



Arriba® Embedded Linux Edition

Embedded Linux is rapidly emerging as the operating system of choice for high performance networking and multimedia embedded devices. Today, Linux runs on many integrated System-On-Chip (SOC) processors that are geared toward high-growth embedded devices including digital set-top boxes, digital televisions, DVD recordable devices, broadband access devices, digital cameras, laser printers and network routers.

The Arriba® Embedded Linux Edition provides significant benefits toward the software development of embedded Linux drivers and applications running such devices. Key highlights and benefits include:

Features	Benefits
State-of-art Linux kernel and application debugger over high-speed Ethernet link	Shorter development cycle and time-to-market for products
Compatibility with commercial, open-source, or in-house Linux distributions	Rapidly meeting the needs of Linux users with existing installations
Eclipse plug-in for Linux and Windows hosts ¹	Cost savings and portability. Shorter learning curve for developers
Provision of the embedded Linux kernel, GNU tool-chain and target file systems	Reduced startup time and enhanced out of box experience

Overview

The Arriba Embedded Linux Edition delivers an out of box, install-ready software development toolkit that includes:

>> **The Embedded Linux Kernel** - Built and tested for the popular RISC platforms, included with full source code

>> **The GNU Cross Tool-Chain** - GNU compiler, assembler, linker and supporting tools and libraries

>> **The Arriba IDE** - An Eclipse-based environment to edit and debug kernel drivers and applications

>> **The VMON2 Debug Agent** - A state-of-the art debug agent that provide source-level debugging of the Linux target over high-speed Ethernet

Reducing Time-to-Market

Bringing up Linux on an embedded processor can be a daunting experience. The Embedded Linux Edition provides a suite of tools aimed at minimizing the learning curve for the new users, while reducing the development cycle for the seasoned coders:

Providing a complete out-of-box package that includes the Linux kernel, cross GNU compiler and libraries, and an integrated ready-to-go target debug agent allows user of the Embedded Linux Edition to rapidly develop, test, debug and deploy their drivers and applications.

The Arriba plug-in lets user access the debugging power of VMON2 from the intuitive and easy-to-use Eclipse IDE. Use of Eclipse means shorter or no learning curve for developers while preserving existing investments in Eclipse-based tools and products.

index	pid	name	kSP
3	2	migration/0	0x83fc5eb0
4	3	ksoftirqd/0	0x83fc9ef0
5	4	events/0	0x83fcbea0
6	5	khelper	0x83fcfea0
7	6	kthread	0x83fd5ea0
8	22	kblockd/0	0x810b1ea0
9	23	kseriod	0x810afeb8
10	45	pdflush	0x810b3eb8
11	46	pdflush	0x810bbeb8
12	47	kswapd0	0x810b7e70
13	48	aio/0	0x810a1ea0
14	665	mtdblockd	0x83f07ef0
15	712	dropbear	0x80467a10
16	716	getty	0x83f19d58
17	718	getty	0x83f0dd58
18	720	sh	0x810add58
19	721	syslogd	0x8046ba10
20	722	klogd	0x810bfe58
21	723	tail	0x83f17df0

Debugger Highlights

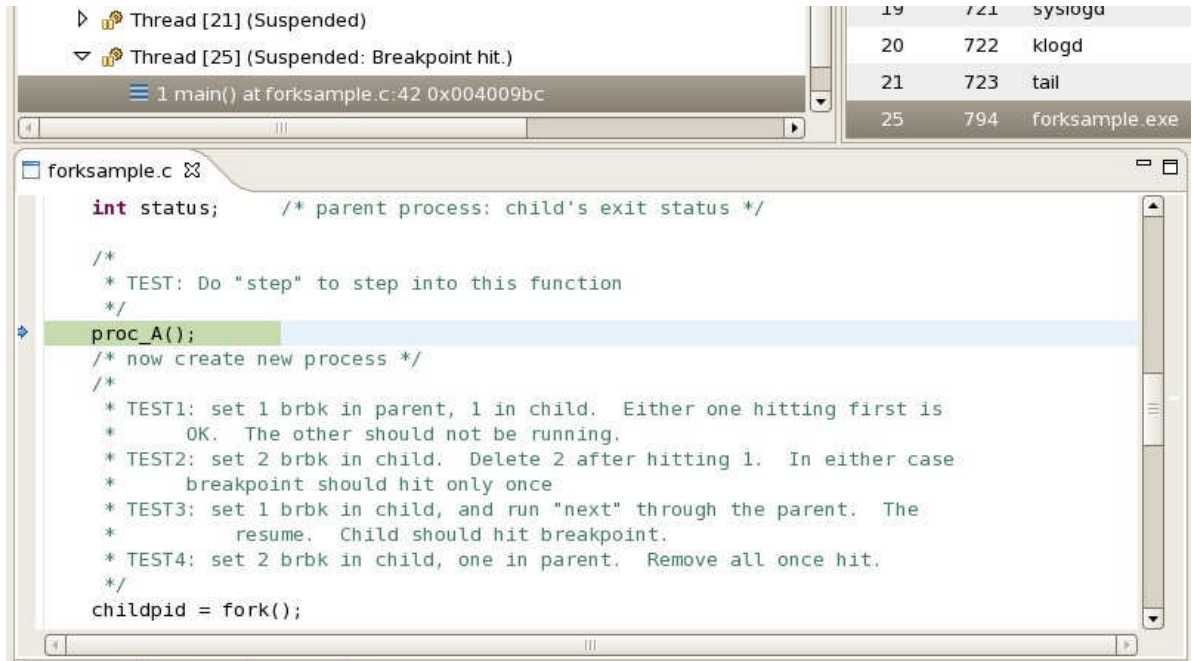
- > Integrated debugging of drivers and applications
- > High-speed Ethernet connectivity
- > Optional connection over JTAG (from FS2²)
- > Transparent debugging of loadable modules
- > Automatic loading of debug symbol(s)
- > Patch-less debugging of kernel and drivers
- > Non-preemptive debugging of kernel and drivers
- > User-definable extensible debug plug-in
- > Advanced application debugging features

¹ Eclipse plug-in for Windows-host available in Q4 2007

² First-Silicon Solutions (www.fs2.com)

Source Level Debugger

One of the biggest challenges faced by the embedded Linux developer is the inability to debug device drivers and/or multi-threaded applications that use shared libraries. The Linux kernel consists of over 2.5 millions lines of code (LOCs). At an average of ten bugs per thousand LOCs, an embedded Linux device can potentially be exposed to roughly thirty thousands bugs. Consequently, a capable debugger is the developer biggest defense against product delays and defects.



The Arriba Embedded Linux Edition includes the VMON2 debug monitor, aimed specifically at solving difficult debugging problems of embedded Linux. Based on patent(s) pending technology, VMON2 provides:

High speed & Low cost Connectivity:

VMON2 communicates with the Arriba host debugger via the Ethernet connection. VMON2 over Ethernet offers a faster, more reliable, and easier to use means of debugging the target than comparable methods based on JTAG or over Serial.

Live Debugging:

JTAG-based debug solutions halt the target when under debug. This pre-empts the exception handler(s) on the target from responding to a variety of time sensitive events such as the arrival of network packets, or the completion of certain multi-media operations. Failure to handle such events often leads to undesirable side effects that subsequently impact the target's operation. VMON2 provides full debugging of device drivers and bottom-half kernel code without disrupting the kernel servicing of time-sensitive events.

Debugging of Production-Kernel:

Conventional software based debug solutions require source level changes to the Linux kernel. A production kernel is unlikely to have such changes enabled in its code space, and thus cannot be debugged. In contrast, VMON2 can be loaded and unloaded on demand, making it possible to debug a production kernel.

Complete Debugging Coverage:

In instances where debugging of standalone programs (such as boot loader) or interrupt-service routines (ISR) are required, the Arriba Embedded Linux Edition comes with an optional plug-in that enables the source debugger to be used with a JTAG probe, offered by First Silicon Solutions, Inc (www.fs2.com). This flexibility enables the Arriba Embedded Linux Edition to address all debugging needs on embedded platforms, ranging from board bring-up to high-level multi-media applications.

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