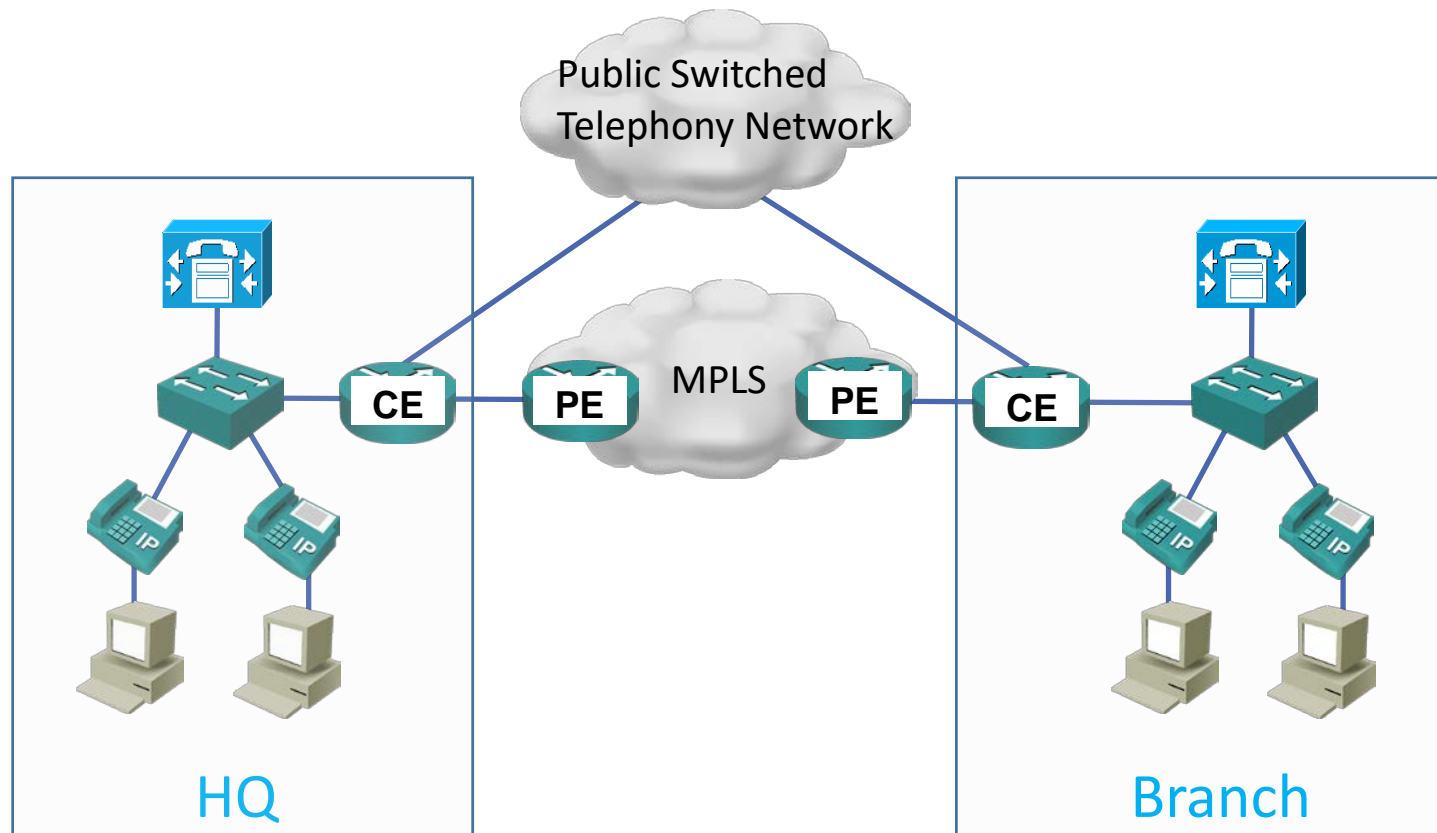


Shaping and Policing



- Traffic Shaping and Policing can be used to control traffic rate.
- They both measure the rate of traffic through an interface and take an action if the rate is above a configured limit.
- Traffic shaping buffers any excess traffic so the overall traffic stays within the desired rate limit.
- Traffic policing drops or re-marks excess traffic to enforce the specified rate limit.
- Classification can be used to allow different rates for different traffic types.

Policing Scenario – Service Provider PE



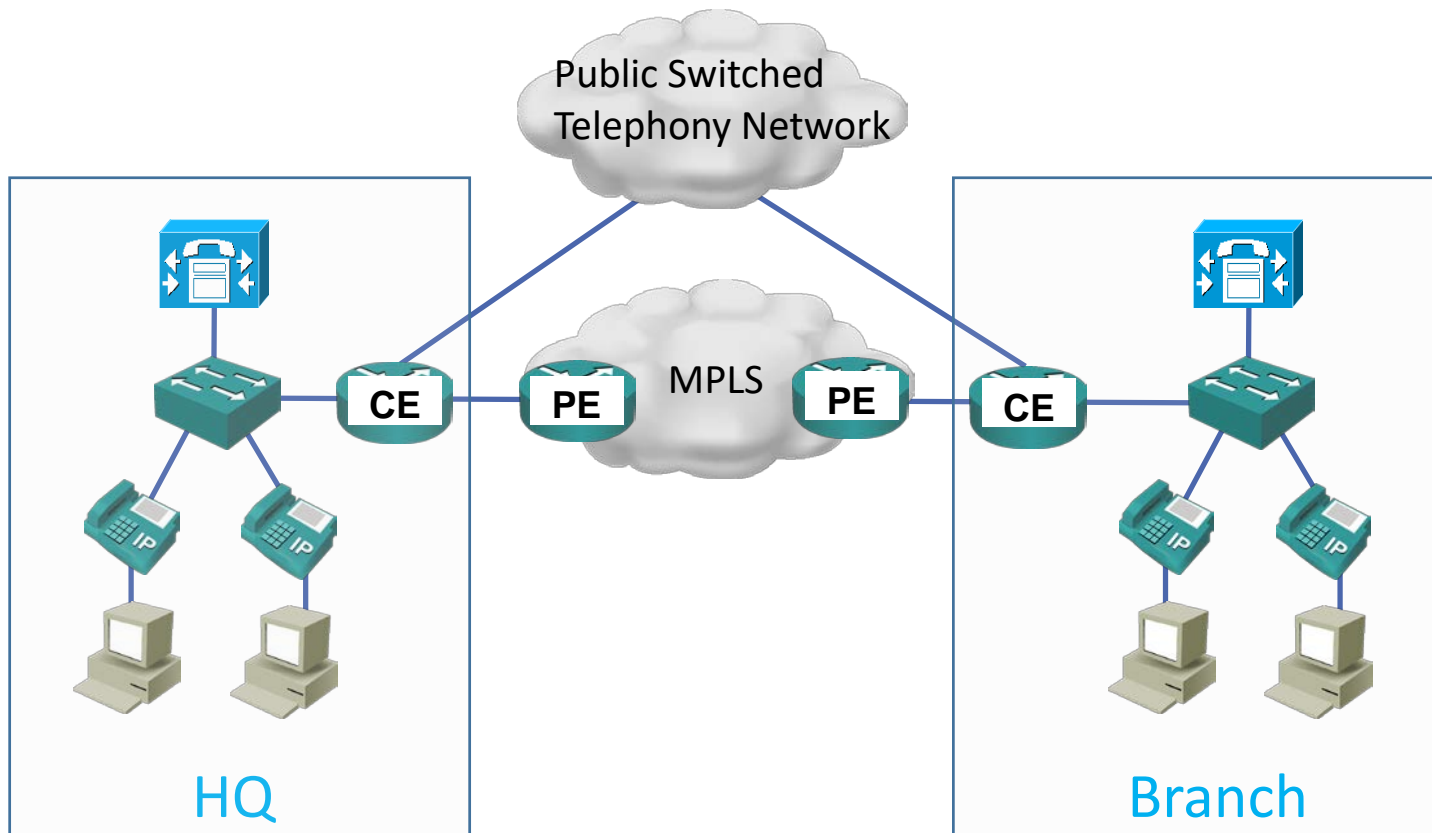
- In this example the customer has provisioned an MPLS VPN with a service provider
- The physical links from the CE to PE routers are 100 Mbps, but the customer has paid for 10 Mbps in their SLA
- The service provider enables policing inbound on the PE routers to limit the customer to 10 Mbps bandwidth. Excess traffic is dropped

Policing within Enterprises



- Another use case for policing is worm and junk traffic mitigation
- An enterprise can configure classification and marking to recognise worms, and junk traffic like peer to peer file sharing applications
- This is known as ‘Scavenger’ traffic. The recommended DSCP value to mark it with is DSCP 8 (CS1)
- Policing can be used to rate limit junk traffic down to prevent it from taking bandwidth from business applications

Shaping Scenario – Customer CE



- The CE to PE link is 100 Mbps. If the customer sends at a rate above 50 Mbps, excess traffic will be dropped by the provider
- Some traffic would reach the destination, some would not
- The dropped traffic would be random, it could be data or voice
- When voice packets are dropped call quality is unacceptable
- The customer configures shaping outbound on the CE WAN interfaces, with nested LLQ

Shaping Example



- 10 Mbps SLA on WAN outside interface
- 100Mbps LAN inside interface
- 1 Mbps provisioned for voice
- 3 Mbps provisioned for video
- 6 Mbps provisioned for data
- Data will sometimes burst above 6 Mbps creating congestion

```
class-map VOICE
  match ip dscp ef
class-map VIDEO
  match ip dscp af41
class-map SIGNALLING
  match ip dscp cs3
```

```
policy-map NESTED
  class VOICE
    priority 1024
  class VIDEO
    priority 3072
  class SIGNALING
    bandwidth 128
  class class-default
    fair-queue
```

```
policy-map WAN-EDGE
  class class-default
    shape average 10000000
    service-policy NESTED
```

```
Interface FastEthernet0/0
  service-policy out WAN-EDGE
```