

REDHAT KICKSTART

Automating Linux Installation

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Kickstart

- What is Kickstart?
- Review of Features
- Observations
- Demo Installation

- This talk is intended to give people an appreciation of what Kickstart can do
- It does not intend to be all encompassing
- Slides based on Redhat 7.2

Kickstart – What is it?

- RedHat Linux comes with a feature called KickStart. This feature lets you automate most/all of a RedHat Linux installation.
- It lets you create a single file (ks.cfg) which contains the answers to all the questions that would normally be asked during a typical RedHat Linux installation.
- I386, alpha or sparc architecture
- Yes, there is a GUI, enough said.

Kickstart – What is it good for?

- Standardized installations
 - Firewalls
 - More than one machine or experimenting different types of installations
- Can tolerate a certain amount of hardware differences
 - NIC
 - Video
 - Hard drive sizes

Kickstart Requirements

Disk based installs

- RH boot disk (boot.img or bootnet.img) or bootable CDROM
- MS-DOS floppy with ks.cf
- RedHat distribution cdroms

Network based installs

- RH boot disk
- Dhcp server and one of:
 - Nfs, Ftp, or Http server

Kickstart Features

Kickstart automates:

- Language selection
- Network configuration
- Keyboard selection
- Boot loader installation (e.g. Lilo, GRUB)
- Disk partitioning and filesystem creation

Kickstart Features

- Mouse selection
- X Window system server configuration
- Timezone selection
- Selection of an (initial) root password
- Which packages to install
- Pre-install
- Post-install

Kickstart Features

- Kickstart configuration file: ks.cfg
- Contains information for installation
- Either on network or MS-DOS floppy
- Process requires no human intervention
- If there are errors in the configuration file, Kickstart will either drop down into a normal install or display python debug messages and tell you it's safe to reboot.

Kickstart – ks.cfg

Three main sections:

- Commands
- Packages
- Pre-install / Post-install

- **SECTIONS MUST BE IN ORDER!!**

Kickstart – ks.cfg Commands

Required Options:

- lang
- langsupport
- keyboard
- part
- mouse
- rootpw
- timezone
- auth
- bootloader
- installation method

Optional Options:

- autostep
- upgrade
- interactive
- clearpart
- device
- driverdisk
- deviceprobe
- firewall
- lilocheck
- network
- raid
- reboot
- text
- skipx
- xconfig
- zerombr
- deviceprobe

Kickstart – Required Options

lang

- set language to use during install
- Eg: `lang en_US`

langsupport

- Set language to install on system
- Eg: `langsupport -default en_US fr_FR`

keyboard

- Set keyboard type, Eg: `keyboard us`

Kickstart – Required Options

part

- Creates partitions
- Types: swap, raid.<id>, --fstype <type>
- Mount point: /<mntpoint>
- Where: --onpart, ondisk, asprimary
 - --onpart for existing partitions (use --noformat)
- Size: --size <#>, --grow, maxsize <#>
- Get down to block level if desired
- Eg: `part /export/home --size 400 --grow \
• --asprimary`

Kickstart – Required Options

mouse

- Configure GUI and text mouse
- Eg: `mouse --emulthree genericps/2`

rootpw

- Sets the systems root password
- Eg: `rootpw --iscrypted 12h2h33dd`

Kickstart – Required Options

timezone

- Sets the system timezone
- Eg: `timezone Canada/Central`

auth

- Sets up authentication
- `--enablemd5`, `--usesshadow`, etc
- LDAP support
- SMB support
- Eg: `auth --usesshadow`

Kickstart – Required Options

bootloader

- Specifies how boot loader should be installed
- Supports GRUB and LILO
- Eg: `bootloader --useLilo --location=mbr`

Installation method

- nfs: `nfs --server <server> --dir <dir>`, `cdrom`
- harddrive: `harddrive --partition <part> --dir<dir>`
- url: `ftp`, `http`,
- Eg: `url --url ftp://bob:pass@rhserver/rh72`

Kickstart – Optional Options

interactive

- Uses info from ks.cfg but allows for inspection and modification of values

autostep

- Similar to “interactive” but goes to next screen for you

upgrade

- Upgrade system (default is install)

Kickstart – Optional Options

clearpart

- Clears partitions from system
- `--linux`, `--all`, `--drives <#>`, `--initlabel <type>`
- Eg: `clearpart --all`

device <type> <modulename> --opts <options>

- Forces loading of install extra modules

deviceprobe

- Forces probe of PCI bus

Kickstart – Optional Options

`driverdisk <partition> [--type <fstype>]`

- Supports use of driverdisks

`firewall`

- Configure firewall options
- `--high`, `--medium`, `--disabled`
- `--trust <device>`, Eg: `--trust eth0`
- Allow services: `--dhcp`, `--ssh`, etc
- Set `--port <portspec>`, Eg: `--port imap:tcp`

Kickstart – Optional Options

lilocheck

- Checks for lilo and reboots system if found

network

- Configures network info for one interface
- --bootproto <dhcp, bootp, static>
- --device <interface> (only on floppy based install)
- For --bootproto static:
 - --ip <#>, gateway <#>, nameserver <str>
 - --netmask <#>, --hostname <string>

Kickstart – Optional Options

raid

- Assembles software RAID device
- `raid <mntpoint> --level <level> \`
`--device <mddevice> <partitions>`
- / must be level 1 unless /boot partition separate
- `--spares=<#>`, `--fstype`, `--noformat`
- Eg:

```
part raid.01 -size 200 --ondisk hda --asprimary
part raid.02 --size 200 --ondisk hdb --asprimary
raid / --level 1 --device md0 raid.01 raid.02
```

Kickstart – Optional Options

reboot

- Reboot after installation complete

text

- Perform install in text mode
- Install Graphical by default

skipx

- Skip X configuration

Kickstart – Optional Options

xconfig

- Configure the X window system
- Options:
 - --noprobe, --card <card>, --videoram <#>
 - --monitor <mon> --hsync <#>, --vsync <#>
 - --defaultdesktop=<GNOME,KDE>
 - --startonboot
 - --resolution <res>, --depth <depth>

zerombr

- Zero master boot record

Kickstart – ks.cfg – packages

Packages - RedHat packages to install

- section starts with: `%packages`
- check out RedHat/base/comps on CDRROM
- components (groups of packages - starts with "@")
- individual packages may be added
- Example:

```
%packages
@ Network Server
Mtools
perl
Zip
```

Kickstart – ks.cfg – pre-install

Pre-installation commands

- run immediately after ks.cfg parsed
- network running (no name services)
- section starts with: `%pre`
- scripts, more packages, etc
- the pre-install script is not run in the change root environment - new partitions mounted on `/tmp`

Kickstart – ks.cfg – post-install

Post-installation commands:

- Run once installation complete
- Section starts with: `%post`
- Scripts, system commands, etc
- run in chroot env (can't access installation media)
- Example:

```
%post
```

```
/usr/sbin/netconfig --bootproto=static\  
--ip=192.168.13.254 --netmask 255.255.255.0\  
--hostname=test13 --device=eth1
```

Kickstart – Simple Install

- Boot off cdrom or floppy
- ks.cfg on MSDOS floppy or written to boot floppy
- Modify the boot image and/or add the ks.cfg file to the floppy (more in Observations section)
- Fastest way to get going
- On installation machine:
 - Boot off RH boot floppy (boot.img) or cdrom
 - At syslinux boot prompt: `linux ks=floppy`

Kickstart – Network Install

- More complex to setup
- Lets you install to machines without cdrom drives.
- It is possible to install into a vmware machine from the host machine (great way to test).
- Boot off floppy with bootnet.img image (RedHat cdrom has boot.img, not bootnet.img)
- DHCP in conjunction with nfs, http, ftp supported

Kickstart – Network Install

- Example of install using DHCP and nfs with Linux RH7.2 server:
- NOTE: if you are on network with an existing DHCP server, disconnect from the main network before starting your DHCP server.
- On server:
 - 1) Create base directory for RH RPM's and Kickstart file:

```
mkdir /rh72
```

 - Copy your ks.cfg into this directory

Kickstart – Network Install

2) Setup DHCP, note: 192.168.8.102 is IP of nfs server

- /etc/dhcpd.conf:

```
subnet 192.168.8.0 netmask 255.255.255.0 {  
    range 192.168.8.70 192.168.8.80;  
    filename "/rh72/ks.cfg";  
    next-server 192.168.8.102;  
}
```

- startup DHCP services:

```
/etc/init.d/dhcpd start
```

Kickstart – Network Install

3) Copy installation information from RH cdroms

- Insert disc 1, mount /mnt/cdrom

```
cp -a /mnt/cdrom/RedHat /rh72
```

- Replace disc 1 with disc 2, mount /mnt/cdrom

```
cp -a /mnt/cdrom/RedHat /rh72
```

- NOTE: Make sure you get all the directories within RedHat/ on both CDROMs

Kickstart – Network Install

4) Setup nfs to share /rh72

- create /etc/exports with single line:

```
/rh72 * (rw)
```

- start portmap, nfs, and nfslock

```
/etc/init.d/portmap start
```

```
/etc/init.d/nfs start
```

```
/etc/init.d/nfslock start
```

- If nfs already running just run: `exportfs -a`

Kickstart – Network Install

On installation machine:

- Install network card and connect to network
 - Pick a common NIC if possible
- Boot off Redhat boot floppy (bootnet.img)
- At syslinux boot prompt enter: `linux ks`
 - (or use special floppy described below)
- If your ks.cfg is correct, you're finished!!
- use tcpdump, tail /var/log/messages to debug problems

Kickstart – Observations

Partitioning

- If you like primary partitions:
- Eg: `part / --size 2000 --asprimary`

Multiple Disk support

- use `--ondisk` on `part` option

Network Installs

- NFS is faster than http but harder to setup

Kickstart – Observations

RAID it!!

- if you have two disk you can RAID 1 (mirror) them at install time:

```
part raid.01 --size 500 --ondisk hda -asprimary
part raid.02 --size 500 --ondisk hdb --asprimary
part swap --size 32 --ondisk hda --asprimary
part swap --size 32 --ondisk hdb -asprimary
part raid.11 --grow --ondisk hda --asprimary
part raid.12 --grow --ondisk hdb --asprimary
raid / --level 1 --device md0 raid.01 raid.02
raid /var --level 2 --device md1 raid.11 raid.12
```

Kickstart – Observations

Customize your Floppy boot disk to do it all

- Mount up boot image or floppy with kernel on loop back device:

```
mount -o loop -t msdos bootnet.img \  
      /mnt/boot
```

- Edit syslinux.cfg:
 - Change:"default linux" to "default linux ks"
or "default linux ks=floppy"
 - Copy ks.cfg to image: `cp ks.cfg /boot/mnt`
- unmount the image and dd it to a floppy

Kickstart – Observations

- If editing ks.cfg under DOS watch for CR/LF.
- During the installation process, a Kickstart file reflecting the user-selected installation options is written to /root/anaconda-ks.cfg. This file can be used to create a installation similar to the newly-installed system.
- Note: This file is not ready to run - partitioning info is commented out.

Kickstart – SAMPLE ks.cfg

- Sample ks.cfg file which will create a basic machine with networking but no X config. it will wipe out the mbr and the current partition table. It is setup to install off of the network.

```
lang en_us
```

```
langsupport -default en_us
```

```
network --bootproto static --ip 192.168.12.254 \  
        --netmask 255.255.255.0 \  
        --gateway 192.168.12.1 --device eth0
```

```
cdrom
```

```
keyboard "us"
```

```
zerombr yes
```

```
clearpart -all
```

Kickstart – SAMPLE ks.cfg

```
part / --size 2000 --asprimary
part /var -size 2000 -asprimary
part swap --size 128 --asprimary
part /export/home -size 1 --grow -asprimary
install
mouse genericps/2
timezone canada/central
rootpw mypass
auth -useshadow
bootloader -useLilo --location=mbr
skipx
text
```

Kickstart – SAMPLE ks.cfg

```
%packages
```

```
@ Network Server
```

```
mtools
```

```
perl
```

```
zip
```

```
unzip
```

```
tcpdump
```

```
%post
```

Kickstart – References

HOWTO: wwwcache.ja.net/dev/kickstart/

Redhat 7.2 documents:

- www.redhat.com/docs/manuals/linux/RHL-7.2-Manual/custom-guide/ch-kickstart2.html

Using the Kickstart configurator (GUI):

- www.redhat.com/docs/manuals/linux/RHL-7.2-Manual/custom-guide/ch-ksconfig.html