KVM Forum 2014 - Keynote

Paolo Bonzini
Red Hat, Inc.
KVM Forum 2014
KVM in 2014

- 7 in-tree architectures
  - Active: ARM/ARM64, MIPS, PPC, x86, s390
  - Dead: ia64
  - Out-of-tree: Tilera, MIPS hardware virt
- 2 main userspace implementations
  - All architectures except ia64 supported in QEMU
  - ARM/ARM64, MIPS, PPC, x86 in linux-kvm
- 6 releases, 1105 commits, ~35 companies
Commits in each release

- 3.13 (Nov 2013): 168
- 3.14: 122
- 3.15: 120
- 3.16: 217
- 3.17: 243
- 3.18-rc1 (Oct 2014): 150

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Commits by architecture

- x86: 334
- PPC: 249
- S390: 179
- ARM/ARM64: 171
- MIPS: 41
- Generic: 131
Main contributors

- Red Hat: maintenance, x86
- IBM: PPC, s390
- Linaro+ARM: ARM/ARM64
- SuSE: PPC, s390
- Freescale: PPC
- Imagination Technologies: MIPS
- Intel: x86 hardware enablement & nested virt
- Fujitsu, Google, Huawei, Siemens,...
Commits by employer

IBM: 360
Red Hat: 185
Linaro+ARM: 175
SuSE: 78
Freescale: 60
Technion: 53
Siemens: 43
ImgTec: 39
Intel: 30
Others: 82
Highlights

- x86: VFIO integration, SMAP, MPX, nested virt, emulator bugfixes, PLE optimization
- PPC: transactional memory, POWER8, ppc64le, u-boot
- s390: migration, gdb, optimizations
- ARM: transparent huge pages, big-endian guests, migration, PSCI 0.2, ARM64 gdb
- MIPS: QEMU support
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x86 nested virtualization

- People are using it!
- Testing is hard!
- Migration support, optimization,…
- Guest hypervisors other than KVM?
Security

- Several security issues found by Google
  - Thanks!
  - Stay for Andy's talk!
- Fuzzing done at Technion University
  - x86 only
  - PPC/s390 folks, now it's your turn!
Testing

- 160 commits to kvm-unit-tests
  - x86: emulator, nested virt
  - Initial work on ARM unit tests
- virt-test
- Periodic integration testing from Intel
- linux-next, continuous build,...
## SPECvirt_sc®2013 (as of Sep 30, 2014)

### Top results:

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Hypervisor</th>
<th>Guest</th>
<th>Result</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM x480 X6 60 x86 cores 120 threads</td>
<td>KVM (RHEL6.5)</td>
<td>RHEL6.5</td>
<td>2082@116</td>
<td>Feb 2014</td>
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<tr>
<td>IBM x3850 X6 60 x86 cores 120 threads</td>
<td>KVM (RHEL6.5)</td>
<td>RHEL6.5</td>
<td>2081@116</td>
<td>May 2014</td>
</tr>
<tr>
<td>HP DL360 36 x86 cores 72 threads</td>
<td>KVM (RHEL7)</td>
<td>RHEL6.5</td>
<td>1614@95</td>
<td>Aug 2014</td>
</tr>
<tr>
<td>IBM S824 24 POWER cores 192 threads</td>
<td>PowerVM</td>
<td>RHEL6.5, AIX7.1</td>
<td>1370@79</td>
<td>Jun 2014</td>
</tr>
</tbody>
</table>

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### SPECvirt_sc®2013 (as of Sep 30, 2014)

Same-hardware comparison with ESX:

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<tr>
<td>HP DL380p 16 cores 32 threads</td>
<td>KVM (FusionSphere)</td>
<td>RHEL6.4</td>
<td>631.6@37</td>
<td>Jul 2014</td>
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<tr>
<td>HP DL380p 16 cores 32 threads</td>
<td>ESXi 5.1</td>
<td>RHEL6.4</td>
<td>472.3@27</td>
<td>Apr 2013</td>
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Have a great time!