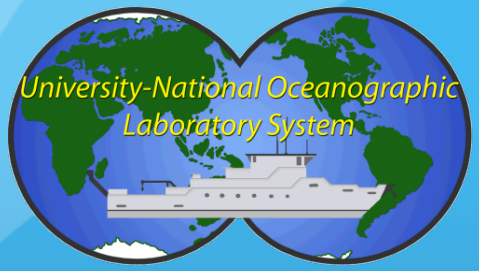

Ship/Shore Communications Subcommittee

UNOLS Council Meeting

12 March 2014

Goal Statement

"The goal of the ship/shore communications subcommittee is to help the federal funding agencies develop a viable plan for the US Academic fleet's ship/shore communications that will help the ships meet the growing demands of internet connectivity for general communications and telepresence."

- Define/quantify day to day bandwidth needs
- Give guidance on infrastructure and models for telepresence
- Create ideas/plans on how to meet the above

Ship/Shore Communications Subcommittee

- 12 members
- 2 Meetings:
  - RVTEC – College Station, TX – 21Nov13
  - NSF – 16Jan14
- Report of findings and recommendations

Report

1. Current Systems/Background
2. Future Day to Day Requirements
3. Telepresence
4. Bandwidth Management
5. Upcoming Technology
6. Recommendations

Current Systems/Background

HiSeasNet (HSN)/C & Ku-Band

- In place since 2002
- "Use it or Lose it"

Pros	Cons
Global Coverage (C-band)	Antennas are large and complicated
Room for Expansion	Not enough bandwidth
Cost/MB	Infrastructure is older
	Ships go out of HSN footprint

~4TB sent through HSN in 2013

Current Systems/Background

Fleet BroadBand (FBB)/L-band

- In place since 2009
- Pay per MB sent

Pros	Cons
Global Coverage	Limited bandwidth
Smaller, more robust antenna	Cost
Reliability	

~1.2TB sent through FBB in 2013

Day to Day Requirements

- Internet at sea
  - Science Operational Support
  - Ship Operational Support
  - Data to ship
  - Data from ship
  - Ship email
  - Access to shore/web email
  - Morale
  - Non-cruise related science business
- Telemedicine
- Voice
  - Science Operational
  - Ship Operational
  - Safety
  - Morale
- Video –streaming
- Video-conferencing
- Desktop-sharing (eg Webex, Go To meeting)
  - Telepresence
  - VPN

Day to Day Requirements (cont.)

- Separate systems
- Auditing capabilities
- Security
- Flexibility
- Scalability
- Reliability

	Shore to Ship	Ship to Shore
C-Band	512 Kbps	256 Kbps
Ku-Band	256 Kbps	256 Kbps

4X the current bandwidth!

Telepresence

- Requests are on the rise

Level	Type	Bandwidth		Example
		Ship to Shore	Shore to Ship	
1	Public Viewing	1.5-2 Mbps	512 Kbps	Streaming standard definition video to the internet.
2	Remote Learning/ Media Events/ Outreach	1.5-2 Mbps	1024 Kbps	Streaming standard definition video to the internet with direct interaction (2-way audio/video) with a school, other venue or media via two-way audio.
3	Telepresence-Enabled Science	6.0-20 Mbps	1.5 Mbps	Streaming at least one channel of high definition video to shore with bi-lateral audio support to shore based scientists working daily with ship-based scientists on a cruise.

Bandwidth Management

- Concern that “bigger pipe” will simply become clogged again.
- Various “systems” within the fleet
- Difficult to create a one-size fits all policy
- Will collect user-level data for 1year
- Draft a plan at the next RVTEC meeting

Upcoming Technology

- C & Ku-Band
  - More efficient, less expensive modems
  - Dual band antennas
- Ka-Band & INMARSAT Global Express (GX)
  - Ka-Band is large spectrum with incredible capability
  - Global spot-beam coverage
  - GX combines L-Band with Ka-band
  - Pros & Cons
  - GX to be fully operational by Q2 2015

Recommendations

Three-Year Plan

Overall:

- Keep current system of HSN as primary & FBB back-up
- Increase HSN bandwidth by 4x & improve infrastructure
- Thoroughly test GX as it starts coming online
- Monitor bandwidth and create a Management Plan
- Move ships toward Level 3 telepresence capability as need and budget allow
- Meet annually at RVTEC
- Review after 3 years

Questions?

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Tech Exchanges / Tech Pool

2013 – 2 ½ Tech Pool Techs

- 30 Total placements

2014 – 3 ½ Tech Pool Techs

- Run through WHOI with independent contractors
- 50 placements set-up so far
- non-”standard” requestors
- “Pool” of other available technician