SPECIAL PROGRAM IN TECHNICAL VOCATIONAL EDUCATION (SPTVE)
COMPUTER SYSTEMS SERVICING 9 Q3-W7

I. Topic: Network connectivity checking procedures and techniques

II. Objectives:

1. recognize the different strategies in checking network connectivity;
2. determine the correct procedure in checking network connectivity and;
3. examine the easiest ways in troubleshooting network connectivity.

III. Brief Introduction of the Lesson

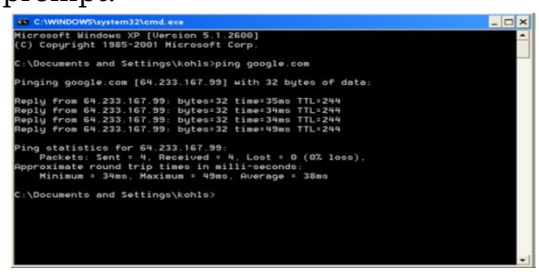
Basic Network Problems

- **Cable Problem**: The cable which is used to connect two devices can get faulty, shortened or can be physically damaged.
- **Connectivity Problem**: The port or interface on which the device is connected or configured can be physically down or faulty due to which the source host will not be able to communicate with the destination host.
- **Configuration Issue**: Due to a wrong configuration, looping the IP, routing problem and other configuration issues, network fault may arise and the services will get affected.
- **Software Issue**: Owing to software compatibility issues and version mismatch, the transmission of IP data packets between the source and destination is interrupted.
- **Traffic overload:** If the link is over utilized then the capacity or traffic on a device is more than the carrying capacity of it and due to overload condition the device will start behaving abnormally.
- **Network IP issue:** Due to improper configuration of IP addresses and subnet mask and routing IP to the next hop, the source will not be able to reach the destination IP through the network.

The Ping Utility

The ping utility is one of the most helpful tools in network problem troubleshooting. It gives you a very quick way to determine if a device or network service is functioning correctly on a network. How to Use:

1. In Windows, click on Start and Run.
2. In the Open: box, type cmd and press <Enter>. You will see a window with a black background and a command prompt.



3. At the command prompt, type ping followed by either the host name (e.g. computer name, website address, etc.) or the IP address of the device or service you would like to test then press <Enter>.
4. If pinging the network device or service was unsuccessful, you may see one of several screens shown in the succeeding steps. This screen is usually a case

where the machine has absolutely no connectivity to a network. This could be a result of the computer you are running the ping on not physically connected to the network.
Here are some examples of what could be the problem:
a. Unplugged or bad network patch cable (cable that connects the computer to the wall jack);
b. Bad network line or jack run from the wall outlet back to the data center room switch;
c. Bad network switch;
d. Bad network card;
e. Incorrect network card drivers loaded on the machine;
f. Wrong network settings on the computer.

The ipconfig Utility
The ipconfig utility is used to find out what network settings are being applied to a computer. Network settings include the machines IP address, subnet mask, default gateway, and other network information.

How To Use:
1. Follow the same steps explained above for the tracert and ping utility to bring up a command prompt window.
2. At the command prompt, simply type ipconfig and press <Enter>.
3. In the screen above you will notice the Connection-specific DNS suffix which is simply just the name of the network also known as a domain that the machine resides in.
4. One option of using ipconfig for troubleshooting is to perform one of the following tasks to have the machine acquire a new IP address.
i. First type ipconfig /release. This will remove the current IP address of the machine. If you run this, you should not be able to access any network resources.
ii. Now, type ipconfig /renew. This will send out a request to the nearest server for a new IP address. Doing so will bring the machine back onto the network.
These can be helpful when you are not sure if the machine is having problems due to a change in network settings at a higher level. It will also tell you that the machine is communicating over the network successfully.

How to use the netstat command to view network connections
1. Click the 'Start' button.
2. Enter 'cmd' into the search bar to open the command prompt.
3. Wait for command prompt (black window) to appear. This is the window where you'll enter the 'netstat' command.
4. Enter 'netstat -a' to view current connections.
When you run netstat command, a list of current TCP (Transmission Control Protocol connections and ports) with the details like computer name, local address, remote address, state, etc. will display.
5. Enter 'netstat -b' to see the programs using connections.
6. Enter 'netstat -n' to see the IP addresses.
When you run this command, it will also show the TCP list but with the IP address of the computers or services instead of their name.
7. Enter 'netstat /?' to view the more commands available for you.

IV. Activities:

Activity 1

Directions: Arrange the steps of using the netstat command to view network connections in chronological order by using number 1 to 7. Write your answer on the space provided for.

____Enter 'netstat /?' to view the more commands available for you
____Enter 'netstat -n' to see the IP addresses.
____Enter 'netstat -b' to see the programs using connections.
____Enter 'netstat -a' to view current connections.
____Wait for command prompt (black window) to appear
____Enter 'cmd' into the search bar to open the command prompt.
____Click the 'Start' button.

Activity 2

Directions: Arrange the steps of network checking connectivity using PING in chronological order by using letter A to D. Write your answer on the space provided for.

____ This could be a result of the computer you are running the ping on not physically connected to the network
____At the command prompt, type ping followed by either the host name (e.g. computer name, website address, etc.) or the IP address of the device or service you would like to test then press <Enter>.
____In the Open: box, type cmd and press <Enter>. You will see a window with a black background and a command prompt
____ In Windows, click on Start and Run.

Activity 3

Directions: Give a short solution on how to troubleshoot the following problem. Write your answer on the space provided for.

1.Cable Problem:

2.Connectivity Problem:

3.Configuration Issue:

4.Software Issue:

5.Traffic overload:

6.Network IP issue:

V. Assessment:

Directions: Encircle only the letter of the correct answer.

1.You are the new IT admin, and you need to find the network configuration. What should you use?
A. ipconfig B. cmd C. netchange D. newnet
2.This cmd utility is used for remote server management.
A .telnet B. netstat C. ping D. SSH
3.Which command will open the command prompt from windows environment?
A. Edit B.CMD C. Prompt D. commando
4.Which command shows the contents of the current working directory?
A. dir B. direcotry C.RD D. pwd
5.Which command test connectivity between two devices?
A. ping B. poing C. test D. test connection/all

VI. Reflection:

Why is basic troubleshooting network connectivity important to learn first?

References:
1. https://www.softwaretestinghelp.com/network-troubleshooting-steps-tools/
Date retrieved: January 7, 2021

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