

SD-WAN ip|engine Quick Installation Sheet

This document describes how to install ip|engines for SD-WAN network deployment.

Prior to installation, the ip|engine must have been provisioned on the **Zero Touch Provisioning** Server.

Before installing an ip|engine, you should sign in to the **SD-WAN Orchestrator** and benefit from the **ZTP** service to identify the ip|engine and configure it according to the ip|engine deployment mode and type (hybrid/full router mode, multi-wan/multi-path, etc.).

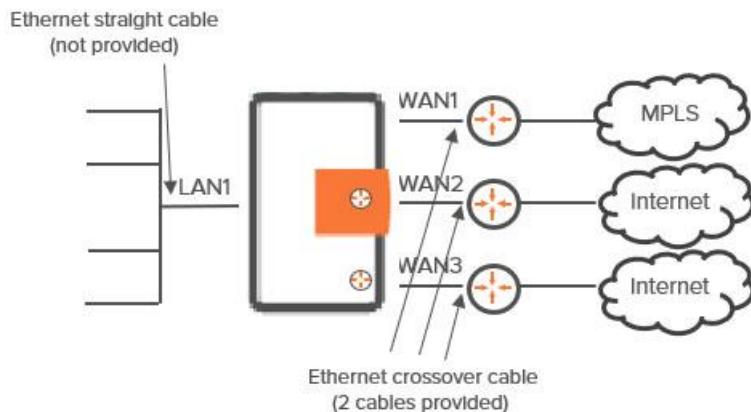
You may also start installing and connecting the ip|engine and subsequently log in to the SD-WAN Orchestrator to finetune its configuration.

Refer to SD-WAN Orchestrator Online Help for configuration explanations.

Installation

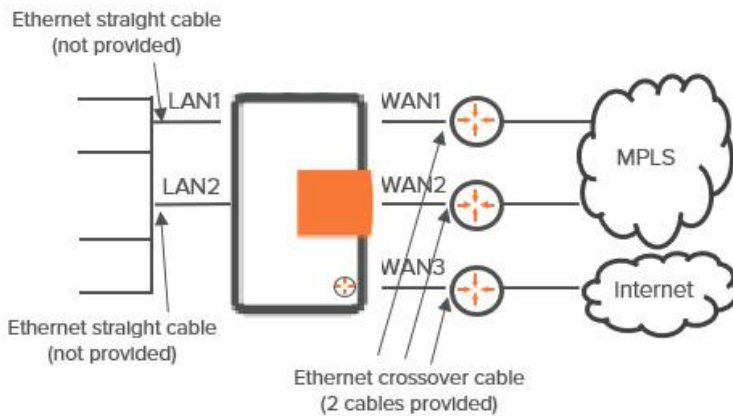
The installation procedures listed below correspond to the most common use cases – they are not exhaustive.

Hybrid SD-WAN ip|engine with 1 MPLS link and 2 Internet Access links (factory configuration)



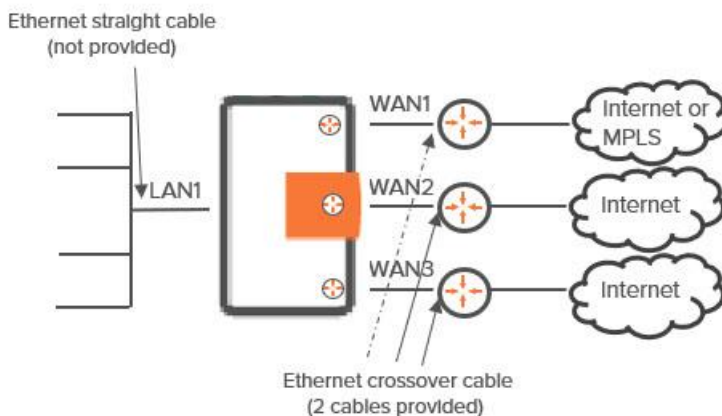
1. Install the ip|engine between your WAN router(s) and the LAN as shown in the diagram.
2. Connect the ip|engine to the mains. Check that the Power LED goes on.
3. Plug a straight cable into the ip|engine LAN1 port.
4. To connect the ip|engine to the Internet, connect one provided crossover cable to the WAN Internet Access router and to the ip|engine WAN2 **or** WAN3 port.
5. Then, use other crossover cables to connect the other ip|engine WAN ports to the WAN Internet Access or CE (MPLS) routers.

Hybrid SD-WAN ip|engine with 2 MPLS links and 1 Internet Access link – Multi-path (2 LANs)



1. Install the ip|engine between your WAN router(s) and the LAN as shown in the diagram.
2. Connect the ip|engine to the mains. Check that the Power LED goes on.
3. Plug a straight cable into the ip|engine LAN1 **and** LAN2 ports.
4. Use the provided crossover cables to connect the ip|engine WAN1 and WAN2 ports to the CE (MPLS) routers.
5. Then, connect another crossover cable to the ip|engine WAN3 port and to the WAN Internet Access router, to enable the ip|engine to access the Internet.

Full Router SD-WAN ip|engine with 2 Internet Access links and a third link, either Internet or MPLS



1. Install the ip|engine between your WAN router(s) and the LAN as shown in the diagram.
2. Connect the ip|engine to the mains. Check that the Power LED goes on.
3. Plug a straight cable into the ip|engine LAN1 port.
4. To connect the ip|engine to the Internet, connect one provided crossover cable to the WAN Internet Access router and to the ip|engine WAN2 **or** WAN3 port.
5. Then, use other crossover cables to connect the other ip|engine WAN ports to the WAN Internet Access routers, or to one WAN Internet Access router for WAN2 and one CE (MPLS) router for WAN1 in the case this interface is connected to MPLS.

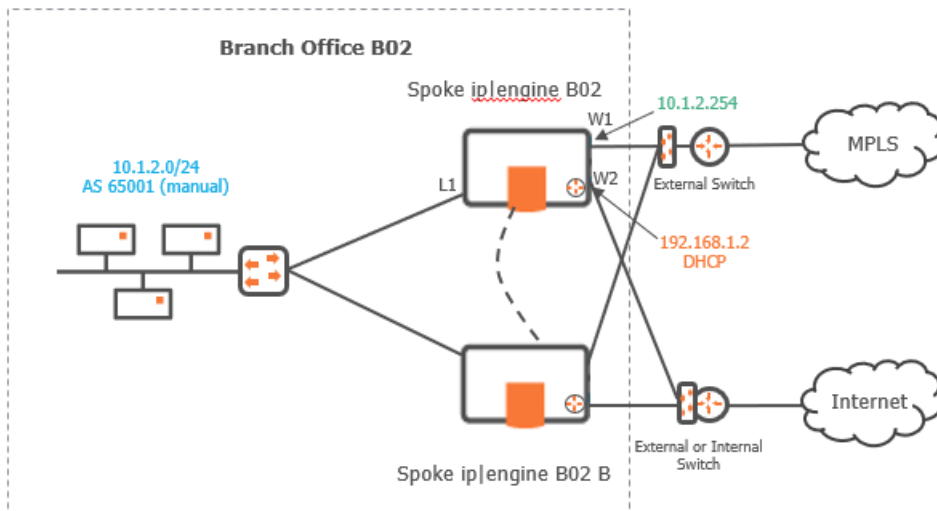
Warning: WAN1 is connected only after it has been configured in full router mode in the SD-WAN Orchestrator.

Advanced Installation

Bridge or Hybrid SD-WAN ip|engine: installation for IHAP deployment

With High Availability, two ip|engines are declared on a cluster site but only one ip|engine executes Application Visibility, Application Control, WAN Optimization and Dynamic WAN Selection processes. This ip|engine is called HA active engine. The other ip|engine is kept as HA standby engine.

In a standard IHAP nominal/backup configuration, the active engine is the nominal one. When this engine goes down, the standby engine becomes active and starts the processes.



IHAP Deployment – Site Upgrade with a second Hybrid ip|engine

In this deployment,

- the first hybrid ip|engine already operates in your network. It is completely wired (LAN1, WAN1, WAN2) and is configured as the HA 'nominal' ip|engine in the SD-WAN Orchestrator
- the second ip|engine is new. It will be configured as the HA 'backup' ip|engine in the SD-WAN Orchestrator

Installing and configuring the new Backup ip|engine

1. If this B02B device was previously used at another location of your network, reset it to its [factory configuration](#) (see the last section of this document) and power it off.
2. Configure the ip|engine in the SD-WAN Orchestrator (refer to 'Deploying the Network -> Configuring multi-ip|engine Sites -> Configuring a multi-ip|engine Branch Office Site through IHAP' in the **SD-WAN Orchestrator User Guide**).
3. Wire this ip|engine on WAN1.
4. Power the ip|engine on.
5. Check the B02 Troubleshooting information in the SD-WAN Orchestrator to ensure IHAP is configured with B02B.
6. Wire the B02B ip|engine completely – add LAN1 and WAN2 connections.
7. Check the Supervision information of both ip|engines in the SD-WAN Orchestrator.

IHAP Deployment – Fresh Installation of 2 Hybrid ip|engines

In this deployment, the two ip|engines are new; they must be configured and installed in your network.

If these devices were previously used at another location of your network, reset them to their [factory configuration](#) (see the last section of this document) and power the ip|engines off.

Installing and configuring the ip|engines

1. Configure both ip|engines in the SD-WAN Orchestrator (refer to 'Deploying the Network -> Configuring multi-ip|engine Sites -> Configuring a multi-ip|engine Branch Office Site through IHAP' in the **SD-WAN Orchestrator User Guide**).
2. Wire the nominal ip|engine completely and power it on.
3. Check the B02 Supervision and Troubleshooting information in the SD-WAN Orchestrator.

- Then, for the backup B02B ip|engine, repeat steps 3 to 7 of the previous procedure [IHAP Deployment – Site Upgrade with a second Hybrid ip|engine](#).

Testing the IHAP Configuration

The `hatest` command enables you to simulate several HA scenarios.

For example, you can simulate a dead unresponsive ip|engine or bad engine health and check whether your configuration is correct to authorize the backup engine to take over when the nominal active engine is down or when its health is bad.

```
# hatest
```

```
Test tool for forcibly changing HA behaviour
Usage: hatest          Print this help and exit
hatest  -s, --stop     Makes engine unresponsive from HA perspective
hatest  -f, --fake    Send fake bad health to peer
hatest  -t, --period  Time period for which HA will behaves as per the
                       given command. (Allowed range: 200 msec to 2 mins)
```

- Make the ip|engine unresponsive during 60 seconds: `hatest -s -t 60000`
This command sends the nominal engine to a backup state. If the backup engine is not ready to take over the Visibility, Control and Optimization tasks, user traffic might be blocked during the test period.
- Generate fake bad health during 50 seconds: `hatest -f -t 50000`

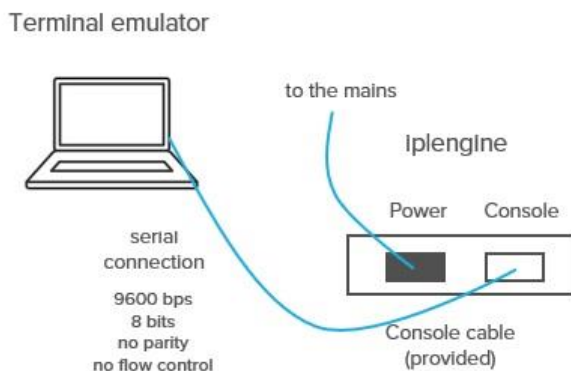
After the specified period has elapsed, the nominal ip|engine normally resumes its HA tasks

Local Configuration

Full Router SD-WAN ip|engine: configuring WAN interfaces locally

If the ip|engine cannot retrieve its WAN configuration parameters automatically (IP address, subnet mask, default gateway, DNS server list) because there is no DHCP server in the router in front of the WAN interface, you must manually define a temporary address for this WAN interface to enable its connection to the SD-WAN Orchestrator.

- Launch a terminal emulator on your laptop (for instance Putty under Windows) and establish a serial connection to the ip|engine.



- Log in as user `ipanema`, password `ipanema`.
- Use the following command to set the ip|engine WAN interface IP address and subnet mask (`-a`), default gateway (`-g`) and dns servers (`-s`) to match your network addresses.

```
inetconfig -i <WAN interface> -a <ip address/mask> -g <ip address>
-s <dns1 ip address> -s <dns2 ip address>
```

- Reboot the ip|engine.

As soon as the ip|engine is able to contact the SD-WAN Orchestrator, this manual configuration is replaced with the configuration defined in the SD-WAN Orchestrator.

Bridge or Hybrid SD-WAN ip|engine: configuring the LAN locally

If the ip|engine cannot retrieve its configuration parameters automatically because there is no DHCP server, you must manually define a temporary address for the ip|engine LAN to enable its connection to the SD-WAN Orchestrator.

1. Launch a terminal emulator on your laptop (for instance Putty under Windows) and establish a serial connection to the ip|engine as described in the previous section. Log in as user **ipanema**, password **ipanema**.
2. Use the following command to set the ip|engine IP address and subnet mask (**-a**, **-m**), default gateway (**-g**), hostname (**-h**) and dns servers (**-ns**) to match your network addresses.

```
ipconfig lan -a <ip address> -m <ip mask> -g <gateway ip address> -h <hostname> -ns1 <DNS1> -ns2 <DNS2>
```

3. Reboot the ip|engine.

As soon as the ip|engine is able to contact the SD-WAN Orchestrator, this manual configuration is replaced with the configuration defined in the SD-WAN Orchestrator.

Resetting an ip|engine to its factory configuration

Factory configuration corresponds to the Installation first Use Case: ['Hybrid SD-WAN ip|engine with 1 MPLS link and 2 Internet Access links \(factory configuration\)'](#).

You may need to reset an ip|engine to its factory configuration for the current version of the SD-WAN Agent (the last version you installed), if you move the ip|engine from one Site to another Site or if you receive it back from after-sale Customer Service.

Use one of the following methods:

1. Unplug all the WAN cables.
2. Connect to the ip|engine via your Ipanema user account.
3. Enter the following command:

```
factory_reset and select y to confirm
```

Cleanup is executed by the system. At the end of the process, you may reconfigure the ip|engine.

OR

1. Unplug all the WAN cables.
2. Connect the ip|engine to your PC or laptop in console mode (ip|e console port – laptop serial port) via the provided console cable.
3. Reboot the ip|engine and when prompted by the system, press Escape to display the GRUB menu.
4. Select the second GRUB entry (Rescue Mode Agent) and press Enter.

Cleanup is executed by the system. At the end of the process, you may reconfigure the ip|engine.

Also refer to the Support Website.