An Introduction to Emulation

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Agenda

1. A (Very) Brief History of Emulation
2. The “Virtual Machine”
   a. Emulation vs. Virtualization
3. Strategic Uses of Emulation (“Rendering Matters”)
   a. Evaluation + Assessment
   b. Exhibition
   c. Format Migration/Transcoding
4. Challenges and SPN/EaaSI Efforts
   a. Software Description
   b. Sustainability
   c. Scale
5. Copyright and Confidence
6. Lab: Running Legacy Software in VirtualBox
A Brief History of Emulation
Two presentations of *The Erl-King* (Grahame Weinbren and Roberta Friedman, 1982-1985)

*Seeing Double: Emulation in Theory and Practice* (Guggenheim, 2004)
PlayStation Classic
(bad implementation of PCSX emulator)
Billy Mitchell threatens legal action over vacated Donkey Kong scores

Lawyers demand retraction from Twin Galaxies, Guinness, or they’ll sue

By Owen S. Good | Sep 14, 2019, 12:26pm EDT

Most Read

New Pokémon revealed in 24-hour Sword and Shield stream appears to be a Galarian Ponyta

Logos taken from project/product websites for: VICE, MAME, DOSBOX, vmware, VirtualBox, MESS, WinUAE, QEMU, Mini vMac, SheepShaver, Hatari
The “Virtual Machine”
Emulated Environment

Emulator Settings
- Specific to application used

Bootable System:
- Operating System, File System, Drivers, Applications, etc.
- (Disk Image)
  - Raw (.dd, .img, .bin, etc.)
  - VirtualBox (.vdi)
  - Virtual PC (.vhd)
  - VMWare (.vmdk)
  - Expert Witness Format (.E01)
  - QEMU (.qcow/.qcow2)

Additional Software or Content
- (Disk Image)
  - Raw (.dd, .img, .ima, .bin, etc.)
  - ISO (.iso, .cdr, .img, etc.)
Emulation or Virtualization?

- Guest hardware recreated entirely in software
- Overcoming incompatibility or obsolescence
- Guest software can run at least in part directly on host hardware
- Managing and using hardware more efficiently
Strategic Uses of Emulation in Preservation
Looking cold and pale
Sleeping on a London roof
Fell off in a gale
He flapped his wings with all his might
But didn’t stand a chance
And long before his breakfast time
He found himself in France
He landed in the Bois Boulogne
And gazed around unsure
Until a lady sparrow
Walked up and said “bonjour:”
“As you are a stranger here”
“I’ll show you my Paris”
“Would you like to promenade?”
Said Fred, “the answer’s oui”
And as they flew across the town
The lady sparrow sang
And as she did her youthful voice
Across the rooftops rang
“Below us is the Champs Elysees”
“Where I have often dined”
"I knew you were for me"
So they found a small cafe
In a cobbled street
He told her that his name was Fred
She said, "mine's Marguerite"
She said, "the memory of our day"
"Is one I'll always keep"
And after taking bread and wine.
The sparrows fell asleep
He woke up to the sound of bells
And said, "those bells I know"
"Those ain't the bells of Notre Dame"
"Them there's the Bells of Bow"
It's just another sparrow's dream
Above a London street.
But I'll remember all my life
A bird called Marguerite,"

mbed and locked my hands about his neck. The stick swished twice as
Examples

Evaluation and Assessment:
- Imports of Merchandise CD-ROMs, Clip-Poemas

Exhibition and Access:
- Theresa Duncan CD-ROMs, *Amnesia* by Thomas Disch

Format Migration and Transcoding:
- Sibelius examples
Challenges and SPN/EaaSI Efforts
Software Description

- Software-as-object
- Schema shortcomings

**EaaSI Solution**: EaaSI metadata model
(expressed in PostgreSQL, METS XML, export to Wikidata)
Sustainability

- Software preservation paradox
- Maintaining shared digital platforms

**EaaSI Solution:** Emulator packaging and metadata, business modeling and community investment with Educopia
Scale

- Collection size
- Variability of software, operating systems, emulator applications
- Staff time and training for optimization

**EaaSI Solution:** Improvements to the EaaS platform, public resources, UVI
Copyright and Confidence
Here lies copyright objections to software preservation in GLAMs d. 2018

Press SPACE BAR to continue
Required Reading

- ARL Code of Best Practices in Fair Use for Software Preservation
- A Preservationist’s Guide to the DMCA for Software Preservation
Lab: Running Legacy Software in VirtualBox
1. Boot Windows 2000
2. Load the “Demo.img” floppy file and try to open the included file
3. Load the Microsoft Office 97 ISO file
4. Install
5. Open the file again
Thanks!

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Learn more at
- [www.softwarepreservationnetwork.org/eaasi](http://www.softwarepreservationnetwork.org/eaasi)
- [github.com/EG-tech/emulation-resources](https://github.com/EG-tech/emulation-resources)
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