

1ST WORKSHOP ON AUTONOMIC MANAGEMENT OF LARGE SCALE CONTAINER-BASED SYSTEMS

co-located with the 2017 IEEE International Conference on Cloud and Autonomic Computing (ICCAC), part of the PHASE * – Foundations and Applications of Self * Systems

The University of Arizona, Tucson, AZ, United States, September 18, 2017

Workshop program

9:30 Welcome

9:40 Invited Talk

Justin Cappos - *Securing Docker's Supply Chain with TUF*

10:30 - 11:00 Coffee break

11:00 ***SWITCHing from multi-tenant to event-driven videoconferencing services***, Jernej Trnkoczy, Uroš Paščinski, Sandi Gec and Vlado Stankovski

11:25 ***In Search of the Ideal Storage Configuration for Docker Containers***, Vasily Tarasov, Lukas Rupperecht, Dimitrios Skourtis, Amit Warke, Dean Hildebrand, Mohamed Mohamed, Nagapramod Mandagere, Wenji Li, Ming Zhao and Raju Rangaswami

11:50 ***Auto-scaling of containers: the impact of relative and absolute metrics***, Emiliano Casalicchio and Vanessa Perciballi

1230 - 1400 Lunch

14:00 Invited Talk

Alan Sill - *Emulation of Automated Control of Large Data Centers At Scale Using Containers*

14:50 ***FID: A Faster Image Distribution System For Docker Platform***, Kangjin Wang, Yong Yang, Ying Li, Hanmei Luo and Lin Ma

15:15 ***Quality of Service models for Micro-services and their integration into the SWITCH IDE***, Polona Štefanič, Matej Cigale, Andrew Jones and Vlado Stankovski

15:40 – 16:00 Coffee break

16:00 Invited Talk

Abdelwahed, Sherif - *Distributed Performance Management for Large-Scale Enterprise Systems: A Model-based Approach*

16:50 – 17:30 Final discussion on future/hot topics/challenges among the participants, organiser and invited speaker

Invited Talks

Titles, Abstracts and Bios



Justin Cappos

Securing Docker's Supply Chain with TUF

Abstract. If you want to compromise millions of machines and users, software distribution and software updates are an excellent attack vector. Using public cryptography to sign your packages is a good starting point, but as we will see, it still leaves you open to a variety of attacks. This is why we designed TUF, a secure software update framework. TUF helps to handle key revocation securely, limits the impact a man-in-the-middle attacker may have, and reduces the impact of repository compromise. We will discuss TUF's protections and integration into Docker's Notary software. We also will demonstrate on-going work on a project in-toto which we are integrating into Docker to verify other parts of the software supply chain, including the development, build, and quality assurance processes. This talk will include a live demonstration of the technology and will provide next steps audience members can use to secure their own software supply chain.

Bio. Justin Cappos is an associate professor in the Computer Science and Engineering Department at New York University. Justin's research philosophy focuses on improving real world systems, often by addressing issues that arise in practical deployments.

His research advances are deployed in widely used software including git, Python, VMware, DigitalOcean, Docker, and most Linux distributions. Due to the practical impact of his research, Justin has received several awards including being named to Popular Science's Brilliant 10 list in 2013.

More information is available at <https://ssl.engineering.nyu.edu/personalpages/jcappos/>



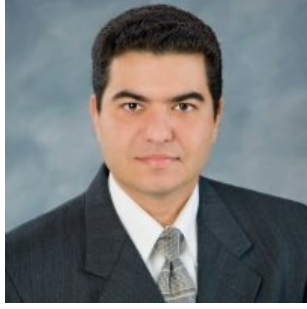
Alan Sill

Emulation of Automated Control of Large Data Centers At Scale Using Containers

Abstract. –

Bio. Dr. Alan Sill is Senior Director of the High Performance Computing Center and Adjunct Professor of Physics at Texas Tech University. He also holds positions as Co-Director for the multi-university US National Science Foundation Cloud and Autonomic Computing Industry/University Cooperative Research Center and Visiting Professor of Distributed Computing at University of Derby, UK. He is an internationally recognized expert on large-scale advanced computing systems and software, and has played a strong role in design and creation of many scientific distributed computing, cloud and grid development projects and associated standards efforts.

More information is available at <https://members.educause.edu/alan-sill>



Sherif Abdelwahed

Distributed Performance Management for Large-Scale Enterprise Systems: A Model-based Approach

Abstract. This presentation introduces a scalable distributed performance optimization framework for the autonomic performance management of distributed computing systems operating in a dynamic environment to satisfy desired quality-of-service objectives. To efficiently solve the performance management problems of interest in a distributed setting, we develop a hierarchical structure where a high-level limited-lookahead

controller manages interactions between lower-level controllers using forecast operating and environment parameters. The overall control structure is presented, and as a case study, show how to efficiently manage the power consumed by a computer cluster. Using real-life workload traces, we show via simulations that the proposed method is scalable, has low run-time overhead, and adapts quickly to time-varying workload patterns.

Bio. Sherif Abdelwahed is Professor of Electrical and Computer Engineering at Virginia Commonwealth University (VCU) where he teaches and conducts research in the area of computer engineering, with specific interests in cyber-physical systems, cyber-security, autonomic computing, real-time systems, modeling and analysis of discrete-event and hybrid systems, model-integrated computing, and formal verification. Prior to joining VCU in 2017, he was as an Associate Director of the Distributed Analytics and Security Institute (DASI) and an Associate Professor in the Electrical and Computer Engineering Department at Mississippi State University (MSU). He received his Ph.D. in 2002 from the Department of Electrical and Computer Engineering at the University of Toronto. Prior to joining Mississippi State University, he was a research assistant professor at the Department of Electrical Engineering and Computer Science and senior research scientist at the Institute for Software Integrated Systems, Vanderbilt University, from 2001-2007. From 2000-2001 he worked as a research scientist with Rockwell Scientific Company. He established, collaboratively, the first NSF I/UCRC center at Mississippi State University, the Center for Autonomic Computing. He is currently the co-director of this center. He chaired several international conferences and conference tracks, and has served as technical committee member at various national and international conferences. He received the MSU StatePride Faculty award for 2010 and 2011, the MSU Bagley College of Engineering Hearin Faculty Excellence award in 2010, and recently the MCU 2016 Faculty Research Award from the Bagley College of Engineering at MSU. Dr. Abdelwahed has more than 130 publications and is a senior member of the IEEE.