Troubleshooting TCP/IP LAN Communication Issues

GC/LC ChemStation

Agilent Technologies

Contents

1. Introduction

This topic provides information and tasks designed to help resolve problems related to TCP/IP LAN communications when running the Agilent GC, LC ChemStation. This topic assumes a basic knowledge of LAN communications, including the TCP/IP protocol, a basic understanding of networks and networking, and a basic understanding of the hardware and functions of networks (cabling types, hubs, switches, routers, static versus dynamic IP addresses, DNS servers, subnets, gateways, and so forth).

LAN-based communications problems can appear with any of the following symptoms:

- Cannot connect to an instrument

- Intermittent loss of communications with an instrument

- Sudden loss of communications to an instrument

2. General Information

DHCP cannot be used to assign IP addresses to Agilent instruments used with MT ChemStation. The Agilent ChemStation computer and all connected instruments must use static IP addresses assigned at the PC, instrument front panel, or from a BootP service (used with some older instrument models).

Each computer and instrument uses a Network Interface Card (NIC) to provide LAN communications. In some instruments such as the 7890A, the NIC is built-in. For some other instruments, the NIC is a separate accessory or "card" that is installed. In either case, the NIC provides communications programming and the physical connector (jack) for the LAN cable.

3. Connectivity Issues

General test procedure

1. **Determine the IP addresses used in the configuration**. Each computer, printer, and instrument on the network must have a unique IP address. Duplicated addresses cause conflicts and disrupted communications. To determine the current computer IP address:

   a. Click **Start…Run**, then in the **Open** field type **cmd** . Click **OK**.

   b. Type the following command, then press <Enter>:
      Ipconfig /all <Enter>
      The communications settings for all LAN devices in the computer are listed.

   c. Record the IP address, subnet mask, and gateway settings for the PC.

   d. Check to make sure that you have the same class IP address and the associated subnet mask in your LAN.

2. **Record the IP address,** subnet **mask, and gateway** for every instrument you wish to control using the Agilent ChemStation.

   - **If using the BootP** service, open the **Bootp Settings** screen. Select **Start > Agilent BootP Service > EditBootPSettings**. On the **Bootp Settings** screen, click **Edit BootP Addresses**... to display the list of the IP addresses. Make sure there are no duplicates in the list. Record the entries for your instruments.

   - **From Configuration Editor**, select **Start-Programs > Agilent ChemStation > Configuration Editor**. You will see all configured instruments displayed and their corresponding IP addresses.

   - **If using a 6890N, 6850N, or 7890A** the IP address can be obtained from the front GC keypad. For 7820A, view the IP address using the software keypad/remote controller.

3. **Compare the collected IP addresses**. Make sure that the IP addresses entered into Configuration Editor match the IP addresses used for the instruments.

4. **Check Cables and LEDs.** Ensure that all the network cables are tightly plugged at both ends. Check the end in the Hub/Switch and the one in the LAN card of the PC or instrument. When properly connected and working, LAN cards provide green and yellow LEDs as a visual indicator of network connectivity. Look on the back of the NIC adapter of the PC and the back of the instrument.

   If there is no green LED, there is no connectivity. Look for a hardware problem such as a disconnected cable, dead LAN, defective switch/hub, router, or defective NIC.
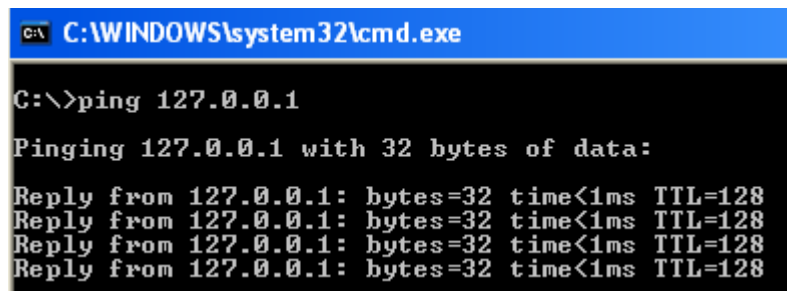
   If there is a red LED lit, there is a problem with the NIC.

   If the green LED is lit, with a flashing yellow or orange LED, the LAN card is properly connected and working. This condition indicates an active network, and verifies that the jack in the wall is working.

Disconnect the LAN cable and confirm that the network reports it is disconnected. Re-connect the LAN cable and confirm the PC reports the connection.

Power cycle the router.

5. Check your firewall settings and make sure that the firewall is not blocking the incoming and outgoing traffic from the Bootp Service for example.

6. You can test to see if the jack is having trouble by plugging your cable into another jack you know is working. You can also plug another device with a working LAN connection, such as a laptop, into the same jack.

7. If the error message 'Service Control Manager reported an error etc.' when you logon to Windows, this could indicate a bad NIC card or corrupt software driver for the NIC card. If this occurs, check the Windows **Event Viewer** program for details found in Administrative Tools.

8. Check if the computer's network card is functioning properly and that TCP/IP is installed correctly as follows:

   a. Click **Start -> Run**, then type "**cmd**" and click **OK**. This opens the Command Prompt.

   b. Type "**ping 127.0.0.1**" and press **<Enter>.** You should see four lines that read something like this
   "**Reply from 127.0.0.1: bytes=32 time<10ms TTL=64**".
   If you are getting anything else, there is a problem with your NIC card. Reinstall the driver of the NIC adapter and if the problem is still there then change the NIC adapter and reconfigure it.

   c. You might have to reinstall the NIC adapter and the software drivers that came with it.

   d. If you are getting a normal ping response, next ping your PC IP address. You should see four lines that read something like this
   "**Reply from 129.174.xxx.xxx: bytes=32 time<10ms TTL=64**". A successful ping means TCP/IP is installed and correctly initialized. If you are getting anything else, there is a problem with your TCP/IP protocol. Remove the TCP/IP protocol that you have in your network configurations and then reinstall it.

If the PING 'Request Timed Out' when pinging the instrument, try the following:

1. Check the cabling (did the cable become unplugged?).

2. Test the cabling connection by disconnecting and reconnecting the cabling and check the PC for the LAN connection status.

3. Check the hub, switch, or router settings. Make sure the instrument is not connected to the switch or hub Cascade port. Try a different switch or hub--has the Switch gone bad?

4. Check that no DHCP servers interfere with the usage of Agilent BootP Service, as these servers also respond to BootP requests. DHCP servers also may send a different IP address to the instrument each time it is started.

5. Restart the BootP service and then power cycle the instrument. After restart, open a command prompt. Repeat the Ping test for the IP address of the newly power cycled instrument.

6. Review the BootP Log file for the correct Mac Address is assigned with the correct IP address.

7. Power off the hub/switch or router and power it back on again, then repeat the Instrument's ping test. Use a crossover cable (no switch/hub) to one instrument and ping again.

Possible to Ping the Instrument, but not connect to an instrument from ChemStation

1. Consider if the network is just very busy. If there is too much traffic going on the network, this can interfere with ChemStation data acquisition and instrument control. Monitor the collision lights on the switch or hub.

2. Verify that the same IP address is used in the BootP service and the configuration editor.

3. Verify that the same IP address is used in the instrument and the configuration editor.

4. If the ping request was answered successfully by the instrument but you cannot connect to the instrument with your ChemStation, you need to verify that your Windows TCP/IP settings are correct for the selected network; especially the subnet mask and gateway settings. PING only checks the hardware levels and not the subnet mask or gateway. The gateway and subnet mask can be incorrect and you can PING (receive a reply) the instrument but not connect to the instrument using ChemStation.

5. The instrument may be used by another software application.

6. In Configuration Editor, check if the wrong instrument type was selected.

4. Multi-Homed or Dual NIC Card Configuration Section

It is important to have the Network Bindings set correctly for any Windows operating system. The following is applicable to GC/LC ChemStation.

Change the bindings order to ensure the Local Network Connection for the instrument (GC, LC, etc) is at the top of the Bindings order.

To change the Windows® XP Professional Network Bindings:

1. Select Start > Settings > Network Connections.

2. Click on Advanced menu then Advanced Settings... menu! This menu has the Adapters and Bindings settings panel.

3. Move the Local Area Connection connected to the instrument to the Top of this list. Highlight the correct connection, and then use the arrows to the right of the panel.

To change the Windows® Vista Network Bindings:

1. Select Start > Control Panel > Network and Internet Connections > Network Connections > Manage Network Connections > Organize > Menu.

2. Click on Advanced menu then Advanced Settings. Advanced Settings will give Network Adapters and Bindings Order.

3. Move the Local Area Connection connected to the instrument to the Top of this list. Highlight the correct connection, and then use the arrows to the right of the panel.

To change the Windows 2000 Network Bindings:

1. Right click on My Network Places, select Properties.

2. Click on Advanced menu then Advanced Settings... menu! This menu has the Adapters and Bindings settings panel.

3. Move the Local Area Connection connected to the instrument to the Top of this list.

Multi-homed NIC cards – Windows® NT

Make sure the instrument is communicating with only one LAN card, then add second card. This ensures the Bootp service program binds to the first card -- the one associated with the instrument(s).

Note if you have 2 NIC cards: On Windows NT, the first LAN card Adapter must be configured for the ChemStation and instrument control, not your company LAN. If this is not the case, remove the second LAN adapter, then reconfigure the first Adapter for the ChemStation.

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