Operation and System Administration

Updated for SOS 4.0.1

1. Basic Setup
    a. SOS is two computers, four video projectors, one sphere
    b. Four video projectors
        i. One to four starting with number one closest to the computer and then going counterclockwise
    c. Two dual output graphics cards to support the four projectors and a third graphics card to run the user interface
    d. The computer is responsible for:
        i. running the main user interface to the system
        ii. real time data collection
        iii. providing the interface to the automation control protocol
    e. All Linux operating system Ubuntu (currently version **12.04**)
    f. "hot" spare is identical to the primary computer as a backup system
    g. All of the SOS software is written and maintained by NOAA.

2. System Specifications
    a. Computer standard computer system with mid- to high-end graphics cards
    b. Primary and spare computers are identical from a hardware perspective to allow easy swapping of components
    c. Projectors are "board room" projectors and can be left on for long periods
    d. Projectors have high brightness and resolution of at least 1024x768
    e. Audio system typically includes a mixer, microphones, and four speakers

3. System Maintenance
    a. Main priority is keeping the projectors aligned
        i. Should be checked weekly at first
    b. The rest of the components in SOS tend to be rather maintenance-free

4. Power Down Schedule
    a. Both of the SOS computers should remain powered up all the time in order to receive real time data and for system backups
    b. Projectors only need to be on during operation and should be powered down to save lamp life when not in use
        i. With network capability, it's possible to set the projectors on a timer with schedule power on and power off times
    c. A single press of the power button starts a clean shutdown
    d. Holding the power button will force a shutdown

5. Projector Filters and Lamps
    a. A typical projector lamp lasts anywhere from 1500 to 3000 hours
        i. In darker settings, the economy mode can extend the life of the lamp
    b. Replace all the lamps at the same time to keep image color and brightness consistent
    c. When replacing the lamps, change one lamp and then fix the alignment of that projector before moving on to the next projector

d. For LCD projectors, air filters should be checked monthly to ensure proper airflow

6. Computer Maintenance
    a. Ubuntu releases operating system patches
        i. Notification of patches will appear in the left-hand menu in the Ubuntu Update Manager
    b. If NOAA comes across an operating system patch that adversely affects system operation, sites will be informed through the SOS Yahoo Forum
    c. SOS software upgrades will also appear in the Ubuntu Update Manager
        i. An announcement with full instructions for the upgrade and a description of the new features in the upgrade will be posted to the SOS Yahoo Forum
    d. **Log files** for SOS are stored in the home folder for each user in a directory called **soslogs**

7. Network
    a. Computers are connected via a gigabit network to enable high speed communication and data transport
    b. Primary and spare computers reside in a private, non-routable network space
        i. usually in the 10.x.x.x network range
    c. Primary computer also usually sits on the border between the private SOS network and the sites local Intranet
        i. Enables outside access for remote systems administration, software updates, and download of real time data from the NOAA servers.
    d. Projectors can also be connected to the private network to allow for remote power on/off
    e. Wi-Fi network is required for iPad/iPhone SOS Remote App
        i. Existing Wi-Fi infrastructure can be used, or a dedicated Wi-Fi network can be set up for use with SOS
            1. Dedicated Wi-Fi network provides the most responsive control
        ii. SOS personnel work with the site staff to determine the best options for each individual site

8. System Control
    a. The two options are the Wii remote and the iPad/iPhone app
        i. Wii remote – Bluetooth connection
        ii. iPad app – WiFi connection
    b. Automation Control Protocol makes it possible for sites to create their own interface

9. Wii Remote Control
    a. Must first be paired to the SOS computer.
        i. Launch the SOS Stream GUI
        ii. From the Desktop, open the Alignment software
        iii. Select “Wiimotes.”
        iv. In the window that pops up, select “Pair a Wiimote”
        v. Press the red button on the back of the remote
    b. Remote will need to be connected to the software each time it is started
        i. Launch the SOS Stream GUI
        ii. Press any button on the remote
        iii. Once connected one blue light will be on

c. If the remote will not connect, close the SOS Stream GUI and restart it
d. If it still won't connect, pull out the Bluetooth dongle, plug it in again, and try again

10. iPad Remote Control
    a. Must be on the same Wi-Fi network as the SOS system
    b. SOS Remote App is freely available through the Apple App Store for download onto Apple devices (iPad, iPhone and iPod Touch) with iOS version 5.1 and above
    c. After downloading and joining the same Wi-Fi network
        i. Tap on the Settings app icon on the homepage of your device
        ii. Tap on SOS Remote located under the Apps category
        iii. In the Name or IP field under SOS computer to control, enter the host name or IP address of your SOS computer and close settings
        iv. Tap on the SOS Remote app icon to open the application
        v. Tap on the Settings icon located in the tab bar to open the SOS Settings page
        vi. If the Connection switch is set to OFF, under the Settings tab, tap the ON/OFF slider to the ON position
            1. The SOS Stream GUI must be running in order for the iPad to connect
    d. Visitors have access to the SOS Remote App through the Apple App Store, but it's useless without the IP address of SOS computer and Wi-Fi access

11. Backups
    a. Computers set to run backup scripts early every morning to push data from the primary computer to the spare computer
    b. Site specific data includes
        i. Custom playlist data in the SOS home directory
        ii. Alignment configuration files that are in the home directory
        iii. Custom site content that was developed in house
    c. All of the media files and playlist files are synced from the primary to the spare computer
    d. Backup copies of the playlist and alignment files are stored on the spare computer in **/shared/sos/site-backup.*hostname***
        i. In case of failure, the spare computer has a duplicate copy of everything needed, though the alignment files will have to be moved from the backup folder to /shared/sos/site-config
    e. Sites are encouraged to backup data on a separate system as well.
    f. Backups are also stored on the local computer in **/shared/sos/site-backup.*hostname***
        i. These are dated files that include configuration files and playlists
    g. Backups of the playlist files are tarred and stored every time the playlist editor is opened
        i. Stored in **/home/sos/sosrc-backups** and **/home/sosdemo/sosrc-backups**

12. Site Configuration
    a. Configuration information about projector height, resolution, distance is stored in **/home/sos/sos_stream_control.config**
        i. The parameters in this file are set during installation and should only be changed if the exhibit is reconfigured
        ii. This is where the default timer for autorun can be modified
    b. Alignment files are stored in /shared/sos/site-config
        i. Pairing information about the Wii remotes is also stored here

13. SOS Crontab
    a. Cron is a time-based job scheduler that is used to automate processes on the computer
    b. Included in the default SOS crontab are:
        i. Hourly realtime data downloads
        ii. Daily data syncs and backups
        iii. Weekly downloads of new datasets
        iv. Projector on/off timer is desired
    c. In a terminal, entering “crontab –l” will display everything that is included in the cron
    d. Tutorials are available on SOS website

14. Remote Login
    a. SOS computers come loaded with TeamViewer
        i. Allows the SOS support team to logon remotely to the SOS computers
        ii. Site must launch the software and provide log in information to the SOS team

15. User Accounts
    a. SOS system uses two user id's: sos and sosdemo
        i. **sos** is an administrative account that has the ability to download new data, run the alignment software, install updates and manage the real-time data downloads, use the sudo command
        ii. **sosdemo** is used for day to day system operation and running the SOS software
            1. sosdemo does not have permission to delete data, edit the software or run alignment
    b. The super user account in Linux is called "root"