Anastassios **Nanos**

SYSTEMS RESEARCHER

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Research Interests

Hypervisor technologies, Systems Software, Unikernel Frameworks, Lightweight workload deployment, I/O Virtualization.

Skills

Programming	C, python, bash, C++, C, PHP, perl, JS, Java
Linux Kernel Programming	Device Drivers (Block/Network), DMA API, Virtual Memory Management, x86 and ARMv7/8, SoC bootstrap
Unikernels	rumpkernels, unikraft, LKL, OSv
Virtualization	Xen (extensive experience with MM, scheduling, device/drivers integration), KVM (MM, virtio)
Embedded systems:	Exynos (5422, 7420), Zynq-7000/Ultrascale+, KU3, LanaiXP, ARM XScale, custom FPGA boards
Interconnects	10GbE, Infiniband, Myrinet/GM (advanced) – Myrinet/MX, Open-MX (advanced)
Database Management Systems	MySQL, PostgreSQL, MongoDB

Technical & Language Skills

Operating Systems	Linux, Unix, Free/Net/OpenBSD, MS Windows
Systems Administration	Extensive experience setting up various Data Center related services such as: DNS (bind), WWW (apache, nginx), Mail (sendmail & postfix, dovecot), DBMS (MySQL/Postgres, MongoDB), Auth and Directory services (openLDAP & Heimdal Kerberos), VoIP (Asterisk), Networking (CISCO IOS, iptables, openVPN), Monitoring (collectd, graphite, munin & mrtg). Familiar with setup and deployment of Cloud Computing platforms (OpenStack).
Typesetting	LaTeX, MS Word
Languagues	English (Fluent), French (Moderate), Greek (Native)

Experience

Nubificus Ltd *Athens, GR / Sheffield, UK*

DIRECTOR *Aug. 2018 -*

- Nubificus Ltd is a software consultancy tackling complex virtualization problems. We explore lightweight virtualization solutions for edge, low-power devices, aiming to bring Serverless / FaaS at the Edge.

Sunlight.IO Limited *Cambridge, UK*

RESEARCHER | SYSTEMS ENGINEER *Jul. 2018 - Apr. 2020*

- Span out from the Emerging Technologies department of OnApp Limited
- Architected, implemented, and optimized a state-of-the-art hyperconverged hypervisor stack that achieves extreme storage and network performance.

OnApp Limited *Cambridge, UK*

RESEARCHER | SYSTEMS ENGINEER *Feb. 2015 - Jun. 2018*

- Conducted research in emerging, power-efficient micro-server architectures on scalable network and storage I/O, and energy-driven resource management in cloud architectures.
- Additionally, I was involved in architecting and implementing low-level hypervisor and OS mechanisms in the context of EU-funded projects (EUROSERVER, SHARCS, ACTICLOUD, SUPERFLUIDITY, NGPaaS).

Up2Metric S.A. *Athens, GR / Sheffield, UK*

SOFTWARE ENGINEER *May. 2016 - Sep. 2016*

- Ported a computer vision algorithm to provide Augmented Reality annotation to staircases for Otolift's core products.

Mist.io Inc *Athens, GR*

COFOUNDER & SYSTEMS ENGINEER *Jan. 2012 - Jan. 2015*

- Design, develop, deploy and maintain the company's product. Mist.io is about cloud server management, monitoring and automation across multiple cloud providers from any web device. Mostly develop in python, Javascript and bash.

Unweb.me Ltd *Athens, GR*

SYSTEMS ENGINEER *Jan. 2011 – Dec. 2013*

- Served as a systems engineer, deploying, administering and maintaining the company's infrastructure both on bare-metal servers (co-located) as well as cloud servers (mostly Amazon EC2).

Computing Systems Lab, NTUA
Athens, GR

Post-doctoral Research Fellow
Jan. 2014 - Jan. 2015

- Worked on I/O Virtualization, systems software for high-performance I/O in virtualized environments, communication architectures for clusters, and scalable storage architectures based on clusters.

Junior Researcher
Apr. 2007 – Dec. 2013

- For the purpose of my PhD thesis, I worked on scalable block-level storage systems, communication architectures for clusters, custom 10gigE interconnection frameworks and I/O Virtualization.

Senior Unix/Linux Administrator
Apr. 2007 – Dec. 2013

- Maintained, administered and supported the lab (10-20 grad students, faculty members and visiting staff) providing services such as: DNS, WWW, Mail, VoiP and DBMS. From Sept 2011, my role was mostly advising the systems administration team.

Maxeler Technologies Ltd
London, UK

Intern
Sep. 2011 - Mar. 2012

- Worked on porting the company's custom FPGA boards to virtualized environments. As my task was completed quickly, I joined the hardware group working on the company's new product line (MPCX), doing performance evaluation at first as well as kernel developing for the board's interface driver and the networking stack (Infiniband).

Computer Center, ECE, NTUA
Athens, GR

Senior Unix/Linux Administrator
Oct. 2005 - Sep. 2010

- Setup the entire lab (25-30 workstations, 5 servers), migrated from Solaris/SunOS 4.3 to Debian GNU/Linux, and maintained the lab which featured a fully autonomous setup, able to provide the necessary software for students to work on ECE school's projects.

PC Systems S.A.
Athens, GR

Unix Support Engineer
May 2004 – Sep. 2004

- Served as backend support for the company's clients mostly Solaris and some Linux-based setups.

Small accounting business
Athens, GR

Linux/Windows Administrator
Sep. 2001 – Sep. 2006

- Maintained all workstations (5) based on Windows 95/98/XP, migrated the server from Novel Netware to Windows server and finally Linux. Provided support for the integration of commercial software suites specific to the business (accounting) as well as general purpose software (network file sharing, scanning/printing etc.).

Freelance
Athens, GR

Web developer
Sep. 2002 – Sep. 2005

- Built small sites (static/dynamic) using HTML, PHP and mySQL.

Education

NTUA (National Technical University of Athens)
Athens, GR

Ph.D. in Computer Engineering
Dec. 2013

- Thesis title: Efficient I/O Device Sharing in Virtualized Environments

NTUA (National Technical University of Athens)
Athens, GR

Diploma in Electrical and Computer Engineering
Sep. 2006

- Thesis title: Design and implementation of a mechanism transferring data from storage devices to Myrinet networks bypassing the memory hierarchy

Publications

Extending storage support for unikernel containers
WOSC 19, MIDDLEWARE 19

O. Lagkas-Nikolos, K. Papazafeiropoulos, S. Psomadakis, A. Nanos, and N. Koziris.
UC Davis, CA, USA 2019

- DOI: `https://doi.org/10.1145/3366623.3368138`

V4VSockets: low-overhead intra-node communication in Xen
CloudDP 15, EuroSys 15

A. Nanos, S. Gerangelos, I. Alifieraki, and N. Koziris
Boredaux, France

- DOI: `http://dx.doi.org/10.1145/2744210.2744215`

I/O Performance Modeling for Big Data Applications over Cloud Infrastructures
IC2E 2015

I. Mytilinis, D. Tsoumakos, V. Kantere, A. Nanos and N. Koziris
Tempe, AZ, USA

- DOI: `http://dx.doi.org/10.1109/IC2E.2015.29`

Xen2MX: High-performance communication in Virtualized Environments
Journal of Systems and Software

A. Nanos and N. Koziris
2014

- DOI: `http://dx.doi.org/10.1016/j.jss.2014.04.036`

Xen2MX: Towards High-performance communication in the Cloud

A. Nanos and N. Koziris

A Smart HPC interconnect for clusters of Virtual Machines

A. Nanos, N. Nikoleris, S. Psomadakis, E. Kozyri and N. Koziris

Coexisting Scheduling Policies boosting I/O Virtual Machines

D. Aragiorgis, A. Nanos, and N. Koziris

Exploring I/O Virtualization Data paths for MPI Applications in a Cluster of VMs: A Networking Perspective

A. Nanos, G. Goumas and N. Koziris

MyriXen: Message Passing in Xen Virtual Machines over Myrinet and Ethernet

A. Nanos and N. Koziris

GMBlock: Optimizing Data Movement in a Block-level Storage Sharing System over Myrinet

E. Koukis, A. Nanos and N. Koziris

Synchronized Send Operations for Efficient Streaming Block I/O over Myrinet

E. Koukis, A. Nanos and N. Koziris

Presentations & Posters

Lightweight Hypervisors in the Cloud and at the Edge

Virtualization and IaaS devroom, FOSDEM

Brussels, Belgium

Feb. 2-3th 2020

Unikernel Support for NFV-like Applications on Xen ARM 64bit

Design Session, Xen Summit

Budapest, Hungary

Jul. 2017

Hypervisor support for emerging scale-out/scale-up architectures

VHPC 17, ISC-HPC 2017

Frankfurt, Germany

Jun 22nd, 2017

High-performance I/O in Virtualized environments

Invited Talk, CARV group, FORTH-ICS

Heraklion, Greece

Nov. 2013

I/O in Virtualized environments

Invited Talk, WBI seminar, Humboldt University of Berlin

Berlin, Germany

Jun. 2013

Experimenting with I/O data paths in Virtualized Environments

ASPLOS 2012 Doctoral Workshop

London, UK

Mar. 2012

High-Performance I/O in Virtualized Environments: A Networking Perspective

Eurosys 2010 Doctoral Workshop

Paris, France

Apr. 2010

System-level Support for Heterogeneous Architectures

Poster in ARM Research Summit

Cambridge, UK

Sep. 11-13th 2017

Towards an HPC I/O framework for clusters of Virtual Machines

Poster in ACACES 2011, HiPEAC summer School

Fiuggi, Italy

July 10-16, 2011

Deploying MPI applications in a cluster of Xen VMs: A Networking Perspective

Terrassa (near Barcelona), Spain

Poster in ACACES 2010, HiPEAC summer School

July 11-17, 2010

Message Passing in Xen VMs

New Orleans, Louisiana, USA

Poster, Cluster 2009

September 2, 2009

Program Committees

2012-2020	**Co-chair,** Workshop on Virtualization for High-Performance Cloud Computing	*VHPC @ EuroPar, SC, ISC*
2015	**Co-chair,** Workshop on Dependable Parallel, Distributed and Network-Centric Systems	*DPDNS @ IPDPS*
2013	**Co-chair,** Workshop on Middleware on HPC and Big Data systems	*MHPC @ EuroPar*
2019	**TPC Member,** IEEE/ACM International Symposium in Cluster, Cloud, and Grid Computing	*CCGrid*
2015 – 2016	**TPC Member,** Workshop on Dependable Parallel, Distributed and Network-Centric Systems	*DPDNS @ IPDPS*
2015	**TPC Member,** IEEE 4th Symposium on Network Cloud Computing and Applications	*NCCA*
2015 – 2017	**Shadow PC member,** European Conference on Computer Systems	*EuroSys*
2008 – 2010	**External Referee,** Workshop on Communication Architecture for Clusters	*CAC @ IPDPS*
2008	**External Referee,** International Conference on Parallel Processing	*ICPP*
2008	**External Referee,** International Forum on Next-Generation Multicore/Manycore Technologies	*IFMT*

Honors, Grants & Awards

2019 – 2022	**EU H2020 project,** "5G-COMPLETE", Funding: €6M, NBFC: €280k, PI-100%	
2010 – 2013	**PhD thesis Scholarship,** EU "IRAKLITOS II", Funding: €45k	
2007 – 2010	**PhD thesis Scholarship,** Greek State Scholarships Foundation, Funding: €16k	