2015 24th International Conference on Computer Communication and Networks (ICCCN 2015)

Las Vegas, Nevada, USA
3-6 August 2015
August 3 (Monday) 8:50-10:20

Keynote I: 5G Cellular Systems: Research Challenges
Speaker: Ian Akyildiz, Georgia Tech, USA
Chair: Aaron Striegel (University of Notre Dame)
Room: Acacia D

August 3 (Monday) 10:40-12:20

Session 1: SPT 1
Chair: Gaspar Modelo-Howard (Symantec, Inc.)
Room: Palo Verde A
- Privacy-Preserving Optimization of Cross-domain Firewalls with Dynamic Rule Updates 95
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- Efficient Location Privacy for Moving Clients in Database-driven Dynamic Spectrum Access 79
  Erald Troja (City University of New York), Spiridon Bakiras (City University of New York)
- A Privacy-Preserving and Efficient Traffic Jam Information Sharing Scheme for Secure VANET Communication 87
  Zijian Zhang (Beijing Institute of Technology), Cong Guo (Beijing Institute of Technology), Liehuang Zhu (Beijing Institute of Technology), Jie Liu (Capital Normal University), Zhengtao Yu (Kunming University of Science and Technology)
- DIAMoND: Distributed Intrusion/Anomaly Monitoring for Nonparametric Detection 103
  Maciej Korczynski (Delft University of Technology), Ali Hamieh (Rutgers University), Jun Huh Ho (Honeywell ACS Labs), Henrik Holm (Forest Glen Research, LLC), Siva Rajagopalan (Honeywell ACS Labs), Nina Fefferman (Rutgers University)

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Chair: Petr Novotny (Imperial College London)
Room: Acacia D
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- Disseminating Authorized Content in Interest-centric Opportunistic Social Networks 119
  Chenguang Kong (Georgia State University), Xiaojun Cao (Georgia State University)
- HAEP: Hospital Assignment for Emergency Patients in a Big City 135
  Peng Liu (Hangzhou Dianzi University), Biao Xu (Hangzhou Dianzi University), Zhen Jiang (West Chester University), Jie Wu (Temple University)
- RobustGeo: a Disruption-Tolerant Geo-routing Protocol 111
  Ruolin Fan (UCLA), Yu-Ting Yu (Qualcomm Research), Mario Gerla (UCLA)
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  Tarek Abdelzaher (University of Illinois at Urbana Champaign), Jongdeog Lee (University of Illinois at Urbana Champaign), Akash Kapoor (University of Illinois at Urbana Champaign), Md Tanvir Al Amin (University of Illinois at Urbana Champaign), Zeyuan Zhang (University of Illinois at Urbana Champaign), Radhika Goyal (University of Illinois at Urbana Champaign), Zhehao Wang (University of California at Los Angeles)
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August 3 (Monday) 13:30-15:00

Panel I: Networking Cyber-physical Applications in a Data-centric World
Moderator: Tarek Abdelzaher (UIUC)
Room: Acacia D
Panelists:
- Jie Wu (Temple University)
- Sajal Das (Missouri Univ of Science and Tech)
- Jeff Burke (UCLA)
- Azer Bestavros (Boston University)
Room: Acacia D

August 3 (Monday) 15:30-18:00

Session 2: GCIP
Chair: Paul Rad (Rackspace Inc)
Room: Palo Verde A
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• **HAECubie: A Highly Adaptive and Energy-Efficient Computing Demonstrator**  241  
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Chair: Victor C. Valgenti (Petabi, Inc.)  
Room: Acacia D

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Leland Miller (UC Santa Cruz), Kevin Abas (UC Santa Cruz), Katia Obraczka (UC Santa Cruz)

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Amitangshu Pal (Temple University), Krishna Kant (Temple University)

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• **Truthful Auction for Resource Allocation in Cooperative Cognitive Radio Networks**  143  
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**August 4 (Tuesday) 8:30-10:00**

**Keynote II: Some Advances in Wireless Networking for Cyber Physical Systems**
Speaker: Tom Hou, Virginia Tech  
Chair: Kewei Sha, Oklahoma City University  
Room: Acacia D
Session 3: SPT 2
Chair: Abhishek Parakh (University of Nebraska at Omaha)
Room: Palo Verde A

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- A Moving Target Defense Approach Based on POF to Thwart Blind DDoS Attack 440
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Session 3: CAAME 2
Chair: Gokarna Sharma (Louisiana State University)
Room: Acacia D

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- Building and Evaluating COTS Based Optical Interlinks for Nanosatellites 373
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- IPv6 Transition for the Other Billions 389
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Chair: Siguang Chen (Nanjing University of Posts and Telecommunications)
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  Celimuge Wu (The University of Electro-communications), Xianfu Chen (VTT Technical Research Centre of Finland), Yusheng Ji (National Institute of Informatics), Satoshi Ohzahata (The University of Electro-communications)

August 4 (Tuesday) 13:30-15:00

**Distinguished Invited Talk: IoT: The Promises and the Challenges**

Speaker: Prof. Robin Kravets, University of Illinois at Urbana-Champaign
Chair: Aaron Striegel, University of Notre Dame
Room: Acacia D

August 4 (Tuesday) 15:30-18:00

Session 4: SNPC
Chair: Celimuge Wu (The University of Electro-communications)
Room: Palo Verde A

- **Demonstrating the Threat of Hardware Trojans in Wireless Sensor Networks  596**
  Maryam Jalalitabar (Georgia State University), Marco Valero (Georgia State University), Anu G. Bourgeois (Georgia State University),

- **Tight Bounds on Localized Sensor Self-Deployment for Focused Coverage  611**
  Gokarna Sharma (Louisiana State University), Hari Krishnan (Center of computation and technology, Louisiana State University)

- **D2CS: Dynamic Duty Cycle Scheme in an Opportunistic Routing Sensor Network  588**
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• **Clustered Spatio-Temporal Compression Design for Wireless Sensor Networks** 582
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• **Optimal Deployment of Wireless Sensor Networks for Air Pollution Monitoring** 604
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- **A More Scalable Approach to Content Centric Networking** 566
  J.J. Garcia-Luna-Aceves (UC Santa Cruz and Xerox PARC)

- **Controlled spectrum sensing and scheduling under resource constraints** 553
  Nicolo Michelusi (University of Southern California), Urbashi Mitra (University of Southern California)

- **Making Dense Networks Work for You** 574
  Farhana Ashraf (Google), Robin Kravets (UIUC)

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- **Towards Effective Intra-flow Network Coding in Software Defined Wireless Mesh Networks** 530
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- **Exploiting Active Sub-areas for Multi-copy Routing in VDTNs** 522
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- **Energy Minimization for Cellular Network Interfaces with Dynamic Link Quality** 538
  Hai Jin (Huazhong University of Science and Technology), Xiao Lei (Huazhong University of Science and Technology), Zaiyang Tang (Huazhong University of Science and Technology), Peng Li (The University of Aizu), Song Guo (The University of Aizu), Xiaofei Liao (Huazhong University of Science and Technology), Feng Lu (Huazhong University of Science and Technology), Kun Hua (Lawrence Technological University)
August 5 (Wednesday) 8:30-10:00

Keynote III: Overlay Networking in Software-Defined Networks  
Speaker: Benson Schliesser, Brocade  
Chair: Min Song (Michigan Tech University)  
Room: Acacia D

August 5 (Wednesday) 10:20-12:20

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Chair: Zhiwei Wang (Nanjing University of Posts & Telecommunications)  
Room: Palo Verde A  

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- **REDuce: Removing Redundancy from Regular Expression Matching in Network Security** 719  
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- **Security Considerations for Negative Acknowledgment in Information-Centric Networking** 736  
  Alberto Compagno (Sapienza University of Rome), Mauro Conti (University of Padua), Cesar Ghali (University of California, Irvine), Gene Tsudik (University of California, Irvine)

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Chair: Aleksandar Milenkovic (The University of Alabama in Huntsville),  
Room: Acacia D

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Room: Palo Verde B  

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- **OpenRouteFlow: Enable Legacy Router as a Software-Defined Routing Service for Hybrid SDN** 703  
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- **A Framework for Security-Aware Virtual Network Embedding** 688  
Yang Wang (La Salle University), Phanvu Chau (La Salle University), Fuyu Chen (SUNY, University at Buffalo)

- **An Effective Policy Relocation Scheme for VM Migration in Software-Defined Networks** 695  
Kun Xu (Tsinghua University), Chuang Lin (Tsinghua University), Zhen Chen (Tsinghua University), Kun Meng (Tsinghua University), Mourad Hakmaoui (Tsinghua University)

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**August 5 (Wednesday) 13:30-15:10**

Session 6: IoT  
Chair: Ernesto Exposito, (University of Toulouse)  
Room: Palo Verde A  

- **parkITsmart: Minimization of Cruising for Parking** 795  
Christos Tsiaras (University of Zurich), Livio Hobi (University of Zurich), Fabian Hofstetter (University of Zurich), Samuel Liniger (University of Zurich), Burkhard Stiller (University of Zurich)

- **Optimizing load schedule for building energy management in smart grids** 803  
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- **On Effectiveness of Smart Grid Applications using Co-simulation** 810  
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Chair: Anand Seetharam (California State University Monterey Bay)  
Room: Acacia D  

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Christopher Buckley (University of California, Davis), Parth H. Pathak (University of California, Davis), Aveek Das (University of California, Davis), Chen-Nee Chuah (University of California, Davis), Prasant Mohapatra (University of California, Davis)

- **Receiver Awareness Contention: Pilot Detection Based Channel Access in Adhoc Network** 787  
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Chair: Yang Wang (La Salle University), Room: Palo Verde B
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- **SocialQ&A: An Online Social Network Based Question and Answer System**  763
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August 5 (Wednesday) 15:30-18:00

Session 7: GREEN
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  Liang Chen (Shenzhen University), Suiming Guo (The Chinese University of Hong Kong), Dah Ming Chiu (The Chinese University of Hong Kong)
- **FCell: Towards the Tradeoffs in Designing Data Center Network Architectures**  826
  Dawei Li (Temple University), Jie Wu (Temple University)
- **EAFR: An Energy-Efficient Adaptive File Replication System In Data-Intensive Clusters**  818
  Haiying Shen (Clemson University), Yuhua Lin (Clemson University)
- **Robust Energy-Aware Routing with Uncertain Traffic Demands**  842
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Session 7: MRN
Chair: Baek-Young Choi (University of Missouri-Kansas City), Room: Acacia D
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  Hengky Susanto (University of Massachusetts Lowell), Byungguk Kim (University of Massachusetts Lowell), Benyuan Liu (University of Massachusetts Lowell)
- **Adaptive Forward Error Correction for ECG Signal Transmission for Emotional Stress Assessment**  891
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• **Faster Web through Client-side DNS Redirection** 881  
  Utkarsh Goel (Montana State University), Mike Wittie (Montana State University), Moritz Steiner (Akamai Technologies)

• **pcp: Internet Latency Estimation Using CDN Replicas** 873  
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• **NDN Live Video Broadcasting over Wireless LAN** 866  
  Menghan Li (Tsinghua University), Dan Pei (Tsinghua University), Xiaoping Zhang (Tsinghua University), Beichuan Zhang (University of Arizona), Ke Xu (Tsinghua University)

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**Session 7: WAM 3**

Chair: Lin Wang (Shanghai Jiao Tong University)  
Room: Palo Verde B

• **An Agent Based Data Collection Scheme for Vehicular Sensor Networks** 914  
  Hui Huang (UNSW Australia), Lavy Libman (UNSW Australia), Glenn Geers (National ICT Australia)

• **Inferring Network Topologies in MANETs Applied to Service Redeployment** 906  
  Simone Silvestri (Missouri University of Science and Technology), Brett Holbert (Pennsylvania State University), Petr Novotny (Imperial College London), Tom La Porta (Pennsylvania State University), Alexander Wolf (Imperial College London), Ananthram Swami (Army Research Laboratory)

• **PACTON: Parallelization of Contention and Transmission in OFDM-Based Wireless Networks** 930  
  Yueyue Chen (National University of Defense Technology), Pin Lv (National University of Defense Technology), Xudong Wang (Shanghai Jiao Tong University), Ming Xu (National University of Defense Technology)

• **WiG: WiFi-based Gesture Recognition System** 923  
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• **Adaptive Monitoring for Mobile Networks in Challenging Environments** 898  
  Nils Richerzhagen (TU Darmstadt), Dominik Stingl (TU Darmstadt), Björn Richerzhagen (TU Darmstadt), Andreas Mauthe (Lancaster University), Ralf Steinmetz (TU Darmstadt)
Integrated Workshop Schedule

Session 1: ContextQoS

Session Chair: Dr.-Ing. Patrick-Benjamin Bök, Weidmüller Group

Keynote: “Challenges for Industrial Internet”

Speaker: Dr.-Ing. Patrick-Benjamin Bök, Weidmüller Group

Abstract: The challenges of industrial internet are manifold, especially regarding the interconnection within and between production networks to perform some kind of advanced manufacturing. Context-aware approaches have to focus on the different parts of the industrial internet. Within machines, different components communicate with each other and exchange information to fulfill the production task. Within the production site, different machines will communicate with each other to exchange information and control the workflows of the production. Between production sites and, especially, between production, suppliers and distributors information will be exchanged to optimize the whole supply chain. In the future, this will not be the information at which point in time finished products will be available and delivered. Communication will begin at machine component level to have detailed information. This leads to a lot of challenges for the communication network because it will be a network of networks of networks of networks with heterogeneous technologies and protocols having varying performance requirements on the communication path between two entities. Furthermore, the security requirements of these networks are critical due to their contact to critical infrastructures, e.g. if advanced manufacturing is integrated into smart local grids. Based on scenarios having distributed production sites as a basis, the challenges of industrial internet are motivated.

Bio: Dr.-Ing. Patrick-Benjamin Bök received his B.Sc. (with honors) and his M.Sc. (with honors) at the Ruhr-University Bochum, Germany, both in Applied Computer Sciences, in 2006 and 2007, respectively. From 2007 to 2012 he was a research assistant and Ph.D. student at the Research Group for Integrated Information System in the Department of Electrical Engineering and Information Sciences at Ruhr-University Bochum, Germany, before he received his PhD (with honors). From 2012 to 2014 he was a senior scientist at the Communication Networks Institute (CNI) of the TU Dortmund University. At CNI, he was the head of "Highly Dynamic Networks, Wireless Robotics and Emergency Response Management" research group. He performed tutorials about technical improvements for computer networks and also about enterprise planning of computer networks. Today, he is Assistant to the CEO of Weidmüller Group.

On the Benefits of Clustered Capillary Networks for Congestion Control in Machine Type 44 Communications over LTE
Rachaen Mahfuz Huq (KTH), Kevin Perez Moreno (KTH), Hui Zhu (KTH), Jue Zhang (KTH), Oscar Ohlsson (Ericsson), Mohammad Istiak Hossain (KTH)

Using Ethernet commodity switches to build a switch fabric in routers 36
Bochra Boughzala (Ericsson), Mahmoud Mohamed Bahnasy (École de Technologie Supérieur- eure), Andre Beliveau(Ericsson), Brian Alleyne(Ericsson), Chakri Padala (Ericsson), Karim Idoudi (Université du Québec à Montréal), Halima Elbiaze (Université du Québec à Montréal)
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**Session Chair:** Abhishek Parakh (University of Nebraska at Omaha)

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**A Multi-authority Attribute-based Encryption Scheme with Pre-decryption**  62
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**Minimizing Black Hat SEO to Improve Security in Mobile Platforms**  69
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**Privacy Sensitive Resource Access Monitoring for Android Systems**  56
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**Session 1: MASONS**

**Session Chair:** Amitava Biswas, Cisco Systems, USA

**Keynote:** “Security and the Software Defined Network”

**Speaker:** Phillip Porras, Program Director - Internet Security Group, SRI International

**Abstract:** Modern networks are undergoing an exciting transition toward a paradigm of greater programmability and dynamic flow management. For the network security community, this transformation is opening attractive opportunities for more innovative forms of threat mitigation. It is also raising interesting challenges in how to reconcile our legacy notions of well-defined security policy enforcement. I will discuss some of the ongoing work toward securing software-defined networks (SDNs), as well as some interesting new SDN-enabled security and management applications.

**Bio:** Phillip Porras is a Program Director, an SRI Fellow, and leader of SRI's Internet Security Group in the Computer Science Laboratory at SRI International. Phillip is an established leader in live Internet malware analysis, with strong alliances with the whitehat community, and maintains ongoing collaborations with the top INFOSEC researchers in academia and the private sector. He has been a Principal Investigator for many research projects sponsored by DARPA, DoD, DHS, NSF, NSA, commercial customers, and others. Phillip has led multi-organizational large-scale projects with mixed academic and commercial collaborators, led many advanced research projects, and has been highly productive in acquiring government, military, and commercial projects involving Cyber Security R&D. He is an active researcher, publishing and conducting technology development in intrusion detection, alarm correlation, malware analysis, active networks, and wireless security. Previously, Phillip was a manager in the Trusted Computer Systems Department of the Aerospace Corporation, where he was also an experienced trusted product evaluator for NSA (which includes security testing, risk assessment, and penetration testing of systems and networks). He has participated on numerous program committees, and editorial boards, and on multiple commercial company technical advisory boards. Phillip's research technologies have transitioned as lead products in multiple companies, holds fourteen U.S. patents involving INFOSEC technologies, and have been awarded Best Paper honors in 1995, 1999, and 2008.
Session 1: WiMAN

**Session Chair:** Habib M. Ammari, University of Michigan-Dearborn, USA

**Keynote:** “Taking VANET to the Clouds”

**Speaker:** Prof. Stephan Olariu, Old Dominion University, USA

**Abstract:** Inspired by the success of conventional cloud services, a number of researchers have recently introduced the concept of a Vehicular Cloud (VC). In this keynote address, we envision a VC involving cars in the parking lot of a major airport. The patrons of such a parking lot are typically on travel for several days, providing a pool of cars that can serve as the basis for a data center at the airport. We anticipate a scenario where the cars that participate in the vehicular cloud are plugged into a standard power outlet and are provided wireless connection to a central server at the airport. The defining difference between vehicular and conventional clouds lie in the distributed ownership and, consequently, the unpredictable availability of computational resources. As cars enter and leave the parking lot, new computational resources become available while others depart creating a dynamic environment where the task of efficiently assigning cars to jobs becomes very challenging.

**Bio:** Professor Olariu has held many different roles and responsibilities as a member of numerous organizations and teams. Much of his experience has been with the design and implementation of robust protocols for wireless networks and in particular sensor networks and their applications. Professor Olariu is an Associate Editor-in-Chief of IEEE Transactions on Parallel and Distributed Systems and serves on the editorial board of IEEE Transactions on Computers, Networks, Journal of Parallel and Distributed Computing, Journal of Ad hoc and Sensor Networks, and Parallel, Emergent and Distributed Systems. Professor Olariu is applying mathematical modeling and analytical frameworks to the resolution of problems ranging from securing communications, to predicting the behavior of complex systems, to evaluating performance of wireless networks. His research interests are in the area of complex intelligent systems enabled by large-scale deployments of sensors and actors and more specifically in securing systems of systems.

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Session 2: MASONs  
Session Chair: Phillip Porras, Program Director - Internet Security Group, SRI International

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Extending Software Defined Networking to End User Devices  
Marvin Moser (Alcatel Lucent), Fabio Jaramillo (Alcatel Lucent)

Novel Applications of and Experiments on Programmable Infrastructures  
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Mitigating SDN controller performance bottlenecks  
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Inder Monga (Moderator), CTO, ESNet
Josh Bailey, Google
Deepak Bansal, Manager, Microsoft
Douglas Freimuth, STSM - Master Inventor, IBM Research
Dr. Ashutosh Dutta, Lead Member of Technical Staff - Mobility & Cloud Security, AT&T
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