

## Intelligent IP Traffic Management for Satellite Providers

*Satellite communication technology has become a highly effective solution for providing broadband Internet service. With quick installation and “always on” connection, satellite-delivered access appeals to businesses and consumers looking for high-speed Internet service.*

### Satellite Challenges

Satellite providers, like all service organizations, strive to deliver quality service while at the same time achieving solid financial performance. To do this, satellite providers need to maximize throughput across their most expensive asset – the satellite link. When evaluating IP traffic management solutions, network managers must factor in several satellite-specific considerations, including the round-trip latency of the medium and the need to manage unidirectional and/or bi-directional traffic. They will also want insight into their network in the form of real-time monitoring, historical reporting, and autodiscovery of network entities.

### The Dyband Solution

Dyband provides an IP traffic management solution for satellite providers that truly optimizes their satellite connection and supports the management of their internal network.

### Maximizing Throughput

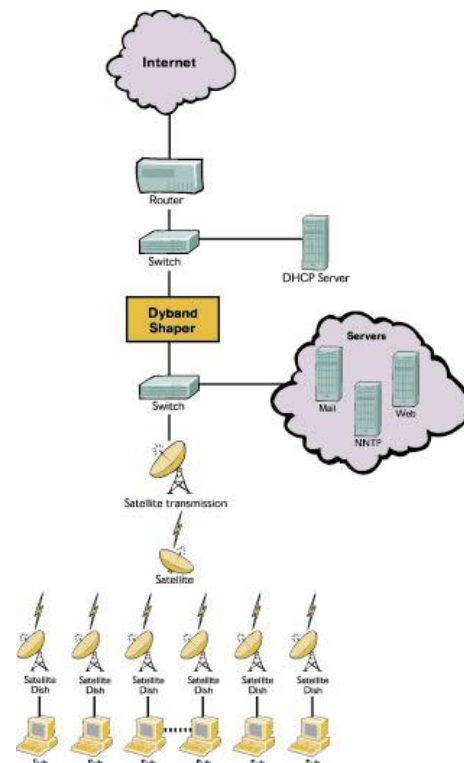
Dyband manages traffic dynamically, evaluating traffic conditions throughout the network topology, down to the level of individual subscriber, every 10 ms. When congestion is detected, transfer rates are immediately restricted in the affected areas; when congestion is relieved, transfer rates return immediately to normal limits. By assessing and responding to traffic conditions every 10 ms, Dyband is able to rapidly toggle transfer rates between normal and congested limits, thus making full use of available bandwidth. Dyband also enhances the efficiency of the Internet connection by reducing packet loss, thereby minimizing the need for packet retransmissions.

### Reducing Packet Loss

A key benefit of Dyband’s quick response to surges in network load is a significant reduction in packet loss.

### Reducing Retransmission Requests

In an access network that is not dynamically managed, a few subscribers may be able to monopolize bandwidth. Subscribers who do not receive fair access may have to request retransmission of data that has been only partially received before a timeout (stall). This is inefficient because the backbone must carry the same data more than once. The duplicated data may saturate the queue at the backbone provider’s router, and packets may have to be dropped.



Dyband's system of dynamic priorities achieves a reduction in retransmission requests by providing subscribers with equitable access to bandwidth, and thus reduces packet loss at upstream routers.

### **Delaying New Requests**

Dyband further reduces packet loss by leveraging the closed loop system of TCP/IP. In TCP/IP, a new request is not issued until a response has been completely received or a timeout occurs. Dyband, using real-time enforcement of configured rate limits, can slow the completion of a given TCP/IP exchange and thus hold off additional traffic, which would otherwise be requested and received at the upstream router. In this way, queue saturation and packet loss at the upstream router can be significantly reduced.

### **Effects of Reduced Packet Loss**

One of the clear benefits of reduced packet loss is the effect on the subscriber's perception of service. Stalls due to packet drops are obvious to users; in contrast, the slowing produced by Dyband's enforcement of rate limits is too brief to be perceptible.

In addition, when packets at upstream routers are dropped, they are dropped randomly. This undermines the ability of the service provider to guarantee preferential service to higher-paying subscribers. By reducing packet loss at upstream routers, Dyband improves service for all subscribers and also gives service providers true control over the service levels that they market.

### **Real-Time Traffic Shaping**

Dyband evaluates and shapes traffic every 10 ms, regardless of the inherent latency of the Internet connection. This is a significant benefit for satellite providers, where the average delay between the earth station and the satellite is considerable (500 ms round-trip). Note that

Dyband coexists with TCP's inherent rate negotiation.

### **Handling Unidirectional and/or Bi-directional Traffic**

Dyband offers complete flexibility in managing upstream and downstream traffic by providing separate controls for each traffic direction. For a satellite provider, this means that a single software solution can manage its IP traffic even if the nature of the distribution network (unidirectional vs. bi-directional) changes over time or from one service area to another.

### **Insight into the Distribution Network**

Dyband provides insight into both the topology and performance of the distribution network. It is able to autodiscover individual hosts and traffic aggregation points (subnets and gateways) and place them in the appropriate location in the Dyband topology tree. For each object autodiscovered or manually inserted into the tree, Dyband can provide real-time statistics within a 24-hour moving window and extensive, customized reports on historical statistics. Tools such as Dyband's "Top 10" reports, based on operator-defined criteria, give a satellite operator unparalleled insight into the performance of his network, supporting timely management decisions and long-term planning.

### **Summary**

Using the Dyband solution, satellite providers maximize the use of their most valuable asset – the satellite link. Dyband's real-time approach to IP traffic management minimizes periods of congestion and reduces packet loss. Additionally, with separate controls for upstream and downstream traffic, Dyband provides complete flexibility in managing a satellite distribution network. Dyband also provides effective tools for service management through its autodiscovery capability and its real-time and historical insight into network performance.

***For more details about Dyband's real-time traffic shaping see our white paper, "Dynamic IP Traffic Management Using Dyband".***

**For further information on Dyband, and how it can benefit your firm, contact us at**  
sales@dyband.com  
**or visit us at**  
www.dyband.com

**Dyband Corporation**  
215 Stafford Road West, Unit 103  
Ottawa, Ontario K2H 9C1  
Canada  
**(613) 820-3677**

