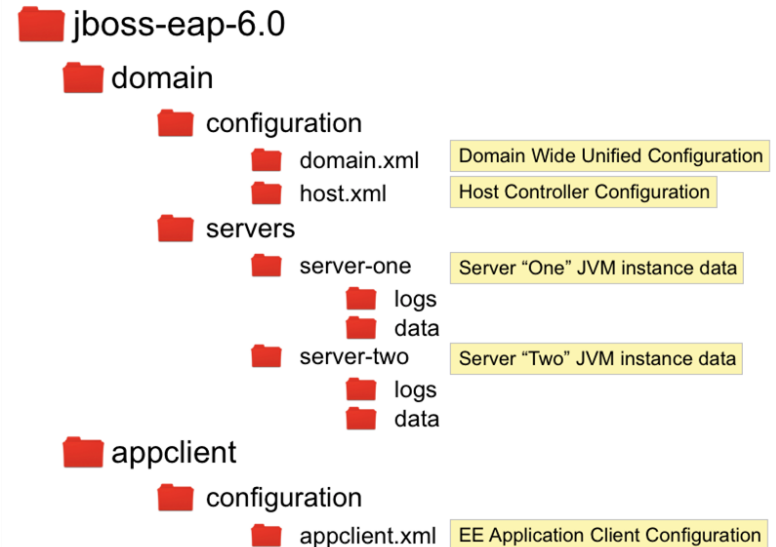
# JBoss의 주요 디렉토리 구조

■ /svc/test/was/jboss-eap-6.0

## File Layout



## File Layout (Cont)



# JBoss의 도메인 디렉토리 구조

- /svc/test/was/domains/**standalone1** → 서버 인스턴스 명

## JBoss 도메인 디렉토리

- **\*.sh**                      해당 JBoss 인스턴스 실행, 중지, 강제종료, 로그 보기, 스레드 덤프 생성 등 인스턴스를 운영하기 위해 필요한 스크립트들이 보관되어 있다.
- **configuration**              JBoss의 메인 설정 파일이 보관되어 있는 디렉토리이다.
- **data**                      JBoss 실행시 생성되는 파일들이 보관되는 디렉토리이다.
- **deployment**              JBoss에 배포할 애플리케이션을 놓을 위치이다.
- **lib**                      해당 인스턴스가 사용하게 될 Library 파일들이 보관되어 있다.
- **log**                      JBoss의 내부 로그 파일이 여기에 보관된다. 'server.log' 로그가 생성된다.
- **nohup**                      서버를 다시 띄울 때 nohup로그를 move하여 이 디렉토리에 보관한다.

# JBoss 인스턴스 관리자 설정

## ■ \$SERVER\_HOME/add-user.sh

```
[jjeon@jjeon-t520 standalone1]$ ./add-user.sh
```

```
JBoss_HOME=/home/jjeon/jboss/eap/jboss-eap-6.0
DOMAIN_BASE=/home/jjeon/jboss/eap/domains.600
SERVER_NAME=standalone1
CONFIG_FILE=standalone-ha.xml
BIND_ADDR=10.64.160.197
PORT_OFFSET=0
MULTICAST_ADDR=230.1.0.1
CONTROLLER=127.0.0.1:9999
```

What type of user do you wish to add?

- a) Management User (mgmt-users.properties)
- b) Application User (application-users.properties)

(a):

Enter the details of the new user to add.

Realm (ManagementRealm) :

Username : admin

Password :

Re-enter Password :

The username 'admin' is easy to guess

Are you sure you want to add user 'admin' yes/no? yes

About to add user 'admin' for realm 'ManagementRealm'

Is this correct yes/no? yes

Added user 'admin' to file '/home/jjeon/jboss/eap/domains.600/standalone1/configuration/mgmt-users.properties'

Added user 'admin' to file '/home/jjeon/jboss/eap/jboss-eap-6.0/domain/configuration/mgmt-users.properties'

Is this new user going to be used for one AS process to connect to another AS process e.g. slave domain controller?  
yes/no? yes

To represent the user add the following to the server-identities definition <secret value="cXdlcjA50Dc=" />

## 2개의 운영 모드

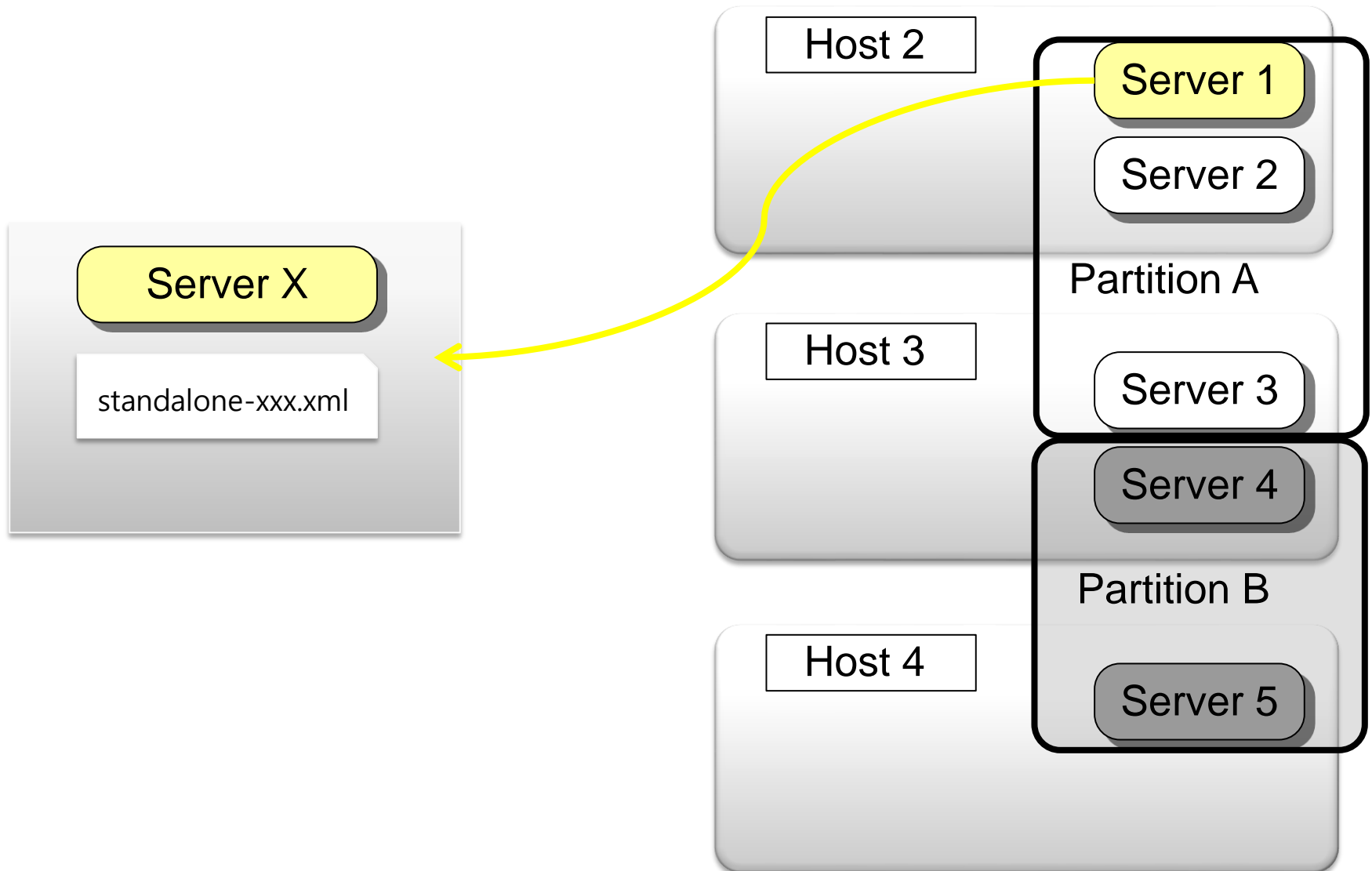
### ■ Standalone Mode

- 이전 버전 JBoss와 같은 단일 JVM 서버로 구성
- 관리 기능이 IN-VM에 있음
- Lifecycle 관리가 없음(shutdown만 가능)

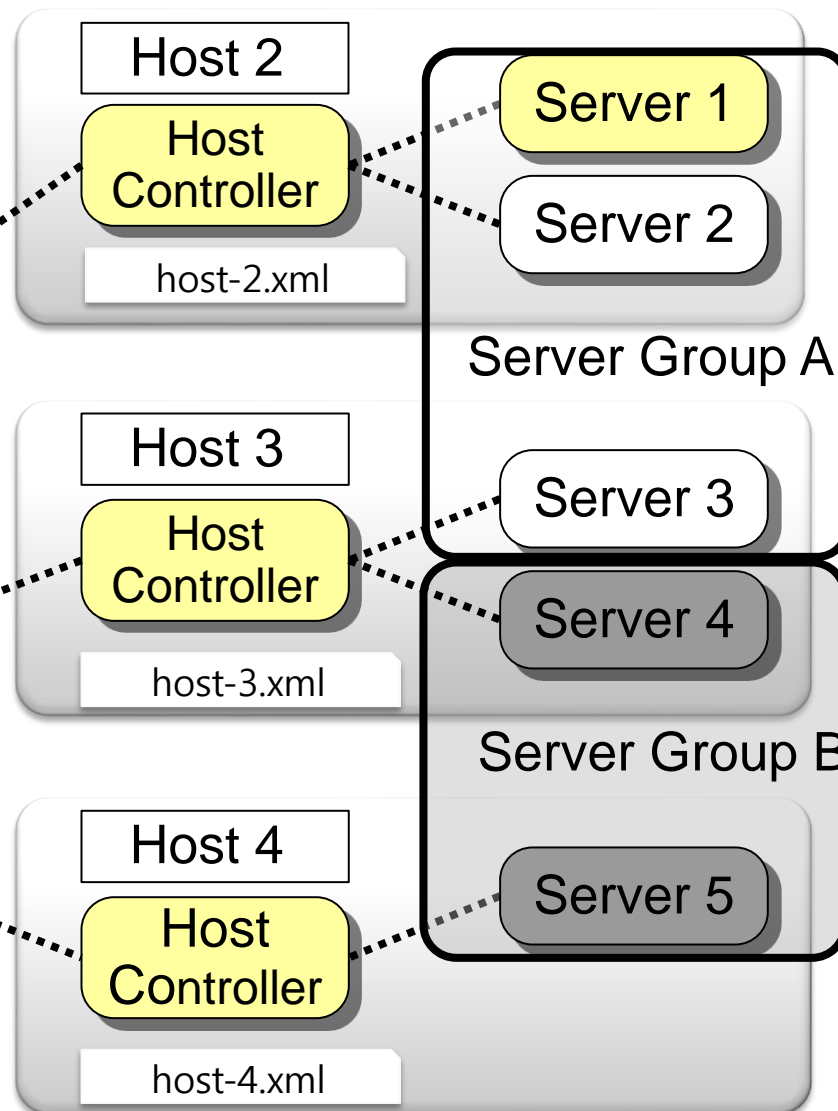
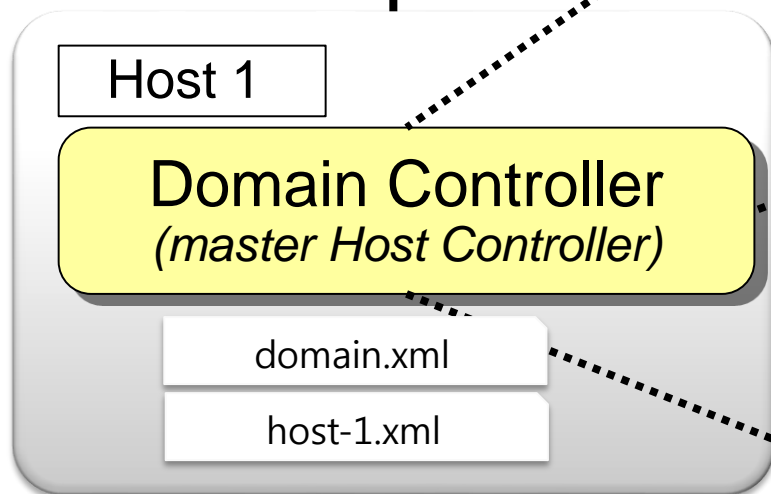
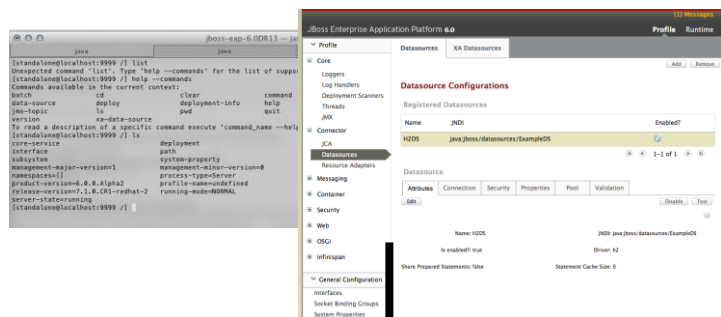
### ■ Domain Mode

- Multi-JVM, multi-server 모델
- 도메인 컨트롤러로 관리함
- 호스트에 여러 서버 인스턴스(JVM) 사용
- 프로세스 컨트롤러로 Full lifecycle 관리

# Standalone Mode



# Domain Mode



관리 스크립트





# 관리를 위한 스크립트(standalone)

## ■ env.sh

```
#!/bin/sh

DATE=`date +%Y%m%d%H%M%S`

##### JBOSS Directory Setup #####
export JBOSS_HOME=/home/jjeon/jboss/eap/jboss-eap-6.0
export DOMAIN_BASE=/home/jjeon/jboss/eap/domains.600
export SERVER_NAME=standalone1

##### Configuration File #####
#export CONFIG_FILE=standalone-full-ha.xml
export CONFIG_FILE=standalone-ha.xml

export HOST_NAME=master
export NODE_NAME=$SERVER_NAME
export PORT_OFFSET=0

export JBOSS_USER=jjeon

##### Bind Address #####
export BIND_ADDR=10.64.160.197

export MULTICAST_ADDR=230.1.0.1
export JMS_MULTICAST_ADDR=231.7.0.1
export MODCLUSTER_MULTICAST_ADDR=224.0.1.105

export MGMT_ADDR=127.0.0.1

...중략...
#export JAVA_OPTS=" $JAVA_OPTS -verbose:gc"
export JAVA_OPTS=" $JAVA_OPTS -Djava.net.preferIPv4Stack=true"
export JAVA_OPTS=" $JAVA_OPTS -Djboss.socket.binding.port-offset=$PORT_OFFSET"
export JAVA_OPTS=" $JAVA_OPTS -Djboss.node.name=$NODE_NAME"
export JAVA_OPTS=" $JAVA_OPTS -Djboss.bind.address.management=$MGMT_ADDR "
...중략...
```

# 관리를 위한 스크립트(standalone)

## ■ start.sh

```
#!/bin/sh

DATE=`date +%Y%m%d%H%M%S`

. ./env.sh

PID=`ps -ef | grep java | grep "$SERVER_NAME " | awk '{print $2}'`
echo $PID

if [ e$PID != "e" ]
then
    echo "JBoss SERVER - $SERVER_NAME is already RUNNING..."
    exit;
fi

UNAME=`id -u -n`
if [ e$UNAME != "e$JBOSS_USER" ]
then
    echo "Use $JBOSS_USER account to start JBoss SERVER - $SERVER_NAME..."
    exit;
fi

echo $JAVA_OPTS
if [ ! -d "./nohup" ];
then
    mkdir nohup
fi

mv $SERVER_NAME.out ./nohup/$SERVER_NAME.out.$DATE

nohup $JBOSS_HOME/bin/standalone.sh -Dserver=$SERVER_NAME -P=$DOMAIN_BASE/$SERVER_NAME/env.properties -c $CONFIG_FILE >> $SERVER_NAME.out &

if [ e$1 = "enotail" ]
then
    echo "Starting... $SERVER_NAME"
    exit;
fi
```

## 관리를 위한 alias 설정

- 손쉬운 관리를 위하여 Shell에 alias가 설정되어 있다
  - \$ dom [enter] 와 같이 alias만 입력하면 된다.
- jboss user에 대한 alias
  - **dom**                    'cd /svc/test/was/domains'  
JBoss 도메인 디렉토리로 이동
  - **s1~s4**                'cd /svc/tes/was/domains/\${serverName}'  
서비스용 JBoss 인스턴스가 있는 디렉토리로 이동  
각 장비의 첫 번째 부터 4번째 인스턴스까지 이동하는 alias

# JBoss 운영 방법

- **jboss** user로 로그인 한다.( root에서 'su - jboss' )

- 해당 인스턴스로 이동한다.

```
$ s1 (혹은 s1~s4)
```

- 인스턴스를 구동

```
$ ./start.sh (해당 인스턴스 디렉토리에서)
```

- 인스턴스를 정상 종료

```
$ ./stop.sh (해당 인스턴스 디렉토리에서)
```

- 인스턴스를 강제 종료

```
$ ./kill.sh
```

- 인스턴스가 수행중 인지 체크

```
$ ./status.sh
```

- 인스턴스의 nohup로그 tail로 출력

```
$ ./tail.sh
```

- 인스턴스의 Thread Dump출력

```
$ ./dump.sh
```

# JBoss 인스턴스 시작하기

## ■ \$SERVER\_HOME/start.sh

```
[jjeon@jjeon-t520 standalone1]$ ./start.sh
```

```
JBoss_HOME=/home/jjeon/jboss/eap/jboss-eap-6.0
DOMAIN_BASE=/home/jjeon/jboss/eap/domains.600
SERVER_NAME=standalone1
CONFIG_FILE=standalone-ha.xml
BIND_ADDR=10.64.160.197
PORT_OFFSET=0
MULTICAST_ADDR=230.1.0.1
CONTROLLER=127.0.0.1:9999
```

```
-server -Xms64m -Xmx512m -XX:MaxPermSize=256m -XX:+PrintGCTimeStamps -XX:+PrintGCDetails -
Xloggc:log/gc_20120911194437.log -XX:+UseParallelGC -XX:+ExplicitGCInvokesConcurrent -XX:-
HeapDumpOnOutOfMemoryError -Djava.net.preferIPv4Stack=true -Dorg.jboss.resolver.warning=true -
Dsun.rmi.dgc.client.gcInterval=3600000 -Dsun.rmi.dgc.server.gcInterval=3600000 -
Djboss.modules.system.pkgs=org.jboss.byteman -Djava.awt.headless=true -
Djboss.server.base.dir=/home/jjeon/jboss/eap/domains.600/standalone1 -Djboss.socket.binding.port-offset=0 -
Djboss.node.name=standalone1 -Djboss.bind.address.management=127.0.0.1 -Djboss.bind.address=10.64.160.197 -
Djboss.default.multicast.address=230.1.0.1 -Djboss.messaging.group.address=231.7.0.1 -
Djboss.modcluster.multicast.address=224.0.1.105 -Dserver.mode=local
... 생략 ...
19:44:40,745 INFO [org.jboss.as.clustering] (MSC service thread 1-3) JBAS010238: Number of cluster members: 2
19:44:40,840 INFO [org.jboss.web] (MSC service thread 1-6) JBAS018210: Registering web context: /session
19:44:40,857 INFO [org.jboss.as.server] (Controller Boot Thread) JBAS018559: Deployed "session.war"
19:44:40,974 INFO [org.jboss.as] (Controller Boot Thread) JBAS015951: Admin console listening on
http://127.0.0.1:9990
19:44:40,975 INFO [org.jboss.as] (Controller Boot Thread) JBAS015874: JBoss EAP 6.0.0.GA (AS 7.1.2.Final-
redhat-1) started in 2984ms - Started 176 of 321 services (144 services are passive or on-demand)
```

# 인스턴스의 포트 구성

- 각 서버의 인스턴스 별로 아래와 같은 주요 포트가 할당되어 있다.

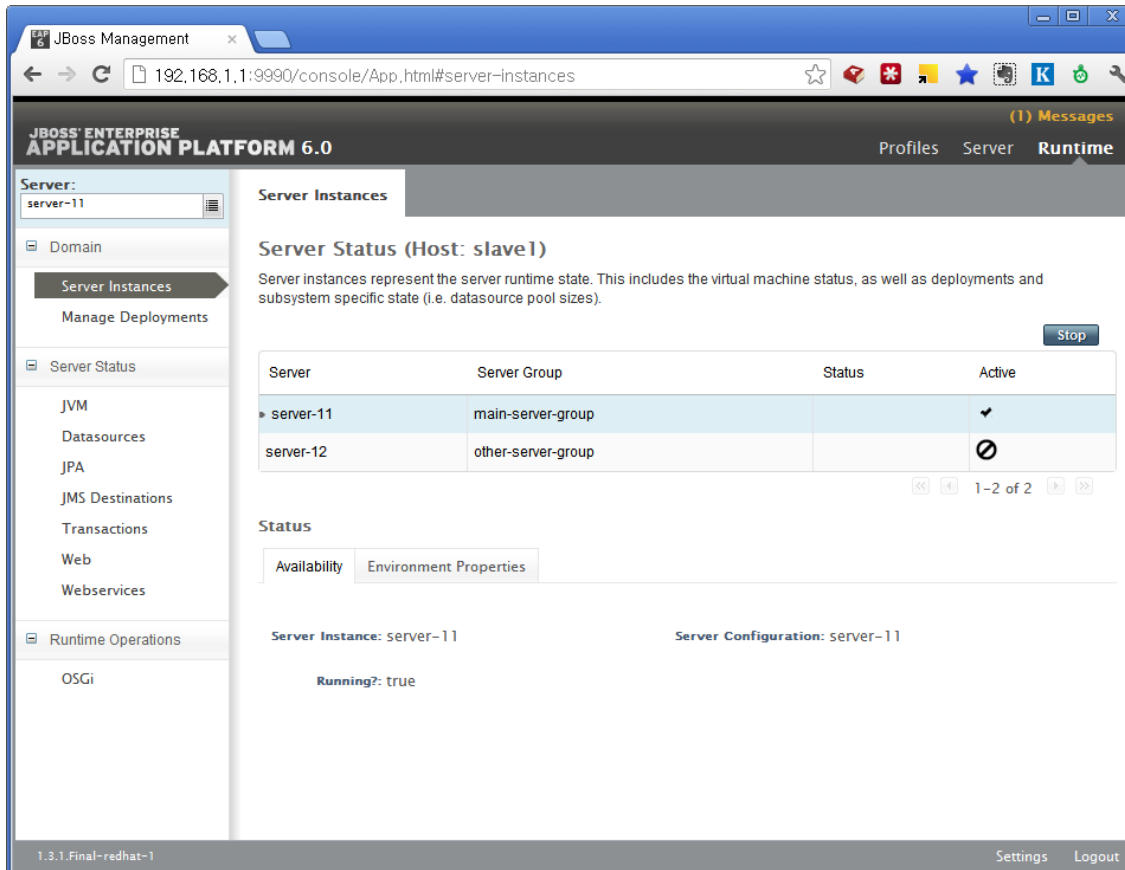
Alias	Port Offset	Console	Native Mgmt.	HTTP Port	AJP13 Port
<b>s0</b>	<b>0</b>	9990	9999	8080	8009
<b>s1</b>	<b>100</b>	10090	10099	8180	8109
<b>s2</b>	<b>200</b>	10190	10199	8280	8209
<b>s3</b>	<b>300</b>	10290	10299	8380	8309

- HTTP 포트는 사용자가 브라우저를 이용하여 직접 해당 인스턴스로 접속할 수 있는 포트
- AJP13포트는 사용자가 Apache를 통해서 접속될 때 사용되는 포트
- env.sh 파일에서 아래 부분을 설정하면 포트가 변경됨

```
export PORT_OFFSET=0
export JAVA_OPTS=" $JAVA_OPTS -Djboss.socket.binding.port-offset=$PORT_OFFSET"
```

# 모니터링 콘솔

- 해당 인스턴스의 포트 번호로 직접 접속하여 모니터링 가능
- 아이디 / 패스워드 : admin / \*\*\*\* (보안설정에서 설정한 아이디/패스워드 사용)  
Port = 9990+Offset



The screenshot shows the JBoss Management console interface. The browser address bar displays the URL: 192.168.1.1:9990/console/App.html#server-instances. The page title is "JBoss Management". The main header shows "JBoss Enterprise Application Platform 6.0" and navigation tabs for "Profiles", "Server", and "Runtime". The left sidebar contains a tree view with "Server" selected, showing sub-items like "Domain", "Server Instances", "Server Status", "JVM", "Databases", "JPA", "JMS Destinations", "Transactions", "Web", "Webservices", "Runtime Operations", and "OSGi". The "Server Instances" section is active, displaying "Server Status (Host: slave1)". Below this, a table lists server instances:

Server	Server Group	Status	Active
server-11	main-server-group		✓
server-12	other-server-group		✗

Below the table, there are tabs for "Availability" and "Environment Properties". The "Availability" tab is selected, showing "Server Instance: server-11" and "Server Configuration: server-11". The status "Running?: true" is displayed.





JBoss Admin

# JBoss Admin

## ■ Admin Console

- `http://hostip:9990/`

## ■ CLI

```
./jboss-cli.sh --controller=192.168.1.1:9999 --connect  
[domain@192.168.1.1:9999 /]  
  
/profile=full-ha/subsystem=web/configuration=jsp-configuration/:write-attribute(name=development,value=true)  
  
/profile=full-ha/subsystem=web/configuration=jsp-configuration/:write-attribute(name=check-interval,value=5)
```

## ■ CLI Batch Mode

- `jboss-cli.sh --file logging.cli`

```
batch  
cd profile=default/subsystem=logging  
./size-rotating-file-handler=FILE_BY_SIZE:add(level=INFO,formatter="%d{HH:mm:ss,SSS} %-5p [%c]  
(%t) %s%E%n",max-backup-index=3,rotate-size=3,file={"path"=>"production-server.log","relative-  
to"=>"jboss.server.log.dir"})  
./logger=com.jboss.logtest:add(level=INFO,handlers=["FILE_BY_SIZE"])  
run-batch
```



# JBoss Application Deploy

## ■ Admin Console

- `http://hostip:9990/`
- Runtime → Manage Deployments → Deployment Content → Add Content

## ■ CLI

```
./jboss-cli.sh --controller=192.168.1.1:9999 --connect  
[domain@192.168.1.1:9999 /]  
  
deploy /home/jjeon/jboss/workspaces/workspace_eap6qs/session/session.war --server-groups=main-server-group
```

# JMX API

## ■ JMX API

```
String host = HOST_IP;
int port = 4447; // management-native port

String urlString = System.getProperty("jmx.service.url", "service:jmx:remoting-jmx://" + host + ":" + port);
JMXServiceURL serviceURL = new JMXServiceURL(urlString);
JMXConnector jmxConnector = JMXConnectorFactory.connect(serviceURL, null);
MBeanServerConnection connection = jmxConnector.getMBeanServerConnection();

Hashtable<String, String> table = new Hashtable<String, String>();
table.put("subsystem", "messaging");
table.put("hornetq-server", "default");

ObjectName name = ObjectName.getInstance("jboss.as", table);
Boolean started = (Boolean) connection.getAttribute(name, "started");

System.out.println(started);

jmxConnector.close();
```

# DMR API

## ■ DMR(Dynamic Model Representation) API

```
ModelControllerClient client = ModelControllerClient.Factory.create(InetAddress.getByName(HOST_IP), 9999);

// /host=master/server=server-one/interface=public:read-attribute(name=resolved-address)
ModelNode op = new ModelNode();
op.get("operation").set("read-attribute");

ModelNode a = op.get("address");

a.add("host", "master");
a.add("server", "server-one");
a.add("interface", "public");

op.get("name").set("resolved-address");

System.out.println("==== request ====");
System.out.println("op=" + op);
System.out.println("==== request ====");

ModelNode returnVal = client.execute(op);
System.out.println("==== response ====");
System.out.println("returnVal=" + returnVal);
System.out.println("==== response ====");

client.close();
```

# Management API

## ■ CLI API

```
// Initialize the CLI context
final CommandContext ctx;
try {
    ctx = CommandContextFactory.getInstance().newCommandContext();
} catch (CliInitializationException e) {
    throw new IllegalStateException("Failed to initialize CLI context", e);
}

try {
    // connect to the server controller
    ctx.connectController();

    // execute commands and operations
    ctx.handle(":take-snapshot");
    ctx.handle("deploy myapp.ear");
} catch (CommandLineException e) {
    // the operation or the command has failed
} finally {
    // terminate the session and
    // close the connection to the controller
    ctx.terminateSession();
}
```

# REST API

## ■ Ruby REST API

```
# Standard HTTP File Upload, Decode JSON response
hash = JSON.parse(RestClient.post("http://localhost:9990/
management/add-content", :file => File.new("foo.jar", 'rb')))[ 'result' ][ 'BYTES_VALUE' ]

print "The uploaded hash is #{hash}\n"

# Encode JSON Deployment Request

RestClient.post("http://localhost:9990/management", {
  'content' => [ 'hash' => { 'BYTES_VALUE' => hash } ],
  'address' => [ 'deployment' => 'node-info.war' ],
  'operation' => 'add',
  'enabled' => 'true'
}.to_json)

print "Success!!\n"
```

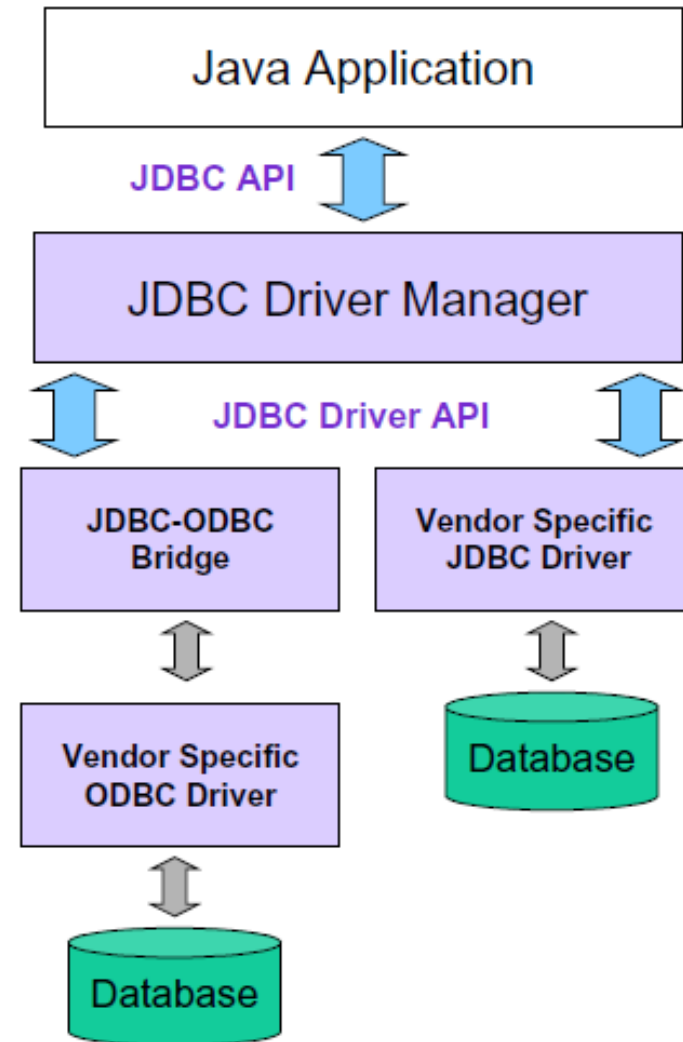


A close-up photograph of several bright yellow chrysanthemum flowers. The petals are numerous, layered, and have a slightly ruffled texture. The centers of the flowers are visible, showing a cluster of small, darker yellow stamens. The background is dark and out of focus, making the flowers stand out.

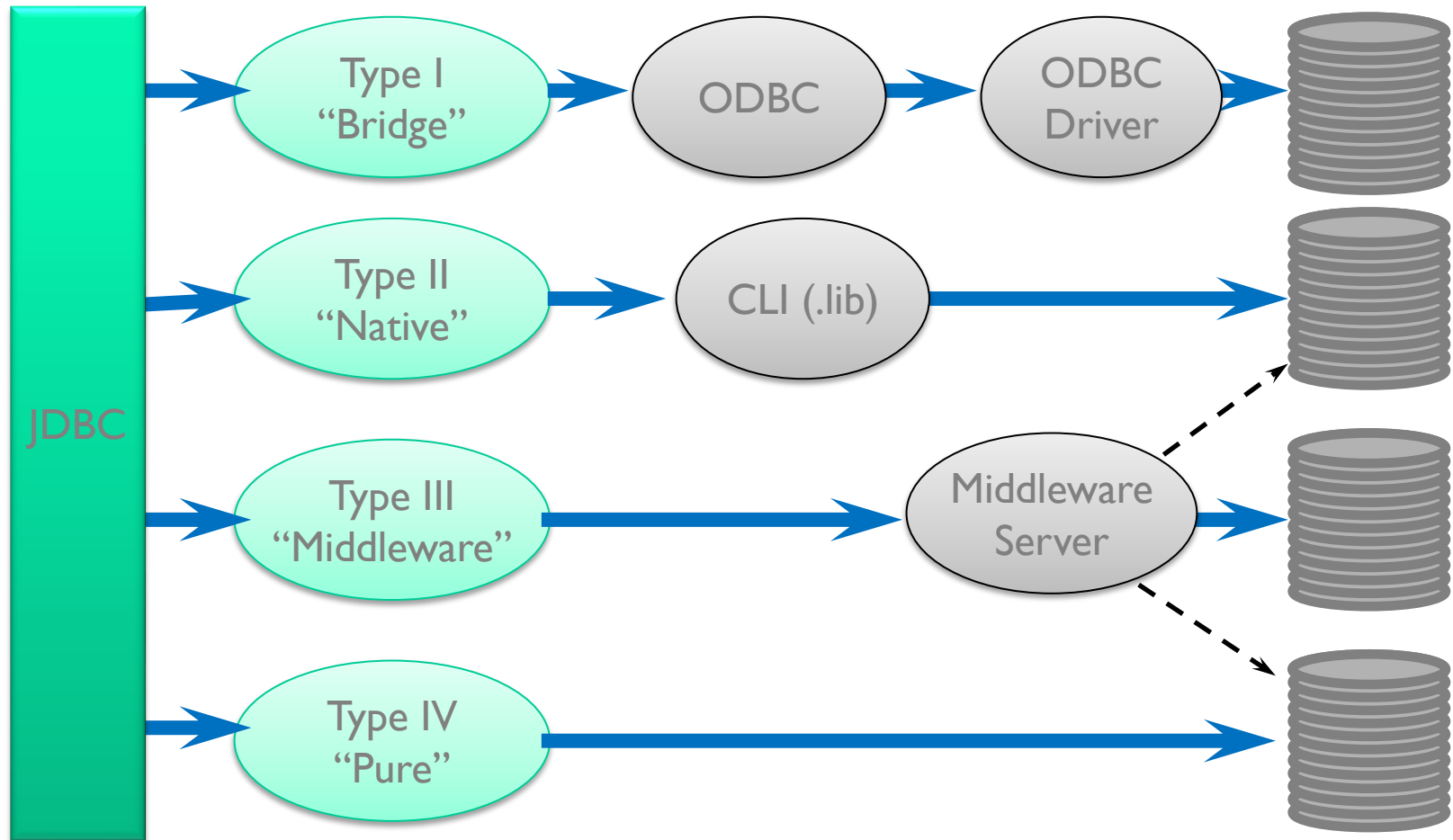
데이터 소스 설정

# JDBC란?

- JDBC가 하는일
  - 데이터베이스 연결
  - SQL문장 전송
  - 결과 처리



# JDBC Driver의 Type



# JDBC Driver의 선택

## ■ Oracle JDBC Driver의 선택 가이드

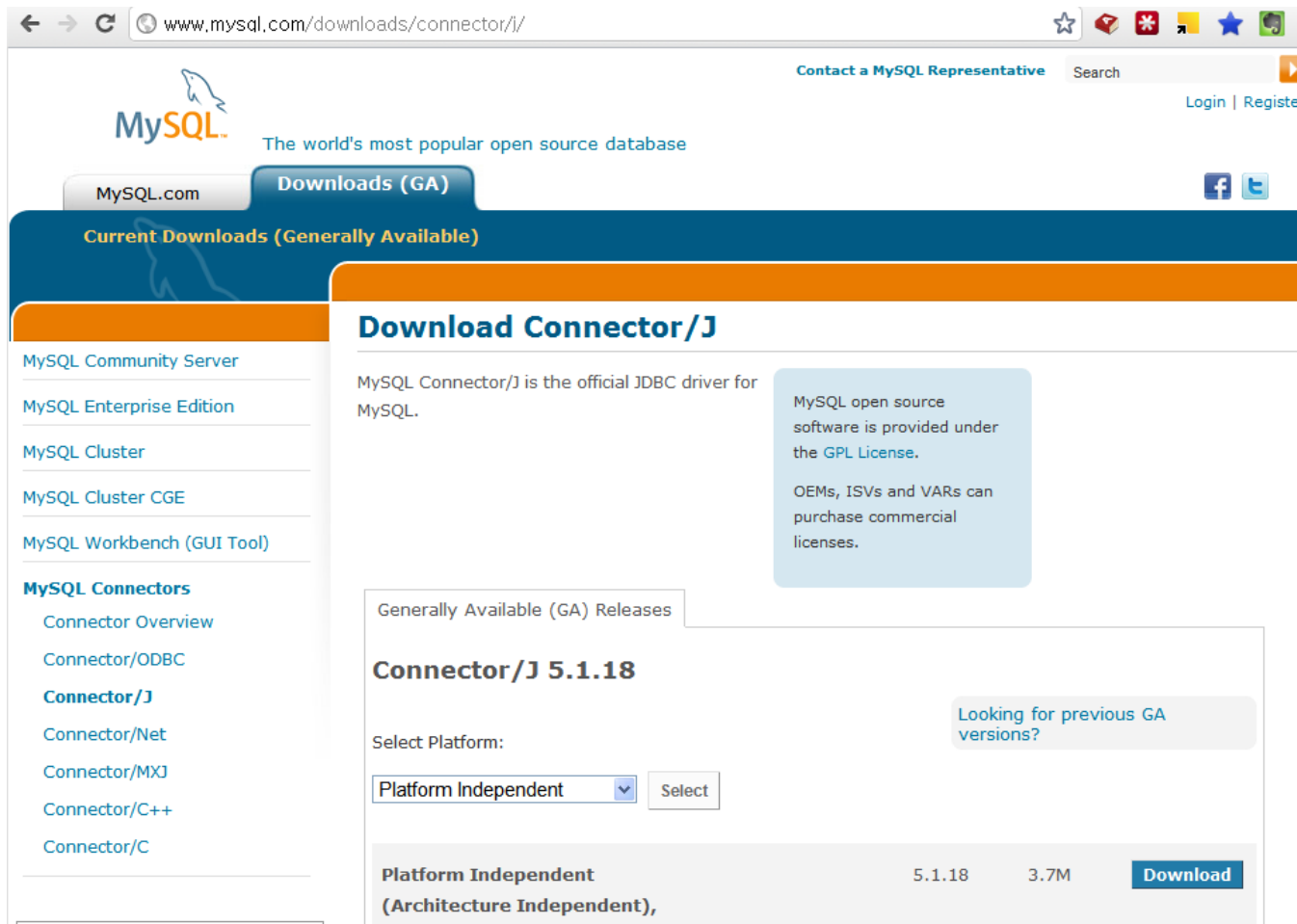
- Oracle의 경우 RAC TAF를 사용하지 않는다면 Thin 드라이버를 사용하라
- Oracle JDBC Driver 호환성 테이블
  - [http://www.oracle.com/technetwork/database/enterprise-edition/jdbc-faq-090281.html#02\\_02](http://www.oracle.com/technetwork/database/enterprise-edition/jdbc-faq-090281.html#02_02)
  - 드라이버 버전 별 사용 가능한 DB
    - 11 Driver → 11g, 10g, 9i DB
    - 9.2 ~ 10.2 Driver → 11g, 10g, 9i, 8 DB
    - 10.1 Driver → 11g, 10g, 9i, 8, 7 DB
  - JDK 버전별 Driver 파일명
    - ojdbc5.jar → JDK 1.5용, ojdbc6.jar → JDK 1.6용, classes111.jar → JDK 1.1용
    - classes12.jar → JDK 1.2, 1.3용, ojdbc14.jar → JDK 1.4용
    - \*\_g.jar 파일 → 디버그정보를 포함한 드라이버
- OCI 드라이버 → libocijdbc<major\_version\_id>.so 버전번호가 표시됨
- 데이터베이스 벤더에서 제공하는 최신의 JDBC 드라이버를 사용

# JDBC Connection Pool

- WAS의 JDBC *connection pool*.
  - JDBC를 통한 Database연결 속도가 느리기 때문에 연결을 미리 맺어 Pool을 만들어 이를 애플리케이션에 제공한다
  - Pool의 Connection은 재사용하며, 사용량에 따라 Pool내의 Connection개수를 늘리거나, 줄인다(Shrink).
  - 애플리케이션에서는 JNDI 트리에 바인딩된 DataSource를 통해 접근
- WAS는 prepared, callable statement를 캐시할 수 있다
  - Statement를 Cache하면 WAS  $\longleftrightarrow$  DB간의 overhead를 줄인다
  - 성능을 향상시킬 수 있다.
  - 애플리케이션의 특성에 따라 Cache 크기를 조절한다(일반적으로 100정도)

# MySQL Driver

- mysql.com에서 최신 JDBC 드라이버를 다운로드 받는다.



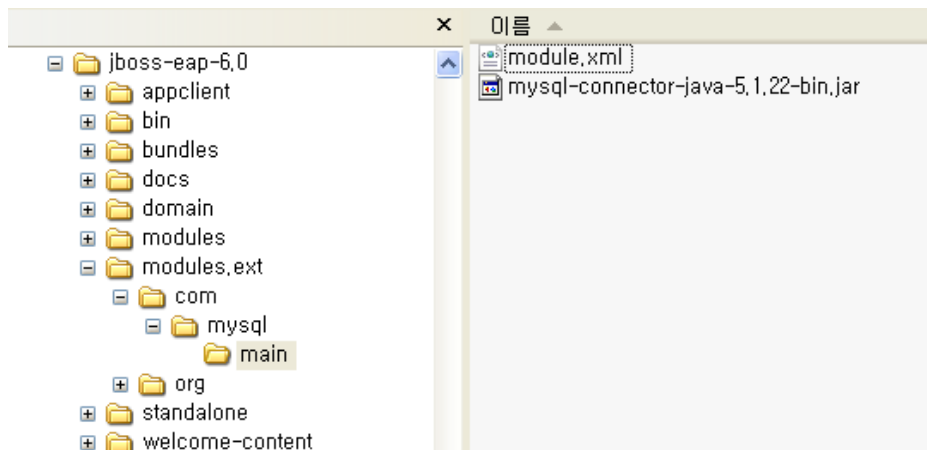
The screenshot shows the MySQL Connector/J download page. The browser address bar displays `www.mysql.com/downloads/connector/j/`. The page features the MySQL logo and the tagline "The world's most popular open source database". A navigation bar includes "MySQL.com", "Downloads (GA)", and social media links for Facebook and Twitter. A sidebar on the left lists various MySQL products and connectors, with "MySQL Connectors" expanded to show "Connector/J". The main content area is titled "Download Connector/J" and describes it as the official JDBC driver for MySQL. It includes a text box stating that MySQL open source software is provided under the GPL License and that OEMs, ISVs, and VARs can purchase commercial licenses. Below this, a section for "Generally Available (GA) Releases" shows the "Connector/J 5.1.18" version. A "Select Platform:" dropdown menu is set to "Platform Independent", with a "Select" button next to it. A "Looking for previous GA versions?" link is also present. At the bottom, a table lists the download details for the "Platform Independent (Architecture Independent)" version, showing version "5.1.18" and size "3.7M", with a "Download" button.

Platform Independent (Architecture Independent),	5.1.18	3.7M	Download

# JDBC 드라이버 설치

## ■ JDBC Driver Jar 파일의 위치

- \$SERVER\_HOME/modules.ext 디렉토리에 하위 디렉토리를 만들고 jar 파일을 복사, modules.xml 파일을 작성



modules.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<module xmlns="urn:jboss:module:1.0" name="com.mysql">
  <resources>
    <resource-root path="mysql-connector-java.jar"/>
  </resources>
  <dependencies>
    <module name="javax.api"/>
    <module name="javax.transaction.api"/>
  </dependencies>
</module>
```

# JDBC 데이터 소스 설정

## ■ GUI Console에서

<https://access.redhat.com/knowledge/docs/en-US/JBoss Enterprise Application Platform/6/html-single/Administration and Configuration Guide/index.html#sect-Non-XA Datasources>

## ■ CLI 이용 설정

```
data-source add --name=DATASOURCE_NAME --jndi-name=JNDI_NAME --driver-name=DRIVER_NAME --connection-url=CONNECTION_URL
```

## ■ standalone-XX.xml 편집

```
<datasources>
  <datasource jndi-name="java:jboss/datasources/MySQLDS" pool-name="MySQLDS" enabled="true" use-java-context="true">
    <connection-url>jdbc:mysql://localhost:3306/mydb</connection-url>
    <driver>com.mysql</driver>
    <security>
      <user-name>dbuser</user-name>
      <password>dbpasswd</password>
    </security>
    <validation>
      <valid-connection-checker class-name="org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLValidConnectionChecker"></valid-connection-checker>
      <exception-sorter class-name="org.jboss.jca.adapters.jdbc.extensions.mysql.MySQLExceptionSorter"></exception-sorter>
    </validation>
  </datasource>
</datasources>
```

## ■ \*-ds.xml 사용

- EAP 5.x 버전과 같이 사용가능, 개발용으로만 사용할 것(Console, CLI에서 접근할 수 없음)



# JBoss valid-connection-check란?

## ■ JBoss의 valid-connection-checker의 동작 방식

- JBoss에서는 JDBC Driver에서 제공하는 pingDatabase 메소드를 이용하여 JDBC Connection의 상태를 체크함
- 오라클의 경우엔 아래와 같이 OracleConnection의 pingDatabase(int) 함수를 이용하여 체크함
- 참고 :오라클 JDBC Driver API
  - [http://download-llnw.oracle.com/otn/utilities\\_drivers/jdbc/10201/javadoc/oracle/jdbc/OracleConnection.html](http://download-llnw.oracle.com/otn/utilities_drivers/jdbc/10201/javadoc/oracle/jdbc/OracleConnection.html)

```
public class OracleValidConnectionChecker implements ValidConnectionChecker, Serializable {
    public OracleValidConnectionChecker()
    {
        try
        {
            Class oracleConnection =
Thread.currentThread().getContextClassLoader().loadClass("oracle.jdbc.driver.OracleConnection");
            ping = oracleConnection.getMethod("pingDatabase", new Class[] { Integer.TYPE });
        }
        ...생략...
        public SQLException isValidConnection(Connection c)
        {
            try
            {
                Integer status = (Integer) ping.invoke(c, params);
            }
        }
    }
}
```



웹서버 설치

# 운영환경 구성(Hardware Architecture)

사용자 PC



L4 Switch



Web Server



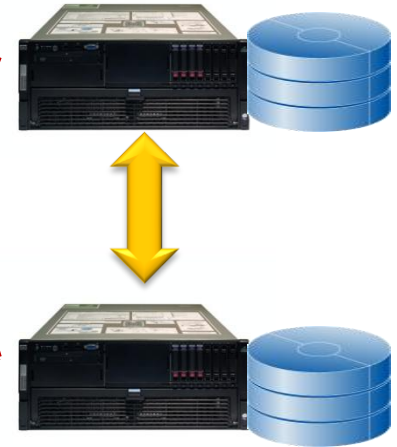
Red Hat Enterprise Linux 5.x

WAS Server



Red Hat Enterprise Linux 5.x

Oracle RAC Server



Red Hat Enterprise Linux 5.x

Database 구성

# Apache 버전

- A Patch of NCSA httpd 1.3로 1995에 시작
- apache 재단으로 발전
- Apache License
  
- Preforked child process 방식
  - Child 프로세스를 미리 fork
- MPM(Multi-Processing Module)방식
  - 2.0부터 지원
  
- JBoss EWS(Enterprise Web Server) 다운로드
  - <http://access.redhat.com/>
    - JBoss Enterprise Platforms → Web Server
    - Appliaction Platform / 6.0 → Apache HTTP Server for XXX

# Apache Tomcat Connector : mod\_jk, mod\_cluster

- Apache 웹서버와 Tomcat 연결을 위한 모듈
- 지원 웹서버
  - Apache
  - IIS
  - Netscape/SunOne Web Server
- AJPv13 프로토콜 사용
  - <http://tomcat.apache.org/connectors-doc/ajp/ajpv13a.html>
- 다운로드
  - <http://access.redhat.com/>
    - Application Platform 6.0 → WebServer Connector Natives for XXX
- 설치
  - 아파치 module 을 복사하여 설정( modules/natives/... )

# Tomcat Native, HornetQ AIO

- Tomcat Native란?
  - WLS의 Performance Pack과 유사하게 OS Native IO를 이용
  - APR(Apache Portable Runtime) 모듈을 이용하여 구현됨
  - JNI 모듈을 이용 - libtcnative-1.so
- HornetQ AIO
  - JMS(HornetQ)에서 File IO 성능을 위해 사용하는 리눅스 AIO 모듈
- 다운로드
  - <http://access.redhat.com/>
    - Application Platform 6.0 → Native Components for XXX
- 설치
  - \$JBOSS\_HOME 디렉토리에 압축을 푼다.

# Apache 웹서버의 디렉토리 구조


## ■ /etc/httpd


### Apache 디렉토리

- **conf** Apache의 메인 설정 파일이 보관되어 있는 디렉토리이다.
  - **conf.d** 추가 모듈 설정이 보관되는 디렉토리이다.  
JBoss연동을 위한 설정 `mod_jk.conf`, `workers.properties`도 이 디렉토리에 만든다.  
\*.conf 파일이 모두 로딩된다.
  - **modules** apache 동적 모듈이 보관되어 있다. Apache - JBoss 연동을 위한 `mod_jk.so`파일
  - **logs** Apache에서 발생하는 로그가 이 디렉토리에 보관된다.
  - **run** Apache 실행시 관련 정보가 이 디렉토리에 보관된다.
- /usr/sbin** Apache 인스턴스 실행 파일 및 인스턴스를 운영하기 위해 필요한 스크립트들이 있음.

# RHEL에 JBoss EWS 설치

## ■ RHEL에 EWS Channel 추가 등록


**CUSTOMER PORTAL**




Knowledge
Groups
Support
Downloads
Security
Subscriptions

Search
Junshik Jeon

GENERAL
Systems
All
Virtual Systems
Out of Date
Untitled
Inactive
Recently Registered
Advanced Search
Notifications
MANAGEMENT
System Set Manager
System Groups
Schedule
Stored Profiles
PROVISIONING
Custom System Info


CLASSIC SUBSCRIPTION MANAGEMENT

No SYSTEMS SELECTED [MANAGE | CLEAR]



**test**
 delete system

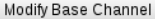
Details
Software
Virtualization
Groups
Events


Errata
Packages
Software Channels


**Base Software Channel**

You can change the base software channel your system is subscribed to. The system will be unsubscribed from all software channels, and subscribed to the new base software channel.

Base Channel: Red Hat Enterprise Linux Server (v. 6 for 64-bit x86\_64) [No Change]





**Software Channel Subscriptions**

This system is subscribed to the base channel, listed at top, and to the checked channels beneath, if any. Disabled checkboxes indicate channels that can't be manually subscribed or unsubscribed from.

Release Channels for Red Hat Enterprise Linux 6 for x86\_64
BETA Channels for Red Hat Enterprise Linux 6 for x86\_64
Additional Services Channels for Red Hat Enterprise Linux 6 for x86\_64

Channel Entitlement	Entitlement Usage ?
<input type="checkbox"/> JBoss Application Platform (v 5) for 6Server x86_64 (Channel Details)	Consumes a regular entitlement (1231 available)
<input type="checkbox"/> JBoss Application Platform (v 6) for 6Server x86_64 (Channel Details)	Consumes a regular entitlement (1231 available)
<input type="checkbox"/> JBoss EWP (v 5) for 6Server x86_64 (Channel Details)	Consumes a regular entitlement (3002 available)
<input type="checkbox"/> JBoss EWS Debuginfo for 6Server x86_64 (Channel Details)	Consumes a regular entitlement (3001 available)
<input checked="" type="checkbox"/> JBoss EWS for 6Server x86_64 (Channel Details)	Consumes a regular entitlement (3001 available)
<input type="checkbox"/> MRG Grid Execute Node v. 2 (for RHEL 6 Server x86_64) (Channel Details)	Consumes a regular entitlement (3000 available)



# JBoss EWS 설치

- RHEL에 rpm 설치 ( /etc/httpd )
  - RHEL Channel 확인
    - `sudo yum repolist`
  - HTTP 설치
    - `sudo yum httpd httpd-tools mod_jk mod_cluster`
  - RHEL 서비스 등록
    - `sudo chkconfig httpd on`
    - `sudo chkconfig --list httpd`
  - worker로 변경
    - `sudo vi /etc/sysconfig/httpd`
    - `HTTPD=/usr/sbin/httpd.worker`
  - HTTP 시작 종료
    - `sudo service httpd start`
    - `sudo service httpd stop`
    - `sudo service httpd status`

# JBoss EWS 설치

## ■ /etc/httpd/conf/httpd.conf

```
KeepAlive On
MaxKeppAliveRequest 1000

<IfModule worker.c>
StartServers      3
ServerLimit       64
MaxClients        4096
ThreadLimit       4096
MinSpareThreads   512
MaxSpareThreads   1024
ThreadsPerChild   64
MaxRequestsPerChild 10000
</IfModule>

ListenBackLog 1000
```

# httpd 확인

- `$APACHE_HOME/bin/httpd -V`
  - 상세 컴파일 정보 표시
- `$APACHE_HOME/bin/httpd -v`
  - 간략 버전 정보 표시
- `$APACHE_HOME/bin/httpd -l`
  - 컴파일된 모듈 표시
- `$APACHE_HOME/bin/httpd -t`
  - config 파일의 문법 체크

# mod\_jk 설정

## ■ conf.d/mod\_jk.conf

```
# Load mod_jk module
LoadModule jk_module          modules/mod_jk.so

# Where to find workers.properties
JkWorkersFile conf.d/workers.properties

# Where to put jk logs
JkLogFile      logs/mod_jk.log
JkShmFile      logs/mod_jk.shm

# Set the jk log level [debug/error/info]
JkLogLevel     info

# Select the log format
JkLogStampFormat "[%a %b %d %H:%M:%S %Y] "

# JkOptions indicate to send SSL KEY SIZE,
JkOptions      +ForwardKeySize +ForwardURICompat -ForwardDirectories +ForwardURICompatUnparsed

# JkRequestLogFormat set the request format
JkRequestLogFormat "%w %V %T "

# Send everything for context /examples to worker named worker1 (ajp13)
JkMount /*.jsp loadbalancer
JkMount /*.do loadbalancer
JkMount /jkstatus* jkstatus
```

# workers.properties 설정

## ■ conf.d/workers.properties

```
worker.list=loadbalancer,jkstatus

# Templates
worker.template.type=ajp13
worker.template.maintain=60
worker.template.lbfactor=1
worker.template.ping_mode=A
worker.template.ping_timeout=2000
worker.template.prepost_timeout=2000
worker.template.socket_timeout=60
worker.template.socket_connect_timeout=2000
worker.template.socket_keepalive=true
worker.template.connection_pool_timeout=60
worker.template.connect_timeout=10000
worker.template.recovery_options=7

# Set properties for bmtSrv11 (ajp13)
worker.bmtSrv11.reference=worker.template
worker.bmtSrv11.host=localhost
worker.bmtSrv11.port=8109

# Set properties for bmtSrv12 (ajp13)
worker.bmtSrv12.reference=worker.template
worker.bmtSrv12.host=localhost
worker.bmtSrv12.port=8209

worker.loadbalancer.type=lb
worker.loadbalancer.balance_workers=bmtSrv11,bmtSrv12
worker.loadbalancer.method=Session
worker.loadbalancer.sticky_session=True

worker.jkstatus.type=status
```

# JBoss Tomcat 설정

## ■ standalone-XX.xml / domain.xml

```
<subsystem xmlns="urn:jboss:domain:web:1.1" default-virtual-server="default-host" instance-  
id="${jboss.node.name}" native="false">  
  <connector name="http" protocol="HTTP/1.1" scheme="http" socket-binding="http"/>  
  <connector name="ajp" protocol="AJP/1.3" scheme="http" socket-binding="ajp"/>  
  <virtual-server name="default-host" enable-welcome-root="true">  
    <alias name="localhost"/>  
    <alias name="example.com"/>  
  </virtual-server>  
</subsystem>
```

# Virtual Host 설정

## ■ conf.d/vhost.conf

```
# Use name-based virtual hosting.
NameVirtualHost *:80

#
# VirtualHost example:
# Almost any Apache directive may go into a VirtualHost container.
# The first VirtualHost section is used for all requests that do not
# match a ServerName or ServerAlias in any <VirtualHost> block.
#
<VirtualHost *:80>
    ServerAdmin webmaster@test.com
    DocumentRoot "/svc/web/test"
    ServerName test.com
    ServerAlias www.test.com
    ErrorLog "logs/www.test.com-error_log"
    CustomLog "logs/www.test.com-access_log" common

    JkMount /*.jsp testlb
    JkMount /*.do testlb
</VirtualHost>

<VirtualHost *:80>
    ServerAdmin webmaster@test.com
    DocumentRoot "/svc/web/m"
    ServerName m.test.com
    ServerAlias m.test.com
    ErrorLog "logs/m.test.com-error_log"
    CustomLog "logs/m.test.com-access_log" common

    JkMount /*.jsp mlb
    JkMount /*.do mlb
</VirtualHost>
```

# Apache 운영 방법

- **root** user로 로그인 한다.
- Apache 디렉토리로 이동한다.

```
$ web
```

- 아파치 구동

```
$ sudo service httpd start
```

- 아파치 종료

```
$ sudo service httpd stop
```

- 아파치 재기동

```
$ sudo service httpd restart
```

- 아파치 확인

```
$ sudo service httpd status
```

- 아파치 프로세스 확인

```
$ ps -ef | grep httpd
```



A close-up photograph of a lavender flower cluster. The central flower is in sharp focus, showing its two light purple petals and a dark, textured base. Other flower clusters are visible in the background, slightly out of focus. The overall color palette is dominated by various shades of green and purple.

클러스터링

# Clustering의 목적

- 부하분산 (State Replication)
  - 동시 접속자 증가에 따른 성능저하 방지
  - 요청을 서버들에 전달하여 고가용성 및 성능향상
- 상태복제 (Load Balancing)
  - 서비스 접근 시 응답속도의 항상성 유지
  - 클러스터 내의 모든 노드들이 상태 접근가능
  - 하나의 노드가 장애 시 다른 노드에서 클라이언트와 통신하여 서비스 제공
- 자동 장애복구 (Silent Failover)
  - 서비스 장애 시 정상적인 서비스 보장
  - 시스템 장애 시 클라이언트는 다른 노드로 redirection

# Clustering

- JBoss Cluster를 통한 엔터프라이즈 서비스의 High availability 제공
- 클라이언트에 대한 Single View를 제공하여 Cluster Node(여러 서버)에서 애플리케이션을 실행하기 위한 것
- Clustering의 필요성
  - Scalable 엔터프라이즈 애플리케이션
    - 시스템의 수평/수직 확장
    - 애플리케이션 Capacity 향상
  - Highly availability
    - 애플리케이션 redundancy 지원

# JBoss의 WebApp 세션 복제 설정

## ■ web.xml

```
<?xml version="1.0"?>
<web-app xmlns="http://java.sun.com/xml/ns/j2ee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://java.sun.com/xml/ns/j2ee
    http://java.sun.com/xml/ns/j2ee/web-app_2_4.xsd"
  version="2.4">

    <distributed/>

    <!-- ... -->
</web-app>
```

# 세션 복제 테스트 Application

## ■ Counter를 증가시키는 JSP 파일

```
<html>
  <head><title>Session Tracking Test</title>
</head>
  <body>
    <h1>Session Tracking Test 2</h1>
    Session tracking with JSP is easy
    <P>
<%@ page session="true" %>
<%
    // Get the session data value
    Integer ival = (Integer) session.getValue ("counter");
    if (ival == null) ival = new Integer (1);
    else ival = new Integer (ival.intValue() + 1);
    session.putValue ("counter", ival);
%>
    You have hit this page <%= ival %> times.<br>
<%
    out.println("Your Session ID is " + session.getId() + "<br>");
    System.out.println("session=" + session.getId());
%>
</body></html>
```

# mod\_cluster

- /etc/httpd/conf/httpd.conf

```
#LoadModule proxy_balancer_module modules/mod_proxy_balancer.so
```

- /etc/httpd/conf.d/mod\_cluster.conf

```
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_ajp_module modules/mod_proxy_ajp.so
LoadModule slotmem_module modules/mod_slotmem.so
LoadModule manager_module modules/mod_manager.so
LoadModule proxy_cluster_module modules/mod_proxy_cluster.so
LoadModule advertise_module modules/mod_advertise.so

MemManagerFile /var/cache/httpd

<VirtualHost *:80>
  ProxyPass /* balancer://main-server-group/* stickysession=JSESSIONID|jsessionid nofailover=On
  ProxyPassMatch ^/.*\.(jsp|do|mvc)$ balancer://main-server-group/

  <Location /mod_cluster_manager>
    SetHandler mod_cluster-manager
  </Location>

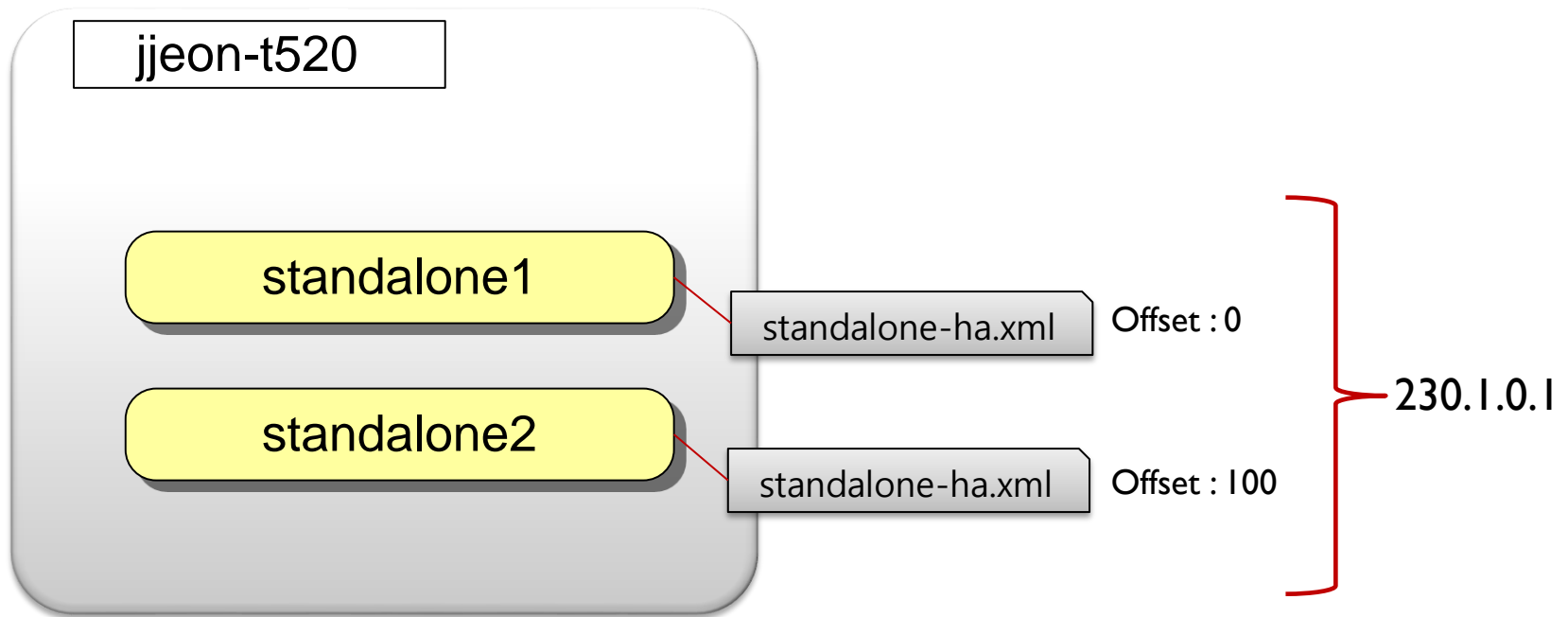
  KeepAliveTimeout 60
  MaxKeepAliveRequests 0

  EnableMCPMReceive
  ManagerBalancerName main-server-group
  AdvertiseFrequency 5
  ServerAdvertise On
</VirtualHost>
```



JBoss EAP 6 데모

# Standalone Mode





[illegible]

# JBoss EAP 6 데모

- domain mode
  - CLI server group start
  - CLI server group stop
- CLI session.war deploy
- Web Console deploy
- CLI change attribute
- mod\_cluster 확인




iPhone

# JBoss Admin in iPhone

## JBoss Admin


**Christos Vasilakis** 제작

iTunes을 열어 Apps를 구입하고 다운로드합니다.



[View in iTunes](#)


**무료**

카테고리: **생산성**  
업데이트: 2012.05.25  
버전: 1.1  
크기: 0.4 MB  
언어: 영어  
개발자: Christos Vasilakis  
© 2012 Christos Vasilakis  
4+ 

**요구 사항:** iPhone 3GS, iPhone 4, iPhone 4S, iPod touch (3세대), iPod touch (4세대) 및 iPad와(과) 호환. iOS 4.0 버전 이상이 필요.

**고객 평가**  
이 앱에 프로그램의 현재 버전의 평가판을 표시할 만능 평가되지 않았습니다.

**Christos Vasilakis의 iPhone App 더 보기**

 [AccessJ](#)  
[iTunes에서 보기](#)



**설명**

The app will allow you to remotely administer a JBoss 7 server using the server's exposed http management interface.

[Christos Vasilakis](#) [웹 사이트](#) · [JBoss Admin](#) [지면](#) · [...자세히](#)

**1.1 버전의 새로운 기능**  
minor UI bug fixes

### iPhone 스크린샷

A close-up photograph of a pink flower, likely a cherry blossom, with soft, layered petals. The flower is the central focus, with its center showing a cluster of stamens. The background is blurred, showing more of the same flower and some green foliage.

# 감사합니다

- 문서 <http://docs.redhat.com/>
- 기술지원 <http://access.redhat.com/>
- 전화 080-081-0880