



Application Brief: Flawless VoIP All the Time With Anagran

Premise: Anagran Fast Flow Technology™ ensures perfect-quality VoIP under all traffic conditions, all the time.

Challenge: VoIP quality can suffer when VoIP traffic competes for network capacity with other applications.

Solution: Adding Anagran enables perfect quality VoIP under all conditions, regardless of the volume or nature of contending traffic.

Voice over IP (VoIP) has a common form of traffic running over both service provider and enterprise IP networks. Unfortunately, VoIP traffic has long been plagued by network delay and congestion, both of which audibly impact voice quality. To date, the only way to guarantee IP network voice quality has been to over-provision the network as a whole, or to “nail up” a fixed portion of network capacity dedicated just to voice.

Anagran resolves the common delay and congestion issues to enable perfect-quality VoIP, all the time. With its delay-less architecture, Anagran’s Fast Flow Technology™ (FFT) eliminates delay caused by packet loss and queuing. Anagran also ensures that bandwidth is always available for VoIP, even during periods of extreme network congestion. As shown in Figure 1, users may typically be running email, FTP, and ERP applications along with voice, video, and other interactive traffic, all of which contend for the same finite amount of network capacity. Without Anagran to properly manage congestion, voice and other interactive traffic are “stepped on” by bulk traffic as they all compete for the same bandwidth. As a result, voice calls fail to connect or get dropped, Quality of Experience (QoE) suffers and end-users are dissatisfied.

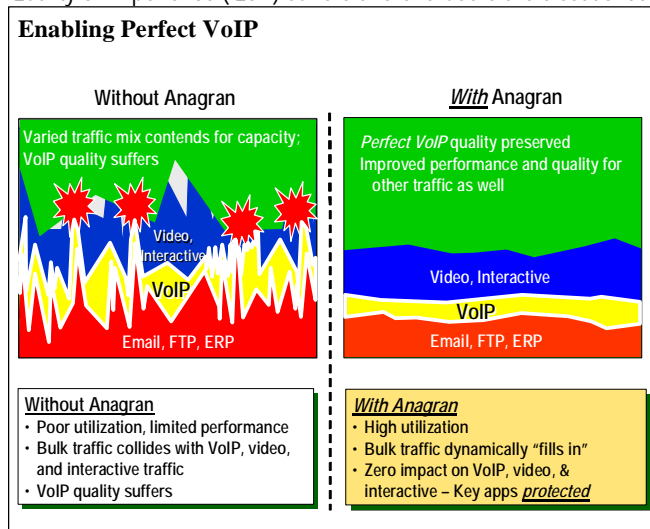


Figure 1: *With Anagran, voice is protected and stays perfect.*

With Anagran, each flow is properly categorized and treated per its flow class, *without adding any latency*. Bandwidth is dynamically

allocated for VoIP and other interactive traffic. Any remaining unused bandwidth is applied toward any other traffic that is not delay-sensitive such as email and FTP, for example. As the amount of VoIP and other delay-sensitive traffic expands and contracts, so too does the bulk traffic in inverse proportion to ensure that network capacity is always used as efficiently as possible. Adding Anagran flow management results in sustained, perfect VoIP, along with very high network utilization.

Extensive VoIP testing reveals that with Anagran, voice quality is preserved as more flows are added to the network.

ANAGRAN FEATURE SPOTLIGHT

Key Anagran Features That Enable Perfect VoIP
Any Time ...While Reducing Costs

Delay-less Architecture:

- Wire-speed forwarding without output buffer queues adds zero delay – prohibits jitter for perfect voice quality

Behavioral Traffic Control (BTC) Feature:

- Sustains perfect VoIP – protects it from bulk data by throttling select flows (e.g., file transfers) per policies

Intelligent Flow Discard (IFD) Feature:

- Bulk traffic dynamically shrinks and expands to “fill in” per available capacity, without impacting key apps like VoIP

Rate Control Feature:

- Maintains consistently low delay to ensure high voice quality, even over WiFi, WiMAX, and 3G/4G wireless

Figure 2 below shows the measured test results for Mean Opinion Score (MOS) with and without Anagran. Anagran returns a stunning value of higher than 4.0 MOS in all conditions, even as more data traffic gets injected. Without Anagran, voice quality audibly degrades after only a few data flows.

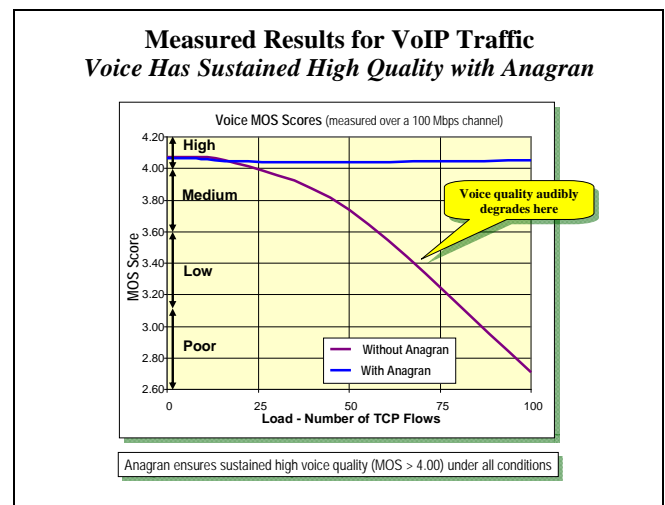


Figure 2: *Voice quality is sustained with Anagran.*

Conclusion:

With Anagran, VoIP *can* run with perfect quality all the time, regardless of the mix and volume of contending traffic. Even over WiFi, WiMAX, and 3G/4G wireless access networks.

Offer circuit-quality VoIP – always – with Anagran!