

Jean-Marc Saffroy

Email: <saffroy@gmail.com>

Mail: 37 rue Saint Fargeau – 75020 PARIS – FRANCE

Phone: (+33) 06 37 56 60 39

SENIOR SOFTWARE ENGINEER

System software development on Linux/Unix

Education

Masters degree in Computer Science (French *diplôme d'ingénieur*), with final year focused on **Networking and Distributed Systems**. ENSEIRB, 2000.

Skills

Distributed system design and implementation (Scality SOFS – proprietary filesystem)

Unix/Linux operating systems internals (mainly Linux)

Other software skills:

- **C, Python, shell/awk/sed** scripts, assembler (x86 and IA64), basic C++;
- **performance analysis** of large distributed systems: the **Lustre** distributed filesystem, Voltaire **Infiniband** networks, DataDirect Networks disk arrays, the **Scality** distributed filesystem and object store;
- **debugging** in difficult environments (Linux kernel crash dump analysis on large Itanium-based servers);
- **modeling** of concurrent / distributed systems with **TLA+**;
- GCC backend internals and related topics: GNU toolchain, ELF format, relocations;
- curious about Haskell and Rust;
- small web apps with Python (Flask) and Javascript (Vue, D3js);
- version control (git, Mercurial, CVS), continuous integration, code reviews.

Soft skills:

- customer support;
- hiring interviews;
- trainings;
- project lead;
- **fluent oral and written English**;
- native French speaker.

Experience

Scality (2011-2020): Senior Software Engineer, Lead Engineer – Scality SOFS filesystem

- Proposed, designed and wrote a **Distributed Lock Manager** (DLM) for SOFS, similar to the [VAX/VMS DLM](#). Used **ZooKeeper** for distributed group membership, and fixed [two bugs](#) in [Kazoo](#). Protocol validation with the TLA+ model checker.
- Designed and wrote a library implementing **high performance file storage** on top of a distributed object store, with parallel data access, asynchronous writes, and read-ahead (detect sequential reads to prefetch data and reduce latency). Integrated this module in two filesystems: Gluster, Scality SOFS.
- Proposed, designed and wrote **distributed tracing** infrastructure for **performance analysis** and as part of **observability**, similar to [Google Dapper](#) (and before OpenTracing/OpenTelemetry), using Elasticsearch to store and query data, Kibana for data analysis, and D3js for trace visualisation.
- Proposed, designed and implemented major **performance optimizations** in SOFS: caching of directory entries, lazy (DLM notification-based) cache invalidation for FUSE, per-directory case-insensitive support (including a new Samba module), yielding a 60x performance gain when listing large directories (30k-100k files) over SMB.
- Turned an **NFSv3** server prototype into a product.
- Designed and wrote filesystem quotas for SOFS.

- Contributed a Cinder driver ([block storage on Scalify SOFS](#)) to the **OpenStack** project.
- Served as team lead for the SOFS team for a year.
- Conducted hiring interviews.
- Ran training sessions on the product for new hires, and on new features for pre-sales and support engineers.

Joguin SAS (2009-2011): R&D Engineer

- Ported the **GNU toolchain** (**GCC**, binutils, simulator) to target a new virtual machine instruction set.
- As a demonstrator of the toolchain, ported VICE (a C64 emulator) and SDL to the simulator.

Silicomp Ingénierie, then **Orange Business Services** (2004-2008): Expert Software Engineer

- Developed and integrated a software maintenance system for the Airbus A380, based on embedded Linux and FreeBSD servers.
- Designed and wrote an extension to the GNU debugger **gdb**, to add support for user-level **cooperative threads** (coroutines) inside single- and multithreaded applications.
- Worked for Bull on the Lustre **parallel file system** for **high performance clusters** (2004-2007)
 - Performed Lustre integration to the Bull Linux kernel, bug fixes, tests, RPM packaging.
 - Investigated CPU, memory, network and storage performance issues with Lustre on large NUMA multiprocessor systems for the [TERA10](#) and [CCRT/Platine](#) clusters.
 - Defined a team process and wrote tools to streamline integration of new Lustre releases using CVS.
 - Contributed kernel bug fixes ([IA64 module relocations](#), [VMM](#)).
- Prototyped a compatibility library providing file I/O and threading APIs to port a set of Windows multithreaded applications (services) to Linux. Wrote an efficient and easy to use build system. Initiated the use of source control (CVS) in the company (industrial customer).

Silicomp Research Institute (2000-2003): Research Engineer

- Worked on **LiS**, a STREAMS stack for Linux
 - Audited the code, improved its stability and performance.
 - Wrote a test environment using DejaGnu.
 - Added assertions to LiS and to the Linux kernel's interprocessor locking primitives.
- **Ported** several components to eCos on embedded targets (ARM7TDMI boards, 64-128 KB RAM): the OpenSSH daemon, a **PPP** layer (BSD kernel code and pppd daemon), the Linux JFFS2 **file system** for flash memory devices.
- Contributed to the design, and wrote extensions to the kernel driver of the Netwall firewall, enabling fast switching between preloaded configurations. Integrated application-level proxy programs.
- Wrote internal notices on **Bluetooth** security and BlueZ (Linux Bluetooth stack). Designed and wrote an RFCOMM connection server in Java using BlueZ. Produced RPM packages.
- For the port of a « real-time » backup system from Windows to Linux, showed feasibility, co-designed and wrote the Linux kernel modules that intercept **VFS** operations (ie. file system methods) in live inodes of an unmodified **Linux kernel**, in order to perform data replication on a remote server. Contributed a patch to boot Linux 2.4 on XXPRESS host.

ENSEIRB (1997-2000): Student

- 3 month **final student project**. Designed and wrote the [IP Personality](#) kernel extension to the **Linux** firewall, a versatile network stack fingerprint emulation engine, so as to counter fingerprinting tools such as **nmap**.
- 5 month **internship** at **Matra Marconi Space** (later EADS Astrium) in Toulouse. Wrote tools and drivers to control the measurement instruments used in validation and tests of satellite avionics. Ported a test language interpreter from Solaris to Linux.

Hobbies

Coffee, books (fiction and non-fiction), reading industry articles and papers, photography, music.