

SatNAG

Satellite Network Advisory Group

2021 UPDATE



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SatNAG - Satellite Network Advisory Group

- **Advisory Group Members**

- Laura Stolp / Woods Hole Oceanographic Institution
- Ken Feldman / University Of Washington
- Erich Gruebel / University Of Rhode Island
- John Haverlack / University of Alaska Fairbanks

- **Mission Statement**

- To steward the objective, effective and efficient use of ship to shore network resources and optimize positive customer experiences for the UNOLS fleet

- **What We Do**

- SatNAG works in good faith as advocates to the benefit of ARF over personal or home institution interests to advise NSF, the ARF community, and UNOLS Council about key aspects of satellite communication and fleetwide bandwidth management.



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SatNAG - 2021 Year in Review

- **Cyber Infrastructure Working Group (CIWG)**
 - SatNAG members participate in the UNOLS CI/CS Working Group
 - Worked with Peregrine to refine Cyber Security requirements for IMO and ONR
 - Contract development for cooperative agreement with ResearchSOC
- **Next Generation Firewall**
 - Transition from Cyberoam to Sophos XG is in process
 - Completed on R/V Oceanus, R/V Armstrong, R/V Thompson, R/V Atlantis
 - Collaboration with ResearchSOC will influence next iteration
- **Internet Use Policy** being applied on SatNAG members' vessels.
 - satnag.unols.org/internet-use-policy
 - Raised the daily quota to 400 MB per day per user
- **SatNAG wiki** - Regularly updated with current info. tips, and how-tos



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<https://satnag.unols.org>



SatNAG wiki

<https://satnag.unols.org/>

- **Web based documentation and searchable knowledge base**
- **U.S. ARF Maritime Cybersecurity Resources**
 - <https://satnag.unols.org/cybersec/>
- **Documented procedures and how-to docs (continuous improvement)**
 - Sophos upgrade procedures
 - Telepresence and ship to shore solutions
 - Bandwidth management tips and tricks
 - Device maintenance
- **Links to online resources**
 - Internet Use Policy
 - Satellite System Hardware



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Next Generation Firewall

Bandwidth Management

- Controlling the amount of data that a single user or device can consume over a given time period
- Blocking inappropriate or insecure internet access
- Ensures that a limited and very expensive resource is available to all users and is used appropriately

Traffic Monitoring

- North/South: Network traffic moving on/off the ship
- East/West: Network traffic moving within the ship (between LANS/VLANS)
- Detect and isolate problem users
- Detect and isolate problem devices
- Improve network performance

The *Next Generation Firewall* may be a stack of technologies



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Why are RV Networks so Challenging?

- Research Vessels have a very complicated network environment with limited capability to connect with the outside world
 - Bring Your Own Device (BYOD)
 - Need to support every OS
 - Permanent infrastructure for science
 - Permanent infrastructure for ship ops
 - A mix of Information Technology (IT) and Operational Technology (OT)
- In a very short amount of time we've gone from simple networks to Tier 2 or Tier 3 datacenters
 - Redundant, fault tolerant, high performance, hardened against cyber attack
- Every ARF vessel's network is different
- Limited time and personnel for upkeep and improvements



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2021-2022 Goals

- **Deploy Sophos XG Firewalls**

- The Sophos XG is the next iteration of bandwidth management used on ARF research vessels
- Rebuild the traffic usage metrics & reporting

- **Work with HSN, CIWG and ResearchSOC**

- Technical oversight for HiSeasNet on Satellite Communications Services
 - Evaluation of Fleetwide Bandwidth Needs
- Technical oversight for ResearchSOC on Cybersecurity Program
- Next-Generation Firewall / Stop Gap Firewall Future Directions
- Develop a Network Reference Architecture

- **Maintain the user-facing SatNAG website content**

- More tips, tricks, and best practices
- Ongoing Cyber Infrastructure/Security section



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Feedback in Needed and Appreciated

- Email satnag@unols.org
- We want to hear about your needs as scientists, technicians, and vessel operators
- Feedback is especially needed from Regional and Coastal/Local class operators



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Thank You!

Questions?



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