



**Full-Width 1RU turboIP-G2**



**1/2-Wide turboIP-G2**

### **Network Challenges Over Satellite**

With the convergence of voice, data and video over satellite becoming more common; networks becoming more fragmented and spread over larger geographical areas; and the need to shift large amounts of data from place to place growing rapidly; some organizations are encountering performance limitations. At the forefront of the challenge is user experience coupled against the cost of running and maintaining the link. Users need more access to remote data, and if user experience degrades, users are less likely to use remote services. Historically, administrators have no choice but to throw more money at the problem, either through more bandwidth or very expensive, high-end technology that provides value over long payback periods.

The *turboIP-G2* Performance Enhancement Proxy is designed to tackle these intricate wide area network (WAN) complications. The *turboIP-G2* is designed with the most effective WAN optimization features, targeted specifically for the unique challenges of satellite communication. Most notably, acceleration and caching are used to improve network responsiveness, keeping user experience optimized. In addition, advanced compression techniques are used to minimize data traversing the satellite link, allowing the reduction of monthly WAN bills or avoiding the purchase of additional bandwidth. Finally, the *turboIP-G2* is priced well below other vendors' offerings because the *turboIP-G2* concentrates on the features that provide the biggest return on investment, and is not riddled with over designed and complicated-to-configure features. Simple, to the point, and priced to provide high value for the money invested, the moment it is turned on.

### **Transparent TCP Acceleration**

Typical satellite links exhibit both high latency and bit error rates (impaired links), which can be challenging for the transmission of TCP. With this connection-oriented protocol, a number of factors contribute to its performance degradation over impaired links, including:

- The time required for an acknowledgement can severely limit the ramp up in transmission rate
- Sender's small window size reduces throughput
- Delay that is interpreted as network congestion versus propagation causes reduced transmission rates
- Packet loss that is interpreted as network congestion versus corruption causes reduced transmission rates

Acceleration at speeds up to 155 Mbps, *turboIP-G2* provides transparent acceleration of TCP sessions, increasing throughput over satellite links while requiring minimal topology changes. The Performance Enhancement Proxy is standards-based, supporting the Space Communications Protocol Standard Transport Protocol (SCPS-TP). The *turboIP-G2* provides reliable connection-oriented, end-to-end data transfer for user applications. This powerful platform also overcomes the deficiencies that exist with TCP, including slow start and congestion control. Since they interoperate with TCP/IP networks and devices, *turboIP-G2* can be seamlessly integrated into existing networks in a staged manner, avoiding the need for network-wide upgrades.

### **WAN Optimization**

The *turboIP-G2* delivers additional value through a powerful add-on WAN Optimization package. The WAN Optimization package was designed to make more efficient use of WAN links through advanced compression techniques as well as practical caching.

CIFS Acceleration provides benefit for remote file access that allows most applications to open and share file across IP-based networks.

Data Redundancy Elimination (DRE) takes advantage of file objects with identical content-based data that can be suppressed for delivery and completely reconstructed on the receiving end. Any block of data remaining is then sent through a standard compression engine, for additional WAN savings.

Persistent-LZ is a standards-based compression that takes advantage of long-lived history for TCP flows. By taking advantage of data patterns previously seen, the system does not need to resend large chunks of data, only a pointer to the history location.

WebCache is standard HTTP caching engine which keeps local copies of any HTTP document passing through. Successive requests for the same content can be served locally versus traversing the link for the same file.

## Security Aware

*turboIP-G2* meets strong security requirements for cached data by providing an optional secure erase hard drive technology, allowing for deeper storage and history buffers, while maintaining guaranteed security of stored data.

## Key Features

### Implements Open Standards

- SCPS-TP May 1999
- ISO standard (15893)
- CC SDS standard (714.0-B-1)
- MIL-STD (MIL-STD-2045-44000)
- RFCs 768, 793, 1122 & 1323

### IPv4/IPv6 Acceleration and Management

- IPv6 traffic acceleration and box management will be necessary as networks around the world are transitioned to Internet Protocol, Version 6.

### Selective Acceleration (U.S. patent 6,937,560)

- This powerful feature provides a method of Quality of Service (QoS) for IPv4 datagrams that are received on the local area network (LAN) interface and forwarded to the wide area network (WAN) interface.
- Rules are established to control the processing, including acceleration, compression and filtering for all IP packets. Up to 255 rules can be established. Rule parameters can include source and destination IP address and mask, protocol (TCP, UDP or any), and TCP or UDP source and destination ports. Each rule is assigned 1 of 8 priority levels plus a maximum data rate.

### Session Support

- Up to 10,000 simultaneous accelerated sessions.
- Up to 40,000 memorized sessions, for idle session support, when sessions are started and left idle.
- Unlimited session bypass beyond 10,000. If 10,000 sessions are under acceleration, additional sessions will not be stopped, they simply bypass unaccelerated

### Data and Header Compression

- Data and header compression functionality is applicable to accelerated TCP traffic, and is enabled/disabled on a session-by-session basis. The compressibility of each segment payload is evaluated individually and only those payloads where the impacts would be beneficial are compressed. Enabling data and header compression on *turboIP-G2* can reduce both bandwidth and transmission time over wide area network links. If disabled, no sessions are compressed.

### VLAN (802.1Q) and GRE Tunnel (RFC 2784) Support

- Two widely used network protocol configuration and traffic types, VLAN and GRE tunnel acceleration support, provide more network usage efficiency increases.

### Intelligent Congestion Control

- Optimized for real-world, mixed-loss environments; distinguishes data corruption from congestion-induced data loss, prevents unnecessary activation of congestion control mechanisms

### Automatic Window Scaling (RFC 1323)

- A larger window size is recommended to improve TCP performance in network paths with large bandwidth, and large latency characteristics. By immediately opening the window size of a TCP transfer, TCP slow startup can be mitigated.

### Rate Pacing versus Dynamic Bandwidth Support

- Rate Pacing mode meters out bursty traffic based on rate configured for WAN link, preventing channel congestion **OR**
- Dynamic Bandwidth or per connection mode ensures accelerated traffic optimization when multiple paths exist and those paths contain different bandwidths or delay characteristics

### Black Hole Detection & Recovery

- Supports detection and forwarding of non-accelerated traffic to users that do not support the SCPS option

### Path Maximum Transmission Unit (MTU) Discovery

- Adjusts MTU per connection based on receipt of ICMP messages

### Tolerates packet reordering & Large Queues

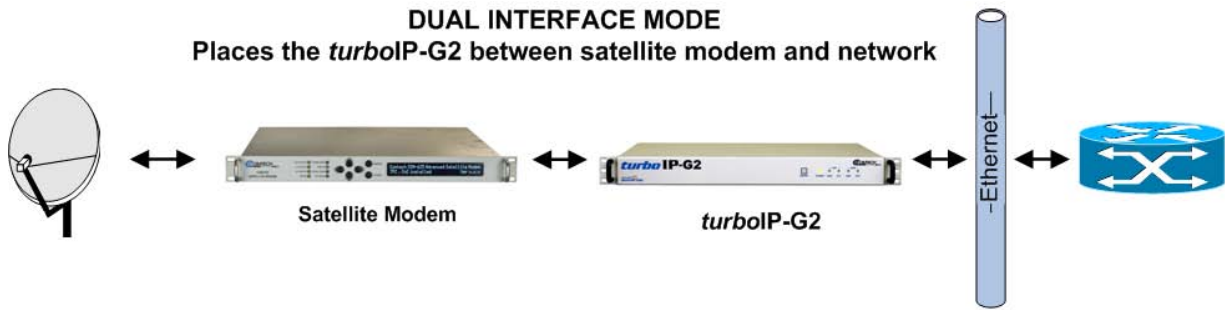
- Out-of-order packets not interpreted as lost packet
- Adjusts retransmission timeout (RTO) based on the round-trip time (RTT) to support large queues

### Asymmetrical Route Management

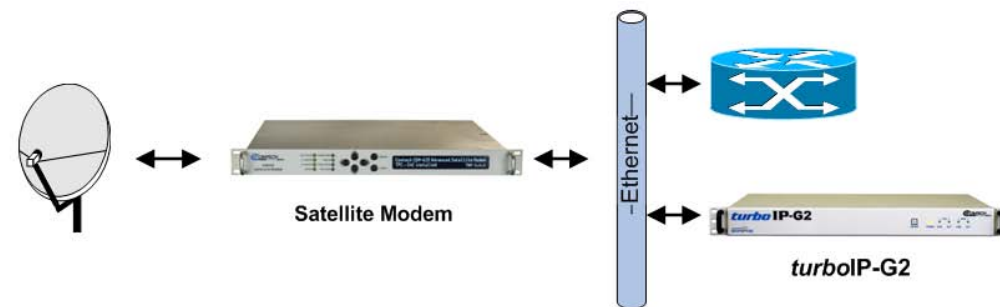
- Enables accelerated traffic to pass thru a different pair of *turboIP-G2* units in each direction (forward and return link)

## Dual OR Single Interface Mode with Policy-Based Routing

- *turboIP-G2* can now be placed as network device hanging on edge of network, as opposed to in-line on uplink and/or downlink side, as shown below:



**SINGLE INTERFACE MODE**  
Places the *turboIP-G2* on the network side, allowing Policy Based Routing (PBR) to be used to control the flow of packets to the device only when needed



## Simplified, Yet Powerful Management

### Quick Start

- This feature allows fast configuration and rapid deployment.

### Flexible Management Interfaces

- Web-based interface
- SNMP v3/v2/v1 – supports Management Information Base (MIB) II (RFC 1213) and private MIB
- Command Line Interface (CLI) via serial port and emulation program
- Secure Shell (SSH) management interface security

### Configuration and Management

#### Operational Statistics

Multiple operational statistics, indicating the status of the *turboIP-G2* system, are available.

#### Event Log

This management feature captures a listing of informational, warning and error events that have occurred.

#### Configuration Wizard

A configuration wizard helps to simplify setup of network and SNMP parameters.

### Enhanced Performance Analysis Tools

#### Real Time Graphs

Real time graphing shows current utilization and rates being experienced by both the LAN and WAN interfaces.

## Feature Enhancements

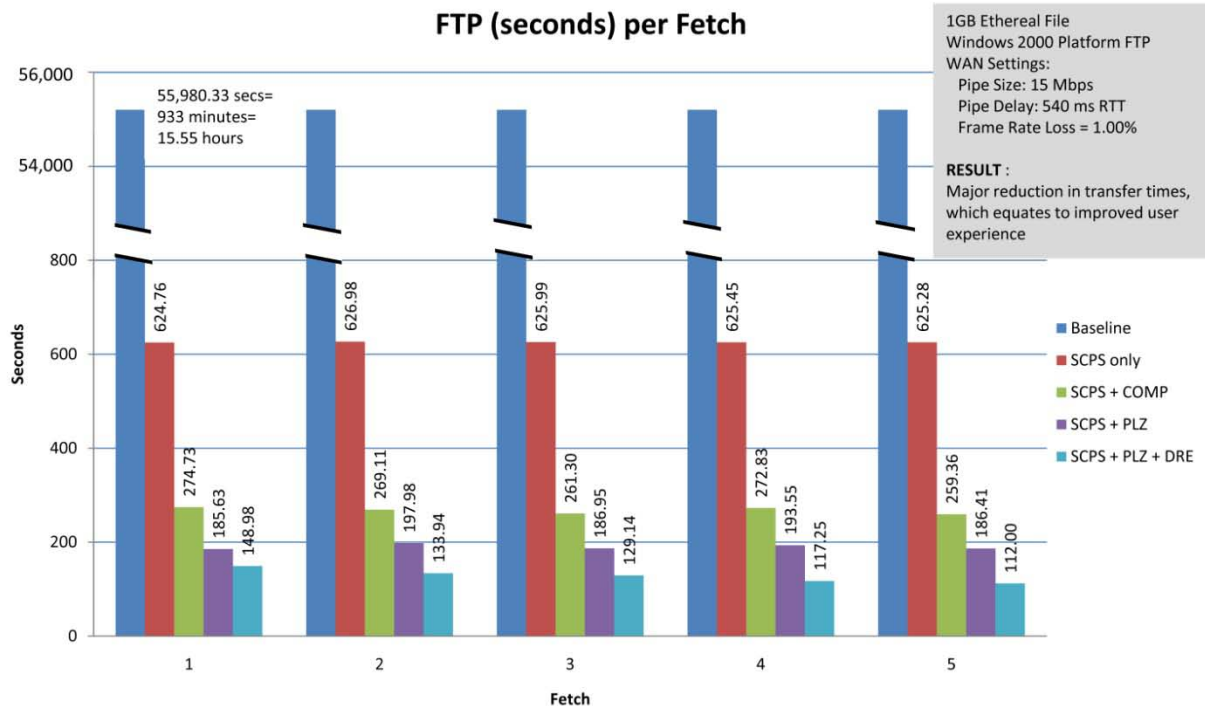
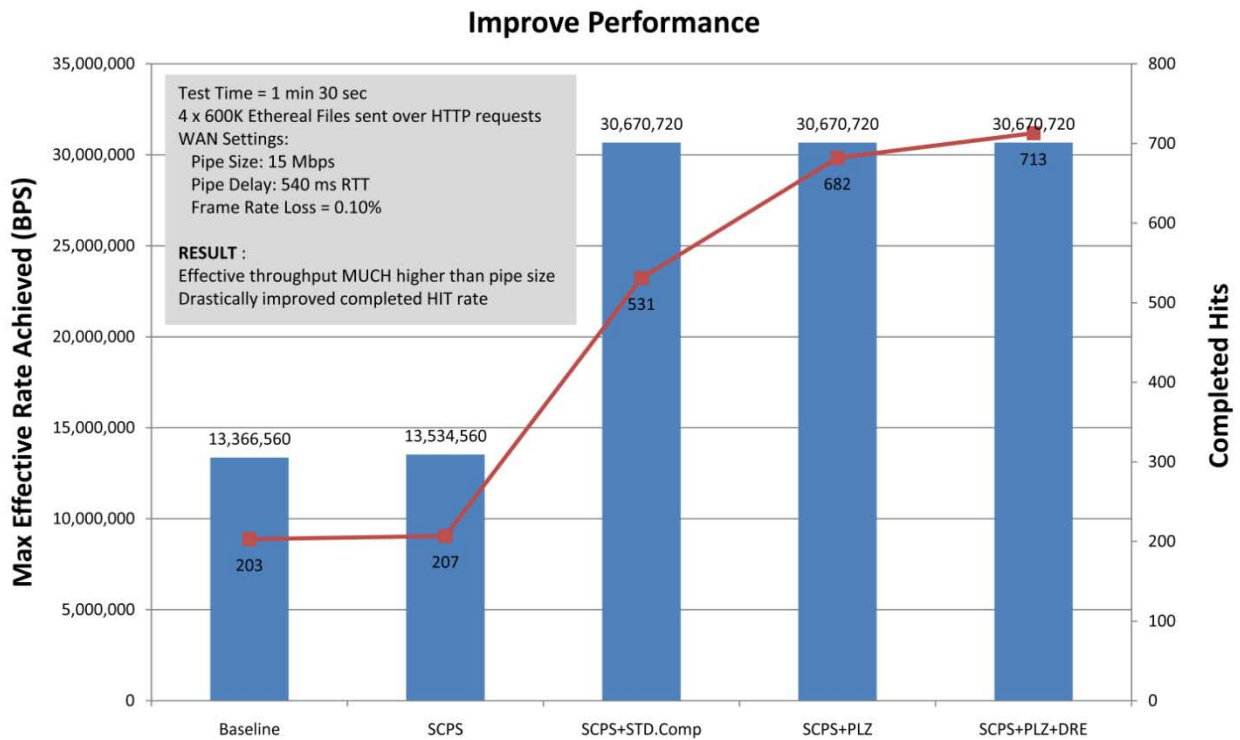
Enhancing the capability of *turboIP-G2* in the field is easy. Features that do not require additional hardware can be added on site, using FAST access codes purchased from Comtech EF Data.

### Optional Fast Field Upgrades

- 45 Mbps WAN rate
- 155 Mbps WAN rate
- WAN Optimization add-on package

## Get Results

The charts below illustrate the advantage of using *turboIP-G2* in a real network, with advanced WAN optimization features. The first chart illustrates a doubling effect of the effective throughput. With this type of gain, an operator can delay upgrading equipment and/or buying additional satellite bandwidth, which translates into operator cost savings. The second chart illustrates end user experience gains, as transfer times are greatly reduced and iterative fetch times are decreased, which translates to increased user experience.



## Specifications

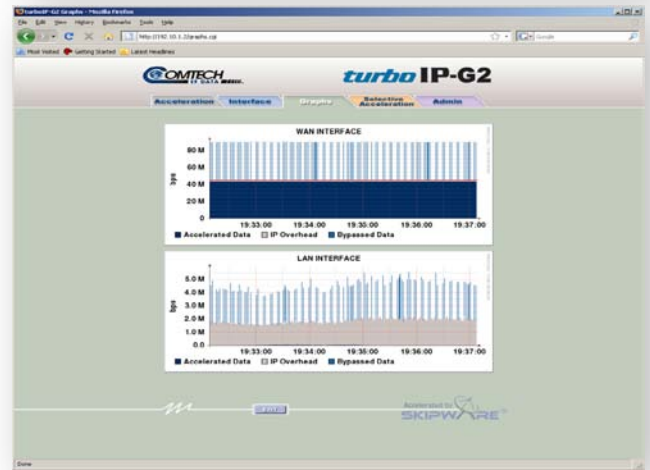
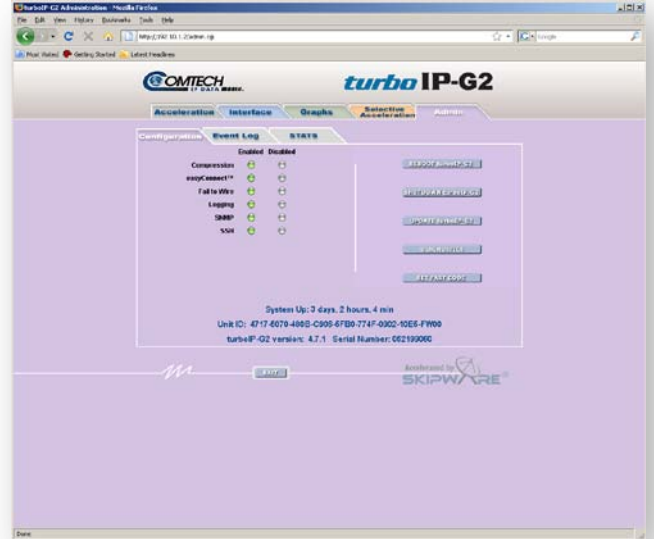
Rear Connectors (5)	LAN, WAN, MGT (1 each): RJ-45, 10/100/1000Base-T Ethernet, auto-sensing and auto-crossover EIA-232 (CONSOLE) AC power (IEC-320)
Front Panel Status LEDs	Link and activity for LAN, WAN Power indication with on/off control
Temperature	Operating: 5° to 60° C Storage: 0° to 75° C
Humidity	Operating: 5 to 90% @40° C, non-condensing
Vibration	Operating: 5 to 17 Hz, 0.1" double amplitude displacement 17 to 500 Hz, 1.5G acceleration peak-to-peak (max.)
Shock	Operating: 15G acceleration peak (1 ms duration)
Safety	EN-60950 (CE)
EMC	FCC Part 15 Class B / EN55022-EN55024 (CE)

### Chassis 1/2-Wide

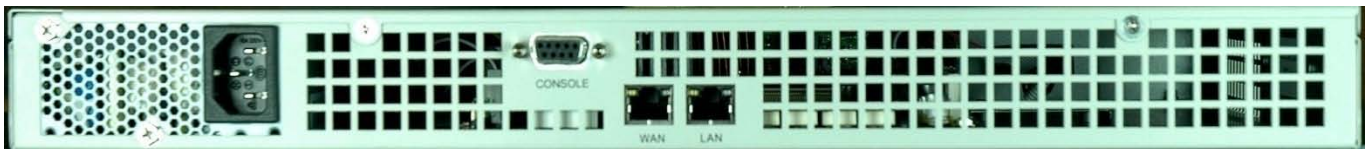
Dimensions (height x width x depth)	1.68" x 8.25" x 15.3" (43 x 210 x 389 mm)
Weight	< 7 lbs (3.2 kg)
Power Supply	100 to 240 VAC, 50 to 60 Hz, 90 W max.
Rack Kit Optional Rack Kit	Fits into standard 19" rack Dual mount side-by-side or single left or single right configurations

### Chassis Full-Wide

Dimensions (height x width x depth)	1.73" x 16.75" x 12.3" 44 x 425.45 x 312 mm)
Weight	8.5 lbs (3.86 kg)
Power Supply	90 to 264 VAC, 47 to 63 Hz, 110 W max.



Rear View 1/2-Wide turboIP-G2 Dual Mounted in 19" Rack Mount Kit



Rear View Standard 19" turboIP-G2



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