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Public Sector

White Paper

Delivering applications and desktops to downrange personnel

Desktop virtualization is the concept of running desktops and applications in a datacenter and then remotely displaying the screen to a user

Connection quality is the problem

While delivery resources over the LAN can be simple, providing resources over unreliable WAN links can present many problems. Latency, packet loss, and various bandwidth capacity issues cause links to be unreliable in tactical scenarios. This tends to limit the flexibility Department of Defense organizations have delivering services downrange to personnel from enterprise datacenters or forward operating bases (FOBs).

Virtualizing enterprise services for tactical delivery

Desktop virtualization is the concept of running desktops and applications in a datacenter and then remotely displaying the screen to a user. This concept keeps data in the datacenter, eliminating data-at-rest (DAR), and also keeps services that perform poorly over a WAN on the high-speed LAN. Display remoting allows an organization to deliver enterprise services and specialized use cases to users anywhere from any device.

Many services are not designed for poor links. Even a simple file copy can suffer when latency exists. While Citrix's desktop virtualization protocol has always been optimized for WAN links, recent improvements have made it even more possible to deliver services from enterprise datacenters, or FOBs, to downrange personnel regardless of their location.

How it is done

Adaptive display is Citrix's technology for taking the bits that make up the screen and encoding them for delivery to the end user device. In the past this may have been treating the entire screen as a changing image (jpeg) or as a high definition video (H.264). Today this is done based on content, providing the best user experience possible.

- Video can be handled with H.264 providing an excellent experience to the user
- Text is reproduced without loss of quality or the consumption of excess bandwidth
- Other areas are handled with Citrix's Thinwire optimizations, which have continually evolved
- Recent improvements in the protocol have reduced bandwidth consumption by up to 60%!
- A new 8-bit color mode allows the delivery of productivity apps over very low bandwidth links

This encoded screen must now be delivered to the user over a potentially poor WAN link. Traditionally this was TCP based, which made it very reliable but subject to issues utilizing available bandwidth on links with varying latency. TCP scales back bandwidth usage quickly when hitting latency but ramps up consumption slowly. UDP, on the other hand, is much more eager to consume bandwidth but lacks reliability. Citrix provides two custom UDP based transports

Figure 1 - Windows workloads run in the datacenter and only the display is sent to the user.

Figure 2 - Adaptive display breaks the screen down for more efficient transport.

that provide the reliability of TCP but retain the bandwidth consumption properties of UDP.

• **Enlightened Data Transport (EDT)** – This can be leveraged as the default for all connections further improving the user experience over the WAN.

• **Framehawk** – Designed for very high latency and high packet loss links.

In addition to improving display remoting Citrix's EDT offering can even improve copying files over WAN links, outperforming the traditional VPN model.

Ensuring uptime for the tactical network

It is important to keep downrange sites connected and provide an optimal path for services coming from the datacenter. Citrix's SD-WAN offering provides intelligent path selection over multiple links, reliability of data delivery, and helps reduce redundant data, freeing up more bandwidth.

• Awareness of upload and download characteristics of links to use them appropriately

• Detection of link degradation in order to retransmit lost packets

• Packet duplication across multiple links with high priority traffic to guarantee delivery

• Application centric policies

• Detection of additional sites for automatic creation of mesh network

• Feeds duplicate data out of a cache to provide WAN optimization, reducing impact of multiple users

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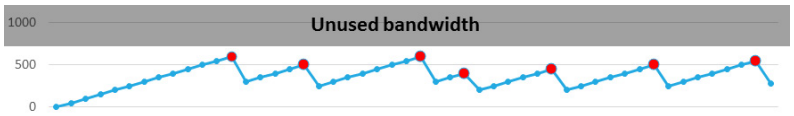

Figure 3- TCP bandwidth consumption issue with latency spikes (red dot)

Redefine service delivery for downrange personnel

The ability to keep non WAN-friendly services within the datacenter and delivering only a display via display remoting opens the door to providing a better user experience

to downrange personnel, such as the individual warfighter. Organizations gain flexibility and keep personnel connected to more current data. To learn how to leverage Citrix solutions to redefine service delivery within the enterprise and tactical spaces, visit the Citrix Government Briefing Center online at www.citrixgbc.com or contact your Citrix account representative.

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