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# LinuxCon Europe 2013

Maksim Melnikau

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# Intro, Jim Zemlin

- ▶ Xen and KVM under the same roof after so many years
- ▶ best way to use Linux - is via collaborate development
- ▶ twitter has 100 public repos on github
- ▶ for every \$1 spent on AWS, up to \$4 not being spent on traditional IT
- ▶ 1B html5 capable browsers, 2M web developers writing apps
- ▶ gaming industry towards Linux and Open Source
- ▶ huge talent war for developers
- ▶ We need more lawyers who understand open source and collaboration.
- ▶ Linux Foundation: some sponsors here only to recruit
- ▶ Linux - code as poetry, better, faster, cheaper.



# We won, what next?, Mark Hinkle, Citrix

- ▶ collaboration models are cool - being used in new & different domains.
- ▶ FOSS sharing model will be adopted by governments & healthcare
- ▶ Linux is running supercomputers, smartphones etc
- ▶ oss not a zero-sum game - companies add value on top of it.
- ▶ taking Linux and oss tools and finding ways to innovate in different categories.
- ▶ CERN LHC creates 30 petabytes of data a year
- ▶ Linux and OSS devs are setting the standard for the way tech will be developed
- ▶ Linux - platform for innovation
- ▶ Let open source culture be a lesson not just for software .... The future is open
- ▶ using oss to solve problems other domains: medicine, energy, etc
- ▶ The future is open and it's our responsibility to share what we know



# Evolution Of The Twitter Stack, Chris Aniszczyk

- ▶ 500M tweets a day, 6k tweets a second, 145k tps in peak
- ▶ failure is an option
- ▶ "throwing machines on problem" isn't the best solution, twitter at LinuxCon
- ▶ Twitter is of course all running on Linux, why would you need anything else?
- ▶ Twitter find solution for their problem - JVM
- ▶ zipkin - gives you a visual representation where most of the time fulfill in request
- ▶ Mesos, Linux and cgroups - reshare cluster dynamically
- ▶ twitter have 2000+ employees, half of them are engineers
- ▶ Embrace open source, Incremental change, Data center as computer



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# Application Level Tracing and Debugging Tools

- ▶ gdb, valgrind - fine, but no overview and can change app behavior
- ▶ undo takes snapshots and you can run your program backwards
- ▶ strace, ltrace - solve some problems, but don't cope well with large applications
- ▶ LD\_PRELOAD - powerful interface that can trace and control application
- ▶ yocto project uses LD\_PRELOAD tool called PSeudo ('sudo') to fake root access
- ▶ glibc can have multiple version of same function
- ▶ multi machine jobs, suspend/resume, virtualization, one VM per app
- ▶ tracing problems - heterogeneous usecase, what to measure
- ▶ we all know about Design For Test - what about Design For Profiling ?!
- ▶ Big Data - monitoring everything and correlate
- ▶ difficult to get fine-grain coverage without harming performance
- ▶ cloud computing makes profiling even more complex
- ▶ LTTng - nice tracing solution for Linux



# Architectural Changes in NetworkManager, Pavel Simerda

- ▶ NM is about changing configuration on-the-fly and making notification
- ▶ NM was redesigned for server: use cases, making desktop behavior more optimal
- ▶ interesting question: what should be done, when NetworkManager restarts?
- ▶ NM runtime configuration; ipv4/ipv6; DNS
- ▶ api and tools - a lot of abilities to configure your interfaces
- ▶ NM still have a lot of problems with ipv6, some kernel features still missing



# Exploring The Dustier Corners of System Firmware, Matthew Garrett

- ▶ firmware - vendor "policy", sometimes it is the only one difference between devices
- ▶ OS and firmware do same task, but kernel never knows what firmware do
- ▶ acpi 5.0 would help a bit to "speak" with firmware
- ▶ Physical Device Location - colour, location, shape, size, etc (removable in Linux)
- ▶ firmware could help to log kernel crashes (pstore)
- ▶ WMI - easiest call firmware from Windows, commonly used for vendor extensions
- ▶ reading specs ACPI and UEFI - not the most efficient techniques
- ▶ follow <http://lwn.net/Articles/367630/>
- ▶ specs are rarely written with Linux in mind
- ▶ every vendor has his own method to speak with firmware
- ▶ and future could be "web api" calls to BMC
- ▶ UEFI have a lot of interesting things





# Grand Unification of ACPI-based device Hot-Plug, Rafael J. Wysocki

- ▶ ACPI - rules for communication between platform firmware and the OS
- ▶ ACPI Machine Language (AML), ACPI Source Language (ASL), ACPI Namespace
- ▶ kernel speak with device directly (good) or via AML Interpreter (bad)
- ▶ ACPI Hot-Plug Notification Values - Bus Check, Device Check, Eject Request
- ▶ with ACPI hot-plug allows you to add/remove even CPU and Memory



# Snapshots of Ram in oVirt

- ▶ system checkpoint - disk snapshot + memory snapshot
- ▶ oVirt could reuse memory snapshots
- ▶ libvirt have interesting feature - preview snapshots



# Next Generation Cloud Platforms, Mac Devine

- ▶ we are API generation developers...
- ▶ there are so many new challenges and opportunities for IT and for developers
- ▶ a cloud service is only as good as its API
- ▶ cloud first mentality is starting to prevail. Developed and deploy at cloud speed.
- ▶ CEOs now identify technology as the most important external force
- ▶ don't afraid of mistakes, afraid of not learning on them
- ▶ big data optimized to be easy and fast accessible from softlayer
- ▶ simplicity wins. The easier to consume, the more likely it'll be consumed



# LinuxCon Panel: What's the next generation cloud platform?

- ▶ all about APIs: quality, management.
- ▶ the internet of things is a Pandora's box
- ▶ how to adapt to diff geos, create predictability and scalability.



# Samsung R&D Innovation with Open Source Development, Yannick Pellet

- ▶ samsung is #7 contributor in Linux kernel development
- ▶ consumer — collaborator — contributor — leadership and innovation
- ▶ in past 5 yrs Samsung: consumer — big contributor
- ▶ not only combine open source and commercial products, but also do education



# Linux Kernel Developer Panel

- ▶ no separate scheduler per arch, even for arm
- ▶ all the work that enterprise systems did has helped embedded
- ▶ kernel developers put private emails directly to /dev/null, write to maillists
- ▶ how to get started? Ask specific questions. Always ask on the list.
- ▶ if you submit code, be around to maintain it
- ▶ device-tree is still flame topic in arm world
- ▶ on security: if you report a problem we'll fix it ASAP
- ▶ there will always be fixes. Linux changes because the world changes.
- ▶ how do you get better? Reading code is a really good way to learn.



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# systemd nspawn, Lennart Poettering

- ▶ systemd-nspawn was written originally for testing purpose
- ▶ most distros have "one line" command to bootstrap os image
- ▶ and nspawn could run it "next line"
- ▶ systemd-nspawn demo goes successfully, but one small bug onhided
- ▶ machinectl - management interface to nspawn and other cgroups virtualizations
- ▶ there are still few bugs in linux kernel. systemd, fedora...



# Linus Torvalds (and Dirk Hohndel)

- ▶ Linus is happy that few latest linux kernel releases hadn't big problems
- ▶ the most important thing in maintainer, not tech skills, but responsibility
- ▶ good thing about technology — when you do something wrong you can fix it
- ▶ I use Open Source because it's fun and it works!
- ▶ I do Linux because I want to see it work on a desktop.
- ▶ the core kernel is solid. The new and exciting ideas are on the periphery.
- ▶ Linus Torvalds: If it gets boring or I can't cope, I'll retire.
- ▶ there's no end plan. What works is what survives.
- ▶ 10 Best Quotes from Linus Torvalds' Keynote <http://bit.ly/18JYuqJ>



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# Living in a Surveillance State, Mikko Hypponen

- ▶ wholesale blanket surveillance, on everyone.
- ▶ some surveillance is ok
- ▶ today, data is cheap, we can keep everything
- ▶ people are more honest with their search engine
- ▶ the Internet has become a colony of the United States.
- ▶ countries could fight with US services together - doing Open Source
- ▶ to fight these problems, use open source. Let's work together



# Multi-layered Web Security, Konstantin Ryabitsev

- ▶ why multiple layers - we are all made out of meat, fail gracefully
- ▶ encryption is easy to get wrong
- ▶ personal questions are backdoors to your system
- ▶ captchas help against bots (a bit), but expiring tokens help better
- ▶ templating systems are just bad, keep an eye
- ▶ SELinux is first and foremost a labeling system
- ▶ ModSecurity - Web Application Firewall - analysis of http traffic
- ▶ but ModSecurity is not a silver bullet, and it is even more complex than SELinux...
- ▶ most "vulnerability scanners" will only check well known software and bugs
- ▶ security trade-off in terms of: effort, money, usability
- ▶ be prepared when things fail



## Qt Project 2 Years Later, Thiago Macieira

- ▶ Qt has long line to openness, from QPL till GPLv3
- ▶ Qt openness motivation: desire to really be an open project
- ▶ Qt goals: one workflow for everyone, regardless of employer
- ▶ Qt project principles: Fair, Transparent, Inclusive, Meritocratic
- ▶ qt3d and qtwayland will be merged to qt some day
- ▶ Qt - 450 commits/week
- ▶ 75% of qt contributions comes from digia now
- ▶ loss after nokia changes was quite big - about 25%
- ▶ face-to-face meeting really helps broke the ice



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# OSv, Glauber Costa, Avi Kivity

- ▶ app — app server — jvm — OS — hypervisor — OS — hardware
- ▶ jvm, operation system, hypervisor - do same job, wtf?!
- ▶ people don't update OS in VM now
- ▶ no hardware, no users, no apps — most features not used
- ▶ OSv mission - be the best OS powering virtual machines in the cloud
- ▶ OSv runs application in kernel space! and api not changed for the app
- ▶ Be the best OS powering virtual machine in the cloud
- ▶ hypervisor OS has nice feature - you don't need to write so much drivers
- ▶ memcached runs 40% better on OSv than native - I want check it myself!
- ▶ credibility — open source these days
- ▶ OSv runs on kvm, xen hvm (still work in progress), vmware - planned
- ▶ virtio-app - bypass I/O stack completely - consume data from virtio rings
- ▶ virtualization 2.0 - stateless servers
- ▶ OSv could run your C apps\*



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# Containers and the Cloud, James Bottomley

- ▶ virtualization was so much hyped in 2005
- ▶ the enterprise charged down the Hypervisor alley
- ▶ the Hosting market turned to Containers
- ▶ concontainers - its all about density
- ▶ containers vs hypervisors - you know everything about it
- ▶ may be someday containers tools will be merged



# GlusterFS Workshop

- ▶ distributed storage system - see also: ceph, xstreamfs, fhgfs, glusterfs
- ▶ user space, global namespace, stackable, everything is file
- ▶ glusterfs clients - fuse, NFSv3 and Libgfapi for kvm, samba
- ▶ no metadata server, multi-protocol access, replication, self-healing
- ▶ is the simplest distribution fs in terms of setting env
- ▶ mainly for non-structured data - media, shared storage, big data, objects
- ▶ glusterfs could be nicely integrated to openstack
- ▶ distributed block storage for VM
- ▶ paradigm changes block — object, central — distributed, server — storage



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# Thank You. Questions

Maksim Melnikau

[mailto:m\\_melnikau@wargaming.net](mailto:m_melnikau@wargaming.net)

<https://plus.google.com/114669104565190507739/>

[https://twitter.com/max\\_posedon](https://twitter.com/max_posedon)

<http://wargaming.com>



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