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1) What is an application Server?

- A) Application server provides the runtime environment for the applications. It takes the responsibility to receive the request from the end users and identify the requested resource to execute a resource and to generate response to the end users.

2) What is the difference between Web application and Enterprise application?

* A) Web Application

i) It is a collection of web resources like html files, servlets, JSP's, XML files, properties, JAVA scripts etc., and build together as .war file.

2) It won't contain an EJB components/container.

3) To execute web application or a .war file we require a web container which is available in Apache Tomcat, IBM Websphere, Oracle Weblogic and Redhat Jboss.

Eg:- Normal websites like

www.ngit.in, www.andhranaadi.com etc,

3) How to set java path in windows and linux?

A) In windows we will provide java path in system environment entries.

Control Panel → system & security → system → Advanced system settings → Environment variables

→ In environment variable settings select new system variables
select new and add jdk folder path and in variable name
type give JAVA_HOME and variable value as copied path of
jdk folder. Now click OK.

→ In system variables select path and click edit then add jdk/bin
as new variable value and then click OK.

In linux to set java path

```
export JAVA_HOME = "/installDir/jdk-1.8-144"  
export PATH = $JAVA_HOME/bin:$PATH
```

4) How to check java version (a) what is the command to check java version?

- A) java -fullversion
- B) In how many ways Jboss can be installed and explain how to install by using zip extraction and console mode?
- C) There are 5 ways to install JBoss:-

- 1) GUI mode
- 2) Zip extraction
- 3) Console mode
- 4) Silent mode
- 5) rpm file

Zip extraction:

→ Copy the downloaded zip bundle and copy to any directory
(opt) and extract it.

→ Then start the server and check it's properly extracted and working or not.

- 1) Download zip file of Jboss and extract zip file to specified folder.
- 2) Copy EAP home/bin folder path and paste it in command prompt.
- 3) Now execute a command

add-user.bat (Windows)

add-user.sh (Linux)

then select management user and enter

6) 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?

A) 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

8080 → To access application

8443 → https port for finding

8009 → ajp port

- 9) What is the command to start a server in standalone mode, with port offset?
- A) Standalone.bat -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. Hence administration is local.
- 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 a command standalone.sh in linux environment.
- 1) It provides centralized administration.
- 2) We can manage multiple servers on remote machines from a single management console.
- 3) Here we have a concept of master and slave.
- 4) With the help of server groups, it will be easy to deploy application on multiple servers.
- 5) Here we use domain.sh to start a server in linux environment.

(12) What are the important configuration files in JBoss?

- A) In standalone mode In domain mode
- standalone.xml
 - Standalone-ha.xml
 - standalone-full.xml
 - Standalone-full-ha.xml
 - 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) 5 different types of profiles:-

1) default

2) ha

3) full

4) full-ha

5) load-balancer

default:- It supports jee web profile components without clustering.

ha:- It supports jee web profile components with clustering.

full:- It supports jee full profile components without clustering.

full-ha:- It supports jee full profile components with clustering.

load-balancer:- We can configure for load balancing for appserver.

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

A) *standalone.bat -Djboss.server.base.dir="absolute path of new Jboss instance" → with default port-offset = 5000.

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

netstat -an | grep 8080 If none or its with any port, then you can set offset value.

15) What is the linux command to check the port availability?

A) netstat -antp | grep portnumber

16) What are the important log files in Jboss?

A) server.log host-controller1.log gc.log process-controller1.log.

reloading as no reloads no package of this application in Jboss?

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
- 4) Eclipse
- 5) MyEclipse
- 6) ANT
- 7) Maven
- 8) UC-deploy (Urban Code)

- 18) How to check the apache http Version (or) 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-7.1.1.jar
-
- 21) What is the command to deploy an application in a particular server group?
- 22) How to deploy an application using file based deployment?
- 23) At the time of deployment in which location Content file will be created in standalone & domain modes?
- 24) Which xml file will be updated at the time of deployment in standalone & domain modes?
- 25) How will you confirm that application has been deployed successfully?
- 26) Can we start a server if a content file is deleted?
- 27) What are different types of jdbc drivers? In how many ways we can configure jboss and db server?
- 28) What is the connection url for oracle?
- 29) How to troubleshoot if a db connection fails?
- 30) What is the jboss-cli command to create a server group?
-
- 21) What is the command to deploy an application in a particular Server group?
- A) deploy <path of .war (or) .ear> (In standalone mode)
deploy <path of .war> --server-groups=main-server-group
(In domain mode)
- ↓
This may be .war file (or) .ear file

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

- 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?

- 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?

- In standalone mode:> standalone.xml will be updated

→ 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?

- Look into server.log > Here we can find the deployment log message.
<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.

→ JDBC driver is a software component that enables java application to interact with the database.

server applications are used by JDBC providers to retrieve data from databases.

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

→ JDBC providers holds implementation type

→ JDBC provides an interface for datasource to connect a database.

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 -> oracle@192.168.1.34:1521:xe

Eg: jdbc:oracle:thin:@192.168.1.34:1521:xe

30) How to troubleshoot if a database connection fails?

A) 1) 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 host name / 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.

2) If we get java.sql.SQL Exception: invalid username / password; logon denied.

jar files.

4) Verify the connection url.

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

ii) /server-group = ICICI-Bank: add

(profile=ha, socket-binding-group=ha-sockets)

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32) Write all the jboss-cli commands to create a datasource?

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

34) What is a datasource?

35) What is difference b/w XA and Non-XA datasources?

36) What is a connection pool?

37) What is the difference b/w background Validation and Validation-on-match?

38) what are the jar files that are required for oracle, DB2 and mySQL?

39) What is the use of Telnet? syntax for Telnet?

40) what is the diff b/w Webserver and App Server?

41) Explain request flow?

42) What is default Telnet and SSH port numbers?

43) How to connect to the remote linux servers (a) cloud servers in the broad environments (b) real time environments?

32) Write all the jboss-cli commands to create a datasource?

i) Load jar file by executing a command:-

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

ii) Update the driver by executing a command:-

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

3) Create a 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

4) Test the connection:-
/subsystem=datalources/data-source=oracle-DS-PAYTM:test-connection-in-pool.

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

A) /subsystem=datalources/data-source=oracle-DS-PAYTM:test-connection-in-pool.

34) What is a datasource?

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

35) What is the difference b/w XA and non-XA datasources?

A) XA datasource

Non-XA datasource

* It supports global transactions. * It supports local transactions.

* If a transaction is completed, * Once a transaction is completed it won't commit immediately until & with a particular schema (a) DB unless all the dependent transactions immediately it will commit. It are successful. won't wait for the dependencies.

* In XA datasource either it will - * Normally we will use non XA commit all the schemas (a) DB's when immediately transactions at once (b) none of the schemas will commit, it won't wait. (c) DB's will commit.

* XA ds is used whenever applications. * We can use non-XA ds if there are no dependencies.

are trying to use the 3rd party applications or external applications, dependent on external applications. * It supports single phase commit.

* It supports 2 phase commit.

36) What is a connection pool?

A) * It maintains pre-defined connection object.

* Whenever app server request database connection, it will use existing connection objects from connection pool, instead of.

creating a new connection object.

* 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.

37) 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 recheck that the connection object is active or not before assigning the connection object to a request.

* If validate-on-match is true that will impacts the performance.

* If we enable it as true that will increase 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: ojdbc14.jar

For 7.0 Version: ojdbc6.jar

For DB2:- Db2jcc.jar, Db2jcc-license-eu.jar, db2jcc-license-cisuz.jar

For MySQL:- com.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 port number 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,

Appserver

1) It can serve both static and dynamic resources like servlet's, jsp's, inner etc..

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

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

3) Here we can deploy both Web & enterprise applications.

(4) 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 and it forwards that request to load balancer. Load balancer forwards that request to Webserver.
 - At the time of webserver startup, it loads http.conf file into the server, it contains path of the plugin-cfg.xml file.
 - plugin-cfg.xml file contains complete information about 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 Web Container 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.

4th Mar'22

- Ques)
- 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?

- (Ques)
- How to install Apache webserver?
- A)
- 1) We can install in 5 ways
 - 1) Download
 - 2) Extract
 - 3) Configure
 - 4) make
 - 5) make install
- 1) After downloading software we need to extract by using command
`tar -zxf <file name>`
- 2) then we can use configure command
`cd <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.

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

A) Command to check apache version:- `/apachectl -v` or `(0) ./httpd -v`

Start the server command:- `/apachectl -k start`

Command to stop the server:- `/apachectl -k stop`

46) What is the command to check what are all the modules that are loaded by apache and command to check syntax is OK (0) not?

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

Command to check syntax is OK (0) 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 or well known port no.

Default HTTP secure port number / web server/secure port no. = 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 httpserver/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 lets 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 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.

Q1) In how many ways we can integrate Apache and Jboss :-

A) There are 3 ways

1) mod-jk mode

2) mod-cluster mode

3) mod-Proxy mode

(Q2) Explain how to configure Apache and Jboss by using mod-jk?

A) 1) Application server side:

* Take backup of standalone.xml file and standard config file.

* Add a parameter 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 = 8009).

2) 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 dir)

2) Load mod-jk module by adding a parameter

```
LoadModule jk_module modules/mod-jk.so,
```

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 all parameters.

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, jkmount file - the location of uriworkermap.properties.

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

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

8) Restart web server

9) 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 not available.

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

3) While starting appserver check if there are any errors, 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. After enabling

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 with which ip and port number & the context root.

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

12th Mar'22

(54) Explain how to configure mod-cluster?

55) How to build horizontal cluster in domain mode (or) explain master-slave configuration?

56) What is heap memory?

57) What is garbage collector and what are different types of gc policies?

58) What are the differences b/w heap dumps & thread dumps?

59) What is the command to generate thread dump?

60) What is the command to generate heap dump?

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

62) Write a shell script to send mail alert if its CPU utilization reaches more than 90%.

63) How to run a shell script in debug mode?

64) Write a shell script to count the number of java processes and send a mail alert?

65) How to register JBoss as a linux service?

54) Explain how to configure mod-cluster?

A) i) download mod-cluster file

ii) Extract tar -zXvf mod-cluster-file.tar.gz into apache directory

iii) After extract copy the 4 files in apache modules directory

a) filenames

1) mod-proxy-cluster.so

2) mod_manager.so

3) mod-cluster-slb.so

4) mod_advertise.so

iv) check the multicast ip working in apache and jboss

v) do change in httpd.conf file virtual host sections, what are the ips that apache will handle and which port?

vi) add ip address and lines

vii) set handler after

viii) Order deny, allow

- 11) After save the httpd config
 → 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=127.0.0.1 -Djboss.bind.address=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-offset=300 -Djboss.bind.address.management=ip address -b ipaddress`
- 55) Explain master-slave configuration?
- A)
- 1) First we will create in two boxes
 - 2) both two missions java and jboss installation
 - 3) First we will use 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.bind.address=[Master IP Address]] -Djboss.domain.master.address=master ip address -b slave ip address`

1) young generation

2) Old generation

57) 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.

GC policies:-

1) Serial collector

(ro)

2) Parallel Collector

concurrent marking garbage collector

3) Concurrent mark and sweep collector

uses concurrent marking and sweeping

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.

other - jmap -dump: format = b, file = filename pid

(or)

• jmap -heap pid > filename

Thread dump:-

- * 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 issues

kill -3 pid

jstack -l pid > filename

59) What is the command to generate thread dump?

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

kill -3 pid

jstack -l pid > filename.txt

60) What is the command to generate heapdump?

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

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

./jmap -heap pid > filename

61) How to resolve out of memory error?

A) 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 new build into the server.

value

- 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 mail alert when its CPU utilization reaches more than 90%.

A) If you are using linux system.

→ First install a email sending programme and mailx.

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

```
#!/bin/bash
current=$(df -h | grep / | awk '{print $5}' | sed 's/%//g')
Threshold=90
if ["$current" -gt "$Threshold"]; then
    mail -s "Disk Space Alert Server Name"
    someone@somewhere.com
fi
```

→ 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 reaches a given threshold, then use the script given below

```
/usr/bin/cat /proc/loadavg | awk '{print $1}' | awk '{if ($1>90)
printf ("Current, CPU utilization is: %.2f %.\n"), $0;}' | mail -s
"High CPU Alert" example@gmail.com
```

→ Output: You will be getting an email alert similar to the one below

Current CPU Utilization is: 90.40%

and Unix using various methods:

⇒ -x option to debug a bash shell script:-

→ Run a shell script with -x option will trigger numbers of

\$ bash -x script-name

\$ bash -x domain.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 shell configuration file (~/.bashrc)

#!/bin/bash

source /etc/profile

Q4) Write a shell script to count the no. of java processes and to send a mail alert?

A) ⇒ Code for processes count and sends a mail alert:-

#!/bin/sh

NOP='ps -ef | grep -I nagi0s.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 associated configuration file are located in the \$JBOSS_HOME/bin/init.d/ directory.

→ 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
```

restarted.

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.

66) Troubleshooting Performance issue:-

- 1) Check load on server
- 2) Check all cluster instances are running or not
- 3) if any jvm's are down, up the jvm's
- 4) Check the cpu utilization
- 5) Check the disk usage and memory, if any process 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.

67) Features of Jboss:-

- 1) Fast response
- 2) High availability and clustering

- 4) New management
- 5) Centralized administration / domain mode
- 6) Simplified configuration
- 7) Light weight and less memory
- 8) Cloud support

68) Wildfly

- 1) It is open source software
no need to pay.
- 2) Not support
- 3) Latest version - 24.0.0

69) Mod-jk

- 1) In mod-jk we need only one module file Mod-jk.so which provides interface between apache and jboss.
- 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.
- Apache will handle requests and then forward them to application server.

EAP

- 1) It is payable software.

- 2) It is supportable software application.
- 3) Latest Version - 7.4

Mod-cluster

- 1) In Mod-cluster we need 4 modules

- 1) Mod-advertise.so
- 2) Mod-manager.so
- 3) Mod-proxy-cluster.so
- 4) Mod-cluster-slotmen.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

70) Type-2 driver

- 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 ap2 calls.

71) Weblogic 11g

- 1) It supports jdk 6 and 7
- 2) We will get the plug-in module along with Weblogic installation.
- 3) We can apply patches by using BSU smart updates.
- 4) For entire installation we will use only one node manager.
- 5) It supports static clusters.

72) Websphere 7.0

- 1) There is no concept of IM.
- 2) No liberty profile.
- 3) No dynamic clusters.
- 4) We can't generate thread dumps and heap dumps through admin console.

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 servers with the help of driver class.

Weblogic 12c

- 1) It supports jdk 7
- 2) We have to download plug in module separately from oracle support site.
- 3) We have O patch utility to apply patch.
- 4) For each and every domain we will get separate node manager.
- 5) It supports dynamic clusters.

Websphere 8.0 & 8.5

- 1) It install IM before installing Websphere IM's plugins.
- 2) There are introduced liberty profile.
- 3) Here we have dynamic clusters depends on the load clusters.
- 4) We can generate thread dumps and heap dumps through admin console.

- 1) What are the diff blw packages?
explain the diff blw packages?
- 2) What are the prerequisites to check before installing Websphere?
- 3) In how many we can install WAS-7.0?
- 4) What is the command to install Installation Manager?
- 5) What is the Imcl command to install WAS-8.5?
- 6) What is the Imcl command to install IHS-8.5?
- 7) What is the Imcl command to install plugins-8.5?
- 8) What is a profile?
- 9) What are different types of profiles in WAS-7.0 & WAS-8.5?
application server profile and deployment manager profile,
- 10) What are the differences blw deployment manager profile, application server profile and custom profile?
- 11) What is the command to create a profile?
- 12) What is the log file that will update at the time of profile creation? How will you confirm that profile has been created successfully and where is the log file located?
- 13) What is the command to list the profiles?
- 14) What is the command to delete the profiles?
- 15) Which xml file have all profiles information?
- 16) Explain about federation?
- 17) What is the command to federate a node?
- 18) What is the default dmgr soap connector port number?
Where we can find the [Simple object access protocol]
port no.?
- 19) What is nodeagent?
- 20) What is the command to start a nodeagent?
- 21) What is the command to synchronize a node?
- 22) What is the command to take a backup without stopping a server?
- 23) Is it possible to access applications if a nodeagent is down?

- 24) Is it possible to access applications? -
- 25) What is the wsadmin command to create a JDBC provider
↓
Websphere scripting and a datasource?
- 26) Explain how to configure JDBC provider and datasource
through admin console?
- 27) What is JDBC provider?
- 28) What is the difference b/w connection pool, datasource
and XA datasource?
- 29) What is a datasource?
- 30) What is the connection url for oracle?
- 31) What is the use of J2C alias?
- 32) What is the jar file required to configure oracle and db2?
- 33) What are the default port no.s of oracle and db2?
- 34) What are the xml files that will update at the time of
configuring JDBC provider and datasource? resources.xml
variables.xml
- 35) What is a connection pool?
- 36) What is unused timeout and Aged timeout?
- 37) What is a reap time?
- 38) What are different purge policies and explain the differences?
- 39) What is the cause of stale connection exceptions?
- 40) What are the default minimum connections and maximum
connections?
- 41) How to troubleshoot if DB connection fails?
- 42) What type of applications we can deploy in WebSphere?
- 43) What is the wsadmin command to deploy an application?
- 44) In which location application will be deployed by default?
- 45) Explain the steps to deploy an application by using admin
console?

- 46) What is the log file that will update at the time of deployment?
- 47) How to take a backup of an application?
- 48) What are different wsadmin objects and explain the importance of each object?
- 49) Where we can find context root?
- 50) Explain Request flow?
- 51) Explain how to integrate IHS, plugins and WebSphere?
- 52) What is the module that is required for IHS to configure with plugins and Websphere? ~~Mod-was-ap22~~
- 53) What is the command to generate plugin-cfg.xml?
- 54) Where the plugin-cfg.xml will be generated by default?
- 55) What is the use of Plugins?
- 56) What information is available in plugin-cfg.xml?
- 57) If I want to stop the request to the particular JVM, what are the changes that we have to do in plugins?
- 58) How to enable trace (for) in plugins?
- 59) What are different log files?
- 60) How to troubleshoot 404 error?
- 61) How to troubleshoot 500 internal server error?
- 62) What is a cluster and what are difference types of clusters?
- 63) Explain how to configure horizontal cluster?
- 64) What are the differences b/w thread dumps and heap dumps?
- 65) What is the wsadmin command to generate thread dumps?
- 66) What is the wsadmin command to generate heap dumps?
- 67) What are the configuration changes we have to do to generate both thread dumps and heap dumps by using kill -3 pid?
- 68) How to enable verbose gc?
- 69) What are different gc policies in WebSphere?
- 70) Where we can increase heap size in WebSphere?

- 71) What is the XML file that will update whenever we do heap changes?
- 72) What is the command to install fix pack?
- 73) What is the command to check installed packages?
- 74) What is the command to check WAS version?
- 75) What is the difference b/w fix pack and refresh pack?
- 76) What is the default location that thread dumps and heap dumps will be generated and what are the filenames?
- 77) What are the differences b/w WAS-7.0 & WAS-8.5
- 78) What is a liberty profile?
- 79) What are the differences b/w thick driver and thin driver?
- (a) Type 2 driver and Type 4 driver
- 80) Explain the steps to install fix pack?

Dumps file names :- Javacore.timestamp.pid.dumpnumber.txt
heapprof.timestamp.pid.dumpnumber.phd

- Virtual host
- ↓
- 2 types
- dynamic cluster
- ↓
- based on load
- it will start & stop
- Management User
- Jboss
- We can do all admin activities
- Application User
- JBoss
- JBoss
- JBoss
- Ripple starts
- includes
- server crash
- server hung
- Jenkins is an open source automation tool written in java with plugins built for continuous integration purpose.
- Plugins allows integration of various devops stages.
- Find and replace a string without vi editor
- sed -i 's/oldstring/newstring/g' file.txt
- In vi editor
- esc : %s/oldstring/newstring/g
- esc :wq

	Default Port Number	HTTP Port → 9080
Admin	Console → 9060	Soap Connect Port
Admin	Console Secure → 9043	→ 8880
HTTP	Port Secure → 9443	Scanned with CamScanner

Answers:-

Draj Arshad
Date: 10-10-2023



Q) There are 3 types of packages in Websphere:-

1) Express package

2) Base package

3) Network Deployment package

→ Express package and Base package supports standalone environments. It does not support clustering. Here we can create only application server profile.

→ Network deployment package supports distributed environments and it supports clustering.

2) Prerequisites to install Websphere:

1) check the compatibility

2) Free disk space minimum to 10GB and 5GB in tmp

3) Check file permissions

4) check the free memory and CPU

3) In 2 ways we can install WAS-7.0:

1) Graphical mode (GUI mode)

2) Silent mode

→ To install WAS-7.0 by using silent mode:

1) In the setup we have response file called responsefile.nd.txt

2) Take the backup of that response file

3) Modify the response file, we have to specify licenseacceptance=true, installation.location, profile type and profile parameters,

4) Then execute that modified response file by using a command

./install -options <path of the modified response file> -silent

5) If it is installed successfully, we will get a message

INSTCONF SUCCESS in the log file log.txt

<WAS-ROOT>/logs/install directory.

4) Command to install Installation Manager :-

GUI mode:- ./install

Console mode:- ./installc -c

ID
package of IM

Imcl command:- ./imcl install com.ibm.cic.agent -repositories

" /path of repository.config" ("root/Desktop/softwares/IM/repository.config")

-installationDirectory "/opt/IBM/InstallationManager/eclipse" -accessRights

admin -acceptLicense -showProgress

Silent mode:- ./installc -log /tmp/im-install-log.txt -acceptLicense

5) Imcl command to install WAS-8.5 :-

./imcl install "package id of WAS-8.5" -repositories "path of repository.

config file" -installationDirectory "specify the location where we have"

to install Websphere" -acceptLicense -showProgress.

6) Imcl command to install IHS-8.5 :-

./imcl install "package id" -repositories "/root/Desktop/IHS-extracted/

repository.config" -installationDirectory "/opt/IHS-8.5" -acceptLicense

-properties user.ih.s.httpport=80 -showProgress

7) Imcl command to install plugins-8.5 :-

./imcl install "package id of plugin" -repositories "/root/Desktop/

plugins-extracted/repository.config" -installationDirectory "/opt/plugins-8.5"

-acceptLicense -showProgress

8) Profile:-

→ A profile is an environment, which contains server, admin console, node and some supporting configuration files; which helps to do admin activities on servers and applications.

9) Types of profiles in WAS-7.0 :-

1) Default profile (Application Server Profile)

2) Deployment manager profile (DMGR profile)

3) Custom (or) managed profile

4) Cell profile

7) Job manager profile

In WAS-8.5 :-

- 1) Default profile (Application Server Profile)
- 2) Deployment manager profile
- 3) Custom (or) managed profile
- 4) Cell profile
- 5) Admin Agent profile
- 6) Secure Proxy profile
- 7) Job manager profile
- 8) Liberty profile

10) Deployment manager profile:-

→ It contains Dmgr cell, admin console, Dmgr node and Dmgr server.

→ We cannot deploy any applications under Dmgr server. Dmgr server is mainly used to manage the federated profile servers and applications.

→ We can create multiple servers through Dmgr admin console; if the node of either application server profile (or) custom profile is available with Dmgr cell. The Deployment manager runs in its own JVM.

Application Server profile:-

→ Here by default we will get a server server1, admin console, node and additional configuration files.

→ We can create multiple servers under the Appnode, if the node is associated with the Dmgr.

Custom Profile (or) Managed profile:-

→ Here by default we will get an empty node and we won't get any admin console and server to deploy applications.

→ This node must be federated to the Dmgr cell then only it will be useful, otherwise it is useless.

Note: We cannot create multiple nodes within the profile.

Path <absolute template path> -hocelName <name of the cell>
-cellName <name of the cell> -hostName <name of the host>

12) Log file that will be created at the time of profile creation:-

profilename -create.log

→ If it is created successfully then we will get a message
INSTCONFSUCCESS

→ Location of that log file -<WAS-Root>/logs/manageprofiles directory

13) Command to list the profiles:-

→ Go to WAS-Root/bin directory and execute the command

WAS-Root/bin> ./manageprofiles.sh -listProfiles

14) Command to delete a profile:-

→ Go to WAS-Root/bin directory and execute the command

./manageprofiles.sh -delete -profileName <name of the profile>

If it deletes successfully we will get INSTCONFSUCCESS message.

15) XML file which have all profiles information:-

→ Profile Registry.xml file contains all the profile information.

→ It will be under WAS-Root/Properties directory.

16) Federation:-

→ Federation is the process of adding node (i.e.) either Application profile node (or) custom profile node to the DMGR cell.

→ After federation we can achieve single point administration and we can create 'n' number of servers and can deploy 'n' applications under that federated node.

Go to WAS-Root/profiles/APPserver01/bin > execute below command.

```
./addNode.sh <hostname of DMGR> <SOAP connector address of DMGR> -includeapps
```

18) Default DMGR, SOAP connector port number:-

8879

→ We can find port number in Serverindex.xml (or) in admin console also we can find port number by expanding ports.

19) NodeAgent:-

→ Node Agent is a server which acts as communication between Dmgr and application server profile/custom profile which is federated to Dmgr.

→ Node Agent will create during federation process.

20) Command to start a nodeagent:-

→ If you have federated with Appserver node then go to profiles/appserver01/bin directory and execute the command WAS-Root/profiles/APPserver01/bin > ./startNode.sh

→ We cannot start nodeagent through admin console. But we can restart through admin console.

21) Command to synchronize a node:-

The full synchronization command is Go to WAS-Root/profiles/

AppSrv01/bin directory and execute the below command

```
./syncNode.sh <hostname of DMGR> <SOAP connector Address of DMGR>
```

22) Command to take backup without stopping a server:-

Go to WAS-Root/bin directory and execute the below command WAS-Root/bin > ./backupconfig.sh -nostop. (this command is for taking entire WAS backup)

profile-home/bin> ./backupconfig.sh -mybackup
(with mybackup file name)

23) Is it possible to access applications, if a nodeagent is down?

A) Yes, we can access the applications, if the node agent is down or stopped. There is no impact on end users. But, we cannot do administration activities through the dmgr admin console.

24) Is it possible to access applications, if dmgr is down?

A) After federation, if a dmgr is down or machine is completely crashed, at that time also there is no impact for the federated profile servers and applications.

We can access applications normally. But we cannot access dmgr admin console and we cannot do any admin activities on servers and applications.

25) What is the wsadmin command to create a JDBC provider and a datasource?

A) AdminTask.CreateJDBCProvider([-scope specify the scope -database server type -providerType "Oracle JDBC driver" -implementationType specify connection pool datasource / XA datasource -classPath specify the jar file path])

AdminConfig.save() / defining the name and giving the alias

→ To create a datasource execute

AdminTask.CreateDatasource ([-specify for which JDBC provider have to create datasource] -name specify the datasource name -jndiname specify the jndiname and specify the alias name and provide a connection url, for oracle we have to give url and port number : d

AdminConfig.save()

Q26) Explain how to configure JDBC provider and datasource through admin console?

A) Login to management console

Go to resources → Expand JDBC → provider

↓ click on the jdbc provider

↓ select scope

↓ click new → select database type : oracle

↳ Provider type: oracle JDBC - provider

Select JDBC provider → next → implementation: connection pool type

↓ click on datasource configuration (L) Give name

↓ New → click on Alias → give alias name → next → Give path of ojdbc6.jar file

↓ click on JNDI name → give JNDI name → next → finish → Review & save changes → OK

↓ click on URL → give URL (e.g.: jdbc:oracle:thin:@localhost:1521:xe)

↓ click on Test Connection → click on OK → click on Next → Finish → Review → Sync → Save → OK

↓ click on the created datasource

click on JAS-J2C Authentication Data

↓ New

↳ Alias: Give alias name

↳ Userid: Give Username of db

↳ Password: Give db password

↓ click OK → Apply → Review → sync & save the changes → OK

click on the datasource which we created

click on security settings

↓ components managed (select alias name)

↓ OK → Review → sync → OK

click on the datasource → click test connection.

27) JDBC provider:-

→ It specifies what type of database we are running (or) using and supplies the specific JDBC driver implementation classes for accessing specific database and what type of implementation mechanism we are using either connection pool data source (d) XA data source.

28) Difference between connection pool datasource and XA datasource:

Connection Pool datasource XA datasource

- | | |
|---|--|
| 1) It is single phase commit. | 1) It is two phases commit. |
| 2) In case of connection pool datasource, once transaction with a particular schema is completed immediately that schema will be committed. | 2) In case of XA datasource, once a transaction within a particular schema is completed. It will not be committed immediately. |
| 3) It won't consider other schema transactions are successful or not. | 3) Once all the dependency schema transactions are successful, otherwise none of the schema will be committed. |
| 4) It supports local transaction.
<u>Example:-</u> Withdraw an amount from your account. | 4) It supports distributed transaction. |

29) Datasource :-

→ It is a unique name which holds the information about database like hostname of database server, port number of database server, type of the driver, database name and user credentials of database like username and password.

30) What is the connection url for oracle database?

A) protocol: subprotocol: type of driver: @hostname of Database: port number of database: database name

Example:- jdbc:oracle:thin:@192.168.59.130:1521:xe

A) JCA :-

System to an application server and enterprise applications. It stores the username and password. It can use same username and password for multiple resources.

We can create a username and password, But no need to restart server. If you create username and password for DB2, no need to create alias. We can use same username and password.

J2C Alias: J2C aliases is known as Java 2 connection authentication, here we can give authentication data for administrators. This includes username, password of the database.

32) What is the jar files required to configure oracle and DB2?

A) For oracle:-

6.0 & 6.1 version:- ojdbc14.jar

7.0 Version:- ojdbc6.jar

For DB2:- Db2jcc-license_cu.jar, db2jcc-license_cisuz.jar

33) What are the default port numbers of oracle and db2?

A) Default port number of Oracle: 1521

Default port number of DB2: 50,000

35) What is a connection pool?

A) It contains predefined connection objects. Server won't create new connection for each and every request. Server can use existing connection objects from the connection pool, once transaction is completed that connection object will be back to the pool.

If you don't have connection pool mechanism, for each and every request a new connection object will be created by server. Once the transaction is completed, that connection object will be closed and no more available.

36) What is unused timeout and Aged timeout?

A) Unused timeout:- It is the time interval, which specifies when the unused connection objects to be discarded from

Default time interval is zero (0). It means it will never expire.

37) What is a reap time?

- A) It is the time interval, which specifies when the pool's maintenance thread runs across the connection pool. Lesser the reap time more accuracy. Default reap timeout: 180 seconds.

38) What are different purge policies and explain the differences?

- A) Purge is nothing but delete, if any connection/thread was failed, simply its deleted that failed connection.

Purge is having two policies:-

- 1) Entire connection (or) entire pool, 2) Failed connection (or) failing connection

* Purge policy specifies how to do purge connections, when a stale connection or fatal connection errors are detected.

* By default it is entire pool. If we choose entire pool, all physical connections in the pool are destroyed when a stale connection is detected.

* If we choose failing connection, it attempts to destroy only stale connection. The other connection remains in the pool.

* By using purge policy we can resolve stale connection exception.

To resolve this issue we have to apply purge policy.

39) What is the cause of stale connection exception usually happens, when Websphere

- A) → Stale connection exception usually happens, when Websphere was disconnected from the database. It can be caused by database restart or by network issue.

→ 99% of stale connections exceptions are caused by broken firewalls that have TCP timeouts.

→ Whenever server tries to connect through the database with invalid connection objects at that time we will get stale connections exceptions. The connection pool connection objects becomes invalid.

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A) The default maximum connection objects: 10

41) How to troubleshoot if DB connection fails?

A) I will check the synchronization by executing syncnode.sh
hostname of Dmgr soap connector address of Dmgr command
under WAS-Root/profiles/Appserver01/bin directory.

Example:- syncnode.sh 192.168.59.130 8879

* I will check jar files configuration. Expand environments in
admin console → select Websphere variables and I will check the
path of the jar files.

* I will check whether node agent is started or not; If not
started, I will start node agent by using startNode.sh command.

* I will check the login credentials. Click on J2EE authentication
under data sources in admin console, check the database login
credentials. If the database is up and running. If not I

* I will check whether database is up and running. If not I
will up the database.

* Check the datasource details are provided properly or not. If
not I will provide valid datasource details.

* Check whether connection is there between application server
and database. If not I will make a connection.

42) What type of applications we can deploy in Websphere?

A) We can deploy either a .war file or .ear file

→ If it is a .war file we have to provide a context root.

→ If it is a .ear file no need to provide a context root.

43) What is the wsadmin command to deploy an application?

A) Go to Dmgr/bin directory and execute ./wsadmin.sh -lang
python command.

Wsadmin>AdminApp.install('/root/Desktop/softwares/PlantsBy
WebSphere.ear', [-node nodename -host hostname -cell cellname

, -server servername']) → for installing
application

40) What is the default minimum and maximum connection objects?

A) The default minimum connection objects : 01

B) The default maximum connection objects : 10

C) How to troubleshoot if DB connection fails?

D) How to troubleshoot if DB connection fails?

A) I will check the synchronization by executing syncnode.sh

hostname of Dmgr soap connector address of Dmgr command under WAS-Root/profiles/Appserver01/bin directory.

Example:- syncnode.sh 192.168.59.130 8879

* I will check jar files configuration. Expand environments in admin console → select Websphere variables and I will check the path of the jar files, will check whether node agent is started or not. If not

* I will check whether node agent by using startNode.sh command. started; I will start node agent by using startNode.sh command.

* I will check the login credentials. Click on J2EE authentication under data sources lwsadmin, console, check the database login credentials. If the database is up and running. If not I

* I will check whether database is up and running. If not I will up the database.

* Check the datasource details are provided properly or not. If not I will provide valid datasource details.

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A) Go to Dmgr/bin directory and execute ./wsadmin.sh -lang python command.

wsadmin>AdminApp.install ('/root/Desktop/softwares/PlantsByWebSphere.ear', ['-node nodename -host hostname -cell cellname -server servername']) → for installing application

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44) In which location application will be deployed by default?

A) WAS-Root / profiles / profilename / installedapps / cellname is the default application deployment location.

45) Explain the steps to deploy an application by using admin console?

A) Login in to admin console → Expand applications → Select enterprise applications and select install.

* Browse the location of .war file (or) .ear file (if it is .war file we have to provide context root)

* Provide the application parameters like application name, installation location, whether it contains any web services or ejb's.

* Specify the target under which server / under which cluster, the application has to be deployed.

* Map the resources like data sources and EJB's with JNDI.

* Specify the virtual host name (By default it will take

* Specify the virtual host name as default-host)

* Save the changes and start your application

* Note: if you don't specify the directory to install the application it will be installed by default in <profile-homes>/installedapps.

46) What is the log file that will update at the time of deployment?

A) systemOut.log file of dmgr will get updated. It will be

available under WAS-Root / profiles / Dmgr / logs / servername.

47) How to take a backup of an application?

A) When you execute backupconfig command it will stop the node before backup is made so that partically synchronized information is not saved so you can specify -nostop command

line parameter so that the backup is taken without stopping the server.

cd to <WAS-ROOT> /IBM / WebSphere / AppServer / profiles / Dmgr / bin folder

Execute below command in bin folder to start backing up:

backupConfig.bat | sh

Backup-File-Name-Date.ZIP

backupConfig.sh backup-file [options]

48) What are different wsadmin objects and explain the importance of each object?

A) AdminTask :- set heap size, update application, create server type etc,

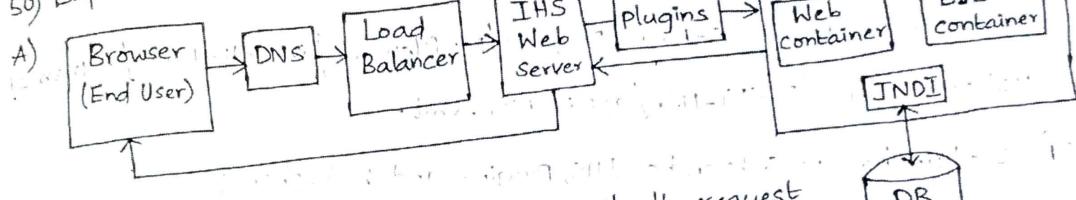
AdminConfig :- create new cluster member, create JDBC data sources

AdminControl :- start, startServer, getPort, cell, names etc

AdminApp :- Application related tasks like deployapp, uninstall apps, deployment status.

Help:- help

50) Explain Request flow?



* Whenever user makes a request, initially request will go to DNS (Domain Name Space); DNS forwards that request to load balancer. Load balancer forwards that request to webserver. We are using IHS as a webserver.

* At the time of webserver startup, it loads http.conf file into the server, it contains path of plugin-cfg.xml file; In plugin-cfg.xml file contains complete information about application server environment.

* Application server contains mainly two containers 1) Web container, 2) EJB container.

* Web container is responsible to execute web resources like servlets, JSP's, HTML etc;

* EJB Container is responsible to execute Web resources like servlets, JSP's, HTML, Session beans, entity beans and message driven beans etc;

* If request is looking for web resources like servlets, JSP's, HTML etc;

orwarded to EJB container through JNDI and RMI (0) -> via protocol by Web container.

* If the request requires any database interaction, that request will be forwarded to connection pool through JNDI. Based on connection pool properties it attains a connection object. Once the transaction has completed, that connection object will be back to the pool.

* Finally response will be forwarded from Web container to Web server and Webserver will forward that response to end user.

Q) Where we can find context root?

A) We can find context-root in application.xml file. It will be available under WAS-Root/profiles/profilename/installedapps/cellname/applicationname/META-INF/application.xml.

Q) Explain how to integrate IHS, Plugins and Websphere?

A) * Install Webserver

* Install plugins, while installing plugins specify the webserver to configure, httpd.conf file location, WAS-ROOT location, Webserver port number, Webserver definition and profile name.

* After installing plugins, generate Plugin file by using.

GenPluginCfg.sh under dmgr01/bin directory path.

* Copy that generated plugin-cfg.xml file and paste it into the location which is pointed by the httpd.conf file.

* Restart your Webserver if necessary.

* Generated plugin-cfg.xml file will be under

<dmgr profile-home>/config/cells directory

* Copy plugin-cfg.xml and go to /opt/IHS/conf → open httpd.conf file → go to last of the file. Here one path is pointing go to that path, take a backup of old plugin-cfg.xml and paste new plugin-cfg.xml file.

* Now restart the Webserver, start the node agent, start your server, start your admin console.

53) What is the command to generate plugin-cfg.xml?

A) Go to Dmgr/bin directory and execute below command

WAS-Root/profiles/dmgr/bin > ./GenPluginCfg.sh

54) Where the plugin-cfg.xml will be generated by default?

A) In version 8.5 plugin-cfg.xml file will be in /opt/plugins/config/templates/directory.

55) What is the use of plugins?

A) The primary responsibility of a plug-in is to forward the request to the application server. The plug-ins acts as a mediator between webserver and application server.

The plugins contain all information about application server like host name of application server, default port numbers, application name, context root etc. It contains virtualhost, port number, context-root, cluster member name, load balance algorithm weights.

56) What information is available in plugin-cfg.xml?

A) Virtual host, servers, clusters, refresh interval, requests matrix information, retry interval, server timeout, connection timeout, host name, port number and context root.

57) If I want to stop the request to the particular JVM, what are the changes that we have to do in plugins?

A) To stop one of the cluster member (or) particular JVM, make the response weight is zero (i.e, 0) in plugin-cfg.xml file. Or we can select idle for particular cluster member in admin console.

58) How to enable trace in plugins?

A) In the plugin-cfg.xml we have a parameter load balance weight, for the particular cluster member log level, by default for which we don't want to send the request.

log level="error", we have to change the request.

log level="trace". Whenever we update log level = trace in

plugin-cfg.xml, then it will update detailed messages about

request routing in http-plugin.log.

1) Types of logs:-

1) JVM logs

→ systemOut.log

→ systemError.log

2) Native logs / process logs

→ native-stdout.log

→ native-stderr.log

3) Command line logs

→ startServer.log

→ stopServer.log

→ serverStatus.log

→ addNode.log

→ syncNode.log

4) Installation log

→ postinstall.log (log.txt)

5) Profile creation logs

→ profileName-create.log

6) FFDC logs (First Failure Data Capture)

IHS logs:-

1) access-log

2) error-log

3) admin_error.log

Plugin log:-

→ http-plugin.log

60) How to troubleshoot 404 error?

A) * Whenever we will get 404 error, first I will check with the client, what is the url they are trying to access the application, because if we giving wrong url at the time also we will get 404 error.

* If the url is not specified in the ticket description, I will ask them to share that url.

* Now, I will try to access the application through webserver, If I am also getting same error may be issue is with the application. If the application is down at that time also we will get 404 error.

* Before checking application and application server I will check with the access.log file time stamp and status code to confirm my request is receiving by the web server or not.

* Then I will try to access the application through application server by using http transport port, If I am unable to access from application server, I will login to admin console and I will check the status of the application, whether it is running or not.

* If application is down, I will start the application, once

application server by using http transport port, once I am able to access from application server, then I will try to access through the web server.

* In case if I am unable to access the application through once again webserver, may be issue is with the plugins and plugin-cfg.xml file.

* I will go through the plugin-cfg.xml and atleast I will enable tracing for the plugins, after taking backup of plugin-cfg.xml file.

* Then I will make a request through webserver, now http-plugin log file will get updated and we can find detailed messages in the log files, so that we can understand where the request is failing.

* In this way I will troubleshoot 404 error in my environment.

6) How to troubleshoot 500 internal server error.
If the application server is down, then we will get 500 error.

A) If the application server is down, if requested resources are not available or not responded then we will get 500 error.

* At the time of executing servlets or JSP's, if requested resources are not available or not responded then we will get 500 error.

* If default host port numbers are not registered with virtual host → host aliases, then also we will get 500 error.

Resolving Procedure:-

- 1) I will start the server if it is down.
- 2) I will do synchronization if required.
- 3) I will check the systemout.log and systemErr.log for error messages. Based on error messages I will start my troubleshooting.
- 4) If default host port number is not registered with virtual host, host aliases then I will add port numbers.

5) I will enable loglevel=trace in plugin-cfg.xml file.

6) At last I will restart Server & application, if did not get any error messages.

7) This is the way how I will troubleshoot this issue.

A cluster is a group of servers which provides high availability, load balancing and management.

Types of clusters:-

Horizontal cluster

Vertical cluster

Explain how to configure horizontal cluster.

We require minimum 2 physical machines.

) We need Dmgr and two profiles either application profile (or) custom profile.

) Federate the application server profile (or) custom profile which in different machines to the Dmgr profile.

3) Login to the Dmgr admin console and expand the servers.

4) click on the server type.

5) Then click on clusters.

5) Select websphere application cluster → select new → give cluster name and specify the cluster member with weight under different nodes.

6) Then click on Save. At this time virtualhost.xml, systemapps.xml, serverindex.xml file will be updated.

7) Now start the clusters and deploy the applications and access the applications.

8) What are the differences b/w thread dumps and heap dumps?

Thread Dump

1) It contains information about reads.

By using thread dumps we can know the state of threads like

Heap Dump

1) It contains information about java objects/heap objects.

2) We can find the size of the object, references of an object,

- 3) The thread dumps are more useful in debugging hung threads.
- 4) The thread dump file format is javacore.timestamp.pid.dumpnumber.txt file.
- 3) The heap dumps are more useful in debugging memory leaks.
- 4) The heap dump file format is heapdump.timestamp.pid.dumpnumber.hprof

34) What are the XML files that will update at the time of configuring JDBC provider and datasource?

A) Resources.xml and variables.xml

52) What is the plugin-module that is required for IHTs to configure with plugins and websphere?

A) Mod-WAS-ap22

→ The module that is to be configured for plugging in the httpd.conf

is Mod-WAS-ap22_http.socket.dynamically loadable To Q-Lock SO - shared object file, SOAP - Simple Object Access Protocol

65) What is the wsadmin command to generate thread dumps?

A) Go to WAS-Root/profiles/Dmgr/bin directory

Dmgr/bin > ./wsadmin.sh

→ Set the environment by using below command

```
wsadmin> set.jvm[$AdminControl CompleteObjectName type=JVM,  
process=server1,*]
```

wsadmin> \$AdminControl invoke \$jvm dumpThreads

→ By default thread dumps will be generated in WAS-Root/profiles/
profile-name directory.

66) What is the wsadmin command to generate heap dumps?

A) Go to WAS-Root/profiles/Dmgr/bin directory

Dmgr/bin > ./wsadmin.sh

→ Set the environment by using below command

```
wsadmin> set.jvm[$AdminControl CompleteObjectName type=JVM, process=  
server1,*]
```

wsadmin> \$AdminControl invoke \$jvm generateHeapDump

→ By default heap dumps will be generated in WAS-Root/profiles/
profile-name directory.

- /VersionInfo.sh
- 2) We can check the installed packages by executing the command
• /imcl list Installed Packages
- 3) It will show the list of packages that were installed.
- 4) Stop the servers and take backup of each and every profile
then execute

• /imcl install "packageid of fixpack" -repositories "Path of repository config file of fix pack" -installationDirectory "Specify the WAS-Root location" -acceptLicense -showProgress

5) Once fix pack is installed execute versionInfo.sh; we can find updated version number in fourth digit.

6) Now start the servers.

75) What is the difference between fix pack and refresh pack?

A) Fix pack Refresh pack

1) Fix pack contains bugfixes, patches to resolve bugs and errors in the product.
1) Mainly contains enhancements and fixes, features to the product.

69) What are different gc policies in WebSphere?

A) There are 4 types of gc policies:-

- | | |
|--|--|
| 1) optthruput (optimal throughput) | * Optimal throughput |
| 2) optavgpause (optimal average pause) | * Optimal average pause |
| 3) gencon (default gc policy) | * Generational concurrent (i.e, Gen-con) |
| 4) balanced | * Sub-pooling |

Optthruput:- Here gc will not be executed until free memory has been exhausted.

→ Once heap memory is filled with full of objects, all the application

requests will be kept on pause and entire heap will be scanned to delete the objects. Here the pause times are more, users have to tolerate pause times while gc is executing in entire heap.

OptavgPause:- This gc policy is designed to minimize the pause times.

→ garbage collection work can be done concurrently while application is running.

gencon:- This is the default gc policy in WAS-8.5, if the majority of the objects are created and used for short period of time, this is the best gc policy where heap is divided into different areas and collected at different intervals.

Balanced:- If the application can be deployed only on the heap greater than 4GB at that time we will use balanced gc policy. Here, the pause times are huge.

67) What are the configuration changes we have to do to generate both thread dumps and heap dumps by using kill -3 pid?

A) By using kill -3 pid we can generate thread dumps normally, but we can generate thread dumps & heap dumps also by adding some arguments.

Now in admin console → Expand servers → server types → Websphere application servers → server 1 → server infrastructure → process definition → environment entries → select new entry dumptype with value IBM_HEAPDUMP=true, IBM_HEAP_DUMP=true

→ these parameters are configured under admin console and save the changes.

68) How to enable Verbose gc?

A) → Go to Admin. console
→ Expand servers → server types → Websphere Application servers
→ click on server which we want eg:- Server1
→ on configuration tab, under server infrastructure expand java process management → click process definition

→ Apply, review & save the changes → OK

→ Restart Application server for changes.

70) Where we can increase heap size in Websphere?

A) Login into admin console → expand servers → click on application servers → expand Java & process management → select process definition → select Java Virtual machine → modify initial and maximum heap size and save the changes.

71) What is the XML file that will update whenever we do heap changes?

A) Server.xml file will get updated whenever we do heap changes.

72) What is the command to install fix pack?

A) ./imcl install "package id of fix pack" -repositories "Path of repository config file of fix pack" -installationDirectory "Specify WAS-Root location" -acceptLicense -showProgress.

73) What is the command to check installed packages?

A) ./imcl listInstalledPackages

74) What is the command to check WAS Version?

A) ./versionInfo.sh

75) What is the default location that thread dumps and heap dumps will be generated and what are the filenames?

A) profile-home directory [i.e., WAS-Root/profiles/profile-name directory]

File names:-

thread dump: javacore.timestamp.pid.dumpnumber.txt

heap dump: heapdump.timestamp.pid.dumpnumber.hhd

✓ 7) Differences b/w WAS-7.0 & WAS-8.5?

A) WAS-7.0

1) There is no concept of IM.

WAS-8.5

1) Here install IM before installing Websphere IHS plugins.

-
- 2) No liberty profile
- 3) No dynamic clusters
- 4) We can't generate heap dumps and thread dumps through admin console.
- 2) There are introduced liberty profile.
- 3) Here we have dynamic clusters depends on load clusters.
- 4) Here we can generate heap dumps and thread dumps through admin console.

78) What is a liberty profile?

- 1) It is a light weight profile. It provides the runtime environment where we can deploy the application very fast. The startup time is 5secs. Here we will be having dropins folders where we can drop our .war (or) .ear applications and we can access.

79) What are the differences b/w type 2 driver and type 4 driver?

A) Type 2 drivers

- 1) Type 2 driver cannot communicate directly to database. Type 2 drivers required native API to communicate with database.
- 2) Type 2 driver is thicked client.
- 3) Type 2 drivers convert JDBC calls into database specific calls.
- 4) Type 2 drivers are not thread safe.
- 5) If we change the database, we have to change the native API as it is specific to a database.
- 6) Type 2 drivers are not written in Java language which forms a portability issue.

Type 4 drivers

- 1) Type 4 drivers are entirely written in java language.
- 2) Type 4 drivers are thinned client.
- 3) Type 4 drivers are directly communicates with database through socket connection.
- 4) Type 4 drivers don't have to translate database requests to ODBC.
- 5) You don't need to install special software on the client (or) server side.
- 6) Numbers of transaction layers are very less.