Single-board computers provide solutions at nominal cost

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Overview

The Raspberry Pi and Beagle Bone Black computers provide an economical and versatile platform that can be utilized for many situations. Their small size allows them to be easily located without the need for traditional rack space (see figure 4). The ease of use of the RPi (Raspberry Pi) allows users to quickly setup a working PC within a matter of minutes. The two boards retail for roughly the same amount.

What can they be used for?

PBX: Private Branch eXchange VoIP system
General-Use PCs: Open Office software
Network Monitor: NTOP, MRTG, Cacti
Server: ELOG server, general webpage server
Linux: If you need for a Linux machine for anything
Hardware Hacking: General purpose I/O pins
DAS system: UDP network broadcaster

Raspberry Pi

Technical Specifications:
- Broadcom ARM CPU (700 MHz) & Memory (512MB)
- SD Memory Card (Contains Operating System)
- Ethernet Network (100MBit)
- HDMI Video Output
- Micro USB Power Connection (5VDC / 800mA)
- 2x Full Speed USB (480MBit)

Prices approximate, does not include monitor or S&H, $USD
Raspberry Pi (Model B): $35
4GB SD card: $8
HDMI to HDMI / DVI lead: $8
Keyboard and mouse: $15
Ethernet cable: n/a
Power supply: $8
TOTAL COST: $ 74

BeagleBone Black

Technical Specifications:
- Sitara AM335x CPU (1GHz)
- 2GB on-board storage (eMMC)
- Ethernet Network (10/100)
- HDMI Video Output
- miniUSB Power Connection (5VDC / 500mA)
- SD/MMC Connector microSD, 3.3V
- USB 2.0 Client Port via miniUSB
- USB 2.0 Host Port

Singel-board computers currently in use:
- R/V Oceanus - RPi used as network traffic monitor using NTOP software
- R/V Oceanus - RPi used as web-head display in science main lab
- R/V Oceanus - RPi PBX back-up system (working to move to primary)
- USCGC Healy - RPi used as web-head display in science main lab
- USCGC Healy - RPi, in work project DAS board
- OSU Martech Project: RPi “disk farm” USB hard drive manager