

# Fabien Gaud

*Multicore programming expert*

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🌐 [www.fabiengaud.net](http://www.fabiengaud.net)

👤 [github.com/fgaud](https://github.com/fgaud)

📄 [fabien.gaud](#)

*Since 2007, I am working on improving the performance of applications, runtimes and operating systems on multicore architectures. My solutions noticeably increase the Linux kernel efficiency on multicore architectures as well as the performance of a variety of workloads: scientific applications, MapReduce applications, the Apache Web server, and a multicore event-driven runtime.*

## Employments

- Since May 2014 **Senior Software Engineer**, *Coho Data*, Vancouver, Canada.  
*Working on performance and scalability of a distributed NFS server*
- October 2011 **Post-doc**, *Simon Fraser University*, SYNAR Lab, Vancouver, Canada.  
May 2014 *Working on efficiently exploiting large pages for NUMA multicore architectures*
- Implemented a solution to transparently use large pages when they are beneficial while avoiding costly NUMA effects
  - Increased the performance of various applications (scientific and MapReduce applications, data servers) by up to 100% compared to Linux with small pages and up to 81% compared to Linux with large pages
- Worked on traffic management for NUMA multicore architectures*
- Implemented a solution to replicate memory pages in the Linux kernel
  - Redesigned thread and memory placement algorithms to consider traffic congestion on memory controllers and interconnects
  - Increased the performance of scientific and MapReduce applications by up to 150% compared to Linux
  - Code is available at <https://github.com/Carrefour>
- January 2011 **Research engineer**, *INRIA*, Sardes team, Grenoble, France.  
September 2011 **Worked on improving the performance of data servers on NUMA multicore architectures**
- Designed a runtime able to leverage the asymmetric performance of recent NUMA multicore processors
  - Evaluated the performance impact of task management strategies for multi-tier servers on NUMA multicore machine
- September 2007 **Ph.D candidate**, *Grenoble University*, Sardes team, Grenoble, France.  
December 2010 *Worked on improving the performance of data servers on multicore architectures*
- Studied the Apache Web server on multicore NUMA machines. Improved performance by up to 30% on the SPECWeb benchmark
  - Designed a multicore event-driven runtime up to 70% more efficient than the state-of-the-art solution on data servers.
  - Code is available at <https://github.com/fgaud/Mely>
- September 2007 **Teaching assistant**, *Université Joseph Fourier*, Grenoble, France.  
June 2010 *Taught graduate courses at Joseph Fourier University (Polytech'Grenoble / UFR-IMA)*
- Instructor of the middleware part of the Middleware and Databases course (UFR-IMA, 2 years)
  - Teaching assistant on the E-commerce project (Polytech'Grenoble, 3 years)
  - Teaching assistant on the computer networks course (Polytech'Grenoble, 2 years)
  - Teaching assistant on the distributed systems course (Polytech'Grenoble and UFR-IMA, 1 year)
- March 2007 **MSc candidate**, *INRIA*, Sardes team, Grenoble, France.  
August 2007 *Worked on autonomic management of event-based execution flows*
- Designed a new scheduling mechanism capable of switching from a thread-based execution to an event-based execution for the staged event-driven architecture (SEDA)
- June 2006 **Internship**, *INRIA*, ID-IMAG Lab, Grenoble, France.  
September 2006 *Created tools to automatically deploy distributed file systems on GRID5000, a grid of computers*

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## Education

- 2010 **Ph.D. in Computer Science**, *Grenoble University*, Grenoble, France.  
*Title* : Improving the performance of data servers on multicore architectures  
*Advisors* : Jean-Bernard STEFANI, Renaud LACHAIZE and Vivien QUÉMA
- 2007 **Master of Science in Computer Science**, *Université Joseph Fourier*, Grenoble, France.  
*Title* : Autonomic management of event-based execution flows in component-based systems  
*Advisors* : Renaud LACHAIZE and Vivien QUÉMA
- 2007 **Engineering degree in Computer Science**, *Polytech'Grenoble*, Grenoble, France.

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## Computing skills

- Languages **C, Perl, Latex, C++, JAVA, JEE, x86 assembly, SQL**
- Systems **Linux kernel programming, Scheduling, Memory management**, Distributed systems
- Networks Administration, Routing protocols
- Software **GNU tools, VCS (Git, Subversion), Eclipse**, Oracle, PostgreSQL
- OS **Linux (Debian/Ubuntu/Gentoo)**, Windows

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## Spoken languages

- French Native
- English Fluent

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## Publications

### International conferences

- J.P. Lozi, B. Lepers, J. Funston, F. Gaud, A. Fedorova and V. Quéma.  
***The Linux Scheduler: A Decade of Wasted Cores.***  
European Conference on Computer Systems (EuroSys), 2016.
- F. Gaud, B. Lepers, J. Funston, J. Decouchant, J. Funston, A. Fedorova and V. Quéma.  
***Large Pages May be Harmful on NUMA Systems.***  
USENIX Annual Technical Conference (USENIX ATC), 2014.
- M. Dashti, A. Fedorova, J. Funston, F. Gaud, R. Lachaize, B. Lepers, V. Quéma, and M. Roth.  
***Traffic Management: A Holistic Approach to Memory Placement on NUMA Systems.***  
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2013.
- T. Dwyer, A. Fedorova, S. Blagodurov, M. Roth, F. Gaud and J. Pei.  
***A Practical Method for Estimating Performance Degradation on Multicore Processors and its Application to HPC Workloads.***  
Supercomputing Conference (SC), 2012.
- F. Gaud, S. Genevès, R. Lachaize, B. Lepers, F. Mottet, G. Muller, and V. Quéma.  
***Efficient Workstealing for Multicore Event-Driven Systems.***  
International Conference on Distributed Computing Systems (ICDCS), 2010.

### Journals

- F. Gaud, B. Lepers, J. Funston, M. Dashti, A. Fedorova, V. Quéma, R. Lachaize, and M. Roth  
***Challenges of memory management on modern NUMA systems.***  
Communication of the ACM 58, 12, pp. 59-66, 2015.

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## References

- Dr. Alexandra Fedorova **Associate Professor**, *Electrical and Computer Engineering, UBC*, Vancouver, Canada.  
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