IBM Websphere Application Server on Solaris 10
(Clustering and Work Load Management)

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Overview:

You can find many documents about Websphere Application Server V6 installation for Windows and UNIX in which there is a single Web (HTTP) Server and a single application server, and both are co-resident on a single machine. Please note that such a configuration is not recommended for security reasons; there is no DMZ established. Naturally, the performance characteristics of this setup are limited by the power of the machine on which it is running. This may be suitable for development but in production the scenario is different. This document is a step-by-step guide of installing a cell managed application servers on one machine and a Web server on a separate machine.
Objective:

This paper describes how WAS is installed and configured in a production environment. It defines the system configuration that exhibits the following properties.

- Scalability
- Workload management
- Availability
- Session management

The type of scaling we will do, is logical horizontal scaling. It is termed logical because all nodes are on the same machine. In this situation, where all servers are on the same machine, it doesn’t really make much difference if you do vertical or horizontal scaling. In fact vertical scaling would be more efficient because you would have less nodeagents. However, this scenario (using two nodes) is more realistic, even though both nodes are on the same machine.

When I am working on this article I have two Solaris machines you might want to pair them up and have them do true horizontal scaling where they cluster one node from each machine. You will find this in my new article. At the end of the document you will find hints on true horizontal scaling.

Chapter 1:

Install WebSphere Application Server Network Deployment, V6
Machine name “v157s03” will be used for Application Server’s Machine and ‘v157s02’ for Web (HTTP) Server’s Machine. The WebSphere Application Server Network Deployment V6 installation files have been extracted at “\tmp\WASND\” path.

**Note:** Mozilla should be installed and setup as default web browser.

1. Log in to machine v157s03, as root user

2. Start the WebSphere Application Server Launchpad.
   a. Open a terminal window and navigate to /opt/tmp/WASND/
   b. Invoke `.launchpad.sh`.

```
# cd temp
 temp: does not exist
# cd tm
 tm: does not exist
# cd tmp
# cd WASND
# ls
C903IML.tar.gz readme_nd-noappclient_en.html
Copyright.txt readme_nd-noappclient_es.html
GSKit readme_nd-noappclient_fr.html
IHS readme_nd-noappclient_it.html
JDK readme_nd-noappclient_ja.html
launchpad readme_nd-noappclient_ko.html
launchpad.sh readme_nd-noappclient_pt_BR.html
License.txt readme_nd-noappclient_zh.html
Notices.txt readme_nd-noappclient_zh_TW.html
plugin Version.txt
readme_nd-noappclient_de.html WAS
# ./launchpad.sh
```

3. Click **Launch the installation wizard for WebSphere Application Server** to launch the installation wizard for WebSphere Application Server.
a. Click **Next** to continue the installation.
b. Accept and click **Next**.
c. The installation wizard will check system prerequisites. If it detects any incorrect prerequisites a warning page will be displayed. If it detects an existing installation of WebSphere Application Server you will be given the opportunity to add features to the existing copy, install a new copy or perform an upgrade of a trial installation to a full product.

d. The next page lets you change the installation directory for WebSphere Application Server. Click **Next**.

e. The next page lists the features to install. All components are selected by default.
Click Next to continue the installation.

f. The last page is simply a confirmation of all the choices you have made on previous screens. Double-check your information with what is shown below. Click Next to begin the installation.
4. After the installation is complete, you then need to create a profile. Make sure the Launch the Profile creation wizard box is checked. Use the Profile creation wizard to create application server run-time environments, called profiles. Click Next.

a. On the Welcome screen for the Profile creation wizard click Next to continue.
You can create multiple application servers on your system without installing the product again by creating profiles. When using the Profile creation wizard, there are three types of profiles you can create:

- **Deployment Manager Profile** which creates a new instance of deployment manager. Each instance of deployment manager is a unique cell.
- **Application Server Profile** which creates a new instance of a standalone node with a single application server. Standalone nodes have only one application server.
- **Custom Profile** which creates an automatically federated/managed node with no pre-defined application servers. Managed nodes can have multiple application servers.

b. Select the Create an Application Server profile option and click Next
c. Provide a unique name for a profile. Specify **profile1** for the profile name. Click Next.
d. Specify a directory for the files for the profile. Use the default directory or profile1. Click Next.

**INFORMATION:** It is a good idea to keep all profiles under the same directory structure under the `<profile_root>` folder.

e. The next page lets you set the node name and TCP/IP host name. Default values will be filled in based on the detected TCP/IP host name for your machine. Ensure the correct node name and host name are entered – check with your instructor if you are unsure.
f. The next screen allows you to set any ports for the application server so there are no conflicts with other profiles. Keep all the defaults and click Next.
g. The Profile summary will appear with all of the choices you have made on previous screens. Double-check your information with what is shown below. Click Next to continue.

![Profile creation wizard](image)

h. The profile creation is complete and profile1 has been created. Notice that the Launch the First steps console box is selected. Click Finish and the First Steps program will launch.
First Steps

The First Steps program allows you to access the WebSphere InfoCenter (at the IBM Web site), start/stop the server and launch various tools. You can also migrate previous WebSphere Application Server versions to WebSphere Application Server V6.

a. The First steps console is associated with the application server profile, profile1 that was just created. Each profile has its own First steps console.
Click Installation verification from the First steps console.

b. The installation verification test tool will run and display messages to indicate its status. You should see message “IVTL0080I: Installation Verification is complete”. Use the scroll bar to scroll down to the bottom to view all messages.
Close the First steps Installation verification output window.

c. From the First steps console select Administrative console. This will launch the Administrative console for profile1.
d. Log in to the administrative console user id as admin.
**Information**: The user id root is not a real user that has been defined in a registry. This user id will be used when logging into the administrative console. The user id specified during login is used to track configuration changes made by the user.

e. The main console for the WebSphere administrative console should appear.
5. Verify that the DefaultApplication has been installed and is running.

a. Select Applications --> Enterprise Applications. You should see the DefaultApplication and it should be running.
b. Open another browser window and type in the following URL:
http://localhost:9080/snoop

This will execute a servlet called snoop, which comes with the DefaultApplication and
will bring up a page with information about the runtime environment of the server.
This further confirms that the application server is operating correctly.

**Creating Profile Backup**

a. Create the backup by entering the following command in the `<profile_root>/bin` directory.

```
./backupConfig.sh
```

The command will create a backup file called `WebSphereConfig_<date>.jar` using the current date and place it in the `<profile_root>/profile1/bin` directory. By default, all servers on the node stop before the backup is made so that partially synchronized information is not saved. The `-nostop` option tells the command not to stop the servers before backing up the configuration.

```
./backupConfig.sh -nostop
```

You can also specify the path and the name of the file.
Chapter 2:

Creating Deployment Manager Profile

This chapter tells how to create a Deployment Manager Profile which is similar to the first chapter in which you created an application server profile.

a. Open Terminal window and navigate to 
/opt/IBM/WebSphere/AppServer/bin/ProfileCreator/ and type java –jar pct.jar and enter to start the Profile Creation Wizard.

```
# cd /opt/IBM/WebSphere/AppServer/bin/ProfileCreator
# java -jar pct.jar
```

b. The Welcome screen for the Profile creation wizard appears.

c. Click Next.

2. Create a deployment manager profile called DmgrProfile.

a. Select the Create a deployment manager profile option and click Next.
b. Specify **DmgrProfile** for the deployment manager profile name. Do not select **Make this profile the default** option. Click **Next**.
**Information:** Normally the first file on the machine is the default file but it is possible to change which file should be the default file by Profile creation wizard or wasprofile command.

c. Next specify a directory for the files for the deployment manager profile. Use the default directory `/opt/IBM/WebSphere/AppServer/profiles/DmgrProfile`. Click Next.

**Recommendation:** Installing all profiles in the same profile directory.

d. The next window sets the node, host and cell names. Default values are filled in based on the detected TCP/IP host name for your machine. **Ensure the correct names are entered.** Check with your instructor if you are unsure.
Type only the Host name not the fully qualified Host name. Click **Next**.

e. The next window allows you to set any ports for the deployment manager so there are no conflicts with other profiles. Keep all the defaults and click **Next**.
After the Installation is finished verify the installation using First Step Installation Verification as you did before.

Take a backup of the profile using backupConfig command.

Chapter 3:

Federation

Federate Profile1 into the Deployment Manager’s cell

This step Federates profile1 into the cell that is defined by the Deployment Manager profile that was created earlier in this chapter.

a. Verify that the profile1’s server1 is running (see Appendix A)
b. Verify that the Deployment Manager is running. (see Appendix A)
c. Open a web browser and type the following URL to start the deployment manager console. Administrative port of deployment manager is 9061.

   http://localhost:9061/ibm/console/

d. Log in to the Deployment Manager’s console as userid admin.

1. Federate a node into the cell.

   a. From the administrative console select System administration > Nodes
   b. Click Add Node

   c. Select the option to create a Managed node. A managed node contains a WebSphere application server and a node agent. The application server runs as part of the network deployment environment. Click Next.
d. Specify your host name v157s03 for the host and select the options for Include applications and Include buses. Keep all remaining defaults. Click OK.

Note: Don’t be confused with user name and password fields. I have taken this screen shot from the machine in which the global securities are enabled. You will not see these options unless you enable the global securities which are beyond the scope of this article.
Information: The port number above points to the node you want to add to the cell.
e. Verify that the node was added to the cell configuration. You should see the message “Congratulations! Your node v157s03Node02 has been successfully incorporated into the cell.”

f. Logout of the administrative console. The new node will not be available in the administrative console until you log in again.

Verify the cell configuration.

a. Log in to the administrative console using the userid admin.

b. Select System administration —> Nodes. Two nodes should be listed. The following nodes should be listed

   v157s03CellManager01

   v157s03Node01

c. Verify that the node agent on v15703Node01 has started. Select System administration —> Node agents. The status of the node agent is Started.

d. Open another browser window and type in the following URL for testing the snoop server:

   http://localhost:9080/snoop

Create a custom profile and federate into the Deployment Manager’s cell

Now you know how to start the Profile Creation Wizard. Select the Create a custom profile option. Don’t check on Federate this node later using this AddNode Command. Default this option is not check and leave it as default as we want to federate it into the deployment manager’s cell.

a. Specify profile2 for the unique name for the profile. Do not select to make this profile the default. Click Next.

b. Keep the defaults for the profile directory on the Profile directory window. The directory should be /opt/IBM/WebSphere/AppServer/profiles/profile2. Click Next.

c. Default values will appear on the Node and host names windows. Verify a node name of v157s03Node02 and a host name v157s03. Click Next.
d. The next window allows you to set any ports to be used so there are no conflicts with other profiles. Keep all the defaults and click Next.

e. The profile summary will appear with all of the choices made on previous screens. Double-check your choices against what is shown. Click Next.

f. The profile creation is now complete. On the Profile creation wizard window unselect the Launch the First steps console option. Do not use the First steps console for profile2. Click Finish to exit the wizard.

The node v157s03Node02 is automatically federated into the deployment manager configuration. Verify these new configuration changes.

a. Using the deployment managers administrative console, list the nodes. Select System administration —> Nodes. You should see that the node v157s03Node02 had been federated.

**Information:** Using a Custom profile does not create a server1 instance. This is useful when adding nodes to an existing cell since the intention of federating a new node into a cell is normally to either add cluster members to the node or create servers named something other than server1.

### Chapter 4:

**IBM HTTP Server Installation :**

In this chapter we will install IBM HTTP server and the WebSphere Plug-ins on machine v157s02 also map modules to the Web server and regenerate and propagate the plug-in configuration file.

1. Log in to machine v157s02, as root user

2. Start the WebSphere Application Server Launchpad.

   a. Open a terminal window and navigate to /opt/tmp/WASND/.
   b. Invoke ./launchpad.sh. (see Chapter 1)
This installation of IBM HTTP server is very simple. After the IBM HTTP Server is installed launch the WebSphere Application Server - Plugin in the same wizard to Install WebSphere Plug-ins.
Information: After installing the application server and a Web server, you can install a WebSphere Application Server plug-in for a supported Web server. The binary plug-in is unique for each type of Web server. The purpose of the plug-in is to provide the communication protocol between the Web server and the application server.

3. Select IBM Http Server and click Next.

4. Select the installation scenario that matches your environment. When the application server and Web server exist on the same machine, choose the local installation scenario. If they are not on the same machine you choose remote installation

Select Web server machine (remote). Click Next.
5. Specify the Web server plug-ins installation location. Specify the fully qualified path to where the plug-in modules are installed. By default this value is filled in. Click Next.
**Recommendation:** Keep the default values for Web server plug-ins installation.

6. Select the existing IBM Http Server httpd.conf configuration file. Browse to the HTTP Server\conf folder and select httpd.conf. Keep the default for the Web server port, port 80. Click Next.

   a. Click on Browse.
b. Browse the file httpd.conf from /opt/IBMIHS/conf.
7. Chose the unique Web Server Name or leave it as default **webserver1**.

8. Select the plugin-cfg.xml file to use for the selected Web server. Keep the default location. Click Next.
9. Specify the host name of the application server machine. Specify the machine name `v157s03`. Click Next.

To propagate plugin-cfg.xml file from application server to web server the Web Server plugin-cfg.xml file at the following location 
/opt/IBM/WebSphere?Plugins/config/webserver1 should have min permission 755 or 777
Now that the IBM Http Server has been installed create a user ID for use for the IBM Http

1. In a command prompt navigate to <ihs_root>/bin.

2. Enter the following command:

   `htpasswd -cm ../conf/admin.passwd ihsadmin`

   when you Enter it will ask the new password and re-type new password for id ihsadmin

**Note:** Remember the id and password you just created as you will need these while adding a web server in Admin Console.

3. Very the HTTP server is running by entering `http://localhost` in the web browser. You will see a welcome screen.
Chapter 5:

Add the Web server to the configuration

1: Create a Web Server node

Create a new node and add the Web server to the node. When adding a node you may create either a managed or unmanaged node. A managed node contains a WebSphere application server and a node agent. An unmanaged node does not have a node agent and is used for defining remote Web servers in the topology.

1. Verify the deployment manager is running. If the deployment manager is not running start it using the startManager (see Appendix A)

2. Launch the administrative console for the deployment manager.

   http://localhost:9061/ibm/console/

3. Log in as the user ID admin.

4. Create a new unmanaged node for the Web server. An unmanaged node does not have a node agent and is used for defining Web servers.

   a. In the navigation tree, expand System administration and click Nodes.

   b. Click the Add Node button.

   c. In the Add Node window select Unmanaged node and click Next.
d. In the Nodes window specify configuration information for the node. Specify the name **ihsnode** and **v157s02** for Host Name. The Platform Type is Windows. Click OK.

**IMPORTANT:** Host name is the name of machine where the IBM HTTP Server is installed.
e. The node **ihsnode** should be added to the list of nodes.

f. Save the changes to master configuration.
2: Add the Web server

a. In the administrative console select **Servers > Web servers.**

b. Click New to add a Web server.

c. On step 1 of creating a new Web server entry select the node ihsnode from the drop-down menu. Specify the server name of **webserver1.**

   **Information:** The Web server name must match the name that was assigned during the IBM Http Server installation.

d. On step 2, specify the properties for the new Web server.
e. In order for the administrative console to access the IBM HTTP administration server, you must define a valid user ID and password. We have already defined the User ID and password in previous chapter.

f. On step 3, select IHS for the Web server template. Click Next.
g. On step 4, the summary, click FINISH.

h. Save the changes to master configuration.

Recommendation: Stop and Start the Web Server `webserver1` from administrative console.
The Web Server has been added to the configuration but to test the application you have to map the modules of the application to servers and have to generate and propagate the plugin-cfg.xml file. We will do these steps later with cluster.

Chapter 6:

Clustering and Session Management

There we will create a new cluster with two servers. The first server comes from the original profile created in earlier chapter. The second server is part of the node that was created using a custom profile. The actual server is created at the time the cluster is created.

Recommendation: Test both before and after the Distributed Session Management is configured, pointing out the differences.

This chapter contains two parts creating a cluster and replicating domain. We will also see how the applications are mapped to the servers.

1. Creating the TestCluster cluster

In this step you create the cluster that will contain the cluster members that will participate in workload management. A cluster is composed of two or more servers in a cell which are assigned to run the same application. Clusters are logical constructs which are equivalent to servers.

Create a new cluster called TestCluster.

a. Select Servers —> Clusters.
b. Click New.

c. Enter TestCluster for the Cluster name,

d. Select Prefer local and Create a replication domain for this cluster.

![Create a new cluster](image)

**Attention:** You may see a different screen than shown above with options to select existing server. Click on option **Select an existing server to add to this cluster**, if you see this on Step1 of create cluster screen, and chose server1 from the list and leave the default value of weight = 2. If you select an existing server to add to this cluster you will see this in the list on Step2.

e. Define second Member of the cluster as **server2** on node v157s03Node02. You may not have typed first member name and it may have taken it as server1. Scroll below the screen to see if server1 is listed. If you have defined the first member of the cluster from the already existing server as **server1**
**Information**: Notice the first server of the cluster is already listed at the bottom of the page.

f. Click Apply. At the bottom of the page, make sure *server2* has been added.

g. Click Next and Finish.

h. Save your changes and synchronize with the nodes.

i. Verify the new cluster has been added to the server configuration. Select **Servers > Clusters**. The **TestCluster** cluster should be displayed on the page.
j. Verify the cluster members. Select Servers > Clusters. Click on the TestCluster and in the additional properties click Cluster members. It should show the list of cluster members as below.

<table>
<thead>
<tr>
<th>New</th>
<th>Delete</th>
<th>Start</th>
<th>Stop</th>
<th>ImmediateStop</th>
<th>Terminate</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
<td><img src="image_url" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Select</th>
<th>Member name</th>
<th>Node</th>
<th>Version</th>
<th>Configured weight</th>
<th>Runtime weight</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image_url" alt="Image" /></td>
<td>server1</td>
<td>v157s03Node01</td>
<td>8.0.2.3</td>
<td>2</td>
<td>2</td>
<td><img src="image_url" alt="Image" /></td>
</tr>
<tr>
<td><img src="image_url" alt="Image" /></td>
<td>server2</td>
<td>v157s03Node02</td>
<td>8.0.2.3</td>
<td>2</td>
<td>2</td>
<td><img src="image_url" alt="Image" /></td>
</tr>
</tbody>
</table>

Total 2

**Recommendation:** Test Applications on cluster by stopping server1 and server2 one by one.

I will document the mapping of application to servers and testing at the end because of avoiding repetition of the same matter. You can test Application after each step. If you want to test applications from Web Server you will have to generate and propagate plugin-cfg.xml every time when an application or module of application is installed.

### 2. Session Management for Distributed Configuration

In order for session information to be shared between members of a cluster, a strategy to share session data must be put in place. WebSphere Application Server provides a variety of mechanisms to achieve this goal. The main strategies are Database and memory-to-memory replication. Setting up either of these is very straightforward. In this document memory-to-memory replication is setup to handle session data replication. Session management must be set on each of the servers in the cluster. Perform the following steps first on server1 and then on server2.

1. Select Servers —> Application servers.
2. Click servers1.
3. Click session management under the Container Settings > Web Container Settings.
4. Under Additional properties, click Distributed environment settings.
5. Click Memory-to-memory replication. This will switch you to the next page.
6. Select the TestCluster Replication domain and set the Replication mode to Both client and server.

7. OK

8. Saves changes. Repeat steps 1 to 7 for server2.

9. Restart the Cluster.

**Recommendation:** Use Ripplestart to restart the cluster.

**Information:** Ripplestart will stop and start one server of the cluster at a time. Once the first server has been cycled, the next server is stopped and started. This way you are assured only one server is down at any one time. It also does not overload the system by cycling multiple servers at the same time.

### 3. Map Default Application

Each module of an application is mapped to one or more target servers. The target server can be an application server, cluster of application servers or a Web server. Web servers specified as targets will have routing information for the application generated in the plug-in configuration file for the Web server.

**Information:** This mapping takes place during application deployment. Since the **DefaultApplication** was already deployed when you installed the Web server, you need to map the modules to the Web server.

1. Using the Deployment Manager’s administrative console map the DefaultApplication’s modules to the Web server.

   a. Select **Application ->Enterprise Application -> DefaultApplication**.

   b. Under **Additional Properties** select **Map Modules to servers**.
c. In the Clusters and Servers list select both the **TestCluster** cluster and the **webserver1** Web servers (use the Ctrl key to select multiple servers)
d. Apply and Click OK.
e. Make sure that the modules were mapped to both the **TestCluster** and the
f. Save the configuration changes
g. Regenerate and propagate the plug-in configuration file. (This should happen automatically, do it manually if it didn't)

**Regenerating and Propagating the plug-in configuration file**

The plug-in configuration file contains routing information for all applications mapped to the Web Server. The plug-in configuration file needs to be regenerated and propagated to the Web server when there are changes to the WebSphere configuration that affect how requests are routed from the Web server to the application server.

1. Regenerate the plug-in configuration file.
   a. In the administrative console select Servers -> Web servers.
   b. Click the box to the left of the Web server. Click Generate Plug-in.

   ![Web server configuration](image)

   c. Verify the generation was successful by viewing the messages.
   d. Click the box to the left of the Web Server. Click Propagate Plug-in.

   e. Verify the propagation was successful by viewing the message.

   **INFORMATION**: You can manually propagate plugin-cfg.xml from application server to Web Server. To manually propagate plugin-cfg.xml move it from Application Server to Web Server using FTP or any other way.

   **RECOMMENDATION**: Take backup of plugin-cfg.xml file before replacing.
4. Testing Cluster and Web Server and Session Management

Testing Web Server

a. Log on to Web Server machine and Type first the following URL to test the snoop servlet
   http://localhost:9080/snoop
   by using the port 9080 you are bypassing the external IBM Http Server.

b. Verify the Web server is forwarding requests to the application server by using the address http://localhost/snoop. This request will first go to the Web server.

Test Cluster and Session Management

You cannot test Cluster without Session Replication as Memory-to-Memory Replication has been setup. You should test Cluster only before setting up the Session management. Here we will test Cluster with Session Replication.

a. Open a browser window on Web Server and type the following URL.
   http://localhost/hitcount. You should see a page similar to the following.

By this application test you do not know which server is serving to this application. You can close server1 using the administrative console on Application Server and refresh the opened linked http://localhost/hitcount or click on any button. It should still be working. Start server1 and stop server2 and refresh http://localhost/hitcount or click on any button on hitcount result page.
Appendix A:

Trouble Shooting the Installation and Common Tasks

1. Start a Process

The task of starting server processes is done from a command window, which will differ depending on which operating system is in use. This example illustrates the Solaris case.

a. Open a Terminal Program

b. Navigate to the bin directory of the relevant profile.
   For example, if your profile is DmgrProfile --
   cd /opt/IBM/WebSphere/AppServer/profiles/DmgrProfile/bin

c. To start a process, the command varies depending on the server type.
   For a Deployment Manager, enter the command ./startManager.sh
   For a Node Agent, enter the command ./startNode.sh
   For an Application Server, enter the command ./startServer.sh <server name>

INFORMATION: WebSphere commands are profile aware. There is a profile option in many commands. If you don’t give the profile name it assumes the default profile.

d. Server start is successful when the following line appears in the terminal window
   open for e-business; process id is XXX

2. Stop a Process

The task of stopping stop processes is done from a command window, which will differ depending on which operating system is in use. This example illustrates the Solaris case.

a. Open a Terminal Program

b. Navigate to the bin directory of the relevant profile.
   For example, if your profile is DmgrProfile --
   cd /opt/IBM/WebSphere/AppServer/profiles/DmgrProfile/bin

c. To stop a process, the command varies depending on the server type.
   For a Deployment Manager, enter the command ./stopManager.sh
   For a Node Agent, enter the command ./stopNode.sh
   For an Application Server, enter the command ./stopServer.sh <server name>

   d. If global security is enabled:
      Use the options --username <user name> and -password <password> with the commands in c. above

e. Server stop is successful when the following line appears in the terminal window
   ADMU4000I: Server <server name> stop complete
2. Look at the subdirectories and their contents:

- **bin**: programs, scripts, and DLLs
- **config**: configuration files -etc
- **dummy**: keyring, keytab files, plug-in keys
- **firststeps**: firststeps utility
- **installableApps**: applications which may be installed
- **installedApps**: applications installed in WebSphere Application Server
- **installedConnectors**: installed resource adapters
- **installedFilters**: filters
- **logs**: trace and log files
- **properties**: configuration property files used by WebSphere
- **temp**: temporary area for files created during JSP processing
- **tranlog**: transaction log files
- **wstemp**: temporary area for events

3. Check the Installation Log Files.

A number of log files are created during the installation and profile creation process. It is useful to check these files to verify that the installation completed successfully.
**log.txt:** In `<was_root>\logs`. This file records installation status.

**wasprofile_create_profile1.log:** In `<was_root>\logs\wasprofile`. This log records creation events that occur when creating the profile, profile1. Verify that profile1 creation was successful.

**pctLog.txt:** This log records installation events that occur when creating profiles with the Profile creation wizard.

**backupConfig.log:** This log records events that occur when creating a backup of the configuration directory structure.

**ivt_config.log:** This logs the messages during installation of the installation verification test application. Verify that no errors occurred during installation.

**ivtClient.log:** This logs results from the installation verification command.

**portdef.props:** This properties file logs information about the default ports for an application server.

**SystemErr.log:** This contains the standard error output from the Java virtual machine (JVM) running the application server. This file should be empty if the server has started correctly.

**SystemOut.log:** This contains the standard output from the Java virtual machine (JVM) running the application server. This file should contain a lot more detailed messages indicating the steps performed during startup of the server. These steps include security initialization, messaging initialization, registering resources in the JNDI namespace, EJB initialization, Web module initialization and HTTP transport initialization. This file also contains messages from application System.out print line code.
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