



## Critical Voice VLAN Support

The Critical Voice VLAN Support feature directs phone traffic to the configured voice VLAN of a port if the authentication server becomes unreachable.

With normal network connectivity, when an IP phone successfully authenticates on a port, the authentication server directs the phone traffic to the voice domain of the port. If the authentication server becomes unreachable, IP phones cannot authenticate the phone traffic. In multidomain authentication (MDA) mode or multiauthentication mode, you can configure the Critical Voice VLAN Support feature to direct phone traffic to the configured voice VLAN of the port. The phone is authorized as an unknown domain. Both data and voice are enabled for the phone.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfnng.cisco.com/>. An account on Cisco.com is not required.

## Restrictions for Critical Voice VLAN Support

- Different VLANs must be configured for voice and data.
- The voice VLAN must be configured on a device.
- The Critical Voice VLAN Support feature does not support standard Access Control Lists (ACLs) on the switch port.

# Information About Critical Voice VLAN Support

## Critical Voice VLAN Support in Multidomain Authentication Mode

If a critical voice VLAN is deployed using an interface in multidomain authentication (MDA) mode, the host mode is changed to multihost and the first phone device is installed as a static forwarding entries. Any additional phone devices are installed as dynamic forwarding entry in the Host Access Table (HAT).

For further information about host modes, see the *802.1X Authentication Services Configuration Guide*.



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**Note** If a critical port is already authorized and reauthentication occurs, the switch puts the port in the critical-authentication state in the current VLAN, which might be the one previously assigned by the RADIUS server.

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**Note** Inaccessible authentication bypass is compatible with guest VLAN. When a guest VLAN is enabled on a 802.1X port, the features interact as follows: if all RADIUS servers are not available and if a client is connected to a critical port and was previously assigned to a guest VLAN, the switch keeps the port in the guest VLAN.

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## Critical Voice VLAN Support in Multiauthentication Mode

If the critical authentication feature is deployed in multiauthentication mode, only one phone device will be allowed and a second phone trying to authorize will trigger a violation.

The **show authentication sessions** command displays the critical voice client data. A critically authorized voice client in multiauthentication host mode will be in the “authz success” and “authz fail” state.



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**Note** If critical voice is required, then critical data should be configured too. Otherwise, the critical voice client will be displayed in the “authz fail” state while the voice VLAN will be open.

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## Critical Voice VLAN Support in a Service Template

On enterprise Edge (eEdge) devices, the critical access of phones is configured by activating a critical service template when the authentication server becomes unreachable. The voice feature plug-in registers with the Enterprise Policy Manager (EPM) by using an authentication, authorization, and accounting (AAA) voice attribute, and it allows unconditional access to the voice VLAN while the AAA services are unavailable.

To enable critical voice VLAN support, the critical authentication of phones must be configured using a combination of control policy rules and a service template.

When the authentication server is unavailable and the host is unauthorized, the AAA attribute device-traffic-type is not populated. The phone is authorized as an unknown domain, and both the data and voice VLAN are enabled for this device, allowing the device to handle voice traffic.

# How to Configure Critical Voice VLAN Support

## Configuring a Voice VLAN in a Service Template

Perform this task on a port to configure critical voice VLAN support using a service template.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **service-template** *template-name*
4. **vlan** *vlan-id*
5. **exit**
6. **service-template** *template-name*
7. **voice vlan**
8. **exit**
9. **class-map type control subscriber** {**match-all** | **match-any** | **match-none**} *control-class-name*
10. **match result-type** [method {**dot1x** | **mab** | **webauth**}] *result-type*
11. **match authorization-status** {**authorized** | **unauthorized**}
12. **exit**
13. **class-map type control subscriber** {**match-all** | **match-any** | **match-none**} *control-class-name*
14. **match result-type** [method {**dot1x** | **mab** | **webauth**}] *result-type*
15. **match authorization-status** {**authorized** | **unauthorized**}
16. **end**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>service-template</b> <i>template-name</i> <b>Example:</b> Device(config)# service-template SERVICE-TEMPLATE	Defines a template that contains a set of service policy attributes to apply to subscriber sessions and enters service template configuration mode.
Step 4	<b>vlan</b> <i>vlan-id</i> <b>Example:</b>	Assigns a VLAN to a subscriber session.

	Command or Action	Purpose
	<code>Device(config-service-template)# vlan 116</code>	
<b>Step 5</b>	<b>exit</b> <b>Example:</b> <code>Device(config-service-template)# exit</code>	Exits service template configuration mode and returns to global configuration mode.
<b>Step 6</b>	<b>service-template</b> <i>template-name</i> <b>Example:</b> <code>Device(config)# service-template CRITICAL-VOICE</code>	Defines a template that contains a set of service policy attributes to apply to subscriber sessions and enters service template configuration mode.
<b>Step 7</b>	<b>voice vlan</b> <b>Example:</b> <code>Device(config-service-template)# voice vlan</code>	Assigns a critical voice VLAN to a subscriber session.
<b>Step 8</b>	<b>exit</b> <b>Example:</b> <code>Device(config-service-template)# exit</code>	Exits service template configuration mode and returns to global configuration mode.
<b>Step 9</b>	<b>class-map type control subscriber {match-all   match-any   match-none} control-class-name</b> <b>Example:</b> <code>Device(config)# class-map type control subscriber match-all AAA-SVR-DOWN-UNAUTHD-HOST</code>	Creates a control class, which defines the conditions under which the actions of a control policy are executed and enters control class-map filter configuration mode.
<b>Step 10</b>	<b>match result-type [method {dot1x   mab   webauth}] result-type</b> <b>Example:</b> <code>Device(config-filter-control-classmap)# match result-type aaa-timeout</code>	Creates a condition that returns true based on the specified authentication result.
<b>Step 11</b>	<b>match authorization-status {authorized   unauthorized}</b> <b>Example:</b> <code>Device(config-filter-control-classmap)# match authorization-status unauthorized</code>	Creates a condition that returns true based on the authorization status of a session.
<b>Step 12</b>	<b>exit</b> <b>Example:</b> <code>Device(config-filter-control-classmap)# exit</code>	Exits control class-map filter configuration mode and returns to global configuration mode.
<b>Step 13</b>	<b>class-map type control subscriber {match-all   match-any   match-none} control-class-name</b> <b>Example:</b> <code>Device(config)# class-map type control subscriber match-all AAA-SVR-DOWN-AUTHD-HOST</code>	Creates a control class, which defines the conditions under which the actions of a control policy are executed and enters control class-map filter configuration mode.

	Command or Action	Purpose
Step 14	<b>match result-type</b> [method {dot1x   mab   webauth}] <i>result-type</i> <b>Example:</b> Device(config-filter-control-classmap)# match result-type aaa-timeout	Creates a condition that returns true based on the specified authentication result.
Step 15	<b>match authorization-status</b> {authorized   unauthorized} <b>Example:</b> Device(config-filter-control-classmap)# match authorization-status authorized	Creates a condition that returns true based on the authorization status of a session.
Step 16	<b>end</b> <b>Example:</b> Device(config-filter-control-classmap)# end	Exits control class-map filter configuration mode and returns to privileged EXEC mode.

## Activating Critical Voice VLAN

Perform the following task to activate a critical voice VLAN that is configured on a service template.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **policy-map type control subscriber** *control-policy-name*
4. **event authentication-failure** [match-all | match-first]
5. *priority-number* **class** {*control-class-name* | always} [do-all | do-until-failure | do-until-success]
6. *action-number* **activate** {**policy type control subscriber** *control-policy-name* | **service-template** *template-name* [aaa-list *list-name*] [precedence [replace-all]]}
7. *action-number* **activate** {**policy type control subscriber** *control-policy-name* | **service-template** *template-name* [aaa-list *list-name*] [precedence [replace-all]]}
8. *action-number* **authorize**
9. *action-number* **pause reauthentication**
10. **exit**
11. *priority-number* **class** {*control-class-name* | always} [do-all | do-until-failure | do-until-success]
12. *action-number* **pause reauthentication**
13. **end**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>	Enables privileged EXEC mode.

	Command or Action	Purpose
	<b>Example:</b> Device> enable	<ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>policy-map type control subscriber</b> <i>control-policy-name</i> <b>Example:</b> Device(config)# policy-map type control subscriber cisco-subscriber	Defines a control policy for subscriber sessions and enters control policy-map event configuration mode.
<b>Step 4</b>	<b>event authentication-failure</b> [ <b>match-all</b>   <b>match-first</b> ] <b>Example:</b> Device(config-event-control-policymap)# event authentication-failure match-first	Specifies the type of event that triggers actions in a control policy if all authentication events are a match and enters control policy-map class configuration mode.
<b>Step 5</b>	<b>priority-number class</b> { <i>control-class-name</i>   <b>always</b> } <b>[do-all   do-until-failure   do-until-success]</b> <b>Example:</b> Device(config-class-control-policymap)# 10 class AAA-SVR-DOWN-UNAUTHD-HOST do-until-failure	Specifies that the control class should execute the actions in a control policy, in the specified order, until one of the actions fails, and enters control policy-map action configuration mode.
<b>Step 6</b>	<i>action-number</i> <b>activate</b> { <b>policy type control subscriber</b> <i>control-policy-name</i>   <b>service-template</b> <i>template-name</i> <b>[aaa-list list-name] [precedence [replace-all]]</b> } <b>Example:</b> Device(config-action-control-policymap)# 10 activate service-template foo-DATA	Activates a control policy associated with the VLAN on a subscriber session.
<b>Step 7</b>	<i>action-number</i> <b>activate</b> { <b>policy type control subscriber</b> <i>control-policy-name</i>   <b>service-template</b> <i>template-name</i> <b>[aaa-list list-name] [precedence [replace-all]]</b> } <b>Example:</b> Device(config-action-control-policymap)# 10 activate service-template CRITICAL-VOICE	Activates a control policy associated with the voice VLAN on a subscriber session.
<b>Step 8</b>	<i>action-number</i> <b>authorize</b> <b>Example:</b> Device(config-action-control-policymap)# 30 authorize	Initiates the authorization of a subscriber session.
<b>Step 9</b>	<i>action-number</i> <b>pause reauthentication</b> <b>Example:</b> Device(config-action-control-policymap)# 40 pause reauthentication	Pauses the reauthentication process after an authentication failure.

	Command or Action	Purpose
Step 10	<b>exit</b> <b>Example:</b> Device(config-action-control-policymap)# exit	Exits control policy-map action configuration mode and enters control policy-map class configuration mode.
Step 11	<i>priority-number class {control-class-name   always}</i> <i>[do-all   do-until-failure   do-until-success]</i> <b>Example:</b> Device(config-class-control-policymap)# 20 class AAA-SVR-DOWN-AUTHD-HOST	Specifies that the control class should execute the actions in a control policy, in the specified order, until one of the actions fails, and enters control policy-map action configuration mode.
Step 12	<i>action-number pause reauthentication</i> <b>Example:</b> Device(config-action-control-policymap)# 10 pause reauthentication	Pauses the reauthentication process after an authentication failure.
Step 13	<b>end</b> <b>Example:</b> Device(config-action-control-policymap)# exit	Exits control policy-map action configuration mode and enters privileged EXEC mode.

## Configuration Examples for Critical Voice VLAN Support

### Example: Configuring a Voice VLAN in a Service Template

```

Device> enable
Device# configure terminal
Device(config)# service-template SERVICE-TEMPLATE
Device(config-service-template)# vlan 116
Device(config-service-template)# exit
Device(config)# service-template CRITICAL-VOICE
Device(config-service-template)# voice vlan
Device(config-service-template)# exit
Device(config)# class-map type control subscriber match-all AAA-SVR-DOWN-UNAUTHD-HOST
Device(config-filter-control-classmap)# match result-type aaa-timeout
Device(config-filter-control-classmap)# match authorization-status unauthorized
Device(config-filter-control-classmap)# exit
Device(config)# class-map type control subscriber match-all AAA-SVR-DOWN-AUTHD-HOST
Device(config-filter-control-classmap)# match result-type aaa-timeout
Device(config-filter-control-classmap)# match authorization-status authorized
Device(config-filter-control-classmap)# end

```

### Example: Activating a Critical Voice VLAN on a Service Template

```

Device> enable
Device# configure terminal
Device(config)# policy-map type control subscriber cisco-subscriber
Device(config-event-control-policymap)# event authentication-failure match-first

```

```

Device(config-class-control-policymap) # 10 class AAA-SVR-DOWN-UNAUTHD-HOST do-until-failure
Device(config-action-control-policymap) # 10 activate service-template SERVICE-TEMPLATE
Device(config-action-control-policymap) # 10 activate service-template CRITICAL-VOICE
Device(config-action-control-policymap) # 30 authorize
Device(config-action-control-policymap) # 40 pause reauthentication
Device(config-action-control-policymap) # exit
Device(config-class-control-policymap) # 20 class AAA-SVR-DOWN-AUTHD-HOST
Device(config-action-control-policymap) # 10 pause reauthentication
Device(config-action-control-policymap) # end

```

## Additional References for Critical Voice VLAN Support

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Command List, All Releases</a>
Cisco Identity-Based Networking Services commands	<a href="#">Cisco IOS Identity-Based Networking Services Command Reference</a>

### Standards and RFCs

Standard/RFC	Title
IEEE 802.1X	<i>Port based Network Access Control</i>

### Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for Critical Voice VLAN Support

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.



**Table 1: Feature Information for Critical Voice VLAN Support**

Feature Name	Releases	Feature Information
Critical Voice VLAN Support	Cisco IOS XE Release 15.2(1)E	<p>This feature enables critical voice VLAN support, which puts phone traffic into the configured voice VLAN of a port if the authentication server becomes unreachable.</p> <p>In Cisco IOS Release 15.2(1)E, this feature is supported on the following platforms:</p> <ul style="list-style-type: none"><li>• Cisco Catalyst 2960-X Series Switches</li><li>• Cisco Catalyst 3560-C Series Switches</li><li>• Cisco Catalyst 3750-X Series Switches</li><li>• Cisco Catalyst 4500-X Series Switches</li><li>• Cisco Catalyst 4900 Series Switches</li></ul> <p>The following command was added or modified: <b>voice vlan</b></p>

