

Configuring Backup Controllers

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Backup Controllers

A single controller at a centralized location can act as a backup for access points when they lose connectivity with the primary controller in the local region. Centralized and regional controllers do not need to be in the same mobility group. You can specify a primary, secondary, and tertiary controller for specific access points in your network. Using the controller GUI or CLI, you can specify the IP addresses of the backup controllers, which allows the access points to fail over to controllers outside of the mobility group.

The following are some guidelines for configuring backup controllers:

- You can configure primary and secondary backup controllers (which are used if primary, secondary, or tertiary controllers are not specified or are not responsive) for all access points connected to the controller as well as various timers, including heartbeat timers and discovery request timers. To reduce the controller failure detection time, you can configure the fast heartbeat interval (between the controller and the access point) with a smaller timeout value. When the fast heartbeat timer expires (at every heartbeat interval), the access point determines if any data packets have been received from the controller within the last interval. If no packets have been received, the access point sends a fast echo request to the controller.
- The access point maintains a list of backup controllers and periodically sends primary discovery requests to each entry on the list. When the access point receives a new discovery response from a controller, the backup controller list is updated. Any controller that fails to respond to two consecutive primary discovery requests is removed from the list. If the access point's local controller fails, it chooses an available controller from the backup controller list in this order: primary, secondary, tertiary, primary backup, and secondary backup. The access point waits for a discovery response from the first available controller in the backup list and joins the controller if it receives a response within the time configured for the primary discovery request timer. If the time limit is reached, the access point assumes that the controller cannot be joined and waits for a discovery response from the next available controller in the list.
- When an access point's primary controller comes back online, the access point disassociates from the backup controller and reconnects to its primary controller. The access point falls back only to its primary controller and not to any available secondary controller for which it is configured. For example, if an access point is configured with primary, secondary, and tertiary controllers, it fails over to the tertiary controller when the primary and secondary controllers become unresponsive. If the secondary controller

comes back online while the primary controller is down, the access point does not fall back to the secondary controller and stays connected to the tertiary controller. The access point waits until the primary controller comes back online to fall back from the tertiary controller to the primary controller. If the tertiary controller fails and the primary controller is still down, the access point then falls back to the available secondary controller.

This section contains the following subsections:

Restrictions for Configuring Backup Controllers

• You can configure the fast heartbeat timer only for access points in local and FlexConnect modes.

Configuring Backup Controllers (GUI)

Step 1	Choose Wireless > Access Points > Global Configuration to open the Global Configuration page.		
Step 2	From the Local Mode AP Fast Heartbeat Timer State drop-down list, choose Enable to enable the fast heartbeat timer for access points in local mode or choose Disable to disable this timer. The default value is Disable.		
Step 3	If you chose Enable in Step 2, enter the Local Mode AP Fast Heartbeat Timeout text box to configure the fast heartbeat timer for access points in local mode. Specifying a small heartbeat interval reduces the amount of time it takes to detect a controller failure.		
	The rang (inclusiv default v	ge for the AP Fast Heartbeat Timeout value for Cisco Flex 7510 Controllers is 10–15 (inclusive) and is 1–10 (inclusive) and is	
Step 4	From the timer fo	From the FlexConnect Mode AP Fast Heartbeat Timer State drop-down list, choose Enable to enable the fast heartbeat timer for FlexConnect access points or choose Disable to disable this timer. The default value is Disable.	
Step 5	If you enable FlexConnect fast heartbeat, enter the FlexConnect Mode AP Fast Heartbeat Timeout value in the FlexConnect Mode AP Fast Heartbeat Timeout text box. Specifying a small heartbeat interval reduces the amount of time it takes to detect a controller failure.		
	The range for the FlexConnect Mode AP Fast Heartbeat Timeout value for Cisco Flex 7510 Controllers is 10–15 (inclusive) and is 1–10 for other controllers. The default value for the heartbeat timeout for Cisco Flex 7510 Controllers is 10. The default value for other controllers is 1 second.		
Step 6	In the AP Primary Discovery Timeout text box, a value between 30 and 3600 seconds (inclusive) to configure the access point primary discovery request timer. The default value is 120 seconds.		
Step 7	If you want to specify a primary backup controller for all access points, enter the IPv4/IPv6 address of the primary backup controller in the Back-up Primary Controller IP Address (IPv4/IPv6) text box and the name of the controller in the Back-up Primary Controller Name text box.		
	Note	The default value for the IP address is 0.0.0.0, which disables the primary backup controller.	
Step 8	If you want to specify a secondary backup controller for all access points, enter the IPv4/IPv6 address of the secondary backup controller in the Back-up Secondary Controller IP Address (IPv4/IPv6) text box and the name of the controller in the Back-up Secondary Controller Name text box.		
	Note	The default value for the IP address is 0.0.0.0, which disables the secondary backup controller.	

Step 9 Click **Apply** to commit your changes.

- **Step 10** Configure primary, secondary, and tertiary backup controllers for a specific access point as follows:
 - a) Choose Access Points > All APs to open the All APs page.
 - b) Click the name of the access point for which you want to configure primary, secondary, and tertiary backup controllers.
 - c) Choose the High Availability tab to open the All APs > Details for (High Availability) page.
 - d) If desired, enter the name and IP address of the primary controller for this access point in the Primary Controller text boxes.
 - **Note** Entering an IP address for the backup controller is optional in this step and the next two steps. If the backup controller is outside the mobility group to which the access point is connected (the primary controller), then you need to provide the IP address of the primary, secondary, or tertiary controller, respectively. The controller name and IP address must belong to the same primary, secondary, or tertiary controller. Otherwise, the access point cannot join the backup controller.
 - e) If desired, enter the name and IP address of the secondary controller for this access point in the Secondary Controller text boxes.
 - If desired, enter the name and IP address of the tertiary controller for this access point in the Tertiary Controller text boxes.
 - g) Click Apply to commit your changes.
- **Step 11** Click **Save Configuration** to save your changes.

Configuring Backup Controllers (CLI)

Step 1 Configure a primary controller for a specific access point by entering this command:

config ap primary-base controller_name Cisco_AP [controller_ip_address]

- **Note** The *controller_ip_address* parameter in this command and the next two commands is optional. If the backup controller is outside the mobility group to which the access point is connected (the primary controller), then you need to provide the IP address of the primary, secondary, or tertiary controller, respectively. In each command, the *controller_name* and *controller_ip_address* must belong to the same primary, secondary, or tertiary controller. Otherwise, the access point cannot join the backup controller.
- **Step 2** Configure a secondary controller for a specific access point by entering this command:

config ap secondary-base *controller_name Cisco_AP* [*controller_ip_address*]

Step 3 Configure a tertiary controller for a specific access point by entering this command:

config ap tertiary-base controller_name Cisco_AP [controller_ip_address]

- Step 4
 Configure a primary backup controller for all access points by entering this command:

 config advanced backup-controller primary system name ip_addr
 - **Note** This command is valid for both IPv4 and IPv6
- **Step 5** Configure a secondary backup controller for all access points by entering this command:

config advanced backup-controller secondary system name ip_addr

- **Note** To delete a primary or secondary backup controller entry, enter 0.0.0.0 for the controller IPv4/IPv6 address.
- **Note** This command is valid for both IPv4 and IPv6
- **Step 6** Enable or disable the fast heartbeat timer for local or FlexConnect access points by entering this command:

config advanced timers ap-fast-heartbeat {local | flexconnect | all} {enable | disable} interval

where **all** is both local and FlexConnect access points, and *interval* is a value between 1 and 10 seconds (inclusive). Specifying a small heartbeat interval reduces the amount of time that it takes to detect a controller failure. The default value is disabled.Configure the access point heartbeat timer by entering this command:

config advanced timers ap-heartbeat-timeout interval

where *interval* is a value between 1 and 30 seconds (inclusive). This value should be at least three times larger than the fast heartbeat timer. The default value is 30 seconds.

- **Caution** Do not enable the fast heartbeat timer with the high latency link. If you have to enable the fast heartbeat timer, the timer value must be greater than the latency.
- **Step 7** Configure the access point primary discovery request timer by entering this command:

config advanced timers ap-primary-discovery-timeout interval

where *interval* is a value between 30 and 3600 seconds. The default value is 120 seconds.

Step 8 Configure the access point discovery timer by entering this command:

config advanced timers ap-discovery-timeout interval

where *interval* is a value between 1 and 10 seconds (inclusive). The default value is 10 seconds.

Step 9 Configure the 802.11 authentication response timer by entering this command:

config advanced timers auth-timeout interval

where *interval* is a value between 5 and 600 seconds (inclusive). The default value is 10 seconds.

Step 10 Save your changes by entering this command:

save config

- **Step 11** See an access point's configuration by entering these commands:
 - show ap config general Cisco_AP
 - show advanced backup-controller
 - show advanced timers

Information similar to the following appears for the **show ap config general** *Cisco_AP* command for Primary Cisco Switch IP Address using IPv4:

Information similar to the following appears for the **show ap config general** *Cisco_AP* command for Primary Cisco Switch IP Address using IPv6:

Cisco AP Identifier	1
Cisco AP Name	AP6
Country code	US - United States
Regulatory Domain allowed by Country	802.11bg:-A 802.11a:-A
AP Country code	US - United States
AP Regulatory Domain	802.11bg:-A 802.11a:-A
Switch Port Number	13
MAC Address	44:2b:03:9a:9d:30
IPv6 Address Configuration	DHCPv6
IPv6 Address	2001:9:5:96:295d:3b2:2db2:9b47
IPv6 Prefix Length	128
Gateway IPv6 Addr	fe80::6abd:abff:fe8c:764a
NAT External IP Address	None
CAPWAP Path MTU	1473
Telnet State	Globally Disabled
Ssh State	Globally Disabled
Cisco AP Location	_5500
Cisco AP Floor Label	0
Cisco AP Group Name	IPv6-Same_VLAN
Primary Cisco Switch Name	Maulik_WLC_5500-HA
Primary Cisco Switch IP Address	2001:9:5:95::11

Information similar to the following appears for the **show advanced backup-controller** command when configured using IPv4:

AP primary Backup Controller controller1 10.10.10.10 AP secondary Backup Controller 0.0.0.0

Information similar to the following appears for the **show advanced backup-controller** command when configured using IPv6:

AP primary Backup Controller WLC_5500-2 fd09:9:5:94::11 AP secondary Backup Controller vWLC 9.5.92.11

Information similar to the following appears for the **show advanced timers** command:

Authentication Response Timeout (seconds)..... 10 Rogue Entry Timeout (seconds)..... 1300 AP Heart Beat Timeout (seconds)..... 30 AP Discovery Timeout (seconds)..... 10 AP Local mode Fast Heartbeat (seconds)..... 10 (enable) AP flexconnect mode Fast Heartbeat (seconds)..... disable AP Primary Discovery Timeout (seconds)..... 120