Sikuliaq IT Overview


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https://docs.google.com/present/edit?id=0ARWQiKNTI-EwZDM4dHFyaF81M2Ztcjh3bWRj
Organizational Structures

- **UA** - [University of Alaska](#)
  - **UAS** - University of Alaska Southeast
  - **UAA** - University of Alaska Anchorage
  - **UAF** - [University of Alaska Fairbanks](#)
    - **OIT** - [UA Office of Information Technology](#)
    - **SFOS** - [School of Fisheries and Ocean Sciences](#)
      - **SMC** - [Seward Marine Center](#)
      - **R/V** - [Sikuliaq](#)
Sikuliaq IT Overview

- Project Management
- Data Center
- UA Networks
- Sikuliaq Network
- Ship to Shore Replication
- Virtualization and Mockup
- Configuration Management
- System Reuse
- IT System Access
- Timeline
Project Management

https://web.sfos.uaf.edu/trac/sikuliaq/wiki

- Trac
- Wiki
- Tickets
- Subversion
Sikuliaq Data Center

- ~410 Square Feet
- Sonar and ADCP WS
- CTD Control Station
- Underway Data Station
- IT Network and Systems
Ship and Shore Side Replication

Ship to Shore
- Underway Data
- IT System Health Status
- Outreach Updates
- Science Updates
- Logs

Shared
- Configuration Management
- Authentication
- Documentation
- Messaging

Shore to Ship
- News Feeds
- Patch Updates
- File Transfer Requests
- Email Payload
Ship and Shore Side Replication

noSQL (CouchDB)
- Master - Master Replication Ship and Shore
- Eventual Consistency

SQL (MySQL, Postgres SQL)
- Master Slave Shore Side Replication
- Possible Journal Log Updates one way Shore to Ship or Ship to Shore

Files
- rsync one way replication with bandwidth throttling
- Revision Control - GIT / Subversion Repository
### IT System Mockup and Life Cycle Strategy

Virtualization + Configuration Management

1. **Mockup** ship and shore side virtualized systems for development and testing prior to ship delivery
2. All systems are **Configuration Managed** for rapid deployment, rebuild or recovery
3. Config Mgmt. provides **environmental consistency** and **hierarchical inheritance** as well as system patch updates
4. **Replicating a complete** ship or shore side network is **quick and easy** to do
5. Production ship systems are no different than mockup systems.
6. New system can be developed and tested shore side in an identical environment to that on the ship and deployed to the ship as a configuration managed profile
7. Adhoc solutions can be rolled in to configuration management and redeployed after the fact
Mockup Network Current Status

- VM Hypervisor
  - VirtualBox + CentOS
  - phpVirtualBox
- Firewall / Router
  - Shorewall
  - IPTables
- DNS - PowerDNS + MySQL
- DHCP - dhcpd + MySQL
- Configuration Management
  - CentOS Linux 6.0
  - YUM + Mirror + Proxy
  - CBS = Puppet + Subversion
  - LINF = Modular Kickstart
Configuration Management

CentOS Linux
OS X
Debian
Ubuntu
Windows

CM applies to physical and virtualized systems

Not tied to platform or OS
System Reuse

- SFOS VirtualBox Infrastructure
- SFOS Configuration Management

- Mockup networks for initial development and testing
- Ship to shore replicated environment for backup and near real time data sharing
- Shoreside sandbox environment for ongoing development
- Access to shoreside simulated ship environment for cruise planning and familiarization

User and staff familiar with one environment are familiar with others
ITU System Access

- Limited Bandwidth = SSH + Web UI
- VPN - For Shore Side Access
- SSH Gateway - 2 Factor Auth + Port Forward Shore to Ship
- Trac - Subversion + MySQL + Tickets + Wiki
- DNS + DHCP - Power DNS + Web UI
- Authentication - noSQL + LDAP + Web UI
- Firewall / Router - Shorewall + Webmin
- VirtualBox - phpVirtualBox + vboxdashboard

Need for RDP + VNC should be kept minimal
Shorewall + Webmin

Shorewall Firewall
Shorewall version 4.4.23.3

Network Zones (zones)
Network Interfaces (interfaces)
Default Policies (policy)
Firewall Rules (rules)

TOS
Types of Service (tos)
Masquerading (masq)
Static NAT (nat)
Proxy ARP (proxyarp)

When Stopped (routestopped)
VPN Tunnels (tunnels)
Zone Hosts (hosts)
Blacklist Hosts (blacklist)

Additional Routing Providers (providers)
Custom parameters (params)
Master configuration file (shorewall.conf)

Apply Configuration
Refresh Configuration
Clear Firewall
Stop Firewall
Show Status
Check Firewall
Show Dump

Click this button to activate the current Shorewall configuration with the shorewall restart command.
Click this button to activate just the Blacklist and Traffic Shaping tables with the shorewall refresh command.
Click this button to clear the Shorewall firewall with the shorewall clear command. This will allow access from all hosts without restriction.
Click this button to shut down Shorewall with the shorewall stop command. This will block access from all hosts except those in the When Stopped table.
Click this button to view Shorewall's tables and rules from the shorewall status command.
Click this button to have Shorewall validate your firewall configuration with the shorewall check command.
Click this button to view Shorewall tracing information from the shorewall dump command.

Login: jehev00rback
Webmin
Backup Configuration Files
Change Language and Theme
Webmin Actions Log
Webmin Configuration
Webmin Servers Index
Webmin Users
System
Servers
Others
Networking
ADSL Client
Bandwidth Monitoring
Kerberos5
Linux Firewall
NFS Exports
NIS Clients and Server
Network Configuration
PPP Dialin Server
SSL Tunnels
Shorewall Firewall
TCP Wrappers
idmapd daemon
Hardware
Cluster
Un-used Modules
Search: subversion

View Module's Logs
System Information
Refresh Modules
Logout
Power DNS
sikuliahq.alaska.edu

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<th>Type</th>
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<th>TTL</th>
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Comments:

Commit changes | Reset changes

Add record

Owner of zone
Administrator

Delete
Add
Type
Change

a completi,poweradmin v2.14 - credits
## Timeline

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<tr>
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<th>Quarter</th>
<th>Event</th>
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<tr>
<td>2011</td>
<td>4th Quarter</td>
<td>VM Mockup Ship Network Ready for IT Access</td>
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<tr>
<td>2012</td>
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<td>VM Mockup Ship Network Ready for Tester Access</td>
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<tr>
<td>2012</td>
<td>2nd Quarter</td>
<td>VM Mockup Shore Network Ready for Demo</td>
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<td>2012</td>
<td>3rd Quarter</td>
<td>Sikuliaq Launch</td>
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<td>2012</td>
<td>4th Quarter</td>
<td>Underway Data System Testing</td>
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<td>2013</td>
<td>1st Quarter</td>
<td>Deploy Production Shore Side Systems</td>
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<tr>
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<td>Ship Side Systems Deployment Ready</td>
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<td>2013</td>
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<td>Delivery to UAF Install Ship Side Systems</td>
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<td>4th Quarter</td>
<td>TBD</td>
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