

WebSphere Topologies

Version 1.0



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Federation in IBM WebSphere Application Server

What is Federation?

Federation in IBM WebSphere Application Server (WAS) is the process of integrating a standalone application server (also known as a base server or standalone server) into a centralized administrative domain managed by a Deployment Manager (DMGR). By federating a standalone server, it becomes part of a **cell** managed by the DMGR, allowing centralized administration, configuration, and management of multiple application servers across different nodes.

A standalone server operates independently with its own administrative console, whereas a federated server is managed through the DMGR's administrative console, enabling features such as:

- Centralized configuration management.
- Workload distribution across multiple servers.
- High availability and failover support.
- Simplified administration of multiple servers in a cell.

Federation is a key feature in WebSphere Network Deployment (ND) environments, as it allows administrators to manage multiple application servers as a single cohesive unit, improving scalability and operational efficiency.

How to Federate a Standalone Server to a DMGR

To federate a standalone server to a Deployment Manager, you use the `addNode` command provided by WebSphere Application Server. This process integrates the standalone server's node into the DMGR's cell, placing the server under the DMGR's administrative control. Below are the steps to federate a standalone server:

Prerequisites

1. **Deployment Manager:** Ensure the DMGR is installed, configured, and running.
2. **Standalone Server:** The standalone server must be installed and running on a node that will be federated.
3. **Network Connectivity:** Verify that the standalone server can communicate with the DMGR over the network (e.g., correct hostnames, ports, and firewall settings).
4. **Administrative Credentials:** You need administrative credentials for both the standalone server and the DMGR.
5. **Matching Versions:** The WebSphere Application Server version of the standalone server and DMGR should be compatible (ideally the same version or a supported combination).

Steps to Federate a Standalone Server

1. Stop the Standalone Server (Optional):

- While not always mandatory, stopping the standalone server before federation can prevent potential issues. Use the stopServer command:

```
<WAS_HOME>/bin/stopServer.sh <server_name> -username <admin_user> -password <admin_password>
```

Replace <WAS_HOME> with the WebSphere installation directory, <server_name> with the name of the standalone server, and provide the appropriate credentials.

2. Run the addNode Command:

- Navigate to the bin directory of the standalone server's profile:
`cd <WAS_HOME>/profiles/<standalone_profile_name>/bin`
- Execute the addNode command to federate the node to the DMGR:
`./addNode.sh <dmgr_host> <dmgr_port> -username <dmgr_admin_user> -password <dmgr_admin_password>`
 - <dmgr_host>: Hostname or IP address of the DMGR.
 - <dmgr_port>: SOAP port of the DMGR (default is 8879; verify in the DMGR's configuration).
 - <dmgr_admin_user> and <dmgr_admin_password>: Administrative credentials for the DMGR.

Example:

```
./addNode.sh dmgr.example.com 8879 -username wasadmin -password waspass
```

3. Verify Federation:

- After the addNode command completes successfully, the standalone server's node is added to the DMGR's cell.
 - Log in to the DMGR's administrative console (e.g., `https://<dmgr_host>:<admin_port>/ibm/console`).
 - Navigate to **System Administration > Nodes** to confirm that the new node appears in the list.
 - The standalone server will now appear under **Servers > Application Servers** in the DMGR's console.

4. Synchronize the Node:

- After federation, the node must synchronize its configuration with the DMGR. This typically happens automatically, but you can manually trigger synchronization:
 - In the DMGR's administrative console, go to **System Administration > Nodes**, select the newly added node, and click **Synchronize**.
 - Alternatively, use the syncNode command from the node's bin directory:
`./syncNode.sh <dmgr_host> <dmgr_port> -username <dmgr_admin_user> -password <dmgr_admin_password>`

5. Start the Federated Server:

- If the server was stopped, start it using the DMGR's administrative console or the startServer command:
`<WAS_HOME>/bin/startServer.sh <server_name> -username <admin_user> -password <admin_password>`

Post-Federation Considerations

- **Administrative Console Access:** After federation, the standalone server's administrative console is disabled. All management tasks are performed through the DMGR's console.
- **Node Agent:** Federation creates a **node agent** on the federated node. The node agent is a process that facilitates communication between the DMGR and the application servers on that node. Ensure the node agent is running:
`<WAS_HOME>/bin/startNode.sh`
- **Configuration Backup:** Before federation, back up the standalone server's configuration using the backupConfig command to allow restoration if needed:
`<WAS_HOME>/bin/backupConfig.sh <backup_file_name>`
- **Security Considerations:** Ensure that security settings (e.g., LDAP, SSL) are compatible between the standalone server and DMGR to avoid authentication issues during federation.

Common Issues and Troubleshooting

- **Port Conflicts:** Ensure there are no port conflicts between the DMGR, node agent, and application server. Check port assignments in the serverindex.xml file.
- **Connectivity Errors:** Verify network connectivity and correct hostname/port settings if the addNode command fails.
- **Version Mismatch:** If the DMGR and standalone server versions are incompatible, federation may fail. Check the WebSphere documentation for supported version combinations.
- **Log Files:** Review logs in `<WAS_HOME>/profiles/<profile_name>/logs` (e.g., addNode.log, SystemOut.log) for errors during federation.

Benefits of Federation

- **Centralized Management:** Manage multiple servers from a single DMGR console.
- **Scalability:** Easily add more servers to the cell as needed.
- **High Availability:** Leverage clustering and workload management features available in WebSphere Network Deployment.

By federating a standalone server to a DMGR, you transform an independent server into part of a robust, centrally managed environment, enabling better control and scalability for enterprise applications.

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