

Poornaprajna Udupi's Project Portfolio

Current Job Summary (Researcher at Sun Labs)

- Device-Independent Small-footprint SSL/TLS Implementation

Developing a device-independent but extensible small-footprint SSL implementation (both client and server-side) for use on various Java platforms. This experimental library will be useful for prototyping various applied cryptography projects as well as extensible to provide security for new experimental platforms in the Sun Labs. This is a work in progress

- Intelligent Sensor Deployment for Data Center Energy Efficiency

Involved with developing an intelligent data collection, monitoring and predictive failure diagnostics infrastructure for increasing energy efficiency in data centers using Sun SPOTs (www.sunspotworld.com). This is a work in progress.

- Anti-Phishing Protocols and Prototyping

In the recent past my research focused on developing anti-phishing protocols for Web Security. I demonstrated some phishing techniques by using Mozilla browser, Squid web proxy cache, GNU Wget, Apache web server and OpenSSL. With my team at Sun Labs, we invented a new class of anti-phishing protocols called "Multi-Factor Password Authenticated Key Exchange (MFPAK)" (eprint.iacr.org/2008/214). I demonstrated the effectiveness of MFPAK by prototyping one of the candidates using OpenSSH, S/KEY and OpenSSL.

- New URL scheme for Mozilla Browser

Created a new URL scheme (called **https://**) for tunneling http protocol messages via an experimental Secure Socket Layer.

- AutoSPOTS (autospots.dev.java.net)

The AutoSPOTS project provides remote navigation and autonomous navigation capabilities to RC cars and trucks using Sun SPOTs (www.sunspotworld.com)

Past Projects

- Linux Application Environment on Solaris

Quality engineering for infrastructure that allows execution of non-native binaries on Solaris 10.

- Samba (<http://www.samba.org>)

Worked on a test suite for testing interoperability between Solaris and Windows machines using Samba.

- Solaris x86 port to AMD64

Quality engineering for the Solaris x86 port to AMD 64-bit platforms.

- KMDB - Kernel Modular Debugger (<http://docs.sun.com/app/docs/doc/806-6545>)

KMDB is the Solaris in-situ kernel debugger. KMDB allows single-stepping the kernel, all the while looking at CTF data, running dcmds, etc. KMDB also supports loadable dmods, and includes all of the kvm dmods currently built for mdb. I worked on testing the debugger for putback into Solaris 10.

- Contracts (<http://www.sun.com/bigadmin/content/selfheal/smf-quickstart.html>)

Contracts project is a part of the Solaris Service Management Framework (SMF) that helps to formalize the relationship between a process and the kernel-managed resources it depends on. I provided the quality engineering support for the project.

- **DTrace** (<http://www.sun.com/bigadmin/content/dtrace/>)

The DTrace project adds dynamic instrumentation and tracing facilities to the Solaris kernel. I was the only Quality Engineer for the project.

- **Module Writer** (<http://www.ncbi.nlm.nih.gov/pubmed/12821310>)

MODULEWRITER is a PERL object relational mapping (ORM) tool that automatically generates database specific application programming interfaces (APIs) for SQL databases.

- **Security Attribute Certification Infrastructure (SACI)**

Designed and implemented the SACI component to handle trust management and policies between the software mobile agents and the servers in a secure mobile software agent system.

- **Implementation of the IP Layer**

Implemented the routing, fragmentation and reassembly functionality of IP Layer for BSD 4.3 Unix in C.

- **C-On-Line, a global online C - Programming Contest:**

Co-Designed and Co-Implemented a fully automated tool-kit using Perl, CGI, C and JavaScripts for conducting an online C-programming contest. The processes included registering the participants, evaluating and grading code submissions, sending back responses and at the same time maintaining the entire system safe and secure from any external/internal attacks.