



# Configuring TCP Acceleration on KlasRouter

*KB article reference no. Q10616*

*Version: 1.0*

*Keywords: KlasRouter, TCP Acceleration, SCPS*

The information in this article applies to:

- o KlasRouter v2.0

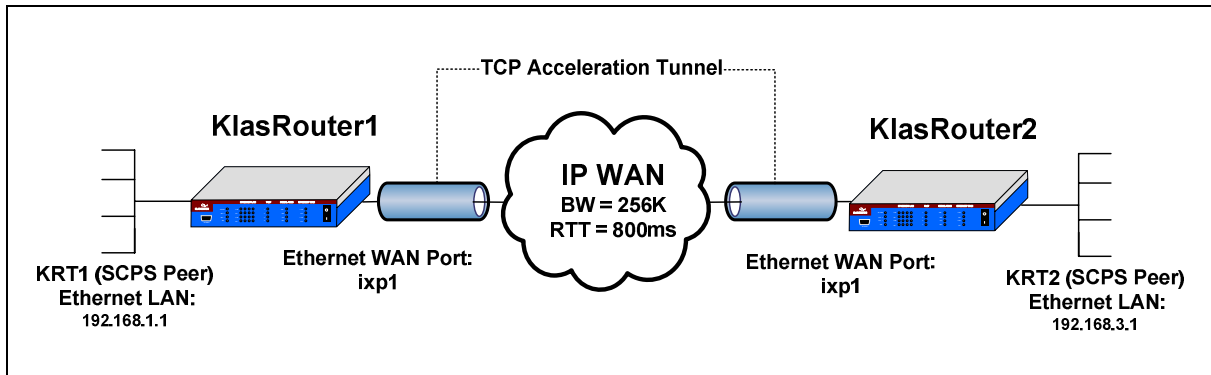
## Table of Contents

1.0 Introduction.....	2
2.0 Configuration of KlasRouter.....	3
2.1 Cable Connections .....	3
2.2 Establishing a HyperTerminal Session .....	3
2.3 Configuring the Ethernet LAN .....	3
2.4 Configuring the WAN Interface .....	3
2.5 Configuring SCPS TCP Acceleration.....	3
2.5.1 Configuring SCPS.....	4
2.5.2 Starting SCPS.....	5
2.5.2 Stopping SCPS.....	5

## Table of Figures

Figure 1. TCP Acceleration Example .....	2
Figure 2. SCPS TCP Acceleration Configuration Menu .....	4
Figure 3. Configuring SCPS TCP Acceleration .....	5
Figure 4. Starting SCPS TCP Acceleration .....	5
Figure 5. Stopping SCPS TCP Acceleration.....	6

## 1.0 Introduction



**Figure 1. TCP Acceleration Example**

This document describes how to configure TCP Acceleration on KlasRouter and explains how TCP Acceleration makes WAN links more efficient. TCP Acceleration is a technique used to overcome the two difficulties TCP encounters over WAN links with high latencies: inefficient window sizes and high error rates. KlasRouter uses a protocol called the Space Communications Protocol Standard (SCPS), which was developed by NASA, as a standards-based TCP Acceleration solution.

The first advantage of TCP Acceleration is in adjusting the window size to eliminate wasted bandwidth. The TCP protocol defines an acknowledgment window for all transmissions. The window specifies how many bytes can be sent without an acknowledgment from the opposite side confirming that all packets have been received. Over WAN links with high latencies, this often has the effect of causing the sender to be idle and waste bandwidth while it waits for an acknowledgment. Configuring KlasRouter to use SCPS TCP Acceleration solves this problem by acting as an intermediary between the two sides. As soon as KlasRouter receives a certain number of packets, it sends an immediate acknowledgement to that application. At the same time, KlasRouter automatically adjusts its internal TCP window size for maximum efficiency depending on the bandwidth of the link. KlasRouter buffers the packets and sends them across the WAN to the opposite side without the need to continually wait for an acknowledgment. This gives the effect of wire-speed transmissions even over high latency networks.

The second advantage of SCPS TCP Acceleration is in overcoming “TCP slow-start” and inefficient error recovery rules. This is another element of the TCP protocol that dictates a TCP session must test the link for reliability before it sends over the maximum allowed window size. As more and more acknowledgments are received, TCP will gradually increase the number of bytes sent in the window as it gains confidence in the link. Over a slow link, this procedure can take a long time and waste bandwidth. Additionally, when an error occurs, TCP immediately drops the transmission rate in half and slowly builds back up again. With SCPS TCP Acceleration, the session goes to wire-speed at the maximum allowed window size almost immediately. Also, SCPS TCP Acceleration is more tolerant of errors and just resends unacknowledged packets while maintaining the maximum window size throughout the session.

Figure 1 shows a sample topology where opposite KlasRouters are configured for SCPS TCP Acceleration over the Ethernet WAN link. Figure 1 will be used throughout the

## Configuring TCP Acceleration on KlasRouter

rest of the application note for specific configuration examples. The following sections outline the steps needed to configure SCPS TCP Acceleration with KlasRouter.

## **2.0 Configuration of KlasRouter**

### **2.1 Cable Connections**

Prior to beginning, ensure the following cable connections have been properly secured:

1. Power cord is plugged in and KlasRouter is on.
2. Control Port Cable is connected to the PCs serial port.
3. Control Port Cable is connected to the 'Control' port on the front of the KlasRouter.
4. RJ-45 Ethernet cable connected to the KlasRouter Ethernet WAN port.

### **2.2 Establishing a HyperTerminal Session**

To configure KlasRouter, you must establish a HyperTerminal Session between a PC and KlasRouter. Follow the instructions in KlasRouter Application Note Q10601 to successfully establish a HyperTerminal Session and open the KlasRouter Main Configuration Menu.

### **2.3 Configuring the Ethernet LAN**

Most likely, the Ethernet LAN on KlasRouter, otherwise known as the SCPS peer, will be the origin of any data destined for the SCPS tunnel. There must be a KlasRouter on either end of the SCPS tunnel, so the Ethernet LANs on opposite sides of the tunnel act as SCPS peers, as shown in Figure 1. In Figure 1, the Ethernet LAN IP addresses for KlasRouter1 and KlasRouter2 are 192.168.1.1 and 192.168.3.1, respectively. Follow the directions in Klas Application Note Q10605 in order to configure the Ethernet LAN for each KlasRouter.

### **2.4 Configuring the WAN Interface**

You must configure a WAN port on KlasRouter to route data across the WAN link. In Figure 1, KlasRouter is using the Ethernet WAN port. However, any WAN interface can be used, including a VPN interface such as 'ipsec0'. Refer to the following KlasRouter App Notes for configuration instructions specifically addressing the WAN interface you are using:

- KlasRouter App Note Q10603 – Configuring the KlasRouter Serial WAN Port
- KlasRouter App Note Q10604 – Configuring the KlasRouter Ethernet WAN Port
- KlasRouter App Note Q10615 – Configuring VPN on KlasRouter

### **2.5 Configuring SCPS TCP Acceleration**

In order to get to the SCPS TCP Acceleration Configuration Menu, follow the steps below:

1. Enter '7' from the Main Configuration Menu to enter the Advanced Configuration Menu.
2. Enter ''7' from the Advanced Configuration Menu to enter the SCPS TCP Acceleration Configuration Menu, shown below in Figure 2.

```

SCPS TCP Acceleration Configuration Menu
-----
SCPS is Stopped.
Current Configuration:
- Bandwidth:      1000000 bps
- Round-Trip Time: 1000 ms
- Local SCPS Peer: 192.168.1.1
- Remote SCPS Peer: 192.168.3.1
- WAN Interface:  ixp1

1) Configure SCPS
2) Start SCPS
3) Stop SCPS
Press 'x' to Return

Enter Option>

```

**Figure 2. SCPS TCP Acceleration Configuration Menu**

The following sections describe how to configure, start and stop SCPS TCP Acceleration with KlasRouter.

### 2.5.1 Configuring SCPS

1. Press '1' on the SCPS TCP Acceleration Menu.
2. Enter the bandwidth of the WAN link in bits per second (bps). Using the example from Figure 1, the WAN link has a bandwidth of 256Kbps. Enter '256000' to configure this bandwidth, as shown in Figure 3.
3. Enter the round-trip time of the WAN link in milliseconds (ms). Using the example from Figure 1, the WAN link has a round-trip time of 800 ms. Enter '800' to configure the latency, as shown in Figure 3.
4. Enter the IP address of the local SCPS peer. Using KlasRouter1 from the example in Figure 1, the Ethernet LAN IP address is the SCPS peer, so the local SCPS peer is 192.168.1.1. Enter '192.168.1.1' to configure the local SCPS peer, as shown in Figure 3. (*Note: if you were configuring KlasRouter2, the local SCPS peer would be 192.168.3.1*)
5. Enter the IP address of the remote SCPS peer. Using KlasRouter2 from the example in Figure 1, the Ethernet LAN IP address is the SCPS peer, so the remote SCPS peer is 192.168.3.1. Enter '192.168.3.1' to configure the remote SCPS peer, as shown in Figure 3. (*Note: if you were configuring KlasRouter1, the remote SCPS peer would be 192.168.1.1*)
6. Enter the interface code for the interface you want use SCPS with. The example from Figure 1 uses the Ethernet WAN Interface. Enter 'ixp1' to use the Ethernet WAN Interface, as shown in Figure 3. If you need a list of all available interfaces, press '?' to view the entire list.

```

Enter Bandwidth in bits/per sec (64000-4000000) ('q' to quit)>256000
Enter Round-trip Time in ms (20-5000) ('q' to quit)>800
Enter Local SCPS Peer ('q' to quit)>192.168.1.1
Enter Remote SCPS Peer ('q' to quit)>192.168.3.1
Enter WAN Interface ('?' for help | 'q' to quit)>ixp1
SCPS Configured Successfully.
Press Enter to Return to SCPS TCP Acceleration Configuration

```

**Figure 3. Configuring SCPS TCP Acceleration**

7. Press 'Enter' to return to the SCPS TCP Acceleration Configuration Menu.

### 2.5.2 Starting SCPS

1. Press '2' on the SCPS TCP Acceleration Configuration Menu start SCPS, as shown in Figure 4.

```

SCPS TCP Acceleration Configuration Menu
-----
SCPS is Stopped.
Current Configuration:
- Bandwidth:      256000 bps
- Round-Trip Time: 800 ms
- Local SCPS Peer: 192.168.1.1
- Remote SCPS Peer: 192.168.3.1
- WAN Interface:  ixp1

1) Configure SCPS
2) Start SCPS
3) Stop SCPS
Press 'x' to Return

Enter Option>2

Starting SCPS ... OK.

Press Enter to Return to SCPS TCP Acceleration Configuration

```

**Figure 4. Starting SCPS TCP Acceleration**

2. Press 'Enter' to return to the SCPS TCP Acceleration Configuration Menu.

### 2.5.2 Stopping SCPS

1. Press '3' on the SCPS TCP Acceleration Configuration Menu start SCPS, as shown in Figure 5.

```

SCPS TCP Acceleration Configuration Menu
-----
SCPS is Started.
Current Configuration:
- Bandwidth: 256000 bps
- Round-Trip Time: 800 ms
- Local SCPS Peer: 192.168.1.1
- Remote SCPS Peer: 192.168.3.1
- WAN Interface: i xp1
1) Configure SCPS
2) Start SCPS
3) Stop SCPS
Press 'x' to Return
Enter Option>3
Stopping SCPS ... OK.
Press Enter to Return to SCPS TCP Acceleration Configuration

```

**Figure 5. Stopping SCPS TCP Acceleration**

2. Press 'Enter' to return to the SCPS TCP Acceleration Configuration Menu.

## MORE INFORMATION

For more information about KlasRouter and other Klas products, visit the following Klas website:

*<www.klasonline.com>*

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