State of KVM

- 6 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 kvmtool
- Since 3.18: 5 releases, 702 commits, ~25 companies
Commits by architecture

- X86: 331
- S390: 109
- ARM/ARM64: 89
- PPC: 46
- MIPS: 36
- IA64: 4
- Generic: 94
Main contributors

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

- Red Hat: 169
- IBM: 157
- Linaro: 104
- Technion: 83
- Intel: 64
- ImgTec: 34
- Others: 98
Highlights

● Spring cleaning: IA64, hardware-assisted virtualization on PPC970
● x86: real-time, nested APICv, PML, improved MTRR support, SMM, AMD PMU, XSAVES
● PPC: performance improvements, bug fixes
● s390: improved userspace access, SIMD, 2GB pages inside guests
● ARM: irqfd/ioeventfd (VFIO, vhost, dataplane)
● MIPS: FPU, SIMD
Performance

- Still dominating SPECvirt, but we can do better!
- Low-latency hlt (halt_poll_ns)
- Eager FPU (x86 specific)
- Improved latency for real-time workloads
KVM-RT latency jitter plot

cyclicstest -m -n -N -q -v -p95 -h60 -i 200 -D 1h

- RHEL 7.2 (259)
- RHEL-RT 7.2 (237)
- RHEL-RT 7.2 (237+KVM)
Realtime KVM patches (as of June 2015)

- sched: 45
- nohz: 12
- vmstat: 6
- timer: 4
- workqueue: 4
- kvm: 4
- kernel-rt: 4
- cpusets, isolcpus: 2
- irqbalance: 3
- libvirt: 6
In the pipeline

- Performance improvements for guests spanning multiple NUMA nodes
- Split irqchip (x86, KVM Forum 2014)
- ARM debugging support
- ARM MSI support
- More kvm-unit-tests (ARM, PPC)
Have a great time!