FOSDEM 2014

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FOSDEM

- I'm at #fosdem 2014! http://pic.twitter.com/cGep6vrjTE
- K level1, I think it is 2% of all attendences here http://pic.twitter.com/e0XAVnaND3
- 1st day is over, a lot of tweeting without laptop charging, and powertop says that I have 1 hour 40 minutes more - very nice!
- FOSDEM is over, thank you, see you next time http://pic.twitter.com/LDRGMYury1
- 300+ hours video recorded, enough to see 1h/day till next #fosdem

How Find and Fix Million Grammar and Style Errors in Wikipedia (1/2)

- http://pic.twitter.com/Xa3X3qhXlW
- Wikipedia uses languagetool (Java) to find errors
- languagetool finds errors, but explanation sometimes wrong
- languagetool - 10ms per sentence, 37k articles checked, 1 mln errors is projection
- All sessions will be recorded —except the java dev room they are too cool
- there is so many falsa alarms - difficult text extraction, math language, non-English terms
- languagetool false error examples: 68000 assembler (suggest: assemblers), if a is algebraic over K(suggest: an)
- LanguageTool: the next step after spell checking, LGPL, 10 regular commiters, Java+XML
- languagetool: plain text => sentences => words => find part-of-speech and base form => analyzed sentences against error patterns
- languagetool patterns are easy to contribute in XML format, no java skills required
- languagetool supports many different languages including russian and belarusian

How Find and Fix Million Grammar and Style Errors in Wikipedia (2/2)

- grammar is set of rules that describe how valid words, sentences, and texts looks like
- English wasn't made for being parsed
- "Sorry for my bed English"grammatically is fine...
- errors find, but how to *fix the million* Wikipedia errors?
- fix errors from recent changes http://community.languagetool.org/feedMatches/list?lang=en . . . , fix only changed part
- Must check OpenNLP for machine learning. #fosdem
- languagetool wish: make style and grammar checking ubiquitous
- Belarusian haven't maintainer in languagetool team
- no need to stick to spell checking today - more powerful checks are available

kdbus, Lennart Poettering (1/2)

- `http://pic.twitter.com/or7GRd4qIK`
- D-Dbus is powerful IPC: method call transactions, signals, properties, broadcasting, discovery, introspection, policy, activation...
- D-Bus ... security, monitoring, expose APIs, File Description passing, Language agnostic, Network transparency, no trust required...
- D-Bus has limitations: suitable only for control, not payload; inefficient; not available in early boot, initrd; baroque codebase...
- if you try to solve problem with XML, you have two problems, about dbus in kdbus talk
- but still, D-Bus is fantastic, solves real problems

kdbus, Lennart Poettering (2/2)

- kdbus suitable for large data (GiB!), zero-copy, optionally reusable; implicit timestamping; always available; no XML...
- kdbus overview: receiver buffer, single copy to dst(s), method call window, name registr ...
- memfds: zero copy, sealing, 512K zero copy is faster than single copy (a bit like Android ashmem)
- 2 previous tries to get d-bus in kernel grandiosly failed

miracast on Linux

- http://pic.twitter.com/59Nu5lWk9n
- miracast: HDMI over IP over Wifi
- ieee 802.11; wifi-p2p => wifi direct; wifi-display => miracast
- miracast: P2P transport setup, ip link auto discovery, A/V streams
- mirascast: many Linux wifi drivers not working (b43, brcmac, rtl818x, ath5k), some supposed to work (ath9k,brcmfmac, iwl-mvm)...
- known to work: iwl+mwm + intel wifi 7260 + wpa_supplicant: git-78f79 ...
- HDMI over IP is RTSP + RTP + h264 + audio + mpeg2-TS
- Additional Features: PTP, HDCP, UIBC, split-sink

Sailfish and Jolla (1/2)

- http://pic.twitter.com/BDyv8WiN39
- half people at sailfish talk have jolla device already!
- jolla: no factory images, but recovery mode; fastboot; abillity to unlock bootloader and flash own kernels; full root available
- sailfishos: systemd, gcc, btrfs, gstreamer, wayland, qt5
- libhybris - leverage existing Android hardware adaptation
- https://together.jolla.com/questions/ - joll's idea how to make users involve to contriubute
- #jolla contribute to everything except: artwork/trademark and L&F UI, 3rd party closed source drivers, some NDA stuff ...
- contribute to sailfishos: contribute to nemo, mer, and a lot of upstream projects!

Sailfish and Jolla (2/2)

- libhybris - port Android/bionic linker to glibc environment, and it works; allows use existing hardware for non-android OSs
- it seems ridiculous to load glibc and bionic to address space of process but works for almost all cases
- android_dlopen("libEGL.so") - we could build (glibc) libEGL.so and libGLESv2.so wrappers that accessed the android ones!
- libhybris today used by Jolla/SailfishOS, Intel/Tizen, Canonical/Ubuntu

Fedora.Next

- http://pic.twitter.com/EVINqplhDK
- Fedora.Next split to Workstation, Server, Cloud
- Fedora Workstation - graphical user environment for Student, Independent Developer, Small Company Developer, Developer in large Org
- Fedora Server - Headless "pet"server, Server Roles, IaaS Host, Stable platform for critical infrastructure
- Fedora Cloud - cloud image "cattle"server, scale-out, packaged images for public clouds
- some people in room dislike that Fedora.NEXT is smth, which was "designed"behind closed doors
- Fedora has so many infrastructure problems: bugs, reviews, build system, etc.

FOSDEM network, NAT64 and DNS64 (1/2)

- http://pic.twitter.com/JQwXYYaw5z
- NAT64 Statistics Total active translations: 23636
- but too many people escaped to fosdem-dualstack :( )
- So, I'm switched to ipv6 #fosdem ESSID ... It is my first time ever when I use ipv6 ... http://pic.twitter.com/KO1nCoCwHr
- IPv4 has run out, IPv5 never made it to public use, so IPv6
- there was a war in begging of IPv6: 64bit vs unlimited!
- clients, content, carriers, applications, hardware - Mexican standoff - nobody want to do first step
- World IPv6 day - lets turn it on and see what breaks
- google, facebook, yahoo, youtube, netflix, akamai and many more run ipv6 today
- different countries (main providers) enables ipv6 one by one - France, Germany, Belgium etc

FOSDEM network, NAT64 and DNS64 (2/2)

- - 5000+ hackers which could test, debug and fix ipv6 problems
- if you run NAT anyway - why not unable IPv6 and use NAT64 and DNS64 ?!
- we can hide a complete legacy internet in a /96!
- My twit at #fosdem ipv6 talk, I'm famous now! :)
  `http://pic.twitter.com/EEqM0XKIQM`
- nexus could not get ipv6 only address
- FOSDEM'14 is the first general-purpose conference which has ipv6 network by default

KDE Connect

- `http://pic.twitter.com/Z5ZaXSvzRT`
- KDE Connect - fuse your devices as mush as possible and desirable
- KDE Connect protocol: json based, medium abstracted, easy extended, easy implemented
- KDE Connect: Notifications, Actions, Battery, MPRIS2, Send files and Urls, Clipboard synchronization, Encryption
- Connect: Qt => libconnect => Server => Plugins => DBus => Plasma, KCM, Apps

GPU Offload on Wayland

- http://pic.twitter.com/BIUK0CmUp8
- render-nodes - Allow to render without authentication to DRM master(but without some functionality)
- 1080p screen buffer with 60fps 480MB/s, PCI express is 4GB/s, thunderbolt 1GB/s
- tiling - special pixel ordering optimized to exploit local spatial coherence - good for performance
- GPU offload with X DRI2: DDX per device/provider, configure with xrandr
- Two displays: A and B, two cards: 1 connected to A, 2 connected to B - classic nvidia optimus layout
- wayland gpu offload: shutdown the dedicated GPU when unneeded works now
- XWayland: wlglamor, Xserver linked to Wayland compositor - no need for gpu offloading

Wine User Experience

- `http://pic.twitter.com/WGR6nkEhuQ`
- once a year somebody writes at wine forum what "everything is work, and you are rock!"
- #ubuntu still ships 1.4.x wine version, why?!
- common problem when you answer to user question if user hides, you don't know why: does everything work, user give up or died ...

Performance of Wine and Graphical Drivers (1/2)

- http://pic.twitter.com/jRFI2OxRqT
- wine performance becomes a bit faster on windows last year (yes, wine works on windows too)
- R300g+wine become a bit slower with reason of some unknown regression, but R600g got greate improvements
- nvidia legacy is unchanged, so quite silent time from user point of view => but it was a lot of work inside
- wine multithread command stream - move most d3d work into separate thread => better CPU utilization => 2x performance (in theory)
- easy synchronization in multi-threaded games, even bigger performance gains, 3x in CoD 4:MW, btw Windows does the same thing
- GeForce 460 GTX, wine performance a 40% lower than in windows for UT2004

Performance of Wine and Graphical Drivers (2/2)

- wine CSMT improvements - some games faster on wine than on windows
- CSMT brings better performance mostly on fast systems like 460gtx + i7 ...
- drivers don't like to be called from two threads without looking, even with separate contexts
- CSMT and Nvidia's threaded opt - essentially the same thing, differences is in synchronization
- CSMT wine next steps: upstream, improve data streaming, reduce draw overhead in wine, wine performance outside d3d ...
- wine could have a big problems running on wayland natively - many windows apps rely on window posistions for example

Persistant Storage (1/2)

- `http://pic.twitter.com/5TOmumYiiw`
- file system performance: maximize throughput or latency? target embedded, power consumption or performance?
- high bandwidth has been the traditional focus - backup, streaming video, etc
- SSD's made life more complicated - not too painful at first, plaggued in
- PCI-e SSD Devices Turn up the Heat - opened a lot of other bottlenecks in Linux Storage Stack - 1 million IOPS/device
- a single file system is easy for users and applications, and can perform better than multiple file systems
- wow! fsck which works more than week!
- persistent memory - a variety of new technologies are coming from multiple vendors - Linux need to be (mostly) technology neutral
- SNIA - Storage Network Industry Association, Working Group on NVM.

Persistant Storage (2/2)

- SMR Drive Write Bands - sequential write only
- Host is aware of SMR topology at some layer
- Open source drives emerging for PCI-e cards, open source drivers should become more popular than closed vendor one
- SMR and PM together - interesting workload for out future
- for x86_64 machines, normally block size limit is 4k, storage hardware often have very large internal blocks - 65k
- Persistent Storage - you will never ever wait for storage anymore, CPU will be bottleneck

Concurrent Programming Made Simple - Transaction Memory (1/2)

- `http://pic.twitter.com/loaFWPhMFI`
- shared memory (synchronization) + Transactions = Transaction memory (TM)
- TM is programming abstraction - allow programmers to declare which code sequences are atomic
- TM is still rather new - standartization for C/C++ started 5 years go, GCC has support since 4.7, HW implementations - haswell
- __transaction_atomic { if (x<10) y++; } - code in atomic transactions must be transaction-safe
- transactions extend the C11/C++1 memory model - all transactions totally ordered
- TM supports modular programming - programmers don't need to manage association between shared data and synchronization metadata

Concurrent Programming Made Simple - Transaction Memory (2/2)

- GCC implementation: compiler - ensure atomicity guarantee (at compile time!) - find all transaction safe code
- GCC implementation: TM runtime library (libitm) => enforces atomicity o transactions at runtime (contains SW-only implementation)
- performance: it's a tool, not magic - *useful balance* between easy-to-use and performance, but implementations are wip
- single-thread performance: STM slower than sequential, HTM equals. In multi-thread both STM and HTM scales well
- TM, use it: gcc -fgnu-tm, report bugs and dive into libitm / GCC
- Transaction Memory as Distributed Transaction Memory
- eventually consistency - is not consistency at all!

Thank You. Questions

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