Supported Linuxcomputing @ DESY Hamburg

I. Introduction

II. Support / computing models
- batch, wgs and *desktop*
- installation / administration

III. Technical prerequisites

IV. Installation method
- some considerations
- how does it work ?

V. Conclusions, outlook

Dirk Wetter, Computer Center DESY, CHEP 1998, ANL

I. Introduction

@

- motivation (experiments/computer center):
  - performance
  - low costs for hardware /
    total costs of ownership (TCO):
    (installation, administration, technical support,...)
  - stable and reliable UNIX OS
  - desktop:
    homogeneous environment, e.g. accessing wgs
    effect of *personal* computer

- computing models:
  - workgroupserver
  - batch / farm
  - desktop

- Linux: *multi purpose* OS (well suited for all models)

  NT: desktop Solaris: classic wgs platform

II. Support/computing models

a. human resources

- another operating system causes
  costs and additional load:
  - installation (preparing / maintaining / performing)
  - administration / maintenance
  - application software
  - user support

- job situation in computing:
  - big demand for people
  - in general companies pay more than research
    institutes/universities
  - German factor:
    cut of expenses from government

II. Support/computing models

b. workgroupserver

→ computing model:

- keyrole: distributed filesystem (AFS)
  - homedirs in AFS (integrated login, ...)
  - application software (/usr/local/bin) in AFS
  - basic system software on local disk
- DESY ENV: HEP-, X11ENV,YP, DESY-mail, -printing
- centrally located (computer center / dedicated rooms, no desktop), access 24h / day
- no local display
- no server functionality → central server (imap/pop, inn, bind, ~http or local mail)
- mounts of data disks via automounter
- fast network access
- monitored

II. Support/computing models

c. workgroupserver/farm support

→ prerequisites for Linux:

- some 10 PCs
- to be easily administrated
  with existing tools / concepts
- batch machines:
  setup *could* be similar to wgs

→ support, same as for UNIX brands :

- installation support
- administration by experiments/computer center
- full application SW support
- user support
- batch machines: only if setup like wgs

→ systems:

- ZEUS farm: 18 PCs, formerly NT ;)
- other collaborations: 14 (some on stack) PCs

II. Support/computing models

d. desktops at DESY

- ***large* number of *decentralized* systems**
  - ➪ good concept needed to support centrally

- ~ 1200 X terminals
  - most easy to install and to support

- ~ 800 NT PCs
  - local netscaping/IE, office applications, ...
  - Exceed (X Server)
  - AFS (optionally)
  - models of administration:

    green / yellow / red

- and ... Linux (is resistance futile) ?
  - up to now: lots of self installed systems
  - security ?

physicists

- $\sum$ work $\gg$ $\sum$ work

people=0 computer center

II. Support/computing models

e. desktop support

→ status:

- most often requested (incl. AFS client);
  estimated: a couple of hundred PCs
- security concerns:
  - login from everywhere
  - hackers 1st choice (cheap PC hardware)

↳ needs:

  - secure setup
  - well scalable solution
  - hardware standards (DESY standard PC)

- setup based on wgs (AFS, DESY ENV, printing,...)

→ support:

- providing easy to use network installation
- perf. installation + administration: group admin
- no dual boot systems
- **rules,** like green NT PCs, e.g.:
  - users don't have root passwort
  - root + user access for the computer center
  - ...

→ systems:

- ~ 40 test installations (production ~4th quarter)

III. Technical prerequisites

a. Linux

- PC hardware:
  - great variety:
    disadvantage & advantage
  - should be carefully choosen:
    reliability (CPU fans, harddisks, assembly, ...)
  - dumb BIOS:
    no serial console prompt, serial connection after LILO
- software:
  - availability / stability:
    drivers for brand new network-, graphic cards
  - kernel 2.0 older 2 years (SMP, NFS, > 64MB, ...)
    2.2 much better
  - 3rd party SW, availability, e.g.:
    - Loadleveler, ~LSF (token extension)
    - DFS client
    - native Motif

    although some things have changed:
    Objectivity, Oracle, IBM (ADSM !)

III. Technical prerequisites

b. AFS

- **AFS: keyrole for DESY environment**
- Linux-AFS status:
  - not free SW (binaries + sources)
  - support:
    none from TRANSARC,
    MIT graduate student developer/maintainer, for how long ?
  - versions:
    MIT is 3.3a, TRANSARC 3.4a
  - MIT distribution not complete:
    - AFS binaries (r-cmds, inetd.afs, scout, dlog, package,..)
    - libraries only available for US sites
      (PAM and kerberos helps)...
  - difficult to install:
    - kernel release (8 AFS-versions since 2.0.1)
    - SMP
    - modutils (and CONFIG_MODVERSIONS)

IV. Installation method

a. general considerations

- DESY uses currently S.u.S.E. distribution
  - DESY needs:
    easy to perform network installation (≅ jumpstart)
  - binary format:
    kickstart from RH is bound to glibc (aka libc6)
    (CERNLIB, AFS)
  - influence:
    on the network installation mechanism:
    we paid for that (free available since SuSE 5.2)
  - security:
    - chance that exploit doesn't work for SuSE
    - IMHO: security of SuSE system is better
  - but monolithic server:
    ~no degree of freedom for client during
    installation, everything's on the server
    (more cathedral model than Linux' bazaar)

IV. Installation method

b. how does it work ?

- before installing:
  - bootp + DNS server entry (group admin)
  - NFS server entry (YP) (computer center)
  - wgs: RPMs have to be prepared (kernel, cluster,...)
- floppy disk, including:
  - generic user kernel
  - ramdisk
  - bootp client
- sends bootp request, bootp server identifies system
- NFS mount to install server
- preparing harddisk
  (according to simple rules on installation server)
- basic installation:
  (different extent of SuSE/DESY RPMs),
  everything's configured automatically !!!

IV. Installation method

b. how does it work (cont.) ?

- with SuSE postinstall some RPMs:
  - security fixes
  - kernel ("reasonable" patches) + modules
  - modutils usable for AFS
  - cluster specific RPMs:

    /etc/passwd+shadow, YP client conf., autofs maps, ...
- hook: /sbin/init.d/rc[23].d for DESY postinstall, reboot
- DESY postinstall:
  - AFS itself
  - AFS aware binaries, PAM modules for authentication
  - DESY look & feel: HEP-, X11ENV, DESY-printing, -mail
- reboot, remove the hook ;)
- go ! 20-60 min. since inserting the floppy,
  w/o any interaction
- local manually customizations (desktop):
  - keyboard type (US/German)
  - screensize
  - root password

V. Conclusions, outlook

- in spite of the additional load DESY Hamburg computing center succeeded in a short time to raise a support for Linux

- two different support models:
  - workgroupserver: full support as for other UNIX flavors
  - desktop: will provide only installation

- open issues:
  - AFS: future availabilty and functionality ?
    (Kernel 2.2, AFS version 3.5)
  - scalable support + computing model for desktop ?