2015-07: Changes for Serial-to-IP Conversion for the Teledyne Modem (DRAFT)

Overview

During the history of HiSeasNet, the satellite modems on ship and shore have connected to routers via a synchronous serial link. The new modems have the ability to route IP traffic themselves and provide some forms of acceleration to the links. Moving the modems from serial connections to IP will allow some optimization of the links, the removal of many if not all of the shipboard HiSeasNet routers, and open up the possibility for significantly more shore-based monitoring and management of shipboard modems, much more proactive management of the HiSeasNet links, and some automated adjustments to maintain sketchy links.

Many of the detailed changes required for this transition can be made from shore. The intent is to have ship techs make a sufficient number of basic changes to bring the ship modems online so that shore staff can handle the detailed changes and not burden the techs. During the course of these changes there will be NO changes to the RF settings (frequencies, power levels, data rates, etc.) or any DAC tracking. All of the changes are related to IP routing and modem-to-network data exchange.

Unfortunately, all of the ship and shore modems on a given satellite beam must be converted at the same time to complete the IP paths. The plan is to find convenient (in port, on transit, or otherwise less critical) times for each beam to be transitioned over with minimal disruption. The HiSeasNet staff hopes to make these transitions reasonably quick, on the order of an hour or so. Once complete, ships should not need to complete this process again as future satellite beam moves will be handled as they have been in the past.

Like beam transitions, the changes described below can be performed at any time, but will take the ship offline until all ships make the transition. The process will be easiest if techs read through these instructions prior to the actual change, get familiar with the equipment and settings to be changed, and are available on Slack (preferred) or IM via a backup satellite link at the agreed upon time. Should there be catastrophic trouble of some sort, changing the ship settings to point back to the previous values on the satellite will NOT be enough to restore service. In addition to the ship changes, there will be significant changes being made on shore to support the new flow of data. Steve Foley's phone number is 858-822-3356. If you are still having trouble 1 hour after the designated time and have not been in touch with Steve, try Jon Meyer at 858-534-5194.

Teledyne Satellite Modem

First, confirm that you are running a newer version of firmware, either DE_6May or an official Teledyne release after that. If you aren't running a recent release, see the bottom of the Teledyne wiki page (https://wiki.hiseasnet.ucsd.edu/display/hsnops/Teledyne+Q-Flex+modems) for upgrade instructions.

Second, make sure you enable the old-style menus after you upgrade to a firmware that is 24June or later. To do this:

1. Telnet to the modem M&C IP address and login with user "pup" and password "TEST" (hit enter a few times to get a prompt), then issue the following commands from a '$' prompt
    a. **login paradise**
    b. **save showBridgeMode**
2. You should see a message saying "File saved OK" when you were successful.
3. Reset or power cycle the modem to enable the new menus.

Third, adjust the HiSeasNet settings:

1. When ready to proceed, perform the following tasks through the front panel or web interface:
2. Save existing configuration with a name and a save at (**Edit** -> **Memories** -> **Store**).
3. Switch from *serial* to *Ethernet* mode by setting (**Edit** -> **Tx** -> **Service** -> **Closed** -> **Terrestrial Interface**) to "IP"
4. Turn *Bridge M&C* to 0n in (**Edit** -> **IP**).

5. From the (**Edit** -> **IP** -> **Advanced** -> **DHCP&NAT**) menu in the “Miscellaneous” section, do the following:

Point to Multipoint mode	`Remote`
VLAN Filtering	`On`
VLAN ID	`<see table below for your ship ID>`
Ethernet Address Learning	`On`

6. Setup traffic IP address and gateway from the (Edit -> IP) page using the following fields:
    a. Traffic IP address as **defined in the table below**
    b. Traffic IP subnet mask `255.255.255.128`
    c. Modem IP gateway IP address as **defined in the table below**
7. From the (Edit -> IP -> Advanced) menu in the `DHCP & NAT` section, set the `DHCP Server Start Address` to something in your Traffic IP subnet.
8. Setup NTP
9. Change cabling so that the CAT5 cable currently between the Cisco router and the “DMZ” network is moved between the DMZ and the Teledyne modem’s Traffic port.

Once this is done, HiSeasNet shore staff should be able to configure the rest of the details over the satellite. There may need to be some adjustments to IP addresses or other settings as the router parameters of the modem are tuned to each ship’s individual settings.

Ship Settings

Ship	VLAN ID	M&C IP address (external network/"WAN")	M&C subnet mask	Traffic address (internal network/"LAN" -- former Cisco IP)	Traffic subnet mask	Gateway IP	Multiple subnets?
Atlantis	193	192.168.96.193	255.255.255.128	128.128.252.1	255.255.255.240	192.168.96.129	—
Revelle	194	192.168.96.194	255.255.255.128	137.110.254.217	255.255.255.248	192.168.96.129	—
Thompson	195	192.168.96.195	255.255.255.128	140.142.254.201	255.255.255.248	192.168.96.129	✓
Kilo Moana	196	192.168.96.196	255.255.255.128	128.171.124.241	255.255.255.248	192.168.96.129	—
Langseth	197	192.168.96.197	255.255.255.128	129.236.95.1	255.255.255.0	192.168.96.129	✓
Sikuliaq	198	192.168.96.198	255.255.255.128	199.165.123.1	255.255.255.240	192.168.96.129	✓
Endeavor	209	192.168.96.209	255.255.255.128	131.128.217.225	255.255.255.224	192.168.96.130	—
Pelican	210	192.168.96.210	255.255.255.128	192.168.3.1	255.255.255.224	192.168.96.130	—
Walton Smith	211	192.168.96.211	255.255.255.128	10.106.39.1	255.255.255.0	192.168.96.130	✓
Oceanus	212	192.168.96.212	255.255.255.128	192.168.4.241	255.255.255.240	192.168.96.130	—