

## DOA Traffic Shaping Policy

Customers are responsible for shaping of their traffic prior to delivery to the BCN. Please refer to the “Traffic Shaping Requirements” section of this document for detailed information.

### ***Traffic Shaping and Additional Customer Responsibilities***

- If VLAN ID's are required to achieve traffic segregation, also referred to as service multiplexing, the local service provider will assign all VLAN IDs to customer traffic/connections.
- If the customer will utilize port based point-to-point service, no coordination is necessary as the local service provider will pass both tagged and untagged traffic across the point-to-point connection.
- The local service provider will NOT assign an IP address to the customer port. The link between customer and the local service provider is a trunk.
- The local service provider will NOT enable CDP to/from the WBAA port
- The local service provider will NOT enable udld
- The local service provider will NOT enable keepalive
- The local service provider will also drop customer's BPDU at UNI.

#### **1. To insure maximum throughput efficiency, Traffic Shaping should be enabled on your CPE**

When traffic policing is applied on the BCN network, traffic shaping is required in order to ensure that packets are not dropped when entering the network.

If shaping is not turned on, BCN will randomly drop traffic if the customer exceeds the amount of bandwidth that is contracted per connection. Most routers on the market should support traffic shaping, which makes it easy to implement in its simplest form.

Shaping is supported in the standard Cisco IOS since it is a common IP software function.

BCN can scale from 1 Mbps to 10 Gbps as long as the customer can shape its traffic. If customers are not able to shape their traffic, they should purchase service in the 10/100/1000 Mbps speed tiers to achieve maximum use of the bandwidth. **Failure to comply with this recommendation could result in reduced throughput and performance!**

#### **2. Customer Premise Equipment (CPE)**

The customer CPE can be a switch, bridge or router. If a customer elects to connect to the WBAA network using a switch or bridge, then the customer must be made aware of the limitations on MAC addresses per port.

There are certain types of equipment that can't work with the WBAA's 2950 or 3550 switches. The CPE that Cisco has identified are the Cisco 8550 and the Cisco 5550. The basic problem is that these switches will cause an intermittent 2-second flap.

Compatibility of other vendors' equipment is unknown at this time.

### **3. MAC Address Limitations**

If the customer connects to the OPT-E-MAN network using a bridge or switch for Layer 2 connectivity, a total of 50 MAC addresses can be utilized per Layer 2 device, per port. Any additional MAC addresses will be assessed an additional charge, **with a limit of 100 MAC addresses total per port.**

### **Multicast and Broadcast traffic limitations**

WBAA has implemented basic traffic controls that are placed on multipoint-to-multipoint network configurations as follows:

**Broadcast Traffic** - used to refer to Ethernet frames that are forwarded to all nodes on the network using the broadcast Ethernet address.

**Multicast Traffic** - used to refer to Ethernet frames that are forwarded, in a point to multipoint fashion, across the network to multiple recipients that belong to groups that are identified using any of the multicast Ethernet addresses defined by the Internet Assigned Numbers Authority (IANA) as Internet Multicast.

**Reason for Controls** - Continuous and unpredicted floods of broadcast and multicast traffic can use substantial network bandwidth to the point of overloading the network's capacity. For this reason, it is necessary to place the following limits on the traffic types noted above:

Broadcast traffic limitation = 200 packets per second per port

Multicast traffic limitation = 1 Mbps per port

### ***The customer must complete the following on the CPE prior to service turn-up.***

If the customer is connecting to a 2950 or 3550 port that *will not* have multiple EVCs assigned to a 10/100 Mbps connection, the WBAA will require the customer to configure the interfacing data port with the following:

- Speed set to 100 Mbps (No auto-negotiation)
  - Duplex set to Full (No auto-negotiation)
  - Traffic Shaping/Policing - limit output rate at or below the bandwidth usage purchased per connection
  - If utilizing multipoint-to-multipoint configuration, customer should enable controls for multicast and broadcast traffic within the customer network(s).
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If the customer is connecting to a 2950 or 3550 port that *will* support multiple EVCs assigned to a 10/100 Mbps connection, WBAA will require the customer to configure the interfacing data port with the following:

- VLAN tagging - Customer traffic needs to be tagged with local service provider assigned VLAN(s) provided by the BadgerNet NMC.
- Speed set to 100 Mbps (No auto-negotiation)
- Duplex set to Full (No auto-negotiation)
- Traffic Shaping/Policing - limit output rate at or below the bandwidth usage purchased per connection
- If utilizing multipoint-to-multipoint configuration, customer should enable controls for multicast and broadcast traffic within the customer network(s).

If the customer is connecting to a 2950 or 3550 port that *will not* have multiple EVCs assigned to the 1 Gbps connection, the WBAA will require the customer to configure the interfacing data port with the following:

- Speed set to no auto-negotiation
- Duplex set to full
- Traffic Shaping/Policing - limit output rate at or below the bandwidth usage purchased per connection
- If utilizing multipoint-to-multipoint configuration, customer should enable controls for multicast and broadcast traffic within the customer network(s).

If the customer is connecting to a 2950 or 3550 port that *will* have multiple EVCs assigned to the 1 Gbps connection, the WBAA will require the customer to configure the interfacing data port with the following:

- VLAN tagging - Customer traffic needs to be tagged with the local service provider assigned VLAN(s) provided by the BadgerNet NMC.
- Speed set to no auto-negotiation
- Traffic Shaping/Policing - limit output rate at or below the bandwidth usage purchased per connection
- If utilizing multipoint-to-multipoint configuration, customer should enable controls for multicast and broadcast traffic within the customer network(s).

#### **Caveats for conversion of service:**

- Changes to Customer Requirements – should the customer change interface types, quantities, or locations, this would invalidate the network design agreed upon between DOA, WBAA and the customer. This could delay service turn-up as it may result in a change in the type of equipment to which the customer will be connecting.
- Distance limitation – The customer may need to address signal regeneration beyond the demarcation. See the following table for signaling limits from the WBAA equipment, which will be at some point behind the initial telecommunication demarcation within your building.

Circuit Speed	Cable type	Overall Limit
100 Mb	UTP electrical (CAT5e or better)	90 M
1000-SX	50u Multi-Mode Fiber	550M