



Application Brief: Ensuring Perfect Telepresence and Streaming Video All the Time, Over Any IP Network

Premise: Adding Anagran Fast Flow Technology™ allows HD or regular IP video to scale with perfect quality without impacting the quality or performance of other applications.

Challenge: How to economically scale video traffic with required quality AND provide adequate performance and QoS for the rest of your applications.

Solution: Add Anagran to dynamically groom your entire network traffic mix for improved performance and QoE, and to ensure flawless video that economically scales.

Video conferencing over IP promises to deliver the next wave of productivity and revenue over IP networks. Ironically, while IP video represents the bulk of the next generation of network traffic, it also creates the biggest challenges to the network's ability to scale and to deliver consistent Quality of Experience (QoE).

When TCP/IP was invented in 1973, delivering high quality video in volume was not a top design goal. As such, packet networks were architected for traditional "data" services like file transfer, email, and then web browsing. Voce over IP (VoIP) came next. Video, however poses a severe challenge to today's networks, whose basic packet forwarding architectures have remained unchanged for over thirty years.

What impacts the quality of video traffic? The largest factor is packet loss, witnessed as pixilation and jitter – visible quality flaws that cause viewers to disengage. The primary cause of packet loss is **network congestion**, usually created by the aggressive nature of data traffic mixed with the video. This competing data traffic also drives standard queue based routers to add significant delay which impairs the quality of a video or voice call. The high throughput requirements of video, HD video, or HD telepresence makes the likelihood of congestion even greater.

Solution: Intelligent Flow Management

The simplest, crude solution to address network congestion is to massively over-provision network links and router ports – a cost-prohibitive proposal. Even more challenging is determining the required peak network capacity for video, which can vary dramatically, based on the content itself, the target audience, and how it is delivered (unicast, multicast, streaming, or on-demand).

Anagran solves the IP video challenge with an effective, economical solution: a unique real-time metering function called **Intelligent Flow Discard™** (IFD), as well as **behavioral** traffic management.

Intelligent Flow Discard™ for TCP

The major cause of quality loss for video is the congestion caused by standard TCP data traffic. As shown in Figure 1,

when even a handful of data flows are added to a trunk with video traffic, the video is quickly impaired. When Anagran's IFD is inserted into the path, it proactively controls the data flows to not disturb the video or voice. At the same time, this control improves the data response time and improves the overall trunk utilization.

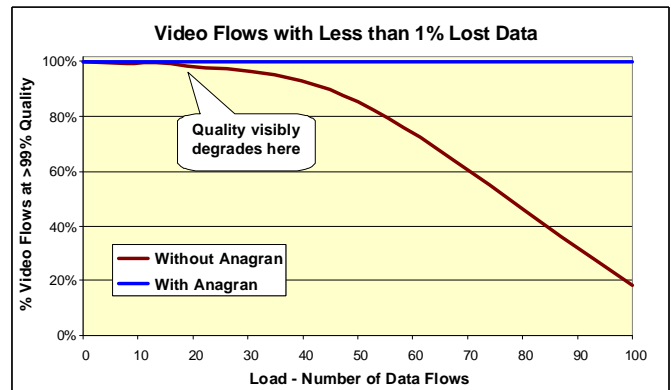


Figure 1: Anagran protects video even when overall traffic increases

Behavioral Traffic Control™

In addition to IFD, Anagran flow technology watches flows over time and re-classifies them as needed. This allows the separation of interactive and bulk traffic so different rate control rules can be applied. The result is the ability to insure sufficient capacity is always available to support video and still provide rapid interactive response with high utilization.

ANAGRAN FEATURE SPOTLIGHT

Key Anagran Features That Ensure Flawless Video All the Time... While Reducing Costs

Intelligent Flow Discard (IFD) Feature:

- Optimally grooms traffic mix and protects video from sudden spikes from other applications
- Reduces network latency and ensures required quality for video traffic in particular

Behavioral Traffic Control (BTC) Feature:

- Observes flow *behavior* and promotes or throttles select flows per policies
- Ensures end-user QoE for all key applications, like video

Conclusion

Anagran IFD™ provides the proactive, intelligent metering required for video to successfully operate with flawless quality, within any IP network. Behavioral Traffic Control™ allows the video services to meet users' quality demands, even as network load and behavior fluctuates.

Anagran's intelligent flow management with IFD and BTC delivers the next wave of video applications with unmatched ease and efficiency. Finally, instead of repeating the costly process of simply buying more network capacity and equipment, real-time video services can economically scale over a converged IP network, and at a small fraction of the established operating and capital expense.

