ARITARI
PACKET LOSS

How Aritari overcomes packet loss

OVERVIEW

Packet loss is one of the most disruptive and destructive issues facing organizations in networks, and even more so for organization's that leverage the Internet to develop their network strategies and deliver their business critical applications.
Packet loss is the cause of two common issues namely that once in a while a network will lose a packet, and the second common problem relates to when too many packets exist at a certain point (router/switch buffers are full) resulting in a network slowdown.

While we can consider the detail of how and why this occurs, for the purpose of our investigation we are more interested in the effect that packet loss has on network bandwidth and as a result the end-user experience.

Included with that we want to understand whether the issue of packet loss can be resolved or managed.

- Can the effects of packet loss be overcome with technology?
- If packet loss can be overcome, what results can we expect?
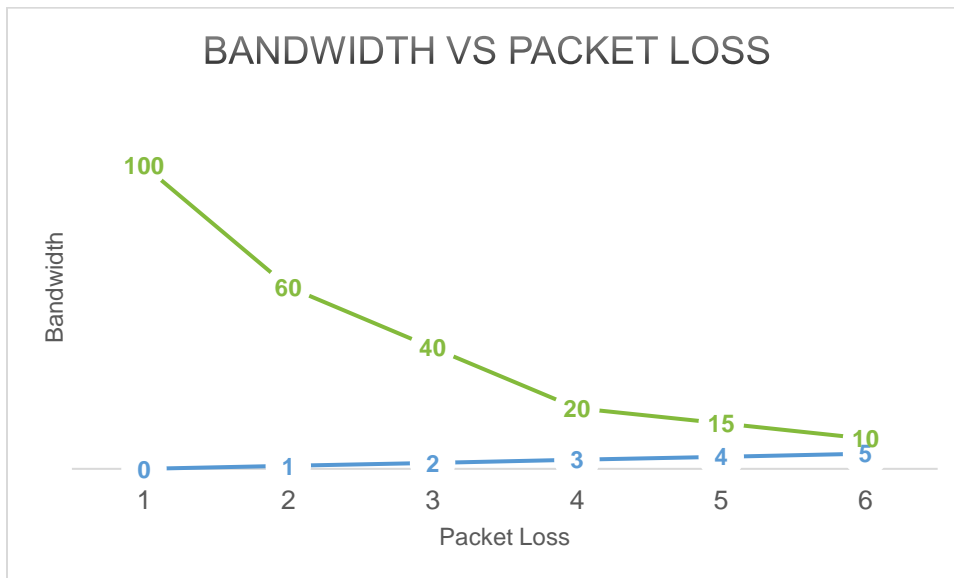
Packet Loss and TCP Protocol

For greater technical detail about the relationship between packet loss and the TCP protocol one can read https://www.noction.com/blog/network_latency_packet_loss_effects. Our discussion will remain high level and simply accept that packet loss in some cases is the result of the TCP protocols inefficiency when dealing with lost packets or full route/switch buffers.

To understand the effect of packet loss on the network and more importantly the user, we need to take a view of the network performance degradation as we introduce packet loss.

Graph 1.1 Highlights that the more packet loss you introduce into a network, the less usable bandwidth you have available in the network. As little as 2% packet loss can result in as much as a 75% reduction of usable bandwidth. From this information we can draw the following conclusions:

1. The TCP protocol is inefficient in the way it deals with packet retransmit which has sever implications for the network
2. Networks need the ability to deal with packet loss to minimize its effect on user experience

Graph 1.1: The relationship between network bandwidth and packet loss

BANDWIDTH VS PACKET LOSS

This diagram highlights the reduction in bandwidth from 100 Mbps to 10 Mbps as packet loss increases from 0% to 5%.

ARITARI VPN SOFTWARE

Aritari has developed and refined its own transfer protocol to make sure that users of the software do not face the same issues present in TCP IP in terms of packet loss.

This is achieved by two specific capabilities and techniques.

1. The first and primary difference between the Aritari VPN and TCP protocol is that Aritari does not use TCP to transfer packets. Aritari has developed its own unique proprietary VPN tunnel which deals with packet retransmits in a different way, resulting in a different and improved outcome.

Without exposing any secrets the Aritari VPN does not apply the same inefficient rules when dealing with lost or out of order packets, resulting in considerably faster corrections.
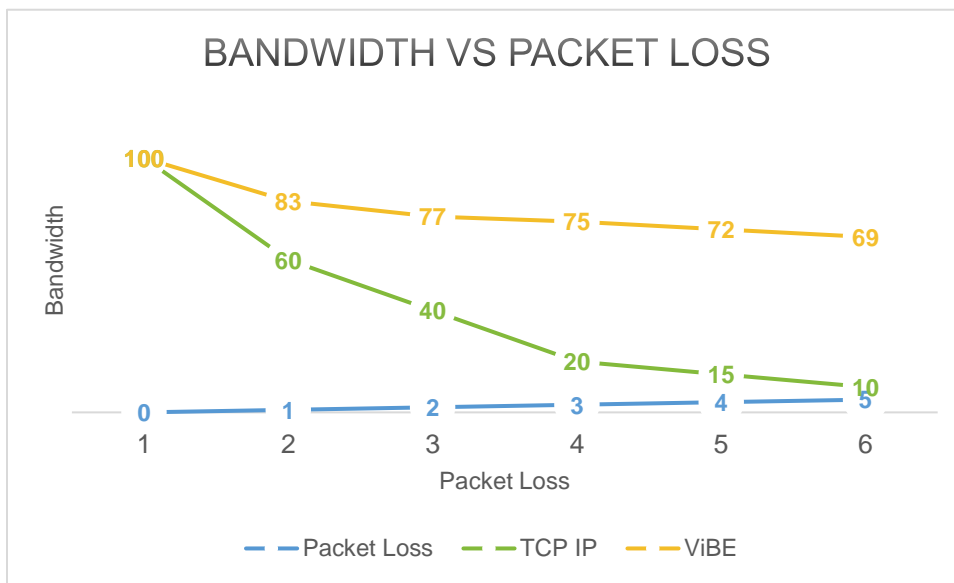
2. In addition to the unique Aritari VPN protocol, Aritari provides a feature which is referred to as Rain Mode. Rain Mode will send each Voice or data packet to the network twice through the same link, or over two or more separate links for last mile redundancy. In this instance the first packet to reach the destination will be accepted by the network and any other duplicate packets would be discarded. This reduces the likelihood of lost or seriously out-of-order packets in the network and ensures quality and network performance is maintained.

To best describe the difference between the use of TCP Protocol VS the Aritari VPN we did some tests where we sent data through a normal link while introducing packet loss to measure the effect on TCP Window size.

Test Results

As per diagram 1.2 the overall bandwidth available in the Aritari tunnel decreases at a far lower rate than normal TCP IP as more packet loss is introduced into the network highlighting Aritari's more efficient packet delivery system.

Graph 1.2: TCP Protocol VS Aritari VPN

CONCLUSION

Aritari has a unique and powerful ability to overcome packet loss. This is particularly valuable in global Internet VPN's as well as the growing amount of Cloud based applications being delivered over the Internet.

From the results above, Aritari can maintain a good TCP window size even when packet loss is increased to levels where normal networks would fail.