# *turbo*IP®-G2 Performance Enhancement Proxy


1/2-Wide *turbo*IP-G2


Full-Width 1RU *turbo*IP-G2

## TCP/IP CHALLENGES OVER SATELLITE

With convergence of voice, data and video over satellite becoming more common, some organizations are encountering TCP/IP performance limitations. 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

## TRANSPARENT TCP ACCELERATION

Accelerating at speeds of 15 or 45 Mbps, Comtech EF Data's *turbo*IP-G2 Performance Enhancement Proxy was designed to combat the inherent challenges of transmitting TCP over satellite links. Available, in two distinct form factors – full 1RU 19" rack and 1RU ½ rack – *turbo*IP-G2, offers the same features and functionality, but with different consideration of size, weight, and power (SWaP) requirements. The units provide 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). *turboIP*-G2 provides reliable connection-oriented, end-to-end data transfer for user applications. These powerful platforms also overcome the deficiencies that exist with TCP, including slow start and congestion control. Since they interoperate with TCP/IP networks and devices, *turbo*IP-G2 can be seamlessly integrated into existing networks in a staged manner, avoiding the need for network-wide upgrades.

## FEATURE ENHANCEMENTS

Enhancing the capability of *turbo*IP-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.

## THROUGHTPUT (Bi-Directional)

The *turbo*IP-G2 can be software configurable, via FAST codes to move support from 15 Mbps up to 45 Mbps, maximum single session and/or maximum aggregate throughput rates.

## BENEFITS OF ACCELERATION

The feature set in *turbo*IP-G2 can deliver performance gains for your network, including:

- Increases network throughput for TCP session
- Restores network efficiency
- Overcomes the inherent limitations of TCP/IP traffic on impaired links
- Interoperates with TCP/IP networks and TCP devices
- Enables staged deployment
- Provides flexibility to bypass where applications cannot benefit

## KEY FEATURES

- Fully compliant with SCPS-TP Standard
- Implements Open Standards
- IPv6/IPv4 capable
- VLAN and GRE Tunnel support
- Network Device Position Configurable
- Intelligent Congestion Control
- Rate Pacing or Dynamic Bandwidth support
- Black Hole Detection & Recovery
- Path Maximum Transmission Unit (MTU) discovery
- Packet Reordering Tolerance
- Large Queue support
- Up to 3200 simultaneous accelerated sessions with additional session bypass
- Asymmetrical Route Management
- Selective Acceleration
- Automatic Window Scaling
- DHCP support
- Management – HTTP and SNMP v3/v2/v1
- Enhanced configuration and management option

Performance Enhancement Proxies

## *turbo*IP-G2 Performance Enhancement Proxy

- Provides optimized interoperability with all previous *turbo*IP models

### KEY FEATURES

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.

Data and Header Compression (Currently Available)

- 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 *turbo*IP-G2 can reduce both bandwidth and transmission time over wide area network links. If disabled, no sessions are compressed.

HTTP – RAM Based Caching

- HTTP Caching provides the ability to store HTTP content locally, reducing the need to go over the network time and time again to retrieve content that has already been requested. This reduces network traffic in general and provides faster HTTP data serve time. To continue to provide a small form-factor, light weight, and cost effective solution, *turbo*IP-G2 will offer 4GB of RAM based caching

CIFS / WAFS Acceleration

- Client systems typically use the Common Internet File System (CIFS) protocol to request file and print services from server systems over a network.

- Wide Area File Systems (WAFS) are growing in popularity as branch offices need remote office users to have fast access to file and applications that are still hosted at the branch office. By accelerating this type of traffic, *turbo*IP-G2 makes this technology even more powerful.

Seamless Integration

- Enables seamless integration into existing links without impacting non-TCP traffic and requiring device reconfiguration
- Simplifies new installations by not requiring additional subnets
- Forwards IP multicast and non-IP traffic, and can be placed directly between the existing LAN and router

Implements Open Standards

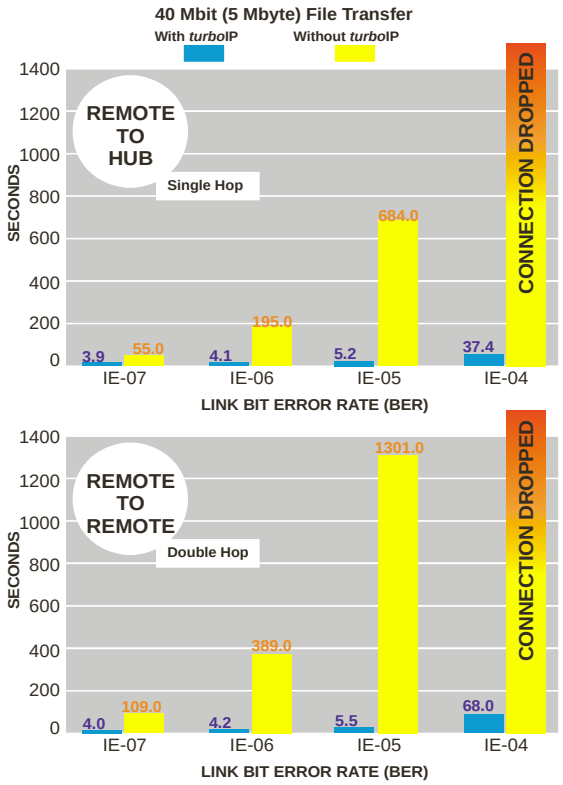
- SCPS-TP May 1999
- ISO standard (15893)
- CC SDS standard (714.0-B-1)
- MIL-STD (MIL-STD-2045-44000)
- RFCs 768, 793, 1122 & 1323

IPv6/IPv4 Capable

- Already supporting IPv4 traffic acceleration and box management, IPv6 capabilities have been added including the ability to silently bridge IPv6 packets.

The charts below illustrate the advantage of using *turbo*IP-G2 to accelerate TCP performance.

Results charted are for a single session file transfer over a 10 Mbps full duplex link on a Microsoft Windows 2000™ Professional FTP server and client with factory default settings for TCP.




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

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

Network Device Position Configurable

- *turbo*IP-G2 can now be placed as network device hanging on edge of network, as opposed to in-line on uplink and/or downlink side.

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

Rate Pacing

- Meters out bursty traffic based on rate configured for WAN link, preventing channel congestion

- Dynamic Bandwidth Support (Per Connection)
  - Ensure 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

Increased session support
- Up to 3200 simultaneous accelerated sessions, with additional session bypass.

Asymmetrical Route Management
- Enables accelerated traffic to pass thru a different pair of *turbo*IP-G2 units in each direction (forward and return link)

Selective Acceleration
- 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.

## 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 *turbo*IP-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.

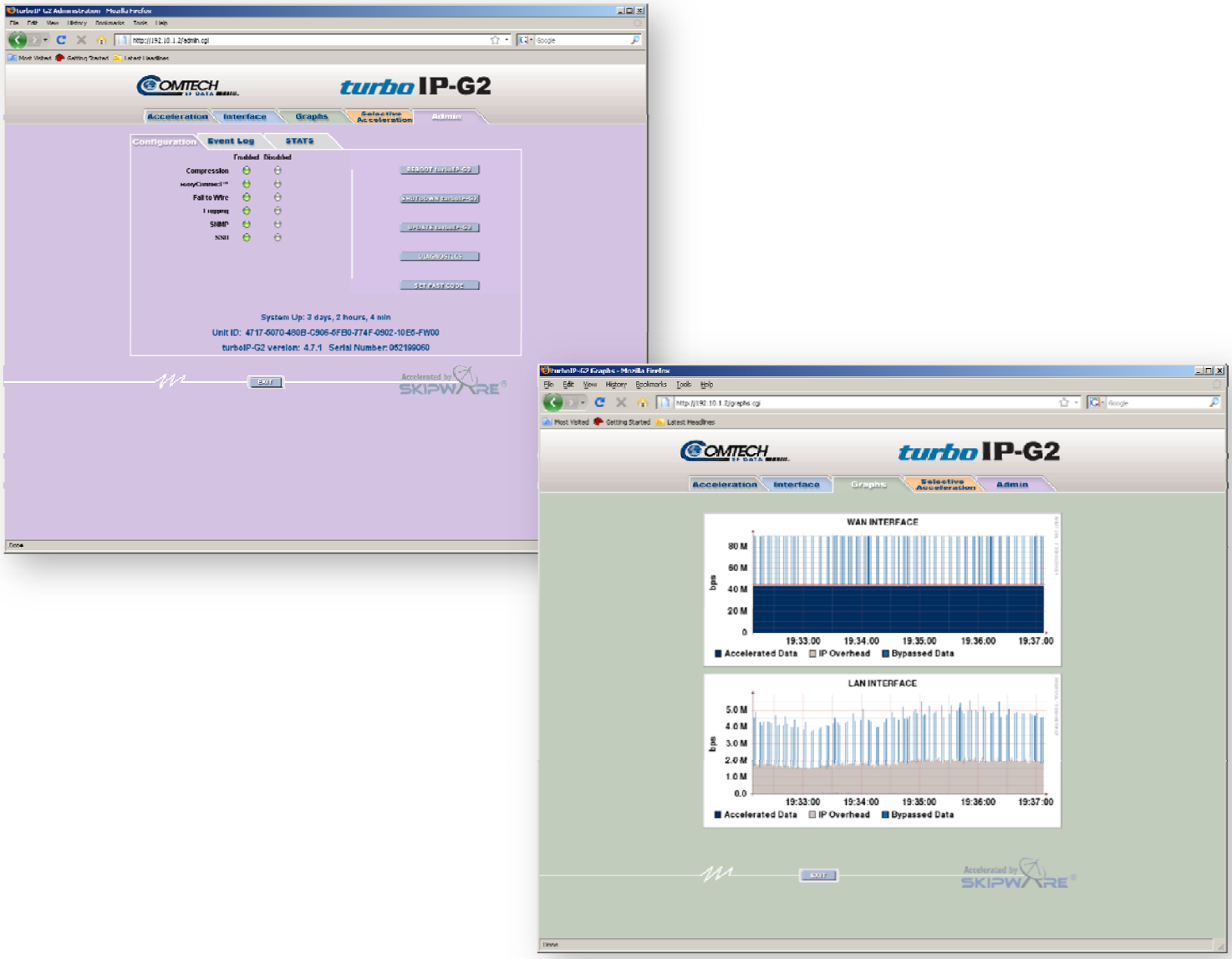
PHYSICAL FEATURES
- Available in 1RU 19" rack form factor
- Available in hardened 1RU 19" ½ width rack form factor
- Rack kit allows left or right or dual mount positions
- Fail-to-Wire
- Size, Weight, and Power considerations (SWaP)
- 10/100/1000 Mbps Auto Sensing, Auto Crossover Capabilities
- Developed in the USA
- 1 year hardware warranty

OPTIONAL FUTURE FAST FIELD UPGRADES
- IPv6 acceleration and management
- Data and Header Compression (Currently Available)
- HTTP RAM-based Caching
- CIFS/WAFS Acceleration
- 45 Mbps WAN rate

## SPECIFICATIONS

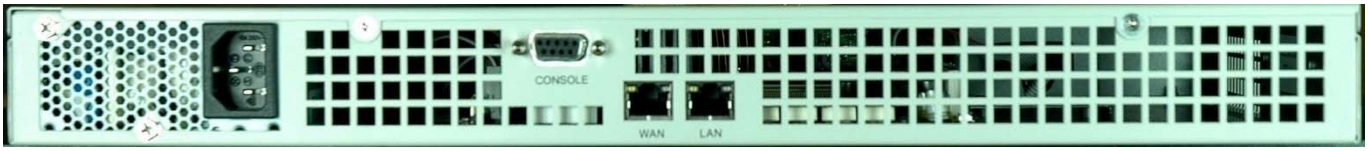
| | |
|---|---|
| Rear Connectors (4) | LAN and WAN (1 each): RJ-45, 10/100/1000BaseT Ethernet, auto-sensing and auto-crossover<br>EIA-232 (CONSOLE)<br>AC Power (IEC-320) |
| Front Panel Status LEDs | Link and activity for LAN, WAN<br>Power indication with on/off control |
| Temperature | Operating: 5° to 60° C<br>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) |
| Power Supply | 90~132 VAC or 180~260 VAC @ 47~63 Hz, 110W max |
| Chassis 1/2-Wide Dimensions<br><br>Weight<br><br>Optional Rack Kit | 8.25W x 1.68H x 15.3D inches (210W x 43H x 389D mm)<br>< 7lbs (3.2 Kg)<br>Fits into standard 19" rack<br>Dual Mount Side-by-Side or Single Left or Single Right Configurations |
| Chassis Full-Wide Dimensions<br><br>Weight | 16.75W x 1.73H x 12.3D inches (425.45W x 44H x 312D mm)<br><br>8.5 lbs (3.86 kg) |

# *turbo*IP®-G2 Performance Enhancement Proxy





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




Rear View Standard 19" *turbo*IP-G2

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