

EaaS Sandbox Workflow

In order to use the Emulation as a Service (EaaS) platform, you will first need to log into the platform and upload your files/programs to the system. The current login information for the University of Arizona's portal is:

username: (redacted for publication)

password: (redacted for publication)

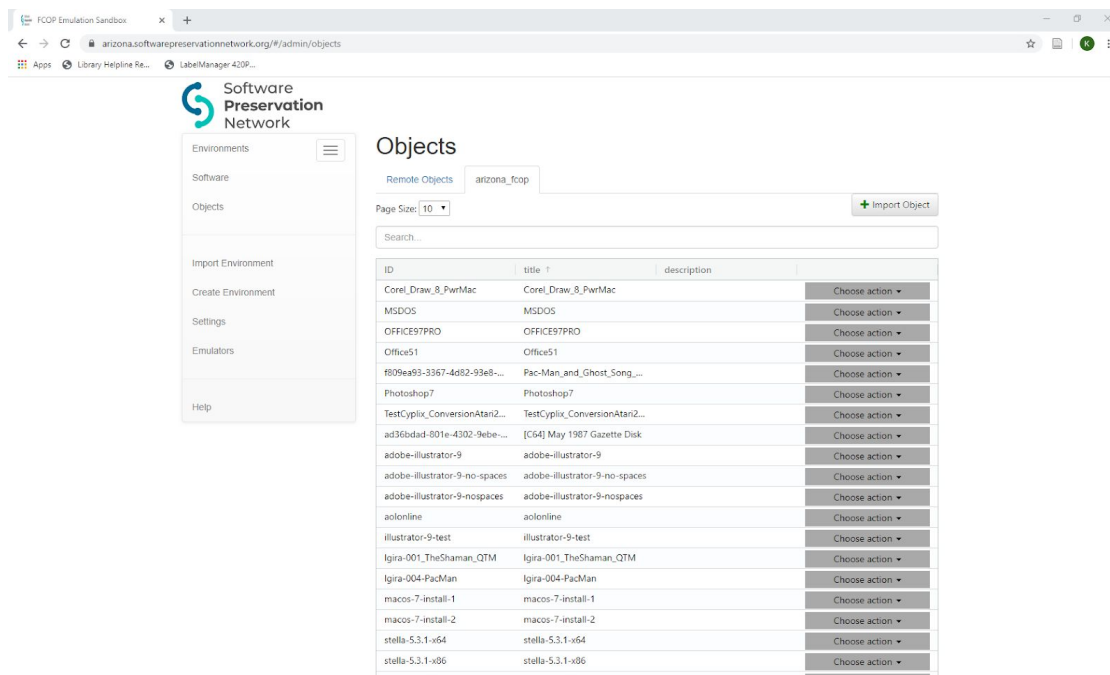
The following steps are presented in the order that someone accessing the service for the first time would. If you are returning to a previously started project, you may skip to running an environment. Additionally, there are a number of already created environments that you can add files to without the need to add an operating system yourself.

Adding an Object

An object can be a file, a piece of software, or an operating system.

Access arizona.softwarepreservationnetwork.org

1. Select "Objects" from the side menu
2. Select "Import Object"
3. At this point, you will need to fill in information about your object. Give it a name, select what type of media it is e (ISO, Floppy, Disk, or a File).
4. Select "Add file" you will be prompted to add a file from your computer as the object
5. Click "Import"



Characterizing an Object as Software and/or and Operating System

Characterizing an Object as Software (not an operating system):

1. Select “Objects” from the side menu
2. You should see a list of objects. If you don’t, make sure to click on “arizona_fcop.” Locate the object you added. There may be multiple pages of objects, and they may not be sorted by default in an easy to access way. You can click headers (such as the name) to sort alphabetically by the name/title/id of the object.
3. Once you’ve located your object, select the “choose action” drop down menu next to it, and select “details”
4. One on the details page, there is a box you can check to categorize the object as software; check the box and then click the “Save” button at the top of the screen.

Creating an Environment using an operating system:

1. If not using a pre-uploaded OS, first create the OS as a software object, following the instructions from the previous step. After checking the “this object is software” box, an extra tab should appear called “software properties”
2. In the “software properties” tab, you can further characterize the software as being an operating system, limit the number of times that the software can be simultaneously launched, and add information about any licensing the software carries with it.
3. After you are done making selections, click the “Save” button at the top of the screen..

Object Details

Object Details

Object ID: MSDOS
Object Label: MSDOS
 Object is software

Rendering Environments >

Classification Details >

Software Properties ▾

License information

Enter license information...

Allowed number of instances (for unlimited choose -1):
-1

QID

Enter QID

Is an operation system

Search and choose an operating system preset...

Rendering Capabilities: Native FMTs

[Note: After characterizing an object as software, it will no longer appear in the object menu, and can instead be accessed in the software menu]

Running an Environment

Access arizona.softwarepreservationnetwork.org

1. Select “Environments”
2. Select the environment you would like to run (this might be a private or public environment)
3. From the “choose an action” drop-down menu next to the environment you’d like to run, select “run environment.”

Environments

The screenshot shows the 'Environments' page with two tabs: 'Base Environments' and 'Object Environments'. Below the tabs are filters for 'Private', 'Public', and 'Remote'. The 'Private' filter is selected. The page indicates 'Number of Environments: 4' and 'Page Size: 10'. A search bar is present. The main table lists four environments:

	Name ↑	ID	Owner	Actions
<input type="checkbox"/>	Microsoft DOS 6.20 (CD-ROM)	f63e0293-...	arizona_fc...	Choose action ▾
<input type="checkbox"/>	Microsoft Windows 3.11	88c01f49-...	arizona_fc...	Run Environment
<input type="checkbox"/>	WindowsXP	4fa9a94b-...	arizona_fc...	Details
<input type="checkbox"/>	lubuntu 18.04	a859ecb8-...	arizona_fc...	Delete

Additional actions visible in the dropdown menu include 'Add Software' and 'Landing Page'. The page footer shows '[1] to [4] of [4]' and a right arrow.

This should open the environment in a browser window . Depending on the complexity and size of the OS/Software being emulated, it might take a long time for it to load. Once it is loaded, you will be able to control the emulated environment using your keyboard and mouse, depending on what the original OS supported. Each environment will generate a UUID that identifies it. These can be used to make sure you’re using the correct environment each time, even if someone saves a new version of it:

UUIDs for several useful environments:

Lubuntu 18.04 (Linux): 598d8cdf-40e8-4dbc-8ccb-10c905c97c57

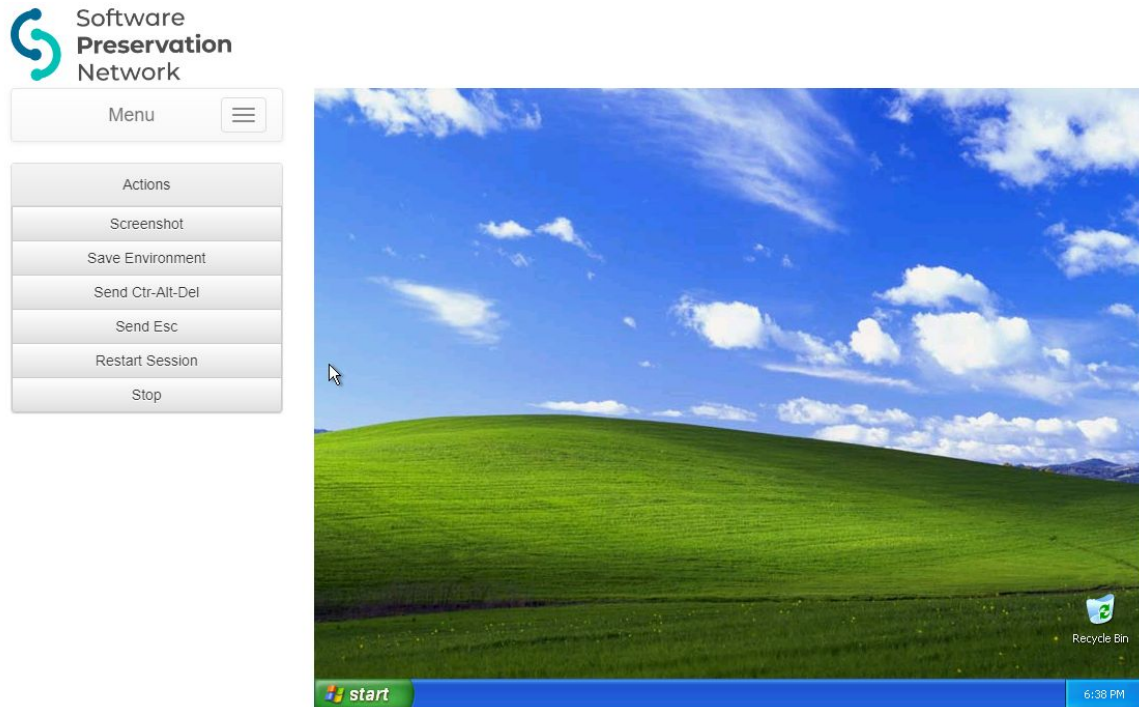
WindowsXP: 4fa9a94b-a3be-4c5f-9d3f-e444abd3ef8c

Windows 3.11: 88c01f49-c484-412f-b6e9-240faf27bef2

Microsoft DOS 6.20: f63e0293-d41c-4a44-948c-04d504ec5610

Mac OSX 10.2: 82ed7ea-803f-47b0-ab50-f970f84f709f

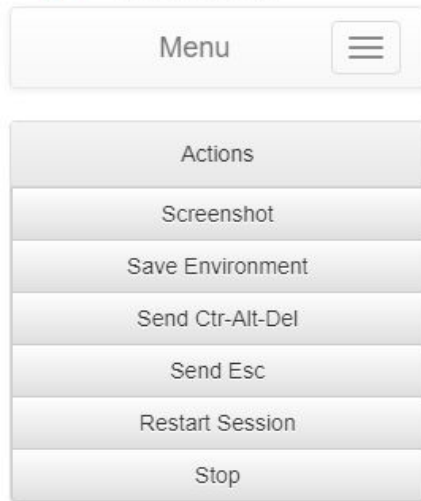
Mac OSX 10.3: xb53d9a07-22a8-4ef2-9134-e313b9bb42ec



(A session running an emulated version of WindowsXP)

Saving an Environment:

1. Follow the steps for “Running an Environment”
2. After installing new software or changing another setting in the environment, select the “save environment” button from the emulator menu. It will ask you to fill in a new name and description for the environment. It will warn you to “shut down the guest operating system before saving.” This is not referring to the emulator environment itself, so do not shut down linux/windows etc.
3. Click save. It might take some time to save the environment. If you click out of the window, it will cancel the process. The window will automatically close and redirect you when it is finished saving.



Sample Workflow

Steps for Emulating ___ in WindowsXP environment? (Tentative, attempting to find software that can be installed to one of the environments as a test case)

Example workflow:

Steps for Emulating Atari 2600 using EaaS in a Linux environment (Please refer to the above instructions for the detailed steps when performing this workflow)

1. First, upload the objects you will need. For this emulation, we will need an Operating System (in our case Ubuntu, a lightweight linux distribution), the Atari 2600 Emulator (in this case, Stella, a donationware emulator), and the games you want to emulate (we will be using a number of derivative game hacks)
2. After uploading your objects [Uploading large files, like operating systems, can take a while], characterize your operating system and emulation software.
3. Select, create environment, and select the linux distribution you created as an object. You will also have the option to select the disk size for this environment. You'll need at least enough space to install your OS and have your software and files available. Install this like you would a regular operating system.
4. After you install the operating system, it may ask you to restart the operating system. If it does, let the system completely restart before saving the environment.
5. Save the environment.

Atari Emulation Walkthrough:

For this test, we will be using assets that have already been uploaded to the EaaS environment. This test will emulate Atari 2600 within a Linux environment using the Stella emulator.

1. Navigate to arizona.softwarepreservationnetwork.org and log in
2. Click on Environments, on the left side menu
 - a. Locate the environment that you want to emulate, in this case we're using a Linux environment loaded with the Stella Atari Emulator (UUID:)
 - b. Click on the grey menu box for the emulator and select add software.
 - c. This should bring up a list of software. In this case, you'll want to choose at least one Atari 2600 game:
 - i. Pac-Man_and_Ghost_Song_(2008)(Charles_F._Gray) (UUID: 11be766d-8b49-4ea3-b9d0-93148bdcd8f9)
 - ii. Alamogordo_Landfill_(2008)(Cosmic_Swarm_Hack)(Charles_F._Gray) (UUID: f5d43da7-c8e6-40b8-af23-88034bb523a3)
 - iii. Acid_Trip_(2006)(Beany_Bopper_Hack)(Charles_F._Gray)
 - iv. Tron-Man_1_(2008)(Charles_F._Gray,_Greg_Zumwalt) (UUID: 44077f67-e350-4c06-ba8a-166c5ace1963)
3. Once you select the game, the emulator should launch. This may take some time.
4. Once the emulator has launched, you should see the game file on the desktop. Open the Stella emulator and then select the game to launch it.

C64 Emulator Walkthrough:

1. Navigate to arizona.softwarepreservationnetwork.org and log in
2. Click on Environments, on the left side menu
 - a. Locate the environment that you want to emulate, in this case we're using a 64alt emulator
 - b. Click on the grey menu box for the emulator and select add software.
 - c. This should bring up a list of software. In this case, you'll want to choose at least one C64 program or disk:
 - i. LGIRA-C64-03. Once you select the game, the emulator should launch. This may take some time.
3. Once the emulator has launched, the program should immediately run.