

## Troubleshooting “Slow” Network Performance

It's Monday morning and users are already starting to call: “Why is the CRM system so slow?” As a network administrator, you know it could be a network, server, or application problem, but the first step is to make sure it's not a network problem. Using the following techniques can help quickly locate possible bandwidth and performance issues.

### 1 Check for over-utilized WAN links

Because T1-based WAN links are limited to 1.54 Mbps (compared to much faster 100Mbps or 1Gbps LAN speeds), they often develop performance bottlenecks, particularly during peak times. Use SNMP to check the utilization and discard rates for the router interfaces servicing your WAN links (be sure to check both the inbound and outbound rates).

As interface utilization approaches 80 to 90%, queuing delays will develop and an interface will start to drop or discard packets. Packet discards exceeding 5% of total bandwidth can result in noticeable performance degradation. If you're seeing 10% packet loss or greater, that's almost certainly the reason your users are calling.

**TIP:** Keep in mind that your router is calculating utilization using the “interface speed” value listed for the interface. Make sure the correct speed has been entered or your utilization rates will be over or under reported.

### 2 Check WAN connectivity and latency

Traceroute is still one of the fastest and easiest ways to verify network connectivity between users and servers. In most instances, if the trace times out or stops at a particular router or server, that's where the connectivity problem lies. Sometimes, however, the trace only appears to “stop” because the responding packets encountered a problem and were dropped on the return route. In this case, Traceroute can only assume a timeout occurred, even though the device responded to the probe packets. To verify a connectivity problem, initiate a Traceroute from computer A to computer B and vice versa. If both Traceroutes timeout at the same device, you can be reasonably sure it's the cause of the problem.

**TIP:** Traceroute's response time or latency value is based on the round trip times of just three packets, which isn't much of a sample. Using ping is a better choice for measuring latency since it can send hundreds (or even thousands) of ICMP echo requests, producing a fairly accurate average round trip time. Try pinging each system or router listed in the Traceroute output to identify any latency problems. (This also gives you the added benefit of packet loss statistics.)

### 3 Check switch port status

Make sure the switch ports for the users' workstations and the application server are up and healthy. A switch port that was up just moments ago can suddenly go down because of an internal configuration problem or an error condition. An incorrect duplex setting or MTU mismatch on a switch interface, for example, can shut down the interface. Similarly, a recently damaged cable or RJ-45 jack can corrupt enough packets to shut down an interface due to packet errors.

**TIP:** In the real world, most connectivity problems happen at the physical layer. Be sure to check all cables, connectors, and patch panels between the user's workstation and the switch port.

### 4 Analyze traffic flows

Often, getting down to the source of a bandwidth problem may require traffic analysis using NetFlow (embedded in Cisco routers) or similar instrumentation in other router brands. When analyzing traffic flows over a WAN link, for example, Netflow can capture the top packet flows by total packets, total bytes, and source/destination IP address and port number. This helps you identify which applications and services are consuming the most bandwidth over the WAN link.

If you're not prepared to implement NetFlow or your routers do not support it, try using a packet analyzer or packet sniffer instead. These tools capture, decode and display packet statistics in the same manner as Netflow, but they also allow you to open a packet and view its header and payload. You can also use a packet analyzer or sniffer to reassemble a TCP session and read the "conversation" flow between two computers, including text and graphics.

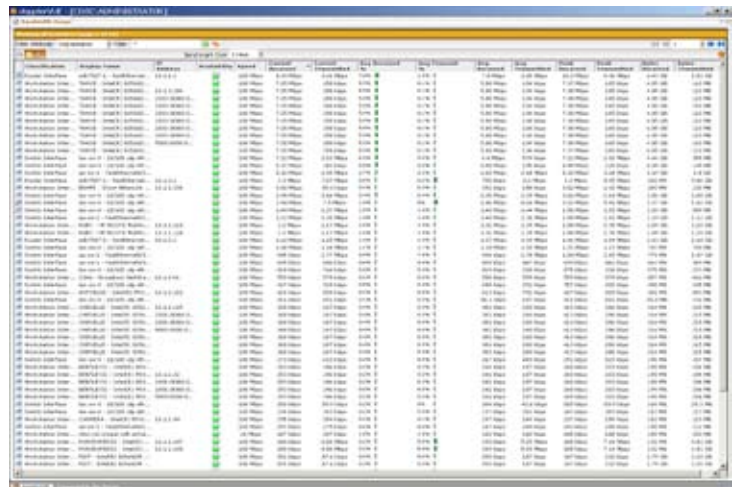
**TIP:** If you're not ready to purchase a proprietary packet analyzer, [WireShark](http://www.wireshark.org) (<http://www.wireshark.org>) is a good freeware alternative.

## 5 Find your top bandwidth users

It's no secret that business applications have to compete with "recreational" users for network bandwidth. Whenever bandwidth and application performance becomes an issue, look for users who may be consuming high levels of bandwidth. See if your network management tool produces a bandwidth report listing workstations and other devices by host name, IP address, and bits-per-second. Try correlating high recreational usage to peak bandwidth utilization on your WAN links, and then notifying users according to your organization's network usage policy.

## Troubleshooting Bandwidth and Performance Issues with dopplerVUE

dopplerVUE's top-down approach to network management makes it easy to quickly locate bandwidth and performance issues. Built-in ICMP, SNMP, NetFlow, IP SLA, and WMI monitoring allows to you easily troubleshoot your WAN connections and other critical network elements. The Bandwidth Usage view constantly monitors interfaces across your network, allowing you to sort across multiple metrics. To see your most active interfaces, sort by Utilization Percentage, or to see your top bandwidth consumers, sort by Current Bits-Per-Seconds. For the performance side, use the Locator view to see the current status of your network devices and servers at a glance, and then drill-down to device, server, and interface details.

The image shows a screenshot of the dopplerVUE software interface, specifically the 'Bandwidth Usage' view. It displays a large table with multiple columns representing different network metrics. The columns include 'Device', 'Interface', 'Current Bits-Per-Seconds', 'Utilization Percentage', and several other performance indicators. The data is sorted, likely by utilization percentage, as indicated by the caption. The interface has a standard Windows-style window with a title bar and menu options.

**Figure 1:** Check top bandwidth usage in one click with dopplerVUE's Bandwidth Usage view. Filter your entire network inventory and sort by an of eight key bandwidth statistics.

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## About dopplerVUE

dopplerVUE is a powerful yet easy to use network management solution for managing up to 5000 network elements. To see how dopplerVUE can solve your network management needs, visit to [www.dopplerVUE.com](http://www.dopplerVUE.com). For more information call 888-dvue-now (888-388-3669).