

# Install Linux On Your Toaster

Not Really. But Consoles and PDAs are fun, too!

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# Why Linux?

- Free as in freedom.
- The power of open source.
- Easy to hack on.

# Why Not Linux?

- Difficulty of installation
- Warranty voiding (usually)
- Loss of some functionality (usually)
- Often requires custom coding

# The Bootloader

- Architecture dependent - GRUB doesn't always work
- Often needs to be custom-written for PDAs and embedded devices
- Consoles present a special challenge due to the per-CD/DVD copy protection.

# Hack Thy Console: Hardware Solutions

- Typical hardware modification for consoles is the “modchip”.
- Works by bypassing the security check – over-rides some wires to fool the console.
- Available for all consoles.
- Tends to be difficult to install, involving soldering.
- Can cause problems with online play (X-BOX Live).

# Hack Thy Console: Software Solutions

- Commonly a buffer overflow in the save game code. (PSO for GC, Mech Assault for X-BOX)
- Requires minimal work and cost (DexDrive for PC).
- Easy for manufacturer to over-ride (dashboard.xbe updates)

# Hack Thy Console: Software Solutions, Cont.

- PS2 has a hybrid solution involving a special CD and a slider tool to open the DVD drive.
- Dreamcast copy protection is easy to break, due to a flaw in how it reads CDs (Mil-CD, CD-R)
- Probably the most feasible solution for non-electrical engineers.

# Compilation Issues

- Consoles and PDAs don't run x86 (with the exception of X-BOX).
- To compile for the appropriate architecture, you must download a cross-compilation toolchain. The toolchain has gcc, glibc headers, and binutils targeted to the appropriate architecture.
- Can be obtained at:  
<http://kegel.com/crosstool>

# Hardware Issues

- If video chipset doesn't have a VGA mode, you've got to debug with a serial console (icky).
- Devices often lack RAM to make GNU/Linux a useful OS.
- Lack of VGA-out means you're stuck with low-res TV.
- Most PDA CPUs lack an memory mapping unit, meaning ucLinux is the only option.

# Hardware Issues, Cont.

- Lack of FPU on PDAs means “normal programs” that are straight ported will go REALLY slow.
- Some consoles lack hard drive, meaning netboot is the only way to get a full system.
- On a PDA, 16mb-64mb of flash storage can run out VERY quickly.
- Most consoles won't have accelerated video due to lack of specs (except for PS2 and DC?)

# Miscellaneous Tips

- Kernel 2.6 is too big to fit on a boot floppy. In order to install Linux in such a situation, install an older distribution and use GRUB to boot a CD image.
- PDAs and Tablets use Xscribble for handwriting recognition – works pretty well.