



# ZTP of New Branch Devices to Regions for Enterprise

Secure SD-WAN



DEFINE / DESIGN / **DEPLOY** / DEMO



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# Change Log

| Date       | Change Description                             |
|------------|--|
| 2022-05-10 | Initial release.                               |
| 2022-11-03 | Updated <a href="#">Branch BGP signaling</a> . |

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# Deployment procedures

This guide demonstrates how to add additional branch devices to an existing SD-WAN implementation. You can provision a single branch device, or you can provision many branch devices using a CSV file.

The deployment instructions include the following topics:

- [Prerequisites on page 4](#)
- [Model device definitions by CSV file on page 4](#)
- [Assumptions on page 5](#)
- [Configuration steps on page 5](#)

## Prerequisites

This guide presumes the SD-WAN configuration has been provisioned and includes the following:

- Templates:
  - IPsec tunnel template
  - BGP template
  - SD-WAN template
  - Post-Run CLI template
- Policy package
- A CSV file of model device definitions (See [Model device definitions by CSV file on page 4.](#))



For information on provisioning an SD-WAN configuration, see the following guides:

- Single Hub
  - Dual Hub (Primary/Secondary)
  - Dual Hub (Primary/Primary)
- 

## Model device definitions by CSV file

You can use a CSV file to add multiple model devices to FortiManager. The CSV file must contain the following columns to be used with the example in this guide:

## ASSUMPTIONS

- sn (serial number)
- device blueprint
- name
- branch\_id

Each row in the CSV file defines a branch device.

The *branch\_id* column is optional. However it is used in this guide to represent a metafield created by the SD-WAN overlay template. Keep in mind:

- Each branch device must have its own unique value.
- Duplicate IDs are not allowed.



You must create a device blueprint in FortiManager before you can import the CSV file. See [Creating a device blueprint on page 5](#).

Following is an example of a CSV file:

| sn               | device blueprint       | name    | branch_id |
|------------------|------------------------|---------|-----------|
| FGVM08TM2100xxxx | corpa_branch_blueprint | Branch3 | 3         |
| FGVM08TM2100xxxx | corpa_branch_blueprint | Branch4 | 4         |
| FGVM08TM2100xxxx | corpa_branch_blueprint | Branch5 | 5         |

## Assumptions

Branch devices in this guide are FortiGate-VM64 models.

Since VMs come with only one, provisioned interface, a specific pre-run CLI is required to create interfaces 2 to 10. The pre-run CLI is typically not needed in production because branch FortiGates are usually physical devices.

## Configuration steps

Following is a summary of the steps required to configure deploy new branch devices to an SD-WAN region using FortiManager:

1. Create a device blueprint. See [Creating a device blueprint on page 5](#).
2. Create a model device. See [Creating model devices on page 6](#).
3. Join branch devices to FortiManager. See [Joining branch devices to FortiManager on page 8](#).

## Creating a device blueprint

To create a device blueprint:

1. In FortiManager, go to *Device Manager*, and select *Device Blueprint* from the *Add Device* dropdown menu. The *Device Blueprint* dialog box is displayed.

## CONFIGURATION STEPS

- Click *Create New*. The *Create New Device Blueprint* pane is displayed.
- Set the following options, and click *OK*.

|                        |   |
|------------------------|---|
| Name                   | ACME_branch_blueprint   |
| Device Model           | FortiGate-VM64-KVM  |
| Add to Device Group    | Branches  |
| Pre-Run CLI template   | kvm_add_interfaces  |
| Assign Policy Package  | Branches  |
| Provisioning Templates | Click to select <i>Template Group</i> , and then select <i>ACME SD-WAN Overlay_branch_grp</i> . |

The screenshot shows the 'Create New Device Blueprint' dialog box with the following configuration:

- Name: ACME\_branch\_blueprint
- Device Model: FortiGate-VM64-KVM
- Enforce Firmware Version:  7.2 (by default)
- Add to Device Group:  Branches
- Add to Folder:
- Pre-Run CLI Template:  kvm\_add\_interfaces
- Assign Policy Package:  Branches
- Provisioning Templates:  ACME SD-WAN Overlay\_branch\_grp (Click here to assign)

At the bottom, there are 'Ok' and 'Cancel' buttons.

The device blueprint is created.

- Click *Close* to close the *Device Blueprint* dialog box.

## Creating model devices

You can create model devices one by one, or you can import a CSV file of definitions to create multiple model devices. This section describes both methods.

## CONFIGURATION STEPS

To create a model device one by one:

1. In FortiManager, go to *Device Manager*, and click *Add Device*. The *Add Device* dialog box displays.
2. Select *Add Model Device*.

The screenshot shows the 'Add Device' dialog box with the following options:

- Discover Device  
To add a device that is currently online.
- Add Model Device  
To add a device that is not yet online. Configure a model device to complete authorization when the device is online.
- Add Model HA Cluster  
Adding an operating FortiGate HA cluster to Device Manager pane is similar to adding a standalone device. Specify the IP address of the primary device.
- Import Model Devices from CSV File  
Import multiple device definitions for devices that are not yet online.

A 'Cancel' button is located at the bottom right of the dialog.

3. Set the following options, and click *Next*:

|                      |  |
|----------------------|--|
| Name                 | Type a name.   |
| Serial Number        | FortiGate-VM64-KVM   |
| Use Device Blueprint | Toggle on and select <i>ACME_branch_blueprint</i> .  |
| Metadata Variables   | Click <i>Edit Variable Mapping</i> , and set the <i>Mapping Value</i> column to 3 for the ( <i>\$branch_id</i> ) variable. Click <i>OK</i> . |

The screenshot shows the 'Add Device' dialog box with the following configuration:

- Add Model Device
- Name: Branch3
- Link Device By:  Serial Number  Pre-shared Key
- Serial Number: FGVM08TM21001234
- Use Device Blueprint:
- Device Blueprint: ACME\_branch\_blueprint (FortiGate-VM64-KVM)
- Metadata Variables: Edit Variable Mapping

The 'Edit Metadata Variable Mapping' dialog box shows the following table:

| # | Variable Name      | Mapping Value | Default Value |
|---|--------------------|---------------|---------------|
| 1 | <i>\$branch_id</i> | 3             |               |

Buttons for 'OK' and 'Cancel' are at the bottom of the dialog.

FortiManager adds the model device.

## CONFIGURATION STEPS

To import multiple model device definitions from a CSV file:

1. Prepare the CSV file.
2. In FortiManager, go to *Device Manager*, and click *Add Device*. The *Add Device* dialog box displays.
3. Select *Import Model Devices from CSV File*.

**Add Device**

Discover Device  
To add a device that is currently online.

Add Model Device  
To add a device that is not yet online. Configure a model device to complete authorization when the device is online.

Add Model HA Cluster  
Adding an operating FortiGate HA cluster to Device Manager pane is similar to adding a standalone device. Specify the IP address of the primary device.

**Import Model Devices from CSV File**  
Import multiple device definitions for devices that are not yet online.

Cancel

4. Drag and drop the CSV file in the window. The contents of the CSV file are displayed:

**Import Model Devices from CSV**

Please select a CSV file and click *Next* below.

NOTE: Based on the current setup, the CSV file must contain the following columns:

- sn
- device blueprint
- name

Upload

Add files by drag & drop here or [Add Files](#)

| sn                 | device blueprint                      | name      | branch_id |
|--------------------|---------------------------------------|-----------|-----------|
| ✓ FGVM08TM21001235 | ACME_branch_blueprint (FortiGate-V... | ✓ Branch4 | 4         |
| ✓ FGVM08TM21001236 | ACME_branch_blueprint (FortiGate-V... | ✓ Branch5 | 5         |
| ✓ FGVM08TM21001237 | ACME_branch_blueprint (FortiGate-V... | ✓ Branch6 | 6         |

< Previous   **Next >**   Cancel

5. Review the list of devices, and click *Next*.  
FortiManager adds the model devices.

## Joining branch devices to FortiManager

After the model devices are configured in FortiManager, connect the physical branch devices to FortiManager for the physical device to retrieve its configuration.



## CONFIGURATION STEPS

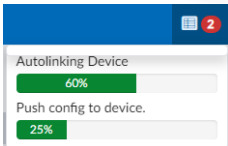
You can use the following methods to connect branch devices to FortiManager:

- FortiDeploy
- Pre-configure a FortiManager IP address

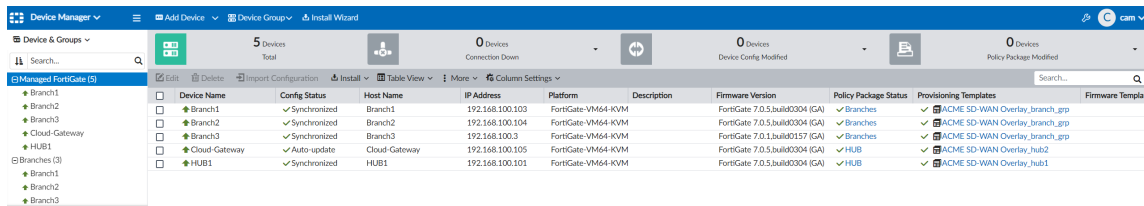
FortiDeploy is the recommended option to automatically join FortiGates to FortiManager for provisioning and continued management.

Once a FortiGate connects to FortiManager, a status window appears in the top-right corner of the FortiManager GUI to display progress for the following processes:

- Autolinking Device
- Push config to device.



When this completes, the branch(es) will show as synchronized for their policy package, config status, and provisioning template. The pre-run CLI template is no longer listed under *Provisioning Templates*.



| Device Name   | Config Status  | Host Name     | IP Address      | Platform           | Description                   | Firmware Version | Policy Package Status            | Provisioning Templates | Firmware Template |
|---------------|----------------|---------------|-----------------|--------------------|-------------------------------|------------------|----------------------------------|------------------------|-------------------|
| Branch1       | ✓ Synchronized | Branch1       | 192.168.100.103 | FortiGate-VM64-KVM | FortiGate-7.0.5.bulk0304 (GA) | ✓ Branches       | ✓ ACME SD-WAN Overlay_branch_grp |                        |                   |
| Branch2       | ✓ Synchronized | Branch2       | 192.168.100.104 | FortiGate-VM64-KVM | FortiGate-7.0.5.bulk0304 (GA) | ✓ Branches       | ✓ ACME SD-WAN Overlay_branch_grp |                        |                   |
| Branch3       | ✓ Synchronized | Branch3       | 192.168.100.3   | FortiGate-VM64-KVM | FortiGate-7.0.1.bulk0157 (GA) | ✓ Branches       | ✓ ACME SD-WAN Overlay_branch_grp |                        |                   |
| Cloud Gateway | ✓ Auto-update  | Cloud Gateway | 192.168.100.105 | FortiGate-VM64-KVM | FortiGate-7.0.5.bulk0304 (GA) | ✓ HUB            | ✓ ACME SD-WAN Overlay_hub2       |                        |                   |
| HUB1          | ✓ Synchronized | HUB1          | 192.168.100.101 | FortiGate-VM64-KVM | FortiGate-7.0.5.bulk0304 (GA) | ✓ HUB            | ✓ ACME SD-WAN Overlay_hub1       |                        |                   |



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