APPENDIX VI

SeaNet Status Report
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SeaNet - Big Ideas

- Extend the existing Internet on, over and through the oceans
- Start to develop an infrastructure that supports a collaborative effort to integrate shared network and telemetry tools for oceanography
- Promote development of network applications that enhance the capabilities of remote research platforms

SeaNet Components

- Communications Nodes (SCN, BCN, End Nodes, Gateways)
- Communications Links (as available)
- Interface Specifications (link, SNMP, SMTP, HTTP)
- Network Management (still to be fully defined)
- Application Layer Service (to help remote science)

Examples of SeaNet Nodes

- Shipboard Communications Node
- Buoy Communications Node
- IP-savvy End Nodes
- Gateway/Proxy Nodes

Potential SeaNet Platforms

- Shore station/laboratory
- Coastal Monitoring Station
- Drifter, various
- Seafloor Observatory
- Buoys
- Aircraft
- Satellite. various
- Ship
- Manned submersible, submarines
- Towed vehicles

- Remotely-operated vehicles
- Autonomous underwater vehicles
- Rain Forests Camps
- Ice Camps

Available Communications Channels

- Direct (verbal, hardcopy)
- Underwater Acoustic Modem (AUV application)
- Cellular Telephone (coastal buoy applications)
- RF, various (RF-LAN, RF-Serial)
- Satellite, shared channel, various (INMARSAT-B)
- Microwave (Point-to-point)
- Satellite, dedicated channel, various (ATS, SATCOM for oceanography ?)
- Shipboard Ethernet
- Fiber Optic (Seafloor observatories, towed vehicle)
- Shipboard Power LAN (?)
- Aircraft Seaphone/RF-Link bridge (?)
- TDRSS (?)

SeaNet Interfaces

- Data Link (TCP/IP or proprietary)
- Human Interface (HTTP)
- Near-RT or software based Command and Mgmt. (SNMP & MIB)
- Store and Forward Command and Mgmt. (SMTP)

SeaNet Network Management

(Still Fuzzy)

- Monitoring SeaNet nodes with SNMP Network
- Accounting (currently integrated into SCN)
- Installation of SCN and BCN Systems

SeaNet-Lite Effort

- Design and Implementation of first Shipboard Communication Node (SCN).
- Implement one of first Maritime INMARSAT-B HSD Data Links for TCP/IP.
- Demonstrate prototype on R/V Thompson in support of JGOFS science.
- Answer "Can we make INMARSAT affordable for ongoing oceanographic science?

SCN Design

- Portable UNIX
- Perl 5 Modules as glue
- Modular and Extendable
- WW front end (SNMP, STMP planned)
- PPP for Satellite Communications

- Incorporate components developed by others
- UNIX freeware where possible

SCN V1.0.1 Parts

- Core
    - SCN v1.0.1 Distribution
    - Solaris 2.4 on SPARC
    - Perl 5
    - MorningStar PPP
    - NCSA HTTPD
    - Netscape client
- UNIX Utilities
    - gcc, gzip, watch

Applications

- Harvest Cache
- Mirrored
- WHOI/MIS/UNIX Sysadmin code
- WHOI/DSL serial port logging code

Potential SeaNet-Lite Applications

- Less costly email delivery
- INMARSAT-B accounting
- Proxy HTTP URL Caching (File Transfer)
- Remote cruise participation
- Directory mirroring
- Data Logging and Internet Multicast Delivery
- Video-conferencing

Collaborators

- Participating Oceanographic Organizations
    - Joint Oceanographic Institutions Inc. (JOI) -Project Coordinator
    - WHOI-SCN and BCN core design development
    - LDEO- INMARSAT-B SES component development
    - NPS-SeaNet component testing, SATCOM forward-looking
    - UWashington-JGOFS pilot project support
    - JGOFS-JGOFS pilot project support
    - UNOLS-RVTEC -Technical review-shipboard systems
- Funding
    - NSF SeaNet-Lite Pilot
    - ONR-SeaNet for AUVs (proposal submitted)
    - NATO/SACLANT -Interested in clone of SCN/SES

This appendix contains "Shipboard Communications Node Top-Level Design" by S. Lerner. Copies of these four pages are available from the UNOLS Office.