# Congestion Management

- Queuing can be used to manage congestion on routers and switches
- CBWFQ (Class Based Weighted Fair Queuing) gives bandwidth guarantees to specified traffic types
- LLQ (Low Latency Queuing) is CBWFQ with a priority queue
- Traffic in the priority queue is sent before other traffic

MQC Modular QoS CLI

- Cisco QoS configuration uses the MQC Modular QoS CLI
- It has 3 main sections
- Class Maps define the traffic to take an action on
- Policy Maps take the action on that traffic
- Service Policies apply the policy to an interface

Congestion Management Example
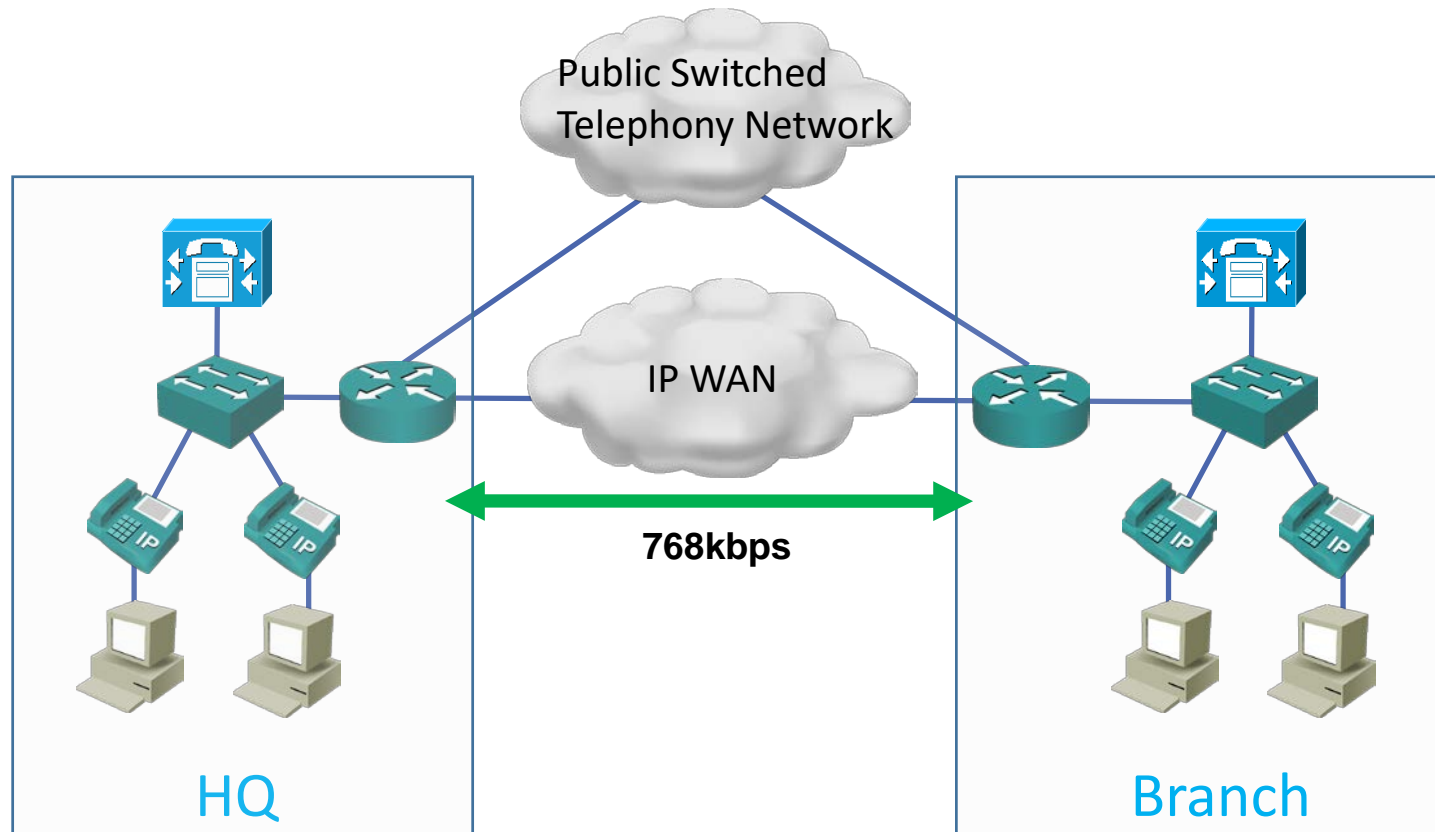
- 768kbps WAN Link between offices
- Need to support 10 concurrent voice calls over the WAN
- Each call = 25.6kbps
- 256kbps provisioned for voice calls
- 512kbps provisioned for data
- Data will sometimes burst above 512kbps creating congestion

Public Switched Telephony Network

IP WAN

768kbps

HQ

Branch

Congestion Management Example - LLQ

- Configure the same LLQ policy on the routers in HQ and the branch
- Apply to the WAN interfaces

```
class-map VOICE-PAYLOAD
match ip dscp ef
class-map CALL-SIGNALING
match ip dscp cs3
!
policy-map WAN-EDGE
class VOICE-PAYLOAD
priority percent 33
class CALL-SIGNALING
bandwidth percent 5
class class-default
fair-queue
!
interface Serial0/0/0
bandwidth 768
service-policy out WAN-EDGE
```