Re: uCLinux on Samsung S3C4510B (ARM7TDMI) based wireless router

Source: http://linux.derkeiler.com/Newsgroups/comp.os.linux.embedded/2003−07/0003.html

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From: pojen (*pojen1_at_hotmail.com*)
Date: 07/13/03

Date: Sun, 13 Jul 2003 00:58:15 −0700

Hi;
I hope I won't disappoint you too much. To begin a embed project from scratch is hard.
First, you need a way to put your new stuff into the board(flash ram) but how?
You need a back door to allow you to do so. For eample, a JTAG connect to serial port or printer port, or a network download(TFTP). But how to switch the original system mode to download mode? It's the first issue. Maybe you will say, well how about the firmware upgrade? Most of the firmware upgrade only allow you to touch a certain data but not all. For example, I will cut my flash to three part: bootloader, kernel and system. Firmware upgrade will only replace my system but not my kernel or bootloader. Only the original developer know how to open the back door. Lucklly, if you know how, then next step...
Second, you need a new boot loader to replace the original one to support linux(debug or kernel loading...) You have to write yours to support JTAG initialization or init serial or network device. Because you are dealing with an embed system no BIOS. If you want JTAG, you have to write serial port support on your bootloader or similar function code.
If you want to use BOOTP(TFTP) you need to initialize your network device at boot time...
If you can do those two step, then you will have the chance to think about linux or further.
So, good luck!

pojen

ps. I will suggest you to begin a project on x86 system first(ex. XBOX project). Because no BIOS is really a pain.

"John Tetreault" <blkthorn30@nospam@verizon.net> wrote in message news:KGHPa.1840$Y92.949@nwrdny01.gnilink.net...
> I need to warn you all first.. I am completely, Linux ignorant (outside of
> being able to navigate around a bash shell a little bit)... I apologize,
but
> I haven't had the time or the real need to wrangle with it long enough to

> learn it, sorry but as a small business computer consultant, the bulk of
my
> potential clients are on Windows based systems... gotta go where the money
> is, but that's neither here nor there... suffice to say, I know Linux is
the
> superior OS (never hurts to suck up to the Linux gurus hehe). anyway. I
> have a situation where I need the capabilities that a linux based wireless
> router will offer.... (ie stock firmware from Wind River Systems, Inc.
sucks
> and won't let the router work the way I want it to work, as a bridge,
> router, access point and print server, all at the same time, preferably
with
> some sort of web based configuration like it has now [gee, I don't want
> much, do I... but I'm certain some form of Linux is up to the task])
>
> I've been looking at the various xAP (openap, opensta, linuxap, openap−ct
> and openap−ng) options as well as uCLinux.
>
> First some background on the hardware I'm trying to configure to use
> embedded Linux.
>
> I got a smoking deal ($20 each through TigerDirect as "open box") on a
> couple Siemens (Efficient Networks) SpeedStream 2623 802.11b DSL Routers,
> they work perfectly, within the limitations of the stock firmware...
they'd
> work a heck of a lot better if I could change the firmware to one of the
xAP
> variants. I'm using the routers to offer a simple free hotspot. I want
one
> of the routers to have the broadband connection and serve as the DHCP
> server, which it does stock now, so I suppose I could leave one of them
> stock? The other, I want to be able to act as a bridge to the first
> router, and any other AP's I may add, while at the same time allowing
> clients. ie multi−point to multi−point.
>
> I've done some research on this router (including cracking the case open),
> and they have a Samsung S3C4510X01−QER0 (ARM7TDMI based) processor and
> utilize a Eumitcom WL11000−1 PCMCIA card for the wireless radio. The
Flash
> RAM in this box is an Intel Flash TE28F800−B3B90 which I believe is a
512k
> x 16... I 'THINK' the router will accept a new kernel from a BOOTP server
> (www.speedstream.com says most of their routers will, to recover from a
> failed flash I assume) This router is equiped with a serial port (for
dial
> up backup it says, but I assume one could hook up a nul modem cable for a
> terminal connection too), a printer port (print server, which I'd like to
be
> able to use once/if Linux is installed), and 3 wired LAN ports as well as
a
> WAN uplink port (WAN port won't currently be used, but may be used in the

> *future to provide greater bandwidth, needs to support PPPOE connection if*
it
> *is hooked up).*
>
> *Since they were so cheap, I can afford to do a little experimenting on one*
> *of the units... although I'd rather avoid toasting it, since I doubt I can*
> *get any more at that price.*
>
> *Doing a little further research, I was able to find this little blurb on*
the
> *uCLinux site.....*
>
> *[Wiscore Inc. (Taipei, Taiwan) announced an ARM7TDMI evaluation kit that*
> *includes a uClinux operating system. Previously available exclusively in*
> *Taiwan, the "NET−Start!" kit is intended for use by system developers,*
> *instructors, and students, the company said.*
>
> *According to Wiscore, the hardware/software kit features a single−board*
> *computer based on a 50 MHz Samsung S3C4510B (ARM7TDMI) system−on−chip*
> *processor, with uClinux preinstalled. Both binaries and sources for the*
> *uClinux (with uClibc) OS are included, providing the ability to easily*
> *tailor the system to fit specific requirements, Wiscore said. Other*
features
> *of the hardware include 16MB SDRAM, 2MB Flash memory, 10/100 Base−T*
Ethernet
> *interface (RJ−45), dual RS232 serial ports, I/O expansion interface (wich*
> *can be used to add an additional Ethernet interface daughter board), JTAG*
> *port, real time clock, watchdog timer, 7−segment display, programmable*
LEDs,
> *DIP switch inputs, and push buttons. Required power and interface cables,*
> *power supply, software, and documentation are also included.]*
>
>
> *So aparantly there is a uCLinux binaries and source available out there*
for
> *the Samsung S3C4510B processor like what is in this router....And seems*
they
> *make their uCLinux Kernel v2.0.38 and uClibc 0.9.5 source code available*
for
> *download (which I have downloaded) don't know how significantly helpful*
that
> *info is or not.*
>
> *So... with all this useful or useless information.... can anybody help me*
> *with this project?*
>
> *I truly know nothing from this point... I have got cygwin installed on my*
> *windows machine so I can at least play around in a linux type environment*
to
> *start learning some things. I'm going to try compiling a uCLinux kernel*
> *later tonight, but again, being Linux ignorant, have no idea what I'm*

doing.
> *I don't know if once I have a kernel I'm going to need some sort of boot*
> *loader for it to work on the Samsung chip or what. Linux is new territory*
> *for me... and embedded Linux even more so.*
>
> *Any and all help is MOST appreciated.*
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