

NETWORK TROUBLESHOOTING

ping!

RESPONSIBILITIES

- Networking systems together is often a difficult task, further complicated by large networks and special requirements.
- For this reason, networking is its own area of expertise
- The network engineer is responsible for everything up to and including the cable and plug connecting to the server
- The systems engineer is responsible for everything within the server, up to and including the network card interfacing to the cable.

BASICS

- Basic network troubleshooting boils down to verifying three aspects of network performance:
 - LAN access
 - Inter-LAN access
 - DNS service
- Notice the parallels to the last lecture? Indeed!

LAN ACCESS

- LAN access means being able to at least talk to another machine *on your subnet*.
- Obtaining at least this level of access indicates that everything is working fine with the network card, the device drivers, the cable and initial point of access to the network
- This also verifies the IP address and subnet mask
- So how to test? First tool of network troubleshooting!

PING

- ping: “Packet Internet Groper”
 - Using IP/ICMP echo requests and echo replies, times the response time between two machines.
- `ping 192.168.0.1`
- Times reported are Round Trip Times (RTT) and represent the time between sending a request and receiving a response.

LAN ACCESS

- Using ping, one can verify LAN connectivity by simply pinging a machine on the LAN.
- But what should you ping?
- The gateway is a great start! Always on the subnet, and [should] always be online.

INTER-LAN ACCESS

- Checking inter-LAN access verifies the gateway in two ways:
 - It tests that the gateway itself is working correctly
 - It also tests that the gateway is correctly configured in the system.
- To test, simply ping an IP address in another subnet.
- But what to ping?
 - DNS servers - they're often times not on the same subnet
 - Memorize another IP in your network, or a public one: 8.8.8.8

DNS

- Checking DNS verifies name to IP mapping
- Simple to test: ping a server by name
- Pick any server: yahoo.com, google.com, mycompany.com
- So long as it's a name, the DNS system will be tested

MORE TOOLS

- Besides ping, there are other network troubleshooting tools available for more advanced diagnostics:
 - `tracert`: Traces the route a message takes to get from the source machine to the destination.
 - `netstat`: Network statistics - details on open and recently closed network connections
 - `iptraf`: network statistics tool

MORE TOOLS

- `nmap`: Network mapper - useful for seeing what services are showing on a particular machine
- `tcpdump`: A tool to dump raw network traffic for analysis
- `wireshark`: GUI interface to a `tcpdump`-like tool
- `ntop`: Top-like command for network connections
- `ngrep`: `grep` for network connections! :)

EXERCISES

- Use ping to check connectivity to rackspace.com.
- Traceroute a few sites and review the output.


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