

As the mobile market keeps growing, especially in developing economies, diverse RAN and specifically satellite cellular backhaul solutions become an important part of MNOs capabilities to gain new market share and provide quality profitable service. In developing countries, broadband capable cellular devices and especially affordable smartphones are widespread regardless of income level, and are the main and sometimes only means for Internet connectivity.

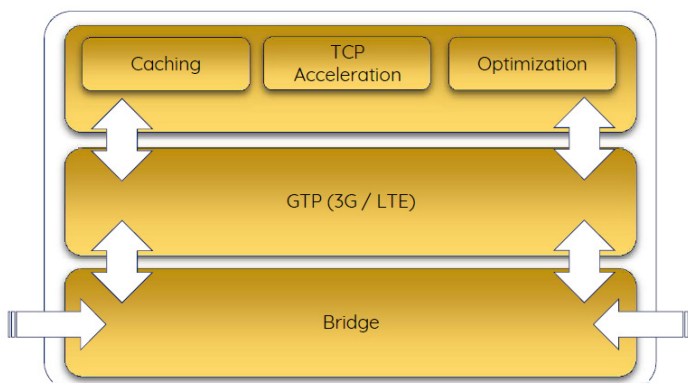
LTE, and in the future 5G, are the most feasible solution to deliver broadband connectivity in these markets, and satellite backhaul is a key enabler. The trends shifting from fixed Internet connectivity to mobile / wireless are universal, placing a lot of pressure on MNOs for ubiquitous service.

Cellular and mobile infrastructures aren't only about backhaul anymore. Technology advancements allow 2G, 3G and 4G / LTE optimized cellular RAN backhaul as well as newer capabilities to push content and services nearer to end users, improving QoE and allowing for new monetization channels.



SpaceBridge has integrated an optimization stack for 2G, 3G and 4G / LTE technologies as part of the ASAT™ System VSAT Routers and hub, providing highest level of savings, scalability and flexibility.

IP service providers and mobile operators can realize high-ROI savings in backhaul OPEX while establishing a software-defined network (SDN) architecture including future migration to LTE backhaul services or traffic offload.



Optimization Stack



## ASAT™ System Mobile and Cellular Backhaul Solutions

### Optimizing 2G, 3G and 4G / LTE Cellular Backhaul

The optimization technology is hosted on the U7780 and U7800 satellite modems and the ASAT™ System Hub. Together the system forms a transparent cellular backhaul optimized channel that has been deeply integrated into the satellite system QoS and ACM mechanisms.

The solution leverages XipLink's field-proven optimization algorithms to reduce backhaul bandwidth and accelerate GTP traffic. The result is a dramatic reduction in bandwidth requirements across the Radio Access Network (RAN) and increase in QoE - without degrading voice quality, IP services availability or network reliability.

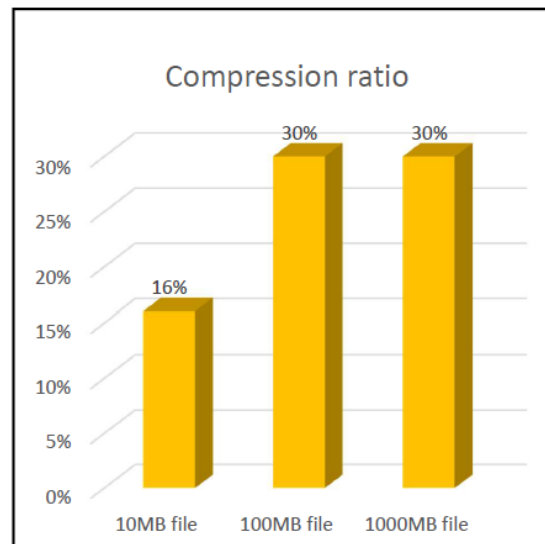
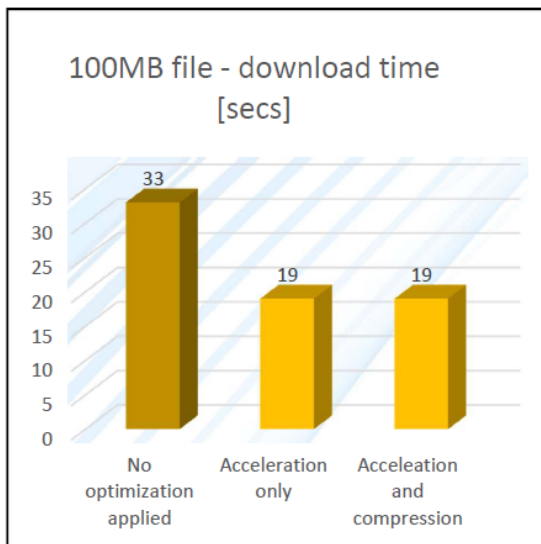
ASAT™ cellular backhaul solution is supported by the U7800 VSAT Router which also fully utilizes WaveSwitch™ technology, allowing a terminal to adapt its waveform based on changing traffic density, dramatically increasing bandwidth savings and delivering best user experience/QoE. Cell traffic volume changes rapidly, especially when mobile data services are offered.



U7780 and U7800 Satellite Modems with Cellular Backhaul Optimization

As a result both MF-TDMA and SCPC are suboptimal backhaul techniques - one suffers from excessive overhead while the other from low BW utilization. WaveSwitch™ tackles this specific issue with waveform adaptation and a choice of 3 waveforms - MF-TDMA, Unique ASCPC™ long transmission bursts for higher density traffic and true Dynamic SCPC - to meet changing traffic needs.

Backhaul optimization is particularly useful for rural or remote areas where low ARPU and subscriber scatter limit mobile coverage due to prohibitively expensive operational costs.



## ASAT™ System Mobile and Cellular Backhaul Solutions

### ASAT™ System solutions for the Mobile and Cellular Industry

Powerful and Scalable Solutions Providing MNOs True Broadband Migration Path, Anywhere

#### Features and Benefits

- U7780 and U7800 offering best in class cellular backhaul optimization:
- Unmatched ROI - save up to 35% Bandwidth for reduced OPEX
- Experience high user throughput via traffic acceleration for 3G luh/4G S1/5G N1 interfaces
- Deep packet IP and L2 header compression coupled with packet coalescing to drastically reduce overhead and pps for 2G/3G/4G and 5G voice and data traffic
- Field-proven 3G luh/4G S1/5G N1 optimization, compression and acceleration, GTP and TCP acceleration.
- Scalable & flexible - deploy and increase cellular coverage in days
  
- Server platform allowing Value Added Services (VAS) and custom applications
- The Ultimate Series VSAT Routers utilize WaveSwitch™ technology for automatic satellite link waveform adaptation to match traffic density
- Fixed and transportable (ad-hoc) cellular deployments with on-the move / on-the-pause OpenAMIP satellite antenna integration

