

Operation and System Administration

Updated for SOS 5.3

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. One six output graphics cards to support the four projectors and a second 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 **16.04**)
- 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.
- h. SOS now requires a licensed Wibu CodeMeter security USB dongle to operate the system. Once installed, the dongle must always be inserted to operate.

2. System Specifications

- a. Standard desktop computer 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 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 scheduled power on and power off times
 - ii. SOS Projector Control on the desktop provides a status of the projectors
- c. A single press of the power button starts a clean shutdown on the computer

- d. Holding the power button will force a shutdown on the computer
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 cleaned monthly to ensure proper airflow
6. Computer Maintenance
- a. DO NOT upgrade the operating system - In order for SOS to work, it must be 16.04
 - b. Ubuntu releases operating system patches that should be applied
 - i. Notification of patches will appear in the left-hand menu in the Ubuntu Update Manager
 - c. If NOAA comes across an operating system patch that adversely affects system operation, sites will be informed through the SOS Yahoo Forum
 - d. 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
 - e. **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 10.1.1.31 (primary) & 10.1.32 (spare)
 - 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 - 10.1.1.71-74
 - 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
8. System Control

- a. The system is remotely controlled by the SOS Remote iPad app
 - i. WiFi connection – default
 - ii. Bluetooth connection – optional (directions: <http://sos.noaa.gov/downloads/docs/ipad-bluetooth-setup.pdf>)
- b. Automation Control Protocol makes it possible for sites to create their own interface

9. iPad Remote Control

- a. Must be on the same Wi-Fi network as the SOS system or paired via Bluetooth
- 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 8+
- c. After downloading the app 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. If you want to use the Bluetooth connection instead
 - i. Set up the SOS computer as a Bluetooth Personal Area Network (PAN)
 - ii. Tap on the Setting app icon on the homepage of your device
 - iii. Select the Wi-Fi section and turn off the Wi-Fi
 - iv. In the Bluetooth section, turn on the Bluetooth and look for your host computer in the list of available device and connect
- e. 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 or Bluetooth access

10. 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. 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
- f. Sites are encouraged to backup data on a separate system as well.
- 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**

11. 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**

12. 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

13. Remote Login

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

14. Usage Statistics

- a. Every SOS play event is logged in a usage log stored in the **soslogs** directory in the Home folder

- i. Four main parameters are recorded: Plays, Autoplays, Duration, and Autoplay Duration
- b. Log files are periodically sent to the SOS team to create usage statistics that are available on the SOS website
- c. Sites can view results from the whole SOS network or from their individual site
 - i. Individual site results are not publically shared

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"

16. SOS Kiosk

- a. The SOS kiosk requires a Windows computer and a touchscreen
 - i. These must be on the same network as the SOS machine
- b. The software can be downloaded to the Windows computer from here:
http://sos.noaa.gov/windows/NOAA_SOS_Kiosk_5.0-Setup.exe
- c. The full manual can be found here:
<http://sos.noaa.gov/Support/noaa-sos-public-kiosk.html>