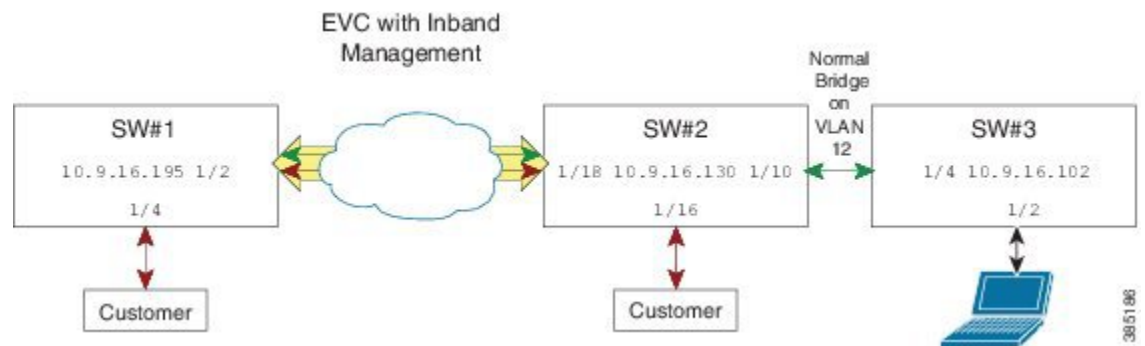




## Double-tagged management VLAN using IVID parameter

This enhancement allows configuring double VLAN tag management for remote management over a single Ethernet service connection where management is done in one VLAN and customer traffic in another VLAN and both are carried over the same Ethernet virtual connection (EVC). Following example describes how double VLAN management works.



In the above diagram, switch SW1 is the remote node, managed through a single EVC carrying both customer and management traffic. SW2 is the end point for the EVC from where customer and management traffic is carried as standard management VLAN (VLAN 12 in example) to SW3. Customer traffic is received on port GigabitEthernet 1/4 on SW1 and sent between SW1 and SW2.

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# Configuring Ethernet Virtual Circuit V2

## SUMMARY STEPS

1. **configure terminal**
2. **controller nid 1/NID\_ID**
3. **ProvisionEVC**
4. **addEVC\_v2 createEvcConfig {instance | internal\_vid learning {enable | disable} | nni\_ports | nni\_vid | policer\_id | name | internal-vid }**
5. **addEVC\_v2 review**
6. **addEVC\_v2 commit**
7. **exit**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Switch# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>controller nid 1/NID_ID</b>  <b>Example:</b> Switch(config)# controller nid 1/1	Enters the controller configuration mode.
<b>Step 3</b>	<b>ProvisionEVC</b>  <b>Example:</b> Switch (config-controller)# ProvisionEVC	Enters the ProvisionEVC mode.
<b>Step 4</b>	<b>addEVC_v2 createEvcConfig {instance   internal_vid learning {enable   disable}   nni_ports   nni_vid   policer_id   name   internal-vid }</b>  <b>Example:</b>  Switch(config-controller-ProvisionEVC)# addEVC-v2 createEvcConfig instance 1 Switch(config-controller-ProvisionEVC)#addEVC-v2 createEvcConfig nni-ports 2 Switch(config-controller-ProvisionEVC)# addEVC-v2 createEvcConfig learning enable Switch(config-controller-ProvisionEVC)#addEVC-v2 createEvcConfig nni-vid 100 Switch(config-controller-ProvisionEVC)#addEVC-v2 createEvcConfig internal-vid 100	Adds the EVE configuration.
<b>Step 5</b>	<b>addEVC_v2 review</b>  <b>Example:</b> Switch(config-controller-ProvisionEVC)# addEVC_v2 review	Reviews the addEVC configuration.

	Command or Action	Purpose
Step 6	<b>addEVC_v2 commit</b>  <b>Example:</b> Switch(config-controller-ProvisionEVC)# addEVC_v2 commit	Sends the addEVC configuration to the Cisco ME 1200 NID.
Step 7	<b>exit</b>  <b>Example:</b> Switch(config-controller-ProvisionEVC)# exit Switch(config-controller)#	Exits to the controller configuration mode.

### Example

On SW1, 2 EVC instances are configured on NNI port GigabitEthernet 1/2. Both instances have VLAN ID (VID)=100, but EVC1 has an internal VID (IVID) = 100 while EVC2 has IVID=12 which is the management VID. This is achieved using addEVC-v2 operation in ProvisionEVC template.

```
(ProvisionEVC)# addEVC-v2 review
Commands in queue: 5
  addEVC_v2 createEvcConfig instance 1
  addEVC_v2 createEvcConfig nni-ports 2
  addEVC_v2 createEvcConfig learning enable
  addEVC_v2 createEvcConfig nni_vid 100
  addEVC_v2 createEvcConfig internal_vid 100
(ProvisionEVC)# addEVC-v2 commit
AddEVC_v2 Commit Success!!!

(ProvisionEVC)# addEVC_v2 review
Commands in queue: 5
  addEVC_v2 createEvcConfig instance 2
  addEVC_v2 createEvcConfig learning enable
  addEVC_v2 createEvcConfig nni_ports 2
  addEVC_v2 createEvcConfig nni_vid 100
  addEVC_v2 createEvcConfig internal_vid 12
(ProvisionEVC)# addEVC_v2 commit
AddEVC_v2 Commit Success!!!
```

## Configuring ECE V3

An EVC control entry (ECE) from UNI-NNI port is configured with outer tag 100 and inner tag 12. This is achieved using addECE-v3 operation in ProvisionEVC template.

## SUMMARY STEPS

1. configure terminal
2. controller nid 1/NID\_ID
3. ProvisionEVC
4. addECE\_v3
5. addECE\_v3 eceConfiguration\_v3 control action {class {disabled | specific *specific\_id*} | direction {both | uni\_to\_uni | uni\_to\_nni} | drop\_precedence {disabled | one | zero} | evc\_id {none | specific *specific\_evc\_id*} | policer\_id {discard | evc | none | specific *specific\_id*} | policy\_id *acl\_policy\_id* | tag\_pop\_count *tag\_pop\_count*} | rule\_type { both | rx | tx } | tx\_lookup { isdx | vid\_only | vid\_pcp }
6. addECE\_v3 eceConfiguration\_v3 control egress-inner-tag addECE ece\_configuration control egress\_inner\_tag {dei-mode | dei\_mode {classified | drop\_prec | fixed} | dei\_value *dei* | pcp\_mode {classified | fixed | mapped} | pcp\_value *pcp\_value* | type *type* | vlan\_id *vlan\_id*}
7. addECE ece\_configuration control egress\_outer\_tag {dei\_mode {classified | drop\_prec | fixed} | dei\_value *dei\_value* | mode {enabled | disabled} | pcp\_mode {classified | fixed | mapped} | pcp\_value *pcp\_value* | vlan\_id *vlan\_id*}
8. addECE ece\_configuration control ingress\_match {frame\_type {any | ipv4 {dest\_ip\_filter | source\_ip\_filter} | ipv6 {dest\_ip\_filter | source\_ip\_filter}} | inner\_tag\_match {match\_fields | match\_type} | mac\_params {dmac\_filer | smac\_filter} | outer\_tag\_match {match\_fields | match\_type} | uni\_ports {GigabitEthernet\_1\_UNI | GigabitEthernet\_2\_UNI | GigabitEthernet\_3\_UNI | GigabitEthernet\_4\_UNI | GigabitEthernet\_5\_UNI | GigabitEthernet\_6\_UNI}}
9. addECE review
10. addECE commit
11. exit

## DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal  Example: Switch# configure terminal	Enters global configuration mode.
Step 2	controller nid 1/NID_ID  Example: Switch(config)# controller nid 1/1	Enters the controller configuration mode.
Step 3	ProvisionEVC  Example: Switch (config-controller) # ProvisionEVC	Enters the ProvisionEVC mode.
Step 4	addECE_v3  Example: Switch(config-controller-ProvisionEVC) # addECE_v3	Adds ECE configuration.

	Command or Action	Purpose
Step 5	<p><b>addECE_v3eceConfiguration_v3 control action</b> {class {disabled   specific <i>specific_id</i>}   direction {bothnni_to_uni   uni_to_nni}   drop_precedence {disabled   one   zero}   evc_id {none   specific <i>specific_evc_id</i>}   policer_id {discard   evc   none   specific <i>specific_id</i>}   policy_id <i>acl_policy_id</i>   tag_pop_count <i>tag_pop_count</i>}   rule_type { both   rx   tx}   tx_lookup { isdx   vid_only   vid_pcp}</p> <p><b>Example:</b></p> <pre>Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions evc_id specific 7 Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions tag_pop_count 1 Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions policer_id specific 1 Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions class specific 4</pre>	<p>Adds the ECE control action configuration.</p> <ul style="list-style-type: none"> <li>• <b>class</b>—Specifies the ECE class.</li> <li>• <b>direction</b>—Specifies the direction of flow of traffic.</li> <li>• <b>drop_precedence</b>—Specifies the drop precedence (higher value means more dropping).</li> <li>• <b>evc_id</b>—Specifies the EVC ID. The valid <b>specific</b> values are from 1 to 1024.</li> <li>• <b>policer_id</b>—Specifies the policer ID. The valid <b>specific</b> values are from 1 to 1022.</li> <li>• <b>policy_id</b>—Specifies the ACL policy ID. The valid values are from 0 to 63.</li> <li>• <b>tag_pop_count</b>—Specifies the tagged VLAN count to be removed (either one or two outermost tags).</li> <li>• <b>rule_type</b>—Specifies a rule type.</li> <li>• <b>tx_lookup</b>—Specifies tx lookup.</li> </ul>
Step 6	<p><b>addECE_v3 eceConfiguration_v3 control egress-inner-tag</b> addECE ece_configuration control egress_inner_tag {dei-mode dei_mode {classified   drop_prec   fixed}   dei_value <i>dei</i>   pcp_mode {classified   fixed   mapped}   pcp_value <i>pcp_value</i>   type <i>type</i>   vlan_id <i>vlan_id</i>}</p> <p><b>Example:</b></p> <pre>Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_inner_tag dei_mode classified Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_inner_tag type none Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_inner_tag vlan_id 3</pre>	<p>Adds the ECE control egress inner tag rewrite configuration.</p> <ul style="list-style-type: none"> <li>• <b>dei_mode</b>—Specifies the DEI mode—whether <b>classified</b>, <b>drop precedence</b>, or <b>fixed</b>.</li> <li>• <b>dei_value</b>—Specifies the DEI value. The valid values are 0 and 1.</li> <li>• <b>pcp_mode</b>—Specifies the PCP mode—whether <b>classified</b>, <b>fixed</b>, or <b>mapped</b>.</li> <li>• <b>pcp_value</b>—Specifies the PCP value. The valid values are from 1 to 7.</li> <li>• <b>type</b>—Specifies the type—whether <b>c-tagged</b>, <b>none</b>, <b>s-custom</b>, or <b>s-tagged</b>.</li> <li>• <b>vlan_id</b>—Specifies the VLAN ID. The valid values are from 1 to 4095.</li> </ul>
Step 7	<p><b>addECE ece_configuration control egress_outer_tag</b> {dei_mode {classified   drop_prec   fixed}   dei_value <i>dei_value</i>   mode {enabled   disabled}   pcp_mode {classified   fixed   mapped}   pcp_value <i>pcp_value</i>   vlan_id <i>vlan_id</i>}</p>	<p>Adds the ECE control egress outer tag rewrite configuration.</p> <ul style="list-style-type: none"> <li>• <b>dei_mode</b>—Specifies the DEI mode—whether <b>classified</b>, <b>drop precedence</b>, or <b>fixed</b>.</li> </ul>

	Command or Action	Purpose
	<p><b>Example:</b></p> <pre>Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_outer_tag pcp_mode fixed Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_outer_tag pcp_value 4</pre>	<ul style="list-style-type: none"> <li>• <b>dei_value</b>—Specifies the DEI value. The valid values are 0 and 1.</li> <li>• <b>mode</b>—Specifies the mode—whether <b>enabled</b> or <b>disabled</b>.</li> <li>• <b>pcp_mode</b>—Specifies the PCP mode—whether <b>classified</b>, <b>fixed</b>, or <b>mapped</b>.</li> <li>• <b>pcp_value</b>—Specifies the PCP value. The valid values are from 1 to 7.</li> <li>• <b>vlan_id</b>—Specifies the VLAN ID. The valid values are from 1 to 4095.</li> </ul>
<b>Step 8</b>	<pre>addECE ece_configuration control ingress_match {frame_type {any   ipv4 {dest_ip_filter   source_ip_filter}   ipv6 {dest_ip_filter   source_ip_filter}}   inner_tag_match {match_fields   match_type}   mac_params {dmac_filer   smac_filter}   outer_tag_match {match_fields   match_type}   uni_ports {GigabitEthernet_1_UNI   GigabitEthernet_2_UNI   GigabitEthernet_3_UNI   GigabitEthernet_4_UNI   GigabitEthernet_5_UNI   GigabitEthernet_6_UNI}}</pre> <p><b>Example:</b></p> <pre>Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match uni_ports GigabitEthernet_2_UNI enable Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match outer_tag_match match_type c_tagged Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match outer_tag_match match_fields vlan_id_filter specific 100 Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match outer_tag_match match_fields inner_pcp val_4-7</pre>	<p>Adds the ECE control ingress inner tag rewrite configuration.</p> <ul style="list-style-type: none"> <li>• <b>frame_type</b>—Specifies the type of frame relay.</li> <li>• <b>inner_tag_match</b>—Specifies the inner tag match value.</li> <li>• <b>mac_params</b>—Specifies the DMAC and SMAC default values.</li> <li>• <b>outer_tag_match</b>—Specifies the outer tag match value.</li> <li>• <b>uni_ports</b>—Specifies the GigabitEthernet UNI ports.</li> </ul>
<b>Step 9</b>	<p><b>addECE review</b></p> <p><b>Example:</b></p> <pre>Switch(config-controller-ProvisionEVC)# addECE_v3 review</pre>	Reviews the addECE configuration.
<b>Step 10</b>	<p><b>addECE commit</b></p> <p><b>Example:</b></p> <pre>Switch(config-controller-ProvisionEVC)# addECE_v3 commit</pre>	Sends the configuration to the NID.

	Command or Action	Purpose
Step 11	<b>exit</b>  <b>Example:</b>  Switch(config-controller-ProvisionEVE)# exit Switch(config-controller)#	Exits to the controller configuration mode.

## Example

An EVC control entry (ECE) from UNI-NNI port is configured with outer tag 100 and inner tag 12. This is achieved using addECE-v3 operation in ProvisionEVC template.

```
(ProvisionEVC)# addECE-v3 review
Commands in queue: 7
  addECE_v3 eceConfiguration_v3 ece-id 5
  addECE_v3 eceConfiguration_v3 control egress_outer_tag mode enabled
  addECE_v3 eceConfiguration_v3 control egress_outer-tag vlan_id 100
  addECE_v3 eceConfiguration_v3 control egress_inner-tag type c_tagged
  addECE_v3 eceConfiguration_v3 control egress_inner-tag vlan_id 12
  addECE_v3 eceConfiguration_v3 control actions rule_type tx
  addECE_v3 eceConfiguration_v3 control actions evc-id specific 2
(ProvisionEVC)# addECE-v3 commit
AddECE_v3 Commit Success!!!
```

Another ECE entry is configured for NNI-UNI direction matching on same tags and popping off the two tags.

```
(ProvisionEVC)# addECE-v3 review
Commands in queue: 10
  addECE_v3 eceConfiguration_v3 ece-id 6
  addECE_v3 eceConfiguration_v3 control ingress_match outer_tag-match match_type
c_tagged
  addECE_v3 eceConfiguration_v3 control ingress_match outer_tag-match match_fields
vlan_id_filter specific 100
  addECE_v3 eceConfiguration_v3 control ingress_match inner_tag-match match_type
c_tagged
  addECE_v3 eceConfiguration_v3 control ingress_match inner_tag-match match_fields
vlan_id_filter specific 12
  addECE_v3 eceConfiguration_v3 control actions_rule_type rx
  addECE_v3 eceConfiguration_v3 control actions_evc-id specific 2
  addECE_v3 eceConfiguration_v3 control actions policer_id none

  addECE_v3 eceConfiguration_v3 control actions tag_pop_count 2
  addECE_v3 eceConfiguration_v3 control actions policy_id 1
(ProvisionEVC)# addECE-v3 commit
AddECE_v3 Commit Success!!!
```

For customer traffic coming on GigabitEthernet1/4 on, say VLAN 10, a third, bi-directional EVC control entry (ECE) is configured with VID=10

```
(ProvisionEVC)# addECE_v3 review
Commands in queue: 6
  addECE_v3 eceConfiguration_v3 ece_id 7
  addECE_v3 eceConfiguration_v3 control ingress_match uni-ports 4
  addECE_v3 eceConfiguration_v3 control ingress_match outer_tag_match match_type
tagged
  addECE_v3 eceConfiguration_v3 control ingress_match outer-tag-match match_fields
vlan_id_filter specific 10
  addECE_v3 eceConfiguration_v3 control actions policer_id none
  addECE_v3 eceConfiguration_v3 control actions policy-id 1
```

```
(ProvisionEVC)# addECE_v3 commit  
AddECE_v3 Commit Success!!!
```