

Better VoIP With Bigleaf

VoIP traffic has some of the most stringent performance requirements of all Internet traffic. Different VoIP implementations and codecs respond in varying ways to network issues so performance may be poor and unstable.

The following shows the performance impact of several basic metrics on VoIP:

	GOAL	NOTICEABLE ISSUE	UNUSABLE
Packet Loss	0.01%	0.5-2%	5%
Latency	20ms	50-100ms	200ms
Jitter	10ms	30-100ms	150ms

Bigleaf Automatically Mitigates VoIP Issues

Bigleaf constantly monitors each circuit for packet loss, latency, and jitter. If we detect an issue, we respond in a manner appropriate to the severity of the problem:

SEVERITY	EXAMPLE	AVG RESPONSE	NOTE
Minor	1% packet loss	45 seconds	Response time is slower for less severe issues to prevent excessive movement of traffic between circuits and to allow for the activation of our dynamic QoS feature.
Major	10% packet loss	8 seconds	
Outage	70% packet loss	3 seconds	

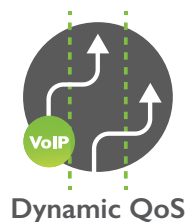
Business VoIP Needs

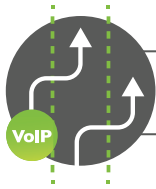
- **Quality Voice** - experience high quality that is typically associated with traditional TDM
- **Over-The-Top Value** - VoIP over low-cost commodity connections



**BIGLEAF ENABLES
QUALITY VOIP
OVER LOW-COST
CONNECTIONS.**

How Bigleaf Improves VoIP





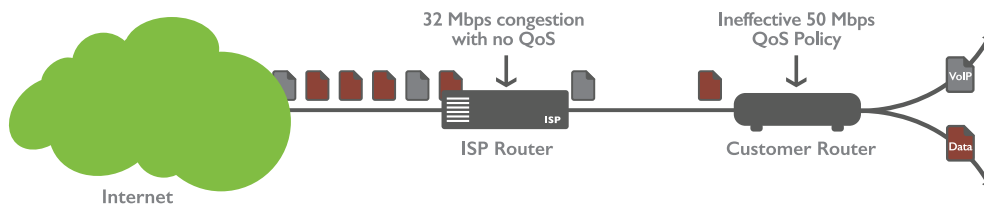
Dynamic QoS

Prioritizes VoIP and other real-time traffic across commodity Internet connections, even with varying bandwidth.

For example, without Bigleaf, a business with VoIP over a commodity 50 Mbps circuit doesn't have adequate options to meet performance expectations.

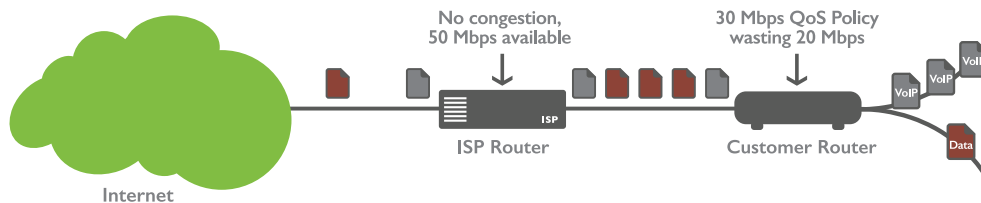
Scenario 1: QoS Policy Set For Circuit Rated Bandwidth

- 5 am** A cable-based 50 Mbps Internet circuit may provide 52 Mbps of usable throughput.
- 8 am** The same circuit may only provide 32 Mbps when other cable users start downloading email and watching videos.
- QoS Issue** If the customer router has a QoS policy set for 50 Mbps, they effectively don't have QoS at 8 am. This is due to their traffic being bottlenecked in the 32 Mbps buffers of the ISP's equipment.



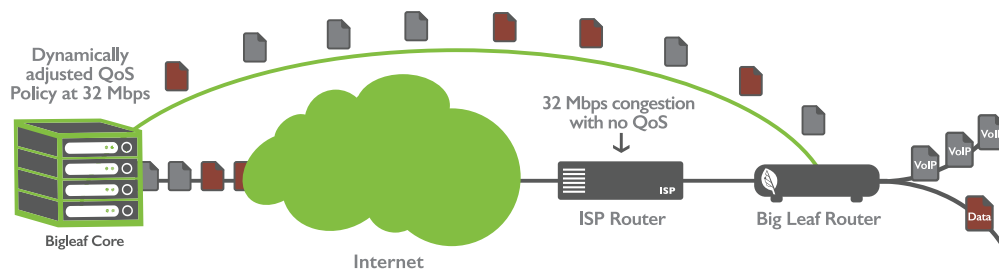
Scenario 2: QoS Policy Set Artificially Low

- Wasted Bandwidth** If the customer router has a QoS policy set at 30 Mbps, they will experience effective QoS. However, they will waste 20 Mbps of usable throughput.



Bigleaf Enables High Performance VoIP

Bigleaf's Dynamic QoS feature detects and responds to changes in available circuit throughput when sensitive traffic could be affected, and prioritizes both inbound and outbound VoIP traffic. Our Dynamic QoS detects the bandwidth bottleneck in the path to and from the customer's site and adapts QoS policies to ensure traffic isn't buffered in QoS-unaware ISP routers.

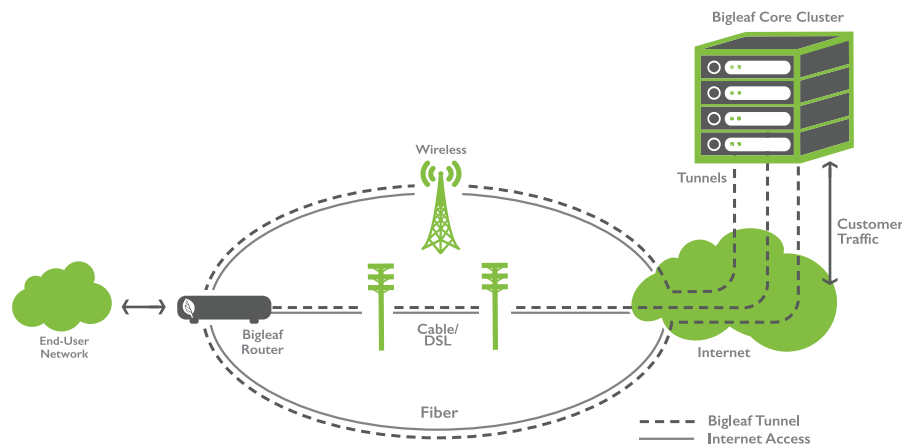




Same IP Address Failover

The benefits of BGP without the hassle and cost. All applications (even VoIP) stay connected when a circuit fails.

Because Bigleaf handles public IP addressing in our cloud, real-time applications aren't interrupted during circuit outages and your VoIP calls stay intact. Before your traffic traverses the path between our core and your building, we encapsulate each packet in a tunnel which enables us to provide you with static IP addresses that don't change when your traffic moves between circuits.



Intelligent Load Balancing

Monitors circuit conditions, adapting load balancing in real-time to match application traffic needs to circuit performance.

When one of your Internet circuits experiences issues such as packet loss, latency, jitter, congestion, or an outage, your VoIP call is moved to a higher-quality circuit in real-time. The Bigleaf monitoring system constantly measures circuit performance in both directions, evaluates traffic flows from your applications, and adapts to changing conditions in real-time based on algorithms and alarm thresholds.

Bigleaf is able to provide an excellent VoIP experience over a combination of commodity Internet circuits like cable and DSL. Businesses can now truly experience low-cost, high performance and highly reliable VoIP with Bigleaf.

About Bigleaf Networks

Bigleaf Networks improves Internet performance and enables peace of mind. We are telecommunications professionals who built our cloud-based optimization and redundancy service based on the natural architecture of leaves. We are dedicated to providing a better Internet experience with simple implementation, friendly support and powerful technology. Founded in 2013, Bigleaf Networks is investor-backed, offering nationwide service.