Testing Verizon Modem

As a test of whether a 3G cellular modem could replace the WIFI network connection at Manitou Forest Observatory, I've setup a titan DSM in my office, with a Cradlepoint CTR350 router and a Verizon USB720 modem. The modem uses an external antenna (6" dipole) in the window of my office.

The modem's signal strength can be viewed from the **Modem**->**Info** page of the router's WWW interface. It is currently showing a 92% signal strength at -79 dBm:

```
Name         Value
Manufacturer:          Novatel Wireless Inc.
Model Info:          MC760 VERIZON
Modem Firmware Version:          Q6085BDRAGONFLY_V139 [Jul 02 2009 18:00:00]
Carrier Status:          UP
ESN/IMEI:          5B4F86F2
Mobile Directory Number:          7204707887
Connection Type:          CDMA
PRL Version:          53013
Signal Strength (%):          92
Signal Strength (dBm):          -79
PhysicalPort          USB1
Connection Status:          Connected
```

CTR350 serial number: MM090168701586
CTR350 MAC: 00 30 44 06 bc 0f

Crontab entries check the status of the ethernet and Verizon link, and can power cycle the router if necessary:

```
# Only run router_check.sh if net_check.sh succeeds to avoid power cycling modem if the problem is with t
he ethernet connection
1,31 * * * * net_check.sh eth0 192.168.0 192.168.0.1 && router_check.sh 8 www.eol.ucar.edu www.google.com
# Every 4 hours, run router_check.sh by itself, in case the router needs
# power cycling to get the ethernet working
10 */4 * * * router_check.sh 8 www.eol.ucar.edu www.google.com
```

Rsync transfers from the Titan to FLAB are running at about 61 KB/sec. This was a transfer with compression enabled, of binary files (shareable libraries):

```
sent 294 bytes  received 5998216 bytes  61523.18 bytes/sec
total size is 16029060  speedup is 2.67
```

Transfers the other way are about 85 KB/sec:

```
sent 5998221 bytes  received 214 bytes  85084.18 bytes/sec
total size is 16029060  speedup is 2.67
```

Remote Admin

Remote admin is enabled on port 30080 from all hosts with 128.117 IP addresses. However I have not been able to successfully get past the login screen. After entering the password, nothing more appears. Firefox status bar says "Transfering...". tcpdump shows packets arriving from port 80 of isfs4.dyndns.org, but nothing is rendered. Cradlepoint tech help says it is because the signal strength of -80 dBm is too low, that it needs to be up around -65 to -70. He says he did get past the login screen, but I have never been able to. I'm dubious. Maybe its a Firefox thing? Steve Oncley just tried Chrome and Safari. No luck.

With the system outside, the signal strength showed as 96%, -77 dBm, but still remote admin would not work.

Power Supply

The power supply consists of the following in a cooler box:

- Power-One HB12 supply, 12V, 1.7A
- Morningstar Sunguard charge controller
- Panasonic lead-acid, 12V, 7.2 Ah battery

On Mar 12, started testing the whole system, modem, router, DSM and power supply in the back lot of FL1 near the yard maintenance shed. Will watch the voltages to see that the HP12, controller and battery can keep up.

Kurt felt the values on 3/13 were too low to maintain a healthy battery, so he turned a pot on the charger to increase the voltage. The values for 3/14 are much better.

Date	HB12 Output	Battery
3/13	12.1 V	12.08 V
3/14	14.2 V	13.7 V

Installed

On March 21, at 11:55 MDT, John Ortega installed the system at Manitou. It came up and is online, and has registered with DynDNS as mfogw.dyndns. org. It is mounted on the scaffolding tower, next to the Skybeam WIFI. A little 6" dipole antenna is connected to the Verizon modem. He attached a grounding strap from the gray DSM box to the tower. There is an ethernet surge protector inside the box to provide protection on the ethernet cable coming up the tower, once it is connected. A GPS is on port 3 and NTP looks good.

Here is the current network configuration. Note that it is not connected to the rest of the MFO network at this time.

host	address
Cradlepoint router	192.168.0.1
RAL server	192.168.0.5
DSM	192.168.0.10

The RAL server at 192.168.0.5 is configured as the DMZ host - the Cradlepoint should pass all traffic, except those ports otherwise forwarded, to the RAL server.