Marco Platania

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Education

Ph.D. Computer Science, "Sapienza" University of Rome, Italy, March 2012
Advisor: Roberto Baldoni

M.Sc. Computer Science, "Sapienza" University of Rome, Italy, June 2008
Advisor: Roberto Baldoni

B.Sc. Computer Science, "Sapienza" University of Rome, Italy, July 2005
Advisor: Marco Temperini

Research Interests

My research interests are in the field of distributed systems:

- Intrusion-tolerant systems, critical infrastructure protection, cloud systems
- Scalable, secure, and dependable middleware
- Data consistency in large-scale systems
- Overlay networks, peer-to-peer systems

Academic Appointments

Postdoctoral Fellow, Johns Hopkins University, October 2012 – Present

Research activities:

- Construction of the first practical survivable intrusion-tolerant replication system
- Design and implementation of efficient state transfer protocols for large-state applications

Postdoctoral Fellow, "Sapienza" University of Rome, March 2012 – September 2012

Research activities:

- Design and implementation of protocols that enhance the quality of service of a publish/subscribe middleware
- Integration of a publish/subscribe system in a distributed platform for the monitoring and control of critical infrastructures

Publications

Released Software

[S1] The Prime intrusion-tolerant replication system with proactive recovery and state transfer, available at www.dsn.jhu.edu/byzrep/prime.html. M. Platania, Y. Amir, J. Kirsch, J. Lane. Byzantine fault-tolerant replication protocol with performance guarantees while under attack. Prime

supports proactive recovery and state transfer. Prime replicas can be periodically rejuvenated from a clean state. Related publications: [C9], [TR4].

Journals

[J4] Efficient Notification Ordering for Geo-Distributed Pub/Sub Systems, *R. Baldoni, S. Bonomi, M. Platania, L. Querzoni*, accepted for publication in IEEE Transactions on Computers

[J3] Reliable and Timely Event Notification for Publish/Subscribe Services over the Internet, *C. Esposito, M. Platania, R. Beraldi*, IEEE/ACM Transactions on Networking, vol. 22, no. 1, pp. 230-243, IEEE/ACM, 2014

[J2] Supporting NGNs Core Software Services: a Hybrid Architecture and its Performance Analysis, *M. Platania, R. Beraldi, G. Lodi, L. Querzoni, R. Baldoni*, Journal on Network and System Management, vol. 20, no. 2, pp. 181-199, Springer, 2012

[J1] Data Dissemination Supporting Complex Event Pattern Detection, *R. Baldoni, S. Bonomi, G. Lodi, M. Platania, L. Querzoni*, International Journal of Next Generation Computing, vol. 2, no. 3, 2011

Refereed Conferences and Workshops

[C9] Towards a Practical Survivable Intrusion Tolerant Replication System, *M. Platania, D. Obenshain, T. Tantillo, R. Sharma, Y. Amir*, The 33rd IEEE International Symposium on Reliable Distributed Systems (SRDS), pp. 242-252, IEEE, 2014 **Nominated for Best Paper Award**

[C8] Improving the Efficiency of Gossiping, *C. Esposito, M. Platania, R. Beraldi*, DEPEND 2013, The 6th International Conference on Dependability, pp. 31-36, 2013

[C7] Exploiting Interest Clustering for Efficient Event Timestamping in Distributed Publish/Subscribe Systems, *R. Baldoni, S. Bonomi, M. Platania, L. Querzoni*, LADIS 2012

[C6] Dynamic Message Ordering for Topic-Based Publish/Subscribe Systems, *R. Baldoni, S. Bonomi, M. Platania, L. Querzoni*, IEEE 26th International Parallel and Distributed Processing Symposium (IPDPS), pp. 909-920, IEEE, 2012

[C5] Achieving Reliable and Timely Event Dissemination over WAN, *S. Russo, C. Esposito, R. Beraldi, M. Platania, R. Baldoni*, 13th International Conference on Distributed Computing and Networking (ICDCN), pp. 265-280, Springer, 2012

[C4] On the benefit of network coding for timely and reliable event dissemination in WAN, *S. Russo, C. Esposito, R. Beraldi, M. Platania*, 30th IEEE Symposium on Reliable Distributed Systems Workshops (SRDSW), pp. 84-89, IEEE, 2011

[C3] Moving Core Services to the Edge in NGNs for Reducing Managed Infrastructure Size, *R. Baldoni, R. Beraldi, G. Lodi, M. Platania, L. Querzoni*, International Conference on Network and Service Management (CNSM), pp. 410-413, IEEE, 2010

[C2] Practical Uniform Peer Sampling under Churn, *R. Baldoni, M. Platania, L. Querzoni, S. Scipioni*, 9th International Symposium on Parallel and Distributed Computing (ISPDC), pp. 93-100, IEEE, 2010

[C1] A Peer to Peer Filter-Based Algorithm for Internal Clock Synchronization in Presence of Corrupted Processes, *R. Baldoni, M. Platania, L. Querzoni, S. Scipioni*, 14th IEEE Pacific Rim International Symposium on Dependable Computing (PRDC), pp. 64-72, IEEE, 2008

Technical Reports

[TR6] Constructing a Practical Intrusion Tolerant Replication System, *M. Platania, D. Obenshain, T. Tantillo, R. Sharma, Y. Amir*, CNDS-2015-1. Johns Hopkins University

[TR5] Towards a Practical Survivable Intrusion Tolerant Replication System, *M. Platania, D. Obenshain, T. Tantillo, R. Sharma, Y. Amir*, CNDS-2014-1. Johns Hopkins University

[TR4] Dynamic Message Ordering for Publish/Subscribe Systems, *R. Baldoni, S. Bonomi, M. Platania, L. Querzoni,* Technical Report 9/2011. "Sapienza" University of Rome

[TR3] Moving Core Services to the Edge in NGNs for Reducing Managed Infrastructure Size, *R. Baldoni, R. Beraldi, G. Lodi, M. Platania, L. Querzoni,* Midlab Technical Report 8/2010. "Sapienza" University of Rome

[TR2] Practical Uniform Peer Sampling under Churn, *R. Baldoni, M. Platania, L. Querzoni, S. Scipioni,* Midlab Technical Report 1/2010. "Sapienza" University of Rome

[TR1] Clock Synchronization*, M. Platania,* Technical Report 2009

Thesis

[T2] Ordering, Timeliness and Reliability for Publish/Subscribe Systems in WAN. Ph.D. Thesis, "Sapienza" University of Rome, March 2012

[T1] Internal Clock Synchronization in Peer-to-Peer Environment in the Presence of Arbitrary Faults. M.Sc. Thesis, "Sapienza" University of Rome, June 2008

Professional Activities

- Program Committee member of the IEEE 35th International Conference on Distributed Computing Systems (ICDCS), 2015
- Co-editor of the special issue "Dependable and Secure Computing for Large-scale Complex Critical Infrastructures" in the *International Journal of Critical Computer-Based Systems* (IJCCBS), Vol. 4, No. 4, 2013
- Co-organizer, PC Chair, and host of DESEC4LCCI, an international workshop on the dependability and security of large-scale complex critical infrastructures, September 2012
- Committee Member, "Sapienza" University of Rome Graduate Board, March 2012
- Regular reviewer for *IEEE Transactions on Dependable and Secure Computing* (TDSC), *IEEE Transactions on Parallel and Distributed Systems* (TPDS), *IEEE Transactions on Computers* (TC) and *IEEE Transactions on Services Computing* (TSC)

Research Projects

- **Toward Intrusion Tolerant Clouds, October 2012 – Present**

  My research focuses on the construction of the first practical survivable intrusion-tolerant replication system. I use an intrusion-tolerant replication engine with performance guarantees even while under attack, compiler-based diversity, and proactive recovery. In addition to survivability, I am working on other important aspects to make the system more practical, such as performance, design and implementation of efficient state transfer protocols to support large-state applications, and deployment strategies in physical and virtualized environments.

- DOTS-LCCI: Dependable Off-The-Shelf based middleware systems for Large-scale Complex Critical Infrastructures, March 2010 – September 2012

  The project focused on the construction of a dependable and secure middleware platform for the protection of complex critical systems. My focus was on the design, implementation, and evaluation of a scalable and reliable data dissemination protocol for monitoring and diagnosis of geo-distributed critical infrastructures.

- BLEND: Blending Technology for Ubiquitous Real-Time Data Access, June 2010 – May 2012

  The project focused on the design and implementation of a technology platform that integrates Data Distribution Service (DDS) with enterprise and Internet technologies (REST, SOAP, JMS, etc.), and allows the deployment of Internet-scale DDS applications. My focus was on the design, implementation, and evaluation of a membership discovery service and a reliable communication protocol for distributed systems deployed on wide area networks.

- Peer-to-Peer telephony, October 2008 – September 2010

  The project focused on peer-to-peer solutions for Internet telephony. My focus was on the design, implementation, and evaluation of peer-to-peer protocols for Telco services (VoIP, video conferencing, etc.) aimed to provide quality of service comparable with a traditional fully managed infrastructure.

Teaching Activities

Johns Hopkins University

- Class lecturer of the Distributed Systems course, Fall 2014

"Sapienza" University of Rome:

- Teaching Assistant of the Intermediate Programming course, Fall 2010
- Co-Instructor of the Advanced Distributed Systems course, Spring 2009, Spring 2010, and Spring 2011