



# **KVM Forum 2014 - Keynote**

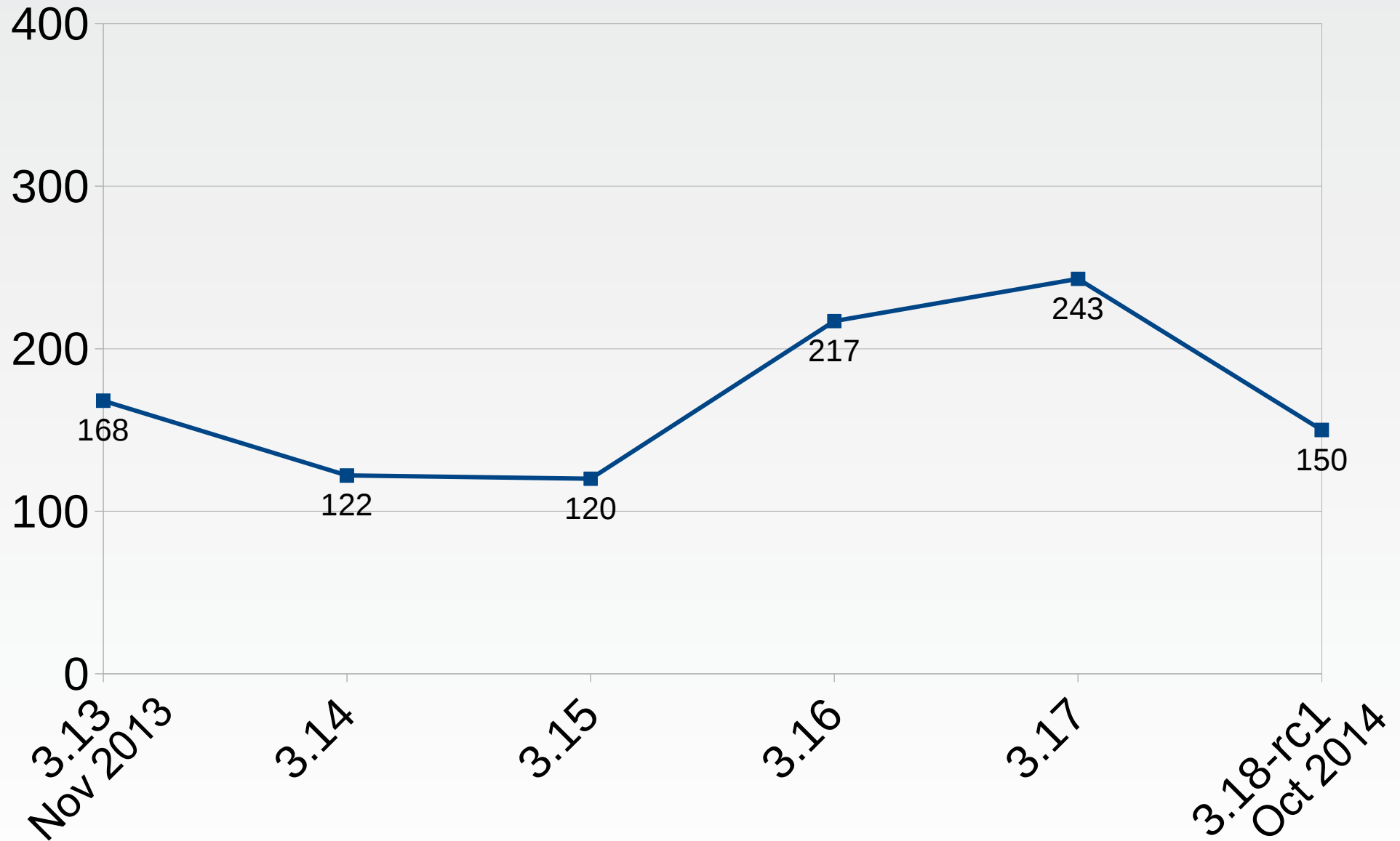
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Red Hat, Inc.  
KVM Forum 2014

# KVM in 2014

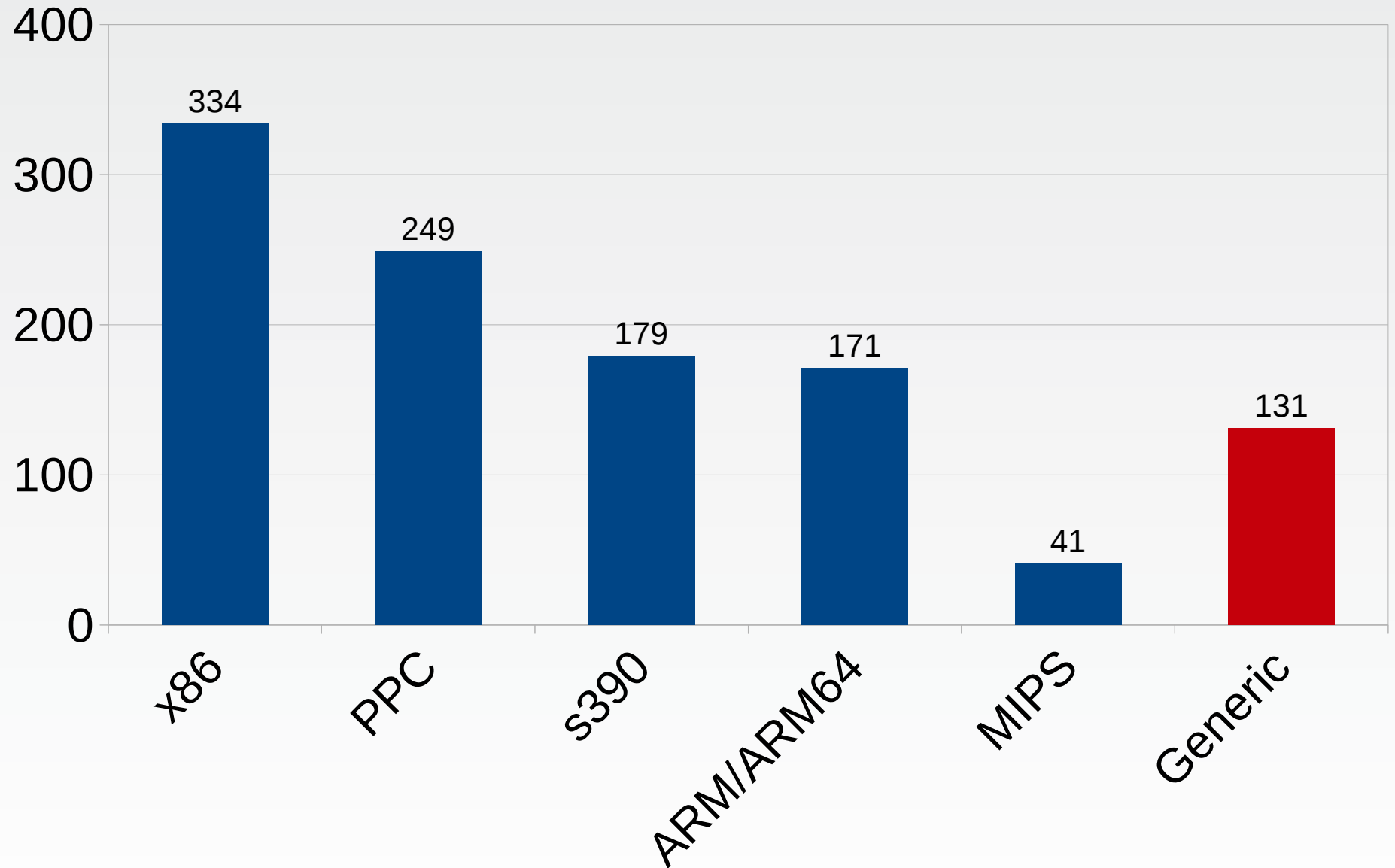
- 7 in-tree architectures
  - Active: ARM/ARM64, MIPS, PPC, x86, s390
  - Dead: ia64
  - Out-of-tree: Tiler, MIPS hardware virt
- 2 main userspace implementations
  - All architectures except ia64 supported in QEMU
  - ARM/ARM64, MIPS, PPC, x86 in linux-kvm
- 6 releases, 1105 commits, ~35 companies



# Commits in each release



# Commits by architecture

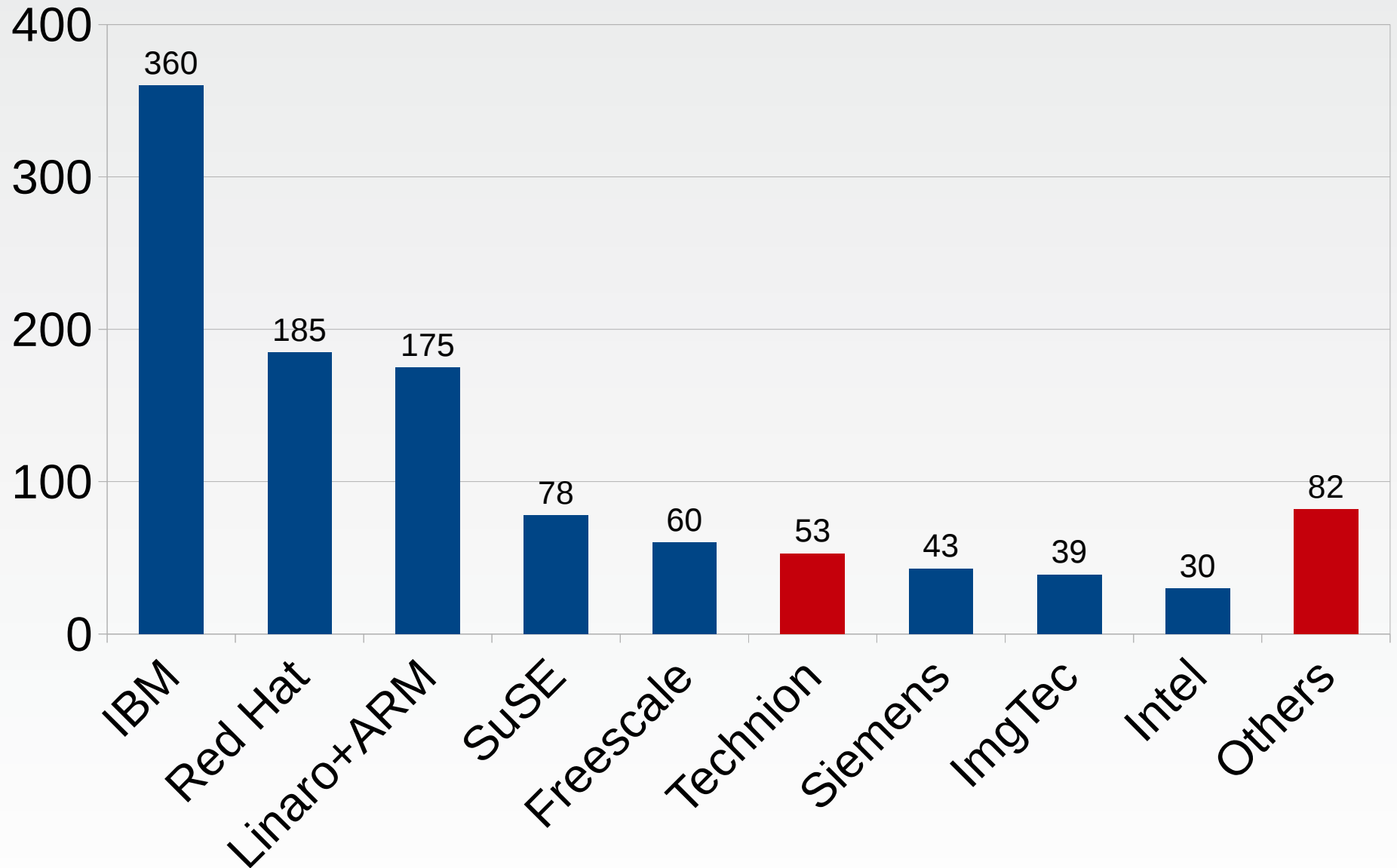


# Main contributors

- 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



# 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
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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:

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

Source: [http://www.spec.org/virt\\_sc2013/](http://www.spec.org/virt_sc2013/).

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# SPECvirt\_sc®2013 (as of Sep 30, 2014)

## Same-hardware comparison with ESX:

Hardware	Hypervisor	Guest	Result	Date
HP DL380p 16 cores 32 threads	KVM (FusionSphere)	RHEL6.4	631.6@37	Jul 2014
HP DL380p 16 cores 32 threads	ESXi 5.1	RHEL6.4	472.3@27	Apr 2013

Source: [http://www.spec.org/virt\\_sc2013/](http://www.spec.org/virt_sc2013/).

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Have a great time!

