

# 802.1ap Port Creation

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**IEEE Interim Meeting January 2008**

# Bridge components

- IEEE 802.1 projects, prior to 802.1ah, supported a single managed bridge per system and only physical ports, so dynamic port creation was not an issue.
- The following new ideas were introduced in 802.1ah:
  - Logical bridge components: Logical components can be added to a system (e.g. when a new I-component is added).
  - Logical bridge ports: Logical bridge ports are dynamically created when a backbone service is created (I-SID).
  - Port assignment to logical components: When new components are added to a system, physical ports can be assigned to different components.

# BEB logical bridge components

- A BEB is constructed of one or more logical bridge components.
- The component types are:
  - I-component
  - B-component
- Specifically, a BEB can have:
  - zero or one B-component
  - zero or multiple I-components
- Each of these components comprises several bridge ports.

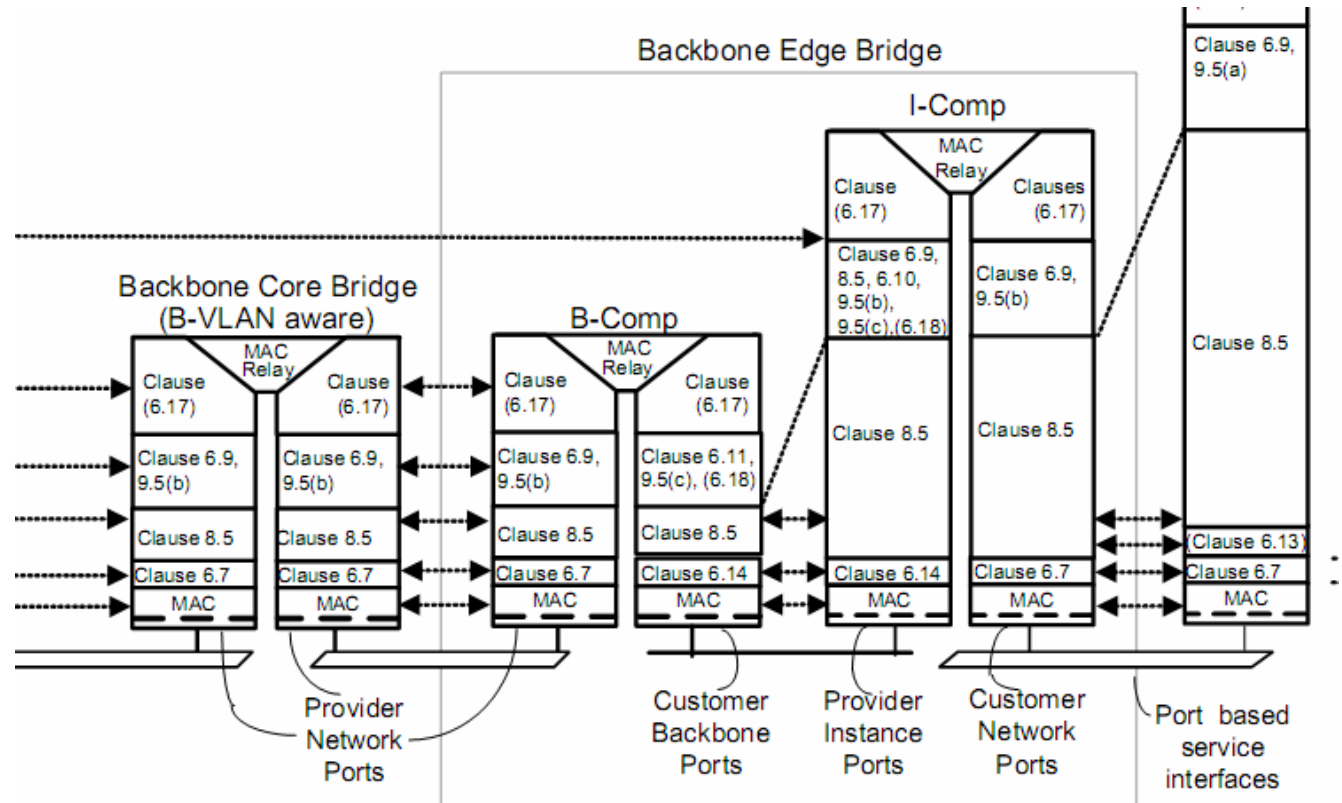
# Bridge port types per component type

I-component:

- CNP
- VIP

B-component:

- CBP
- PNP



# Port types in 802.1ap

Supported port types:

- **customerVlanPort**  
A port on a Q-bridge
- **PNP – Provider Network Port**  
An S-VLAN component port on a Provider Bridge that can transmit and receive frames for multiple customers
- **CNP – Customer Network Port**  
An S-VLAN component port on a Provider Bridge, or within a Provider Edge Bridge, that receives and transmits frames for a single customer
- **CEP – Customer Edge Port**  
A C-VLAN component port on a Provider Edge Bridge that is connected to customer-owned equipment and receives and transmits frames for a single customer
- **CBP – Customer Backbone Port**  
A Backbone Edge Bridge port that can: (1) receive and transmit I-tagged frames for multiple customers, (2) assign B-VIDs, and (3) translate I-SIDs on the basis of the received I-SIDs
- **VIP - Virtual Instance Port**  
A bridge port on an I-component of a Backbone Edge Bridge that provides access to a single backbone service instance

Note: Provider Instance Port (PIP): The set of Virtual Instance Ports that are supported by a single instance of the ISS. The PIP by itself is not a bridge port.

# Port category in PBB

- A bridge port can be attached to a physical port, or it can be a logical port and not be attached to any physical entity.
- Physical ports:
  - PNP
  - CNP
  - CBP
- Logical ports:
  - CBP
  - VIP
- **Note 1:** CBP can be logical or physical. In an IB-BEB it will be logical; in a B-BEB it will be physical.
- **Note 2:** PIP can be logical or physical, however, it is not a bridge port.

# Physical port creation/deletion

- A physical port is always contained in another physical entity (i.e. a card).
- A physical port is automatically created by the agent when:
  - A card is inserted into the chassis.
  - A card is configured administratively in the chassis.
- A physical port is automatically deleted by the agent when:
  - The card on which the port is configured is extracted from the chassis and its configuration is deleted.

# Logical port creation/deletion

- A logical port is automatically created by the agent when another entity is created administratively.
- A CBP is created when:
  - A B-component is created.
  - A PIP is created in an IB-BEB when a dedicated CBP is required for each PIP.
- A CBP is deleted when:
  - A B-component is deleted
  - All PIPs connected to it are deleted and it is not the CBP that was created with the B-component.



# Logical port creation/deletion (cont'd)

- A VIP is created when a backbone service is created. The VIP is created in the context of a specific PIP.
  - **Note:** A VIP cannot move from one PIP to another.
- A VIP is deleted when a backbone service is deleted

# Port tables

## Generic Bridge Port Table (per component) (1)

- The Generic Bridge Port Table – includes all common port attributes:
  - ieee8021BridgeBasePortTable
    - Component ID
    - Port number
    - IfIndex
    - Circuit
    - Statistics of discarded frames
- The specific BEB port table – includes additional common attributes:
  - ieee8021PbbBebPortTable
    - External/internal
    - Capabilities
    - Type

# Port tables (cont'd)

## Generic Bridge Port Table (per component) (2)

- These two tables should be combined into one logical table (augmented).
  - An entry in this logically combined table is automatically created by the agent whenever a physical bridge port is assigned to the component, or whenever a logical bridge port is created on the component.
  - An entry in this table is automatically deleted when either the physical bridge port is assigned to another component, or when a logical bridge port is deleted from the component.
  - There is no need for row status in this combined table.

# Port tables (cont'd)

## VIP Table

- Specific table for VIPs – includes the VIP's specific attributes:
  - ieee8021PbbVipTable:
    - PIP containing this VIP
    - I-SID
    - Default Destination B-MAC ???
    - VIP type – for future use to support asymmetric VLANs
- An entry in this table is automatically created by the agent whenever a service is created.
- An entry in this table is deleted whenever a service is deleted.
- There is no need for row status in this table.

# Port tables (cont'd)

## CBP Table (1)

- Specific table for CBPs - includes the CBP's specific attributes:
  - `ieee8021PbbServiceInstanceTable` (modify the name `ieee8021PbbCBPTable`):
    - Backbone SID
    - B-VID
    - Default B-DA
    - Type - used for Pt-MPt service where ingress or egress limiting is required
    - Local SID
- This table includes both physical and logical CBP ports.

# Port tables (cont'd)

## CBP Table (2)

- An entry in this table is automatically created by the agent:
  - when a B-component is created
  - each time a PIP is created with a specific request for a dedicated CBP
  - whenever the port type in the base table is modified to CBP
- An entry in this table is automatically deleted by the agent:
  - when all the PIPs assigned to this CBP are deleted
  - when the port type in the base table is modified from CBP to another value
- There is no need for row status in this table.

# Assigning a physical port to a component

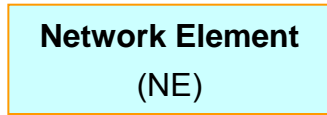
- A physical port must be assigned to a component.
- A physical port can be moved from one component to another component (e.g. when an I-component is added, and a port that was previously assigned to another I-component is assigned to the new I-component).
  - The agent deletes the port from the original component's bridge port table and adds it to the new component.

# Assigning a physical port to a component (cont'd)

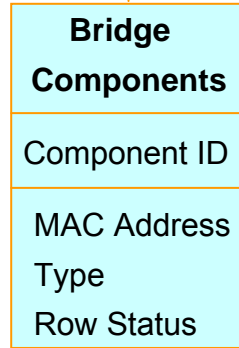
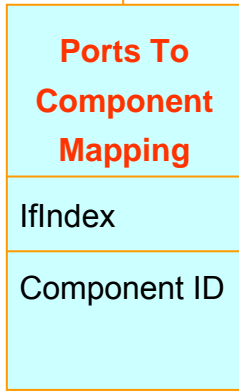
- A new table will handle the assignment of all physical ports to bridge components - `ieee8021PhyPerCompTable`.
  - The ID of a component will indicate to which component the port has been assigned.
  - The component ID of a port can be modified – i.e. the port can be assigned to a different bridge.
    - The agent will automatically delete the port from the bridge port table of the bridge to which it was previously assigned, and will automatically add the port to the bridge port table of the bridge to which it has been newly assigned (i.e. the port will be deleted from the `ieee8021BridgeBasePortTable` of the first bridge and will be added to the `ieee8021BridgeBasePortTable` of the new bridge).
- An entry is automatically created in this table by the agent whenever a physical port is created.
- There is no need for row status since physical ports can be added implicitly, not explicitly.



New table contains the external port mapping to logical components.



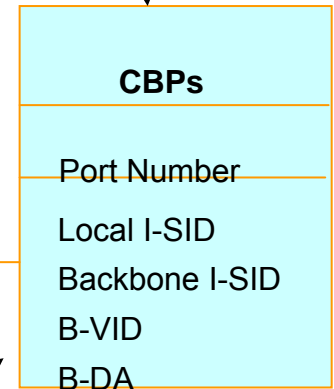
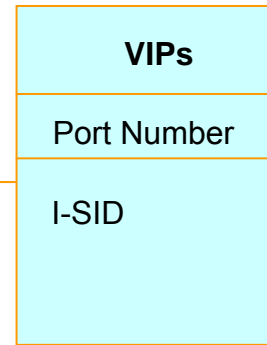
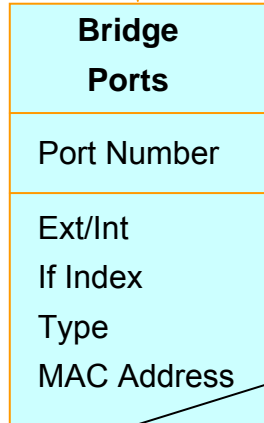
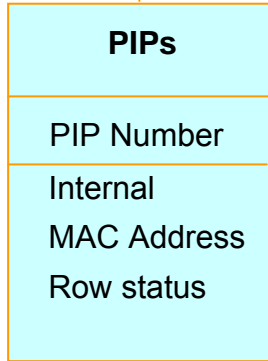
**Bridge Logical Component Table.**  
Includes all the logical components in the node.  
Components can be added or deleted from the network element.



Base port table contains all the common attributes of all bridge ports of a specific bridge component (physical and logical).

Specific port table (per port type) contains all specific attributes of the specific bridge port (child table).

For each entry in the child table there is an entry in the base table for the same port.



When a service is created, an entry is added to the VIP table. When a service is deleted, an entry is deleted from the table

When a B-component is created, an entry is added to the CBP table. When a PIP is created, an entry may be created.



**Thank You**

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