EPiCS

Note: subsections are not ordered. Don't use 12.3!!!!!!!!!!!!! Sysace will not work!

Howto: http://m.lemays.org/blog/linuxforxilinxmicroblazeonml605 [http://m.lemays.org/blog/linuxforxilinxmicroblazeonml605]
Plus use Little-Endian toolchain!!!

ML605 SystemACE IPCore howto

1. ln -s from make to gmake, if gmake is not present
2. Needed to program the FPGA from a CF card
3. CF card contains an ACE file (system.bit / linux.elf) that gets programmed onto the FPGA on startup
4. Then triggers the bootloader to exec the kernel
5. However, the ACE file needs the SystemACE ipcore to “play” ace files
6. http://www.ece.ualberta.ca/~elliott/ece511/studentAppNotes/2004f/misc/use_compactflash/ [http://www.ece.ualberta.ca/~elliott/ece511/studentAppNotes/2004f/misc/use_compactflash/]
7. Create a new project including a SystemACE: https://wiki.ittc.ku.edu/ittc/images/archive/4/40/20070821143241!Edk_baseSystemBuilder.pdf [https://wiki.ittc.ku.edu/ittc/images/archive/4/40/20070821143241!Edk_baseSystemBuilder.pdf]
8. Generate Bitstream

Boot from Compact Flash

1. Boot options for CF: http://xilinx.wikidot.com/device-tree-generator [http://xilinx.wikidot.com/device-tree-generator] (on the bottom)
2. Make sure, the CF card is DOSFS/FAT 16:

```
# hexdump -n 32 -C /dev/sdc1
00000000  eb 3c 90 6d 6b 64 6f 73  66 73 00 00 02 40 01 00  |.<.mkdosfs...@..|
00000010  02 00 02 00 00 f8 f3 00  3f 00 ff 00 00 00 00 00  |........?.......|
00000020
```

1. If not, “mkdosfs -R 1 -F 16 /dev/sdc1”
2. Look at: www.xilinx.com/support/documentation/boards_and_kits/xtp055.pdf [http://www.xilinx.com/support/documentation/boards_and_kits/xtp055.pdf]
3. Mount CF somewhere, cd into it
4. cat xilinx.sys:

```
#Automatically generated. PLEASE DO NOT MODIFY.
dir = XILINX;
cfgaddr0 = cfg0;
cfgaddr1 = cfg1;
cfgaddr2 = cfg2;
cfgaddr3 = cfg3;
cfgaddr4 = cfg4;
cfgaddr5 = cfg5;
cfgaddr6 = cfg6;
cfgaddr7 = cfg7;
```

“The eight different cfgaddr lines tell the (Xilinx) System ACE chip which directory to go to, depending on the state of the three CFGADDR pins of the chip. So different profiles can be chosen from with DIP switches and such. In the case above, all eight configuration point at the same directory, cfg0 [not in our case].”

1. Next steps ….
2. Edt xilinx.sys:

```
dir = xl;
cfgaddr0 = cfg0;
cfgaddr1 = cfg0;
cfgaddr2 = cfg0;
cfgaddr3 = cfg0;
cfgaddr4 = cfg0;
cfgaddr5 = cfg0;
cfgaddr6 = cfg0;
cfgaddr7 = cfg0;
```

1. create the “xl/cfg0” dir, remove the rest of the files
2. Now generate an ACE file!
3. Create somewhere a dir, copy the Tcl script generating ACE file: ISE_DS/EDK/data/xmd/genace.tcl (relative to the path where Xilinx ISE is installed), the bitstream (download.bit) file and the kernel the ELF file into it
4. mkdir geneace
5. geneace$ cp /opt/Xilinx/12.3/ISE_DS/EDK/data/xmd/genace.tcl .
6. geneace$ cp ../Desktop/ml605/edk/implementation/download.bit .
7. geneace$ cp ../linux-2.6-xlnx/arch/microblaze/boot/simpleImage.ml605_epics .
8. Run: xmd -tcl genace.tcl -hw download.bit -elf simpleImage.ml605_epics.elf -ace myace.ace -board ml605 -target mdm
9. (Looking at the genace.tcl script reveals easily which boards are supported.)
10. SystemACE file 'myace.ace' created successfully
11. Copy this into the “xl/cfg0” dir of the CF card
12. More info: http://warp.rice.edu/trac/wiki/SystemACE [http://warp.rice.edu/trac/wiki/SystemACE] and http://inst.eecs.berkeley.edu/~cs150/Documents/UsingSystemACE.PDF [http://inst.eecs.berkeley.edu/~cs150/Documents/UsingSystemACE.PDF]
13. In the end, myace.ace contains the system.bit and the kernel ELF, both have been converted to svf files, appended and then translated to the ace file
14. Make sure you have your kernel compiled with CMDLINE option: root=/dev/xsysace/disc0/partN (where N is the partition number of the root file system.)
15. Note: the CF card shipped with Xilinx boards often has a linux root filesystem on partition 2.
16. Note: a sysace IP core needs to be present in your system with interrupts connected for this to work.
17. For the rootfs, generate a second partition on the CF card, copy the rootfs there and let the kernel cmd point to that (as mentioned above)

http://www.informatik.hu-berlin.de/~brueckne/studienarbeit.pdf [http://www.informatik.hu-berlin.de/~brueckne/studienarbeit.pdf]
:

```
System-ACE:

Der auf zwei der drei Boards verfügbare System-ACE Controller kann direkt mit dem Prozes-
sor kommunizieren. Schiebt man eine Compact-Flash-Karte in den entsprechenden Einschub,
so konguriert der Controller den FPGA, verbindet sich mit dem dann verfügbaren Prozes-
sor und kopiert die Software (den Kernel) in den DDR-RAM. Er setzt auch selbständig den
Program Counter auf die Startadresse und bootet den Kernel [33]. Diese Variante ist sehr
angenehm, bedingt allerdings auch das Vorhandensein des Controllers. Ein weiterer Vorteil
ist, dass die Karte auch gleich als Massenspeicher benutzt werden kann.
Eine Compact-Flash Karte muss entsprechenden vorbereitet und formatiert werden. Für den
System-ACE Controller muss eine FAT16 Partition mit 64 Sektoren pro Cluster erstellt wer-
den. Um als Massenspeicher genutzt werden zu können, wurden zwei weitere Partitionen für
Linux erstellt (Eine Ext2- und eine Swap -Partition). Nun kann mit Hilfe des TCL-Skripts
genace.tcl eine ACE-Datei erstellt und auf die FAT16 Partition kopiert werden.
```

1. Activate switch for sysace mode (SACE MODE), press sysace reset button on board

Linux 3.0 on ML605

1. Kernel: git clone git://git.xilinx.com/linux-2.6-xlnx.git
2. Initramfs, GNU tools (Big Endian): git clone git://git.xilinx.com/xldk/microblaze_v1.0.git
3. Brings kernel compile error: unkown opcode “lwr”
4. OR: use undocumented tools instead: git clone git://git.xilinx.com/xldk/microblaze_v2.0.git !!!! (found: http://forums.xilinx.com/t5/Embedded-Linux/Microblaze-CROSS-COMPILER-issue/td-p/196384 [http://forums.xilinx.com/t5/Embedded-Linux/Microblaze-CROSS-COMPILER-issue/td-p/196384])
5. Copy kernelconfig ”.config” from old Paderborn kernel into linux-2.6-xlnx/.config
6. Make with options pointing to the unzipped MB GNU tools
7. Accept or reject missing kernel options
8. Build!
9. make CROSS_COMPILE=/home/bordanie/microblaze_v2.0/microblaze-unknown-linux-gnu/bin/microblaze-unknown-linux-gnu- ARCH=microblaze clean simpleImage.ml605_epics
10. On error: make[1]: *** No rule to make target `arch/microblaze/boot/ml605_epics.dtb', needed by `arch/microblaze/boot/system.dtb'. Stop. … do this:
11. Copy the arch/microblaze/boot/dts/ml605_epics.dts from the Paderborn kernel to the new one (or from edk/microblaze_0/libsrc/device-tree/xilinx.dts)
12. Compile
13. You might need a different NFS rootfs: obtain it from Xilinx via Git, unzip it to a USB stick (description is somewhere on this page)
14. mnt# mv rootfs_mb/ rootfs_mb.old/
15. mnt# cp ../home/bordanie/linux-2.6-xlnx/rootfs.cpio.gz .
16. mnt# gunzip rootfs.cpio.gz
17. mnt# mkdir rootfs_mb … cd into dir
18. mnt# cpio -ivd < ../rootfs.cpio
19. mnt# exportfs -ra
20. mnt# /etc/init.d/nfs-kernel-server restart
21. Load to board with dow, et voila, you are in a Linux 3.0
22. Open issues: NFS mounts, but no shell

```
VFS: Mounted root (nfs filesystem) on device 0:10.
Freeing unused kernel memory: 131k freed
request_module: runaway loop modprobe binfmt-4c46
request_module: runaway loop modprobe binfmt-4c46
request_module: runaway loop modprobe binfmt-4c46
request_module: runaway loop modprobe binfmt-4c46
request_module: runaway loop modprobe binfmt-4c46
```

Solution:

You most likely have the wrong rootfs binaries!

```
Should be: busybox: ELF 32-bit MSB executable, version 1 (SYSV), statically linked, for GNU/Linux 2.0.0, stripped
And yours: busybox: ELF 32-bit LSB executable, version 1 (SYSV), statically linked, for GNU/Linux 2.0.0, stripped
```

And there you go … works now!

Tools (from Ariane)

- xmd = command line tool for downloading elf files (software) to the board
- impact = gui tool for downloading bit files (hardware) to the board
- ise = editor for hardware only FPGA designs
- edk = xps = embedded design kit, used for embedded designs where you can “click” your system together.
- planAhead = floorplanning (e.g., draw partial reconfiguration areas)
- fpga_editor = edit floorplan (for 9.1 tools) you have to do a “export DISPLAY=:0” first. Note, slice coordinates are different from BRAM coordinates!

Links

1. LANA sources: https://github.com/EPiCS/lana [https://github.com/EPiCS/lana]
2. Ariane's EPiCS wiki: https://csgwiki.ethz.ch/arkeller/epics [https://csgwiki.ethz.ch/arkeller/epics]
3. Linux X-ref: http://lingrok.org [http://lingrok.org]
4. Linux + Xilinx howto: http://rmdir.de/~michael/xilinx/ [http://rmdir.de/~michael/xilinx/]
5. Xilinx USB drivers: https://github.com/borkmann/xilinx-usb-driver [https://github.com/borkmann/xilinx-usb-driver]
6. Xilinx Microblaze: http://wiki.xilinx.com/microblaze-linux [http://wiki.xilinx.com/microblaze-linux]
7. Xilinx Microblaze kernel: git clone git://git.xilinx.com/linux-2.6-xlnx.git
8. Howto MB: http://billauer.co.il/blog/2011/08/linux-microblaze-howto-tutorial-primer-2/ [http://billauer.co.il/blog/2011/08/linux-microblaze-howto-tutorial-primer-2/]
9. NFS: https://help.ubuntu.com/community/SettingUpNFSHowTo#NFS_Server [https://help.ubuntu.com/community/SettingUpNFSHowTo#NFS_Server]
10. MB/CF: http://billauer.co.il/blog/2011/07/system-ace-bitstream-microblaze-processor-compact-flash/

[http://billauer.co.il/blog/2011/07/system-ace-bitstream-microblaze-processor-compact-flash/]

11. MB/CF: http://xillybus.com/doc/microblaze-compactflash-setup [http://xillybus.com/doc/microblaze-compactflash-setup]
12. MB GNU Tools: http://wiki.xilinx.com/mb-gnu-tools [http://wiki.xilinx.com/mb-gnu-tools]

Very good Links:

1. http://www.aclevername.com/articles/linux-xilinx-tutorial/index.html [http://www.aclevername.com/articles/linux-xilinx-tutorial/index.html]
2. http://www.aclevername.com/articles/linux-xilinx-tutorial/distfiles/EDK_Tutorial_1.pdf [http://www.aclevername.com/articles/linux-xilinx-tutorial/distfiles/EDK_Tutorial_1.pdf]
3. http://www.scribd.com/doc/63732567/Microblaze-Linux-on-Xilinx-ML605 [http://www.scribd.com/doc/63732567/Microblaze-Linux-on-Xilinx-ML605]

ML605 Sources Paderborn

1. http://pc-techinf-25.cs.upb.de/ml605-linux/ [http://pc-techinf-25.cs.upb.de/ml605-linux/]

ML605 Prepare Board / Download Streams on Debian 6.0

1. Plugin JTAG Cable
2. apt-get install fxload → Needed to load USB firmware hex file!!
3. git clone git://github.com/EPiCS/reconos.git for “dow” tool
4. Xilinx install_drivers.tar.gz for connection to the ML605 board; old kernel drivers! Try libusb version!
5. Xilinx libusb user space driver fails sometimes (try: clear LD_PRELOAD, export XIL_IMPACT_USE_LIBUSB=1) …. 🤔 therefore …
6. git clone git://git.zerfleddert.de/usb-driver or git://github.com/borkmann/xilinx-usb-driver.git
7. Needs libusb-dev and libftdi-dev
8. cd usb-driver; make
9. ./setup_pcusb
10. export LD_PRELOAD=”/home/bordanie/usb-driver/libusb-driver.so”
11. Ensure that the ml605 board is configured for GMII mode (e.g. jumper J66 and J67 on pins 1-2) (SGMII is on pins 2-3)
12. download the bitstream (edk-static/implementation/system.bit) and the kernel image (arch/microblaze/boot/simpleImage.ml605_epics)
13. export RECONOS=”/home/bordanie/Desktop/ml605/reconos”
14. lsusb | grep Xilinx → Note: Bus 002 Device 004: ID 03fd:000d Xilinx, Inc.
15. export XILINX_USB_DEV=“002:004”
16. reconos/tools/impact/dow edk/implementation/system.bit 2
17. reconos/tools/impact/dow linux-2.6-xlnx/arch/microblaze/boot/simpleImage.ml605_epics 2

$ env | grep XIL:

```
XILINX_DSP=/opt/Xilinx/12.3/ISE_DS/ISE
XILINX_EDK=/opt/Xilinx/12.3/ISE_DS/EDK
XILINXD_LICENSE_FILE=8181@lunghin.ee.ethz.ch
XIL_IMPACT_USE_LIBUSB=0
XILINX_PLANAHEAD=/opt/Xilinx/12.3/ISE_DS/PlanAhead
XILINX=/opt/Xilinx/12.3/ISE_DS/ISE
XIL_IMPACT_ENV_LPT1_BASE_ADDRESS=0
XIL_IMPACT_ENV_LPT1_ECP_ADDRESS=400
XIL_IMPACT_ENV_LPT2_BASE_ADDRESS=10
XIL_IMPACT_ENV_LPT2_ECP_ADDRESS=410
XIL_IMPACT_ENV_LPT3_BASE_ADDRESS=20
XIL_IMPACT_ENV_LPT3_ECP_ADDRESS=420
XIL_IMPACT_ENV_LPT4_BASE_ADDRESS=30
XIL_IMPACT_ENV_LPT4_ECP_ADDRESS=430
XIL_IMPACT_USE_WINDRIVER=1
```

/etc/udev/rules.d/xusbdfwu.rules:

```
# version 0003
ATTRS{idVendor}=="03fd", ATTRS{idProduct}=="0008", MODE="666"
SUBSYSTEMS=="usb", ACTION=="add", ATTRS{idVendor}=="03fd", ATTRS{idProduct}=="0007", RUN+="/sbin/fxload -v -t fx2 -I /usr/share/xusbdfwu.hex -D $tempnode"
SUBSYSTEMS=="usb", ACTION=="add", ATTRS{idVendor}=="03fd", ATTRS{idProduct}=="0009", RUN+="/sbin/fxload -v -t fx2 -I /usr/share/xusb_xup.hex -D $tempnode"
SUBSYSTEMS=="usb", ACTION=="add", ATTRS{idVendor}=="03fd", ATTRS{idProduct}=="000d", RUN+="/sbin/fxload -v -t fx2 -I /usr/share/xusb_emb.hex -D $tempnode"
SUBSYSTEMS=="usb", ACTION=="add", ATTRS{idVendor}=="03fd", ATTRS{idProduct}=="000f", RUN+="/sbin/fxload -v -t fx2 -I /usr/share/xusb_xlp.hex -D $tempnode"
SUBSYSTEMS=="usb", ACTION=="add", ATTRS{idVendor}=="03fd", ATTRS{idProduct}=="0013", RUN+="/sbin/fxload -v -t fx2 -I /usr/share/xusb_xp2.hex -D $tempnode"
SUBSYSTEMS=="usb", ACTION=="add", ATTRS{idVendor}=="03fd", ATTRS{idProduct}=="0015", RUN+="/sbin/fxload -v -t fx2 -I /usr/share/xusb_xse.hex -D $tempnode"
```

or manually (depending on lsusb): fxload -v -t fx2 -I /usr/share/xusb_xup.hex -D /dev/bus/usb/<bus>/<dev>

/etc/udev/rules.d/libusb-driver.rules:

```
ACTION=="add", SUBSYSTEMS=="usb", ATTRS{idVendor}=="03fd", MODE="666"
```

LD_PRELOAD:

```
/home/bordanie/usb-driver/libusb-driver.so
```

md5sum /usr/share/*.hex

```
2c7dad395f38e15ddd43be3e874fb1ca  /usr/share/xusbdfwu.hex
545ce982a72441822960fb66a28bde98  /usr/share/xusb_emb.hex
545ce982a72441822960fb66a28bde98  /usr/share/xusb_xlp.hex
2238d1c28743f587830abbca9c389fb2  /usr/share/xusb_xp2.hex
a156c52cf6a1f3456a5bd2626c4e5888  /usr/share/xusb_xpr.hex
ec26ca6affcb6d99bfab3be97410e775  /usr/share/xusb_xse.hex
2c7dad395f38e15ddd43be3e874fb1ca  /usr/share/xusb_xup.hex
```

For fixing error …

```
>ERROR:iMPACT:1062 - Can only assign files to devices between positions 1 to 2
>ERROR:iMPACT:908 - Position specified is greater than the total number of devices.
```

… do this:

```
Using JTAG chain position 3.
USAGE: dow bitstream.bit [jtag_chain_position]
           OR
       dow executable.elf
Standard jtag chain position is 3 (XUP)
```

Patch sent to reconos; https://github.com/borkmann/reconos [https://github.com/borkmann/reconos]

Minicom for ML605

1. Make sure files are downloaded, NFS is running on that IP
2. Plugin UART Cable
3. modprobe usbserial
4. modprobe cp210x.ko
5. entry in /dev/ttyUSB0
6. apt-get install minicom
7. minicom -D /dev/ttyUSB0
8. Settings: 9600 8N1, HW/SW flow control: off
9. Kernelcmd line is: console=ttyUL0 root=/dev/nfs rw nfsroot=192.168.30.1:/exports/rootfs_mb,tcp ip=192.168.30.2::192.168.30.1:255.255f
10. Note: Hosts eth0 goes down on device reset (looses IP)

ETH VPN on Debian 6.0

1. Required for Xilinx licenses if connected via Wifi; board via ethX
2. apt-get install vpnc network-manager-vpnc
3. wget http://debian.isg.ee.ethz.ch/isg.ee-ubuntu/pool-natty/isgee-vpnc-ethz_3.4_all.deb [http://debian.isg.ee.ethz.ch/isg.ee-ubuntu/pool-natty/isgee-vpnc-ethz_3.4_all.deb]
4. dpkg -i isgee-vpnc-ethz_3.4_all.deb
5. As root: update PATH: add /usr/sbin
6. Exec: isgee-vpnc-connect

!!! NFS rootfs for ML605 on Debian 6.0

1. See: http://fscked.org/writings/clusters/nfsroot.txt [http://fscked.org/writings/clusters/nfsroot.txt]
2. ifconfig eth0 192.169.30.1
3. apt-get install nfs-kernel-server
4. uem /etc/exports
5. "/exports/rootfs_mb 192.168.30.2(rw,async,no_root_squash,no_all_squash,no_subtree_check)"
6. exportfs -ra
7. /etc/init.d/nfs-kernel-server restart
8. !!! Issues: will not work on a fully encrypted file system ... maybe try to put it onto a usb stick instead?!
9. Copy it to a ext3 formatted usb stick, change /etc/exports, recompile kernel (→cmdline path)
10. Check that Kernel configs use same NFS version!!!

NFS on ML605: Cannot find rootfs

1. On the Server, eth0 seems to loose its IP when the ML605 brings its interface up
2. Result: ML605 does ARP request on bootstrapping NFS with no response from server; hence, cannot mount
3. Stupid fix on server: while [1]; do ifconfig eth0 192.168.30.1; done
4. Note that this happens only if your eth0 was configured to use dhcp; make it static, reinit eth0 and you're good to go
5. Now, ML605 boots the rootfs!

NFS issues from Paderborn

Their kernel cmdline:

```
Kernel command line: console=ttyUL0 root=/dev/nfs rw nfsroot=192.168.30.1:/exports/rootfs_mb,tcp ip=192.168.30.2::192.168.30.1:255.255.f
```

What comes from that (see IP NFS bootserver) ...

```
IP-Config: Complete:
     device=eth0, addr=192.168.30.2, mask=255.255.255.0, gw=192.168.30.1,
     host=reconos, domain=, nis-domain=(none),
     bootserver=255.255.255.255, rootserver=192.168.30.1, PHY: c00c61f8:07 - Link is Up - 100/Full
VFS: Unable to mount root fs via NFS, trying floppy.
```

So IP entry of cmdline must be fixed like ...

```
CONFIG_CMDLINE_BOOL=y
CONFIG_CMDLINE="console=ttyUL0 ip=192.168.30.2:192.168.30.1:192.168.30.1:255.255.255.0:::off rootfstype=nfs root=/dev/nfs rw nfsroot=192.168.30.1:/exports/rootfs_mb,tcp"
CONFIG_CMDLINE_FORCE=y
CONFIG_SECCOMP=y
```

ML605 build Linux

1. Compile kernel: $ make CROSS_COMPILE=../microblaze_v1.0/microblaze-unknown-linux-gnu/bin/mb-linux- ARCH=microblaze clean simpleImage.ml605_epics

Xilinx .bashrc Things

```
source /opt/Xilinx/12.3/ISE_DS/settings64.sh > /dev/null
export XILINXD_LICENSE_FILE=8181@lunghin.ee.ethz.ch
export LM_LICENSE_FILE=8181@lunghin.ee.ethz.ch
export MGLS_LICENSE_FILE=8161@lunghin.ee.ethz.ch
```

Xilinx tools on Debian 6.0

1. Beware of this while running Xlinlinx:

```
bordanie@nb-10309:~/curvetun-paper$ apt-cache search vpnc
apt-cache: /opt/Xilinx/12.3/ISE_DS/common/lib/lin64/libstdc++.so.6: version `GLIBCXX_3.4.9' not found (required by apt-cache)
apt-cache: /opt/Xilinx/12.3/ISE_DS/common/lib/lin64/libstdc++.so.6: version `GLIBCXX_3.4.11' not found (required by apt-cache)
```

```
apt-cache: /opt/Xilinx/12.3/ISE_DS/common/lib/lin64/libstdc++.so.6: version `GLIBCXX_3.4.11' not found (required by /usr/lib/libapt-pkg.so.4.10)
apt-cache: /opt/Xilinx/12.3/ISE_DS/common/lib/lin64/libstdc++.so.6: version `GLIBCXX_3.4.9' not found (required by /usr/lib/libapt-pkg.so.4.10)

bordanie@nb-10309:~/curvetun-paper$ echo $LD_LIBRARY_PATH
/opt/Xilinx/12.3/ISE_DS/common/lib/lin64:/opt/Xilinx/12.3/ISE_DS/ISE/lib/lin64:/opt/Xilinx/12.3/ISE_DS/ISE/smartmodel/lin64/installed_lin64/lib:/opt/Xilinx/12.3/ISE_DS/EDK/lib/lin64
```

Good dmesg on 2.6.37

```
Linux version 2.6.37-00715-gf5f5376-dirty (bordanie@nb-10309) (gcc version 4.1.2) #37 Mon Dec 12 12:36:50 CET 2011
setup_cpuinfo: initialising
setup_cpuinfo: Using full CPU PVR support
cache: wt_msr_noirq
setup_memory: max_mapnr: 0x10000
setup_memory: min_low_pfn: 0x0
setup_memory: max_low_pfn: 0x10000
On node 0 totalpages: 65536
free_area_init_node: node 0, pgdat c0356980, node_mem_map c03a9000
  Normal zone: 512 pages used for memmap
  Normal zone: 0 pages reserved
  Normal zone: 65024 pages, LIFO batch:15
pcpu-alloc: s0 r0 d32768 u32768 alloc=1*32768
pcpu-alloc: [0] 0
Built 1 zonelists in Zone order, mobility grouping on.  Total pages: 65024
Kernel command line: console=ttyUL0 ip=192.168.30.2:192.168.30.1:192.168.30.1:255.255.255.0:::off rootfstype=nfs root=/dev/nfs rw nfsroop
PID hash table entries: 1024 (order: 0, 4096 bytes)
Dentry cache hash table entries: 32768 (order: 5, 131072 bytes)
Inode-cache hash table entries: 16384 (order: 4, 65536 bytes)
Memory: 255848k/262144k available
NR_IRQS:32
xlnx,xps-intc-1.00.a #0 at 0xd0000000, num_irq=4, edge=0x7
xlnx,xps-timer-1.00.a #0 at 0xd0004000, irq=2
microblaze_timer_set_mode: shutdown
microblaze_timer_set_mode: periodic
Calibrating delay loop... 49.66 BogoMIPS (lpj=248320)
pid_max: default: 4096 minimum: 301
Mount-cache hash table entries: 512
NET: Registered protocol family 16
bio: create slab <bio-0> at 0
XGpio: /plb@0/gpio@81460000: registered
XGpio: /plb@0/gpio@81440000: registered
XGpio: /plb@0/gpio@81420000: registered
XGpio: /plb@0/gpio@81400000: registered
Switching to clocksource microblaze_clocksource
NET: Registered protocol family 2
IP route cache hash table entries: 2048 (order: 1, 8192 bytes)
TCP established hash table entries: 8192 (order: 4, 65536 bytes)
TCP bind hash table entries: 8192 (order: 3, 32768 bytes)
TCP: Hash tables configured (established 8192 bind 8192)
TCP reno registered
NET: Registered protocol family 1
RPC: Registered udp transport module.
RPC: Registered tcp transport module.
RPC: Registered tcp NFSv4.1 backchannel transport module.
Skipping unavailable RESET gpio -2 (reset)
GPIO pin is already allocated
nfs4filelayout_init: NFSv4 File Layout Driver Registering...
msgmni has been set to 499
io scheduler noop registered
io scheduler deadline registered
io scheduler cfq registered (default)
Serial: 8250/16550 driver, 4 ports, IRQ sharing disabled
84000000.serial: ttyUL0 at MMIO 0x84000000 (irq = 1) is a uartlite
console [ttyUL0] enabled
brd: module loaded
Xilinx SystemACE device driver, major=254
of:xilinx_emaclite 81000000.ethernet: Device Tree Probing
Xilinx Emaclite MDIO: probed
of:xilinx_emaclite 81000000.ethernet: MAC address is now 00:0a:35:1d:cd:00
of:xilinx_emaclite 81000000.ethernet: Xilinx EmacLite at 0x81000000 mapped to 0xD00A0000, irq=0
i2c /dev entries driver
Device Tree Probing 'i2c'
of:iic 81660000.i2c: no IRQ found.
of:iic: probe of 81660000.i2c failed with error -1
Device Tree Probing 'i2c'
of:iic 81640000.i2c: no IRQ found.
of:iic: probe of 81640000.i2c failed with error -1
Device Tree Probing 'i2c'
of:iic 81620000.i2c: no IRQ found.
of:iic: probe of 81620000.i2c failed with error -1
Device Tree Probing 'i2c'
of:iic 81600000.i2c: no IRQ found.
of:iic: probe of 81600000.i2c failed with error -1
TCP cubic registered
NET: Registered protocol family 17
Registering the dns_resolver key type
IP-Config: Complete:
     device=eth0, addr=192.168.30.2, mask=255.255.255.0, gw=192.168.30.1,
     host=192.168.30.2, domain=, nis-domain=(none),
     bootserver=192.168.30.1, rootserver=192.168.30.1, rootpath=
PHY: c00c756c:07 - Link is Up - 100/Full
VFS: Mounted root (nfs filesystem) on device 0:10.
Freeing unused kernel memory: 128k freed
```

Current dmesg on 3.0

```
Linux version 3.0.0-01203-g5d397b77 (bordanie@nb-10309) (gcc version 4.1.2) #1 Mon Dec 12 17:00:12 CET 2011
setup_cpuinfo: initialising
setup_cpuinfo: Using full CPU PVR support
cache: wt_msr_noirq
setup_memory: max_mapnr: 0x10000
setup_memory: min_low_pfn: 0x0
setup_memory: max_low_pfn: 0x10000
On node 0 totalpages: 65536
free_area_init_node: node 0, pgdat c03770ac, node_mem_map c03c7000
  Normal zone: 512 pages used for memmap
  Normal zone: 0 pages reserved
  Normal zone: 65024 pages, LIFO batch:15
pcpu-alloc: s0 r0 d32768 u32768 alloc=1*32768
pcpu-alloc: [0] 0
Built 1 zonelists in Zone order, mobility grouping on.  Total pages: 65024
Kernel command line: console=ttyUL0 ip=192.168.30.2:192.168.30.1:192.168.30.1:255.255.255.0:::off rootfstype=nfs root=/dev/nfs rw nfsroot=192.168.30.1:/mnt/rootfs_mb,tcp
PID hash table entries: 1024 (order: 0, 4096 bytes)
Dentry cache hash table entries: 32768 (order: 5, 131072 bytes)
Inode-cache hash table entries: 16384 (order: 4, 65536 bytes)
Memory: 255728k/262144k available
NR_IRQS:32
xlnx,xps-intc-1.00.a #0 at 0xd0000000, num_irq=4, edge=0x7
xlnx,xps-timer-1.00.a #0 at 0xd0002000, irq=2
microblaze_timer_set_mode: shutdown
microblaze_timer_set_mode: periodic
Calibrating delay loop... 49.56 BogoMIPS (lpj=247808)
pid_max: default: 4096 minimum: 301
Mount-cache hash table entries: 512
NET: Registered protocol family 16
bio: create slab <bio-0> at 0
XGpio: /plb@0/gpio@81460000: registered
XGpio: /plb@0/gpio@81440000: registered
XGpio: /plb@0/gpio@81420000: registered
XGpio: /plb@0/gpio@81400000: registered
```

```
Switching to clocksource microblaze_clocksource
NET: Registered protocol family 2
IP route cache hash table entries: 2048 (order: 1, 8192 bytes)
TCP established hash table entries: 8192 (order: 4, 65536 bytes)
TCP bind hash table entries: 8192 (order: 3, 32768 bytes)
TCP: Hash tables configured (established 8192 bind 8192)
TCP reno registered
NET: Registered protocol family 1
RPC: Registered named UNIX socket transport module.
RPC: Registered udp transport module.
RPC: Registered tcp transport module.
RPC: Registered tcp NFSv4.1 backchannel transport module.
Skipping unavailable RESET gpio -2 (reset)
GPIO pin is already allocated
nfs4filelayout_init: NFSv4 File Layout Driver Registering...
msgmni has been set to 499
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Device Tree Probing 'i2c'
iic 81640000.i2c: no IRQ found.
iic: probe of 81640000.i2c failed with error -1
Device Tree Probing 'i2c'
iic 81620000.i2c: no IRQ found.
iic: probe of 81620000.i2c failed with error -1
Device Tree Probing 'i2c'
iic 81600000.i2c: no IRQ found.
iic: probe of 81600000.i2c failed with error -1
TCP cubic registered
NET: Registered protocol family 17
Registering the dns_resolver key type
IP-Config: Complete:
     device=eth0, addr=192.168.30.2, mask=255.255.255.0, gw=192.168.30.1,
     host=192.168.30.2, domain=, nis-domain=(none),
     bootserver=192.168.30.1, rootserver=192.168.30.1, rootpath=
PHY: c0371c18:07 - Link is Up - 100/Full
VFS: Mounted root (nfs filesystem) on device 0:10.
Freeing unused kernel memory: 131k freed
```