STARGATE II

Intel Research
Stargate Developer's Forum

2nd May 2005

The Stargate-1 Platform

Stargate Mainboard

Success Ingredients for Stargate-1

- All the interfaces and connectors that most customers wanted
  - Compact Flash x 2 or PCMCIA socket + CFlash
  - Mica Mote Interface
  - Access to available GPIO line
- Wide range of plug-in cards (e.g., WiFi, GPRS, Storage, AudioIO)
- Competitive cost of $475 main-board + $150 for daughter-board
- Runs from battery or low cost transformer
- Supported Linux software environment available on SourceForge
  - URL http://platformx.sourceforge.net/
  - Responsive user group DL and technical problem solving
- Growing user community that amplifies success:
  - Sold by Crossbow and Acroname. Greater than 55/60 UCLA/CENS projects use Stargate. Also good adoption at ISI, Stanford, UW, GaTech, CMU, and across Intel Research Lablets

Influencing Factors for Revision

- Manufacturing forcing function
  - SA1111 companion chip is end-of-life
- Next Gen Processor: Bulverde PXA271 (to 510MHz)
  - Faster and a larger variety of peripherals
  - Flash and DRAM on board
- New radio technologies of interest to the community
  - Zigbee
- New types of removable cards available
  - SDIO
- Support for next generation wireless sensor nodes

Objectives for Stargate-2

- The next generation Linux-based embedded research platform for our community, replacing Stargate I (EOL)
- Provide the prototype gateway design for Intel's next generation Sensor Network research
- Be synergistic with the Intel Mote-2 deployment and business objectives
- Provide an experimental platform for future mobile systems requiring battery operation, low power and an XScale class processor.

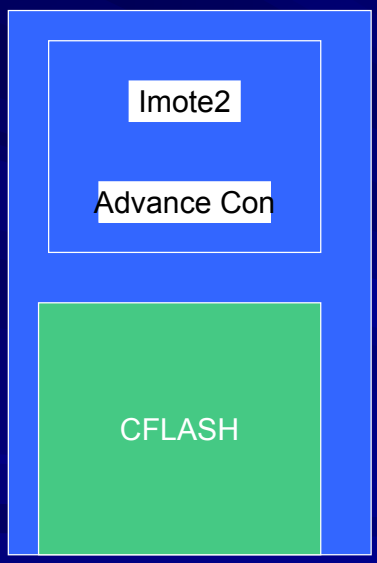
List of Stargate-1 Features

- Stargate-1 Mainboard
  - Intel® XScale™ PXA255 (Cotulla)
  - 32MB Flash
  - 64MB SDRAM
  - 2 CF, or (1 CF + 1 PC-card)
  - Mote connector
  - Docking connector (power, serial, USB)
  - Bluetooth radio (optional)
  - USB Master & USB Slave
  - Serial Interface
  - I2C, SPI and spare GPIO
  - Status LEDs
  - Switches: power & user & reset
  - DC regulator
  - Additional Watchdog timer + RTC
  - Battery operation and gas gauge
  - DVM (for core voltage)
  - Daughter card connector
- Stargate Daughter-Card
  - Ethernet/10BaseT
  - JTAG (10-pin)
  - Serial Interface (DB9)
  - USB Master (socket)

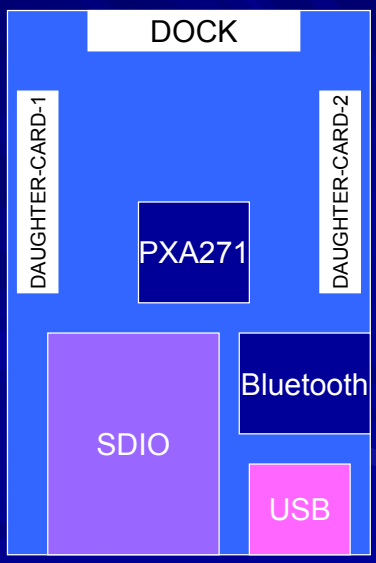
Stargate-2 Proposal

- Stargate-2 Mainboard
  - PXA27x (Bulverde) + Caddo (Crypto)
  - 32 MB Flash
  - 32/64 MB SDRAM
  - 1 CF/PCcard + SDIO card
  - Intel Mote2 basic/advanced connector
  - USB Slave (mini-socket) or RS232
  - USB Master (pads) – now internal
  - Headers: I2C, RS232, SPI, GPIO
  - Status LEDs
  - Switches: power & user & reset
  - PMIC:
    - DC reg, battery charger, gas gauge, DVM
  - Zigbee 802.15.4 radio
  - Bluetooth radio (optional)
  - Battery backed up time reference
  - Dual-anchor daughter-card connector
    - Designed to support expansion x 3
- Stargate Daughter-Card
  - Ethernet/10/100/BaseT
  - Power over Ethernet (optional)
  - JTAG (Socket)
  - USB Master (socket)

Stargate-2 Layout Options

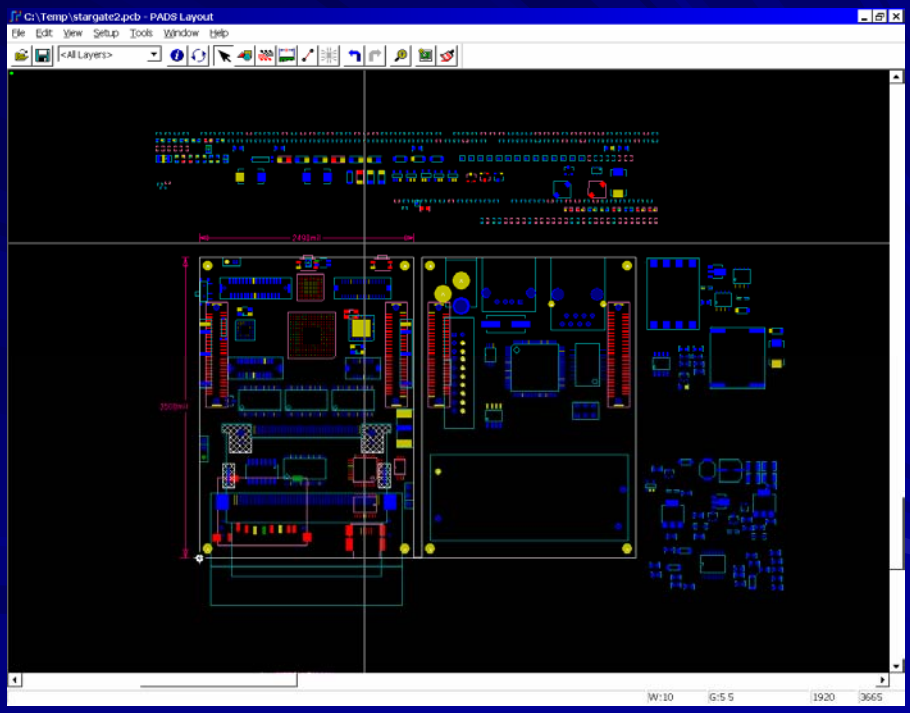


Top Side



Bottom Side

Experimental Stargate PCB Layout



Timeline

- Stargate Forum May 2nd
- Close Feature List May 16th
- Revisions Closed June 1st
- Layout by June 15th
- PCB returned June 22nd
- Assembly and Testing June 30th

Please send us your review feedback