# JBOSS Interview Questions

**1) What is an Application Server?**

An application server provides the runtime environment for applications. It handles requests from end users, identifies the requested resource, executes it, and generates a response.

**2) Difference Between Web Application and Enterprise Application**

| **Feature** | **Web Application** | **Enterprise Application** |
| --- | --- | --- |
| Components | HTML, Servlets, JSP, XML, JS, etc. | All web components + EJBs (Session, Entity, Message-driven beans) |
| Packaging | WAR file | EAR file |
| EJB Support | ❌ No EJB container | ✅ Includes EJB container |
| Servers | Tomcat, WebSphere, WebLogic, JBoss | WebSphere, WebLogic, JBoss |
| Example | — | Banking sites like www.icicibank.com |

**3) How to Set Java Path**

* **Windows**:
  + Go to: Control Panel → System & Security → System → Advanced System Settings → Environment Variables
  + Add new system variable:
    - JAVA\_HOME = <path to JDK>
    - Edit Path variable to include: JAVA\_HOME\bin
* **Linux**:

export JAVA\_HOME=/installDir/jdk1.8.0\_191/

export PATH=$JAVA\_HOME/bin:$PATH

**4) How to Check Java Version ?**

java -fullversion

**5) JBoss Installation Methods ?**

* GUI Mode
* ZIP Extraction
* Console Mode
* Silent Mode

**ZIP Extraction Steps**:

1. Download and extract the JBoss ZIP bundle.
2. Navigate to EAP\_HOME/bin.

Run:

* + add-user.sh (Linux)

1. Select "Management User" and follow prompts.

press any key: As zip mode installation completed we can run servers by executing command standalone.bat

**Console mode:-**

1) Execute jboss-eap-7.1.0-installer jar file as below

Java -jar jboss-eap-7.1.0-installer.jar -console

2) Provide the values as per your requirement

3) If it is successfully installed we will get the below message

[console installation done]

**6) What are the prerequisites to install Jboss?**

1) Check free disk space (1GB)

2) Check memory (1GB)

3) File Permissions

4) Check whether JAVA is installed or not, if installed check whether Java path is set.

**7) What are the 2 files that we update whenever we create a user and in which locations it will update?**

A) At the time of creating a user it will update 2 files

mgmt-users.properties

mgmt-groups.properties

-> These 2 files are located in both standalone and domain directories.

C:\EAP-7.1\standalone\configuration

C:\EAP-7.1\domain\configuration

**8) What are the default Jboss port no's?**

A) 9990 -> default port for admin console

8080 -> To access application

8443 -> secure port no for application

8009 -> ajp portno.

**9) What is the command to start a server in standalone mode with port offset?**

A) go to EAP\_HOME/Bin: ./Standalone.sh -Djboss.socket.binding.port-offset=200 (any value)

**10) In which xml file & in which section we can change port no's?**

A) By default using default port offset we will change port no's in standalone.xml file and in socket-binding section we can change port numbers.

**11) What are the differences b/w standalone and domain mode?**

**A) Standalone**

1) We will get separate management console for each and every server.

2) It's difficult to manage multiple instances.

3) We don't have server groups, host controller and process controller.

4) No concept of master-slave.

5) To start a server in standalone mode, we will use command standalone.sh

6) For each profile , we have separate xml file like, standalone.xml, standalone- ha.xml,standalone-ha.xml and standalone-full-ha.xml.

**B. Domain mode:**

1) It provides centralized administration.

2) We can manage multiple servers, on remote machines from domain.

3) We have concept of master-slave and host controller and process controller.

4) Easy to deploy application and easy to maintain admin activities in multiple servers with the help of server groups.

5) To start a server in domain mode, we will use command domain.sh

6) Process-controller acts as an interface b/w domain-controller and slave server.

**12) What are the important configuration files in Jboss?**

**A) In standalone mode**

-> standalone.xml

-> standalone-ha.xml

-> standalone-full.xml

-> standalone-full-ha.xml

**In domain mode**

-> domain.xml

-> host.xml

-> host-master.xml

-> host-slave.xml

-> These are the important configuration files in Jboss server.

**13) What are the different types of profiles in Jboss & explain the importance of each profile?**

A) 4 different types of profiles: and load balancer.

**1) Default: Supports JSE Web Profile components but does not support clustering.**

**2) HA: Supports Java SE (JSE) Web Profile components with clustering.**

3) **Full: Supports Java SE and Full Profile components, but does not support clustering.**

4) **Full-HA: Supports Java SE and Full Profile components with clustering.**

**14) What is the command to start a new Jboss instance?**

A) standalone.bat -Djboss.server.base.dir="absolute path of new JBoss instance" -Djboss.socket.binding.port-offset=200

**15) What is the Linux command to check the port availability?**

A) netstat -an | grep portnumber (OR)

netstat -tuln | grep <portnumber>

**16) What is the important log files in Jboss?**

A) Server.log

Host-controller.log

Boot.log

Acess.log

gc.log

**17) In how many ways we can deploy an application in Jboss?**

A) 1) Admin console/Management console

2) Jboss-cli (Command line interface)

3) File based deployments (standalone only)

4) Maven

5) Eclips

**18) How to check the apache http version & web version?**

A) apachectl -v

httpd -v

**19) What is the command to check Jboss version?**

A) standalone.sh -v

domain.sh -v

**20) What is the command to execute jar file?**

A) java -jar jboss-eap-7.1.jar

**22) How to deploy an application using file based deployment?**

**A)** We have to copy the .war (or) .ear file directory to standalone deployment directory Go to <EAP-HOME>/standalone/deployments ↓ Paste the application in deployments ↓ Refresh admin console ↓ Now you can access application http://localhost:8080/<context-root>

**23) At the time of deployment in which location content file will be created in standalone and domain modes?**

**A)** In standalone mode: EAP-HOME/standalone/data/content

In domain mode: EAP-HOME/domain/data/content

**24) Which xml files will be updated at the time of deployment in standalone and domain modes?**

**A) In standalone mode**: At the time of application deployment standalone.xml will get updated in EAP-HOME/configuration/standalone.xml (by default) [EAP-HOME/standalone/configuration/standalone.xml]

* **In domain mode:** → EAP-HOME/configuration/domain.xml [EAP-HOME/domain/configuration/domain.xml] domain.xml file will be updated at the time of deployment. (by default profile)

**25) How will you confirm that application has been deployed successfully?**

**A)** Look into server log <EAP-HOME/standalone/log/server.log>

**26) Can we start a server if a content file is deleted?**

**A)** No, we cannot start a server if a content file is deleted.

**27) What are different types of JDBC drivers?**

**A)** 4 types of JDBC drivers:

1. JDBC-ODBC bridge (Application Program Interface)
2. Native API Connection driver
3. Network connection driver
4. Database protocol driver

**28) In how many ways we can configure JBoss and database servers?**

**A)** In 3 ways we can configure JBoss and database servers:

1. Management console
2. JBoss CLI
3. XML files

**29) What is the connection URL for Oracle?**

**A)** Protocol:subprotocol:type of driver:@hostname of database:portnumber of database:database name → jdbc:oracle:thin:@192.168.1.1:1521:xe

**30) How to troubleshoot if a database connection fails?**

**A)** Check the error message in the log file, if the error message have any exceptions. → Now check the connectivity b/w JBoss host and DB host and also DB server is running or not and port is opened or not. → First execute ping remote\_ip then execute telnet remote\_hostname|ip:port\_no\_of\_db\_server. → If it's not connected I will tell DB team to check the status of DB server and to open the port.

**31) What is the command to deploy an application to a particular server group?**

A) ./jboss-cli.sh --connect

In Standalone mode: deploy <path-to-your-app>.war

In Domain mode: deploy <path-to-your-app>.war --server-groups=main-server-group

**32) What is the jboss-cli command to create a server-group?**

**A)** /server-group=ICICI\_Bank:add(profile=ha, socket-binding-group=ha-sockets)

**33) Write all the jboss-cli commands to create a datasource**

1. **Load the JDBC driver JAR**

module add --name=com.oracle --resources=path of ojdbc6.jar file --dependencies=javax.api,javax.transaction.api

2.Register the driver

/subsystem=datasources/jdbc-driver=oracle:add(driver-name=oracle,driver-module-name=com.oracle)

3.Create the datasource

data-source add --jndi-name=java:/oracle\_DS\_PAYTM --name=oracle\_DS\_PAYTM --connection-url=jdbc:oracle:thin:@localhost:1521:XE --driver-name=oracle --user-name=system --password=admin

**34) What is the jboss-cli command to test a datasource?**

**A)** /subsystem=datasources/data-source=oracle\_DS\_PAYTM:test-connection-in-pool

**35) What is a data source?**

**A)** A datasource is a unique name which holds information about database servers like host name, port number, type of drivers, database name, username and password.

**36) What is the difference b/w XA and Non-XA datasources?**

| **XA Datasource** | **Non-XA Datasource** |
| --- | --- |
| Supports global transactions | Supports local transactions |
| Waits for all dependent transactions to succeed before committing | Commits immediately after transaction completes |
| Used for 2-phase commit scenarios | Used when no 2-phase commit is required |
| Either commits all schema(s) or none | Commits independently |
| Suitable for external application dependencies | Suitable for simple, independent transactions |

**37) What is a connection pool?**

**A)** It maintains pre-defined connection objects. Whenever app server requests database connection, it will use existing connection objects from connection pool, instead of creating new connection objects. Once a transaction is completed, the connection object will be back to the pool. If we don't have connection pool, everytime new connection object will be created, once a transaction is completed the connection object will be closed.

**38) what is the difference b/w background validation and validate-on-match?**

**A) Background Validation:**

\* If background validation is true, server will validate that the connection objects are active or not. By default it is true.

**Validate-on-match:**

\* If validate-on-match is true, server will re-check that the connection object is active or not before assigning the connection object to any request.

\* If we enable it is true, that will impacts the performance.

\* By default it is false.

**38) what are the jar files that are required for oracle, DB2 & mysql?**

A) for 6.0 & 6.1 version of oracle: ojdbc6.jar.

For 7.0 version: ojdbc7.jar

For DB2: db2jcc.jar, db2jcc\_license\_cu.jar, db2jcc\_license\_cisuz.jar

For mysql: com.mysql.jdbc\_5.1.5.jar.zip

**39) what is the use of Telnet and syntax for Telnet?**

A) Telnet (Terminal emulation) that enables a user to connect to a remote host or device using a telnet client.

Telnet portnumber is: 23

Syntax: "telnet <IP address of server PC> <Port>"

**40) What is the difference b/w Webserver and Appserver?**

**A) Webserver**

1) It can serve static resources like html image files etc.

2) Here we can't deploy both web & enterprise applications.

**Appserver:**

1) It can serve both static and dynamic resources like servlets, jsps, etc.

2) Here we can deploy both web & enterprise applications.

**41) Explain request flow?**

A) Browser -> DNS -> Load balancer -> Apache webserver -> Application server -> Connection pool -> database server.

\* Whenever user makes a request, initially request will go to DNS, it forwards that request to load balance. Load balancer forwards that request to webserver.

\* At the time of webserver startup, it loads httpd.conf file to the server, it contains path of the plugin-cfg.xml file.

\* plugin-cfg.xml file contains complete information about the application server environment.

\* If the request requires any database interaction, that request will be forwarded to connection pool through JNDI.

\* Finally response will be forwarded from DB to connection pool to webserver, and webserver will forward that response to end user.

**42) What is default telnet and ssh port numbers?**

A) For telnet port number is: 23

For SSH port number is: 22

**43) How to connect to the remote linux servers (or) cloud servers in broad environment (or) real time environment?**

A) We use SSH (Secure socket shell) to connect to a remote server in Linux (or) windows.

There are many ways to establish a connection with a remote machine depending on the OS you are running, but the two most used protocols are:

1) Secure shell (SSH) for linux-based machines

2) Remote Desktop protocol (RDP) for windows-based machines.

**Apache HTTP Server Qns**

**44) How to install Apache webserver?**

**45) What is the command to check apache version, to start and stop the server?**

**46) What is the command to check what are all the modules that are loaded by apache and command to check syntax is OK (or) not?**

**47) What is the imp. configuration file of Apache?**

**48) What are the default ports of apache (both http & https)?**

**49) Where we can change port numbers in Apache?**

**50) What is the diff. b/w forward proxy and reverse proxy?**

**51) In how many ways we can integrate Apache and Jboss?**

**52) Explain how to configure Apache & Jboss by using mod-jk?**

**53) I am trying to access an application, I am getting an error 503 service unavailable, how to troubleshoot an issue?**

**44) How to install Apache webserver?**

A) We can install in 5 steps:

1) Download

2) Extract

3) Execute

4) Configure

5) make

6) make install

1) After downloading software, we need to extract by using command

tar -zxvf <file name>

2) then we can use configure command

<go to apache dir> ./configure --prefix=<installation location>

3) After configuring we can go for make it will compile the source code

http-2.2.25]#make

4) after compiling the all source code, libraries then

http-2.2.25]#make install

5) To install the compiled source file get bin, conf, htdocs, logs, modules, these are the important properties under apache server

6) then we start and stop.

Cd bin# ./apachectl -k start/stop

**45) What is the command to check apache version, to start and stop the server?**

A) Command to check apache version: ./apachectl -v (or) ./httpd -v

Start the server command: ./apachectl -k start

**46) What is the command to check what are all the modules that are loaded by apache and command to check syntax is ok (or) not?**

A) Command to check what are all the modules that are loaded: ./apachectl -M

Command to check syntax is ok (or) not: ./apachectl -t

**47) What is the important configuration file of Apache?**

**A)** httpd.conf is the important configuration file

Path: /opt/Apache Server/conf/httpd.conf

**48) What are the default ports of Apache?**

A) Default HTTP port number/web server port number: 80

Default HTTP secure port number/web server secure port no. is 443

**49) Where we can change port numbers in Apache?**

**A)** To update the Apache HTTP port number

Open httpd.conf file in /opt/Apache http server/conf/httpd.conf and make the changes

-> Restart the Apache server for changes to take effect

**50) What is the difference between forward proxy and reverse proxy?**

**A) Forward Proxy:**

\* Forward proxy let you send a connection request and retrieves the original data from a website.

\* A forward proxy can help you by pass a network block, it usually let client access on firewall restricted website.

**Reverse Proxy:**

\* Reverse proxy can perform authentication tasks, cache, or decrypt data. It provides anonymity for back end servers.

\* not for clients.

\* It controls access to server on a private network.

\* They can encrypt and decrypt data.

\* It acts as a gateway to webserver or group of servers.

\* They can serve as front-facing part of website for the security and flexibility.

\* Reverse proxy helps to bring two or more servers in same url space.

**51) In how many ways we can integrate Apache and Jboss?**

A) There are 3 ways we can integrate Apache with Jboss:

1) mod-jk mode.

2) mod-cluster mode.

3) mod-proxy mode.

**52) Explain how to configure Apache and Jboss by using mod-jk?**

**A)** Application server side:

1) Take backup of standalone.xml file.

2) Add a parameters in standalone.xml

<connector name="ajp" protocol="AJP/1.3" socket-binding="ajp" enable="true" scheme="ajp"/>

Note: above to <virtual-server name=tag>

Check the ajp connector port no under socket binding in standalone.xml (The default port no is 8009)

**Webserver side:**

1) Make sure we have mod-jk module in <apache-home>/modules directory (If it's not available download and place in modules directory)

2) Load mod-jk module by adding ajp parameter

LoadModule jk\_module modules/mod-jk.so in httpd.conf file

3) Create 3 new files in <apache-home>/conf directory

mod-jk.conf

workers.properties

uriworkermap.properties

4) Include mod-jk.conf in httpd.conf file by adding ajp parameter.

Include conf/mod-jk.conf

5) In mod-jk.conf file define the location of workers.properties, jk log file location, log level, log format, jk mount application context, allow from IP address, jk mount file - the location of uriworkermap.properties.

6) In uriworkermap.properties map the context root of an application which we have to access.

a) In workers.properties file specify worker node port, ajp connector port no of the app server instance, host name, protocol, lb factor, load balances, workers, sticky session to true or false etc.

b) Restart web server

c) Now we can access the applications through webserver

**53) I am trying to access an application I am getting an error 503 service unavailable, how to troubleshoot an issue?**

**A)** Steps to troubleshoot 503 service temporarily unavailable

1) Check the status of application server is down will get 503 error service temporarily unavailable.

2) Check the telnet from the webserver to appserver if it is not working and the application server is down and start the app server.

3) While starting appserver check if there are any error, it will be updated in server.log file.

4) Check issues in port, low memory, any file is missing.

5) Once appserver is started, check the application access from appserver. They try from accessing webserver.

6) If still not able to access look into mod-jk.log after enabling log level=debug mod-jk.conf

7) mod-jk.log will update with detailed message webserver is trying to establish ip and port number & the context root.

Based on the above troubleshooting methods we can troubleshoot 503 issue.

**54) Explain how to configure mod-cluster?**

A) 1) Download mod-cluster file

2) Extract tar -zxvf mod-cluster file

3) After extract copy the 4 modules in apache modules directory

\* Filenames:

**1) mod\_proxy\_cluster.so**

**2) mod\_manager.so**

**3) mod\_cluster\_slotmem.so**

**4) mod\_advertise.so**

4) Check the multicast IP working in apache and Jboss

5) Do change in httpd.conf file virtual host sections, what are the IPs that apache

6) Add IP address and lines

7) Set handler after

8) Order deny, allow

11) After save the httpd conf

-> Start the server in apache sbin

./apachectl -k start

12) Console login in firefox http://ip address:6666/mod\_cluster\_manager

13) Multicast IP using start the server command

14) ./standalone.sh -c standalone-ha.xml -u 224.0.1.105 -Djboss.socket.binding.port-offset=200 -Djboss.bind.address.management=(ip address -b ipaddress

15) Multicast IP using start the second server command

16) ./standalone.sh -c standalone-ha.xml -u 224.0.1.105 -Djboss.socket.binding.port-server.base.dir=Path of second server -Djboss.socket.binding.port-offset=300 -Djboss.bind.address.management=ipaddress -b ipaddress

**55) Explain how to build horizontal cluster in domain mode by explain master-slave configuration?**

A) 1) First we will create in two boxes

2) Both two missions java and jboss installation will

3) First box will use a ping command, ip address in master box and slave box

4) In master we will add eap home bin, ./add-user.sh

5) Copy the secret value in slave box domain home configuration host-slave xml and entered in master ip address

6) In host-slave.xml file in domain controller add the username and password

7) After complete save the host-slave.xml

8) In master box eap home bin start the server command

./domain.sh -Djboss.bind.address.management=master ip address -b IP address of master

9) In slave box eap home bin start the server command

./domain.sh --host-config=host-slave.xml -Djboss.domain.master.address=master ip address -b slave ip address

**56) What is the garbage collector and what are different types of gc policies?**

A) Garbage collector:-

\* It’s a mechanism to remove unused objects from a heap memory which don’t have references.

\* GC will delete only abandoned objects.

\* The GC execution in the young generation is called as minor GC and old generation is called as major GC.

\* Minor GC will execute frequently and major GC will not execute frequently.

\* If major GC is execute frequently that will impact the performance on server.

1) Young generation

2) Old generation

GC policies:-

1) Serial collector

2) Parallel Collector

3) Concurrent mark and sweep collector

4) G1GC

**58) What are the difference b/w heap dumps and thread dumps?**

**A) Heap dumps:-**

\* It contains information about java objects or heap objects.

\* We can find the size of the objects, references of the objects and relation between the objects.

\* It is most usefully debug in memory leaks

./jmap -dump:format=b,file=filename pid

(or)

./jmap -heap pid > filename

Thread dumps:-

\* It contains information about the threads.

\* We can find the status of the threads like running, waiting, deadlock and block.

\* It is most usefully debug the performance issuesm,

Kill -3 pid

(a)

jstack -l pid > filename

**59) What is the command to generate thread dump?**

A) We can generate a thread dump by using a command

(a) Kill -3 pid

(b) jstack -l pid > filename.txt

**60) What is the command to generate heapdump?**

A) We can generate a heap dump by using a command

(a) ./jmap -dump:format=b,file=filename,pid

(or)

./jmap -heap pid > filename

**61) How to resolve out of memory error?**

1) First I will generate heap dumps and thread dumps.

2) After getting an approval I will restart the server issue will be resolved.

3) If we are getting continuously the same error, I have to find out RCA.

4) I will analyze the heap dumps if there are any memory leaks I will inform to application team that there are memory leaks with application class packages and I will forward the dumps and the memory leaks screenshots to the application team.

5) They will tune the code and we will get reinstalled into the server.

7) What is the heap size that is assigned for the JVM.

8) If there is no scope to increase the heap size I will inform to onshore support team if they say yes to increase heap size we will increase heap size.

9) This is the exceptional case in general we will take the dumps and we will restart the server, issue will be resolved.

**62) Write a shell script to send an email alert when its CPU utilization reaches more than 90%?**

A) If you are using Linux system.

-> First install an email sending programmer and mailx.

-> You can then use the below script which I used to use for sending email.

#!/bin/bash

current = $(df | grep / | awk '{print $5}' | sed 's/%//g')

Threshold = 90

if [ "$current" -ge "$Threshold" ]; then

mail -s "Disk Space Alert Server Name" someone@somewhere.com << EOF

If you just want to get the percentage of CPU utilization (via an email alert), instead of the information about the processes, when the system

and Unix using various methods:

**-> -x option to debug a bash shell script:**

-> Run a shell script with -x option

# bash -x script-name

# bash -x admin.sh

-> Use of set builtin command:

-> Bash shell offers debugging options which can be turned on or off using the set command:

1) set -x : Display commands & their arguments as they are executed.

2) set -v : Display shell input lines as they are read.

With the following (for debugging) code:

#!/bin/bash -xv

You can replace the standard shebang line:

#!/bin/bash

**64) Write a shell script to count the no. of java processes and to send a mail alert?**

A) Code for processes count and send a mail alert

#!/bin/sh

NOP = `ps -ef | grep -i nagios.cfg | grep -v grep | wc -l`

if [ $NOP -gt 2 ]

then ,

echo "More Parent processes are running on the server" | mail -s "More Parent processes are running on the server" abc@xyz.com

fi

-> And your script can be optimized to one line also.

\* The start-up script and an environment configuration file are located in the EAP\_HOME/bin/init.d directory.

-> 1. Open the configuration file, jboss-as.conf, to edit it.

-> 2. Customize the start-up options in the jboss-as.conf file.

-> There are several options within the jboss-as.conf file. At the minimum, specify the correct values for JBOSS\_HOME and the JBOSS\_USER variables. If these variables are absent, add them.

3) Copy files into system directories

a) Copy the modified configuration file to the /etc/jboss-as directory.

[user@host init.d] $ sudo mkdir /etc/jboss-as

[user@host init.d] $ sudo cp jboss-as.conf /etc/jboss-as/

b) Copy the start-up script to the /etc/init.d directory

[user@host init.d] $ sudo cp jboss-as-standalone.sh /etc/init.d/

4) Add the start-up script as a service

-> Add the new jboss-as-standalone.sh service to list of automatically started services using the chkconfig service management command.

[user@host init.d] $ sudo chkconfig --add jboss-as-standalone.sh

5) Start the service

-> Test that the service has been installed correctly by using the standard syntax for starting Red Hat Enterprise Linux services.

[user@host bin] $ sudo service jboss-as-standalone.sh start

-> If everything has gone correctly, you should get a green [OK]. If you get an error check the error logs and make sure your paths are correct in the configuration file.

6) Make the service start automatically when you restart your server.

-> To add the service to the list of services which start automatically when your server restarts, issue the following command:

[root@host ~]# chkconfig jboss-as-standalone.sh on

Note: The steps above describe running EAP as a service in standalone mode. In order to run EAP as a service in domain mode, use the same steps but replace the start-up script with jboss-as-domain.sh.

**65) Troubleshooting Performance Issues:**

1) Check load on server

2) Check all cluster instances are running or not

3) If any JVMs are down, up the JVMs

4) Check the cpu utilization

5) Check the disk usage and memory, if any process is consuming high cpu utilization. If required I will generate heap dumps and thread dumps. I will check the status of JVM.

6) Check the GC behaviour how frequently major GC is executing. If major GC is executing frequently, that will impact the performance because of multiple major pause times.

7) Check the connection pool usage, if connection pool don't have any connections request have to wait for connection objects that has impacts performance.

8) If there is any scope to tune the resources I will create a change activity after getting change approval I will implement change activity.

**66) Features of Jboss:**

1) Fast response

2) High availability and clustering

3) New management tools

4) Centralized administration/domain mode

5) Simplified configuration

6) Light weight and less memory

7) Cloud support

**67) Diff b/w Wildfly and EAP**

**Wildfly:**

1) It is open source software "no need to pay"

2) Not support

3) Latest version - 24.0.0

**6b) EAP**

1) It is payable software

2) It is supportable software application

3) Latest version - 7.4

**68) Diff b/w Mod-Cluster and Mod-jk ?**

1) Mod-jk we need only one module file: Mod-jk.so

2) In mod-jk apache is responsible to establish a socket connection b/w webserver and appserver.

3) In mod-jk, auto scaling is not possible.

4) mod-jk will use ajp protocol by default port number: 8009.

**Mod-cluster**

1) In Mod-cluster we need 4 modules

a) Mod-advertise.so b) Mod-manager.so c) Mod-proxy-cluster.so d) Mod-cluster-slowmin.so

2) In mod-cluster jboss is responsible to establish a socket connection b/w webserver and appserver.

3) We achieve auto scaling in mod-cluster.

4) Mod-cluster will use advertise mechanism multicast IP and proxy port number: 6666.

**69) Diff b/w Type-2 driver and Type-4 driver**

**A) Type-2**

1) Type-2 driver is a thick driver.

2) Here we need additional native jar's to communicate b/w app server and db server.

3) The request from appserver is converted into native app calls.

b**) Type-4 driver**

1) It is a pure java driver (thin driver)

2) Here we don't require additional native client.

3) Directory app server will interact with DB server with the help of driver class.