

VMs for Fermi Offline

Welcome

Username:

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Preview

- The big picture for Fermi & VMs
- One piece of the puzzle: developer appliance
- Experiences with VirtualBox
- Conclusions

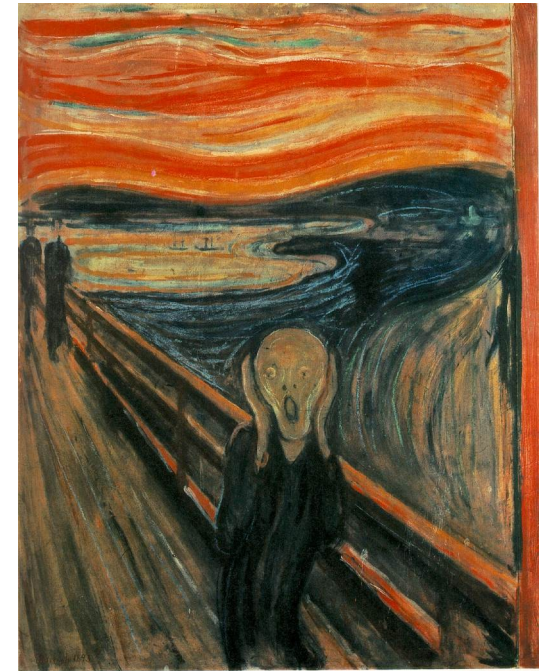
As Time Goes By

- Hardware, OSes evolve; personnel decreases
- Porting homegrown & imported software no longer feasible
- ..so fix on a particular OS version running in virtual machines
- Leads to different, more manageable set of problems



Candidate Apps

- Online
 - Half-pipe
 - Monitoring
- Servers
 - Oracle
 - MySQL
 - Astro Server
 - CVS
- Offline
 - Level 1
 - Reprocessing
 - Simulation
 - Analysis
- Code Dev
 - Developer env
 - Remote
 - In public machine
 - Release Mgr





Redhat 6 Lifetime*

- Production 2 phase through 2017 Q2, production 3 through 2020
 - Apps associated with data-taking do not need to be moved to VMs
 - Eliminates security concerns, need for isolation of obsolete OS
 - Still will convert to VMs for Offline other than L1 proc to take advantage of new hardware.

* <https://access.redhat.com/support/policy/updates/errata/>



Candidate Apps reduced

- ~~Online~~
 - ~~Half-pipe~~
 - ~~Monitoring, ASP~~
- ~~Servers~~
 - ~~Oracle~~
 - ~~MySQL~~
 - Astro Server?
 - ~~EVS~~
- Offline
 - ~~Level 1~~
 - Reprocessing
 - Simulation
 - Analysis
- Code Development
 - Developer env
 - Remote
 - Inside public machine
 - Release Manager

Goal: in place by ~2016



Users Ahead of the Curve

- We are nearly done with conversion to rhel5*
* **painful!**
- Remote developers have Fedora systems well ahead of rhel5
- Compat libs for gcc34 allow them to use rhel4 builds. No such libs exist for gcc41



Make a rhel5 appliance

...in fact, make three models

Developer Appliances

- **Bare-bones** – minimal SL5 system + SCons 2.1.0. Probably useful on Linux hosts only
- **GR standard** – Bare-bones + recon/sim code, external libs, calib archive
- **Standalone** – Standard + local MySQL server, metadata db



VirtualBox



- Product to create, export and run VMs
- We chose it because it
 - Is free, open-source
 - Supports all OSes of interest (Linux, Windows, Mac)
 - Has GUI interface + choice of APIs: command-line, C++, python, web service...
 - Supports shared folders (between host, VM)
- Experience so far largely positive; definitely *not* trouble-free

<https://www.virtualbox.org/>

File Machine Help



New



Settings



Start



Discard



Details



Snapshots (2)

**SL6GR**

Powered Off

**SL5GR** (yum-update)

Powered Off

**SL5-32min** (SL5-32min-v3)

Powered Off

**General**

Name: SL5-32min

OS Type: Red Hat

**System**

Base Memory: 1024 MB

Boot Order: Floppy,
CD/DVD-
ROM, Hard
Disk

Acceleration: VT-x/AMD-V,

**Display**

Video Memory: 12 MB

Remote Desktop Server: Disabled

**Storage**

IDE Controller

IDE Secondary Master (CD/DVD): VBoxGuestAdditions.iso
(49.75 MB)

SATA Controller

SATA Port 0: SL5-32min-disk1.vmdk
(Normal, 8.00 GB)**Preview****SL5-32min**



Appliance status, experiences

- Bare-bones is done; users are happy. Easy to create with GUI. Most work was in stripping down SL5.
- GR standard is ready for testing. Will wait on stand-alone; we might not need it.
- Easy to import & run except
 - boot gets stuck for one user
 - shutting down VM sometimes shuts down host too!
 - Better configuration might fix these things
 - rhel5/SL5 kernel is not recommended for use with VirtualBox; SL6 might be better behaved

More VirtualBox

- Very well-suited to developer appliance task. Supplied abilities to take snapshots, export and import appliances, make shared folders were just what we needed and they're all easy to get at from the GUI.
- We'll also need to use VMs in a more batch-like manner – e.g. start a job on existing VM on a batch machine (or start VM as part of the batch job) and there things are less rosy.
- The C++ API is complete, but no fun at all to use. Doc is for COM (or XPCOM); have to use your imagination to figure out equivalent C++ calls. There were no good examples.
- Could be that command-line level (VBoxManage canned program) will do, but I wasted a lot of time on C++/XPCOM.



Conclusions and a Question

- (VirtualBox) VM appliance works well for user development platform
 - Batch-like use more work but VirtualBox has the tools, including
 - Command-line and programmatic APIs
 - Ability to run headless
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How to integrate VirtualBox (or other VM manager) with Central Services, especially the batch system?