

# Thomas Taranowski

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## Summary of Qualifications

- Expertise in multi-node, multi-core embedded systems design, implementation, and debugging, where minimal latency, fault tolerance, and determinism are critical factors.
  - Experienced in the full life cycle of software development, including product conception, architecture definition, requirements definition, prototyping, interface design, implementation, integration, testing, and maintenance.
  - Experienced in communicating effectively across team boundaries to solve system level design or implementation issues on highly coupled and complex systems.
  - Expertise in coordinating a distributed product team with remote team members as well as external outsourced offshore and onshore contractors.
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## Experience

- **Independent Consultant (baringforge.com)** **Baring, WA**  
*January 2010 to current*  
*Owner*
  - Provide analytic and development support for the lwIP (<http://savannah.nongnu.org/projects/lwip/>) embedded network stack.
  - Toolchain and integration platform support.
  - Netburner product development.
  - General software and firmware consultation services.
- **Oculus (oculusvr.com)** **Seattle, WA**  
*Oculus Acquisition to current*  
*Software Architect / Engineer*
  - Software lead for proprietary portions of the consumer Oculus hardware product.
- **Carbon Design Group (carbondesigngroup.com)** **Seattle, WA**  
*March 2014 to Oculus Acquisition*  
*Software Architect*
  - Software project lead architect. Developed architecture for multiple projects and coordinated team schedule and tasks with current ongoing projects.
  - Hardware bitcoin wallet. Developed a prototype hardware bitcoin wallet. Specific details are currently proprietary.
- **Planetary Resources, (planetaryresources.com)** **Bellevue, WA**  
*August 2012 to March 2014*  
*Senior Flight Software Engineer (aka Software Mechanic)*
  - Worked on design and implementation of Arkyd series spacecraft software architecture. Componentized event-driven architecture using ZeroMQ, Cheetah, C++, XML. Communication interfaces include I2C, SPI, 232, Ethernet, TCP/IP, linux IPC.
  - Software development infrastructure. git, Android repo, GovCloud (ITAR compliant EC2), Xen, Jenkins, CMake, Google Test unit test integration, Vagrant, Puppet, compilers, etc.
  - Worked several successful SBIR proposals, led development of hypervisor SBIR proposal.
- **Blue Origin (blueorigin.com)** **Kent, WA**  
*February 2011 to August 2012*  
*Senior Flight Software Engineer*
  - Architecture, design, and implementation of new launch vehicle software architecture implementation. This included the development of a radically different architectural style, which enabled arbitrary vehicle configurations at runtime. ZeroMQ, C++, Jenkins, CMake.
  - Responsible for battery charging interface and backend software (8051), network, and camera monitoring software (linux) for the Crew Capsule. The full gamut of communication interfaces, including I2C, SPI, CAN, 422, Ethernet, TCP/IP were utilized.

- **Anonymous Customer**  
*Contractor* *December 2009*

  - Implemented quantum random number generator network application, coordinated circuit board design and layout with sub-contractors.
  - Netburner 5234, embedded select loop with async message dispatch, web interface through embedded web server, Eagle, Ajax.
  
- **SpaceX (spacex.com)** **Hawthorne, CA**  
*Flight Software Engineer* *July 2009 to February 2011*

  - Technologies included embedded linux, preempt-rt, multicore PPC platforms, high speed backplane interfaces, including Ethernet and Serial Rapid IO, and time synchronization technologies such as IEEE 1588 (PTP).
  - Worked on initial prototype architecture for Dragon capsule to spearhead development of redundant architecture utilizing several new bleeding edge hardware architectures.
  - Helped coordinate network, platform, and portions of infrastructure development. Included development of new physical layer standard, linux bringup, board bringup, and vehicle test support.
  - Implementation and integration of prototype linux RapidIO driver. Pushed back a very minor bugfix to the linux driver.
  - Responsible for highly customized network driver for General Standards sio4bx card working against a proprietary physical layer protocol. Utilized VxWorks END interface.
  
- **Alset Corporation (alsetcorp.com)** **Hawthorne, CA**  
*Independent Contractor* *January 2007 to February 2010*

  - Developed software portion of the Remote manager product, and provided a web interface to remotely deployed lightening detector assets.
  - Key features included flash-based event log, parameter threshold monitoring and alarm relay control, local keypad and 2-line display interface, proprietary hardware monitoring and control all running on a Netburner 5282.
  - Key interfaces used were I2C, flash file system, PPP dial-up, serial, GPIO, ADC, SPI.
  - SNMP MIB implementation for the embedded target.
  - C# based SNMP feature registration app to register and manage various product features
  
- **LwIP Open Source project (savannah.nongnu.org/projects/lwip)** *January 2007 to July 2009*  
*Contributing Member*

  - Member of the lwIP open source project. In addition to various testing and bug reporting contributions, I implemented the fragment reassembly mechanism due to poor performance of the previous version. My version was then rolled into the mainline.
  
- **Honeywell Operating Systems (honeywell.com)** **Redmond, WA**  
*Senior Software Engineer* *January 2006 to June 2009*

  - Network infrastructure architect and primary network dev for a geographically distributed team focused on enhancing the Deos OS ([http://ddci.com/products\\_deos.php](http://ddci.com/products_deos.php)) offering.
  - Responsible for the networking product concept and vision, development of functionality. Included lwIP selection and integration.
  - Responsible for performance and statistical collection services, implemented netstat, and other well-known stack services.
  - Released a verified and validated package (DO-178b Level D) to multiple customers.
  
- **Honeywell Aircraft Environment Surveillance System (honeywell.com)** **Redmond, WA**  
*Software Engineer* *January 2003 to January 2006*

  - Designed and developed common networking infrastructure to interface all elements of the Airbus A380 Aircraft Environment Surveillance System, with additional responsibility for reusing the networking infrastructure across other products. Included MFC-based stack configuration tool.
  - Designed, implemented, tested, and verified (to DO-178B level C) a lightweight multi-core aware UDP/IP network stack that functioned deterministically and efficiently across all 4 systems on the avionics network.

- Primary contact for OS support and RTOS concepts within the group.
- Implemented an automated build to glue together a mix of python, batch files, and Windows tasks.
- Implemented several key system optimizations, which included a DMA controller driver and integration to copy data from PCI space to local memory, which resulted in a measured 10% savings off maximum CPU usage. Additional optimizations consisted of function level design optimizations driven by analysis of the assembly output by the compiler.
- Resolved multiple Airbus end system integration steps through the implementation and integration of an AFDX test responder application.
- Helped integrate flash memory abstraction layer for a journaling flash file system developed in collaboration with an outsourced team.
- Provided significant support across team boundaries for software component infrastructure, build environment, and OS support, including tasks such as OS configuration, make file debugging/generation, source code debugging, communication link issues, multi-tasking/inter-processor timing issues.

- **AT&T Wireless/Netro (att.com)**

*Software Engineer*

**Redmond, WA**

*July 2000 to November 2002*

- Worked on the platform team for a distributed cellular base station product.
- Platform and management interface deliverables. Implemented distributed event reported mechanism over firewire backplane, backend for java management console, and general product maintenance.
- Ported over several portions of the Fault Management system to a new hardware platform.

- **Motorola (motorola.com)**

*Software Engineer*

**Arlington Heights, IL**

*January 1999 to June 2000*

- Worked on software for analog cellular base stations, using primarily 6809 assembly and C.
- Debugged out several client RF planning issues.
- Implemented DSL in perl to simplify debug log parsing.

- **Illinois State university**

*Software Engineer*

**Normal, IL**

*February 1996 to December 1998*

- Lead dev for team that provided a user-friendly Internet installation and PC configuration that was used to integrate various applications with campus labs. Work included several GUIs developed using Visual C++/MFC, as well as html/cgi based applications.

## Other Random Experience

- Linux Python app to listen for insertion of audio CD on dbus, and automatically backup CD to music NAS, which is accessible via my Sonos module.
- Implemented an automated bank account balance retrieval via Python's very nifty urllib2 module. It's run every night via cron, and optionally emails a bank account balance to one or more recipients one of which is a cell phone.

## Technical Expertise

**Languages:** C, C++, Python, CMake, Make, Bash, Javascript, XML

**Tooling:** git, subversion, cheetah

**OS:** Linux, Windows, uCos, VxWorks, Deos

**Open Source Contributions:** LwIP, linux kernel (Serial RapidIO driver)

**Concepts:** Multi-node system integration, Real-time systems, multi-process and multi-threaded systems, Ethernet/networking, DO-178b

**Driver Experience:** MSP430, CAN, I2C, GPIO, SPI, Ethernet, RS422/RS485 DMA, AFDX, Flash, FPGA, Keypad, Display, VGA

**Certifications:** Certified ScrumMaster (CSM) – Agile development, Certified Netburner Consultant

## Education

- **University of Washington**  
*Agile Development certificate program at U.W. (ScrumMaster Certification)*
- **Illinois State University**  
*College of Engineering, B.S. Computer Science*

**Seattle, WA**  
2008

**Normal, IL**  
1994 – 1998