Marco Emilio Poleggi

Open-Source DevOps Engineer

Education

Dec 2016 Web design. Ateliers Nomades, Geneva, Switzerland

Sep 2012 Advanced PHP programming school. IT Training Academy, Geneva, Switzerland

Dec 2011 Enterprise building school. New Star-t, Geneva, Switzerland

Sep 2005 CERN School of Computing. St. Malo, France

1999 – 2003 Ph.D. in Computer Engineering. "Tor Vergata" University, Rome, Italy. *Highest marks*

1992 – 1999 Master in Electronic Engineering. "Sapienza" University, Rome, Italy. *Cum laude*

Certifications

Nov 2011 – Oct 2014 *CSDP*. IEEE Computer Society

Languages

Mother tongue Italian

Fluent English, French

Notions German

Skills

Managerial

- Product management: configuration, release and delivery
- Workflow analysis and design
- Technical operation coordination
- Test engineering and benchmarking

Technical

- Agile development: CMS, OS, Web UI and simulation
- Performance analysis: synthetic workloads (statistics)
- OS administration: GNU/Linux
- Training and $2^{nd} - 3^{rd}$ level support

Languages and protocols Python, *nix Shell, RegEx, HTML5, CSS, Perl, C, Make, LaTeX, JavaScript, PHP, HTTP, SQL, REST, YAML, LDAP, C++, DNS

Software and systems GNU/Linux, Emacs, IoT, Flask, Apache, WordPress, Git(Lab), Request Tracker, Nginx, Postfix, Mailman, SVN, HPC (SLURM, LSF), Terraform, Ansible, Docker, Dovecot

Experience

May 2019 ***Research assistant (50%) => (Sept. 2021) Scientific collaborator (50%)***

HEPIA – Haute école du paysage d'ingénierie et d'architecture de Genève, Geneva, Switzerland. Teaching and research in the Cloud/Edge/IoT field for smart-city applications.

May 2013 – Apr 2015 ***Bioinformatics analyst & developer (50%)***

HUG – Hôpitaux Universitaires de Genève, Geneva, Switzerland. Tools and workflows for genomic analysis: development and HPC/OS integration.

Dec 2011 ***Freelance IT consultant***

Web and OS development and integration; OS administration; training.

Mar 2009 – Jun 2011 ***Technical manager & developer***

GFI International SA – Geneva, Switzerland, for the State of Geneva. Product testing and release workflows; infrastructure evolution; CMS applications.

Feb 2008 – Jan 2009 ***Configuration manager***

INFN-CNAF, Bologna, Italy. Workflows and configuration tools for HPC storage services.

Feb 2005 – Jan 2008 ***Developer & release manager***

CERN, Geneva, Switzerland. HPC fabric configuration tools and release workflows; datacenter's configuration database administration.

Jun 2003 – Dec 2004 ***Developer – post-doctoral***

"Sapienza" University, Rome, Italy. Software simulators for the performance analysis of content distribution network.

Oct 2000 – Feb 2001 ***IT consultant***

"Sapienza" University, Rome, Italy, for *Quadrics*. Installation and benchmarking of experimental parallel Web servers.

Mar – Jun 2000 ***Computer lab assistant***

"Sapienza" University, Rome, Italy. Workstation software package maintenance and help desk.

Jan 2000 – Jul 2001 ***Lecturer***

- *Performa s.r.l.*, Rome, Italy. TCP/IP networking theory and administration, for *EDS Italia*.
- *Associazione Centro ELIS*, Rome, Italy. Advanced Unix shell programming, for *Infostrada*.

Academic and research activities

Teaching

2021 – 2022 ***Advanced Cloud (MSc)***

HES-SO/HEPIA, Geneva, Switzerland – with Prof. N. Abdennadher. Cloud automation and DevOps. Practical classes.

2019 – 2021 ***Internet of Things (MSc)***

HES-SO/HEPIA, Geneva, Switzerland – with Prof. N. Abdennadher. Development and integration of IoT-based applications. Practical classes.

2000 – 2002 ***Operating Systems (BSc)***

University "Tor Vergata", Rome, Italy – with Prof. D.P. Bovet. System programming in a GNU/Linux environment. Practical classes.

2000 ***Computer Science Fundamentals (BSc)***

University "La Sapienza", Rome, Italy – with Prof. A. Colagrossi. Pascal language programming. Lectures and practical classes..

Selected publications

('Jx' = journal, 'Ix' = international conference, 'Nx' = national conference, 'Tx' = technical report.)

2016 `J2:` "Experience of a Multidisciplinary Task Force with Exome Sequencing for Mendelian Disorders", *Human Genomics*, 2016, Vol. 10, N. 1

2008 `I2:` "Devolved Management of Distributed Infrastructures with Quattor", *22nd Large Installation System Administration Conference (LISA'08)*, San Diego, CA, USA

2007 `J1:` "A Simulation Framework for Cluster-based Web Services", *International Journal of Simulation: Systems, Science & Technology*. Vol. 8, N. 4

2003 "Cooperation Policies and Techniques for Global Caching in Clustered Web Server Systems". Ph.D. thesis, Rome, Italy

2002 `I1:` "Global Caching Mechanisms in Clusters of Web Servers", *10th IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS'02)*, Fort Worth, TX, USA. `T1:` extended version as *IBM Research Report RC-22482*, Yorktown Heights, NY, USA

2001 `N2:` "Cooperation Mechanisms for Locally Distributed Web-servers", *Annual Conference of the Italian Society for Computer Simulation (ISCS'01)*, Naples, Italy

2000 `N1:` "Caching Globale su Cluster di Server Web", emph Workshop on Distributed Systems: Architectures, Algorithms and Languages (WSDAAL'00), Ischia, Italy

Conference and workshop talks

2008 `I2:` *LISA'08*

2006 *Quattor tutorial*, CERN, Geneva

2005 – 2008 *1st – 8th Quattor Workshop*, different venues

2002 `I1:` *MASCOTS'02*

2001 `N2:` *ISCS'01*

2000 `N1:` *WSDAAL'00*

Referees

Federico Santoni: Researcher leader. Centre Hospitalier Universitaire Vaudois CHUV, Rue du Bugnon 21, CH-1011 Lausanne, Vaud, Switzerland. E-mail `Federico.Santoni@unil.ch`

Richard Gerber: Development and operations manager. State of Geneva – PJ/DSI. Rue des Chaudronniers 3, CH-1204 Geneva, Switzerland. Tel. +41 (0)22 327 70 60, e-mail `richard.gerber@etat.ge.ch`

Véronique Lefebure: Section leader. European Organization for Nuclear Research CERN – IT-CS-CE. CH-1211 Geneva 23, Switzerland. Tel. +41 (0)22 76 73 848, e-mail `Veronique.Lefebure@cern.ch`

Abstract of the Ph.D. thesis

"Cooperation Policies and Techniques for Global Caching in Clustered Web Server Systems"

Over the last decade the Internet has experienced an explosive growth: "electronic" services have become the most popular and cheapest way to communicate, and companies strive for obtaining high revenues, either by participating in the Internet infrastructure market, or by exploiting the ubiquity potentials of the World Wide Web to sell their products. In particular, the Web is now the preferred channel for the distribution of digital contents coming from mass-targeted events, such as Olympic Games and interplanetary missions.

As any other communication medium, the Web is not immune to overcrowding: keeping the pace with the ever increasing demand of services is a major challenge for the Web infrastructure. Simply enlarging the number of machines that support the Web, or adding to their processing capacity, does not solve the problem, since each of them is a potential bottleneck. Moreover, as cost-effective solutions are often preferred to high-end systems, there is a widespread tendency to adopt COTS-*based*[a] *appliances, which are typically less performing and reliable than dedicated servers. Hence, COTS machines are grouped together to form locally distributed Web servers, often called* Web clusters *or* Web farms*; this load sharing approach is not yet sufficient to avoid the overloading of the communication end-points.*

At the same time, in order to relieve the traffic saturation in the low-level infrastructure of the Internet, many proxy-caching *hierarchies have been deployed. These systems are based upon two key concepts:* caching *at intermediate points in the communication chain, and* cooperation *among the participating nodes. Even if these solutions have proven not much effective on a geographical scale, their principles can be adopted to reinforce the end-points of the Web: indeed, Web clusters endowed with some cooperative caching mechanism can be much more promising.*

Many cache cooperation alternatives for clustered Web servers do exist: throughout the study, these ideas are generally referred to as Global Caching*. None of previous research works reports a complete analysis of global caching architectures, therefore, a taxonomic scheme will be given in order to classify existing systems on a common basis; the same taxonomy allowed us to discover some unexplored solutions. All the considered global caching alternatives have been simulated in diverse Web scenarios, in order to trace some viability guidelines for the real cases.*

[a] COTS stands for "commodity-off-the-shelf" to denote a system built upon commercial hardware, such as PCs and workstations.