

Welcome to the BSDCon/Euro 2023 presentation program.

(I)ntroduce, (O)verview or (P)resent? i

Setup a user? (enter a lower-case loginname, or 'no') [no] y

No really, what is the lower-case loginname, or 'no'? [no] kn

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# Overview

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- Design Goals
- Modes / Features
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- How it works
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- Testing
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# Design Goals

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- platform agnostic interface
- cover most common cases
- intuitive Q/A workflow
- great first impression
- reliable, resilient
- sane defaults

# Modes / Features

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## ■ Installation & Upgrade

- interactive

- ▶ mostly just <Enter>, <Enter>, ...
- ▶ 'abort' / 'done' to track back
- ▶ sets via disk, CD, NFS, HTTP(S) or FTP

- unattended (5s to interrupt)

- ▶ install.conf via DHCP and HTTP - autoinstall(8)
- ▶ custom sets and scripts - install.site(5)
- ▶ /auto\_upgrade.conf - sysupgrade(8)

## ■ Rescue (S)hell

- debug network

- fix disks

# Examples

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set default EFI entry plus backup in multiboot setup after upgrade

- /upgrade.site

```
mount /boot/
```

```
cp -a /usr/mdec/*.EFI /boot/efi/BOOT/
```

```
cp -a /usr/mdec/*.EFI /boot/efi/openbsd/
```

# Variable components

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- bootstrap - sys/arch/\$(machine)/stand/, sys/stand/
  - biosboot(8/i386), pxeboot(8/amd64), boot\_sparc64(8/sparc64), etc.
  - floppy, CD, disk or netboot
  - software RAID support - softraid(4)
- RAMDISK\* kernel - sys/, etc/firmware/
  - WiFi, (network) drivers
  - NFS
- userspace - distrib/special/
  - minimum selection of SMALL builds
  - not every install media has
    - ▶ dhcpleased(8), kbd(8), ftp(1) TLS, etc.

# How it works

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boot loader -> kernel -> init(8) (+ rc(8) stub) -> root shell

- `/.profile` - glue code (~150 LOC)
  - TTY and timeout setup
  - mode selection
  - `/install`, `/upgrade` or `/autoinstall` execution
- `/install.sub` - the centerpiece (~3700 LOC)
  - helper functions
  - questions / response file handling
  - sysupgrade watchdog
- `/install.md` - machine dependent code

# Build process

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## ■ install media - CD ISO, USB image) - mkhybrid(8)

- bootstrap - boot\_amd64(8/amd64)
- ramdisk (kernel + disk image) - makefs(8), rdsetroot(8)
  - ▶ all programs - crunchgen(8)
  - ▶ installer code - ksh(1)
  - ▶ firmware
  - ▶ sets
  - ▶ timezone data, TLS certs, /etc/ config, ...

## ■ release(8) or... boot media only without no sets

```
# cd /usr/src/ && make obj
```

```
# cd distrib/
```

```
# make -C special/
```

```
# cd amd64/ramdisk_cd/
```

```
# make
```

# Testing

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- quick prototyping (no bootstrap)

```
# vmctl start -c -b obj/bsd.rd rd
```

(I)nstall, (U)pgrade, (A)utoinstall or (S)hell? s

- introspection

```
# FUNCS_ONLY=1 ./install.sub
```

```
# typeset -f get_dkdevs
```

```
get_dkdevs() {
```

```
    echo $(scan_disknames "${MDDKDEVS:-/^[sw]d[0-9][0-9]* /s/ .*//p}")
```

```
}
```

```
# get_dkdevs
```

```
sd0 sd1
```

```
# ed /install.sub
```

- install

```
# vmctl start -r obj/*.img ...
```

- use real hardware, please!

# Recent changes

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- skip vlan and interface setup when there are none
- configure hostname.if(5) by lladdr/MAC
- better sets media default
- 'a' short for 'autoconf'
- Add new question to encrypt the root disk
  - required many fixes across the tree, idea from long ago
    - ▶ bootstrap, installboot(8), kernel, bioctl(8), regress, etc.
    - ▶ testing and feedback from others
    - ▶ may 2020: first commit in the series
    - ▶ aug 2022: first question (7.3 release)
    - ▶ aug 2023: reworked version

# Lessons learned

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- more complicated than it looks
- smaller than it seems
- i386 floppy are a good measure
  - first to suffer from feature/size creep
- good phrasing is hard
- don't mess with muscle memory

# Future ideas

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- more resilient questions, i.e. no need to restart an install
- make 'Setup user?' easier to get right ;)
- keydisk support (diff on tech@)
- UEFI multiboot awareness

Questions?