

# Gianmaria Del Monte

SOFTWARE ENGINEER

Geneva - Switzerland

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## Personal Profile

Diligent Software Engineer with passion of designing and developing **highly scalable software systems**. Excellent attention to details and problem solving, with an innate ability to learn and master new technologies. Experience in software development's life cycle, including **designing, coding, testing, delivery** and **maintenance**. Keen to use my skills to push the frontiers of science and technology.

## Work Experience

### DevOps Storage Engineer for CERNBox (Fellowship)

Geneva, Switzerland

CERN

Jan 2021 - Present

My main responsibility as a member of the agile CERNBox/EOS DevOps team is to lead the development, operation and release to production of the CERNBox server component, a critical asset for the delivery of the service that provides cloud storage for more than 37,000 CERN user accounts and 30 LHC and non-LHC experiments. I use Configuration Management and Infrastructure Automation with Puppet, following CERN IT best practices to operate the infrastructure (OpenStack, Monitoring, Databases) required to deliver the service at the established service level agreement. Part of my job is to also diagnose and optimize Linux Operating Systems (CentOS7, CentOS Stream 8 and Alma9), filesystems (FUSE), targeting the requirements of interested groups and experiments: speed, reliability, and cost.

I proactively help to develop and operate the service alongside other colleagues, and these are my tasks:

- Managing the IT infrastructure and resources required to plan, develop, deliver and support the service to meet the laboratory's needs
- Coordinating the releases of the CERNBox server and backup software to the wide user population so they gain maximum benefit from the service
- Carrying out day-day to operations in a timely and reliable manner (reacting to alarms and performing maintenance tasks)
- Designing and providing meaningful integrations with other data management services (for example, backup with Ceph, cback with CTA, CERNBox with ScienceMesh)
- Leading the software development of different projects (Reva and cback) in different programming languages (Go, Python)
- Showing flexibility to accommodate rapid requirement changes (bugfixes and outages)
- Resolving incidents and problems, including classification, prioritization, initiating action, documentation of root causes, implementation of remedies and escalating them appropriately
- Improving existing procedures and created new ones to augment the service knowledge base
- Automating repetitive tasks to optimize the support ROTA and maintenance operations (cernboxcop)
- Scoping and installing new machines (VM, docker) for supporting the growing needs of the service
- Improving the awareness of the service by providing new monitoring data and better testing probes (new CERNBox SLS probes and new metrics systems for cback)
- Performing interventions on critical components during out-of-working hours and holiday periods
- Developing support tools for enhanced operations using shell programming (Python, Shell)
- Troubleshooting and debugging anomalies in distributed storage systems, especially EOS (CERN large-scale disk system, with more than 50,000 disk across 16,000 servers) over different low-level transport protocols (wire, GRPC, HTTP)
- Tuning and optimizing Linux storage device drivers (FUSE on restic)
- Performing deep-dive investigations across massive amounts of logging data and metrics (EOS logs)

### 2nd line Computer Security Response (ROTA)

Geneva, Switzerland

CERN

May 2022 - Present

My main responsibility as a member of the CERN IT Security ROTA is to help with my skills to mitigate the cybersecurity threats to the laboratory and assisting end-users to protect them from the continuous attacks the organization is facing. My tasks involve:

- Liaising with different units inside and outside the department to harden the security of the IT installations
- Managed security alerts, incident reports, and user inquiries ensuring timely response and resolution
- Validating changes to CERN's outer perimeter firewall and authorizing configuration after successful penetration tests, contributing to the overall security infrastructure

## Skills

**Programming** Go, Python, C

**Miscellaneous** Linux, Shell (Bash/Zsh), Git, MySQL, PostgreSQL, Redis, MongoDB, Puppet, Foreman, Grafana, Docker, Distributed storage systems (EOS), distribute programming, desing patterns, design architectures

**Soft Skills** Time Management, teamwork, problem solving, communication, positive attitude, self-supervising, team leadership, flexibility

## Education

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### MEDILS

Thematic CERN School of Computing

Split, Croatia

2022

- Held on *Security of research computing infrastructures*

### Rome Tre University

M.Sc. in Computer Engineering

Rome, Italy

2019 - 2020

- Thesis title: *Scaling blockchains without giving up decentralization and security*
- Thesis supervisor: Prof. Maurizio Pizzonia
- Final mark: 110/110 with honors

### Rome Tre University

B.Sc. in Computer Engineering

Rome, Italy

2016 - 2018

- Thesis title: *Implementation of an efficient protocol for data integrity on Cloud storage systems*
- Thesis supervisor: Prof. Maurizio Pizzonia
- Final mark: 110/110 with honors

## Publications

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Scaling blockchains without giving up decentralization and security: A solution to the blockchain scalability trilemma

Gianmaria Del Monte, Diego Pennino, Maurizio Pizzonia

*Proceedings of the 3rd Workshop on Cryptocurrencies and Blockchains for Distributed Systems*, 2020

## Conferences

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C(ERN) BACK(UP): consolidated multi-petabyte backup solution for heterogenous storage and filesystems

Gianmaria Del Monte, Elizaveta Ragozina, Roberto Valverde Cameselle

CS3 2023 - Cloud Storage Synchronization and Sharing, 2023, <https://indico.cern.ch/event/1210538/contributions/5207944>

Applications integration beyond local clouds with OCM

Giuseppe Lo Presti, Gianmaria Del Monte, Michiel De Jong

CS3 2023 - Cloud Storage Synchronization and Sharing, 2023, <https://indico.cern.ch/event/1210538/contributions/5206694>

Evolution of the CERN Backup system based on RESTIC and the CERN Tape Archive (CTA)

Fons Rademakers, Gianmaria Del Monte

26TH INTERNATIONAL CONFERENCE ON COMPUTING IN HIGH ENERGY AND NUCLEAR PHYSICS - CHEP2023, 2023, <https://indico.jlab.org/event/459/contributions/11294/>

User-friendly OCM Invitation and Sharing: OCIS, CERNBox

Elizaveta Ragozina, Gianmaria Del Monte, Samuel Alfageme Sainz

CS3 2023 - Cloud Storage Synchronization and Sharing, 2023, <https://indico.cern.ch/event/1210538/contributions/5208014>

CERNBox backup evolution

Gianmaria Del Monte, Roberto Valverde Cameselle

6th EOS workshop, 2022, <https://indico.cern.ch/event/1103358/contributions/4758282>

Data safety in CERNBox

Gianmaria Del Monte

CERNBox User Forum, 2021, <https://indico.cern.ch/event/1067354/contributions/4646494/>

Visualizing physics data in ownCloud Infinite Scale

Gianmaria Del Monte

ownCloud Conference, 2021, <https://cfp.owncloud.com/occon2021/talk/W8KHKM>

## Languages

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**English** Professional proficiency

**Italian** Native proficiency

**French** Basic knowledge