During This Module

- Why does the EaaSI team refer to emulation and computing “environments”?
- What is an EaaSI “Environment” resource?
- What sort of details do we need to describe and maintain environments?
But first...what computer are you using right now to view this slideshow?

Try to describe it in as much detail as possible.
Did you mention...

- The manufacturer?
- The model?
- Desktop, laptop, tablet?
- The operating system?
- The color, the look, the feel?
- The size of your monitor?
- Your peripheral devices? (a mouse, a keyboard, headphones)
- Something else?
Computers are a complex stack of hardware, software, and the digital content we create with them.
Each one has unique potential depending on who is using it, and how
Change one piece of the stack, and the entire thing may behave differently.

I have System 7 and MacWrite installed. I can open this!

I also have System 7 but no MacWrite installed. I can’t open this!
“Environments”

This is why we think about computing in terms of “environments”

Digital objects are surrounded by a certain set of conditions

The EaaSI project maintains that preserving the object may not be enough to provide meaningful access

You must also preserve and present its computing environment
Microsoft Office 365 refusing to open a file created with Microsoft PowerPoint 3.0
macOS Catalina (10.15) refusing to run a 2000s-era, 32-bit application
Emulation

Emulation helps us do that by recreating hardware.

In an emulation environment, we replace physical devices with virtual equivalents.
Environments are the core Resource type in the EaaS platform. That means each Environment is a distinct unit that can be uniquely saved, edited, described, exchanged and interacted with.
We have a lot of them, from across the history of computing
Environment Components

- Emulator: Software recreating hardware
- Software: Legacy and contemporary applications
- Content: Digital objects - files, data sets, code, artwork, etc.
- Metadata: Settings and description necessary to tie these pieces together
**Operating System**

<table>
<thead>
<tr>
<th>RESOURCE NAME</th>
<th>Windows 95 C (OSR 2.5) - Base V2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISPLAY RESOLUTION</td>
<td>800x600</td>
</tr>
<tr>
<td>COLOR DEPTH</td>
<td>True Color</td>
</tr>
<tr>
<td>REGION</td>
<td>U.S.</td>
</tr>
<tr>
<td>TIME ZONE</td>
<td>Eastern Standard Time</td>
</tr>
<tr>
<td>DATE/TIME</td>
<td>1:19PM 5/3/2019</td>
</tr>
<tr>
<td>LANGUAGE</td>
<td>English</td>
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<tr>
<td>LOGIN PASSWORD</td>
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</table>

**Emulator**

<table>
<thead>
<tr>
<th>NAME</th>
<th>Qemu</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMULATOR CONFIGURATION</td>
<td>-m 64 -vga cirrus -soundhw sb16 -net nic,model=pcnet</td>
</tr>
</tbody>
</table>

- **Linux Runtime**: Off
  - EMULATOR VERSION: emucon-roots/qemu-system:v2.12
  - OPERATING SYSTEM: Microsoft Windows 9x

**Configured Drives**

<table>
<thead>
<tr>
<th>DISK</th>
<th>Filesystem: fat32</th>
<th>✓  ❌</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOPPY</td>
<td>Filesystem: fat12</td>
<td>✓  ❌</td>
</tr>
<tr>
<td>CDROM</td>
<td>Filesystem: ISO</td>
<td>✓  ❌</td>
</tr>
</tbody>
</table>

**Example EaaS Metadata**
When we put all those pieces together, we can render and interact in emulation.
What can I do with an Environment?

Anything you can do with a computer, you can do with an emulation environment

- Open those files with your embarrassing high school poetry
- Host web content
- Manipulate, convert, and analyze data sets
- Provide access to born-digital records
- Study digital aesthetics and design
- Play Minesweeper
- Watch or exhibit multimedia art
- Assess and migrate obsolete file formats
Everything is Environments

All the work the EaaSI platform does revolves around the creation and presentation of Environments

Got software? Make an Environment and install it.

Got digital content? Make an Environment and access it.
Credits

○ Training Module written and designed by Ethan Gates, Software Preservation Analyst, Yale University Library

○ All photos, screenshots, and videos recorded by Ethan Gates

○ Icons sourced from The Noun Project
  ○ Exception: “Happy Mac” and “Sad Mac” icons by Susan Kare (Slide 7)

○ EaaSI program of work sponsored by the Alfred P. Sloan Foundation and the Andrew W. Mellon Foundation, hosted by Yale University Library