DCD - Desktop Chromodynamics

or: Linux on DESY Desktops

- A presentation with some details on technical implementation
- But more important, on the discussions coming to these concepts

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Why discussion on Linux desktops?

- DESY provides support for Linux on desktops
- Linux Desktops: ~800, compared to ~4000 Windows desktops
  - Some „desktops“ are used in experiment or control stations
- Zoo of distributions, as of beginning 2015
  - Desktop installations @ Hamburg, March 2015 (Tot 804)

Then, beginning 2015: RHEL 7 (and derivatives) became available
  - Time for a change?
  - Discussions with users and among IT in Hamburg and in Zeuthen
User communities

> Rough overview on past/current Linux/UNIX usage

- HEP people with DESY contract: SL on Desktop
- HEP people Uni-HH: Lots of Ubuntu on Desktop
- Photon science HH: Lots of Ubuntu on Desktop
- Machine people HH: Mixture of SL and Ubuntu
- Astroparticle: Currently SL6

> Large compute resources:

- BIRD/BatchFarm/Grid/HPC: SL only
... And Linux laptops?

> Hamburg offered Laptop installations until early 2015
  > Limited configuration and support
  > Manpower intensive

> Zeuthen dropped Laptop support with SL4EOL

> Linux laptop users are mostly Linux experts
  > Know what they want, and know how to achieve this

> Many people seen nowadays with Apple laptops
  > Need to think about Mac support, but that is a completely different story...

> No Linux laptop support anymore
One central part in the discussion was: How do people work?

Take the examples of the DESY HEP group and Uni-HH HEP group.

Both use the same large computing resources (Batch, Grid,...), same mass data on same storage system, ...

Uni-HH HEP people use their (mostly Ubuntu) Desktops for Office application, and as ssh-Client to the large computing resources

DESY HEP people use their (mostly SL) Desktops for Office, SW development, that will later run on large computing resources
How should people work? In 2015ff?

- One thought: Move

- **from heavy-weight desktops** – and workflows that combine these heavy-weight desktops with large compute and storage clusters

- **to lightweight desktops** - ideally stateless which mostly serve as peak-holes to large infrastructures

- ?

- Use the most appropriate distribution for the respective use-case?
  - Lightweight desktop -> Ubuntu
  - Large infrastructures -> SL / CentOS

http://www.ciao-belly.de/magazin/motivation/wie-schnell-abnehmen
Ubuntu as basis for future desktop

- Many Linux distributions ... But only few with long-term, enterprise grade support

- When it comes to desktop, Ubuntu is natural choice
  - Good balance between frequency of new releases and long-term support
  - Good hardware support
  - Probably highest number of available software – especially around desktop

- What do users think?
  - Mixed: Some would need to rethink workflows
  - Some already using Ubuntu, would profit from streamlined support
  - Some eager to go Ubuntu (e.g. Zeuthen ATLAS group)
  - No problem for some (e.g. IceCube software also supported on Ubuntu)

- First discussion on detail configuration:
  - Window manager ... Ubuntu standard (Unity)
Detail of configuration: $HOME

> In past years, $HOME=/some/network/file/system
  - AFS to be specific

> Why?
  - People were using several systems, and wanted unified $HOME
  - $HOME not only used for .login, but also data and working dirs
  - Backup easy on central FS
  - ... It worked

> Why think about this now?
  - Performance and stability issues: Locking, latency (firefox, .kde, ...)
  - Some people only use one system, no need for more complicated setup
  - Unified .kde not helpful if switching between Ubuntu and SL

http://www.wandspruch.de/Wandsprueche/Wohnen/My-home-is-my-castle.html
Details of configuration: $HOME

➢ Hamburg:
  ▪ $HOME=/home/$USER
  ▪ Local hard drive without backup – educating users
  ▪ AFS is mounted and accessible (K5 and AFS creds. issued at login time)
  ▪ Some links from $HOME to AFS (e.g. Documents)

➢ Zeuthen:
  ▪ $HOME=/afs/...
  ▪ Using local hard drive as scratch/tmp space

➢ Hard discussion and decision

➢ Future: interplay OpenAFS <-> Ubuntu ?
Root rights for local users

- Past: Local user and group admin had root rights

- They used them for
  - small tasks: Adding additional packages
  - Medium tasks: Adding NFS mount
  - Big tasks: Adding PPA repos, configuring network, ...

- Our config management systems and users often were fighting against each others.

- Highlander Principle: There can only be one!
  - The configuration management system (Puppet@HH) -> Green Desktop
  - The user with root rights -> Yellow Desktop

https://plus.google.com/+CybercitiBiz/posts/Zy1bVzKhaZn
This was a big issue for users

Most users want to be able to perform small tasks on their system, mostly adding packages

We enable this via the Ubuntu SoftwareCenter: Users can install packages from pre-defined repos using PolKit

- We offer some additional packages via selected repos (OwnCloud, Chrome) or packages in our own repo.
- Most users are OK with this after some teaching

IT will addconfigs like NFS server

If larger configs are needed, groups are offered the possibility to create these themselves, and distribute them using the config system or packages. The Highlander principle than still applies.
Get rid of HEP ENV

The Unix Shell Environment

> Idea of HEP environment some years ago: Have a common environment on different UNIX flavors AIX, HP-UX, ..., Linux
  - Today: ~99.99% Linux

> Orthogonal HEP environment to $DISTRIBUTION environment
  - Confounds users
  - Adds support load
  - Creates adaption work for sysadmins

> Part mostly used at DESY HH was for group setup
  - Automatically sources some scripts created by the admins of your PRIMARY group
  - Not OK for people working in different groups, or moving between groups

> Get rid of HEP environment completely in HH
  - Create some help that users can EXPLICITLY and MANUALLY source group environment of their choice
Limited HW and lifetime support

➢ To prevent ourselves from turning old, previously WinXP machines into Ubuntu 14.04 and chasing up $Hardware troubles, we only support machines still in hardware support by the vendor.
  ▪ In theory 😊

➢ Official hardware support limited
  ▪ But most hardware work with Ubuntu anyhow
  ▪ ... Well most current distributions

➢ Once the new Ubuntu LTS is out, there will be a transition period of 1 year, after which the support for old LTS versions is on best effort only
Coloring scheme

> Green desktop (default)
  - Ubuntu 14.04, no root rights, local $HOME

> Yellow desktop:
  - If people need root access, they have to fill in a form, get it signed by their supervisor
  - We disable Puppet on these machines
  - Currently ~10% of Green desktops turned into Yellow ones. Mostly developers within IT and people that need special hardware.

> Red desktops:
  - Whatever people want ... We do not care.
  - We just provide basic hints for configuration
  - People need to fill an adequate form
  - No statistics, as we are not involved😊
Ksplice

- Ksplice support for Ubuntu (desktop)
- In usage at DESY since some years
- In 2015, several problems with Ksplice
  - Some related to AFS
- The glibc bug showed us that Ksplice does not always prevent reboots

- Why do people need Ksplice on the desktop anyway?

- Discontinuing Ksplice @ DESY

- ... Waiting to see other techniques for avoiding reboots
Future

> Start working on Ubuntu 16.04

> Work on better graphical access tools for compute resources
  - Should lower the requirements and dependency on desktops even more

> More thoughts on network file system
  - Do we need one for $HOME? Exact specs?
  - What is technically feasible?

> OpenAFS <-> Ubuntu interplay ... Listen to Stephan’s talk!

> What is the far future of Linux Desktops?
  - Linux(-like) User-Land available with Android, OSX and Windows 10 .... In addition to MS Office and Acrobat Reader!

http://de.123rf.com #40678829