

Microsoft® Official Course



Module 5

Resolving Network Connectivity Issues

Microsoft®

Module Overview

- Determining Network Settings
- Troubleshooting Network Connectivity Issues

Lesson 1: Determining Network Settings

- Networking Components of Windows 8.1
- Tools for Troubleshooting Network Settings

Networking Components of Windows 8.1

Windows 8.1 includes a variety of tools for managing network connections:

- Network charm
- Network and Sharing Center
- Network location categories
- Homegroups
- Network Setup Wizard
- NDF
- Network Explorer
- Network discovery

Tools for Troubleshooting Network Settings

Tool	Purpose
Event Viewer	View errors relating to network activity
Windows Network Diagnostics	Diagnose and resolve network problems
IPConfig	Display IP configuration information and control the DNS resolver cache
Ping and Pathping	Verify basic IP connectivity
Tracert	Verify a routing path
NSLookup	Test name resolution
Windows PowerShell	Configure and troubleshoot network-related settings
Microsoft Message Analyzer	Capture and analyze network traffic

Lesson 2: Troubleshooting Network Connectivity Issues

- Procedure for Troubleshooting Network Connections
- Considerations for Troubleshooting Wireless Networks
- Troubleshooting IPv4 Connectivity
- Demonstration: Determining Network Settings
- Troubleshooting Name Resolution
- Demonstration: Troubleshooting DNS
- Additional Considerations for IPv6 Networks
- Microsoft Message Analyzer
- Demonstration: Using Microsoft Message Analyzer to Capture Network Traffic

Procedure for Troubleshooting Network Connections

Use the following steps to troubleshoot network problems:

1. Determine the scope of the problem
2. Determine the IP configuration
3. Determine the network hardware configuration
4. Test communications
 - a) Verify basic connectivity
 - b) Determine the end-to-end routing and firewall configuration
 - c) Test name resolution
 - d) Test connectivity to a specific remote host server process

Considerations for Troubleshooting Wireless Networks

When you troubleshoot wireless networks, the process is slightly modified:

1. Determine the scope of the problem
2. Determine the IP configuration
3. Determine the network hardware configuration
 - a) Check for interference
 - b) Verify a wireless access point is within range
4. Verify that security settings match
5. Test communications

Troubleshooting IPv4 Connectivity

Your troubleshooting process might consist of the following steps:

1. Consult Windows Network Diagnostics
2. Check the local IP configuration
3. Verifying two-way communication
4. Identify each hop between two systems
5. Verify DNS configuration
6. Verify port availability
7. Determine firewall configuration



Troubleshooting IPv4 Connectivity

1. Consult Windows Network Diagnostics
2. Check the local IP configuration
 - IPConfig /all
 - Get-NetIPAddress
 - Get-NetIPv4Protocol



Troubleshooting IPv4 Connectivity

3. Verify two-way communication
 - Portqry or Telnet
 - Ping or test-connection
 - Pathping or Tracert
4. Identify each hop between two systems
 - Pathping or Tracert



Troubleshooting IPv4 Connectivity

5. Verify DNS configuration

- ipconfig /displaydns and /flushdns
- Get-DnsClientCache and Clear-DnsClientCache
- Resolve-Dnsname and NSlookup

6. Verify port availability

- Ping
- Portqry
- telnet

7. Determine firewall configuration



Demonstration: Determining Network Settings

In this practice session, you will:

- View IPv4 configuration from a GUI
- View IPv4 configuration from a command line
- Test connectivity
- Check Windows Firewall configuration
- Reconfigure the IPv4 configuration







Troubleshooting Name Resolution

To troubleshoot name resolution:

1. Clear DNS resolver cache
2. Verify connectivity to remote host by IP address
3. Verify connectivity to the remote host by hostname
4. If the test is unsuccessful, edit the hosts text file
5. Repeat step 3. Name resolution should now be successful
6. Remove the entry that you added to the hosts file, and clear the resolver cache
7. Verify name resolution function. At the command prompt, type one of the following commands:
 - `Nslookup.exe -d2 LON-cl1.adatum.com. > filename.txt`
 - `Resolve-dnsname lon-cl1.adatum.com. > filename.txt`

Demonstration: Troubleshooting DNS

In this practice session, you will:

- View and clear the name cache
- Test name resolution to LON-DC1
- Create a record in the hosts file
- Test the new record
- Test name resolution



Additional Considerations for IPv6 Networks

- IPv6 is enabled by default in Windows 8.1, and is the preferred transport for communication
- IPv6:
 - Does not impair IPv4 functionality
 - Cannot be uninstalled, but can be disabled
 - Troubleshooting steps are very similar to those for IPv4

Microsoft Message Analyzer

The screenshot displays the Microsoft Message Analyzer interface. The window title is "Administrator: Microsoft Message Analyzer". The menu bar includes "File", "Home", and "Charts". The left sidebar contains navigation options: "Save As", "Quick Open", "Close", "Start Page", "Browse", "Capture / Trace", "Options", "About", and "Exit".

The main workspace is divided into several sections:

- Session Information:** "Session name:* Trace Session 3" and a "Comment:" field.
- Trace Scenarios:** A tree view under "My Items (16)" > "Network (7)" showing:
 - Link Layer (PEFNDIS): NDIS LWF Tracing shipped with Message Analyzer (requires Windows 8 or below)
 - Link Layer (NDISCAP): NDIS LWF Tracing shipped with the OS (requires Windows 8.1)
 - Firewall: Windows Filtering Platform Tracing
 - Firewall with Discarded Packets (Administrator privilege required)
 - Windows Filtering Platform Tracing with Discarded Packets
- Trace Scenario Configuration:** A configuration panel for the selected scenario, showing:
 - Buttons: Remove, Clear List, Add Provider
 - Table of providers:

Name	Id
<input checked="" type="checkbox"/> Provider not installed or could not locate manifest.	9de85b12-1202-467c-
 - ETW Provider Core Configuration:

Id	9de85b12-1202-467c-8047-ed308fb776c3
Level	Verbose
KeywordToMask	True
Keywords(Any)	0x0000000000000000
Keywords(All)	0x0000000000000000
 - Id: GUID of the event trace provider that you want to enable or disable.
 - Trace Filter:
 - Buttons: Verify, Library, History, Clear
 - Text: "Enter a filter expression, such as:"
 - Example expressions: `tcp.port==80`, `*address==192.168.1.1`

At the bottom, there are three buttons: "Manage Scenarios", "Advanced Configuration", and "Save Scenario". The status bar at the very bottom shows: "Ready", "Session Total: 0", "Available: 0", "ViewPoint: Default", and "Version: 4.0.6211.0".

Demonstration: Using Microsoft Message Analyzer to Capture Network Traffic

In this practice session, you will:

- Capture network traffic with Microsoft Message Analyzer
- Analyze the captured network traffic
- Filter the network traffic



Lab: Resolving Network Connectivity Issues

- Exercise 1: Resolving a Network Problem (1)
- Exercise 2: Resolving a Network Problem (2)
- Exercise 3: Troubleshooting a Wireless Network

Logon Information

Virtual machines:

20688D-LON-DC1

20688D-LON-CL1

User name:

Adatum\Administrator

Password:

Pa\$\$w0rd

Estimated Time: 60 minutes



Lab Scenario

The help desk at A. Datum Corporation has received a number of network trouble tickets that they cannot resolve. They have passed on these trouble tickets to you. You need to determine how to resolve each of these problems, and then document your solution.

Lab Review

- What was your approach to the first scenario?
How did your approach differ from the class?
- What was your approach to the second scenario?
How did your approach differ from the class?
- What was your approach to the third scenario?
How did your approach differ from the class?

Module Review and Takeaways

- Review Questions