



SD-WAN Mobility: A Lifesaving Backpack LTE Solution

An SD-WAN can bring new levels of performance and availability to mobile-based business use cases using 4G LTE (Long Term Evolution) connectivity. In fact, SD-WAN for mobile-based business applications is spawning a new set of specialized, managed, cloud-based service opportunities for service providers in industries such as on-site construction management, emergency support services and remote logistics management.

LTE provides broadband speeds and high packet-switched data rates that peak at 300Mbps downlink and 75Mbps uplink. An SD-WAN adds QoS management capabilities that enable real-time, service-aware communications for mobile Machine-to-Machine (M2M) and IoT devices and applications. New 5G network deployments over the next few years promise to further expand the opportunity for mobile enterprise use cases.

The Silver Peak [Unity EdgeConnect](#) SD-WAN solution provides the basis for delivering a high-performance, high availability mobility solution that can leverage existing 4G LTE networks for the delivery of managed business services. Here is one example:

Problem:

During a medical emergency, first responders must expeditiously reach injured person(s) and provide essential lifesaving medical assistance on-site and en route to a trauma center or hospital. During this time, it is often very difficult or impossible to secure and maintain reliable access to communications networks for simultaneous transmission of real-time patient vital statistics, audio and video information to medical experts and instructions back to the EMT team. First responders are often on foot and away from their rescue vehicles to treat victims on site. The overall responsiveness of the communications network can be a matter of life and death during these critical first minutes.

Mobile EMT Solution

A health care provider's innovative mobile integrated telemedicine solution gives mobile first responders the ability to connect to doctors for real-time video medicine — anywhere, and at any time even if there is low bandwidth.

This solution is delivered as a “backpack-as-a-service” and includes a ruggedized backpack that, in addition to critical medical supplies, includes a ruggedized laptop, a redundant dual-4G LTE modem connection, 8-hour battery, HD camera, integrated microphone and a small 12-volt DC powered Silver Peak [EdgeConnect EC-US](#) SD-WAN appliance that enables dual LTE connectivity to two diverse 4G networks.

This innovative backpack-as-a-service for the first time enables real-time video telemedicine in truly mobile environments for first responders. The provider's solution software overcomes traditional connectivity issues in even the most difficult environments to enable professionals to treat and monitor patients from anywhere through real-time video that connects to the provider's telemedicine application hosted in AWS.

The Silver Peak EdgeConnect SD-WAN solution capabilities that support this vital service include [Tunnel Bonding](#), which bonds two 4G services to create a single logical connection. Voice, video and data communications sessions can be load-balanced across both services, doubling the available bandwidth for higher performance.

In addition, EdgeConnect includes [Path Conditioning](#) features ideally suited for running time-sensitive applications, like voice and video, over the internet and 4G LTE networks and enables the highest levels of communications performance and availability between EMT personnel in the field and remote healthcare knowledge resources. Path conditioning overcomes the adverse effects of dropped and out-of-order packets that are common with broadband internet, 4G and MPLS connections using two EdgeConnect software features:

- > [Forward Error Correction \(FEC\)](#) uses packet-level FEC to reconstitute dropped packets at the far end of a WAN link, avoiding delays associated with multiple round-trip retransmissions, because the EdgeConnect SD-WAN solution dynamically adjusts FEC in response to changing 4G LTE conditions to minimize overhead.
- > [Real-time Packet Order Correction \(POC\)](#) resequences packets across all IP flows on the far end of the WAN link to avoid retransmissions that occur when packets arrive out of order, doing so with minimal added latency.

EdgeConnect continuously monitors the underlying 4G LTE services for packet loss, latency and jitter. In the event that one of the 4G services experiences excessive loss, latency or jitter or even drops its connection, the EdgeConnect initiates sub-second failover, and voice, video and data connections continue without interruption over the remaining active 4G service.

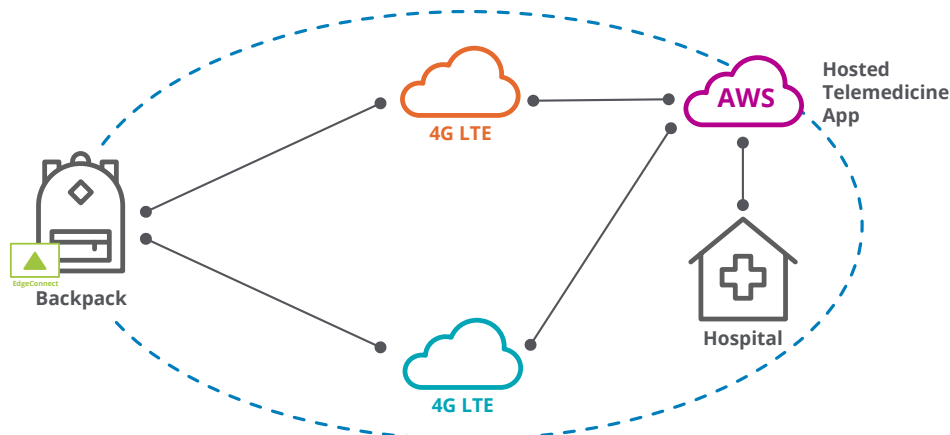


Figure 1. Mobile Telemedicine SD-WAN "Backpack-as-a-service"

The [EdgeConnect](#) management interface, [Unity Orchestrator](#), is utilized by IT administrators to centrally configure and deploy virtual Business Intent Overlays (BIO) that define application-specific Quality of Service and security policies. The health care provider can create different overlays to further optimize the use of the dual mobile links to prioritize low bandwidth voice and vital statistics data transfers. Policies – or any update to them – are automatically pushed to all backpack devices, which minimizes the potential for human errors and lowers administrative costs.

- Medical/Police/Fire and EMT personnel can deploy this “backpack” service rapidly without having to invest in infrastructure, time, CAPEX and IT resources

The unique SD-WAN capabilities of the EdgeConnect solution enable this innovative backpack-as-a-service to deliver the highest quality live video chats between first responders and awaiting doctors and medical staff. In a critical emergency, the fast response and reliability of the network communications solution can make all the difference.

Solution Benefits

- EMT first responders can provide a higher degree of patient care immediately at the injury site with real-time access to vital medical information
- There is a reduction in stress for the EMT first responders with the improved availability of the communications network connecting the on-site team with treatment center staff



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