CentOS: Poor man's SAN with CentOS and gPXE

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Overview

• Usual boot devices
• Supporting a new boot device
• Booting from iSCSI
• Installing CentOS on an iSCSI LUN
• Conclusion
Available boot methods

- Local and removable storage
  - Harddrive
  - Floppy
- CD / DVD
- USB
- SAN with HBA
- PXE
- iSCSI without HBA?
A closer look

- Booting is just "loading code"
- Operating systems expect storage
- Device support is emulation
  - CD/DVD emulates a harddrive or a floppy
  - USB emulates a harddrive
  - HBA emulates a harddrive
- We have to emulate a harddrive somehow
Support a new boot-device

- We need to extend the firmware somehow
- gPXE already supports booting iSCSI and every common NIC
- Can be burned into the NIC's ROM
- Can be chainloaded using normal PXE
Chainload gPXE using PXE

- gPXE is available as PXE Image
- Image can include drivers for all NICs
- Chainloading is simple and NIC independent
- gPXE configured by DHCP options

/etc/dhcpd.conf:
```
option space gpxe;
option gpxe.bus-id
    code 177 = string;
if not exists gpxe.bus-id {
    # just chainload gPXE
    filename "/gpxe.pxe";
} else {
    # options for gPXE
}
```
Boot from iSCSI using gPXE

• Manually using the `sanboot` command

• Providing an iSCSI root-path through DHCP
  – this is documented in RFC 4173 as
    `iscsi:<server>:<protocol>:<port>:<lun>:<target>``

• Connects to the LUN and emulates a standard BIOS device (harddrive)

• The operating system can be loaded with its native bootloader
Installing CentOS

- Support for iSCSI in the OS is still required
- CentOS supports iSCSI out of the box
  - iSCSI boot support is integrated
  - Anaconda has "advanced storage configuration"
- Standard installation without hacking around
- The only extra step is configuring DHCP to provide the correct root-path
Conclusion

- You don't need a HBA to boot from SAN
- iSCSI in CentOS just works out of the box
- The only 3rd-party product involved is gPXE
- A short budget doesn't mean you have to fall back to local storage
Questions?
Thank you!