



Hewlett Packard
Enterprise

BIMS Zero-Configuration Deployment Solution through USB Flash Drive Configuration Examples

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Introduction

This document provides an example for deploying configurations to new CPEs through a USB flash drive.

You can use the BIMS zero-configuration deployment solution to configure and deploy CPEs from IMC BIMS without performing any operations on CPE devices. With this solution, you can manage CPEs on a large-scale network such as a data center or on remote enterprise branches.

Restrictions and guidelines

When you use the BIMS zero-configuration deployment solution to deploy configurations to new CPEs through a USB flash drive, follow these restrictions and guidelines:

- The CPEs must support the TR-069 protocol.
- The CPEs have USB ports.

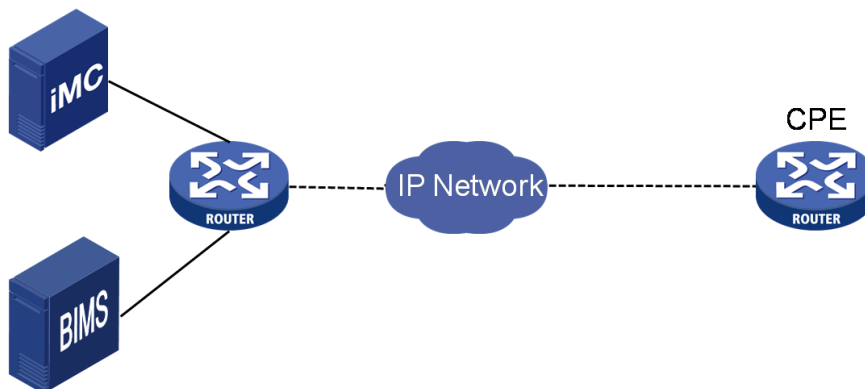
Example: BIMS zero-configuration deployment solution through a USB drive

Network configuration

As shown in [Figure 1](#), the IMC Platform and BIMS component are deployed on the enterprise network with a public IP address of 100.100.50.11. The ACS (BIMS server, with a private IP address of 192.168.1.134:9090) accesses the Internet by using a NATed IP address of 100.100.50.11:9090.

When a CPE is deployed at the branch, use BIMS zero-configuration deployment solution to deploy configurations to the CPE.

Figure 1 Network diagram



Adding a virtual CPE

1. Click the **Service** tab.
2. From the navigation tree, select **BIMS > Resource Management > Add CPE**.
The **Add CPE** page opens.
3. Configure the CPE parameters, as shown in [Figure 2](#):

- a. Select **ACS UserName** from the **Authentication Type** list.
- b. Enter **CPE1** in the **CPE Name** field.
- c. Enter **aaa** in the **ACS Username** field.
- d. Select **Manual Input** from the **ACS Password Generated** list.
- e. Enter **bbb** in the **ACS Password** and **ACS Confirm Password** fields.
- f. Use the default settings for other parameters.

Figure 2 Adding a CPE

4. Click **OK**.

Creating a CPE configuration deployment task

In this example, create a Telnet configuration deployment task for CPE1. After CPE1 comes online in BIMS for the first time, BIMS automatically deploys the Telnet configurations to CPE1 according to the task settings.

Customizing a configuration template

1. Click the **Service** tab.
2. From the navigation tree, select **BIMS > Configuration Management > Config Templates**. The **Configuration Templates** page opens.
3. Click **Add**. The **Add Configuration Template** page opens.
4. Configure the template parameters, as shown in [Figure 3](#):
 - a. Enter **Configure_Telnet.cfg** in the **Name** field.
 - b. Select a template type. You can configure BIMS to deploy configuration files or configuration segments to CPEs. This example uses **Configuration Segment**.
 - c. Select **Console** from the **Segment Type** list.
 - d. Select **RootFolder** from the **Folder** list.

- e. Enter the configuration segments to deploy in the **Content** field.
- f. Use the default settings for other parameters.

Figure 3 Adding a configuration template

Service > BIMS > Configuration Management > Configuration Templates > Add Configuration Template

Add Configuration Template

Name * ?

Template Type *

Segment Type *

Folder

Applicable CPEs

Description

Tips

Variables are allowed in the configuration Template to make it easy to reuse the file. Upon the Template deployment, you are asked for the variable values. Variable format: \$(variable name), such as \$(IP Address) where IP Address is used as the variable name. When you deploy the configuration Template, \$(IP Address) will be replaced by the IP address you set.

The blank before and after the variable will be omitted, \$(paramName) and \$(paramName) are the same.

The variable name cannot include space characters and any of the following characters: \$().

There is no "system" in the beginning of configuration segment.

There is no empty line in the end of configuration segment.

There is no "return" in the end of configuration segment.

Content *

```
telnet server enable
user-interface vty 0 4
authentication-mode scheme
quit
local-user $(Username)
password cipher $(Password)
authorization-attribute level 3
service-type telnet
```

5. Click **OK**.

Creating an automatic CPE configuration deployment task

1. Click the **Service** tab.
2. From the navigation tree, select **BIMS > Configuration Management > Deployment Guide**. The **Deployment Guide** page opens, as shown in [Figure 4](#).

Figure 4 Deployment Guide page

Service > BIMS > Configuration Management > Deployment Guide

Deployment Guide

Deploy Configuration

Auto Deploy Configuration

By CPE

Auto Deploy Software

By CPE

3. In the **Auto Deploy Configuration** area, click **By CPE**.

The **Auto Deploy Configuration** wizard opens.

4. Set the task attributes, as shown in [Figure 5](#):
 - a. Select **RootFolder** from the **Folder** list.
 - b. Select **Configure_Telnet.cfg** from the **File Name** list.
 - c. Select **Running Configuration** from the **File Type to be Deployed** list.
 - d. In the **CPE-to-Deploy** area, click **Select CPE**, select **CPE1**, and click **OK**.

Figure 5 Auto Deploy Configuration wizard

Service > BIMS > Configuration Management > Auto Deploy Configuration Help

1 Select CPE | 2 Configure Parameters | 3 Set Task Attributes

Tips

The auto deploy configuration function deploys configuration templates to CPEs that connect to your network for first time.
A CPE can appear in an auto startup configuration deployment task only once. This does not apply to the deployment task of running configurations.
No configuration segments can be used as startup configuration templates.
You cannot choose the TR-069 form configuration template.

Select Configuration Template

Folder:

File Name:

Deployment Strategy

File Type to be Deployed:

CPE-to-Deploy

CPE Name	Vendor	Serial ID	IP Address	Check result	Delete
CPE1	H3C			✓ Check Passed.	<input type="button" value="Delete"/>

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5. Click **Next**.
- The **Configure Parameters** page opens.
6. Enter **admin** in the **Username** and **Password** fields, as shown in [Figure 6](#).

Figure 6 Configuring CPE login parameters

Service > BIMS > Configuration Management > Auto Deploy Configuration Help

1 Select CPE | **2 Configure Parameters** | 3 Set Task Attributes

Username:

Password:

7. Click **Next**.
8. Enter **Deploy Configure Telnet** in the **Task name** field, as shown in [Figure 7](#).

Figure 7 Setting task attributes for CPE1

Service > BIMS > Configuration Management > Auto Deploy Configuration

1 Select CPE 2 Configure Parameters 3 Set Task Attributes

Task Name * Deploy Configure Telnet ?

Task Type Auto Deploy Configuration

Description ?

Previous Finish Cancel

9. Click **Finish**.

Creating a CPE software deployment task

In this example, create a software deployment task for CPE1. When CPE1 comes online in BIMS for the first time, BIMS automatically deploys the software to CPE1 according to the task settings.

Importing CPE software to BIMS

1. Click the **Service** tab.
2. From the navigation tree, select **BIMS > Configuration Management > Software Library**. The **Software Library** page opens.
3. Click **Import**. The **Import CPE Software** page opens.
4. Click the **Source File** button, browse to the software you want to import, and click **Open**. This example uses the software named **MSR20-CMW520-R2318-SI.BIN**.

The **Target File** and **Software Version** fields are automatically populated according to the information of the selected software, as shown in [Figure 8](#).

Figure 8 Importing CPE software

Service > BIMS > Configuration Management > Software Library > Import CPE Software

Import CPE Software

Source File * MSR20-CMW520-R2318-SI.BIN Source File

Target File * MSR20-CMW520-R2318-SI.BIN ?

Software Version CMW520-R2318-SI ?

Applicable CPEs * H3C MSR20-20 Select Model Delete Model

Description

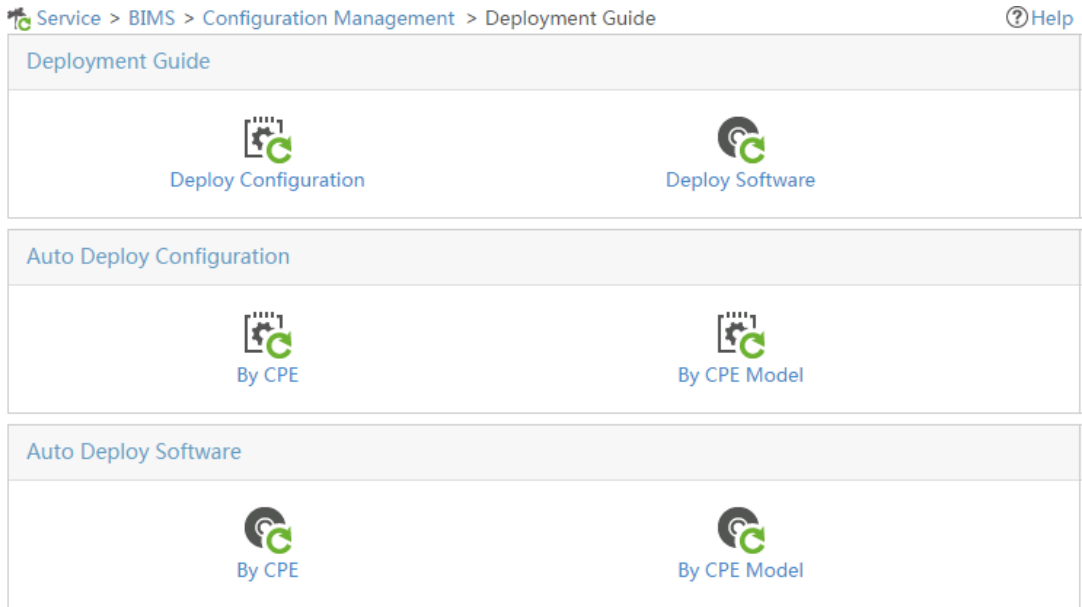
OK Cancel

5. Click the **Select Model** button to select applicable CPE models.
6. Click **OK**.

Creating an automatic CPE software deployment task

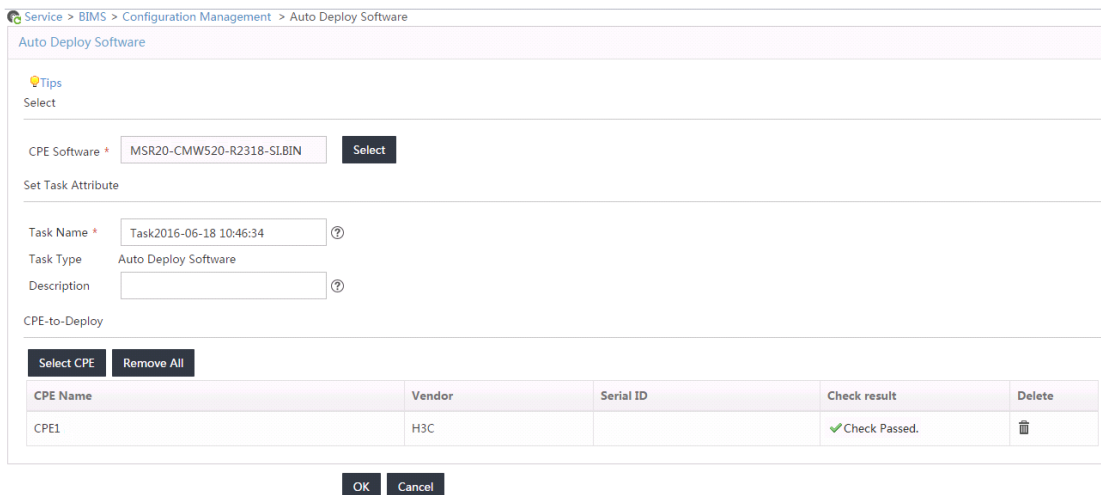
1. Click the **Service** tab.
2. From the navigation tree, select **BIMS > Configuration Management > Deployment Guide**. The **Deployment Guide** page opens, as shown in [Figure 9](#).

Figure 9 Deployment Guide page



3. In the **Auto Deploy Software** area, click **By CPE**. The **Auto Deploy Software** page opens.
4. Perform the following configurations, as shown in [Figure 10](#):
 - a. Click **Select** next to the **CPE Software** field. Select the software **MSR20-CMW520-R2318-SI.BIN**, and click **OK**.
 - b. In the **CPE to Deploy** area, click **Select CPE**, select **CPE1**, and click **OK**.

Figure 10 Auto Deploy Software page



5. Click **OK**.

Customizing a USB configuration template

1. Click the **Service** tab.
2. From the navigation tree, select **BIMS > Configuration Management > Config Templates**. The **Configuration Templates** page opens.
3. Click **Add**. The **Add Configuration Template** page opens.
4. Configure the template parameters, as shown in [Figure 11](#):
 - a. Enter **zero_configuration_pppoe.cfg** in the **Name** field.
 - b. Select **Configuration Segment** from the **Template Type** list.
 - c. Select **Console** from **Segment Type** list.
 - d. Select **RootFolder** from the **Folder** list.
 - e. Enter the following contents in the **Content** field:

```
# Configure PPPoE.
interface Dialer1
 link-protocol ppp
 dialer user USERNAME
 ppp pap local-user USERNAME password simple PASSWORD
 ip address ppp-negotiate
 dialer-group 1
 dialer bundle 1
 interface Ethernet0/0
 port link-mode route
 pppoe-client dial-bundle-number 1
 dialer-rule 1 ip permit
 ip route-static 0.0.0.0 0.0.0.0 Dialer1

# Configure BIMS access settings.
ssl client-policy cpe
cwpmp
    cwpmp acs url https://bims.imc.com:9443
    cwpmp acs username ${ACS_USERNAME}
    cwpmp acs password simple ${ACS_PASSWORD}
    cwpmp cpe inform interval enable
    ssl client-policy cpe

# Enable HTTP.
ip http enable
```

NOTE:

The USERNAME and PASSWORD variables in the command specify the username and password used for accessing the Internet through PPPoE. Branch network administrators can set the username and password as needed.

Figure 11 Adding a configuration template

Service > BIMS > Configuration Management > Configuration Templates > Add Configuration Template Help

Add Configuration Template

Name *	zero_configuration_pppoe.cfg ?
Template Type *	Configuration Segment
Segment Type *	Console
Folder	RootFolder
Applicable CPEs	<div style="border: 1px solid gray; height: 20px; width: 100%;"></div> <div style="float: right; margin-top: -20px;">Select Model Delete Model</div>
Description	<div style="border: 1px solid gray; height: 20px; width: 100%;"></div>

Tips

Variables are allowed in the configuration Template to make it easy to reuse the file. Upon the Template deployment, you are asked for the variable values.
Variable format: \${variable name}, such as \${IP Address} where IP Address is used as the variable name. When you deploy the configuration Template, \${IP Address} will be replaced by the IP address you set.
The blank before and after the variable will be omitted, \${paramName} and \${ paramName } are the same.
The variable name cannot include space characters and any of the following characters: \${}.

Content *

```
# Configure PPPoE.
interface Dialer1
link-protocol ppp
dialer user USERNAME
ppp pap local-user USERNAME password simple PASSWORD
ip address ppp-negotiate
dialer-group 1
dialer bundle 1
interface Ethernet0/0
port link-mode route
pppoe-client dial-bundle-number 1
dialer-rule 1 ip permit
ip route-static 0.0.0.0 0.0.0.0 Dialer1
# Configure BIMS access settings.
ssl client-policy cpe
cwm
cwm acs url https://bims.imc.com:9443
cwm acs username ${ACS_USERNAME}
cwm acs password simple ${ACS_PASSWORD}
cwm cpe inform interval enable
ssl client-policy cpe
# Enable HTTP.
ip http enable
```

OK Cancel

5. Click **OK**.

Exporting the USB boot file

1. On the **Configuration Templates** page, select **zero configuration pppoe.cfg**, and click **Export USB boot files**.
The **Select Configuration Template** area displays the path and name of the file you select.
2. Click **Select CPE**, select **CPE1**, and click **OK**.
3. Click **OK**.
The **Download USB boot files** page opens.
4. Click **USB boot files** and download the USB boot file to the root directory of a USB flash drive.

Booting the CPE from a USB flash drive

The branch network administrator obtains the USB flash drive and completes the following tasks:

1. Specify the username and password for accessing the Internet in the configuration file in the USB flash drive.

2. Copy the configuration file to the root directory of the USB flash drive.
3. Plug the USB flash drive into the CPE, and then power on the CPE.

The CPE boots from the USB flash drive, loads the configurations, and automatically accesses BIMS, as shown in [Figure 12](#).

Figure 12 CPE connecting to BIMS

The screenshot shows the 'Query CPE' interface in the BIMS system. It includes search filters for CPE Name, CPE Model, Vendor, Software Version, Serial ID, CPE Status, IP Address, and Access IP. Below the filters is a toolbar with actions like Delete, Synchronize, IP Ping Test, Remote Reboot, Factory Reset, Synchronize System Name, Customize Columns, and Refresh. A table displays the query results with columns for Status, CPE Name, NAT CPE, Serial ID, CPE Model, IP Address, Last Inform Time, Sync Result, and Operation. One entry is shown for CPE H3C with a 'Major' status and 'Succeeded' sync result.

Status	CPE Name	NAT CPE	Serial ID	CPE Model	IP Address	Last Inform Time	Sync Result	Operation
Major	H3C	No	210235A0L6H114000018	MSR30-20	90.16.0.201	2016-06-18 10:50:45	Succeeded	...

When the CPE is online, BIMS automatically deploys the configurations and software to the CPE, as shown in [Figure 13](#).

Figure 13 Configuration successfully deployed to the CPE

The screenshot shows the 'Query Condition' interface in the BIMS system, specifically for 'Deployment Task'. It includes search filters for Task Name, Task Type, Task Status, and Operation Result. Below the filters is a toolbar with actions like Run, Suspend, Resume, Delete, and Refresh. A table displays the deployment task results with columns for Status--Result, Task Name, Task Type, Creation Time, Creator, Start Time, End Time, and Operation. One entry is shown for 'Deploy Configure Telnet' with a 'Finished--Succeeded' status and a completion time of 2016-06-18 10:47:40.

Status--Result	Task Name	Task Type	Creation Time	Creator	Start Time	End Time	Operation
Finished--Succeeded	Deploy Configure Telnet	Auto Deploy Configur...	2016-06-18 10:45:04	admin	2016-06-18 10:45:04	2016-06-18 10:47:40	...