Current Status

RVTEC 2008

Tallahassee, FL

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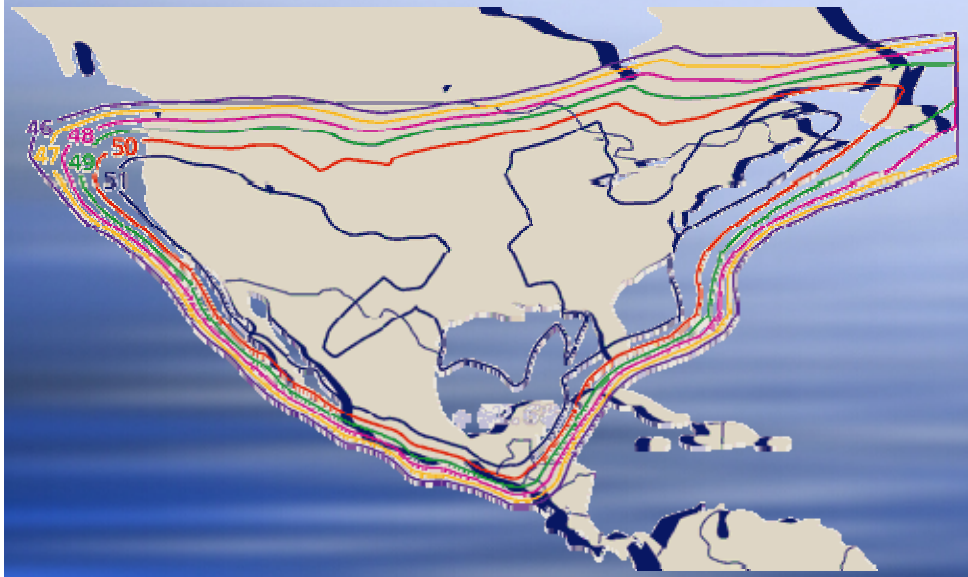
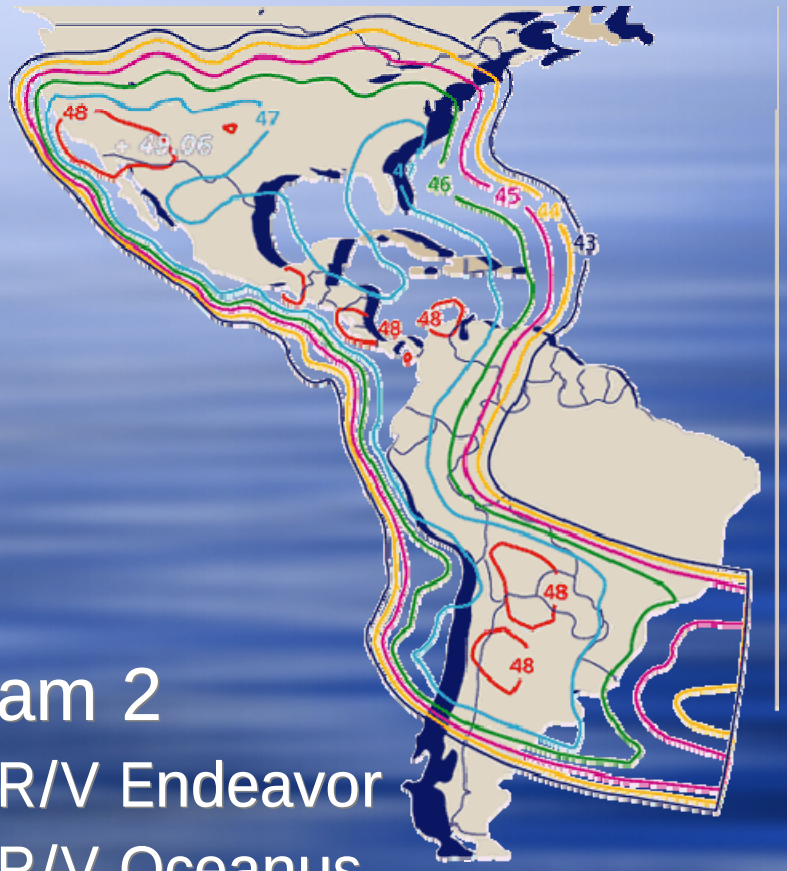
HiSeasNet Services

- Satellite bandwidth
  - Ship-to-shore: 96kbps (C-Band), 64kbps (Ku)
  - Shore-to-ship:
    - 256kbps for 5 slots on both AOR and POR C-Band satellites (~50kbps per ship, but shared)
    - 192 kbps for 3 slots on North Ku-Band, 256kbps for 4 slots on Gulf Ku-Band Beam 2 (~64kbps/ship but shared)
- Earth station connection to Internet in at SIO
  - Direct routing through to home institution
  - Run your own IP services however you want (email, web browsing, VoIP, video teleconferencing, file transfers, campus services, data exchange, remote control, etc.)
- Ship equipment maintenance roughly 2x/year

Ku-Band Coverage (SatMex5)





- Beam 1
  - R/V New Horizon
  - R/V Point Sur
  - R/V Wecoma
- Beam 2
  - R/V Endeavor
  - R/V Oceanus
  - R/V Pelican
  - R/V Walton Smith

HiSeasNet Fleet

- C-Band (2.4m dish, Global coverage)
  - Atlantis
  - Kilo Moana
  - Knorr
  - Langseth
  - Melville
  - Revelle
  - Seward Johnson
  - Thompson
- Ku-Band (North America coastal coverage)
  - Endeavor (1.2m)
  - New Horizon (1.2m)
  - Oceanus (1.5m)
  - Pelican (1m)
  - Point Sur (1m)
  - Walton Smith (1m)
  - Wecoma (1.5m)

HiSeasNet Changes in 2008

- Wecoma online
- POR and AOR both 256 kbps shore-to-ship with 5 slots each, supporting 8 C-band ships
- Wiki improvements (http://www.hiseasnet.net/wiki)
  - Added calendar (ICS feed)
  - Major expansion of FAQ section
  - Added additional resources of all sorts
- Added new statistics page to website that breaks down ship bandwidth usage

Issues addressed since last RVTEC

- Network operating license
  - FCC license required for permanent earth stations, intended to protect spectrum from interference
  - Rules are a little different between C and Ku-band
  - Originally told we didn't need one for mobile stations, classifications are changing now
  - Ship applications are in process at FCC
  - FCC license does not apply in foreign ports
  - C-band earth station license application got lost earlier this year and has been re-submitted. Awaiting interference reports (4 month process, due in early 2009)
- More bandwidth was added for AOR and POR
- Training class developed

Interesting projects in 2008

- 1 month increase in ship-to-shore bandwidth to 256kbps for Endeavor
  - Video stream back to shore, webcast from there
- Wecoma on GE-23 for a short period of time
  - Required some temporary hardware and minor antenna modifications

Equipment Downtime since RVTEC 2007

Date	Station	Description	Ship days lost
12/1/07	Earth Station	KuB1 Tx cable failure	0.13
2/4/08	Melville	A/C fan failure	0
2/11/08	Revelle	Optical Az sensor failure	0.5
2/22/08	Earth Station	POR transceiver hiccup	0.5
2/29/08	Earth Station	KuB2 converter leak	~6
3/21/08	Oceanus	Reactor plate failure	48
4/1/08	Knorr	A/C panel failure	0
5/13/08	Seward Johnson	Isolation springs needed replacement	0
5/15/08	Seward Johnson	Converter setting hiccup	1
6/24/08	Revelle	Isolation wire rope needed replacement	0
7/9/08	Earth Station	POR transceiver hiccup from power outage	1
7/21/08	Knorr	Level cage?	0

Training class

- A 4-day HiSeasNet training class was developed and offered in Feb 2008 at WHOI. 14 students attended.
- Topics included
  - Satellite theory and concepts
  - HiSeasNet equipment functioning and troubleshooting
  - IP Network routing
  - HiSeasNet organization, policies, procedures
- Mix of lectures and hands-on skills
- Interest in west coast class sometime in 2009

Failures and Spares

- Most problems are user or ship related
  - Power outage, antenna repoints, gyro failure, unfamiliarity with gear, etc.
  - **Solution**: Training program has helped techs recognize and solve their own problems
- RF gear failures are major cause of ship outages
  - **Solution**:
    - Have the following spares on board:
      - RF spares (transceiver, LNA, Modem): $23k for C-band, $20k for Ku-band >1m, $14k for Ku-band <1m
      - Antenna spares (Standard spares kit **plus** PCU and level cage if not in the standard kit)
    - Still have depot/earth station RF spares in SD

How do we help each other?

- Get involved in the wiki
  - Read the contents, contribute to it
  - Keep an exported PDF copy of the FAQ handy for offline use
- Let us know what you are doing.
  - New IP services, devices, etc. you have tried and how well they work
  - New practical applications of HiSeasNet
  - Collaborative projects using HiSeasNet (we are happy to post links off our website and share info with other scientists)
- Mention problems sooner rather than later.
- Let us know *well before* your ship needs to move between coverage areas.
- Do you have an online calendar? Google?

Future Work

- One or two more ships left?
- Still looking for better coverage options for Ku-band ships. Not much over the water.
  - GE-23 looks better, but limited to 1.5m POR Ku-band ships...ie Wecoma.
- Always more documentation, troubleshooting guides, resources, etc. going into the wiki
- Continue routine maintenance/upgrades of all equipment
- Offer more training classes
- Looking for more ways for scientists to exploit the system

User Group Summary

- Voice over IP (VoIP) experiences and suggestions
- Statistics monitoring
- Bandwidth tuning and acceleration options
- Training class again?
- Routing and tunnel configuration
- Coverage areas

Contact Info

- The HiSeasNet tech staff answers hiseasnet@ucsd.edu fastest
- Steve can be reached directly at:
  - sfoley@ucsd.edu
  - 858-822-3356 (office forwards to me)
  - Old 619 cell number is no good
- Public HiSeasNet Operations mailing lists are mostly for announcements
  - Tech groups on shore and ship should be subscribed to get the latest info
- HiSeasNet Users list is for scientists and others to discuss applications of HiSeasNet

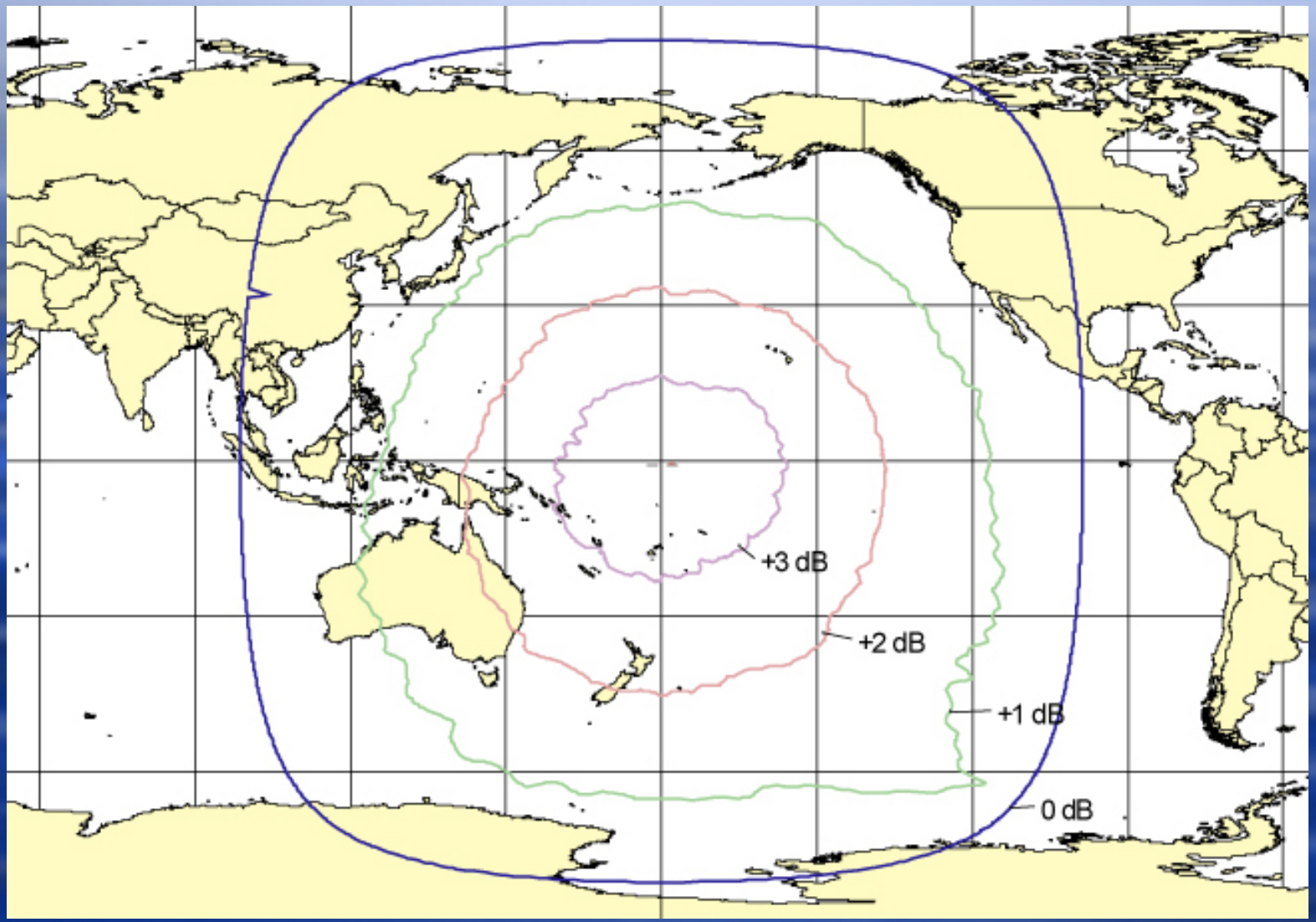
Questions? Comments?

GE-23 Satellite

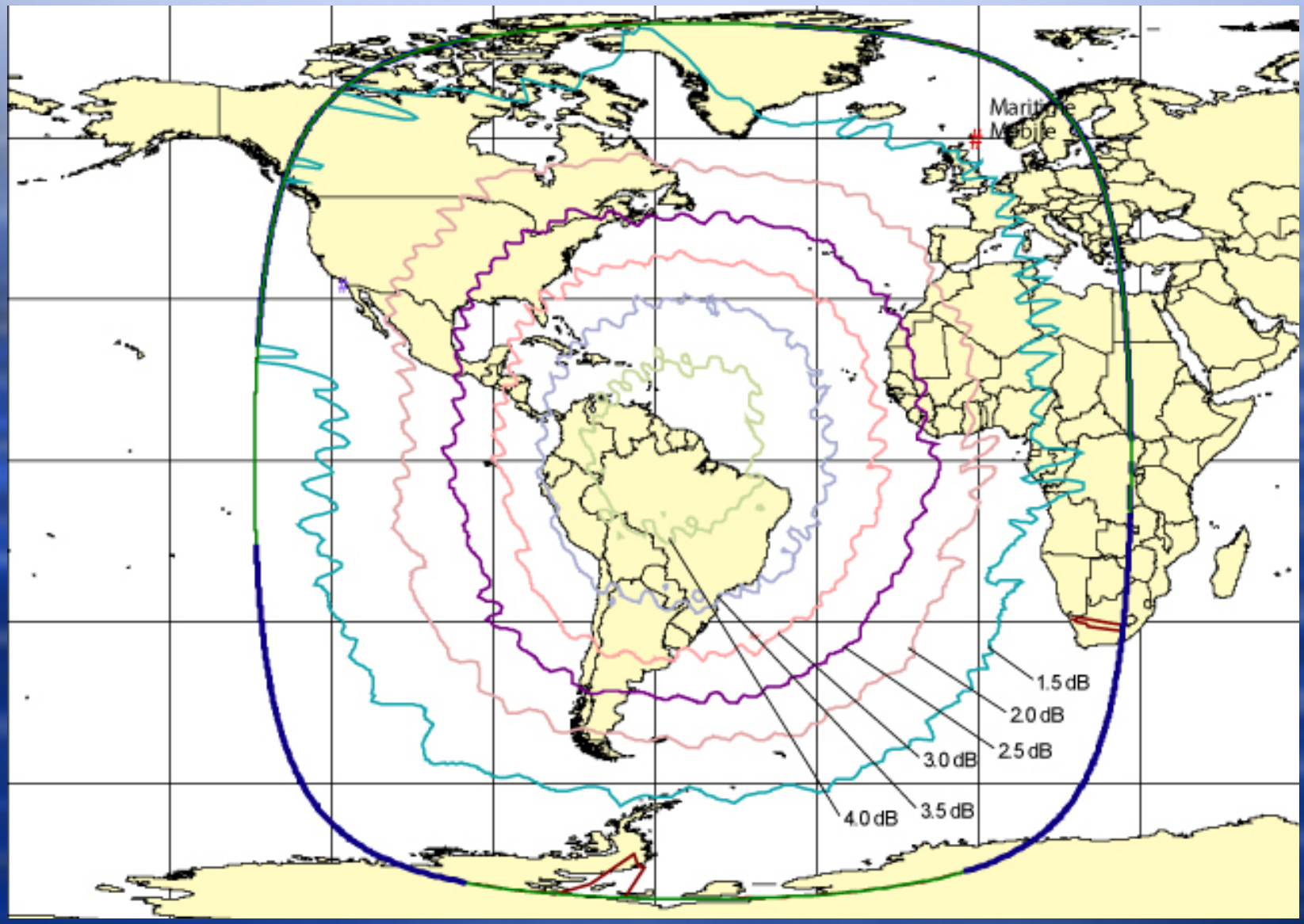
QuickTime™ and a
decompressor
are needed to see this picture.

- Wider beam is weaker and requires larger 1.5m antenna
- No earth station capabilities right now
- Strange satellite, needs some hardware changes to shipboard antennas

Pacific C-band Coverage

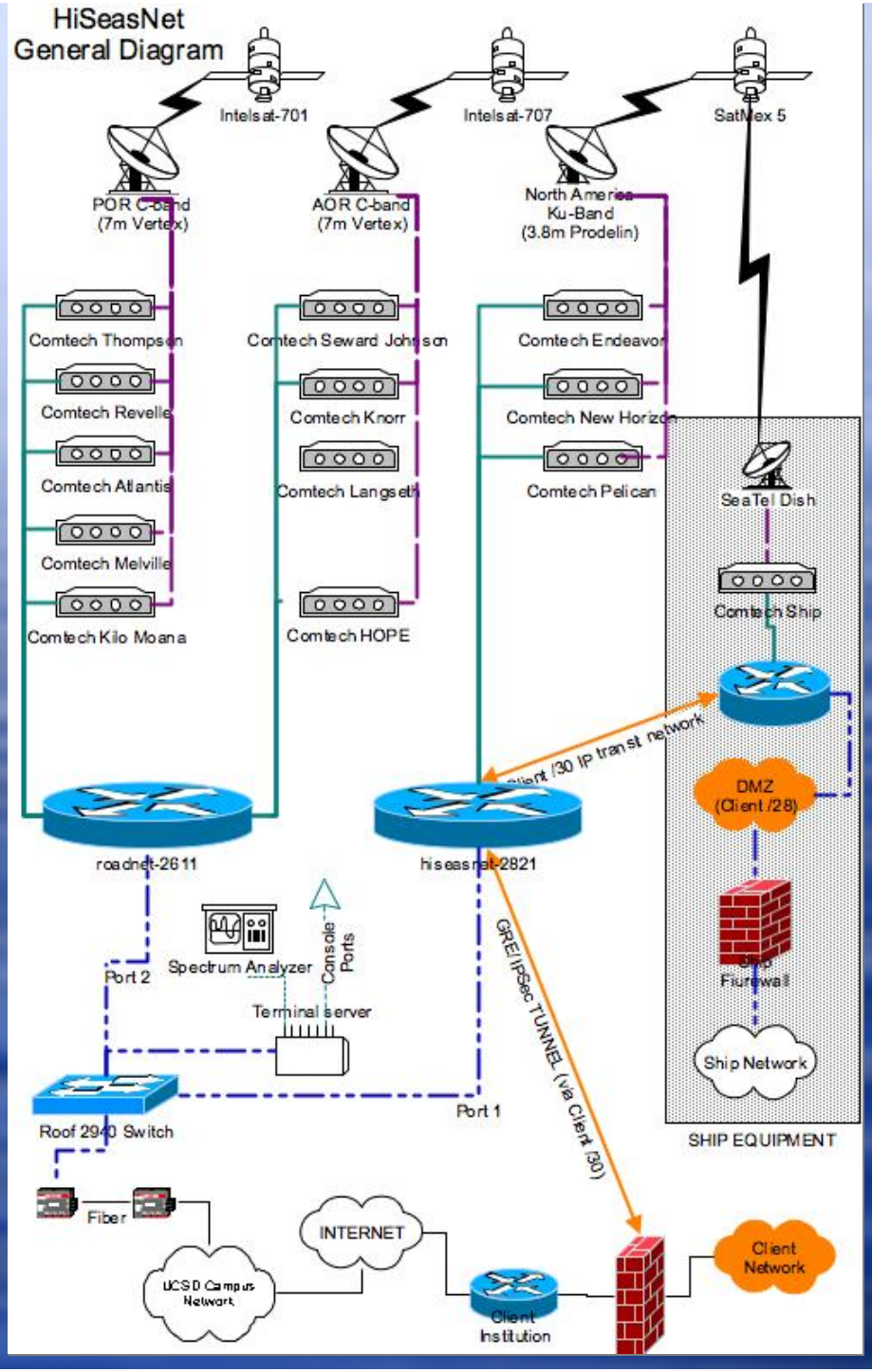


Atlantic/Eastern Pacific C-band



Indian Ocean C-band

Typical Ship Network Setup



High Level Network View