



## 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

Comtech EF Data's *turboIP* performance enhancement proxy was designed to combat the inherent challenges of transmitting TCP over satellite links. It provides transparent acceleration of TCP sessions, or the increase in throughput, over satellite links while requiring minimal topology changes. And, being standards-based, supporting the Space Communications Protocol Standard (SCPS) Transport Protocol (SCPS-TP), it can provide reliable connection-oriented, end-to-end data transfer for user applications. *turboIP* can also overcome the deficiencies that exist with TCP, including slow start and congestion control. Since it interoperates with TCP/IP networks and devices, *turboIP* can be seamlessly integrated into existing networks in a staged manner, avoiding the need for network-wide upgrades.

Available in a 1RU platform, *turboIP* is deployed in government and military agencies plus commercial environments around the globe. Common applications for this performance enhancement proxy are supporting organizations utilizing satellite links for Internet backbone trunking services and organizations with large or evolving satellite bandwidth requirements for Internet traffic.

## BENEFITS OF ACCELERATION

The feature set in *turboIP* can deliver performance gains for your network, including:

- Increases network throughput for TCP sessions
- 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

## FEATURES SUMMARY

<b>easyConnect</b>	<ul style="list-style-type: none"> <li>• Enables seamless integration into existing links without impacting non-TCP traffic and requiring device reconfiguration</li> <li>• Simplifies new installations by not requiring additional subnets</li> <li>• Forwards IP multicast and non-IP traffic, and can be placed directly between the existing LAN and router</li> </ul>
<b>Implements Open Standards</b>	<ul style="list-style-type: none"> <li>• SCPS-TP May 1999</li> <li>• ISO standard (15893)</li> <li>• CC SDS standard (714.0-B-1)</li> <li>• MIL-STD (MIL-STD-2045-44000)</li> <li>• RFCs 768, 793, 1122 &amp; 1323</li> </ul>
<b>Intelligent Congestion Control</b>	<ul style="list-style-type: none"> <li>• Optimized for real-world, mixed-loss environments; distinguishes data corruption from congestion-induced data loss</li> <li>• Prevents unnecessary activation of congestion control mechanisms</li> </ul>
<b>Rate Pacing</b>	<ul style="list-style-type: none"> <li>• Meters out bursty traffic based on rate configured for WAN link</li> <li>• Prevents channel congestion</li> </ul>
<b>Selective Negative Acknowledgments (SNACKs)</b>	<ul style="list-style-type: none"> <li>• Identifies specific lost or damaged packets and retransmits only those packets</li> <li>• Provides for quicker recovery and better bandwidth utilization in lossy environments</li> </ul>
<b>Quick Start</b>	<ul style="list-style-type: none"> <li>• Enables full utilization of bandwidth, eliminating inefficiencies of the TCP slow-start algorithm</li> </ul>
<b>Window Scaling</b>	<ul style="list-style-type: none"> <li>• Supports window sizes up to 1 GByte, far exceeding standard TCP window size of 64 kBytes</li> </ul>
<b>Flexible Management Interfaces</b>	<ul style="list-style-type: none"> <li>• Web-based interface</li> <li>• SNMP – supports Management Information Base (MIB) II (RFC 1213) and private MIB</li> <li>• Command Line Interface (CLI) via serial port and emulation program</li> </ul>

## THROUGHPUT (Bi-Directional)

- Maximum single session ~ 15 Mbps
- Maximum aggregate throughput ~ 15 Mbps



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## SPECIFICATIONS

### Rear Connectors

- RJ-45, 10baseT/100baseTX Ethernet, Auto-sensing (LAN)
- RJ-45, 10baseT/100baseTX Ethernet, Auto-sensing (WAN)
- EIA-232 (CONSOLE)

### Front Panel Status LEDs

- Link and activity for LAN, WAN and Power indication

### Temperature

- Operating: 5° to 45° C Storage: 0° to 75° C

### Humidity

- Operating: 5 to 95% @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

- UL/CSA/TV/CE/FCC

### EMI

- Meets FCC/VDE Class A

### Power supply

- 90~132 VAC or 180~260 VAC @ 47~63 Hz, 150W max

### Chassis

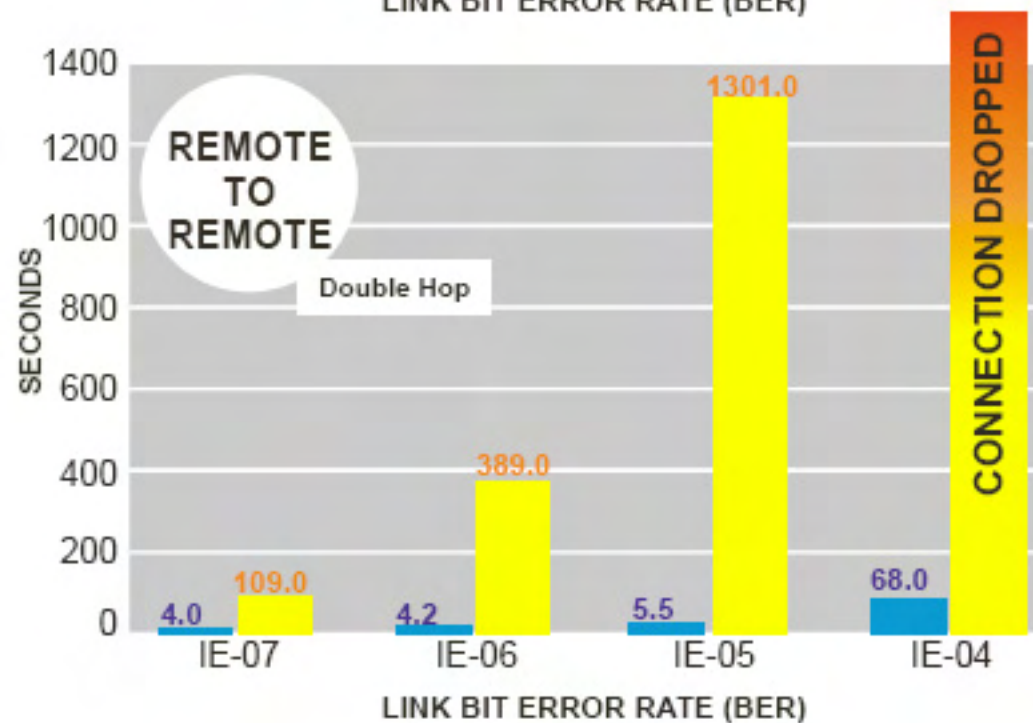
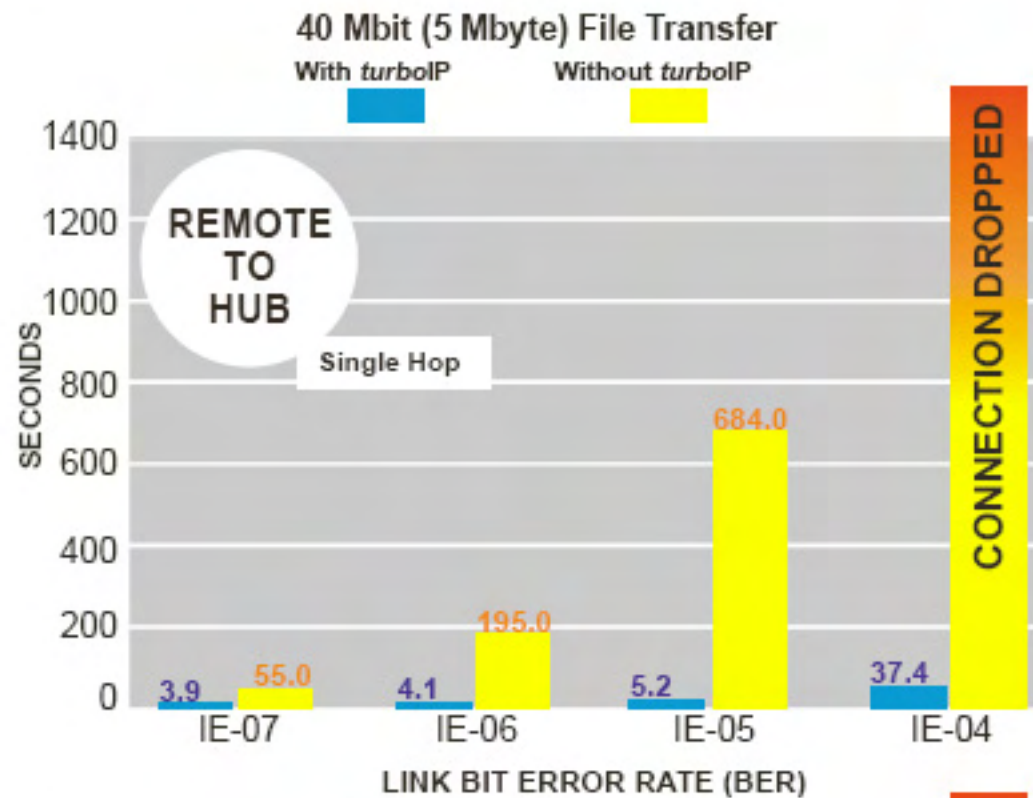
- Heavy duty steel with aluminum front panel
- Dimensions - 19.0" x 1.75" x 18.4" (W x H x D), (483 x 44.5 x 467 mm)
- Weight - 12 lbs (5.44 kg)

### Cooling Fans

- Two 6.3 CFM sleeve cooling fan on rear

The charts below illustrate the advantage of using *turboIP* 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.



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