Network emulation test solution for Satellite Communications

Satellites today are used for a vast array of internet protocol (IP) based communications, from delivering business critical applications to business users, to supporting emergency service responses and military control structures. Lives depend on satellite systems being capable of providing instant and accurate information between any two locations anywhere in the world under any foreseeable circumstances.

As the growth of satellite communications accelerates, organisations across the globe are turning to network emulators to ensure quality of service prior to deployment.

However, satellite networks are susceptible to multiple impairments as the signal travels to and from orbiting vehicles through fluctuating atmospheric conditions. These include:

- High latencies dependent on height and number of satellite hops
- Fading RF channel environments resulting in significant bit error rates and bursts in traffic
- Atmospheric conditions such as rain fade impacting quality of transmissions

Organisations that use satellite networks must have confidence in the systems that direct and support their operations.

In other words, these systems must be rigorously tested under the exact network conditions they must perform under — before they are deployed to those who rely on them.

And, clearly, expensive field trials or deployment should not be the first opportunity to identify and resolve critical application performance issues caused by IP satellite communications.

Calnex's SNE is a precision test solution for emulating the full range of wide area networks from the control and repeatability of a lab testing environment.

The Calnex SNE can accurately create the high latency of uplink/downlink transfers and the effects of poor weather and signal decline that can impact on satellite communications. Satellite transmission bands such as Ka-Band and Ku-Band can also be emulated, alongside point to multi-point VSAT satellite networks, all under worst or best case satellite conditions, or anywhere in between.

Put simply, by introducing network conditions such as latency, bandwidth limitations, jitter, packet loss, and packet fragmentation, issues can be resolved in the test lab long before end users running business critical applications encounter them.

To assure application performance across satellite networks, use the Calnex SNE to replicate real-world network conditions those applications will face. And by optimizing performance before deployment, you won't run the risk of unnecessary costs and time associated with remedial action should issues occur.

Case Study

Calnex was commissioned by one of the world's largest defence manufacturers to ensure its state-of-the-art battlefield control software would deliver for end users across satellite links. This organisation had to adhere to stringent end-to-end service level agreements under all possible field conditions.

The Calnex SNE was employed to rigorously test and troubleshoot critical application performance in an emulated network environment prior to release. Conditions such as limited bandwidth, high latency and data loss were injected onto the test LAN, with measurements taken of how the battlefield control software reacted.

This visibility allowed the application team to implement targeted software optimization before release – dramatically reducing costs and ensuring an on-time release to the end customer.