CloudBridge Virtual WAN 8.0
Installation and Configuration Guide

This document provides basic instructions for installing and configuring Citrix CloudBridge Virtual WAN Appliances and sites in your CloudBridge Virtual WAN network.
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Chapter 1

About This Guide

This chapter provides an overview of the purpose and content of this guide. Topics include:

- Purpose
- Audience
- How This Guide Is Organized
- Document Font Conventions
- Related Documents

The following sections provide details on each of these topics.

Purpose

This guide provides basic instructions for installing and deploying CloudBridge Virtual WAN Appliances and the CloudBridge Virtual WAN software.

Audience

This guide is intended for Network Administrators and Architects. Readers are assumed to be familiar with the physical setup and operation of networking equipment, and general networking concepts.
How This Guide Is Organized

A list and summary of each of the chapters in this guide are provided below.

Chapter 1: About This Guide – This chapter provides an overview of the purpose, audience, and content of this guide. Also provided are a description of the font conventions used in this guide, and a list of recommended and related documents.

Chapter 2: Overview – This chapter provides some basic information about the CloudBridge Virtual WAN software packages and supported Virtual WAN Appliances. Also included is a description and navigation roadmap of the CloudBridge Virtual WAN Management Web Interface.

Chapter 3: Before You Begin – This chapter outlines the hardware and software requirements for deploying Citrix CloudBridge Virtual WAN, and defines any platform dependencies. Also provided is a summary and overview of the CloudBridge Virtual WAN installation and deployment procedures described in this guide.

Chapter 4: Gathering Your CloudBridge Virtual WAN Deployment Information – This chapter provides a checklist of the information you will need to complete the deployment.

Chapter 5: Setting up the CloudBridge Virtual WAN Appliances – This chapter describes the procedures for setting up the CloudBridge Virtual WAN appliance hardware, and configuring the Appliance Management IP Address.

Chapter 6: Setting up the Master Control Node (MCN) Site – This chapter provides instructions for using the Configuration Editor to create and configure the MCN site. Also included are instructions for enabling and configuring High Availability (HA) and Virtual WAN security and encryption.

Chapter 7: Setting up the Branch Sites – This chapter provides instructions for creating and configuring the branch sites.

Chapter 8: Installing the CloudBridge Virtual WAN Software on the MCN Appliance – This provides instructions for uploading the Virtual WAN software and configuration to the MCN appliance.
Chapter 9: Connecting the Client Appliances to Your Network – This chapter provides instructions for connecting the client appliances to your Virtual WAN network, in preparation for installing the Virtual WAN Appliance packages on the clients.

Chapter 10: Installing the Virtual WAN Appliance Packages on the Clients – This chapter provides instructions for installing, staging, and activating the CloudBridge Virtual WAN Appliance packages on the Virtual WAN clients.

Chapter 11: Monitoring Your CloudBridge Virtual WAN – This chapter provides basic instructions for generating and viewing statistics and reports to monitor the status of your CloudBridge Virtual WAN deployment.

Appendix A: Standard MIB Support – This provides a table of the Standard MIBs supported by CloudBridge Virtual WAN, which includes links to the RFC definitions for each of these MIBs.

Glossary – This provides definitions of some of the fundamental CloudBridge Virtual WAN terms and concepts.
Document Font Conventions

<table>
<thead>
<tr>
<th>Font Convention</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arial bold font</strong></td>
<td>Bold font indicates a GUI screen element. This font is also used for table and list headings for visual clarity.</td>
</tr>
<tr>
<td><strong>Arial bold Italic font</strong></td>
<td>Bold Italic font is used to indicate GUI screen elements that might vary according to specific context. This font is also occasionally used for table and list subheadings, for visual clarity.</td>
</tr>
<tr>
<td><strong>Arial plain Italic font</strong></td>
<td>Plain Italic font is used for book or publication titles, and occasionally for emphasis.</td>
</tr>
<tr>
<td><strong>Courier New (plain text) font</strong></td>
<td>Courier New plain text font indicates screen output and non-GUI screen elements, and program or script code text.</td>
</tr>
<tr>
<td><strong>Courier New bold font</strong></td>
<td>Courier New bold font indicates user input (text you must enter manually). It also indicates a script or other executable name.</td>
</tr>
<tr>
<td><strong>Courier New bold Italic font</strong></td>
<td>Courier New bold Italic font indicates variable user input.</td>
</tr>
</tbody>
</table>

Related Documents

The following additional CloudBridge Virtual WAN documentation is available on the Citrix Support Portal (http://www.citrix.com/support):

*Citrix CloudBridge Virtual WAN Deployment Planning Guide*

You can also find the CloudBridge WAN Optimization documentation at his URL:

http://support.citrix.com/proddocs/topic/cloudbridge/cldb-cloudbridge.html
Overview

This chapter provides some basic information about the CloudBridge Virtual WAN software packages and supported Virtual WAN Appliances. Also included is a brief description of the Virtual WAN Master Control Node (MCN), the Virtual WAN Configuration, and the Virtual WAN Appliance packages. The chapter concludes with an overview and navigation roadmap of the CloudBridge Virtual WAN Management Web Interface (MWI), and basic instructions for using the MWI Configuration Editor and Change Management wizard.

The following sections provide the essential information for each of these topics.

The CloudBridge Virtual WAN 8.0 Software Packages

There is a different version of the Citrix CloudBridge Virtual WAN 8.0 software for each supported CloudBridge Virtual WAN Appliance model. You will need to acquire the appropriate version for each appliance model you plan to incorporate into your network.

The following section discusses the supported CloudBridge Virtual WAN Appliance models.
Supported CloudBridge Virtual WAN Appliance Models

Citrix CloudBridge Virtual WAN 8.0 supports the following CloudBridge Virtual WAN Appliance models:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB 1000</td>
<td>Small branch node appliance</td>
</tr>
<tr>
<td>CB 2000</td>
<td>Large branch node appliance</td>
</tr>
<tr>
<td>CB 4000</td>
<td>Data center Master Control Node (MCN) appliance</td>
</tr>
</tbody>
</table>

The following figure illustrates each of the supported models.

*Figure 1. Citrix CloudBridge Virtual WAN Appliances*
The Master Control Node (MCN)

The Master Control Node (MCN) is the central Virtual WAN Appliance that acts as the master controller of the Virtual WAN, and the central administration point for the client nodes. All configuration, software package distribution, and management activities for the Virtual WAN are performed on or from the MCN.

The primary purpose of the MCN is to establish and utilize Virtual Paths with one or more client nodes located across the Virtual WAN, for Enterprise Site-to-Site communications. An MCN can administer and have Virtual Paths to multiple client nodes. There can be more than one MCN, but only one can be active at any given time.

The following diagram illustrates the basic roles and context of the MCN (data center) and client (branch node) appliances.

*Figure 2. The basic roles and context of the MCN and client node*

The CloudBridge Virtual WAN Configuration

The CloudBridge Virtual WAN Configuration describes and defines the topology of your Virtual WAN network. Before you can deploy a CloudBridge Virtual WAN network, you must define the Virtual WAN Configuration. To do this, you use the Configuration Editor in the CloudBridge Management Web Interface on the MCN appliance.

Basic instructions for configuring your Virtual WAN network are provided in this guide. For additional instructions, please refer to the *Citrix CloudBridge Virtual WAN 8.0 Planning Guide* and *Citrix CloudBridge Virtual WAN 8.0 Administration Guide*. 
The CloudBridge Virtual WAN Appliance Packages

There is a different version of the Citrix CloudBridge Virtual WAN 8.0 software for each supported CloudBridge Virtual WAN Appliance model. A Virtual WAN Appliance package is a combined package containing the Virtual WAN software version for a particular appliance model, bundled together with a specific Virtual WAN Configuration package. The two components are bundled together and distributed to the clients by means of the Change Management wizard in the Management Web Interface running on the Master Control Node (MCN). You then must upload, stage, and activate the appropriate Appliance Package on each of the client appliances residing in your Virtual WAN network.

CloudBridge Virtual WAN Security and Encryption Implementation

The use of encryption in the CloudBridge Virtual WAN (for Virtual Paths) is an optional feature for CloudBridge Virtual WAN. Instructions for configuring this feature are provided in the section entitled, “Enabling and Configuring Virtual WAN Security and Encryption (Optional),” in “Chapter 6: Setting up the Master Control Node (MCN) Site.”

The Advanced Encryption Standard (AES) is used by CloudBridge Virtual WAN to secure traffic across the Virtual Path. Both AES 128 and 256 bit ciphers (key sizes) are supported by the Virtual WAN Appliances, and are configurable options. You can select, enable, and configure these and the other encryption options by using the Configuration Editor in Management Web Interface on the Management Control Node (MCN). You must have administrative access on the MCN to modify the configuration, and to distribute your changes across the Virtual WAN. Once the MCN is secured, the encryption settings and their distribution are also secure.

Authentication between sites functions by means of the Virtual WAN Configuration. The network configuration has a secret for each site. For each Virtual Path, the network configuration generates a key by combining the secrets from the sites at each end of the Virtual Path. The initial key exchange that occurs when a Virtual Path is first set up, is dependent upon the ability to encrypt and decrypt packets by means of that combined key.
The CloudBridge Virtual WAN Management Web Interface

This section provides basic navigation instructions, and a navigation roadmap of the Management Web Interface page hierarchy. Also provided are specific navigation instructions for the **Configuration Editor** and **Change Management** wizard.

**Basic Navigation**

The following figure outlines the basic navigation elements of the Management Web Interface, and the terminology used in this guide to identify them.

*Figure 3. CloudBridge Management Web Interface Navigation*
The basic navigation elements are as follows:

- **Title bar** – This is the dark grey bar at the top of all Management Web Interface screens. This displays the appliance model number, Host IP Address for the appliance, the software version currently running on the appliance, and the user name for the current login session. The title bar also contains the **Logout** button for terminating the session.

- **Main menu bar** – This is the light blue bar displayed below the title bar on every Management Web Interface screen. This contains the section tabs for displaying the navigation tree and pages for a selected section.

- **Section tabs** – The section tabs are located in the blue main menu bar at the top of the page. These are the top-level categories for the Management Web Interface pages and forms. Each section has its own navigation tree for navigating the page hierarchy in that section. Click a section tab to display the navigation tree for that section.

- **Navigation tree** – The navigation tree is located in the left blue and grey pane, below the main menu bar. This displays the navigation tree for a section. Click a section tab to display the navigation tree for that section. The navigation tree offers the following display and navigation options:
  - Click a section tab to display the navigation tree and page hierarchy for that section.
  - Click + (plus sign) next to a branch in the tree to reveal the available pages for that branch topic.
  - Click a page name to display that page in the page area.
  - Click – (minus sign) next to a branch item to close the branch.

- **Breadcrumbs** – This displays the navigation path to the current page. The breadcrumbs are located at the top of the page area, just below the main menu bar. Active navigation links display in blue font. The name of the current page is displayed in black bold font.
• **Page area** – This is the page display and work area for the selected page. Select an item in the navigation tree to display the default page for that item.

• **Page tabs** – Some pages contain tabs for displaying additional child pages for that topic or configuration form. These are usually located at the top of the page area, just below the breadcrumbs display. In some cases (as for the Change Management wizard), tabs are located in the left pane of the page area, between the navigation tree and the work area of the page.

• **Page area resizing** – For some pages, you can grow or shrink the width of the page area (or sections of it) to reveal additional fields in a table or form. These pages areas contain a resize bar (not shown in the figure above) for this purpose. Where available, the resize bar is the grey vertical bar located on the right border of a page area pane, form, or table. Roll your cursor over the resize bar until the cursor changes to a bi-directional arrow. Then click and drag the bar to the right or left to grow or shrink the area width.

If the resize bar is not available for a page, you can click and drag the right edge of your browser to display the full page.

### Management Web Interface Page Hierarchy

The Management Web Interface pages and forms are organized into three top-level sections, as follows:

• **Dashboard**

• **Monitoring**

• **Configuration**

Click a section tab in the main menu bar to display the navigation tree for that section. Then select an item in the navigation tree to display the default page for that item.

The following table provides a navigation roadmap of the Management Web Interface navigation tree hierarchy.
Management Web Interface Navigation Tree Hierarchy

<table>
<thead>
<tr>
<th>TOP LEVEL SECTION TAB</th>
<th>TREE LEVEL 1</th>
<th>TREE LEVEL 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dashboard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtual WAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Statistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flows</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Performance Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• QoS Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Usage Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Availability Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Appliance Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appliance Settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Administrator Interface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Logging/Monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Network Adaptors</td>
<td></td>
<td></td>
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<tr>
<td>• NetFlow</td>
<td></td>
<td></td>
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<tr>
<td>• SNMP</td>
<td></td>
<td></td>
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<tr>
<td>• Licensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtual WAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• View Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Configuration Editor (MCN only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Change Management (MCN only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enable/Disable/Purge Flows</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Dynamic Virtual Paths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Delete Files</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Restart System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Date/Time Settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Local Change Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Diagnostics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Update Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Configuration Reset</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Management Web Interface Dashboard

Click the **Dashboard** section tab to display basic information for the local appliance.

The **Dashboard** page displays the following basic information for the appliance:

- System status
- Virtual Path Service status
- Local appliance software version information

The following figure shows a sample Master Control Node (MCN) appliance **Dashboard** display.

**Figure 4. Master Control Node (MCN) Appliance Dashboard**

```
<table>
<thead>
<tr>
<th>Citrix CloudBridge CB4000-</th>
<th>Host Name: 10.199.106.232</th>
<th>Version: 8.0.0.0.30202015</th>
<th>User: admin</th>
<th>Logout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dashboard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**System Status**

- **Name:** DC
- **Model:** CB4000
- **Appliance Mode:** MCN
- **Management IP Address:** 10.199.106.232
- **Appliance Uptime:** 2 days, 19 hours, 3 minutes, 38.6 seconds
- **Service Uptime:** 2 days, 19 hours, 14 minutes, 26.9 seconds

**Virtual Path Service Status**

- **Virtual Path DC RR1:** Uptime: 22.0 seconds

**Local Versions**

- **Software Version:** 8.0.0.0.30202015
- **Built On:** Mar 20, 2015 at 17:42:07
- **Hardware Version:** CB4000
- **OS Partition Version:** 4.5
```

The following figure shows a sample client appliance **Dashboard** display.
The following section provides an overview and navigation instructions for the Management Web Interface Configuration Editor.
The Configuration Editor

The **Configuration Editor** enables you to add and configure CloudBridge Virtual WAN Appliance sites, connections, and provisioning, and to create and define the Virtual WAN Configuration.

The **Configuration Editor** is available when the Management Web Interface is in **MCN Console** mode, only. For information on switching the interface to **MCN Console** mode, see the section entitled, “Specifying the MCN” in “Chapter 6: Setting up the Master Control Node (MCN).”

To navigate to the **Configuration Editor**, do the following:

1. Log into the Management Web Interface on the MCN appliance.
2. Select the **Configuration** tab.
3. In the navigation tree, click + next to the **Virtual WAN** branch in the tree.
   
   This displays the available pages for the **Virtual WAN** category.
4. In the Virtual WAN branch of the tree, select **Configuration Editor**.

The following figure outlines the basic navigation and page elements of the **Configuration Editor**, and the terminology used in this guide to identify them.
The following describes the primary **Configuration Editor** navigation elements referenced in this guide:

- **Configuration Editor menu bar** – The **Configuration Editor** menu bar is located at the top of the page area, just below the breadcrumbs links. The menu bar contains the primary activity buttons for **Configuration Editor** operations. In addition, at the far right edge of the menu bar is the **View Tutorial** link button for initiating the **Configuration Editor** tutorial. The tutorial steps you through a series of bubble descriptions for each element of the **Configuration Editor** display.

- **Configuration Editor sections navigation tree** – The sections navigation tree is the stack of dark grey bars located in the left pane of the **Configuration Editor** page area. Each grey bar represents a top-level section. Click + at the left of a section name to reveal the sub-branches for that section.
• **Configuration Editor sections** – Click + (plus sign) at the left of a section name in the section tree to open a section branch. Click – (minus sign) to close a branch. Each section branch contains one or more sub-branches of configuration categories and forms, which in turn may contain additional child branches and forms.

• **Sites tree** – This lists the site nodes that have been added to the configuration currently opened in the **Configuration Editor**. In the section tree, click + at the left of Sites to open the Sites tree. Click + to the left of a site name to open the branch for that site. Click – (minus sign) to close a branch. For detailed instructions on navigating and using the Sites tree and configuration forms, please refer to the following chapters:
  - **“Chapter 6: Setting up the Master Control Node (MCN) Site”**
  - **“Chapter 7: Setting up the Branch Sites”**

• **Audits status bar** – This is the dark grey bar at the bottom of the **Configuration Editor** page, and spanning the entire width of the Management Web Interface screen. The Audits status bar is available only when the **Configuration Editor** is open. An alert icon (red dot or goldenrod delta) at the far left of the status bar indicates errors present in the currently-opened configuration. Click the status bar to display a complete list of all unresolved alerts for that file.

• **Resize bar** – The resize bar is the thin, grey, vertical bar located on the right border of the main page area pane, and is available in most of the **Configuration Editor** pages. You can use the resize bar to grow or shrink the width of the page area to reveal or truncate content in a table, tree, or form. Roll your cursor over the resize bar until the cursor changes to a bi-directional arrow. Then click and drag the bar to the right or left to grow or shrink the area width.

  If the resize bar is not available for a page area, you can click and drag the right edge of your browser to display the full page.
The Change Management Wizard

The Change Management wizard guides you through the process of uploading, downloading, staging, and activating the CloudBridge Virtual WAN software and configuration on the Master Control Node (MCN) appliance and client appliances.

To open the Change Management Wizard, do the following:

1. Log into the Management Web Interface on the MCN appliance.
2. Select the Configuration tab.
3. In the navigation tree, click + next to the Virtual WAN branch in the tree.
4. In the Virtual WAN branch, select Change Management.

This displays the first page of the Change Management wizard, the Change Process Overview page, as shown in the following figure.

Figure 7. First page of the Change Management wizard
5. To start the wizard, click **Begin**.

   For complete instructions on using the wizard to upload, stage, and activate the Virtual WAN software and configuration on the appliances, see the following chapters in this guide:

   - **“Chapter 8: Installing the CloudBridge Virtual WAN Software on the MCN Appliance”**
   - **“Chapter 10: Installing the Virtual WAN Appliance Packages on the Clients”**

The **Change Management** wizard contains the following navigation elements:

- **Page area** – This displays the forms, tables, and activity buttons for each page of the **Change Management** wizard.

- **Change Management wizard page tabs** – The page tabs are located in the left pane of the page area on each page of the wizard. Tabs are listed in the order that the corresponding steps occur in the wizard process. When a tab is active, you can click it to return to a previous page in the wizard. If a tab is active, the name displays in blue font. Grey font indicates an inactive tab. Tabs are inactive until all dependencies (previous steps) have been fulfilled without error.

- **Appliance-Site table** – This is located at the bottom of the wizard page area, on most wizard pages. The table contains information about each configured appliance site, and links for downloading the active or staged packages for that appliance model and site. A package in this context is a Zip file bundle containing the appropriate CloudBridge Virtual WAN software for that appliance model, and the associated configuration version. The **Configuration Filenames** section above the table shows the file name for the current active and staged packages on the local appliance.
- **Active/Staged download links** – These are located in the **Download Package** field (far right column) of each entry in the **Appliance-Site** table. Click a link in an entry to download the active or staged package for that appliance site.

- **Begin button** – Click **Begin** to initiate the **Change Management** wizard process and proceed to the **Change Preparation** tab page.

The following chapter provides instructions for preparing for your deployment of CloudBridge Virtual WAN 8.0.
Chapter 3

Before You Begin

This chapter outlines the hardware and software requirements for deploying Citrix CloudBridge Virtual WAN, and defines any platform dependencies. Also provided is a summary and overview of the CloudBridge Virtual WAN installation and deployment procedures described in this guide.

Hardware Installation Requirements

Instructions for installing your CloudBridge Virtual WAN Appliances are provided in “Chapter 5: Setting up the CloudBridge Virtual WAN Appliances,” in this guide.

Related information on CloudBridge WAN Optimization can be found at this location:

http://support.citrix.com/proddocs/topic/cloudbridge/cldb-cloudbridge.html

Software Requirements

This section outlines the software requirements for deploying and operating the CloudBridge Virtual WAN. Also provided is basic information on acquiring and downloading the CloudBridge Virtual WAN software packages.

Browser Requirements

Supported browsers must have cookies enabled, and JavaScript installed and enabled.
The CloudBridge Virtual WAN Management Web Interface supports the following browsers and versions:

- Microsoft Internet Explorer 10+
- Mozilla Firefox 35.0+
- Google Chrome 40.0+

CloudBridge Virtual WAN Software Requirements

This section provides basic information on acquiring and downloading the CloudBridge Virtual WAN software.

There is a different version of the software for each CloudBridge Virtual WAN appliance model. You will need to download the appropriate package for each appliance model type you want to add to your network.

CloudBridge Virtual WAN supports these appliance models:

- CB 1000
- CB 2000
- CB 4000

Before you can download the software, you must acquire and register a CloudBridge Virtual WAN software license, as follows:

- **To acquire a license:** For instructions on acquiring a CloudBridge Virtual WAN software license, please contact Citrix CloudBridge Sales or Customer Support.

- **To download the software packages:** To download the CloudBridge Virtual WAN software packages, go to the following URL:


  Instructions for downloading the software are provided on this site.

The following section provides a summary of the steps and procedures involved in deploying CloudBridge Virtual WAN.
Summary of Installation and Deployment Procedures

The following list outlines the steps and procedures involved in deploying CloudBridge Virtual WAN.

1. Gather your CloudBridge Virtual WAN deployment information.

2. Set up the CloudBridge Virtual WAN Appliances.
   a) Set up the hardware.
   b) Set the Management IP Addresses for the appliances.

3. Set up the Master Control Node (MCN) site.
   a) Promote the head end appliance to the role of Master Control Node (MCN).
   b) Add and configure the MCN site.
   c) Configure the Virtual Interface Groups for the MCN site.
   d) Configure the Virtual IP Addresses for the MCN site.
   e) Configure the WAN Links for the MCN site.
   f) Configure the Routes for the MCN site.
   g) (Optional) Configure High Availability (HA) for the MCN site.
   h) (Optional) Configure Virtual WAN security and encryption.
   i) Save the MCN site configuration.

4. Set up the branch sites.
   a) Add the branch site.
   b) Configure the Virtual Interface Groups for the branch site.
   c) Configure the Virtual IP Addresses for the branch site.
   d) Configure the WAN Links for the branch site.
   e) Configure the Routes for the branch site.
   f) (Optional) Configure High Availability (HA) for the branch site.
g) (Optional) Clone the new branch site to create and configure additional sites.

**NOTE:** Cloning the branch site is optional. The Virtual WAN appliance models must be the same for both the original and the cloned sites. You cannot change the specified appliance model for a clone. If the appliance model is different for a site, you must manually add the site, by repeating steps (a) through (f).

h) Resolve any configuration error alerts.

i) Save the new configuration.

j) Export the configuration package to **Change Management** on the MCN.

5. Prepare the Virtual WAN Appliance Packages on the MCN.

6. Connect the client appliances to your network.

7. Install the Virtual WAN Appliance Packages on the clients.

8. Use the **Monitoring** pages to verify the activation and check for any existing or potential configuration issues.

Basic instructions for each of these tasks are provided in the remaining chapters of this guide. The following chapter provides a checklist of the information you will need to complete your deployment of CloudBridge Virtual WAN.
Chapter 4

Gathering Your CloudBridge Virtual WAN Deployment Information

This chapter provides a checklist of the information you will need to complete your deployment.

Installation and Deployment Information Checklist

Gather the following information for each CloudBridge Virtual WAN site you want to deploy:

- Required Network IP Addresses for each appliance to be deployed:
  - Management IP Address
  - Virtual IP Address

- Site Name

- Appliance Name (one per site)

- Virtual WAN Appliance Model (for each appliance to be deployed)

- Deployment Mode (MCN or Client)

- Topology

- Gateway MPLS

- Routes

- VLANs

- Bandwidth at each site for each circuit
Chapter 5

Setting up the CloudBridge Virtual WAN Appliances

This chapter describes the procedures for setting up the CloudBridge Virtual WAN appliance hardware, and configuring the Appliance Management IP Address for each appliance you want to add to your network.

Instructions for these procedures are provided in the following sections.

Setting up the Hardware

This section provides basic instructions for setting up your CloudBridge Virtual WAN Appliance hardware. These instructions apply for each CloudBridge Virtual WAN Appliance you want to add to your network.

NOTE: The following instructions apply to all CloudBridge Virtual WAN Appliance models. Additional details regarding each specific model are provided in the subsections following these general instructions.

To set up your CloudBridge Virtual WAN Appliance hardware, do the following:

1. Set up the chassis.

   CloudBridge Virtual WAN Appliances can be installed in a standard rack. For desktop installation, place the chassis on a flat surface. Make sure that there is a minimum of 2” of side and rear clearance for proper ventilation.
2. Connect the Power.
   a. Make sure the power switch is set to Off.
   b. Plug the power cord into the appliance and an AC outlet.
   c. Press the power button located on the front of the appliance.

3. Connect the appliance Management Port to a personal computer.

   You will need to connect the appliance to a PC in preparation for completing the next procedure, setting the Management IP Address for the appliance.

   **NOTE:** Before you connect the appliance, make sure the Ethernet port is enabled on the PC.

   Use an Ethernet cable to connect the CloudBridge Virtual WAN Appliance Management Port to the default Ethernet port on a personal computer.

   The following subsections provide additional details regarding the Management Port and port IP Address for each CloudBridge Virtual WAN Appliance model.

**CB 1000 Management Port**

The CB 1000 Management Port is the bottom far right port labeled MGMT, on the back of the chassis. The default IP Address for the Management Port is 192.168.100.1.

The following figure shows the location of the CB 1000 Management Port.

*Figure 8. CB 1000 Management Port.*
CB 2000 Management Port

The CB 2000 Management Port is the bottom-left port labeled 0/1, on the front of the chassis. The default IP Address for the Management Port is 192.168.100.1.

The following figure shows the location of the CB 2000 Management Port.

Figure 9. CB 2000 Management Port.

CB 4000 Management Port

The CB 4000 Management Port is the bottom-left port labeled 0/1, on the front of the chassis. The default IP Address for the Management Port is 192.168.100.1.

The following figure shows the location of the CB 4000 Management Port.

Figure 10. CB 4000 Management Port.
Setting the Management IP Addresses for the Appliances

To enable remote access to a CloudBridge Virtual WAN appliance, you must specify a unique Management IP Address for the appliance. To do so, you must first connect the appliance to a personal computer. You can then open a browser on the PC and connect directly to the Management Web Interface on the appliance, where you can set the Management IP Address for that appliance. The Management IP Address must be unique for each appliance.

**NOTE:** You must repeat this process for each appliance you want to add to your network.

To configure the Management IP Address for an appliance, do the following:

1. Connect the appliance to a PC.

   If you have not already done so, connect one end of an Ethernet cable to the Management Port on the appliance, and the other end to the default Ethernet port on the PC.

   **NOTE:** Make sure the Ethernet port is enabled on the PC you are using to connect to the appliance.

2. Record the current Ethernet port settings for the PC you will be using to set the appliance Management IP Address.

   You will need to change the Ethernet port settings on the PC before you can set the appliance Management IP Address. Be sure to record the original settings so you can restore them after configuring the Management IP Address.

3. Change the IP Address for the PC.

   On the PC, open your network interface settings and change the IP Address for your PC to the following:

   \[192.168.100.50\]

4. Change the Subnet Mask setting on your PC to the following:

   \[255.255.0.0\]
5. On the PC, open a browser and enter the default IP Address for the appliance.

**NOTE:** It is recommended that you use Google Chrome browser when connecting to a Virtual WAN Appliance.

Enter the following IP Address in the address line of the browser:

192.168.100.1

**NOTE:** Please ignore any browser certificate warnings for the CloudBridge Management Web Interface.

This opens the CloudBridge Management Web Interface **Login** screen on the connected appliance, as shown in the following figure.

*Figure 11. Citrix CloudBridge Management Web Interface Login Screen*
6. Enter the Administrator user name and password, and click **Login**.

   - Default Administrator user name: **admin**
   - Default Administrator password: **password**

**NOTE:** It is strongly recommended that you change the default password as soon as possible. Be sure to record the password in a secure location, as password recovery might require a configuration reset.

After you have logged into the Management Web Interface, the **Dashboard** screen displays, as shown in the following figure.

*Figure 12. CloudBridge Management Web Interface Dashboard*
7. In the main menu bar, select the **Configuration** section tab.

This displays the **Configuration** navigation tree in the left pane of the screen. The **Configuration** navigation tree contains the following three primary branches:

- **Appliance Settings**
- **Virtual WAN**
- **System Maintenance**

When you select the **Configuration** tab, the **Appliance Settings** branch automatically opens, with the **Administrator Interface** page preselected by default, as shown in the following figure.

*Figure 13. Appliance Settings branch with Administrator Interface page preselected*

8. In the **Appliance Settings** branch of the navigation tree, select **Network Adaptors**.

This displays the **Network Adaptors** settings page with the **IP Address** tab preselected by default, as shown in the following figure.
9. In the **IP Address** tab page, enter the following information for the CloudBridge Virtual WAN Appliance you want to configure.

**NOTE:** The Management IP Address must be unique for each appliance.

- IP Address
- Subnet Mask
- Gateway IP Address

10. Click **Change Settings**.

A confirmation dialog box displays, prompting you to verify that you want to change these settings.

11. Click **OK**.

12. Change the network interface settings on your PC back to the original settings.

**NOTE:** Changing the IP Address for your PC automatically closes the connection to the appliance, and terminates your login session on the Management Web Interface.
13. Disconnect the appliance from the PC and connect the appliance to your network router or switch.

Disconnect the Ethernet cable from the PC, but do not disconnect it from your appliance. Connect the free end of the cable to your network router or switch. The Virtual WAN Appliance is now connected to and available on your network.

14. Test the connection.

On a PC connected to your network, open a browser and enter the Management IP Address you just configured for the appliance.

If the connection is successful, this displays the Login screen for the CloudBridge Virtual WAN Management Web Interface on the appliance you just configured.

You have now set the Management IP Address of your Virtual WAN Appliance, and can connect to the appliance from any location in your network.

**NOTE:** You must repeat these steps for every CloudBridge Virtual WAN Appliance you want to add to your network. The Management IP Address must be unique for each appliance.

**NOTE:** If you have not already downloaded the CloudBridge Virtual WAN software packages to a PC connected to your network, please do so now. For information on acquiring and downloading the software packages, see the section entitled, “CloudBridge Virtual WAN Software Requirements,” in the chapter entitled, “Before You Begin,” earlier in this guide.

The next step is to create and configure the Master Control Node (MCN).
Chapter 6

Setting up the Master Control Node (MCN) Site

This chapter provides basic instructions for creating and deploying the MCN.

The steps involved to complete this process are as follows:

1. Specify the appliance that will act as the Master Control Node (MCN).
2. Add the MCN site.
3. Configure the Virtual Interface Groups for the MCN site.
4. Configure the Virtual IP Addresses for the MCN site.
5. Configure the WAN links for the MCN site.
6. Configure the Access Interfaces for the MCN site.
7. Configure the routes for the MCN site.
8. (Optional) Configure High Availability for the MCN site.
9. (Optional) Configure Virtual WAN security and encryption.
10. Save the MCN site configuration.

Instructions for each of these tasks are provided in the following sections.
Promote the Head End Appliance to the Role of MCN

The CloudBridge Virtual WAN Master Control Node (MCN) serves as the distribution point for the initial system configuration and any subsequent configuration changes. In addition, you conduct most upgrade procedures through the Management Web Interface on the MCN.

To set up the MCN, you first must promote the head end Virtual WAN Appliance—typically, the appliance deployed at your Enterprise data center—from the default role of client to the role of MCN. To do this, you must place the Management Web Interface on the appliance you are promoting into MCN Console mode. Instructions are provided below.

To switch the Management Web Interface to MCN Console mode, do the following:

1. Log into the Management Web Interface on the appliance you want to configure as the MCN.
2. Click Configuration in the main menu bar of the Management Web Interface main screen (blue bar at the top of the page).
3. In the navigation tree (left pane), open the Appliance Settings branch and click Administrator Interface.

   This displays the Administrator Interface page in the middle pane.
4. Select the Miscellaneous tab.

   This displays the Miscellaneous administrative settings page, as shown in the following figure.
At the bottom of the **Miscellaneous** tab page is the **Switch to [Client | MCN] Console** section. This section contains the **Switch Console** button for toggling between appliance console modes.

The section heading indicates the current console mode, as follows:

- When in **Client Console** mode (default), the section heading is **Switch to MCN Console**.
- When in **MCN Console** mode, the section heading is **Switch to Client Console**.

By default, a new appliance is set to **Client Console** mode.

**MCN Console** mode enables the **Configuration Editor** branch in the navigation tree. The **Configuration Editor** is available on the MCN appliance, only.

**NOTE:** Before proceeding to the next step, make sure that the appliance is still set to the default (**Client Console** mode). The section heading should be: **Switch to MCN Console**.

5. Click **Switch Mode** to set the appliance mode to **MCN Console** mode.

The next step is to add the MCN site to the **Sites** table, and begin to configure the new MCN site.
Adding the MCN Site

To add and begin configuring the MCN appliance site, do the following:

1. In the navigation tree, open the Virtual WAN branch and select Configuration Editor.

   This displays the Configuration Editor main page (middle pane), as shown in the following figure.

   **NOTE:** The Configuration Editor is available in MCN Console mode, only. If the Configuration Editor option is not available in the Virtual WAN branch of the navigation tree, please refer to the previous section, “Specifying the MCN,” for instructions on changing the console mode.

   ![Figure 16. MCN Configuration Editor main page](image)

2. Click **New** to start defining a new configuration.

   This displays the New configuration settings page, as shown in the following figure.
3. Click **Add** in the **Sites** bar to begin adding and configuring the MCN site.

This displays the **Add Site** dialog box, as shown in the following figure.
4. Enter the site information, and select **primary MCN** as the mode.

   **NOTE:** Entries cannot contain spaces and must be in Linux format.

5. Click **Add** to add the site.

   This adds the new site to the **Sites** tree, as shown in the following figure.
NOTE: After you click Add, audit warnings may appear indicating that further action is required. A red dot or goldenrod delta icon indicates an error in the section where it appears. You can use these warnings to identify errors or missing configuration information. Roll your cursor over an audit warning icon to display a short description of the error(s) in that section. You can also click the dark grey Audits status bar (bottom of page) to display a complete list of all unresolved audit warnings.
6. (Optional) Save the configuration-in-progress.

If you cannot complete the configuration in one session, you can save it at any time, so you can return to complete it later. The configuration is saved to your workspace on the local appliance.

**NOTE:** To resume working in a saved configuration, click **Open** in the **Configuration Editor** menu bar (top of page area). This displays a dialog box, where you can select the saved configuration from a drop-down menu. Click **OK** to open your selection.

To save the configuration, do the following:

- a) Click **Save As** (at the top of the **Configuration Editor** middle pane).
  
  This opens the **Save As** dialog box, as shown in the following figure.

  **Figure 20. Saving the configuration-in-progress to a file**

  ![Save As dialog box](image)

- b) Enter a descriptive name for the configuration.

- c) Click **Save**.
Configuring the Virtual Interface Groups for the MCN Site

After adding the new site, the next step is to create and configure the Virtual Interface Groups for the site.

The following are some guidelines for configuring Virtual Interface groups:

- Use logical names that will best describe the group.
- Trusted networks are networks that are protected behind a Firewall.
- Virtual Interfaces associate interfaces to Fail to Wire (FTW) pairs.
- Single WAN interfaces cannot be in an FTW pair.

**NOTE:** For additional guidelines and information on configuring Virtual Interface Groups, please refer to the *CloudBridge Virtual WAN 8.0 Deployment Planning Guide*.

To add a Virtual Interface Group to the new site, do the following:

1. Continuing in the **Sites** tree of the **Configuration Editor**, click + next to the name of the site you just added.
   
   This opens the configuration branches for the new site, as shown in the following figure.
2. Click + to the left of the **Interface Groups** branch.

This displays the **Interface Groups** table for the site, as shown in the following figure.
3. Click + to the right of **Interface Groups**.

   This adds a new blank group entry to the table, as shown in the following figure.
4. Select the **Ethernet Interfaces** to include.

   Under **Ethernet Interfaces**, click a box to include/exclude that interface. A goldenrod highlight indicates an included interface, as shown in the following figure.
5. Select the **Bypass Mode** from the drop-down menu (no default).

The **Bypass Mode** specifies the behavior of bridge-paired interfaces in the Virtual Interface Group, in the event of an appliance or service failure or restart. The options are: **Fail-to-Wire** or **Fail-to-Block**.

6. Select the **Security Level** from the drop-down menu.

This specifies the security level for the network segment of the Virtual Interface Group. The options are: **Trusted** or **Untrusted**. Trusted segments are generally protected by a firewall (default is **Trusted**).
7. Click \+ at the left edge of the new blank entry.

This opens the **Virtual Interfaces** and **Bridge Pairs** fields for editing, as shown in the following figure.

**Figure 25. Virtual Interfaces and Bridge Pairs fields**

8. Click \+ to the right of **Virtual Interfaces**.

This opens the **Name** and **VLAN ID** fields for editing, as shown in the following figure.
9. Enter the **Name** and **VLAN ID** for this Virtual Interface Group. 

**Name** – This is the name by which this Virtual Interface will be referenced. 

**VLAN ID** – This is the ID for identifying and marking traffic to and from the Virtual Interface. Use an ID of 0 (zero) for native/untagged traffic.

10. Click + to the right of **Bridge Pairs**.

   This opens the **Bridge Pairs** fields for editing, as shown in the following figure.
11. Select the Ethernet interfaces to be paired from the drop-down menus.

   To add more pairs, click + next to Bridge Pairs again.

12. Click Apply.

   This applies your settings and adds the new Virtual Interface Group to the table, as shown in the following figure.
13. To add more Virtual Interface Groups, click + to the right of the **Interface Groups** branch, and proceed as above.
Configuring the Virtual IP Addresses for the MCN Site

The next step is to configure the Virtual IP Addresses for the site, and assign them to the appropriate group.

1. Continuing in the Sites tree for the new site, click + to the left of the Virtual IP Addresses branch.

This displays the Virtual IP Addresses table for the new site, as shown in the following figure.

**Figure 29. Site Virtual IP Addresses table**
2. Click + to the right of **Virtual IP Addresses** to add an address.

This opens the form for adding a new Virtual IP Address to the site configuration, as shown in the following figure.

*Figure 30. Adding a new Virtual IP Address to the site configuration*

3. Enter the Virtual IP Address, and select the **Virtual Interface** group with which the address is associated.

   The Virtual IP Address must include the full host address and netmask.

   **NOTE:** You can click + again to add additional Virtual IP Addresses before applying your settings.
4. Click **Apply**.
   This adds the address to the site and includes it in the site **Virtual IP Addresses** table.

5. To add more Virtual IP Addresses, click + to the right of the **Virtual IP Addresses** branch, and proceed as above.

### Configuring the WAN Links for the MCN Site

The next step is to configure the WAN links for the site.

1. Continuing in the site tree for the new site, click the **WAN Links** branch label.
   This reveals the Add (+) and Help (?) active icons to the right of the **WAN Links** label, as shown in the following figure.

   **NOTE:** At this point in a new configuration, there are no WAN links to form a table, and therefore no Open (+) icon to the left of the WAN Links branch. However, if links exist, the + active icon is available. If so, click + to the left of the **WAN Links** branch to display the table. This also reveals the Add (+), Edit (pencil), Delete (trashcan), and Help (?) active icons to the right of the **WAN Links** branch.
2. Click + to the right of the **WAN Links** branch to add a new WAN link.

   This opens the **Add WAN Link** dialog box for adding the new WAN link, as shown in the following figure.
3. (Optional) Enter a name for the WAN Link if you do not want to use the default.
   
   The default name is the site name, appended with the following suffix:
   
   
   -WL-<number>
   
   Where <number> is the number of WAN Links for this site, incremented by one.

4. Select the **Access Type** from the drop-down menu.
   
   The options are **Public Internet** or **Private Intranet**.

5. Click **Add**.
   
   This displays the **WAN Links** table, adds the un-configured link to the table, and opens the **Basic Settings** configuration form for the link, as shown in the following figure.
6. Click the Edit (pencil) icon to the right of the Settings branch label to enable editing of the form.
7. Enter the path information for the new WAN link.

Some guidelines are as follows:

- Some Internet links might be asymmetrical.
- Misconfiguring the permitted speed can adversely affect performance for that path.
- Avoid using burst speeds that surpass the Committed Rate.
- For Internet WAN link paths, be sure to add the Public IP Address.

8. Click the **Advanced Settings** section bar.

This opens the **Advanced Settings** form for the link, as shown in the following figure.

*Figure 34. WAN Link Advanced Settings form*
9. Enter the **Advanced Settings** for the link.

10. Click the **Eligibility** section bar.

    This opens the **Eligibility** settings form for the link, as shown in the next figure.

**Figure 35. WAN Links Eligibility settings form**

11. Select the **Eligibility** settings for the link.

12. Click **Apply**.

    This applies the specified settings to the new link.

    The next step is to configure the Access Interfaces for the new link.

13. Click + next to the **Access Interfaces** branch in the configuration tree for the link.

    This opens the **Access Interfaces** table for the site, as shown in the following figure.
14. Click + to the right of the **Access Interfaces** branch to add an interface.

This adds a blank entry to the table and opens it for editing, as shown in the next figure.

**Figure 37. New Access Interfaces entry opened for editing**

15. Enter the **Access Interfaces** settings for the link.

The settings are as follows:

- **Name** – This is the name by which this WAN link will be referenced. This field is automatically populated with the default name for a new entry, which has the following syntax:

  \[
  \text{WAN\_link\_name-}AI\text{-number}
  \]

  Where \textit{WAN\_link\_name} is the name of the WAN link, and \textit{number} is the number of Access Interfaces for this WAN link, incremented by 1.
The name of the **Access Interface** can be modified. If the name appears truncated, you can place your cursor in the field, then click and hold and roll your mouse right or left to see the truncated portion.

- **Virtual Interface** – This is the Virtual Interface that this Access Interface will use.
- **IP Address** – This is the IP Address for the Access Interface endpoint to the WAN.
- **Gateway IP Address** – This is the IP Address for the gateway router.
- **Virtual Path Mode** – This specifies the priority for Virtual Path traffic on this WAN link. The options are: **Primary, Secondary, or Exclude**. If set to **Exclude**, this Access Interface will be used for Internet and Intranet traffic, only.

16. Click **Apply**.

You have now finished configuring the new WAN link. Repeat these steps to add and configure additional WAN links for the site.

The next step is to add and configure the routes for the site.
Configuring the Routes for the MCN Site

To add and configure the routes for the site, do the following:

1. Continuing in the Sites tree for the new site, click + to the left of Routes.

   This displays the Routes table for the site, as shown in the following figure.

   **Figure 38. MCN Site Routes table**

   ![MCN Site Routes table](image)

2. Click + to the right of the Routes branch to add a route.

   This opens the Routes table for editing and adds a blank route entry to the table, as shown in the following figure.
3. Enter the route configuration information.

4. Click **Apply**.

   **NOTE:** After you click **Apply**, audit warnings may appear indicating that further action is required. A red dot or goldenrod delta icon indicates an error in the section where it appears. You can use these warnings to identify errors or missing configuration information. Roll your cursor over an audit warning icon to display a short description of the error(s) in that section. You can also click the dark grey **Audits** status bar (bottom of page) to display a complete list of all audit warnings.

5. To add more routes for the site, click + to the right of the **Routes** branch, and proceed as above.

You have now finished entering the primary configuration information for the new site. The following two sections provide instructions for additional optional steps:

- “Configuring High Availability for the MCN Site (Optional)”
- “Enabling and Configuring Virtual WAN Security and Encryption (Optional)”

If you do not want to configure these features at this time, you can proceed directly to the final section in this chapter, “Naming and Saving the MCN Site Configuration.”
Configuring High Availability for the MCN Site (Optional)

A Virtual WAN High Availability configuration is a configuration in which two Virtual WAN Appliances at a site serve in an Active/Standby partnership, for redundancy purposes.

**NOTE:** Before configuring High Availability for the primary MCN site, it is best first to add and configure the site that will act as the secondary MCN.

To configure High Availability for the MCN site, do the following:

1. Continuing in the Sites tree for the new MCN site, click + to the left of the High Availability branch for the site.

   This displays the High Availability configuration form, as shown in the following figure.
2. Click Edit (pencil icon) to the right of the **High Availability** branch to enable editing of the form.

3. Select the **Enable High Availability** check box.

   This enables High Availability for the site, and enables the first level of fields for configuring. A red asterisk (*) indicates a required field where you must enter a non-default value, as shown in the following figure.
4. Enter the basic **High Availability** parameter values for the HA pair.

Enter or select the following:

- **HA Appliance Name** – This is the name of the HA (secondary) appliance.

  **NOTE**: To change or specify the mode for a site, open the **Basic Settings** branch for the site, and select the mode from the **Mode** drop-down menu. The options are: **client**, **primary MCN**, or **secondary MCN**.

- **Failover Time** – This specifies the wait time (in milliseconds) after contact with the primary MCN appliance is lost, before the standby MCN appliance becomes active.
• **Shared Base MAC** – This is the shared MAC Address for the HA pair appliances.

• **Swap Primary/Secondary** (checkbox) – When this is selected, if both appliances in the HA pair come up simultaneously, the secondary MCN appliance becomes the primary MCN appliance, and takes precedence.

• **Primary Reclaim** (checkbox) – When this is selected, the designated primary MCN appliance reclaim control upon restart after a failover event.

5. Click + to the right of **HA IP Interfaces**.

This adds a new blank entry in the **HA IP Interfaces** table, and enables the entry for editing, as shown in the following figure.

*Figure 42. HA IP Interfaces table with a new blank entry*
6. Enter the HA IP Interfaces information for the MCN site.

Select or enter the following:

**Virtual Interface** – This is the Virtual Interface to be used for communication between the appliances in the MCN HA pair.

**Primary** – This is the unique Virtual IP Address for the primary MCN appliance. The secondary MCN uses this for communication with the primary MCN.

**Secondary** – This is the unique Virtual IP Address for the secondary MCN appliance. The primary MCN uses this for communication with the secondary MCN.

7. Click + to the left of the new **HA IP Interfaces** entry.

This displays the **External Tracking** table, as shown in the following figure.

*Figure 43. High Availability External Tracking table*
8. Click + to the right of **External Tracking**.

This adds a new blank entry to the table and opens it for editing, as shown in the following figure.

*Figure 44. External Tracking table with new blank entry*

9. Enter the External Tracker IP Address.

Enter the IP Address of the external device that will respond to ARP requests for determining the state of the primary MCN appliance.

10. Click **Apply**.

This adds the new **High Availability** configuration settings to the MCN site configuration.
Enabling and Configuring Virtual WAN Security and Encryption (Optional)

To enable and configure Virtual WAN security and encryption, do the following:

**NOTE:** Enabling Virtual WAN security and encryption is optional.

1. At the top of the **Sites** tree of the **Configuration Editor**, click + to the left of the **Virtual WAN Network Settings** branch.

   This opens the branch and displays the **Global Security Settings** configuration form, as shown in the following figure.

*Figure 45. Global Security Settings configuration form*
2. Click Edit (pencil icon) to enable editing for the form.

3. Enter your global security settings.

   The options are as follows:

   - **Network Encryption Mode** – This is the encryption algorithm used for encrypted paths. Select one of the following from the drop-down menu: AES 128-Bit or AES 256-Bit.

   - **Enable Encryption Key Rotation** – When enabled, encryption keys are rotated at intervals of 10 to 15 minutes.

   - **Enable Extended Packet Encryption Header** – When enabled, a 16 byte encrypted counter is prepended to encrypted traffic to serve as an initialization vector, and randomize packet encryption.

   - **Enable Extended Packet Authentication Trailer** – When enabled, an authentication code is appended to the contents of the encrypted traffic to verify that the message is delivered unaltered.

   - **Extended Packet Authentication Trailer Type** – This is the type of trailer used to validate packet contents. Select one of the following from the drop-down menu: 32-Bit Checksum or SHA-256.

4. Click **Apply** to apply your settings to the configuration.

The final step is to name and save the new MCN site configuration, as described in the following section.
Naming and Saving the MCN Site Configuration

The final step is to name and save the new configuration, referred to as a *configuration package*. The configuration package will be saved to your workspace on the local appliance.

**NOTE:** If you have previously saved the new configuration at some point during the *current* configuration session, you can click **Save** to update it with your changes. If you have not saved the configuration previously, or want to ensure that the it is saved to the correct configuration package name, click **Save As** and select or specify the package to update. (**Save As** is strongly recommended, to avoid overwriting the wrong configuration package.)

To save the configuration and generate the configuration package, do the following;

1. Click **Save As** (at the top of the *Configuration Editor* middle pane).
   
   This opens the **Save As** dialog box, as shown in the following figure.

![Figure 46. Saving the new configuration](image)

2. Enter a descriptive name for the configuration.

3. Click **Save**.

You have now completed the MCN site configuration, and created the Virtual WAN configuration package. You are now ready to set up the branch sites, and upload the Virtual WAN Appliance packages to the client appliances.
Adding and Configuring the Branch Sites

This chapter provides instructions for adding and configuring the branch sites. The procedure for adding a branch site is very similar to creating and configuring the MCN site. However, some of the configuration steps and settings do vary slightly for a branch site. In addition, once you have added an initial branch site, for sites that have the same appliance model, you can use the Clone feature to streamline the process of adding and configuring those sites.

As with creating the MCN site, to set up a branch site you must use the Configuration Editor in the Management Web Interface on the MCN appliance. The Configuration Editor is available only when the interface is set to MCN Console mode.

The steps to complete this process are as follows:

1. Add the branch site.
2. Configure the Virtual Interface Groups for the branch site.
3. Configure the Virtual IP Addresses for the branch site.
4. Configure the WAN Links for the branch site.
5. Configure the Routes for the branch site.
6. (Optional) Configure High Availability for the branch site.
7. (Optional) Clone the new branch site to create and configure additional sites.

   **NOTE:** Cloning the site is optional. The Virtual WAN appliance models must be the same for both the original and the cloned sites. You cannot change the specified appliance model for a clone. If the appliance model is different for a site, you must manually add the site.

8. Resolve any configuration error alerts.
9. Save the completed configuration.
Adding the Branch Site

To add a new branch site to the **Sites** table and begin configuring the site, do the following:

**NOTE:** If you logged out of the MCN after creating and saving the new configuration package, you will need to log back in and reopen the configuration before you can continue. To do so, click **Open** in the **Configuration Editor** menu bar (top of page area). This displays a dialog box where you can select the saved configuration from a drop-down menu. Click **OK** to open your selection.

1. Continuing in the **Configuration Editor**, click **Add** in the **Sites** bar to begin adding and configuring the new branch site.

   This displays the **Add Site** dialog box, as shown in the following figure.

**Figure 47. Add Site dialog box**
2. Enter the site information, and select Client as the mode.

   **NOTE:** Entries cannot contain spaces and must be in Linux format.

3. Click Add to add the site.

   This adds the new site to the Sites tree, and opens the Basic Settings configuration form for the site, as shown in the following figure.

*Figure 48. New Client Site Basic Settings form*
4. Click the Edit (pencil) icon to enable editing for the form.

5. Enter the basic settings for the site, and click **Apply**.

   This applies and saves your settings.

   The next step is to add and configure the Virtual Interface Groups for the new site.

### Configuring the Virtual Interface Groups for the Branch Site

After adding the new site, the next step is to create and configure the Virtual Interface Groups for the site.

To add Virtual Interface Groups to the new site, do the following:

1. In the **Sites** navigation tree, click + next to the name of the site you just added.

   This opens the configuration branches for the new site, as shown in the following figure.

   **Figure 49. New site configuration tree**

2. Click + to the left of the **Interface Groups** branch.

   This displays the **Interface Groups** table for the site, as shown in the following figure.
3. Click + to the right of **Interface Groups**.

   This adds a new blank group entry to the table, as shown in the following figure.
4. Select the **Ethernet Interfaces** to include.

   Under **Ethernet Interfaces**, click a box to include/exclude that interface. A goldenrod highlight indicates an included interface, as shown in the following figure.
5. Select the Bypass Mode and Security level from the drop-down menus.

6. Click + at the left edge of the new blank entry.

This opens the entry for editing, as shown in the following figure.

**NOTE:** You can resize the tree pane to reveal any truncated contents. To do so, roll your cursor over the resize bar at the right edge of the tree area. When the cursor changes to a bi-directional arrow, click and drag the bar to the right or left to grow or shrink the pane width.
7. Click + to the right of Virtual Interfaces.

This opens the Name and VLAN ID fields for editing, as shown in the following figure.
8. Enter the **Name** and **VLAN ID** for this Virtual Interface Group.

9. Click + to the right of **Bridge Pairs**.

   This opens the **Bridge Pairs** fields for editing, as shown in the following figure.
10. Select the interfaces to be paired from the drop-down menus.

To add more pairs, click + next to the **Bridge Pairs** field again.

11. Click **Apply**.

This applies your settings and adds the new Virtual Interface Group to the table, as shown in the next figure.
Figure 56. Interface Groups table with new group added, with audit warning icons

12. To add more Virtual Interface groups, click + to the right of the Interface Groups branch, and proceed as above.
Configuring the Virtual IP Addresses for the Branch Site

The next step is to configure the Virtual IP Addresses for the site, and assign them to the appropriate group.

1. Continuing in the site tree for the new site, click + to the left of the Virtual IP Addresses branch.

This displays the Virtual IP Addresses table for the new site, as shown in the following figure.

**Figure 57. Site Virtual IP Addresses table**
2. Click + to the right of the **Virtual IP Addresses** branch to add an address.

   This opens the form for adding a new Virtual IP Address to the site configuration, as shown in the following figure.

   **Figure 58. Adding a new Virtual IP Address to the site configuration**

   ![Adding a new Virtual IP Address to the site configuration](image)

   Enter the Virtual IP Address, and select the Virtual Interface group with which the address is associated.

   **NOTE:** You can click + again to add additional Virtual IP Addresses before proceeding.

3. Click **Apply**.

   This adds the address to the site and includes it in the site **Virtual IP Addresses** table.

4. To add more Virtual IP Addresses, click + to the right of the **Virtual IP Addresses** branch, and proceed as above.
Configuring the WAN Links for the Branch Site

The next step is to configure the WAN links for the site.

1. Continuing in the site tree for the new site, click the **WAN Links** branch label.

   This reveals the Add (+) and Help (?) active icons to the right of the **WAN Links** branch, as shown in the following figure.

   **NOTE:** At this point in a new configuration, there are no WAN links to form a table, and therefore no Open (+) icon to the left of the **WAN Links** branch label. However, if links exist, the + icon is available. If so, click + to the left of the **WAN Links** branch to display the table. This also reveals the Add (+), Edit (pencil), Delete (trashcan), and Help (?) active icons to the right of the **WAN Links** branch.

   ![Figure 59. WAN Links section with Add (+) and Help (?) active icons](image)

2. Click + to the right of the **WAN Links** branch to add a new WAN link.

   This opens the **Add WAN Link** dialog box for adding the new WAN link, as shown in the following figure.
3. (Optional) Enter a name for the WAN Link if you do not want to use the default.

   The default name is the site name, appended with the following suffix:

   
   -WL-<number>

   Where <number> is the number of WAN Links for this site, incremented by one.

4. Select the Access Type from the drop-down menu.

   The options are Public Internet or Private Intranet.

5. Click Add.

   This displays the WAN Links table, adds the (not yet configured) link to the table, and opens the Basic Settings configuration form for the link, as shown in the following figure.
6. Click the Edit (pencil) icon to the right of the **Settings** branch to enable editing of the form.
7. Enter the path information for the new WAN link.

Some guidelines are as follows:

- Some Internet links might be asymmetrical.
- Misconfiguring the permitted speed can adversely affect performance for that path.
- Avoid using burst speeds that surpass the Committed Rate.
- For Internet WAN link paths, be sure to add the Public IP Address.

8. Click the Advanced Settings section bar.

This opens the Advanced Settings form for the link, as shown in the following figure.

**Figure 62. WAN Link Advanced Settings form**
9. Enter the **Advanced Settings** for the link.

10. Click the **Eligibility** section bar.

   This opens the **Eligibility** settings form for the link, as shown in the next figure.

**Figure 63. WAN Links Eligibility settings form**

11. Select the **Eligibility** settings for the link.

12. Click **Apply**.
13. Click + next to the **Access Interfaces** branch in the configuration tree for the link.

This opens the **Access Interfaces** table for the site, as shown in the following figure.

**Figure 64. Access Interfaces table**

![Access Interfaces table](image)

14. Click + to the right of the **Access Interfaces** branch to add an interface.

This adds a blank entry to the table and opens it for editing, as shown in the next figure.

**Figure 65. New Access Interfaces entry opened for editing**

![New Access Interfaces entry opened for editing](image)
15. Enter the **Access Interfaces** settings for the link

16. Click **Apply**.

You have now finished configuring the new WAN link. Repeat these steps to add and configure additional WAN links for the site.

The next step is to add and configure the routes for the site.

**Configuring the Routes for the Branch Site**

To add and configure the routes for the site, do the following:

1. Continuing in the site tree for the new site, click + to the left of the **Routes** branch.

   This displays the **Routes** table for the site, as shown in the following figure.

*Figure 66. Site Routes table*

2. Click + to the right of the **Routes** branch to add a route.

   This opens the **Routes** table for editing and adds a blank route entry to the table, as shown in the following figure.
3. Enter the route configuration information and click **Apply**.

   **NOTE:** After you click **Apply**, audit warnings may appear indicating that further action is required. A red dot or goldenrod delta icon indicates an error in the section where it appears. You can use these warnings to identify errors or missing configuration information. Roll your cursor over an audit warning icon to display a short description of the error(s) in that section. You can also click the dark grey **Audits** status bar (bottom of page) to display a complete list of all audit warnings.

4. To add more routes for the site, click + to the right of the **Routes** branch, and proceed as above.

5. (Recommended.) Save your changes to the configuration.

   If you have previously saved the new configuration package at some point during the current configuration session, you can click **Save** to update the current package with your changes. If you have not saved the configuration previously, or want to ensure that it is saved to the correct package name, click **Save As** and select or specify the package to update. (**Save As** is strongly recommended, to avoid overwriting the wrong configuration package.)
The following two sections provide instructions for the following optional steps:

- **“Configuring High Availability (HA) for the Branch Site (Optional)”** – *High Availability* refers to a configuration in which two Virtual WAN Appliances at a site serve in an Active/Standby partnership capacity for redundancy purposes. If you are not implementing High Availability for this site, you can skip this step.

- **“Cloning the Branch Site (Optional)”** – You have the option of cloning the branch site you just configured, if the appliance models for the original site and the clone are the same. You can then use the clone as a template to streamline the process of adding and configuring additional branch sites.
Configuring High Availability (HA) for the Branch Site (Optional)

To configure **High Availability** for the branch site, do the following:

1. Continuing in the **Sites** tree, click + to the left of the **High Availability** branch for the new site.

   This displays the **High Availability** configuration form, as shown in the following figure.

**Figure 68. High Availability configuration form**

2. Click Edit (pencil icon) to the right of the **High Availability** branch to enable editing of the form.

3. Select the **Enable High Availability** check box.

   This enables High Availability for the site, and enables the first level of fields for configuring. A red asterisk ( * ) indicates a required field where you must enter a non-default value, as shown in the following figure.
4. Enter the basic **High Availability** parameter values for the HA pair.

Enter or select the following:

- **HA Appliance Name** – This is the name of the HA (secondary) appliance.

  **NOTE:** To change or specify the mode for a site, open the **Basic Settings** branch for the site, and select the mode from the **Mode** drop-down menu. The options are: **client**, **primary MCN**, or **secondary MCN**. For a branch site appliance, select **client** as the mode.

- **Failover Time** – This specifies the wait time (in milliseconds) after contact with the primary client appliance is lost, before the standby client appliance becomes active.

- **Shared Base MAC** – This is the shared MAC Address for the HA pair appliances.
• **Swap Primary/Secondary** (checkbox) – When this is selected, if both appliances in the HA pair come up simultaneously, the secondary client appliance becomes the primary client appliance for the site, and takes precedence.

• **Primary Reclaim** (checkbox) – When this is selected, the designated primary client appliance reclaims control upon restart after a failover event.

5. Click + to the right of **HA IP Interfaces**.

This adds a new blank entry in the **HA IP Interfaces** table, and enables the entry for editing, as shown in the following figure:

*Figure 70. HA IP Interfaces table with a new blank entry*
6. Enter the HA IP Interfaces information for the branch site.

Select or enter the following:

**Virtual Interface** – This is the Virtual Interface to be used for communication between the appliances in the HA appliance pair.

**Primary** – This is the unique Virtual IP Address for the primary client appliance for this site. The secondary appliance uses this for communication with the primary client appliance.

**Secondary** – This is the unique Virtual IP Address for the secondary client appliance for this site. The primary appliance uses this for communication with the secondary client appliance.

7. Click `+` to the left of the new **HA IP Interfaces** entry.

This displays the **External Tracking** table, as shown in the following figure.
8. Click + to the right of **External Tracking**.

This adds a new blank entry to the table and opens it for editing, as shown in the following figure.
9. Enter the External Tracker IP Address.

Enter the IP Address of the external device that will respond to ARP requests for determining the state of the primary client appliance.

10. Click **Apply**.

This adds the new **High Availability** configuration settings to the branch site configuration.
Cloning the Branch Site (Optional)

This section provides instructions for cloning the branch site you just configured to use as a partial template for adding more branch sites.

**NOTE:** Cloning the site is optional. The Virtual WAN appliance models must be the same for both the original and the cloned sites. You cannot change the specified appliance model for a clone. If the appliance model is different for a site, you must manually add the site, as instructed in the previous sections.

Cloning a site streamlines the process of adding and configuring additional branch nodes. When a site is cloned, the entire set of configuration settings for the site are copied and displayed in a single form page. You can then modify the settings according to the requirements of the new site. Some of the original settings can be retained, where applicable. However, most of the settings must be unique for each site.

To clone a site, do the following:

1. In the Sites tree (middle pane) of the Configuration Editor, click + to the left of the branch site you want to duplicate.

   This opens that site branch in the Sites tree, and reveals the Clone (double page icon) and Delete (trashcan icon) buttons, as shown in the following figure.

*Figure 73. Clone site button*
2. Click the **Clone** icon to the right of the branch site name in the tree.

   This opens the **Clone Site** configuration page, as shown in the following figure.

   **Figure 74. Clone Site configuration page**

3. Enter the configuration parameter settings for the new site.

   A pink field with an alert icon (red dot) indicates a required parameter setting that must have a value different than the setting for the original cloned site. In most cases, this value must be unique.

   **TIP:** To further streamline the cloning process, use a consistent, pre-defined naming convention when naming the clones.

4. Resolve any error alerts.

   To diagnose an error, roll your cursor over the Alert icon (red dot or goldenrod delta) to reveal bubble help for that specific error.
5. Click **Clone** (far right corner) to create the new site and add it to the **Sites** table.

   **NOTE:** The **Clone** button remains unavailable until you have entered all of the required values, and the new site configuration is error-free.

6. (Optional.) Save your changes to the configuration.

   If you have previously saved the new configuration package at some point during the current configuration session, you can click **Save** to update the current package with your changes. If you have not saved the configuration previously, or want to ensure that it is saved to the correct package name, click **Save As** and select or specify the package to update. (**Save As** is strongly recommended, to avoid overwriting the wrong configuration package.)

   You have now finished configuring the branch sites. The next step is to check the configuration for error alerts, and make corrections or additions as needed.
Resolving Configuration Error Alerts

An Alert icon (a red dot or goldenrod delta) next to an item indicates a configuration error or missing parameter information for that item. A number next to the icon indicates the number of associated errors for that alert. To see bubble help for a particular alert, roll your cursor over the Alert icon. This displays a brief description of the specific errors flagged by that Alert.

For additional information and instructions on diagnosing and resolving configuration errors, please refer to the Citrix CloudBridge Virtual WAN Planning Guide and Citrix CloudBridge Virtual WAN Administration Guide.

Saving the Completed Configuration

The next step is to save the completed configuration package. The file will be saved to your workspace on the local appliance.

**NOTE:** If you have previously saved the new configuration at some point during the current configuration session, you can click Save to update the current package with your changes. If you have not saved the configuration previously, or want to ensure that it is saved to the correct package name, click Save As and select or specify the package to update. (Save As is strongly recommended, to avoid overwriting the wrong configuration package.) If you have not previously saved the configuration package, please follow the instructions below.

To save the configuration and generate or update the configuration package, do the following:

1. Click Save As (at the top of the Configuration Editor middle pane).

   This opens the Save As dialog box, as shown in the following figure.
2. Enter a descriptive name for the configuration.

3. Click **Save**.

### Exporting the Configuration Package

The final step is to export the completed configuration package to the Management Web Interface **Change Management** system, in preparation for uploading the configuration to the MCN and client appliances. You can also use the **Export** feature to download a copy of the configuration package to the local PC.

To export the configuration package to **Change Management**, do the following:

1. In the **Configuration Editor** page, click **Export** (at the top of the page).

   The following figure shows the location of the **Export** button.
This opens the **Export Configuration** dialog box, as shown in the following figure.

**Figure 77. Export Configuration dialog box**
2. Select **Change Management Inbox** as the export destination.

Use the drop-down menu in the **Destination:** field to make your selection.

3. Click **Export.**

When the export operation completes, a green success status message displays at the top of the page, as shown in the following figure.

*Figure 78. Export success status message*

![Figure 78. Export success status message](image)

**TIP:** You can click the blue **Change Management** link in the success message to go directly to the **Change Preparation -- Upload and Verify Files** page (second page) of the **Change Management** wizard. You will need to navigate to this page to perform the next step in the configuration process. However, the success message displays for only a few seconds, after which you must use the navigation tree to open the wizard and then step through to this page. Instructions are provided in the next chapter.

You are now ready to upload the CloudBridge Virtual WAN software package to the MCN Appliance.
Preparing the Virtual WAN Appliance Packages on the MCN

The next step is to prepare the Virtual WAN Appliance packages, by means of the Change Management wizard on the MCN.

There is a different Virtual WAN software version for each Virtual WAN Appliance model. An Appliance Package consists of the software version for a given model, bundled with the configuration package you want to deploy. Consequently, a different Appliance Package must be prepared and generated for each appliance model in your network.

**NOTE:** If you have not already downloaded the required CloudBridge Virtual WAN software versions to a PC connected to your network, you will need to do so now. For information on acquiring and downloading the software, see the section entitled, “CloudBridge Virtual WAN Software Requirements” in “Chapter 3: Before You Begin.”

To upload and install the package and configuration to the MCN, do the following:

1. If you have not already done so, log into the Management Web Interface on the MCN appliance.

   **NOTE:** You will be uploading the software packages you previously downloaded to the connected PC. For convenience, you might want to use this same PC to connect to the MCN again, now.

2. Select the Configuration tab.

3. In the left pane, open the Virtual WAN section, and select Change Management.

   This displays the first page of the Change Management wizard, the Change Process Overview page, as shown in the following figure.
4. Click **Begin**.

   This displays the **Change Preparation** page for uploading and verifying the appliance software version and configuration, as shown in the following figure.
5. Upload each of the Virtual WAN software versions required for your network.

**NOTE:** Before proceeding with this step, make sure you have downloaded a copy of the appropriate Virtual WAN software version for each of the different appliance models in your network. For information on downloading the software packages, see the section entitled, “CloudBridge Virtual WAN Software Requirements” in “Chapter 3: Before You Begin.”

For each Virtual WAN software version you want to deploy, do the following:

a) Click **Choose File** next to the **Upload Item** field.

This opens a file browser for selecting the Virtual WAN software package you want to upload.

b) Select a Virtual WAN software package, and click **OK**.

Navigate to the CloudBridge Virtual WAN software packages you downloaded earlier to the local PC, and select a package to upload.
c) Click **Upload**.

d) Repeat steps (a) through (c) for each of the Virtual WAN software versions required for your network.

6. In the **Configuration** field drop-down menu, select the new configuration package that you just exported to **Change Management**.

7. Click **Next**.

   The selected file is submitted for verification, and the **Verification** results page displays, as shown in the following figure.

*Figure 81. Change Management wizard – Verification Results page.*

8. Click **OK**.

   This dismisses the **Verification** page and proceeds to **Appliance Staging** page, as shown in the following figure.
9. Check the Ignore Incomplete box.

This indicates that the client sites should be ignored for this staging operation, and only the MCN should be updated and staged at this time.

**NOTE:** In the future, if you need to update this configuration after it has been deployed and Virtual Path communication is in effect, you can skip this step. In such a case, the configuration will be automatically distributed from the MCN to all active remotes through the existing Virtual Path.

10. Click Stage Appliances.

This transfers the selected appliance software version and configuration to the MCN, and initiates staging of the MCN. A Transfer Progress status bar displays as the transfer proceeds, as shown in the following figure.
11. Click **Next** to proceed to the **Activation** tab **Activate** page.

12. Click **Activate Staged**.

   This activates the software package and the new configuration on the appliance. This may take several seconds to complete.

   When the activation completes, a status message displays stating **Activation complete**, and the **Done** button becomes available. In addition, the **Configuration Filenames** status line (above the table) now displays the name of newly-activated package in the **Active** field.

13. Click **Done** to exit the wizard and view the activation results.

   After the CloudBridge Virtual Path Service starts on the appliance, click **Done** on the **Activation** page to return to the Management Web Interface **Dashboard** page. This page now displays updated information regarding the software build, the status of the newly-activated appliance, and the status of the CloudBridge Virtual Path.

   You have now successfully uploaded and installed the CloudBridge Virtual WAN software on the MCN. The next step is for the branch Site Administrators to connect the client appliances to your network at their respective branch sites.
Chapter 9

Connecting the Client Appliances to Your Network

The next step is for the branch Site Administrators to connect the client appliances to the network at their respective branch sites. This is in preparation for uploading and activating the appropriate CloudBridge Virtual WAN software version and configuration package to the clients. You will need to contact each branch Site Administrator to initiate and coordinate these procedures.

To connect your appliance, do the following:

1. Connect the appliance to the branch site LAN.
   - Connect one end of an Ethernet cable to a port configured for LAN on the CloudBridge Virtual WAN Appliance, and the other end of the cable to the LAN switch.

2. Connect the appliance to the WAN.
   - Connect one end of an Ethernet cable to a port configured for WAN on the CloudBridge Virtual WAN Appliance, and the other end of the cable to the WAN router.

The next step is for the branch Site Administrators to install and activate the appropriate CloudBridge Virtual WAN Appliance Package on their clients.
Chapter 10

Installing the Virtual WAN Appliance Packages on the Clients

After you have prepared and connected the MCN, and the branch Site Administrators have connected their respective client appliances to the LAN and WAN, the next step is to upload and activate the appropriate CloudBridge Virtual WAN Appliance package on each client. The Change Management wizard guides you through this process.

To install and activate the software and configuration on a client appliance, do the following:

1. On a connected PC, open a browser and log onto the MCN appliance Management Web Interface.

   Enter the Management IP Address for the MCN in the browser address field. This displays the Management Web Interface Dashboard page for the MCN appliance.

2. Select the Configuration tab.

3. Select Virtual WAN and then select Change Management in the navigation pane on the left.

   This displays the Change Process Overview page (the first page of the Change Management wizard), as shown in the following figure.
At the bottom of this page, you will see a table listing the individual sites and appliances. At the far right of the table in the **Download Package** column, are links for the **active** and **staged** Appliance Packages.

4. Click the **Active** link for the package you want to download.

   In the **Site-Appliance** table, locate the entry for your site appliance, and click the **Active** link in the **Download Package** column of that entry. A file browser for selecting the download location (on the local PC) displays.

5. Select the download location and click **OK**.

6. (Optional.) After the download completes, log out of the MCN Management Web Interface.

7. Open a browser, and enter the IP Address for the client to which you want to upload the Appliance Package Zip file.
**NOTE:** Please ignore any browser certificate warnings for the CloudBridge Management Web Interface.

This opens the CloudBridge Management Web Interface **Login** screen on the client appliance, as shown in the following figure.

*Figure 85. Citrix CloudBridge Management Web Interface Login Screen*

8. Enter the Administrator user name and password and click **Login**.

   The default Administrator user name is **admin**; the default password is **password**.

   This displays the Management Web Interface **Dashboard** page for the client appliance, as shown in the next figure.
9. Select the **Configuration** tab.

10. Open the **System Maintenance** branch in the navigation tree (left pane), and select **Local Change Management**.

   This displays the **Local Appliance Change Process Upload** page for uploading and verifying the client software and configuration, as shown in the following figure.
11. Click **Choose File** next to the **Upload Item** field.

   This opens a file browser for selecting the file you want to upload to the client.

12. Navigate to the CloudBridge Virtual WAN software package Zip file you just downloaded from the MCN, select it, and click **OK**.

13. Click **Upload**.

   The upload process takes a few seconds to complete. When completed, a status message displays (left middle of page), stating **Upload complete**, as shown in the following figure.
14. Click **Next**.

This uploads the specified software package, and displays the Local Change Management **Activation** page, as shown in the following figure.
15. Click **Activate Staged**.

This activates the newly-installed package and starts the CloudBridge Virtual Path Service on the client appliance. This process takes several seconds, during which a progress status message displays, as shown in the following figure.

**Figure 90. Activation status message**

When the activation completes, a status message displays stating **Activation complete**, and the **Done** button becomes available.

16. Click **Done** to exit the wizard and view the activation results.

After the CloudBridge Virtual Path Service starts on the appliance, click **Done** on the **Activation** page to return to the Management Web Interface **Dashboard** page. This page should now display updated information regarding the software build, the status of the newly-activated client appliance, and the status of the CloudBridge Virtual Path.

The following figure shows a sample client **Dashboard** page.
This completes the installation and activation of the CloudBridge Virtual WAN software and configuration on the MCN and branch site client appliances. You can now use the Monitoring pages to verify the activation and diagnose any existing or potential configuration issues. Basic instructions are provided in the next chapter.
Chapter 11

Monitoring Your CloudBridge Virtual WAN

This chapter provides basic instructions for using the Management Web Interface to monitor your CloudBridge Virtual WAN.

For additional information about CloudBridge Virtual WAN statistics and statistical reports, please see the CloudBridge Virtual WAN Administration Guide.

Viewing Basic Information for an Appliance

Use a browser to connect to the Management Web Interface of the appliance you want to monitor, and click the Dashboard tab to display basic information for that appliance.

The Dashboard page displays the following basic information for the local appliance:

System Status:

- **Name** – This is the name you assigned to the appliance when you added it to the system.
- **Model** – This is the Virtual WAN appliance model number.
- **Appliance Mode** – This indicates whether this appliance has been configured as the primary or secondary MCN, or as a client appliance.
- **Management IP Address** – This is the Management IP Address for the appliance.
- **Appliance Uptime** – This specifies the duration for which the appliance has been running since the last reboot.
- **Service Uptime** – This specifies the duration for which the Virtual WAN Service has been running since the last restart.
Virtual Path Service Status:

- **Virtual Path [path name]** – This identifies the Virtual Path for this Virtual Path Service.

Local Version Information:

- **Software version** – This is the version of the CloudBridge Virtual Path software package currently activated on the appliance.
- **Build date** – This is the build date for the product version currently running on the local appliance.
- **Hardware version** – This is the hardware model number and version of the appliance.

The following figure shows a sample Dashboard page for the MCN, and MCN Appliance information.

*Figure 92. Example Dashboard page for the MCN Appliance*
The following figure shows a sample Dashboard page and information for a client appliance.

**Figure 93. Client Dashboard page**

![Client Dashboard page](image)

Viewing Path Statistics

To view state and related information about the CloudBridge Virtual Paths for both the MCN and the clients, do the following:

1. Log onto the Management Web Interface for the MCN, and select the Monitoring tab.
2. Open the Virtual WAN branch in the navigation tree (left pane).
3. Select the Statistics branch under Virtual WAN.

This displays the Statistics page with Paths preselected in the Show field, which displays a detailed table of path statistics, as shown in the following figure.
Viewing Other Statistical Information and Reports

This section provides some rudimentary instructions on viewing CloudBridge Virtual WAN statistics and reports information.

Viewing Other Statistical Information

This section provides basic instructions for viewing Virtual WAN Statistics information.

To view statistical information, do the following:

1. Log onto the Management Web Interface for the MCN, and select the Monitoring tab.
2. Open the Virtual WAN branch in the navigation tree (left pane).
3. Select the Statistics branch under Virtual WAN.

This displays the Statistics page with Paths preselected by default in the Show field.
4. Open the **Show** drop-down menu next to the **Show** field.

In addition to the **Paths** statistics, the **Show** menu also offers several additional options for viewing statistical information, as illustrated in the following figure.

**Figure 95. Virtual WAN Statistics Show menu**

5. Select a topic from the **Show** menu to view a table of statistical information for that topic.

**Viewing Flow Information**

This section provides basic instructions for viewing Virtual WAN flow information.

To view flow information, do the following:

1. Log onto the Management Web Interface for the MCN, and select the **Monitoring** tab.

2. Open the **Virtual WAN** branch in the navigation tree (left pane).
3. Select the **Flows** branch under **Virtual WAN**.

   This displays the **Flows** page with **LAN to WAN** preselected in the **Flow Type** field, as shown in the following figure.

   **Figure 96. Virtual WAN Flows page**

   ![](image)

   4. Select the **Flow Type**.

   Next to the **Flow Type** field is a row of checkbox options for selecting the flow information you want to view. You can check one or more boxes to filter the information to be displayed.

   5. Select the **Max Flows to Display** from the drop-down menu next to that field.

   6. **(Optional)** Enter search text in the **Filter** field.

   7. Click **Refresh** to display the results.
Viewing Reports

This section provides basic instructions for generating and viewing CloudBridge Virtual WAN reports using the MCN Management Web Interface. You can also generate reports using a client Management Web Interface, but the scope of those reports in some cases will be limited to the local branch.

To generate and view CloudBridge Virtual WAN reports, do the following:

1. Log onto the Management Web Interface for the MCN, and select the Monitoring tab.
2. Open the Virtual WAN branch in the navigation tree (left pane).

The Virtual WAN branch offers the following options for viewing reports:

- Performance Reports
- QoS Reports
- Usage Reports
- Availability Reports
- Appliance Reports

3. Select the option for the type of report you want to view.

   **NOTE:** For each type of report, there are numerous options for defining and filtering the information you want to view. For a complete description of Virtual WAN reports and monitoring, please refer to the CloudBridge Virtual WAN Administration Guide.
# Appendix A

## Standard MIB Support

The following standard MIBs are supported by the Virtual WAN Appliances.

<table>
<thead>
<tr>
<th>MIB</th>
<th>RFC Definition (Link)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP-MIB (Partial)</td>
<td><a href="https://www.ietf.org/rfc/rfc4293.txt">https://www.ietf.org/rfc/rfc4293.txt</a></td>
</tr>
<tr>
<td>SNMPv2-MIB</td>
<td><a href="https://www.ietf.org/rfc/rfc3418.txt">https://www.ietf.org/rfc/rfc3418.txt</a></td>
</tr>
<tr>
<td>P-BRIDGE-MIB.txt</td>
<td><a href="http://www.icir.org/fenner/mibs/extracted/P-BRIDGE-MIB-rfc2674.txt">http://www.icir.org/fenner/mibs/extracted/P-BRIDGE-MIB-rfc2674.txt</a></td>
</tr>
<tr>
<td>RMON2-MIB.txt</td>
<td><a href="https://www.ietf.org/rfc/rfc3273.txt">https://www.ietf.org/rfc/rfc3273.txt</a></td>
</tr>
</tbody>
</table>
Additional Notes

- Support for these MIBs is provided by default by the `net-snmp snmpd` daemon process on Linux systems. The MIBs provide the basis for supporting Network Management applications, for example: Nagios or SolarWinds.

- The Ethernet port packet and byte counters are in the `IF-MIB` inside the `ifTable`. System information is in the `system` object.

- Ethernet ports are included in the `ifTable`, so walking that should be sufficient to ensure that the SNMP subsystem is running.

- Support for the `Q-BRIDGE-MIB` and the `IP-MIB` provides support for the network mapping application in SolarWinds.
The following table provides basic definitions of the key CloudBridge Virtual WAN terms and concepts.

<table>
<thead>
<tr>
<th>TERM</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Interface</td>
<td>An Access Interface consists of a Virtual Interface, WAN endpoint IP Address, Gateway IP Address, and Virtual Path Mode defined collectively as an interface for a specific WAN link. Each WAN link must have at least one Access Interface.</td>
</tr>
<tr>
<td>branch node</td>
<td>A branch node is a Virtual WAN Appliance that is deployed as a Virtual WAN client at an Enterprise branch (remote) site, and across the Virtual WAN from the associated Master Control Node (MCN). An MCN can be associated with multiple Virtual WAN branch nodes; however, each Virtual WAN branch node can be associated with only one MCN. (See also: client node.)</td>
</tr>
<tr>
<td>branch site</td>
<td>A branch site is an Enterprise branch office (remote) location where a Virtual WAN Appliance is deployed as a Virtual WAN client, across the Virtual WAN from the associated Master Control Node (MCN) site. (See also: client site.)</td>
</tr>
<tr>
<td>class</td>
<td>See: Virtual WAN Class.</td>
</tr>
<tr>
<td>client node (client)</td>
<td>A client node is a CloudBridge Virtual WAN Appliance that is deployed as a Virtual WAN client, and located across the Virtual WAN from the associated Master Control Node (MCN). Client nodes are typically located at an Enterprise branch office (remote) site, whereas the MCN is typically located at the Enterprise primary data center. An MCN can be associated with multiple Virtual WAN client nodes; however, each Virtual WAN client node can be associated with only one MCN. (See also: Virtual WAN client node.)</td>
</tr>
<tr>
<td>client site</td>
<td>This is a site on the Enterprise network at which a Virtual WAN Appliance is deployed as a Virtual WAN client, across the Virtual WAN from the Master Control Node (MCN) site. The MCN site is typically located at the primary data center for the Enterprise, whereas the client sites are typically located at Enterprise branch office (remote) locations.</td>
</tr>
<tr>
<td>Dynamic Virtual Path</td>
<td>A Dynamic Virtual Path Intermediate Site is a site that is actively participating in a Dynamic Virtual Path as an intermediary for two endpoint sites. The intermediate site determines whether a Dynamic Virtual Path should be created between the endpoint sites. The determination is based on bandwidth measurements made at the intermediate site.</td>
</tr>
<tr>
<td>Intermediate Site</td>
<td></td>
</tr>
<tr>
<td>Dynamic Virtual Path Service</td>
<td>A Dynamic Virtual Path Service is a dynamically created and removed Virtual Path Service between two sites within the same WAN to WAN Forwarding Group.</td>
</tr>
<tr>
<td>Enterprise site (site)</td>
<td>An <strong>Enterprise site or site</strong> is a location within the Virtual WAN that connects to the rest of the Virtual WAN through a WAN. A site typically has either a single Virtual WAN Appliance, or a pair of High Availability (HA) Virtual WAN Appliances.</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ethernet Interface</td>
<td>An <strong>Ethernet Interface</strong> is a physical or configurable interface on the CloudBridge Virtual WAN Appliance.</td>
</tr>
<tr>
<td>flow</td>
<td>See: <strong>Virtual WAN flow</strong>.</td>
</tr>
<tr>
<td>Geographically Diverse MCN</td>
<td>A <strong>Geographically Diverse MCN</strong> is a configuration in which two sites serve in an Active/Standby partnership (primary and secondary MCN) for High Availability (redundancy) purposes.</td>
</tr>
<tr>
<td>High Availability (HA) configuration</td>
<td>This is a configuration in which two Virtual WAN Appliances at a site serve in an Active/Standby partnership capacity for redundancy purposes.</td>
</tr>
<tr>
<td>Internet Service</td>
<td>This refers to the service used for traffic between an Enterprise site and sites on the public Internet. Traffic of this type is not encapsulated. During times of congestion, the Virtual WAN actively manages bandwidth by rate-limiting Internet traffic relative to the Virtual Path, and Intranet traffic according to the Virtual WAN configuration established by the Administrator.</td>
</tr>
<tr>
<td>Intranet Service</td>
<td>This refers to a service used for any portion of Enterprise Intranet traffic that has not been defined for transmission across a Virtual Path. As with Internet traffic, it remains unencapsulated, and the Virtual WAN manages bandwidth by rate-limiting this traffic relative to other service types during times of congestion. Note that under certain conditions, and if configured for Intranet Fallback on the Virtual Path, traffic that ordinarily travels by means of a Virtual Path may instead be treated as Intranet traffic, in order to maintain network reliability.</td>
</tr>
<tr>
<td>LAN to WAN</td>
<td><strong>LAN to WAN</strong> refers to the traffic traveling from an Enterprise Site into the WAN. LAN to WAN also refers in general to the following related terms: Upstream, Upload, Up, Transmit, Site Egress.</td>
</tr>
<tr>
<td>Master Control Node (MCN)</td>
<td>The <strong>Master Control Node</strong> (MCN) is the central Virtual WAN Appliance that acts as the master controller of the Virtual WAN, as well as the central point of administration for the client nodes. The primary purpose of the MCN is to establish and employ Virtual Paths between one or more client nodes located across the Virtual WAN for Enterprise Site-to-Site communications. A particular MCN can establish and administer Virtual Paths to multiple client nodes.</td>
</tr>
<tr>
<td>Network Service (service)</td>
<td>A <strong>Network Service</strong> is a logical set of operations performed on traffic as it flows across the Virtual WAN. The set of services supported are Passthrough, Internet, Intranet, and Virtual Path.</td>
</tr>
</tbody>
</table>
| **Passthrough Service** | The *Passthrough Service* handles traffic that is to be passed through the Virtual WAN. Traffic directed to the *Passthrough Service* includes broadcasts, ARPs and other non-IPv4 traffic, as well as traffic on the Virtual WAN Appliance local subnet, specifically-configured subnets, or Rules applied by the Network Administrator. This traffic is not delayed, shaped or modified by the Virtual WAN. Consequently, the Network Administrator must ensure that Passthrough traffic does not consume substantial resources on the WAN links that the Virtual WAN Appliance is configured to use for other services.

For example, Passthrough Service might be used when a host is located on the WAN side of the Virtual WAN Appliance, but access to the host does not impact the specific WAN links of the Virtual WAN Appliance. |
<p>| <strong>Redundant Virtual WAN Control Protocol (RVWCP)</strong> | This is a Citrix protocol used for transmission of availability information between two Virtual WAN Appliances that function as a High Availability (HA) pair. |
| <strong>Rule</strong> | A <em>Rule</em> is a Virtual WAN Networking Service equivalent of a typical router access control list or filter mask. A Rule defines match criteria and properties for IP flows. |
| <strong>Session</strong> | A <em>session</em> is a semi-persistent communication between two or more devices consisting of a series of packets over time between the devices. Sessions used by Virtual WAN are typically OSI L3/L4 sessions identifiable by a 5-tuple of Source IP, Destination IP, IP Protocol Type, and UDP/TCP Source Port and Destination Port. Related terms are: Application Session, TCP Session, Voice Session, HTTP Session. |
| <strong>TCP Termination</strong> | <em>TCP termination</em> provides the ability to split a single TCP connection into three separate TCP connections. |
| <strong>Trusted WAN Interface</strong> | This refers to an appliance interface processing network traffic that is protected by a firewall, performing as if it were a traditional WAN port. |
| <strong>Untrusted WAN Interface</strong> | This refers to an appliance interface processing network segment traffic that is not being protected by a firewall. Non-Virtual Path traffic from the WAN is unable to communicate with any network interface on the appliance. The segment is entirely isolated from the rest of the network, with the exception of the 128-bit AES-encrypted paths of the Virtual WAN. |
| <strong>Virtual IP Address</strong> | A <em>Virtual IP Address</em> is an additional IP address declared on an interface that already has an IP Address. |
| <strong>Virtual Path</strong> | A <em>Virtual Path</em> is a logical link between two WAN links. It comprises a collection of WAN Paths combined to provide high service-level communication between two Virtual WAN nodes. This is accomplished by constantly measuring and adapting to changing application demand and WAN conditions. Virtual WAN Appliances measure the network on a per-path basis. (See also: Virtual Path Service.) |</p>
<table>
<thead>
<tr>
<th><strong>Virtual Path Class</strong></th>
<th>A <em>Virtual Path Class</em> is a queued service point into a Virtual Path. The class to which traffic is assigned determines its share of Virtual Path bandwidth, permitted queue depth, and priority relative to other traffic for Virtual WAN resources.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Virtual Path Control Protocol</strong></td>
<td>The <em>Virtual Path Control Protocol</em> is a proprietary protocol for transport across a Virtual WAN. The protocol uses UDP Port 2156 to encapsulate traffic that is transmitted between two Virtual WAN Appliances across the WAN.</td>
</tr>
<tr>
<td><strong>Virtual Path Service</strong></td>
<td>The <em>Virtual Path Service</em> is a service that is a logical combination of one or more WAN paths. This is the typical service for Enterprise Site-to-Site Intranet traffic, utilizing the full value of the Virtual WAN. With this service, depending on configuration, traffic is actively managed across multiple WAN links to create an end-to-end Virtual Path. All traffic utilizing the Virtual Path is encapsulated. A Virtual Path can be static (always exists) or dynamic (exists only when traffic between two Virtual WAN Appliances meets a configured threshold). The service provides a high service level by constantly measuring and adapting to changing application demands and WAN conditions.</td>
</tr>
<tr>
<td><strong>Virtual WAN</strong></td>
<td>This is an Enterprise network in which a Virtual WAN solution is implemented. It includes the Virtual WAN Appliances, the WAN, the Virtual Paths between peer Virtual WAN Appliances, as well as other network application services.</td>
</tr>
<tr>
<td><strong>Virtual WAN Appliance</strong></td>
<td>A <em>Virtual WAN Appliance</em> is a Citrix CloudBridge Appliance running Virtual WAN software.</td>
</tr>
<tr>
<td><strong>Virtual WAN Appliance package</strong></td>
<td>A <em>Virtual WAN Appliance package</em> consists of the Virtual WAN software and the Virtual WAN Configuration, which are bundled together and distributed by the Master Control Node (MCN). There is a different version of the Virtual WAN software for each Virtual WAN Appliance model. Consequently, the MCN generates a separate and distinct package for each specific Virtual WAN Appliance model included in the configuration. The appropriate Appliance Package is then uploaded and activated on each of the client appliances. (See also: <em>Virtual WAN Configuration</em> and <em>Virtual WAN Software</em>.)</td>
</tr>
<tr>
<td><strong>Virtual WAN client node</strong></td>
<td>This is a CloudBridge Virtual WAN Appliance that is deployed as a Virtual WAN client, and located across the Virtual WAN from the associated Master Control Node (MCN). Client nodes are typically located at an Enterprise branch office (remote) site, whereas the MCN is typically located at the Enterprise primary data center. An MCN can be associated with multiple Virtual WAN client nodes; however, each Virtual WAN client node can be associated with only one MCN.</td>
</tr>
<tr>
<td><strong>Virtual WAN Configuration</strong></td>
<td>Also referred to as a <em>Virtual WAN Configuration package</em>. This is the set of configured parameter settings that define a Virtual WAN network. The configuration is provided to the Master Control Node (MCN), which then bundles the configuration and the Virtual WAN software to generate the Virtual WAN Appliance packages. There is a different version of the Virtual WAN software for each Virtual WAN Appliance model; therefore, a different Appliance package must be generated for each specific Virtual WAN Appliance model included in the configuration. (See also: <em>Virtual WAN Appliance package</em> and <em>Virtual WAN software</em>.)</td>
</tr>
<tr>
<td><strong>Virtual WAN Configuration Editor</strong></td>
<td>This is a web-based configuration tool that is integrated with the Virtual WAN Management Web Interface and the Virtual WAN software. The Configuration Editor enables you to create and edit the Virtual WAN Configuration, and to create, edit, and view Virtual WAN network maps. The Configuration Editor is available only on the Master Control Node (MCN) when the Management Web Interface is in MCN mode.</td>
</tr>
<tr>
<td><strong>Virtual WAN Flow</strong></td>
<td>A <em>Virtual WAN flow</em> (also simply referred to as a <em>flow</em>) is a stateful instance (memory) used to track and treat application traffic from its source to its destination across the Virtual WAN. The properties of a particular flow are derived from the routes, Rules, and Network Service that the flow matches.</td>
</tr>
<tr>
<td><strong>Virtual WAN Network</strong></td>
<td>This is an Enterprise network in which a CloudBridge Virtual WAN solution is implemented. A Virtual WAN network comprises the Virtual WAN nodes, the WAN, and the Network Services.</td>
</tr>
<tr>
<td><strong>Virtual WAN Software</strong></td>
<td>This is the software that runs on a Virtual WAN Appliance. There is a different version of the Virtual WAN software for each Virtual WAN Appliance model. The appropriate Virtual WAN software version and the selected Virtual WAN Configuration are bundled together by the <strong>Change Management</strong> utility on the MCN to generate a Virtual WAN Appliance package for each specific appliance model in the Virtual WAN configuration. The appropriate Appliance Package is then uploaded and activated on each of the client appliances. (See also: <em>Virtual WAN Configuration</em> and <em>Virtual WAN Appliance package</em>.)</td>
</tr>
<tr>
<td><strong>WAN link</strong></td>
<td><em>WAN link</em> is the general term for a connection between an Enterprise network site and a WAN. WAN links are typically connected to router ports. Some examples of WAN Links are T1, DSL, or Frame Relay.</td>
</tr>
<tr>
<td><strong>WAN path</strong></td>
<td>A <em>WAN path</em> is a P2P unidirectional tunnel between two WAN Links across the WAN.</td>
</tr>
<tr>
<td><strong>WAN to LAN</strong></td>
<td><em>WAN to LAN</em> refers to the traffic traveling from a WAN into the Enterprise site Local Area Network.</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>WAN to WAN Forwarding</strong></td>
<td><em>WAN to WAN Forwarding</em> refers to a feature whereby two non-adjacent sites can route traffic to one another by means of a shared neighbor site.</td>
</tr>
<tr>
<td><strong>WAN to WAN Forwarding Group</strong></td>
<td>This refers to a group of sites that can route traffic to one another through a shared neighbor site, by means of WAN to WAN Forwarding.</td>
</tr>
</tbody>
</table>