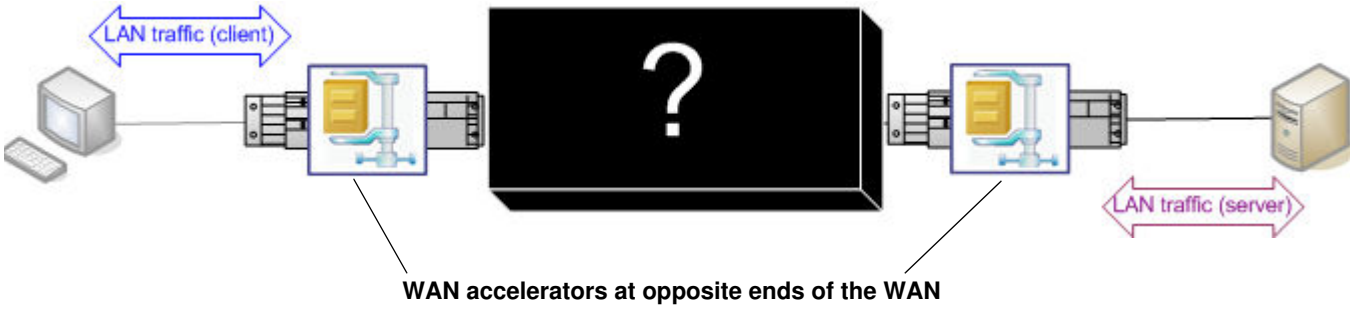
10 WAN Accelerators and AppTransaction Xpert

WAN acceleration devices (also known as *application accelerators* or *WAN optimizers*) work to accelerate network applications by mitigating the effects of limited bandwidth and higher latencies common in Wide Area Networks (WANs). If your network has WAN accelerators deployed, you must take additional steps when capturing and importing traffic. The following sections describe the issues you need to consider and the additional steps you need to take.

Note—Importing and analyzing transactions from WAN-accelerated environments in AppTransaction Xpert requires a license for AppTransaction Xpert Advanced Capabilities or AppTransaction Xpert Plus.

*Key Concept—*In the context of AppTransaction Xpert, any application run over a WAN-accelerated connection automatically becomes a multi-tier application. To analyze these types of transactions, you must capture and import the traffic between the accelerators. Otherwise you have a “black box” in the middle of the application. Because AppTransaction Xpert cannot analyze traffic between the two accelerators, it cannot analyze the application as a whole (Figure 10-1).

Figure 10-1 View of an Application in a WAN-Optimized Environment (No WAN Traffic Captured)



Note—The presence of WAN accelerators is transparent to end-users. Therefore, you should check for the presence of these devices in your network. Do not assume that your network does not use accelerators because you do not “see” them.

The capturing process is discussed in the following sections:

- How WAN Accelerators Work
- Implications for AppTransaction Xpert

- Capturing Application Traffic in a WAN-Accelerated Environment
  - — Direct Captures (On the Accelerators)
  - — Capturing on Cisco and Riverbed Accelerators
  - — Capturing on Other Accelerators
  - — Indirect Captures (Near the Accelerators)

When you import packet traces from WAN accelerators into AppTransaction Xpert, you must specify additional information. This topic is discussed in the following sections:

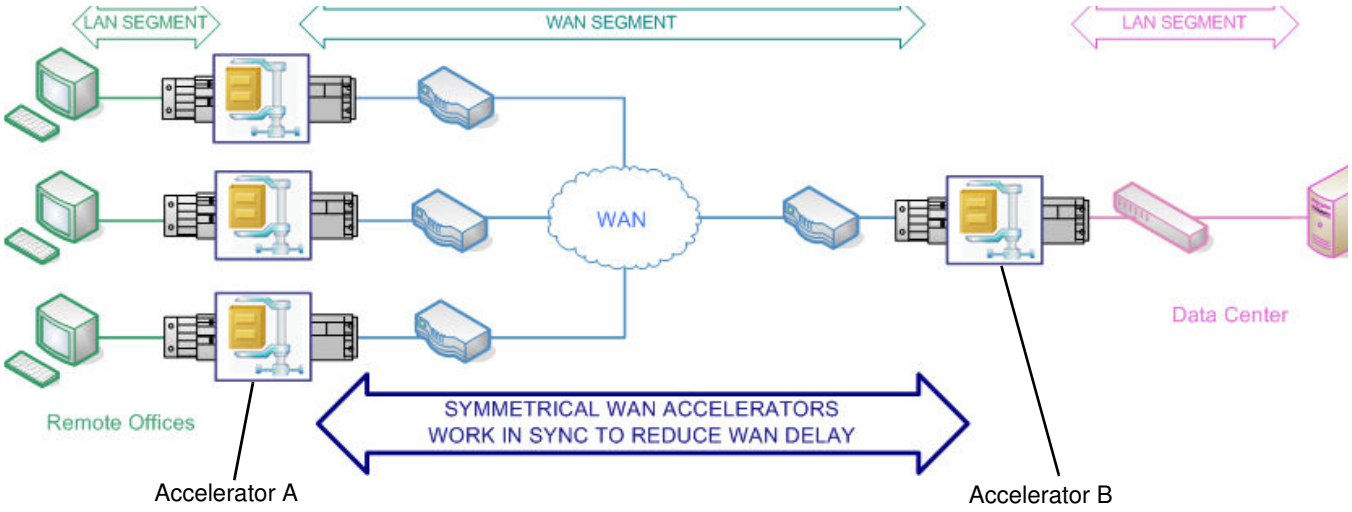
- Importing WAN-Accelerated Capture Data
- Verifying a WAN Acceleration Import
- WAN Acceleration Preferences
- Troubleshooting WAN Acceleration Imports
- WAN Acceleration Worksheet

How WAN Accelerators Work

WAN accelerators are intended to speed up application performance in a WAN environment. Accelerators do this by limiting the effects of low bandwidth and high latency across a WAN connection.

Symmetrical accelerators work in pairs and are placed on opposite sides from the extranet, usually just before the network gateway. Symmetrical accelerators see the same traffic and thus can work together to reduce application delays over a WAN connection. One common setup is to have a large accelerator in a central data center and several smaller accelerators in remote branches, as shown in the following figure.

Figure 10-2 Symmetrical WAN Accelerators: Example Deployment



The following steps describe a “one-way trip” through a pair of WAN accelerators:

1) Accelerator A receives traffic from LAN A.

2) Accelerator A converts this LAN traffic to WAN-optimized traffic.

3) Accelerator A sends the traffic across the WAN to accelerator B.

4) Accelerator B receives the WAN-optimized traffic.

5) Accelerator B converts the WAN traffic back to LAN traffic.

6) Accelerator B sends the traffic to LAN B.

The specific methods used by accelerators are highly vendor-specific. Among the most commonly used methods are the following:

- Data reduction—Reducing the amount of data sent across the WAN by such techniques as LZ compression, static caching, and dynamic caching.
- Transport optimization—Changing and optimizing TCP behavior across the WAN connection by techniques such as TCP spoofing, setting high receive windows, or switching to a more aggressive congestion control algorithm. Some vendors also support polling and multiplexing of TCP connections. A pair of optimizers might exchange traffic across the WAN without using TCP at all.
- Application acceleration—Some applications (HTTP, MS-SQL, NFS, etc.) are known to be inefficient over WAN connections. Accelerators might pre-fetch objects or rewrite application messages to request more objects. These techniques work to reduce latency delays over a WAN.

Implications for AppTransaction Xpert

A pair of accelerators can change TCP behavior, application requests, and traffic patterns during a single user-level transaction across a WAN. This has the following implications for capturing traffic in a WAN-optimized environment:

- A TCP connection between two tiers is now divided into three separate connections (as shown in the following figure). The LAN connections preserve the original IP addresses and ports used by the original connection. However, some accelerators can modify the addresses and ports used in the intermediate WAN segment (this behavior is highly vendor-specific).
- Due to data compression and caching, the WAN segment typically sees different—and less—traffic than the LAN segments.

- If the accelerators rewrite application requests, the two LAN segments can also see different traffic.
- If traffic is encrypted or sent through an encryption tunnel in the WAN segment, it might be impossible to decode this traffic.

The following figures show how WAN accelerators can change the characteristics of the same application.

Figure 10-3 Simple HTTP Transaction (Without WAN Acceleration)

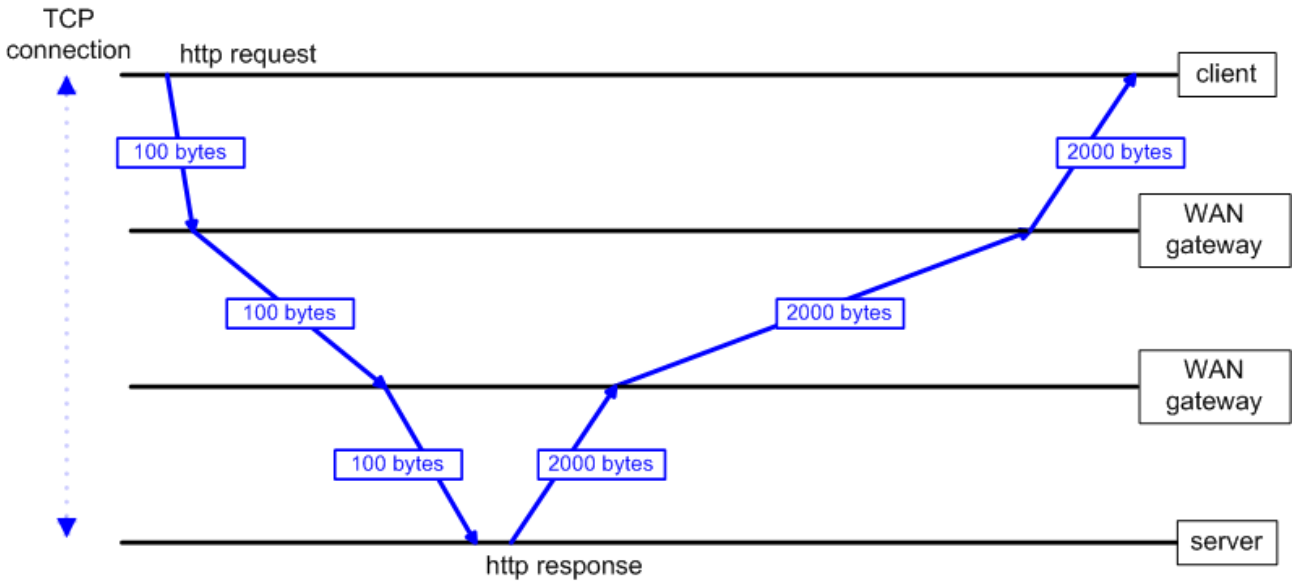


Figure 10-4 Simple HTTP Transaction (With WAN Acceleration)