Addressing and Routing Principles
Exercises

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Ping and Traceroute

- **ping** \[address|host_name\]
  - Enables testing the reachability of a host
- **tracert** \[address|host_name\]  (on Windows)
- **traceroute** \[address|host_name\]  (on Unix)
  - Visualizes the route to a host
Exercise 1: Basic Troubleshooting Tools

Execute the following commands

- ping 130.192.182.33
- tracert 130.192.182.33

Based on the output of the last command, which is the address of the default gateway of the host you are using?

- Execute a ping to that address
Exercise 2: Host Configuration

By looking at the configuration information of your host, find out the following:

- Address of host
- Netmask
- Network part of the address
- Host part of the address
- Address of the default gateway
  - Does it match the one found in the previous exercise?
  - If not, why not?

Execute a ping and a tracert to the address of

- Your host
- Its default gateway
Exercise 3: Direct Reachability

Check the IP configuration of one of the other hosts in the lab

- Compare netmask, network part and default gateway to the one of your host
- **Execute a ping** to the address of that host
  - If using Windows the firewall must be disabled for this to work
- **Execute a tracert** to the address of that host
  - What is different in the output with respect to `tracert 130.192.182.33`
Changing Host Configuration

Since the lab PC configuration is not possible due to lack of administrative privileges, a virtual machine (VM) is used to perform the following exercises:

- A VM image can be found in s:\ComputerNetworks
- Please copy it to c:\temp
- Double click on the .vmx file
  - A linux VM will be executed
- Have the hypervisor generated a new MAC address
- Use linux commands (e.g., ifconfig) to assign addresses 130.192.31.(120+<PC number>)
- Netmask and default gateway are the ones previously observed.
Exercise 4: Host Configuration

Change the IP configuration of your host so that it has the same network part and default gateway of another host in the lab, but different host part.

- Execute the following commands
  - `ping 130.192.182.33`
  - `tracert 130.192.182.33`
  - Compare the output to the one obtained in Exercise 1 and explain the cause of possible differences

- Get the address of another host in the lab
  - Execute a `ping` to that address
  - Execute a `tracert` to that address
  - Compare the output to the one obtained in Exercise 3 and explain the cause of possible differences
Exercize 5: Default Gateway Misconfiguration

In the IP configuration of your host change the default gateway to the address of another host in the lab

- Execute the following commands
  - `ping 130.192.182.33`
  - `tracert 130.192.182.33`
  - Compare the output to the one obtained in Exercise 1 and explain the cause of possible differences

- Get the address of another host in the lab
  - Execute a `ping` to that address
  - Execute a `tracert` to that address
  - Compare the output to the one obtained in Exercise 3 and explain the cause of possible differences
Exercise 6: Logical IP Subnet Misconfiguration

In the IP configuration of your host change the network part of the address

- Execute the following commands
  - `ping 130.192.182.33`
  - `tracert 130.192.182.33`
  - Compare the output to the one obtained in Exercise 1 and explain the cause of possible differences

- Get the address of another host in the lab
  - Execute a `ping` to that address
  - Execute a `tracert` to that address
  - Compare the output to the one obtained in Exercise 3 and explain the cause of possible differences