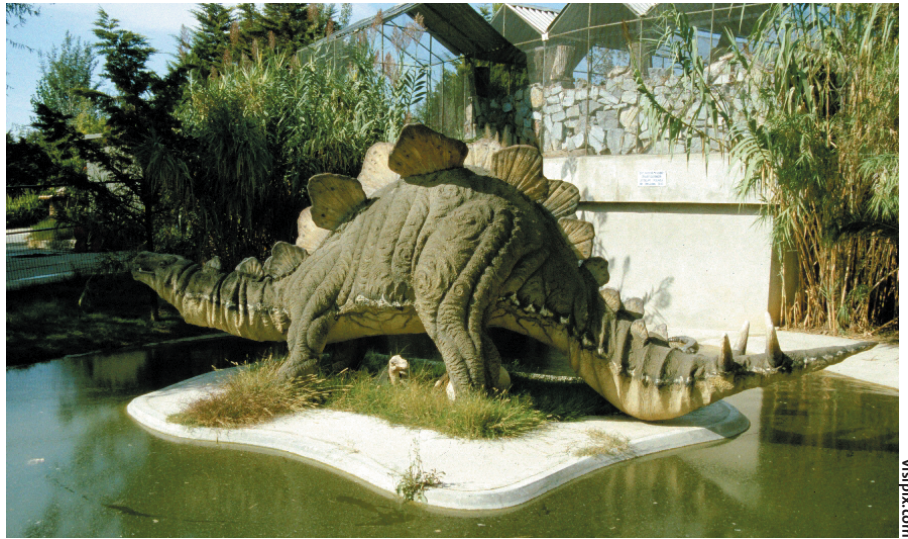OpenZaurus 3.2 Up and Running

Dinosaur Alternative

Linux geeks install their computers themselves – even if they happen to be PDAs – and doing so allows the Sharp Zaurus to shine. Making the most of your tiny hardware bundle is now easier and quicker with your own OpenZaurus system.

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The Sharp Zaurus SL-5500 PDA is still popular amongst Linux users, particularly because Linux is pre-installed on the system. Whether you feel restricted by the Qtopia desktop, or simply want to ensure that your Linux computers, no matter how small they may be, exclusively use free software, or whatever – there are any number reasons to choose OpenZaurus [1].

This totally Open Source based distribution is by no means lacking in comparison with the original. On the contrary, version 3.2, which was released at the end of March, is superior to the original. Unfortunately, installing and configuring the system yourself will mean a lot more work than a system where the manufacturer has completed these tasks for you.

Linux geeks appreciate the fact that the Zaurus boot has a Linux feel to it, and that you can use the mini-keyboard to access a shell, and they enjoy the look&feel of GUI programs based on Qt, which remind you of (the equally Qt based) KDE. OpenZaurus takes this concept a step further and installs a number of tools that should be familiar from the Linux desktop. The OPIE project [2] provides the desktop, a Qtopia extension development.

OpenZaurus uses an updated 2.4.6 Kernel as its operating system. A number of patches have been added allowing for more PDA support than the original Linux version supplied with the Zaurus. A lot of progress has been made in WLAN area, just to mention one specific field.

Memory Issues

The thing that makes OpenZaurus really interesting has very little to do with administrative facilities. This is mainly the memory issue – of course, userspace software cannot extend a system's memory, but at least the user can decide beforehand how to distribute the meager

resources the system provides. Will you need more memory for software (files) or more working memory to run more programs simultaneously?

An OpenZaurus provides Linux users with more convenient management facilities – assuming they have a network connection. The distribution's package manager reminded us of Debian; program packages can be installed via the command line using the *ipkg* tool, or you can use the GUI package manager *AQPkg*.

The Zaurus is a PDA first and foremost; users will expect typical PDA functionality of it. To ensure this, Open-Zaurus provides an OPIE calendar and address book, and the synchronization facilities leave nothing to be desired (not even when compared with Windows). Additionally, the operating system comes complete with a whole bunch of tools, from a mail client, through the embedded Konqueror version (see Figure 3) and the OPIE Mediaplayer2, to Samba or *rsync* [3].

Flash Installation

Sound interesting? To install OpenZaurus 3.2 you will first need a 32 MB Compact-Flash card. This is needed to store the OpenZaurus image that is flashed onto the PDA's ROM. You may need to format
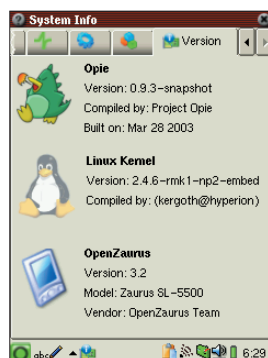

Figure 1: The PDAs new look

Figure 2: System Information

the card with FAT16, although this is typically the default format.

You need to choose a kernel image from [1] at this point. We would recommend *zImage-5500-40memory-24storage. bin*, which provides enough space for software, but also allows you to run a reasonable number of parallel applications. Now rename the image to *zImage*. You will additionally need to download the *initrd.bin* image with the root filesystem you will be using later.

You might like to back up any important data before things start to get serious; the Zaurus will be completely empty, after flashing the operating system. The flash operation requires some nimble finger work. Grab your Zaurus, plug the power cable into the PDA, open the battery enclosure (don't forget to select *Replace Battery* before doing so) and then simultaneously press [C], [D] and *Full Reset* in the lower part of the battery enclosure.

The battery and mail LEDs should light up at this point. If not, this attempt has failed and you will need to start again from scratch. After about five minutes both LEDs switch off. You can now perform another *Full Reset*, close the battery enclosure and move the slider to the *Normal Operation* position again. When you power on, OpenZaurus will pop up to say hello and you can watch the PDA boot.

New Territory

Your first steps should be to enter your own data and familiarize yourself with the standard programs. If you discover a few gaps that you want to fill by installing some of your favorite programs, you will first need to

connect your PDA up to the network.

To access the PDA from a Linux PC, first load the USB module on the PC by typing *modprobe usbnet* in the command line and then type *ifconfig usb0 192.168. 129.200* to set up the interface. You can now log on to the Zaurus from the PC by typing *ssh root@192.168. 129.201* on the PC.

OpenZaurus defaults to using a private IP address *192.168.129.201* for the PDA. You may want to change this address for one that you can route onto the Internet for office use. Home users will typically have to resort to using a Linux gateway computer to allow the PDA to access the global Internet in preparation for software installation tasks (see Box 1).

To allow Zaurus users to address external machines using their host and domain names rather than their IP addresses, you will need to enter the IP address of a nameserver in the */etc/ resolv.conf* file on the PDA.

You can now use *AQPkg* (see Figure 4), the GUI front-end for the command line tool *ipkg*, to install any packages you require. Remember that you can install additionally packages on a CompactFlash card if required. The new package manager is also aware of feeds that comprise of software packages. Debian users know that the *stable* feed provides only stable packages (and these are preferable for a production environment). If you like experimenting, you can also try out *unstable* packages.
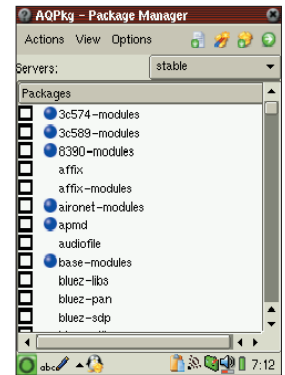

Figure 3: Surfing with Embedded Konqueror

Figure 4: The AQPkg Package Manager Front-end

Similar to Debian, you should consider an occasional *update*, to keep your package list synchronized. *Upgrade* is used to update any packages you have installed.

Replicating Data with the Desktop

Qtopia Desktop [5] is recommended for synchronizing with your desktop, as it was for the Zaurus with the original software configuration. After the software has located your Zaurus, OpenZaurus will issue a security warning to the effect that an unknown computer wants to access your system. You will probably want to permit this access. After doing so synchronizing the OpenZaurus based Zaurus with Qtopia Desktop (using the *Sync* option) should be just as easy as synchronizing the original Zaurus. ∎

INFO
[1] OpenZaurus: *http://www.openzaurus. org/*
[2] OPIE: *http://www.opie.info/*
[3] Heike Jurzik: "Keeping in Sync", Linux Magazine, Issue 28, March 2003, p66
[4] How-to on Ethernet configuration via USB: *http://www.ruault.com/Zaurus/ ethernet-over-usb-howto.html*
[5] Qtopia Desktop 1.6: *ftp://ftp.trolltech. com/qtopia/source/qtopia-desktop-1.6.1-1. i386.rpm*

THE AUTHOR

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Box 1: Accessing the Internet with a private IP address

To allow the Zaurus to access the network with its standard IP address, *192.168.129.201*, the Linux PC that you use to access the Internet needs to be configured to run NAT ("*Network Address Translation*"). If this is not currently the case, the system administrator will first need to type

```
iptables -t nat -F
```
to clear the firewall table and then the following to set up address translation

```
iptables -t nat -A POSTROUTING -j ⤵
SNAT -o eth0 --to IPAddress.for.Linux.Computer
```
The following command

```
echo 1 > /proc/sys/net/ipv4/conf/all/forwarding
```
ensures that the Linux PC will actually forward the network packages.

The hotplug mechanism typically provides a more convenient way of accessing the network with the Zaurus, however, the steps differ from one distribution to the next [4].