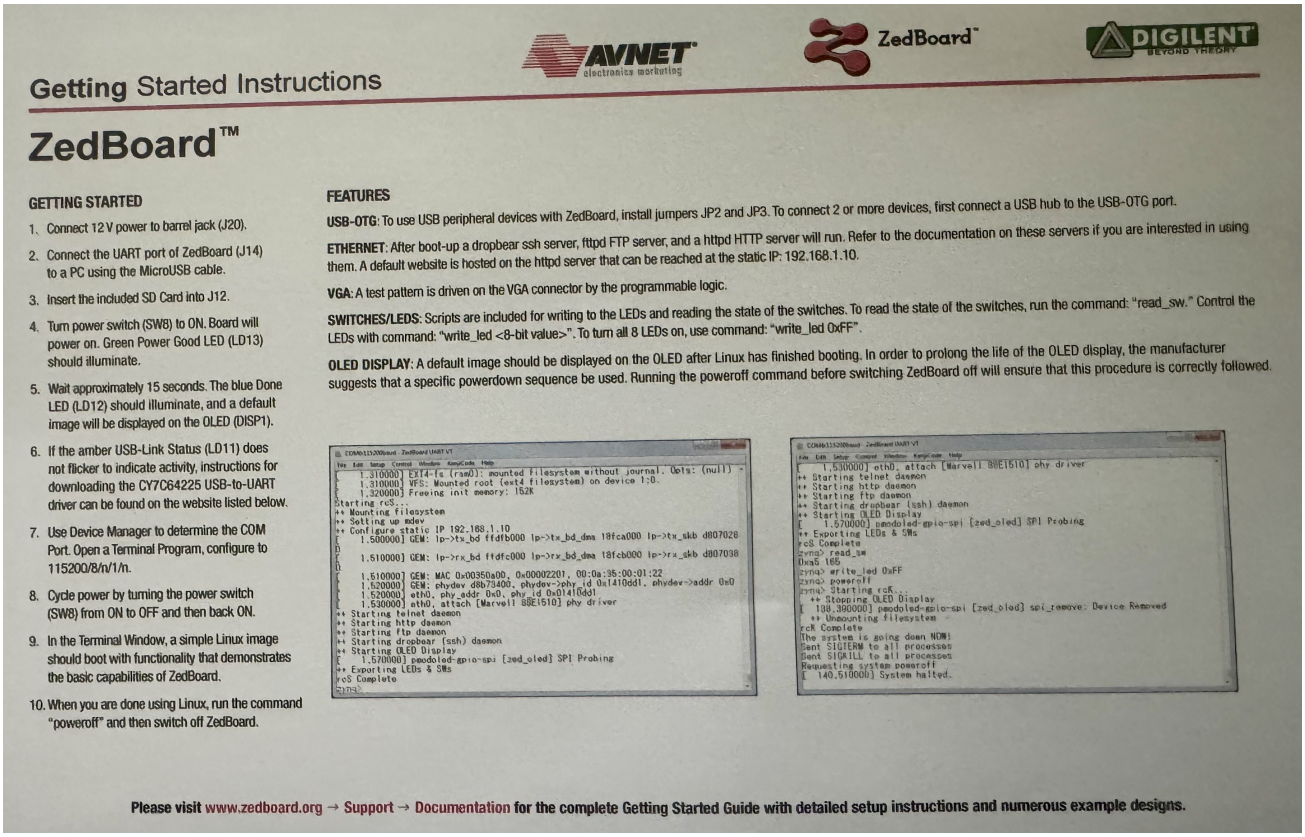
Out of the Box check of ZedBoard

1. ZedBoard Box:

2. Followed “Getting Started Instructions” card included with ZedBoard to bring up board from SDRAM (linux image) and check if working....



Getting Started Instructions

AVNET electronics marketing

ZedBoard™

DIGILENT BEYOND THEORY

ZedBoard™

GETTING STARTED

1. Connect 12 V power to barrel jack (J20).
2. Connect the UART port of ZedBoard (J14) to a PC using the MicroUSB cable.
3. Insert the included SD Card into J12.
4. Turn power switch (SW8) to ON. Board will power on. Green Power Good LED (LD13) should illuminate.
5. Wait approximately 15 seconds. The blue Done LED (LD12) should illuminate, and a default image will be displayed on the OLED (DISP1).
6. If the amber USB-Link Status (LD11) does not flicker to indicate activity, instructions for downloading the CY7C64225 USB-to-UART driver can be found on the website listed below.
7. Use Device Manager to determine the COM Port. Open a Terminal Program, configure to 115200/8/n/1/n.
8. Cycle power by turning the power switch (SW8) from ON to OFF and then back ON.
9. In the Terminal Window, a simple Linux image should boot with functionality that demonstrates the basic capabilities of ZedBoard.
10. When you are done using Linux, run the command "poweroff" and then switch off ZedBoard.

FEATURES

USB-OTG: To use USB peripheral devices with ZedBoard, install jumpers JP2 and JP3. To connect 2 or more devices, first connect a USB hub to the USB-OTG port.

ETHERNET: After boot-up a dropbear ssh server, fttpd FTP server, and a httpd HTTP server will run. Refer to the documentation on these servers if you are interested in using them. A default website is hosted on the httpd server that can be reached at the static IP: 192.168.1.10.

VGA: A test pattern is driven on the VGA connector by the programmable logic.

SWITCHES/LEDS: Scripts are included for writing to the LEDs and reading the state of the switches. To read the state of the switches, run the command: "read_sw." Control the LEDs with command: "write_led <8-bit value>". To turn all 8 LEDs on, use command: "write_led 0xFF".

OLED DISPLAY: A default image should be displayed on the OLED after Linux has finished booting. In order to prolong the life of the OLED display, the manufacturer suggests that a specific powerdown sequence be used. Running the poweroff command before switching ZedBoard off will ensure that this procedure is correctly followed.

Please visit www.zedboard.org → Support → Documentation for the complete Getting Started Guide with detailed setup instructions and numerous example designs.

3. Output from ZedBoard connected to PC via Putty serial connection using USB cable provided in box to "J14" on board (terminal settings: 115200/8/N/1):

U-Boot 2011.03-dirty (Jul 11 2012 - 16:07:00)

DRAM: 512 MiB
MMC: SDHCI: 0
Using default environment

In: serial
Out: serial
Err: serial
Net: zynq_gem
Hit any key to stop autoboot: 0
Copying Linux from SD to RAM...
Device: SDHCI
Manufacturer ID: 12
OEM: 3456
Name: SDTran Speed: 25000000
Rd Block Len: 512
SD version 1.10
High Capacity: Yes
Capacity: 7929331712
Bus Width: 1-bit
reading zImage

```
2479640 bytes read
reading devicetree_ramdisk.dtb

5817 bytes read
reading ramdisk8M.image.gz

3694108 bytes read
## Starting application at 0x00008000 ...
Uncompressing Linux... done, booting the kernel.
[    0.000000] Booting Linux on physical CPU 0
[    0.000000] Linux version 3.3.0-digilent-12.07-zed-beta (tinghui.wang@DIGILENT_LINUX) (gcc
version 4.6.1 (Sourcery CodeBench Lite 2011.09-50) ) #2 SMP PREEMPT Thu Jul 12 21:01:42 PDT
2012
[    0.000000] CPU: ARMv7 Processor [413fc090] revision 0 (ARMv7), cr=18c5387d
[    0.000000] CPU: PIPT / VIPT nonaliasing data cache, VIPT aliasing instruction cache
[    0.000000] Machine: Xilinx Zynq Platform, model: Xilinx Zynq ZED
[    0.000000] bootconsole [earlycon0] enabled
[    0.000000] Memory policy: ECC disabled, Data cache writealloc
[    0.000000] BUG: mapping for 0xf8f00000 at 0xfe00c000 out of vmalloc space
[    0.000000] BUG: mapping for 0xe0000000 at 0xfe000000 out of vmalloc space
[    0.000000] BUG: mapping for 0xffff1000 at 0xfe200000 out of vmalloc space
[    0.000000] PERCPU: Embedded 7 pages/cpu @c1489000 s5696 r8192 d14784 u32768
[    0.000000] Built 1 zonelists in Zone order, mobility grouping on.  Total pages: 125824
[    0.000000] Kernel command line: console=ttyPS0,115200 root=/dev/ram rw initrd=0x800000,8M
earlyprintk rootfstype=ext4 rootwait devtmpfs.mount=0
[    0.000000] PID hash table entries: 2048 (order: 1, 8192 bytes)
[    0.000000] Dentry cache hash table entries: 65536 (order: 6, 262144 bytes)
[    0.000000] Inode-cache hash table entries: 32768 (order: 5, 131072 bytes)
[    0.000000] Memory: 240MB 256MB = 496MB total
[    0.000000] Memory: 489856k/489856k available, 34432k reserved, 0K highmem
[    0.000000] Virtual kernel memory layout:
[    0.000000]     vector  : 0xffff0000 - 0xffff1000   (   4 kB)
[    0.000000]     fixmap  : 0xfff00000 - 0xfffe0000   ( 896 kB)
[    0.000000]     vmalloc : 0xe0800000 - 0xfd000000   ( 456 MB)
[    0.000000]     lowmem  : 0xc0000000 - 0xe0000000   ( 512 MB)
[    0.000000]     pkmap   : 0xbfe00000 - 0xc0000000   (   2 MB)
[    0.000000]     modules : 0xbf000000 - 0xbfe00000   (  14 MB)
[    0.000000]       .text : 0xc0008000 - 0xc042f040   (4253 kB)
[    0.000000]       .init : 0xc0430000 - 0xc0456640   ( 154 kB)
[    0.000000]       .data : 0xc0458000 - 0xc0485dc0   ( 184 kB)
[    0.000000]        .bss : 0xc0485de4 - 0xc049d734   (  95 kB)
[    0.000000] Preemptible hierarchical RCU implementation.
[    0.000000]  Verbose stalled-CPUs detection is disabled.
[    0.000000] NR_IRQS:128
[    0.000000] xlnx,ps7-ttc-1.00.a #0 at 0xe0800000, irq=43
[    0.000000] Console: colour dummy device 80x30
[    0.000000] Calibrating delay loop... 1594.16 BogoMIPS (lpj=7970816)
[    0.090000] pid_max: default: 32768 minimum: 301
```

```
[    0.090000] Mount-cache hash table entries: 512
[    0.090000] CPU: Testing write buffer coherency: ok
[    0.090000] CPU0: thread -1, cpu 0, socket 0, mpidr 80000000
[    0.100000] smp_twd: clock not found: -2
[    0.100000] Calibrating local timer... 399.37MHz.
[    0.170000] hw perfevents: enabled with ARMv7 Cortex-A9 PMU driver, 7 counters available
[    0.170000] Setting up static identity map for 0x2f8d48 - 0x2f8d7c
[    0.270000] CPU1: Booted secondary processor
[    0.310000] CPU1: thread -1, cpu 1, socket 0, mpidr 80000001
[    0.310000] Brought up 2 CPUs
[    0.310000] SMP: Total of 2 processors activated (3188.32 BogoMIPS).
[    0.320000] devtmpfs: initialized
[    0.320000] ------------[ cut here ]------------
[    0.320000] WARNING: at arch/arm/mm/dma-mapping.c:198 consistent_init+0x70/0x104()
[    0.330000] Modules linked in:
[    0.330000] [<c0012920>] (unwind_backtrace+0x0/0xe0) from [<c001e924>]
(warn_slowpath_common+0x4c/0x64)
[    0.340000] [<c001e924>] (warn_slowpath_common+0x4c/0x64) from [<c001e954>]
(warn_slowpath_null+0x18/0x1c)
[    0.350000] [<c001e954>] (warn_slowpath_null+0x18/0x1c) from [<c04345a8>]
(consistent_init+0x70/0x104)
[    0.360000] [<c04345a8>] (consistent_init+0x70/0x104) from [<c000858c>]
(do_one_initcall+0x90/0x160)
[    0.360000] [<c000858c>] (do_one_initcall+0x90/0x160) from [<c043085c>]
(kernel_init+0x84/0x128)
[    0.370000] [<c043085c>] (kernel_init+0x84/0x128) from [<c000dfcc>]
(kernel_thread_exit+0x0/0x8)
[    0.380000] ---[ end trace 1b75b31a2719ed1c ]---
[    0.380000] ------------[ cut here ]------------
[    0.390000] WARNING: at arch/arm/mm/dma-mapping.c:198 consistent_init+0x70/0x104()
[    0.390000] Modules linked in:
[    0.390000] [<c0012920>] (unwind_backtrace+0x0/0xe0) from [<c001e924>]
(warn_slowpath_common+0x4c/0x64)
[    0.400000] [<c001e924>] (warn_slowpath_common+0x4c/0x64) from [<c001e954>]
(warn_slowpath_null+0x18/0x1c)
[    0.410000] [<c001e954>] (warn_slowpath_null+0x18/0x1c) from [<c04345a8>]
(consistent_init+0x70/0x104)
[    0.420000] [<c04345a8>] (consistent_init+0x70/0x104) from [<c000858c>]
(do_one_initcall+0x90/0x160)
[    0.430000] [<c000858c>] (do_one_initcall+0x90/0x160) from [<c043085c>]
(kernel_init+0x84/0x128)
[    0.430000] [<c043085c>] (kernel_init+0x84/0x128) from [<c000dfcc>]
(kernel_thread_exit+0x0/0x8)
[    0.440000] ---[ end trace 1b75b31a2719ed1d ]---
[    0.440000] NET: Registered protocol family 16
[    0.460000] L310 cache controller enabled
[    0.460000] l2x0: 8 ways, CACHE_ID 0x410000c8, AUX_CTRL 0x72060000, Cache size: 524288 B
[    0.460000] registering platform device 'pl330' id 0
[    0.470000] registering platform device 'arm-pmu' id 0
```

```
[    0.470000]
[    0.470000] ################################################
[    0.480000] #                                              #
[    0.480000] #              Board ZED Init                  #
[    0.480000] #                                              #
[    0.490000] ################################################
[    0.490000]
[    0.500000] hw-breakpoint: found 5 (+1 reserved) breakpoint and 1 watchpoint registers.
[    0.500000] hw-breakpoint: maximum watchpoint size is 4 bytes.
[    0.530000] xslcr xslcr.0: at 0xF8000000 mapped to 0xE0808000
[    0.540000] bio: create slab <bio-0> at 0
[    0.540000] gpiochip_add: registered GPIOs 0 to 245 on device: xgpiops
[    0.540000] xgpiops e000a000.gpio: gpio at 0xe000a000 mapped to 0xe080a000
[    0.550000] SCSI subsystem initialized
[    0.550000] usbcore: registered new interface driver usbfs
[    0.560000] usbcore: registered new interface driver hub
[    0.560000] usbcore: registered new device driver usb
[    0.570000] Advanced Linux Sound Architecture Driver Version 1.0.24.
[    0.570000] Switching to clocksource xttcpss_timer1
[    0.580000] NET: Registered protocol family 2
[    0.580000] IP route cache hash table entries: 4096 (order: 2, 16384 bytes)
[    0.580000] TCP established hash table entries: 16384 (order: 5, 131072 bytes)
[    0.590000] TCP bind hash table entries: 16384 (order: 5, 196608 bytes)
[    0.590000] TCP: Hash tables configured (established 16384 bind 16384)
[    0.600000] TCP reno registered
[    0.600000] UDP hash table entries: 256 (order: 1, 8192 bytes)
[    0.610000] UDP-Lite hash table entries: 256 (order: 1, 8192 bytes)
[    0.610000] NET: Registered protocol family 1
[    0.620000] Trying to unpack rootfs image as initramfs...
[    0.620000] rootfs image is not initramfs (no cpio magic); looks like an initrd
[    0.650000] Freeing initrd memory: 8192K
[    0.660000] xscugtimer xscugtimer.0: ioremap fe00c200 to e0810200 with size 400
[    0.660000] pl330 dev 0 probe success
[    0.670000] msgmni has been set to 972
[    0.670000] io scheduler noop registered
[    0.670000] io scheduler deadline registered
[    0.670000] io scheduler cfq registered (default)
[    0.680000] e00
```

```
wY 锛    0.700000] [drm] Initialized drm 1.1.0 20060810
[    0.710000] brd: module loaded
[    0.720000] loop: module loaded
[    0.720000] xqspips e000d000.qspi: at 0xE000D000 mapped to 0xE0816000, irq=51
[    0.730000] GEM: BASEADDRESS hw: e000b000 virt: e0818000
[    0.730000] XEMACPS mii bus: probed
[    0.740000] eth0, pdev->id -1, baseaddr 0xe000b000, irq 54
[    0.740000] ehci_hcd: USB 2.0 'Enhanced' Host Controller (EHCI) Driver
[    0.750000] usb_hcd_xusbps_probe: No OTG assigned!
```

```
[    0.750000] usb_hcd_xusbps_probe: OTG now assigned!
[    0.750000] xusbps-ehci xusbps-ehci.0: Xilinx PS USB EHCI Host Controller
[    0.760000] xusbps-ehci xusbps-ehci.0: new USB bus registered, assigned bus number 1
[    0.800000] xusbps-ehci xusbps-ehci.0: irq 53, io mem 0x00000000
[    0.820000] xusbps-ehci xusbps-ehci.0: USB 2.0 started, EHCI 1.00
[    0.820000] hub 1-0:1.0: USB hub found
[    0.820000] hub 1-0:1.0: 1 port detected
[    0.830000] Initializing USB Mass Storage driver...
[    0.830000] usbcore: registered new interface driver usb-storage
[    0.840000] USB Mass Storage support registered.
[    0.840000] Xilinx PS USB Device Controller driver (Apr 01, 2011)
[    0.850000] mousedev: PS/2 mouse device common for all mice
[    0.850000] Linux video capture interface: v2.00
[    0.860000] gspca_main: v2.14.0 registered
[    0.860000] usbcore: registered new interface driver uvcvideo
[    0.860000] USB Video Class driver (1.1.1)
[    0.870000] WDT OF probe
[    0.870000] xwdtps f8005000.swdt: Xilinx Watchdog Timer at 0xe081c000 with timeout 10 seconds
[    0.880000] sdhci: Secure Digital Host Controller Interface driver
[    0.880000] sdhci: Copyright(c) Pierre Ossman
[    0.890000] sdhci-pltfm: SDHCI platform and OF driver helper
[    0.890000] mmc0: SDHCI controller on e0100000.sdhci [e0100000.sdhci] using ADMA
[    0.900000] No connectors reported connected with modes
[    0.900000] [drm] Cannot find any crtc or sizes - going 1024x768
[    0.910000] usbcore: registered new interface driver usbhid
[    0.920000] drivers/gpu/drm/analog/analog_drm_fbdev.c:analog_drm_fbdev_probe[241]
[    0.930000] usbhid: USB HID core driver
[    0.930000] adv7511 0-0039: Failed to add route DAI IN->TMDS
[    0.960000] Console: switching to colour frame buffer device 128x48
[    0.970000] asoc: adv7511 <-> 75c00000.axi-spdif-tx mapping ok
[    0.970000] axi-spdif 75c00000.axi-spdif-tx: Failed to set DAI format: -22
[    0.970000] ALSA device list:
[    0.970000]   #0: HDMI monitor
[    0.970000] TCP cubic registered
[    0.970000] NET: Registered protocol family 17
[    0.970000] VFP support v0.3: implementor 41 architecture 3 part 30 variant 9 rev 4
[    0.970000] Registering SWP/SWPB emulation handler
[    0.970000] registered taskstats version 1
[    0.970000] drivers/rtc/hctosys.c: unable to open rtc device (rtc0)
[    1.030000] RAMDISK: gzip image found at block 0
[    1.040000] fb0:  frame buffer device
[    1.040000] drm: registered panic notifier
[    1.040000] [drm] Initialized analog_drm 1.0.0 20110530 on minor 0
[    1.060000] mmc0: new high speed SDHC card at address 0001
[    1.060000] mmcblk0: mmc0:0001 SD 7.38 GiB
[    1.070000]  mmcblk0: p1
[    1.300000] EXT4-fs (ram0): warning: mounting unchecked fs, running e2fsck is recommended
[    1.310000] EXT4-fs (ram0): mounted filesystem without journal. Opts: (null)
[    1.310000] VFS: Mounted root (ext4 filesystem) on device 1:0.
```

```
[    1.320000] Freeing init memory: 152K
Starting rcS...
++ Mounting filesystem
++ Setting up mdev
++ Configure static IP 192.168.1.10
[    1.500000] GEM: lp->tx_bd ffdfb000 lp->tx_bd_dma 18ae6000 lp->tx_skb d8ab56c0
[    1.510000] GEM: lp->rx_bd ffdfc000 lp->rx_bd_dma 1829f000 lp->rx_skb d8ab57c0
[    1.510000] GEM: MAC 0x00350a00, 0x00002201, 00:0a:35:00:01:22
[    1.520000] GEM: phydev d8b71400, phydev->phy_id 0x1410dd1, phydev->addr 0x0
[    1.520000] eth0, phy_addr 0x0, phy_id 0x01410dd1
[    1.530000] eth0, attach [Marvell 88E1510] phy driver
++ Starting telnet daemon
++ Starting http daemon
++ Starting ftp daemon
++ Starting dropbear (ssh) daemon
++ Starting OLED Display
[    1.570000] pmodoled-gpio-spi [zed_oled] SPI Probing
++ Exporting LEDs & SWs
rcS Complete
zynq> [    4.530000] eth0: link up (100/FULL)
```

4. Responses to command line commands on ZedBoard:

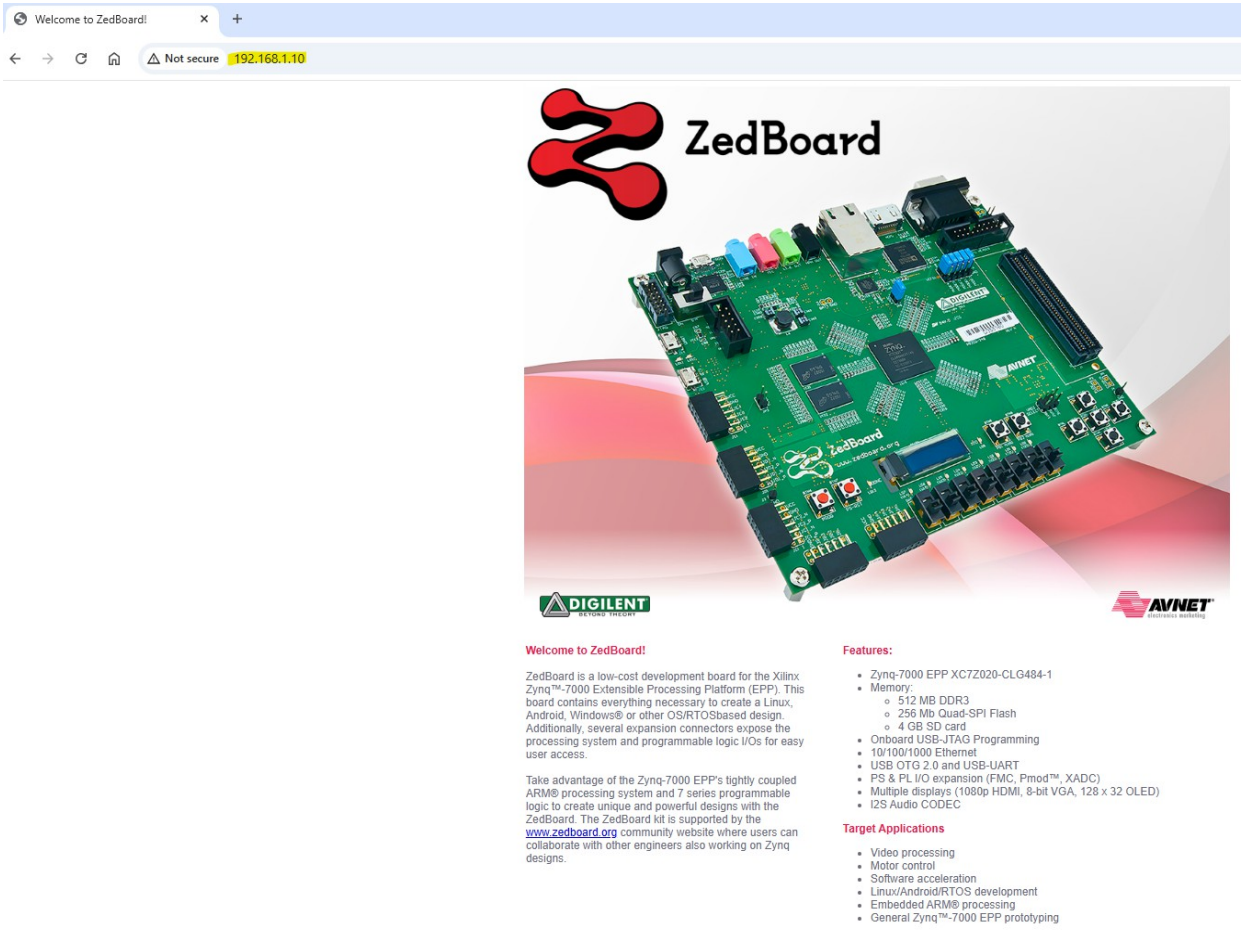
```
zynq> ls -al

total 55
drwxr-xr-x   17 12319    300          1024 Jan  1 00:04 .
drwxr-xr-x   17 12319    300          1024 Jan  1 00:04 ..
-rw-------    1 root     0           25262 Jan  1 00:05 .ash_history
-rw-r--r--    1 root     0               0 Jan  1 00:04 TMDS
-rw-r--r--    1 root     0               0 Jan  1 00:04 addr
drwxr-xr-x    2 12319    300          2048 Jan  9  2012 bin
drwxr-xr-x    4 12319    300          3072 Jan  1 00:00 dev
drwxr-xr-x    4 12319    300          1024 Jan  1 00:00 etc
-rw-r--r--    1 root     0               0 Jan  1 00:04 id
drwxr-xr-x    3 12319    300          2048 Jul 12  2012 lib
drwxr-xr-x   11 12319    300          1024 Jan  9  2012 licenses
lrwxrwxrwx    1 12319    300            11 Jan  9  2012 linuxrc -> bin/busybox
drwx------    2 root     0           12288 Jan  9  2012 lost+found
drwxr-xr-x    2 12319    300          1024 Aug 21  2010 mnt
drwxr-xr-x    2 12319    300          1024 Aug 21  2010 opt
-rw-r--r--    1 root     0               0 Jan  1 00:04 phy_id
dr-xr-xr-x   46 root     0               0 Jan  1 00:00 proc
drwxr-xr-x    2 12319    300          1024 Jul 12  2012 root
-rw-r--r--    1 root     0               0 Jan  1 00:04 rx_bd
-rw-r--r--    1 root     0               0 Jan  1 00:04 rx_bd_dma
-rw-r--r--    1 root     0               0 Jan  1 00:04 rx_skb
drwxr-xr-x    2 12319    300          1024 Jan  9  2012 sbin
drwxr-xr-x   12 root     0               0 Jan  1 00:00 sys
```

```
drwxrwxrwt    2 root     0             40 Jan  1 00:00 tmp
-rw-r--r--    1 root     0              0 Jan  1 00:04 tx_bd
-rw-r--r--    1 root     0              0 Jan  1 00:04 tx_bd_dma
-rw-r--r--    1 root     0              0 Jan  1 00:04 tx_skb
drwxr-xr-x    5 12319    300         1024 Mar 30  2012 usr
drwxr-xr-x    4 12319    300         1024 Oct 25  2010 var

zynq> uname -a

Linux (none) 3.3.0-digilent-12.07-zed-beta #2 SMP PREEMPT Thu Jul 12 21:01:42 PDT 2012 armv7l
GNU/Linux

zynq> cat proc/version

Linux version 3.3.0-digilent-12.07-zed-beta (tinghui.wang@DIGILENT_LINUX) (gcc version 4.6.1
(Sourcery CodeBench Lite 2011.09-50) ) #2 SMP PREEMPT Thu Jul 12 21:01:42 PDT 2012

zynq> free -h

BusyBox v1.18.4 (2012-01-09 15:03:52 PST) multi-call binary.

Usage: free [-b/k/m/g]

Display the amount of free and used system memory

zynq> free -k

             total         used         free       shared      buffers
Mem:        498200        30168       468032            0          260
-/+ buffers:              29908       468292
Swap:            0            0            0

zynq> ifconfig

eth0      Link encap:Ethernet  HWaddr 00:0A:35:00:01:22
          inet addr:192.168.1.10  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1043 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:218976 (213.8 KiB)  TX bytes:0 (0.0 B)
          Interrupt:54 Base address:0xb000
```

5. Connect PC via wired Ethernet port on ZedBoard

   PC IP address = 192.168.1.173/24
   ZedBoard (as defaulted from linux boot) = 192.168.1.10/24

6. Launched web browser on PC and entered ZedBoard IP in URL:



7. Launched SSH session form PC via PUTTY application to ZedBoard IP address:

```
XDS100_USB_SERIAL (COM5)
PING 192.168.1.173 (192.168.1.173): 56 data bytes
^C
--- 192.168.1.173 ping statistics ---
3 packets transmitted, 0 packets received, 100% packet loss
zynq>
zynq>
zynq> ls
TMDS        free        lost+found  root        tmp         var
addr        id          ls          rx_bd       tx_bd
bin         ifconfig    mnt         rx_bd_dma   tx_bd_dma
cat         lib         opt         rx_skb      tx_skb
dev         licenses    phy_id      sbin        uname
etc         linuxrc     proc        sys         usr
zynq> ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0A:35:00:01:22
          inet addr:192.168.1.10  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3085 errors:0 dropped:0 overruns:0 frame:0
          TX packets:951 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:551278 (538.3 KiB)  TX bytes:637073 (622.1 KiB)
          Interrupt:54 Base address:0xb000

zynq>
192.168.1.10 - PuTTY   <-- SSH
login as: root
root@192.168.1.10's password:
zynq>
zynq> ls
logo.bin
zynq>
```

- Putty serial connection confirmed ZedBoard IP address as shown.
- Validated SSH login as shown.

8. ZedBoard operating during out of the box checks: