                         Thursday, January 26, 2017

Lab #01: Taste of Networking
============================

+ To start Lab 1, I ended up working with John Doe and Jane Doe on IT29. We
  decided that Jane would log into the workstation because she was the only one
  of us to currently have a working Windows account.

+ When we looked at the Ethernet outlet next to our workstation, the cable was
  plugged into the left-hand side (LHS). It turns out that the LHS connects to
  the cs.umb.edu network.

+ We decided to use PowerShell as our command line utility, and we also opened
  Notepad, to save our output.

+ For our URL, we chose www.yale.edu, and we typed in the following command:

    ping -n 5 www.yale.edu

  This was our output:

    Ping request could not find host www.yale.edu. Please check the name and try again.

  That output seemed odd, but we noticed that we did not have an actual Internet
  connection while connected to the LHS.

+ Next, we typed in the command "ipconfig /all", and got the following output:

     Windows IP Configuration

         Host Name . . . . : IT25
         Primary Dns Suffix . . . . : winpcs.cs.umb.edu
         Node Type . . . . : Hybrid
         IP Routing Enabled. . . . . : No
         WINS Proxy Enabled. . . . . : No
         DNS Suffix Search List. . . . . . : winpcs.cs.umb.edu
                                             cs.umb.edu
                                             localdomain

     Ethernet adapter Local Area Connection:

         Connection-specific DNS Suffix . : cs.umb.edu
         Description . . . . : Intel(R) Ethernet Connection I217-LM
         Physical Address. . . . . : 34-17-EB-BD-5E-26
         DHCP Enabled. . . . . : Yes
         Autoconfiguration Enabled . . . . : Yes
         Link-local IPv6 Address . . . . . : fe80::a5d8:371f:4866:5850%11(Preferred)
         IPv4 Address. . . . . : 192.168.105.132(Preferred)
         Subnet Mask . . . . : 255.255.0.0
         Lease Obtained. . . . . : Monday, February 06, 2017 7:56:14 PM
         Lease Expires . . . . : Monday, February 06, 2017 9:56:13 PM
         Default Gateway . . . . : 192.168.104.1
         DHCP Server . . . . : 192.168.104.13
         DHCPv6 IAID . . . . : 244879510
         DHCPv6 Client DUID. . . . . : 00-01-00-01-20-10-6F-8D-34-17-EB-BD-5E-26
         DNS Servers . . . . : 10.0.0.251
                                             10.0.0.252
         NetBIOS over Tcpip. . . . . : Enabled

     Ethernet adapter Local Area Connection 3:

         Connection-specific DNS Suffix . : localdomain
         Description . . . . : VMware Virtual Ethernet Adapter for VMnet1

```
        Physical Address. . . . . . . . . : 00-50-56-C0-00-01
        DHCP Enabled. . . . . . . . . . . : Yes
        Autoconfiguration Enabled . . . . : Yes
        Link-local IPv6 Address . . . . . : fe80::5d4a:ca6f:215b:1abb%13(Preferred)
        IPv4 Address. . . . . . . . . . . : 172.16.42.1(Preferred)
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Lease Obtained. . . . . . . . . . : Tuesday, January 31, 2017 11:53:29 AM
        Lease Expires . . . . . . . . . . : Monday, February 06, 2017 8:23:33 PM
        Default Gateway . . . . . . . . . :
        DHCP Server . . . . . . . . . . . : 172.16.42.254
        DHCPv6 IAID . . . . . . . . . . . : 318787670
        DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-20-10-6F-8D-34-17-EB-BD-5E-26
        DNS Servers . . . . . . . . . . . : 172.16.42.1
        NetBIOS over Tcpip. . . . . . . . : Enabled

    Ethernet adapter Local Area Connection 2:

        Connection-specific DNS Suffix  . : localdomain
        Description . . . . . . . . . . . : VMware Virtual Ethernet Adapter for VMnet8
        Physical Address. . . . . . . . . : 00-50-56-C0-00-08
        DHCP Enabled. . . . . . . . . . . : Yes
        Autoconfiguration Enabled . . . . : Yes
        Link-local IPv6 Address . . . . . : fe80::ada9:eff0:c6bf:2077%14(Preferred)
        IPv4 Address. . . . . . . . . . . : 172.16.40.1(Preferred)
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Lease Obtained. . . . . . . . . . : Tuesday, January 31, 2017 11:53:27 AM
        Lease Expires . . . . . . . . . . : Monday, February 06, 2017 8:23:30 PM
        Default Gateway . . . . . . . . . :
        DHCP Server . . . . . . . . . . . : 172.16.40.254
        DHCPv6 IAID . . . . . . . . . . . : 352342102
        DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-20-10-6F-8D-34-17-EB-BD-5E-26
        DNS Servers . . . . . . . . . . . : 172.16.40.2
        Primary WINS Server . . . . . . . : 172.16.40.2
        NetBIOS over Tcpip. . . . . . . . : Enabled

    Tunnel adapter isatap.cs.umb.edu:

        Media State . . . . . . . . . . . : Media disconnected
        Connection-specific DNS Suffix  . : cs.umb.edu
        Description . . . . . . . . . . . : Microsoft ISATAP Adapter
        Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
        DHCP Enabled. . . . . . . . . . . : No
        Autoconfiguration Enabled . . . . : Yes

    Tunnel adapter Local Area Connection* 14:

        Media State . . . . . . . . . . . : Media disconnected
        Connection-specific DNS Suffix  . :
        Description . . . . . . . . . . . : Teredo Tunneling Pseudo-Interface
        Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
        DHCP Enabled. . . . . . . . . . . : No
        Autoconfiguration Enabled . . . . : Yes

    Tunnel adapter isatap.localdomain:

        Media State . . . . . . . . . . . : Media disconnected
        Connection-specific DNS Suffix  . : localdomain
        Description . . . . . . . . . . . : Microsoft ISATAP Adapter #4
        Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
        DHCP Enabled. . . . . . . . . . . : No
        Autoconfiguration Enabled . . . . : Yes

+ Our next command was the following:

    tracert www.yale.edu
```

We got the following for output:

    Unable to resolve target system name www.yale.edu.

  As with the ping command earlier, we were unable to get any usable results,
  most likely because we had no Internet connection through the LHS.

+ After we were done with the LHS, it was time for class to end, so we saved the
  output, and Jane e-mailed it to us so we could have it for our admin logs. She
  then logged out, and we left.

                        Saturday, January 28, 2017

+ I had some time over the weekend, so I did some online research about the ping,
  ipconfig, and tracert commands. Apparently, these are different types of
  command-line tools that you can use to test and troubleshoot your network
  connection. Even though we are working in a Windows environment, there seem
  to be equivalents on other operating systems.

+ Here are a couple of the resources I found on those commands:

  * "8 Common Network Utilities Explained" on How-To Geek
    http://www.howtogeek.com/190148/8-common-network-utilities-explained/

  * "8 Common Network Utilities Explained" on Pluralsight
    https://www.pluralsight.com/blog/it-ops/
                top-7-tcpip-utilities-every-networking-pro-should-know
    (This one is from 2009, but most of it looks like it is still applicable.)

  There are also lots of videos on YouTube, as well, which help to show how they
  actually work in practice. I ended up sending these resources to my lab
  partners so that they could study up on this stuff, too.

+ I have a feeling we will be using a lot of these before the semester is out.

                        Tuesday, January 31, 2017

Lab #01 - Continued
====================

+ Last class, we stopped after completing the instructions for the left-hand
  side (LHS). When we started lab again, we noticed that someone had already
  moved the Ethernet cable to the right-hand side (RHS), so we did not have to
  change anything.

+ The RHS connects to the IT Lab's own LAN -- the it.cs.umb.edu network. For
  this part of the lab exercise, I sat at the keyboard and did the typing and
  copy/pasting, while John and Jane observed and occasionally chimed in.

+ We ran all the same commands, and this time, we seemed to get better output
  because we had an actual Internet connection on the RHS. Below is the output
  we received for each command:

    * Output for "ping -n 5 www.yale.edu":

        Pinging www.yale.edu.cdn.cloudflare.net [104.16.140.133] with 32 bytes of data:
        Reply from 104.16.140.133: bytes=32 time=4ms TTL=56
        Reply from 104.16.140.133: bytes=32 time=3ms TTL=56

```
        Reply from 104.16.140.133: bytes=32 time=3ms TTL=56
        Reply from 104.16.140.133: bytes=32 time=3ms TTL=56
        Reply from 104.16.140.133: bytes=32 time=3ms TTL=56

        Ping statistics for 104.16.140.133:
            Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
        Approximate round trip times in milli-seconds:
            Minimum = 3ms, Maximum = 4ms, Average = 3ms

    * Output for "ipconfig /all":

        Windows IP Configuration

            Host Name . . . . . . . . . . . . : IT25
            Primary Dns Suffix  . . . . . . . : winpcs.cs.umb.edu
            Node Type . . . . . . . . . . . . : Hybrid
            IP Routing Enabled. . . . . . . . : No
            WINS Proxy Enabled. . . . . . . . : No
            DNS Suffix Search List. . . . . . : winpcs.cs.umb.edu
                                                it.cs.umb.edu
                                                localdomain

        Ethernet adapter Local Area Connection:

            Connection-specific DNS Suffix  . : it.cs.umb.edu
            Description . . . . . . . . . . . : Intel(R) Ethernet Connection I217-LM
            Physical Address. . . . . . . . . : 34-17-EB-BD-5E-26
            DHCP Enabled. . . . . . . . . . . : Yes
            Autoconfiguration Enabled . . . . : Yes
            Link-local IPv6 Address . . . . . : fe80::a5d8:371f:4866:5850%11(Preferred)
            IPv4 Address. . . . . . . . . . . : 10.0.0.244(Preferred)
            Subnet Mask . . . . . . . . . . . : 255.255.255.0
            Lease Obtained. . . . . . . . . . : Monday, February 06, 2017 8:11:20 PM
            Lease Expires . . . . . . . . . . : Monday, February 06, 2017 8:21:20 PM
            Default Gateway . . . . . . . . . : 10.0.0.1
            DHCP Server . . . . . . . . . . . : 10.0.0.1
            DHCPv6 IAID . . . . . . . . . . . : 244879510
            DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-20-10-6F-8D-34-17-EB-BD-5E-26
            DNS Servers . . . . . . . . . . . : 10.0.0.251
                                                10.0.0.252
            NetBIOS over Tcpip. . . . . . . . : Enabled

        Ethernet adapter Local Area Connection 3:

            Connection-specific DNS Suffix  . : localdomain
            Description . . . . . . . . . . . : VMware Virtual Ethernet Adapter for VMnet1
            Physical Address. . . . . . . . . : 00-50-56-C0-00-01
            DHCP Enabled. . . . . . . . . . . : Yes
            Autoconfiguration Enabled . . . . : Yes
            Link-local IPv6 Address . . . . . : fe80::5d4a:ca6f:215b:1abb%13(Preferred)
            IPv4 Address. . . . . . . . . . . : 172.16.42.1(Preferred)
            Subnet Mask . . . . . . . . . . . : 255.255.255.0
            Lease Obtained. . . . . . . . . . : Tuesday, January 31, 2017 11:53:28 AM
            Lease Expires . . . . . . . . . . : Monday, February 06, 2017 8:38:34 PM
            Default Gateway . . . . . . . . . :
            DHCP Server . . . . . . . . . . . : 172.16.42.254
            DHCPv6 IAID . . . . . . . . . . . : 318787670
            DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-20-10-6F-8D-34-17-EB-BD-5E-26
            DNS Servers . . . . . . . . . . . : 172.16.42.1
            NetBIOS over Tcpip. . . . . . . . : Enabled

        Ethernet adapter Local Area Connection 2:

            Connection-specific DNS Suffix  . : localdomain
            Description . . . . . . . . . . . : VMware Virtual Ethernet Adapter for VMnet8
```

```
        Physical Address. . . . . . . . . : 00-50-56-C0-00-08
        DHCP Enabled. . . . . . . . . . . : Yes
        Autoconfiguration Enabled . . . . : Yes
        Link-local IPv6 Address . . . . . : fe80::ada9:eff0:c6bf:2077%14(Preferred)
        IPv4 Address. . . . . . . . . . . : 172.16.40.1(Preferred)
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Lease Obtained. . . . . . . . . . : Tuesday, January 31, 2017 11:53:26 AM
        Lease Expires . . . . . . . . . . : Monday, February 06, 2017 8:38:31 PM
        Default Gateway . . . . . . . . . :
        DHCP Server . . . . . . . . . . . : 172.16.40.254
        DHCPv6 IAID . . . . . . . . . . . : 352342102
        DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-20-10-6F-8D-34-17-EB-BD-5E-26
        DNS Servers . . . . . . . . . . . : 172.16.40.2
        Primary WINS Server . . . . . . . : 172.16.40.2
        NetBIOS over Tcpip. . . . . . . . : Enabled

    Tunnel adapter isatap.it.cs.umb.edu:

        Media State . . . . . . . . . . . : Media disconnected
        Connection-specific DNS Suffix  . : it.cs.umb.edu
        Description . . . . . . . . . . . : Microsoft ISATAP Adapter
        Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
        DHCP Enabled. . . . . . . . . . . : No
        Autoconfiguration Enabled . . . . : Yes

    Tunnel adapter Local Area Connection* 14:

        Media State . . . . . . . . . . . : Media disconnected
        Connection-specific DNS Suffix  . :
        Description . . . . . . . . . . . : Teredo Tunneling Pseudo-Interface
        Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
        DHCP Enabled. . . . . . . . . . . : No
        Autoconfiguration Enabled . . . . : Yes

    Tunnel adapter isatap.localdomain:

        Media State . . . . . . . . . . . : Media disconnected
        Connection-specific DNS Suffix  . : localdomain
        Description . . . . . . . . . . . : Microsoft ISATAP Adapter #4
        Physical Address. . . . . . . . . : 00-00-00-00-00-00-00-E0
        DHCP Enabled. . . . . . . . . . . : No
        Autoconfiguration Enabled . . . . : Yes

  * Output for "tracert www.yale.edu":

        Tracing route to www.yale.edu.cdn.cloudflare.net [104.16.140.133]
        over a maximum of 30 hops:

        1    <1 ms    <1 ms    <1 ms   IT20 [10.0.0.1]
        2    <1 ms    <1 ms    <1 ms   158.121.251.129
        3     1 ms    <1 ms     1 ms   158.121.251.241
        4     1 ms    <1 ms    <1 ms   158.121.254.250
        5     1 ms    <1 ms    <1 ms   134.241.2.212
        6     2 ms     1 ms     1 ms   69.16.3.3
        7     4 ms     3 ms     3 ms   nox1sumgw1-miti-cps.nox.org [207.210.142.57]
        8     4 ms     4 ms     3 ms   mass-ix.as13335.net [206.53.143.9]
        9     4 ms     3 ms     3 ms   104.16.140.133

        Trace complete.

+ The output from the ping and tracert commands looked a lot different than they
  did when we were working on the LHS.  This time, there was much more output
  and detail, on the RHS.  We asked about this and it turned out that NO ONE is
  getting network access on the LHS!
```

+ We considered going ahead and working on the Lab #1 questions, but then we
  decided the second lab looked really interesting to us. So, we started working
  on that, instead.

Lab #02: Development Tools and Upper Layers
==

+ To start Lab 2, we left me logged into the workstation, but John took over at
  the keyboard, while Jane and I observed. We opened Google Chrome and decided
  on the following website:

    http://csb.stanford.edu/class/public/pages/sykes_webdesign/05_simple.html

  It seemed like a good choice because it did not have very much going on, in
  terms of page features.

+ While at the page, we opened up the Developer Tools. We actually were not sure
  where to find them, at first. We looked at the Chrome menu, but we did not
  it right away. However, when we scanned it more closely, we noticed the "More
  Tools" part, where we then saw "Developer Tools" and clicked on it.

+ Doing this opened up a view that took up half of the window. This looked kind
  of inconvenient, but Chris showed us how to dock the Developer Tools at the
  bottom of the window, which made it easier for us to navigate.

+ Around this time, we started to read the "Chrome DevTools Overview" at the
  provided URL. We chose to focus on the stuff needed for the Lab -- Elements
  and Network -- while skimming over a lot of the other stuff.

+ A lot of it made sense enough, but there were two parts, in particular, that I
  simply could not wrap my head around:

    * "Debugging Java Script". That seemed to refer to the Sources tab of the
      DevTools, but I could not really understand any of it. It seemed to be
      related to programming in JavaScript, and I haven't done any programming
      until this semester, in one of my other classes.

    * "Audits". That didn't really make any sense to me either, and I guess it
      might have a lot to do with the fact I haven't used many of the Chrome
      browser's more advanced tools in the past. Maybe I'll get more of that
      experience in here.

+ One thing I know I want to read more about later is the Profiles tab because
  it has a lot to do with performance, such as JavaScript and CSS.

+ Class was about to end, so we did not have time to go read more in-depth about
  the Elements and Network tabs. Instead, we all agreed to read about it over
  the next couple of days, before the next class, so that we can continue with
  the work.

                        Wednesday, February 1, 2017

+ Today seemed like a good time to work on the questions for Lab 1, so here they
  are...

Lab #01 Questions
=================

1. Briefly describe the ping command and its uses. (No more than 2 sentences.)

   Ea enim vita expetitur, quae sit animi corporisque expleta virtutibus, in
   eoque summum bonum poni necesse est, quandoquidem id tale esse debet, ut
   rerum expetendarum sit extremum. Adsint etiam formosi pueri, qui ministrent,

respondeat his vestis, argentum, Corinthium, locus ipse, aedificium-hos ergo
asotos bene quidem vivere aut beate numquam dixerim.

2. Was your first ping command successful? How could you tell? If you had to
   try some different URLs, how did you know when you had achieved success?

   Si enim sapiens aliquis miser esse possit, ne ego istam gloriosam memorabile
   virtutem non magno aestimandam putem. Sed tempus est, si videtur, et recta
   quidem ad me. Is ita vivebat, ut nulla tam exquisita posset inveniri voluptas,
   qua non abundaret. Qui et definierunt plurima et definiendi artes reliquerunt,
   quodque est definitioni adiunctum, ut res in partes dividatur, id et fit ab
   illis et quem ad modum fieri oporteat traditur; Tum ille: Finem, inquit,
   interrogandi, si videtur, quod quidem ego a principio ita me malle dixeram
   hoc ipsum providens, dialecticas captiones.

3. Briefly describe the ipconfig command and its uses. (No more than 2 sentences.)

   Cenasti in vita numquam bene, cum omnia in ista Consumis squilla atque
   acupensere cum decimano. Ita enim parvae et exiguae sunt istae accessiones
   bonorum, ut, quem ad modum stellae in radiis solis, sic istae in virtutum
   splendore ne cernantur quidem.

4. What is the Linux equivalent of the ipconfig command?

   [answer to question]

5. For both LHS and RHS, indicate the values of each of the following fields for
   your primary Ethernet adapter when you ran the ipconfig command:

	LHS	RHS
Description	Intel(R) Ethernet Connection I217-LM	Intel(R) Ethernet Connection I217-LM
Physical Address	34-17-EB-BD-5E-26	34-17-EB-BD-5E-26
IPv4 Address	192.168.105.132(Preferred)	10.0.0.244
Subnet Mask	255.255.0.0	255.255.255.0
Lease Obtained	Monday, February 06 2017 7:56:14 PM	Monday, February 06, 2017 8:11:20 PM
Lease Expires	Monday, February 06, 2017 9:56:13 PM	Monday, February 06, 2017 8:21:20 PM
Default Gateway	192.168.104.1	10.0.0.1

https://ozh.github.io/ascii-tables/

6. What were the main differences you noticed in the output for the ipconfig
   command, for LHS versus RHS? What do you think accounts for those differences?

   Itaque hoc frequenter dici solet a vobis, non intellegere nos, quam dicat
   Epicurus voluptatem. Perspicuum est enim, nisi aequitas, fides, iustitia
   proficiscantur a natura, et si omnia haec ad utilitatem referantur, virum
   bonum non posse reperiri. Cenasti in vita numquam bene, cum omnia in ista
   Consumis squilla atque acupensere cum decimano. Ita enim parvae et exiguae
   sunt istae accessiones bonorum, ut, quem ad modum stellae in radiis solis,
   sic istae in virtutum splendore ne cernantur quidem. Itaque hoc frequenter
   dici solet a vobis, non intellegere nos, quam dicat Epicurus voluptatem.

7. Briefly describe the tracert command and its uses. (No more than 2 sentences.)

Cenasti in vita numquam bene, cum omnia in ista, Consumis squilla atque
acupensere cum decimano. Ita enim parvae et exiguae sunt istae accessiones
bonorum, ut, quem ad modum stellae in radiis solis, sic istae in virtutum
splendore ne cernantur quidem.

8. What is the Linux equivalent ....