



Synthetic Transaction Configuration

Synthetic transactions are tests that you configure to run periodically. They provide an additional source of status information from voice-enabled devices to VHM. VHM can monitor the information returned from synthetic transactions and generate events based on the results. VHM supports synthetic transactions that run tests through Cisco CallManagers (CCMs).

The following topics are covered:

- [Synthetic Transaction Overview, page 6-2](#)
- [Configuring Phone Numbers for Tests, page 6-4](#)
- [Maintaining Synthetic Transactions in VHM, page 6-7](#)

Synthetic Transaction Overview

Synthetic transactions can be used to determine the status of voice-enabled devices. For example, you can use synthetic transactions to verify that phones can register with a CCM and that voice gateways are forwarding calls.

If a synthetic transaction fails, VHM generates a critical event. Such events are displayed in both the Real-Time Dashboard–Status View for the Media Server voice device group, and on the alarm log in the Monitoring Console.

These are the synthetic transactions for CCM and the results that each test must produce to pass:

- **Phone Registration**—Opens a connection with the CCM and registers a simulated IP phone.

The expected result is the successful registration of the phone.

- **Off Hook**—Simulates an off-hook state to the CCM and monitors the message stream.

The expected results are:

- Receive a dial tone command from the CCM
- Properly terminate the session when on-hook is signaled

- **Empty Call**—Initiates a call and monitors the message stream.

The expected results are:

- All off-hook signaling
- All on-hook signaling

- **End to End Call**—Initiates a call to a second simulated or real IP Phone.

The expected results are:

- All call initiation results
- Ring indication

- **Phone to Gateway Call**—Initiates a call to an analog phone through a voice gateway. This test ensures that the CCM is able to forward calls made on a particular route pattern to a Voice Gateway, which then forwards the call to the analog phone. This test is an end-to-end call made using particular phone numbers that are known to traverse particular gateways.

To configure and run this transaction, the following steps must be executed on the CCM:

- Set up a Route Pattern to ensure that the calls made on a particular extension are routed to a Voice Gateway. This can be done by going into the **Route Plan > Route Pattern** screen from the CCM Administration page.
- Connect the analog phone to the FXS port of the Voice Gateway.
- Configure the FXS port of the Voice Gateway to assign the POTS directory number to the port to which the analog phone is connected.

Use this configured directory number as the target phone number for the phone-to-gateway transaction.

- **Phone to Conference Bridge Call**—Initiates a call to a conference bridge. This test is basically an end-to-end call to a conference bridge, verifying only the ability to call in to the conference bridge and not the health of the bridge itself.

The expected result is the successful completion of the call.

- **TFTP Download**—Performs a TFTP get-file operation on the TFTP server.

The expected result is the successful download of a configuration file from the TFTP server.



Note Do not use phone numbers that consist of more than five digits.

To configure synthetic transactions:

-
- Step 1** Configure the phone numbers that you will use to run synthetic transactions following the recommendations in the [“Configuring Phone Numbers for Tests” section on page 6-4](#).
 - Step 2** Configure the transactions following the instructions in the [“Maintaining Synthetic Transactions in VHM” section on page 6-7](#).
-

Configuring Phone Numbers for Tests

You can configure synthetic transactions for each CCM in your network. For each synthetic transaction, you must configure one or more phone numbers in the related CCM. When configuring phone numbers:

- Create one phone number and one MAC address for each test and use it for that test *only*.
- Make sure that the combination of the phone number and the MAC address used in a test is unique across the voice cluster.

**Caution**

Failure to follow these recommendations may result in synthetic transaction failures.

Before you configure phone numbers, work through the [“Determining How Many Phone Numbers You Need”](#) section on page 6-4 to estimate how many numbers you will need based on the tests you want to run.

As you configure phone numbers on each CCM, use the worksheet in the [“Configuring Phone Numbers in CCM”](#) section on page 6-5 to simplify data entry into VHM.

Determining How Many Phone Numbers You Need

The number of phone numbers you must create in a CCM for use in synthetic transactions depends on:

- The number of synthetic transactions you want to configure
- The type of tests you want to run

[Table 6-1](#) provides a worksheet for determining how many phone numbers you need.

Table 6-1 Phone Numbers Required per Synthetic Transaction

Number of Test	Type of Test	Phone Numbers Needed for Test	Total Phone Numbers Needed
	Phone Registration	1	
	Off Hook	1	
	Empty Call	2	
	End to End Call	2	
	Phone to Gateway Call	2	
	Phone to Conference Bridge Call	2	
	TFTP Download	0	

Configuring Phone Numbers in CCM

When you configure phone numbers in CCM, you must consider the requirements listed in the [“Meeting the Requirements for Target Phone Numbers”](#) section on [page 6-5](#) and record the phone numbers as you enter them. A sample worksheet is provided in the [“Recording Phone Numbers on a Worksheet”](#) section on [page 6-6](#).

Meeting the Requirements for Target Phone Numbers

For the following transactions, there are special requirements for the target phone number:

- End-to-end call—It is recommended that the target phone number be configured as an incoming call in the CCM.
- Phone-to-gateway call—The target phone number must be a valid phone number known to traverse a particular gateway. This test is supported only for a target phone that automatically picks up when it rings.
- Phone-to-conference bridge—The target phone number must be a valid conference bridge dial-in number. The target phone must be picked up when it rings and may not be picked up by an Interactive Voice Response (IVR) system. This test is supported only when the call goes directly to the conference bridge without passing through an IVR.

Recording Phone Numbers on a Worksheet

As you configure phone numbers in a CCM, record them in a worksheet similar to [Table 6-2](#). You can use the worksheet as an aid when you configure the synthetic transactions in VHM. The design of the worksheet reflects the design of the Synthetic Transaction Configuration window, which presents one complete set of synthetic transactions at a time. You do not, however, need to configure all transactions in a given set.

Use a copy of the worksheet to record:

- **CCM**—You can obtain a list of CCMs from the Synthetic Transaction window. See the [“Maintaining Synthetic Transactions in VHM”](#) section on [page 6-7](#) for instructions on opening the Synthetic CallManager window.
- **Ethernet phone port for the CCM**—This defaults to 2000, but is configurable on the CCM. You can verify the Ethernet phone port used by a CCM on its Administrative pages. See the [“Opening Administration Pages for a CCM”](#) section on [page 6-8](#).
- **Phone numbers and MAC addresses**—Record the phone numbers and MAC addresses you plan to use for each transaction.

Table 6-2 CCM Worksheet for VHM Synthetic Configuration

CCM:	Ethernet Phone Port:			
	Phone Number	MAC Address	Target Phone Number	MAC Address for Incoming Call
Phone Registration			—	—
Off Hook			—	—
Empty Call				—
End to End Call				Same as MAC address of target phone
Phone to Gateway Call				—
Phone to Conference Bridge Call				—
Phone Registration			—	—
Off Hook			—	—
Empty Call				—

Table 6-2 CCM Worksheet for VHM Synthetic Configuration (continued)

CCM:	Ethernet Phone Port:			
	Phone Number	MAC Address	Target Phone Number	MAC Address for Incoming Call
Synthetic Transaction				
End to End Call				
Phone to Gateway Call				—
Phone to Conference Bridge Call				—
Phone Registration			—	—
Off Hook			—	—
Empty Call				—
End to End Call				
Phone to Gateway Call				—
Phone to Conference Bridge Call				—

Maintaining Synthetic Transactions in VHM

To start configuring synthetic transactions:

-
- Step 1** In the **Voice Health Monitor** drawer, click **Administration > Synthetic Transaction > Transaction Configuration**. The Synthetic Transaction window is displayed.
-

The VHM Synthetic Transaction window lists all Cisco CallManagers known to VHM and any synthetic transactions that are configured for them. The window displays:

- **Cisco CallManagers**—When a CCM is installed in the network, it is displayed in this window, ready to configure. When a CCM is removed from the network, any synthetic transactions configured for the CCM are deleted from VHM and the CCM is no longer displayed.

- **Synthetic Transactions**—The synthetic transactions that have been configured are listed with the CCM. If more than one synthetic transaction of a particular type is configured for a CCM, the CCM is listed multiple times.

For more information about what you can do from the Synthetic Transaction window see:

- [Opening Administration Pages for a CCM, page 6-8](#)
- [Adding Synthetic Transactions, page 6-8](#)
- [Modifying Synthetic Transactions, page 6-10](#)
- [Configuring the Timeout Interval for Synthetic Transactions, page 6-11](#)
- [Obtaining Results from Synthetic Transactions, page 6-11](#)
- [Deleting Synthetic Transactions, page 6-12](#)

Opening Administration Pages for a CCM

The Administration pages for a CCM can be opened from the Synthetic Transaction window.

To open the Administration pages for a CCM:

-
- Step 1** On the Synthetic Transaction window, click the name of the CCM.
-

Adding Synthetic Transactions

Before you add synthetic transactions to a CCM, you must configure phone numbers in the CCM following the recommendations in the [“Configuring Phone Numbers for Tests” section on page 6-4](#). When you add synthetic transactions for a CCM, use the worksheet recommended in the [“Configuring Phone Numbers in CCM” section on page 6-5](#) to assist you in entering the correct data.

To add synthetic transactions:

Step 1 Click the Configure icon to the right of the CCM.

If the CCM is listed multiple times, select the Configure button next to any occurrence of the CCM in the list. The Synthetic Transactions Configuration window appears.

Step 2 Enter the correct Ethernet port for the CCM. The default value is 2000, but is configurable on the CCM.



Note The Ethernet port must be the same for all synthetic transactions for the CCM. It is configurable only in the first set, and subsequently is not configurable.

Step 3 If the data fields for the particular type of synthetic transaction that you want to add are already filled in, click the **Add** button. Doing so preserves existing transaction data and presents a cleared Synthetic Transactions Configuration window.

Step 4 Select the check box next to the synthetic transaction you want to configure.



Note If the check box is not selected, the synthetic transaction will not run; any data entered for the transaction is ignored.

Step 5 Enter the phone numbers and MAC addresses from the worksheet.



Note For an end-to-end call, enter the MAC address for the incoming call only if you select the Incoming Call check box. The incoming call phone number will always be the same as the target phone number.

Step 6 Select the interval in seconds between transactions from the drop-down list. The default value for phone registration is 300 seconds. For all other transactions the default value is 30 seconds. The default values are also the minimum values.

Step 7 Click the **Add** button to save the transaction, and continue to add additional transactions.

If there are syntactic errors in MAC addresses or phone numbers, an error message will be displayed. Correct the errors and click the **Add** button again.



Note VHM verifies only that the MAC addresses and phone numbers entered in the Synthetic Transaction Configuration window are syntactically valid. It is the user's responsibility to make sure the correct numbers are entered as configured in the CCM.

Step 8 Click the **Done** button to exit the window and return to the Synthetic Transaction window.

Modifying Synthetic Transactions

To modify synthetic transactions:

-
- Step 1** Click the Configure icon to the right of the CCM.
The Synthetic Transactions Configuration window appears.
- Step 2** Enter the desired information.
- Step 3** Click **Modify**.
-



Note Every time you create or modify a transaction, you should edit the MAC address and phone number as a pair. Do not modify one independently of the other.

Configuring the Timeout Interval for Synthetic Transactions

All synthetic transactions will timeout if the monitored application does not respond in a timely manner. By default, the timeout is set to 25seconds. However, you can change this time if desired.

To change the timeout value:

-
- Step 1** Close all the Synthetic Transaction Configuration screens.
 - Step 2** Using Windows Explorer on your VHM machine open the following folder: `cscopx\objects\vhm\config\vhmamaintegrator` folder.
 - Step 3** Open the `AMAIntegrator.properties` file using a text editor (notepad).
 - Step 4** Edit the value of the property for Timeout. For example, you will see the entry: `Timeout : 25`. Change the timeout duration to the desired number (in seconds).
 - Step 5** Save the file.

**Note**

If the timeout you defined is greater than the transaction interval, the timeout will be reset to 5 seconds less than the transaction interval.

Obtaining Results from Synthetic Transactions

The first time you configure synthetic transactions, results are not displayed immediately in VHM. An initial delay occurs while the synthetic transaction server performs the following tasks:

- Registers the phones—May take up to 5 minutes.
- Samples—Performs sampling for one transaction interval before reporting results.
 - For a phone registration transaction with a minimum interval of 300 seconds, sampling takes 5 minutes.
 - For an off-hook transaction with a minimum interval of 30 seconds, sampling completes after 30 seconds.

Thereafter, results are available after each transaction interval.

Deleting Synthetic Transactions

You can delete synthetic transactions from the Synthetic Transaction window.

To delete one or more sets of synthetic transactions:

-
- Step 1** Select the Delete check box next to each CCM with the transactions that you want to delete.



Note If a CCM appears more than once on the list, click the Configure button to open the Synthetic Transaction Configuration window and check to determine whether you have selected the correct set of transactions to delete.

- Step 2** Scroll to the bottom of the VHM Synthetic Transaction window and click the Delete button.

- Step 3** Click **OK** to confirm the deletion. The Delete Transaction Information window is displayed and provides a status for the deleted transactions.

- Step 4** Click **Done** in the Delete Transaction Information window.
-



Note If you delete all transactions from a CCM, the CCM will still be listed in the VHM Synthetic Transaction window.



Note Always correlate the MAC address and phone number. If you modify a transaction, you should modify the MAC address and phone number together.
