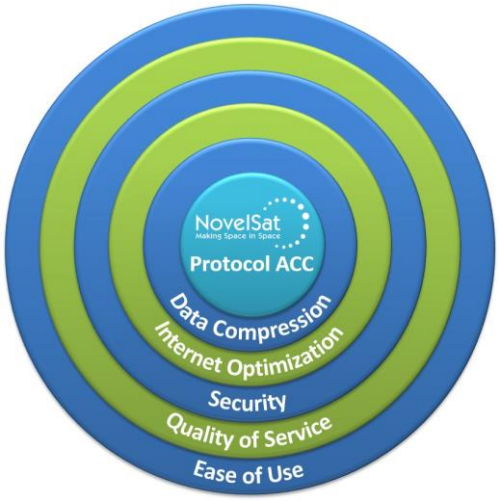
TCP Acceleration, Optimization & Compression Overview

Maximum Wireless Capacity

Increased throughput and reduced cost

NovelSat satellite modems with the embedded TCP Acceleration, Optimization and Compression solution deliver the most advanced satellite and wireless optimization, ensuring proper throughput at a reasonable capital cost. For small and medium sized sites with access speeds from a few Kbps to 45 Mbps, desktop-style appliances are user-installed via logical GUI templates to minimize impact on operations staff. For high speed links or central aggregation sites, fully redundant external appliances optimize links with aggregate capacities from 45 to 300 Mbps, supporting thousands of simultaneous TCP sessions and dramatically increase effective throughput.



Feature	Benefit
Two-Way Stream Compression	Up to 80% savings depending on traffic type
TCP Acceleration (SCPS-TP)	Full line rate acceleration of even a single TCP session
Link Balancing with Bonding (LBB)	Utilize capacity of multiple links as one large link Provide fault tolerance at remote sites
Hub Optimization	Up to 12% savings on outbound capacity no remote units required
Real-Time	Up to 50% savings on VoIP bandwidth
Byte Caching	Up to 80% savings in bandwidth, for repetitive bit patterns
Advanced Cellular Compression (ACC)	Up to 35% savings on cellular backhaul bandwidth requirements
Web Object Caching	Reduce required satellite bandwidth & improve user experience
Advanced QoS	Hierarchical traffic shaping to meet customer SLAs

NovelSat modems with the embedded XipLink Operating System (XipOS), achieve a high rate of bandwidth efficiency by providing simultaneous optimizations including TCP acceleration, several compression mechanisms, sophisticated cache techniques, Web optimizations and header reduction. To increase overall effectiveness, XipOS provides a class-based QoS mechanism and can provide link balancing when multiple paths are present.

Embedded Operating System (XipOS)

SCPS-TP Protocol Acceleration

Fills the wireless link to capacity

- SCPS-TP based TCP acceleration
- Interoperable PEP (I-PEP) compliant
- Transport Control Modes
  - *Enhanced TCP*
  - *Fixed Rate Control*
  - *Dynamic Rate Control*
  - *Delay-Based Rate Control*

Advanced Quality of Service (QoS)

Shape wireless link bandwidth

- Intelligent traffic shaping
- Hierarchical QoS classes
- Understands link state
- Configurable committed, maximum rates

Header and Payload Data Compression

Exceeds wireless link bandwidth

- Dramatic bandwidth gain, as high as 30% to 200%
- Reduces the number of packets
- Bandwidth reduction for Voice/Video over IP & small packets using Real Time Optimization

Internet Optimization

Compress & control the explosion of data & video traffic

- Hub Optimizations
- XiPix lossy & Gzip lossless compression
- Transparent remote cache models

Byte Caching

Dramatic data reduction for multi-pass traffic

- Effective on viral videos, Internet content, etc.
- Up to 80% reduction from most traffic types
- IP-layer: Effective for both TCP and UDP traffic

Link Balancing with Bonding

Dramatic increase in capacity with reliability

- Increase capacity, reliability or both
- Single stream scaled over multiple paths

Advanced Cellular Compression (ACC)

Controls growth in cellular TCP & UDP traffic

- Supports 2.5G, 3G, 4G/LTE & Wi-Fi hotspots
- 30%+ traffic reduction and 100+ Mbps TCP

Advanced Features

Optimizes unique formats and tunneled traffic

- Transparent VLAN support
- GRE and GTP tunnel traffic optimization