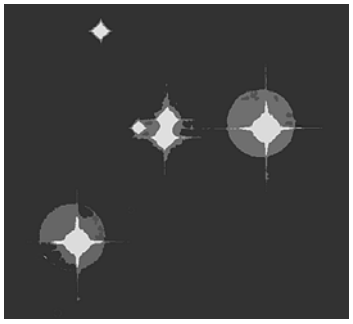
Linux on Stargate



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http://platformx.sourceforge.net
http://www.xbow.com/Products/XScale.htm

Distinguishing Capabilities

- **Sensor Networked Nodes and Gateways**
  Stargates implement smart, networked sensors for monitoring crops, machinery, habitat, security, geology, and environments. They are ideal for implementing heterogeneity ad hoc or managed large or small-scale sensor networks where they can be configured as compute centers, gateways, and data archives.
  - **Mesh Networking**
    The AODV routing protocol for ad hoc 802.11 networked enable Stargates to quickly moves information through a mesh network.
  - **Motes**
    Stargates implement heterogeneous networks by directly supporting Motes, a family of ultra low power wireless sensors and dataloggers. Stargates provide Mote programming and communication utilities.
  - **Power Management**
    System-level suspend resume supports PCMCIA sockets and Bluetooth devices, which allow the Stargate to efficiently acquire and distribute data. It can save power by sleeping during periods of inactivity and wake up when action is required.

- **Embedded Personal Servers**
  The Stargate processing, storage, and communication capabilities in conjunction with its small size make it an ideal platform in ubiquitous devices such as personal servers.
  - **Bluez Stack**
    The Stargate sports a Zeevo onboard Bluetooth radio for low power communication with neighboring devices.
  - **Media Hosting**
    Onboard Apache and Darwin Streaming Server utilities provide web-based text, audio, and video server capabilities.
  - **PCMCIA and Flash Card Support**
    PCMCIA and flash card connectors provide enhanced nonvolatile memory and hard disk expansion. It also supports 802.11 connectivity and other Linux supported devices.

- **General Use and Customizable Platform**
  - **USB Hosting with the OHCI Standard**
    As a USB host the Stargate currently supports HID and web cam devices. Additional USB drivers are easily accommodated.
  - **GPIOs / LEDs**
    User level control of GPIOs and LEDs through the `/proc` file system allows easy hardware expansion and debugging.

Cross-Build Environment

- **Modular**
  The build environment supports the selection of individual components through a Linux standard and customizable menu configuration utility. Individual users can customize the build environment for their system needs by selecting required components.
- **Platform synchronization mechanism**

  The build environment provides a quick mechanism to update the core resources of the Stargate platform. Kernel, core file system, and boot loader can be loaded from a Linux shell taking advantage of wired (or wireless) Ethernet speed and use the capabilities of Linux utilities such as ssh. This provides substantial productivity gains over traditional boot loaders utilizing serial communications.
- **Native build environment**
  A native build environment is accomplished through an NSF mount to a development environment located on a remote files system. Alternatively, a development environment may be placed on a flash card (or PCMCIA hard drive) and physically mounted of a Stargate. As a result the Stargate can compile its own applications eliminating file transfers and compatibility concerns.
- **Cross-build environment**
  Readily available cross build tool-chains support development applications on workstations when greater compute power is required.
- **Runtime configuration mechanism**
  A parameter partition is allocated in the Stargate files system. This provides an easy way to set and configure various runtime parameters, such as, startup programs, auto boot delays, and other persist setting needed to define the characteristics of a system.

Linux Open Source

- **Linux kernel 2.4.19**
  Stargate utilizes a standard open source distribution of Linux, which facilitates easy customization and expansion.
- **Sourceforge Distribution**
  Kernel sources, boot loader sources, and file system images are maintained on Sourceforge for easy updates.
- **Core Linux Tools and Utilities**
  Stargate supports the Familiar Linux Distribution providing a broad range of Linux tools and utilities.
- **Flash Memory**
  Stargate supports standard disk formats (e.g., jffs2, ext2, ext3, vfat, msdos) and can be extended to others.
- **Wireless tools**
  Stargate supports 802.11 and Bluetooth wireless tools. There are HostAP and Spectrum drivers for NetGear, Xcomax, and SocketComm cards. Support for other card is easily added. Stargate contains Bluezy stack and tool set.
- **POSIX and Runtime Environment**
  Stargate is an excellent embedded platform for standard POSIX applications and runtime environment. For example, it supports USC's Player which is an actuator / sensor device server for robotics. Java and Perl are included.