Vincent Bernat

System and network engineer

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2014–2018   **System and network engineer**, *Exoscale*, Lausanne, Switzerland.

Exoscale is a cloud provider with 4 points of presence accross Western Europe. The two main products are virtual machines (CloudStack as an orchestrator, QEMU and KVM for running guests) and a custom S3-compatible object storage.

- Network design (from scratch) and operations:
    - *Juniper MX* as edge routers with multiple transit providers and peerings,
    - Juniper QFX, Mellanox with *Cumulus Linux* as top-of-the-rack switches,
    - full L3 design up to the guests, with *BIRD* as a BGP daemon,
    - *BGP EVPN* with *VXLAN* to expose private L2 segments to customers,
    - redundant site-to-site IPsec VPN using *StrongSwan*,
    - Juniper equipments are managed through *Puppet*;
- System design and operations:
    - day-to-day operations on the platform,
    - infrastructure managed by *Puppet*,
    - automatic DNS management,
    - *Debian* package management,
    - *Kafka* as a message bus for logs and metrics,
    - member of the on-call schedule;
- System developments: network controller (in Go) to handle L3 routing to the guests, small team leader.

2014   **System engineer**, *Deezer*, Paris, France.

Deezer is a music streaming service.

2013–2014   **System and network engineer**, *Dailymotion*, Paris, France.

Dailymotion is a video-sharing technology platform. Member of the infrastructure architecture team, most of my work is around performance and reliability:

- real-user monitoring and application metrics: collection and processing,
- performance instrumentation for the full stack (from kernel to applications, notably with *SystemTap*),

2012–2016   **System developer**, *IMS - Zodiac Aerospace*, Remote.

Development for in-flight entertainment systems (under NDA). Lots of C but also a bit of frontend development using Angular then React.

Since 2008   **Debian Developer**.

2008–2012 **Network engineer**, *Orange Portails*, Paris, France.
Orange Portails is the entity hosting the web portal of the leading telecom and Internet operator in France. Three datacenters. Multi-layer redundancy. Heterogenous environment. Some achievements:
- redundant site-to-site IPsec VPN, L2TP/IPsec VPN for roadwarrior access,
- development of numerous tools to help day-to-day management like *Wiremaps*, a layer-2 network cartography tool,
- network architecture evolutions (notably IPv6 migration and SSL deployment).

2006–2008 **System and network engineer**, *Wallix*, Paris, France.
Wallix is a French security editor. IT consultant. Product development.

2001–2006 **System and network administrator**, *CRANS*, Paris, France.
CRANS is a non-profit organization managing the student network at École Normale Supérieure de Cachan. Wireless network. Multicast IP television service.

2002–2006 **Teaching assistant**, *ÉNS de Cachan*, Paris, France.
C++, C. Network programming. Compilation and static analysis.

Education

2002–2006 **PhD in computer science**, *LSV - ÉNS de Cachan*.
Intruder theories for the verification of cryptographic protocols. With highest honors.

2001–2002 **Master's degree in computer science**, *ÉNS de Cachan - Université Paris VII*.
Vérification. Cryptography. Automata. Complexity. With highest honors.

Languages

C	Proficient	*Author of lldpd, a neighbor discovery daemon.*
Python	Proficient	*Author of Snimpy, a pythonic binding for SNMP.*
Go	Proficient	
Clojure, Java, Javascript	Good	

Publications

I publish technical articles about my work on a blog. Notably:
- Multi-tier load-balancing with Linux
- L3 routing to the hypervisor with BGP
- Route-based IPsec VPN on Linux with strongSwan
- IPv4 route lookup on Linux
- VXLAN: BGP EVPN with Cumulus Quagga (or FRR)
- Testing network software with pytest and Linux namespaces
- Live patching QEMU for VENOM mitigation
- Coping with the TCP TIME-WAIT state on busy Linux servers

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