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11 November 2021

Provider Edge Bridge Instance  
Examples

# Introduction

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- Review the use of the Bridge YANG by using instances and looking at the YANG tree
- Prior work and discussion include:
  - <https://www.ieee802.org/1/files/public/docs2017/cp-mholness-YANG-instance-document-0317-v02.pdf>
  - <https://www.ieee802.org/1/files/public/docs2020/dk-fedyk-dot1aedk-simple-management-0520-v00.pdf>
  - <https://www.ieee802.org/1/files/public/docs2020/dk-fedyk-dot1aedk-vlan-discussion-0320-v01.pdf>

# Simple Customer Bridge Example

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- Goal: Minimum instances needed to realize a simple customer bridge with one component and two ports

# The Tree

- The file pb.htm file has the full tree that can be used for the examples below

Module: **iana-if-type**, Namespace: **urn:ietf:params:xml:ns:yang:iana-if-type**, Prefix: **ianaift**  
Module: **ieee802-dot1q-ats**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-dot1q-ats**, Prefix: **ats**  
Module: **ieee802-dot1q-bridge**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-dot1q-bridge**, Prefix: **dot1q**  
Module: **ieee802-dot1q-pb**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-dot1q-pb**, Prefix: **dot1q-pb**  
Module: **ieee802-dot1q-stream-filters-gates**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-dot1q-stream-filters-gates**, Prefix: **sfsfg**  
Module: **ieee802-dot1q-tpmr**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-dot1q-tpmr**, Prefix: **dot1q-tpmr**  
Module: **ieee802-dot1q-tsn-types**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-dot1q-tsn-types**, Prefix: **dot1q-tsn-types**  
Module: **ieee802-dot1q-types**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-dot1q-types**, Prefix: **dot1q-types**  
Module: **ieee802-types**, Namespace: **urn:ieee:std:802.1Q:yang:ieee802-types**, Prefix: **ieee**  
Module: **ietf-inet-types**, Namespace: **urn:ietf:params:xml:ns:yang:ietf-inet-types**, Prefix: **inet**  
Module: **ietf-interfaces**, Namespace: **urn:ietf:params:xml:ns:yang:ietf-interfaces**, Prefix: **if**  
Module: **ietf-yang-types**, Namespace: **urn:ietf:params:xml:ns:yang:ietf-yang-types**, Prefix: **yang**

Element [+] <a href="#">Expand all</a> [-] <a href="#">Collapse all</a>	Schema	Type	Flags	Opts	Status	Path
▼ <b>ieee802-dot1q-bridge</b>	module					
▼ <b>bridges</b>	container		config		current	/dot1q:bridges
▼ <b>bridge[name]</b>	list		config		current	/dot1q:bridges/dot1q:bridge
name	leaf	<a href="#">dot1qtypes:name-type</a>	config		current	/dot1q:bridges/dot1q:bridge/do
address	leaf	<a href="#">ieee:mac-address</a>	config		current	/dot1q:bridges/dot1q:bridge/do
bridge-type	leaf	<a href="#">identityref</a>	config		current	/dot1q:bridges/dot1q:bridge/do
ports	leaf	<a href="#">uint16</a>	no config	?	current	/dot1q:bridges/dot1q:bridge/do
up-time	leaf	<a href="#">yang:zero-based-counter32</a>	no config	?	current	/dot1q:bridges/dot1q:bridge/do
components	leaf	<a href="#">uint32</a>	no config	?	current	/dot1q:bridges/dot1q:bridge/do
component[id]	list		config		current	/dot1q:bridges/dot1q:bridge/do
▶ <b>ietf-interfaces</b>	module					

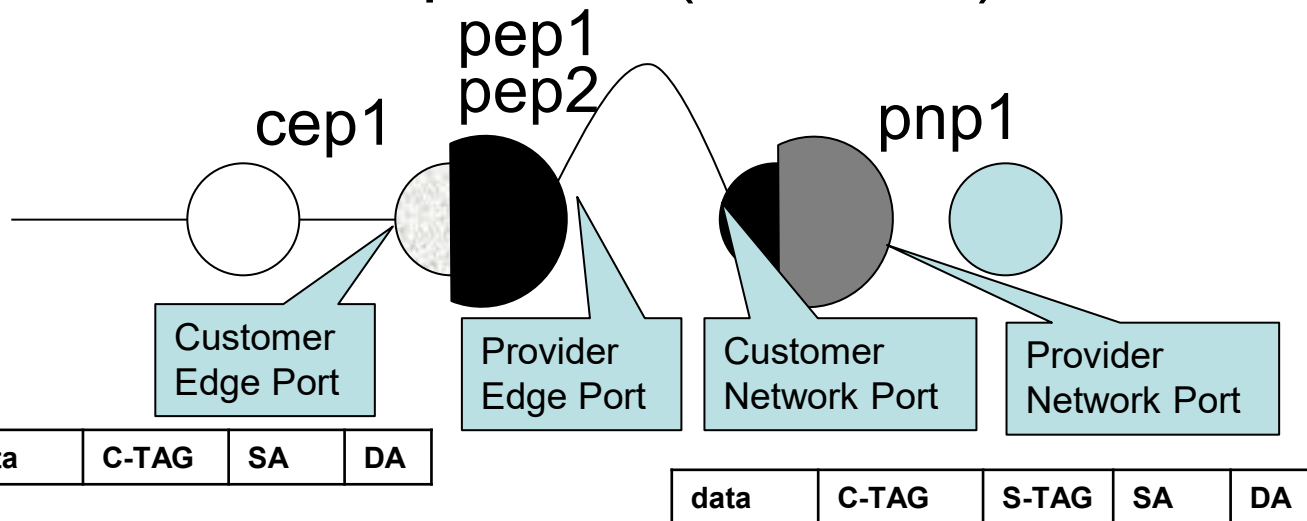
# Customer Bridge

```
<dot1q:bridge>
  <dot1q:name>theCVB</dot1q:name>
  <dot1q:address>10-20-30-40-50-AF</dot1q:address>
  <dot1q:bridge-type>dot1q:customer-vlan-bridge</dot1q:bridge-
type>
  <dot1q:component>
    <dot1q:name>cvlan1</dot1q:name>
    <dot1q:id>2</dot1q:id>
    <dot1q:type>dot1q:c-vlan-component</dot1q:type>
    <dot1q:bridge-vlan>
      <dot1q:vlan>
        <dot1q:vid>10</dot1q:vid>
        <dot1q:name>cvid10</dot1q:name>
      </dot1q:vlan>
    </dot1q:bridge-vlan>
  </dot1q:component>
</dot1q:bridge>
</dot1q:bridges>
```

```
<if:interface>
  <if:name>if1</if:name>
  <if:type>ia:ethernetCsmacd</if:type>
  <if:oper-status>up</if:oper-status>
  <if:statistics>
    <if:discontinuity-time>2021-10-
11T16:14:00Z</if:discontinuity-time>
  </if:statistics>
  <dot1q:bridge-port>
    <dot1q:bridge-name>theCVB</dot1q:bridge-name>
    <dot1q:component-id>2</dot1q:component-id>
    <dot1q:port-type>dot1q:c-vlan-bridge-port</dot1q:port-
type>
  </dot1q:bridge-port>
</if:interface>
<if:interface>
  <if:name>if2</if:name>
  <if:type>ia:ethernetCsmacd</if:type>
  <if:oper-status>up</if:oper-status>
  <if:statistics>
    <if:discontinuity-time>2021-10-
11T16:14:00Z</if:discontinuity-time>
  </if:statistics>
  <dot1q:bridge-port>
    <dot1q:bridge-name>theCVB</dot1q:bridge-name>
    <dot1q:component-id>2</dot1q:component-id>
    <dot1q:port-type>dot1q:c-vlan-bridge-port</dot1q:port-
type>
  </dot1q:bridge-port>
</if:interface>
```

# Instance Example for Provider Edge Bridge (PEB)

- Goal: Create a minimum configuration for a Provider Edge Bridge
- For the example:
  - 2 C-components (cvid 10 and cvid 20)
  - 1 S-component (svid 200)



# Bridge and Components

```
<dot1q:bridge>
  <dot1q:name>my peb name</dot1q:name>
  <dot1q:address>10-20-30-40-50-60</dot1q:address>
  <dot1q:bridge-type>dot1q:provider-edge-
bridge</dot1q:bridge-type>
  <dot1q:component>
    <dot1q:name>svlan1</dot1q:name>
    <dot1q:id>1</dot1q:id>
    <dot1q:type>dot1q:s-vlan-component</dot1q:type>
    <dot1q:bridge-vlan>
      <dot1q:vlan>
        <dot1q:vid>200</dot1q:vid>
        <dot1q:name>svid200</dot1q:name>
      </dot1q:vlan>
    </dot1q:bridge-vlan>
  </dot1q:component>
```

```
<dot1q:component>
  <dot1q:name>cvlan1</dot1q:name>
  <dot1q:id>2</dot1q:id>
  <dot1q:type>dot1q:c-vlan-component</dot1q:type>
  <dot1q:bridge-vlan>
    <dot1q:vlan>
      <dot1q:vid>10</dot1q:vid>
      <dot1q:name>cvid10</dot1q:name>
    </dot1q:vlan>
  </dot1q:bridge-vlan>
</dot1q:component>
<dot1q:component>
  <dot1q:name>cvlan2</dot1q:name>
  <dot1q:id>3</dot1q:id>
  <dot1q:type>dot1q:c-vlan-component</dot1q:type>
  <dot1q:bridge-vlan>
    <dot1q:vlan>
      <dot1q:vid>20</dot1q:vid>
      <dot1q:name>cvid20</dot1q:name>
    </dot1q:vlan>
  </dot1q:bridge-vlan>
</dot1q:component>
</dot1q:bridge>
```

# Interfaces

- Customer Edge Port is an Interface
- CEP is where the PEP mapping occurs using the cvid-registration list

```
<if:interface>  
  <if:name>cep1</if:name>  
  <if:type>ia:bridge</if:type>  
  <if:oper-status>up</if:oper-status>  
  <if:statistics>  
    <if:discontinuity-time>2021-10-11T16:14:00Z</if:discontinuity-time>  
  </if:statistics>  
  <dot1q:bridge-port>  
    <dot1q:bridge-name>my peb name</dot1q:bridge-name>  
    <dot1q:component-id>2</dot1q:component-id>  
    <dot1q:port-type>dot1q:customer-edge-port</dot1q:port-type>  
    <dot1q-pb:cvid-registration>  
      <dot1q-pb:cvid>10</dot1q-pb:cvid>  
      <dot1q-pb:svid>200</dot1q-pb:svid>  
      <dot1q-pb:untagged-pep>>false</dot1q-pb:untagged-pep>  
      <dot1q-pb:untagged-cep>>false</dot1q-pb:untagged-cep>  
    </dot1q-pb:cvid-registration>  
    <dot1q-pb:cvid-registration>  
      <dot1q-pb:cvid>20</dot1q-pb:cvid>  
      <dot1q-pb:svid>200</dot1q-pb:svid>  
      <dot1q-pb:untagged-pep>>false</dot1q-pb:untagged-pep>  
      <dot1q-pb:untagged-cep>>false</dot1q-pb:untagged-cep>  
    </dot1q-pb:cvid-registration>  
  </dot1q:bridge-port>  
</if:interface>
```



# Interfaces (continued)

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- Provider Network Port is an Interface

```
<if:interface>
  <if:name>pnp1</if:name>
  <if:type>ia:bridge</if:type>
  <if:oper-status>up</if:oper-status>
  <if:statistics>
    <if:discontinuity-time>2021-10-11T16:14:00Z</if:discontinuity-time>
  </if:statistics>
  <dot1q:bridge-port>
    <dot1q:bridge-name>my peb name</dot1q:bridge-name>
    <dot1q:component-id>1</dot1q:component-id>
    <dot1q:port-type>dot1q:provider-network-port</dot1q:port-type>
    <dot1q:pvid>200</dot1q:pvid>
  </dot1q:bridge-port>
</if:interface>
```

# Discussion

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- Provider Edge Port is not currently modeled as an Interface
- This is providing troublesome for security enhancements that need to sit in-between the c-tag and s-tag
- For this example a new Identity was created so that the a Provider Edge Port could be modeled as an interface

# PEP Interface

```
<if:interface>
  <if:name>pep1</if:name>
  <if:type>ia:bridge</if:type>
  <if:oper-status>up</if:oper-status>
  <if:statistics>
    <if:discontinuity-time>2021-10-
11T16:14:00Z</if:discontinuity-time>
  </if:statistics>
  <dot1q:bridge-port>
    <dot1q:bridge-name>my peb name</dot1q:bridge-name>
    <dot1q:component-id>1</dot1q:component-id>
    <dot1q:port-type>dot1q:provider-edge-port</dot1q:port-type>
    <dot1q:pvid>10</dot1q:pvid>
    <dot1q:default-priority>5</dot1q:default-priority>
    <dot1q:acceptable-frame>admit-all-
frames</dot1q:acceptable-frame>
    <dot1q:enable-ingress-filtering>true</dot1q:enable-ingress-
filtering>
  </dot1q:bridge-port>
</if:interface>
```

```
<if:interface>
  <if:name>pep2</if:name>
  <if:type>ia:bridge</if:type>
  <if:oper-status>up</if:oper-status>
  <if:statistics>
    <if:discontinuity-time>2021-10-
11T16:14:00Z</if:discontinuity-time>
  </if:statistics>
  <dot1q:bridge-port>
    <dot1q:bridge-name>my peb name</dot1q:bridge-name>
    <dot1q:component-id>1</dot1q:component-id>
    <dot1q:port-type>dot1q:provider-edge-port</dot1q:port-type>
    <dot1q:pvid>20</dot1q:pvid>
    <dot1q:default-priority>5</dot1q:default-priority>
    <dot1q:acceptable-frame>admit-all-
frames</dot1q:acceptable-frame>
    <dot1q:enable-ingress-filtering>true</dot1q:enable-ingress-
filtering>
  </dot1q:bridge-port>
</if:interface>
```