Flow Dynamics for the Dynamic T Service

A Brief Introduction on How Information Flows Through The Dynamic T Converged Access

To better understand the mechanics of information flow, we will review the individual requirements of each type of application and show how they are harmoniously converged onto a single entrance facility.

Application Definitions

Voice & Video: These first two applications are in the "delay sensitive" group of applications and to properly transport them over any media, there must be a guarantee in regards to certain attributes such as delay, jitter, availability and reliability within the transport medium.

Data & Internet: The remaining two applications, data and Internet, belong to the "non-delay sensitive" & "bursty" group of applications. As such, they do not require a guarantee of the above mentioned attributes.

Requirements of Applications

Constant Bit Rate: Voice requires a constant bit rate of availability within the medium to properly be transported.

Variable Bit Rate: Video, data and Internet require a variable bit rate of bandwidth availability within the medium to be properly transported.

With the above facts in mind, lets proceed by showing how one can converge these applications and still guarantee that all of the applications are awarded the required resources within the transport medium.

Pre-Requisites for Convergence

Now that we have learned about each application's requirements for convergence, lets discuss the mechanics of convergence by reviewing the two pre-requisites for convergence:

Common Protocol: All applications must now be converted to a common underlying protocol to peacefully converge. Traditionally, voice has always been delivered based on TDM protocol, Video has always been delivered based on ISDN (2B+D) protocol, while data and Internet has always been delivered based on the very popular IP protocol.

Resource Commitment: The architecture by which the network will guarantee and deliver the required resources based on individual application's requirements must be in place.

The Convergence Process

Step 1: Dynamic IP Convergence
This is the art of converting the original protocol of the applications to a common IP protocol for convergence. This process is done via deployment of an Integrated Access Device (IAD) or Gateway device at the customer premises. This device takes the various protocols and converts them all to the IP protocol. BBCOM commonly utilizes the following IADs/Gateways for this convergence:

1- Zhone 6100 IAD by Zhone Technologies
2- Mediatrix 11XX Gateway Series by Mediatrix

Step 2: Differentiated Services Mechanism for Establishing Priorities
At this point, all of the applications have been converted to a common IP protocol. Now, to deliver the required bandwidth resources to each application, we will need to tag the IP flows with a priority level based on their respective priority requirements. BBCOM delivers the highest priority to all voice IP packets (VOIP), with secondary priority to all video IP packets (video-over-IP). Data and Internet are assigned lower priority levels, respectively. This mechanism allows the departure of the highest priority packets first which minimizes

delay at the ingress and egress point into the local loop facility. Care must be taken in traffic engineering, to guarantee that ample bandwidth is available to all voice applications in the event that the customer utilizes all voice sessions at once.

The Dynamic T

The Dynamic T product addresses all of your convergence needs on a dynamic basis. The dynamic allocation of bandwidth provides the utmost utility of your local loop access and the TDM voice termination ensures the highest quality for your voice traffic.

Dynamic T Guarantees 100% TDM Termination for Voice

Once the VOIP flows through the local loop and reaches our POP, a central office gateway re-converts the VOIP back to TDM protocol and prepares the call for termination through a 100% TDM network.

Dynamic vs. Static Allocation of Bandwidth

Based on the differentiated services mechanism, we can easily see how the Dynamic T is the most efficient means delivering converged services. It's dynamic bandwidth allocation addresses all applications at any point of time with no waste of bandwidth. In absence of higher priority traffic, data and Internet will burst to fill the entire bandwidth available.

End users should be aware that many providers offer Converged Services based on the static allocation of bandwidth. This is the most primitive method of bundling multiple applications over one access loop. One disadvantage of static allocation is the non-utility of idle bandwidth during the absence of its respective application. Another disadvantage is the inflexibility of the static method in allowing certain applications, such as data and Internet, to fully utilize all idle bandwidth during their bursting periods.

While comparing the two methods, one quickly realizes the superiority and extreme utility derived from a transport medium, such as T-1, when the medium is designed to offer bandwidth to a demanding application on a dynamic basis. Findings suggest that the utility derived from a dynamically oriented medium are as high as two times the utility derived from a statically segmented medium.

For a more detailed comparison of Dynamic and Static Allocation, please refer to BBCOM's "Static vs. Dynamic" white paper.