Auto-Anchor Mobility

Information about Auto-Anchor Mobility

You can use auto-anchor mobility (also called guest tunneling) to improve load balancing and security for roaming clients on your wireless LANs. Under normal roaming conditions, client devices join a wireless LAN and are anchored to the first controller that they contact. If a client roams to a different subnet, the controller to which the client roamed sets up a foreign session for the client with the anchor controller. However, when you use the auto-anchor mobility feature, you can specify a controller or set of controllers as the anchor points for clients on a wireless LAN.

In auto-anchor mobility mode, a subset of a mobility group is specified as the anchor controllers for a WLAN. You can use this feature to restrict a WLAN to a single subnet, regardless of a client's entry point into the network. Clients can then access a guest WLAN throughout an enterprise but still be restricted to a specific subnet. Auto-anchor mobility can also provide geographic load balancing because the WLANs can represent a particular section of a building (such as a lobby, a restaurant, and so on), effectively creating a set of home controllers for a WLAN. Instead of being anchored to the first controller that they happen to contact, mobile clients can be anchored to controllers that control access points in a particular vicinity.

When a client first associates to a controller of a mobility group that has been preconfigured as a mobility anchor for a WLAN, the client associates to the controller locally, and a local session is created for the client. Clients can be anchored only to preconfigured anchor controllers of the WLAN. For a given WLAN, you should configure the same set of anchor controllers on all controllers in the mobility group.

When a client first associates to a controller of a mobility group that has not been configured as a mobility anchor for a WLAN, the client associates to the controller locally, a local session is created for the client, and the client is announced to the other controllers in the mobility list. If the announcement is not answered, the controller contacts one of the anchor controllers configured for the WLAN and creates a foreign session for the client on the local switch. Packets from the client are encapsulated through a mobility tunnel using EtherIP and sent to the anchor controller, where they are decapsulated and delivered to the wired network. Packets to the client are received by the anchor controller and forwarded to the foreign controller through a mobility tunnel using EtherIP. The foreign controller decapsulates the packets and forwards them to the client.

If multiple controllers are added as mobility anchors for a particular WLAN on a foreign controller, the foreign controller internally sorts the controller by their IP address. The controller with the lowest IP address is the

first anchor. For example, a typical ordered list would be 172.16.7.25, 172.16.7.28, 192.168.5.15. If the first client associates to the foreign controller's anchored WLAN, the client database entry is sent to the first anchor controller in the list, the second client is sent to the second controller in the list, and so on, until the end of the anchor list is reached. The process is repeated starting with the first anchor controller. If any of the anchor controller is detected to be down, all the clients anchored to the controller are deauthenticated, and the clients then go through the authentication/anchoring process again in a round-robin manner with the remaining controller in the anchor list. This functionality is also extended to regular mobility clients through mobility failover. This feature enables mobility group members to detect failed members and reroute clients.

Restrictions for Auto-Anchor Mobility

- Mobility list members can send ping requests to one another to check the data and control paths among them to find failed members and reroute clients. You can configure the number and interval of ping requests that are sent to each anchor controller. This functionality provides guest N+1 redundancy for guest tunneling and mobility failover for regular mobility.
- You must add controllers to the mobility group member list before you can designate them as mobility anchors for a WLAN.
- You can configure multiple controllers as mobility anchors for a WLAN.
- Auto-anchor mobility supports web authentication but does not support other Layer 3 security types.
- You must configure the WLANs on both the foreign controller and the anchor controller with mobility anchors. On the anchor controller, configure the anchor controller itself as a mobility anchor. On the foreign controller, configure the anchor as a mobility anchor.
- It is not possible for clients, WGB, and wired clients to directly connect to a DMZ guest anchor and move to a foreign controller.
- Auto-anchor mobility is not supported for use with DHCP option 82.
- When using the guest N+1 redundancy and mobility failover features with a firewall, make sure that the following ports are open:
    - UDP 16666 for tunnel control traffic
    - IP Protocol 97 for user data traffic
    - UDP 161 and 162 for SNMP
- In case of roaming between anchor controller and foreign mobility, the client addresses learned at the anchor controller is shown at the foreign controller. You must check the foreign controller to view the RA throttle statistics.
- For Layer 3 RADIUS authentication, the RADIUS requests for authentication are sent by the anchor controller.
- The mobility anchor is not supported on virtual wireless LAN controllers.
- In a guest anchor Cisco WLC deployment, ensure that the foreign Cisco WLC does not have a WLAN mapped to a VLAN that is associated with the guest anchor Cisco WLC.
- In Old Mobility, when roaming from foreign to anchor WLC, the other foreign WLCs in the mobility group do not receive mobile announce messages.

Configuring Auto-Anchor Mobility (GUI)

Step 1 Configure the controller to detect failed anchor controllers within a mobility group as follows:

a) Choose **Controller** > **Mobility Management** > **Mobility Anchor Config** to open the Mobility Anchor Config page.

b) In the Keep Alive Count text box, enter the number of times a ping request is sent to an anchor controller before the anchor is considered to be unreachable. The valid range is 3 to 20, and the default value is 3.

c) In the Keep Alive Interval text box, enter the amount of time (in seconds) between each ping request that is sent to an anchor controller. The valid range is 1 to 30 seconds, and the default value is 10 seconds.

d) In the DSCP Value text box, enter the DSCP value. The default is 0.

Note While configuring the Mobility DSCP value, the mobility control socket (i.e control messages exchanged between mobility peers only and not the data) is also updated. The configured value must reflect in the IPV4 header TOS field. This is a global configuration on the controller that is used to communicate among configured mobility peers only.

e) Click **Apply** to commit your changes.

Step 2 Choose **WLANs** to open the WLANs page.

Step 3 Click the blue drop-down arrow for the desired WLAN or wired guest LAN and choose **Mobility Anchors**. The Mobility Anchors page appears.

This page lists the controllers that have already been configured as mobility anchors and shows the current state of their data and control paths. Controllers within a mobility group communicate among themselves over a well-known UDP port and exchange data traffic through an Ethernet-over-IP (EoIP) tunnel. They send mpings, which test mobility control packet reachability over the management interface over mobility UDP port 16666 and they send epings, which test the mobility data traffic over the management interface over EoIP port 97. The Control Path text box shows whether mpings have passed (up) or failed (down), and the Data Path text box shows whether epings have passed (up) or failed (down). If the Data or Control Path text box shows “down,” the mobility anchor cannot be reached and is considered failed.

Step 4 Select the IPv4/IPv6 address of the controller to be designated a mobility anchor in the Switch IP Address (Anchor) drop-down list.

Step 5 Click **Mobility Anchor Create**. The selected controller becomes an anchor for this WLAN or wired guest LAN.

Note To delete a mobility anchor for a WLAN or wired guest LAN, hover your cursor over the blue drop-down arrow for the anchor and choose **Remove**.

Step 6 Click **Save Configuration**.

Step 7 Repeat *Step 4* and *Step 6* to set any other controllers as mobility anchors for this WLAN or wired guest LAN.

Step 8 Configure the same set of mobility anchors on every controller in the mobility group.

Configuring Auto-Anchor Mobility (CLI)

Procedure

	Command or Action	Purpose
Step 1	The controller is programmed to always detect failed mobility list members. To change the parameters for the ping exchange between mobility members, enter these commands:	• **config mobility group keepalive count** *count*—Specifies the number of times a ping request is sent to a mobility list member before the member is considered to be unreachable. The valid range is 3 to 20, and the default value is 3. • **config mobility group keepalive interval** *seconds*—Specifies the amount of time (in seconds) between each ping request sent to a mobility list member. The valid range is 1 to 30 seconds, and the default value is 10 seconds.
Step 2	Disable the WLAN or wired guest LAN for which you are configuring mobility anchors by entering this command:	**config {wlan | guest-lan} disable** {*wlan_id* | *guest_lan_id*}
Step 3	Create a new mobility anchor for the WLAN or wired guest LAN by entering one of these commands:	• **config mobility group anchor add** {**wlan | guest-lan**} {*wlan_id* | *guest_lan_id*} *anchor_controller_ip_address* • **config** {**wlan | guest-lan**} **mobility anchor add** {*wlan_id* | *guest_lan_id*} *anchor_controller_ip_address* **Note** The *wlan_id* or *guest_lan_id* must exist and be disabled, and the *anchor_controller_ip_address* must be a member of the default mobility group. Auto-anchor mobility is enabled for the WLAN or wired guest LAN when you configure the first mobility anchor.
Step 4	Delete a mobility anchor for the WLAN or wired guest LAN by entering one of these commands:	• **config mobility group anchor delete {wlan | guest-lan} {wlan_id | guest_lan_id}** anchor_controller_ip_address • **config {wlan | guest-lan} mobility anchor delete {wlan_id | guest_lan_id}** anchor_controller_ip_address **Note** The *wlan_id* or *guest_lan_id* must exist and be disabled. Deleting the last anchor disables the auto-anchor mobility feature and resumes normal mobility for new associations.

	Command or Action	Purpose
Step 5	Save your settings by entering this command:	**save config**
Step 6	See a list and status of controllers configured as mobility anchors for a specific WLAN or wired guest LAN by entering this command:	**show mobility anchor** {**wlan** | *guest-lan*} {*wlan_id* | *guest_lan_id*} **Note** The *wlan_id* and *guest_lan_id* parameters are optional and constrain the list to the anchors in a particular WLAN or guest LAN. To see all of the mobility anchors on your system, enter the **show mobility anchor** command. The Status text box shows one of these values: UP—The controller is reachable and able to pass data. CNTRL_PATH_DOWN—The mpings failed. The controller cannot be reached through the control path and is considered failed. DATA_PATH_DOWN—The epings failed. The controller cannot be reached and is considered failed. CNTRL_DATA_PATH_DOWN—Both the mpings and epings failed. The controller cannot be reached and is considered failed.
Step 7	See the status of all mobility group members by entering this command:	**show mobility summary**
Step 8	Troubleshoot mobility issues by entering these commands:	• **debug mobility handoff** {**enable** | **disable**}—Debugs mobility handoff issues. • **debug mobility keep-alive** {**enable** | **disable**} **all**—Dumps the keepalive packets for all mobility anchors. • **debug mobility keep-alive** {**enable** | **disable**} *IP_address*—Dumps the keepalive packets for a specific mobility anchor.