WebSphere Process Server 6.1: Setting up the Full Support Topology ("Golden Topology")

Overview

The installation of a clustered WebSphere Process Server 6.0.2 (hereafter called WPS) environment included many different steps that had to be done manually: from the creation of multiple databases, the import of complex DDLs to the configuration of a variety of resources in the WebSphere admin console. Especially the configuration of the so called "Full Support Topology" (also referred to as "Golden Topology"; see [RB01] for detailed information on the architecture behind) was very time-consuming and error prone (see [DW01] for a description of the installation procedure). Since this topology can be considered as the reference for enterprise-scale WPS environments, it is most likely that it is the most chosen architecture.

In WPS 6.1 the installation process has dramatically been simplified by the introduction of so-called Deployment Environments. You may consider a Deployment Environment as a template for a specific WPS production topology. Or, if you are familiar with WebSphere Application Server 6.1 you can see it as a variation of the cell profile capability (see also [IC01]). A Deployment Environment describes a specific configuration pattern, which consists of topology information, server definitions, cluster definitions and many other WebSphere resources. Since most of the WPS configuration options are included, or rather assembled during installation, this allows the installation routine to generate almost all resources (for instance database tables, applications, clusters etc.) automatically. This automation in turn leads to a faster and less error-prone installation of complex WPS environments. Currently there are three different patterns available:

Single cluster pattern

This pattern simply consists of one cluster referred to as Application Deployment Target (hereafter called ADT), which incorporates all WPS specific applications, functions and capabilities. This pattern finally results in the so called Basic Topology, which is described in detail in [RB01], chapter 4.2.2.
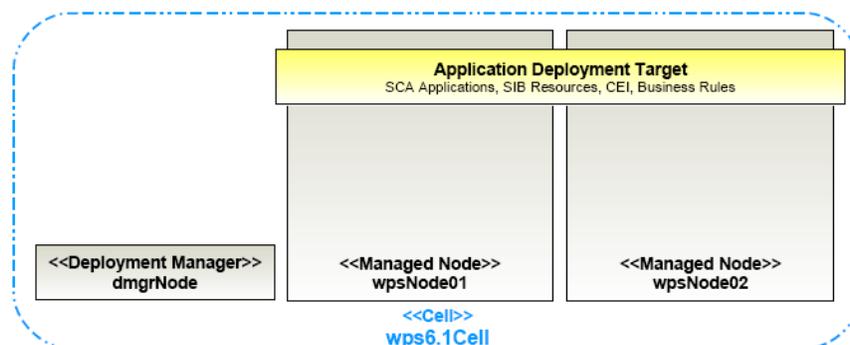
Illustration 1: Result of a single cluster pattern installation

Remote messaging pattern

With this pattern a WPS environment of two separate clusters will be created, whereas one cluster will contain the messaging infrastructure (referred to as Messaging) and one will become the ADT. This pattern creates a topology which is named Loosely Coupled Topology. A detailed description

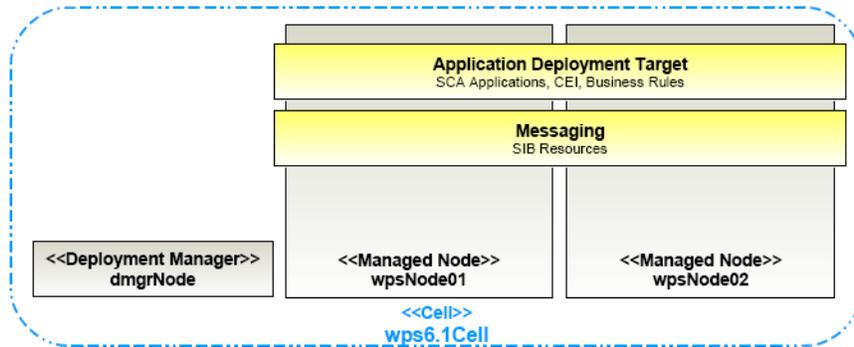of the underlying architecture can be found in [RB01], chapter 4.3.2.

Illustration 2: Result of a remote messaging pattern installation

Remote messaging and remote support pattern

This pattern enables the creation of a Full Support Topology as described in [RB01] and therefore creates three different clusters: an ADT cluster for applications, one Messaging cluster which holds the messaging infrastructure (based on Service Integration Bus configuration items) and a support cluster (officially referred to as Support) that holds all supporting services as CEI for example. The remote messaging and support pattern therefore enables the installation of the best separation-of-concerns topology.
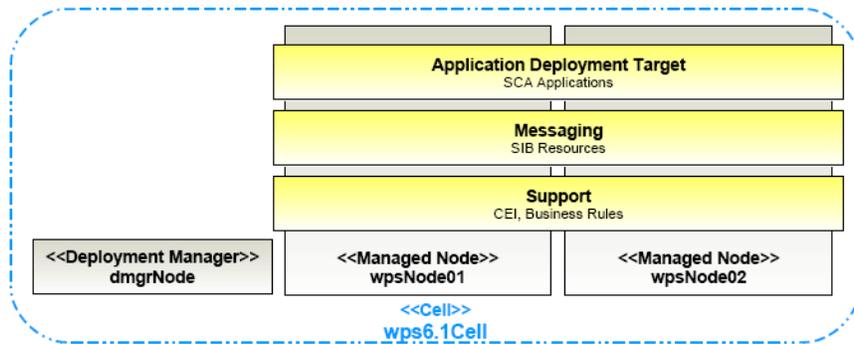
Illustration 3: Result of a remote messaging and remote support pattern installation

If you are unsure which topology will meet your business and technical requirements best, please consult the Redbook [RB01] which contains a detailed decision guide on when to choose which topology. However this article is focused on the installation of the Full Support Topology, whereas the installation procedure may easily be adapted to the other topology options.

Installation procedure

The following sections will show you how to use the "remote messaging and remote support pattern" to install a clustered WPS 6.1 environment that adheres to the Full Support Topology architecture. This guide describes the installation process considering the following conditions:

- Installation of WPS on AIX 5.3 (Technology Level 6)
- DB2 9.1 used as the database system

Please check the WPS detailed requirements page before trying the installation on your own:
http://www.ibm.com/support/docview.wss?rs=2307&context=SSQH9M&uid=swg27009829

Overview

The following activity diagram gives you a rough overview of the installation steps:
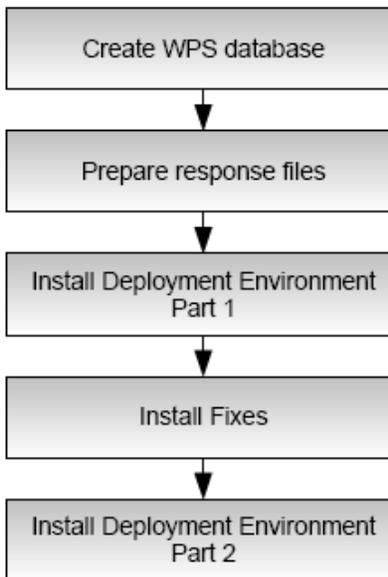
Create WPS database

In version 6.1 WPS needs one database, which holds the tables for all Process Server components including Business Process Choreographer (BPC), Common Event Infrastructure (CEI) and WebSphere Platform Messaging (Service Integration Bus).

Do the following to create the WPS database:

1. Open a terminal on your database system and login with your DB2 instance user (or any other user with database creation rights).

2. Execute the following command:

   ```
   db2 create database WPRCSDB using codeset UTF-8 territory US
   ```

3. Finished.

Prepare response file for Deployment Manager

Important note: In the scope of this document only the silent installation with response files is explained. Of course you will find all the configuration options used here in the graphical installation

wizard.

Complete the following steps:

1. Open a terminal on the system, where you want to install WPS and login with the root user.
2. Go to the directory where you have unzipped the installation files and change to the WBI directory.
3. Make a copy of the response file "responsefile.wbis.txt" and name it "responsefile.wbis.dmgr.txt".
4. Open the response file "responsefile.wbis.dmgr.txt" with your favorite editor and change the following configuration options (you only need to customize the values in <...>):

   Accept the License
   ```
   -OPT silentInstallLicenseAcceptance="true"
   ```

   Indicates that we also want to install the product files
   ```
   -OPT installType="installNew"
   ```

   Install a new Deployment Environment
   ```
   -OPT wpsInstallType="ndGuided"
   ```

   Create a Deployment Manager profile
   ```
   -OPT ndGuidedInstallType="deploymentManager"
   ```

   Specify username and password for the admin user
   ```
   -OPT PROF_adminUserName="<admin_user_name>"
   -OPT PROF_adminPassword="<admin_password>"
   ```

   Specifies your "remote messaging and remote support pattern"
   ```
   -OPT PROF_topologyPattern="Reference"
   ```

   Database settings
   Indicates that no new database is created
   ```
   -OPT PROF_dbCreateNew="false"
   ```

   Indicates that all database artifacts are created automatically
   ```
   -OPT PROF_dbDelayConfig="false"
   -OPT PROF_dbType="DB2_Universal"
   -OPT PROF_dbName="WPRCSDB"
   -OPT PROF_dbHostName="<database_host_name>"
   -OPT PROF_dbServerPort="<database_port>"
   -OPT PROF_dbJDBCClasspath="<wps_install_location>
   /universalDriver_wbi/lib/"
   ```

   Install location of the WPS product files
   ```
   -OPT installLocation="<wps_install_location>"
   ```

   Since we create a Deployment Environment "none" is correct.
   ```
   -OPT profileType="none"
   -OPT PROF_enableAdminSecurity="true"
   ```

   Specify settings for the Deployment Manager profile

```
-OPT PROF_profileName="<dmgr_profile_name>"
-OPT PROF_profilePath="<dmgr_profile_path>"
-OPT PROF_hostName="<dmgr_host_name>"
-OPT PROF_nodeName="<dmgr_node_name>"
-OPT PROF_cellName="<cell_name>"
```
5. Save the response file. Finished.

Prepare response file for Custom Profile

In this step you will prepare another response file, that will be used to create a new Custom profile. In terms of Deployment Environment the creation (and addition to an existing Deployment Environment) of a new profile is referred to as "adding an additional role". However, under the covers there is a Custom profile that will be enriched with information from the chosen pattern (such as "remote messaging and remote support" in our case).

Complete the following steps:
1. Open a terminal on the system, where you want to install WPS and login with the root user.
2. Go to the directory where you have unzipped the installation files and change to the WBI directory.
3. Make a copy of the response file "responsefile.wbis.txt" and name it "responsefile.wbis.managed.txt".
4. Open the response file "responsefile.wbis.managed.txt" with your favorite editor and change the following configuration options (you only need to customize the values in <...>):

Accept the License
```
-OPT silentInstallLicenseAcceptance="true"
```

Indicates that we also want to install the product files
```
-OPT installType="installNew"
```

Install a new Deployment Environment
```
-OPT wpsInstallType="ndGuided"
```

Add roles to your Deployment Environment
```
-OPT ndGuidedInstallType="additionalRoles"
```

Specify connection information for the Deployment Manager
```
-OPT PROF_dmgrHost="<dmgr_host_name>"
-OPT PROF_dmgrPort="<dmgr_soap_port>"
-OPT PROF_dmgrAdminUserName="<admin_user_name>"
-OPT PROF_dmgrAdminPassword="<admin_password>"
```

Database settings
```
-OPT PROF_dbJDBCClasspath="<wps_install_location>
/universalDriver_wbi/lib/"
```

Specify the following roles for "remote messaging and remote support pattern"
```
-OPT PROF_topologyRole="ADT,Messaging,Support"
```

Install location of the WPS product files
```
-OPT installLocation="<wps_install_location>"
```

Since we create a Deployment Environment "none" is correct.
```
-OPT profileType="none"
```

Specify settings for the Custom profile
```
-OPT PROF_profileName="<custom01_profile_name>"
-OPT PROF_profilePath="<custom01_profile_path>"
-OPT PROF_hostName="<custom01_host_name>"
-OPT PROF_nodeName="<custom01_node_name>"
-OPT PROF_cellName="<cell_name>"
-OPT PROF_federateLater="false"
```

5. Save the response file. Finished.

Install deployment environment "remote messaging and remote support pattern" (part 1)

Now you begin the actual installation process by passing the previously created response file to the install application. Complete the following steps:

1. Open a terminal on the system, where you want to install WPS and login with the root user.
2. Go to the directory where you have unzipped the installation files and change to the WBI directory.
3. Execute the following command:

```
./install -options
"<full_qualified_path>/responsefile.wbis.dmgr.txt" -silent
```
4. When the command returns then switch the installation directory and examine the log files:

```
cd <wps_install_location>/logs/wbi/install/
grep INSTCONFSUCCESS log.txt
```

If the installation succeeded then you should see something like this in your terminal:

```
(Dec 31, 2007 1:22:00 PM), Process,
com.ibm.ws.install.ni.ismp.actions.ISMPLogSuccessMessageAction,
msg1, INSTCONFSUCCESS
```
5. Finished.

This is the result after completing this step (see also Illustration 4):
- You have installed the product files of WPS 6.1 in <wps_install_location>
- You have created a Deployment Manager profile (named <dmgr_profile_name>) with the Deployment Environment pattern "remote messaging and remote support".

Illustration 4: Result after installation step 1 for pattern

Install mandatory critical fixes

Important: Before continuing with the installation it is very important to install the mandatory critical fixes for Process Server that are listed on the IBM Software Support page (see [IC02]). The following two technotes describe the update process in detail:
- [TN01] Mandatory WebSphere Application Server critical fix for WebSphere Process Server and WebSphere Enterprise Service Bus, version 6.1, http://www-1.ibm.com/support/docview.wss?rs=2307&uid=swg21291827
- [TN02] Mandatory critical fixes for WebSphere Process Server and WebSphere Enterprise Service Bus, version 6.1, http://www-1.ibm.com/support/docview.wss?rs=2307&uid=swg21291075

Complete the following steps:
1. Install the WebSphere Application Server critical fix as described in technote [TN01].
2. Install the mandatory critical fixes for WPS as explained in technote [TN02].
3. Finished.

Install deployment environment "remote messaging and remote support pattern" (part 2)

Now you resume the actual WPS installation process by passing the second response file ("responsefile.wbis.managed.txt") to the install application. Complete the following steps:

1. Open a terminal on the system, where you want to install WPS and login with the root user.
2. Start the Deployment Manager (created in the previous steps) with the following command:

   ```
   <dmgr_profile_path>/bin/startManager.sh
   ```

3. Go to the directory where you have unzipped the installation files and change to the WBI directory.
4. Execute the following command:

   ```
   ./install -options
   "<full_qualified_path>/responsefile.wbis.managed.txt" -silent
   ```

5. When the command returns then switch the installation directory and examine the log files:

```
cd <wps_install_location>/logs/manageprofiles/
grep INSTCONFSUCCESS <custom01_profile_name>_create.txt
```

If the profile creation succeeded then you should see something like this in your terminal:

```
<message>INSTCONFSUCCESS: Success: Profile wps now exists. Please
consult /opt/ibm/WID61/pf/wps/logs/AboutThisProfile.txt for more
information about this profile.</message>
<message>Returning with return code: INSTCONFSUCCESS</message>
```

6. Now you can login to WebSphere admin console and start your newly created Deployment Environment:

   Servers > Deployment Environment

7. Now you are ready to install SCA modules.
8. In order to complete the installation of your Full Support Topology (as described in [RB01]) you will need to create another Custom Profile and add it to your Deployment Environment. You simply have to repeat the steps explained in section "Prepare response file for Custom Profile" and in this section.
9. Finished.

This is the result after completing this step (see also Illustration 5):
- You have use the already installed WPS 6.1 product files to create a new custom profile named <custom01_profile_name>. In terms of Deployment Environments you have added a role to your environment.
- The according Nodeagent was automatically started by the installation program.
- All database artifacts were created in the database specified (in case of this installation "WPCRSDB"), whereas different schemes are used to hold the tables.
  ○ Tables for CEI are automatically created in the default schema (so in the instance users schema).
  ○ Tables for BPC will be placed in a schema named "WPRBE00" right after the first start of the deployment environment via the admin console.
  ○ Tables for the SIB Messaging Engines will be created in the following schemes right after the first start of the deployment environment via the admin console: "WPRBM00, WPRCM00, WPRSA00, WPRSS00".
- The installation program has created three clusters (ADT, Messaging and Support), each with one cluster member.
- All WPS specific applications as Business Process Choreographer, CEI and so on have already been deployed.
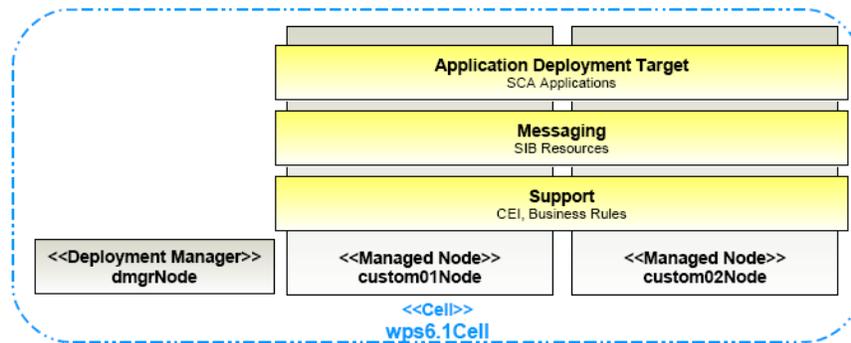
Illustration 5: Result after installation step 2 for pattern

Summary

In this article you got to know a new WPS 6.1 capability called "Deployment Environments", which can be considered as configuration templates for Process Server production topologies. These templates enable the WPS 6.1 installation program to create a lot of resources and configuration items automatically. In the last sections of this article you have used a Deployment Environment pattern called "remote messaging and remote support" which enabled you to accomplish the setup of a WPS Full Support Topology (as described in [RB01]) in little time.

References

[DW01] Clustering WebSphere Process Server V6.0.2, Part 2: Install and configure WebSphere Process Server clusters,
http://www.ibm.com/developerworks/websphere/library/techarticles/0704_chilanti2/0704_chilanti2.html

[RB01] Production Topologies for WebSphere Process Server and WebSphere ESB V6,
http://www.redbooks.ibm.com/abstracts/sg247413.html

[IC01] WebSphere Application Server v6.1 – Profile concepts,
http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/topic/com.ibm.websphere.nd.doc/info/ae/ae/cpro_overview.html

[IC02] IBM Software Support Page for WebSphere Process Server, http://www-1.ibm.com/support/docview.wss?rs=2307&uid=swg27006649

[TN01] Mandatory WebSphere Application Server critical fix for WebSphere Process Server and WebSphere Enterprise Service Bus, version 6.1, http://www-1.ibm.com/support/docview.wss?rs=2307&uid=swg21291827
[TN02] Mandatory critical fixes for WebSphere Process Server and WebSphere Enterprise Service Bus, version 6.1, http://www-1.ibm.com/support/docview.wss?rs=2307&uid=swg21291075