The 47th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2017)



Conference Program

Sponsored by:





Plaza Building

CONCOURSE LEVEL

Breakouts - Governor's Square 16 & 17

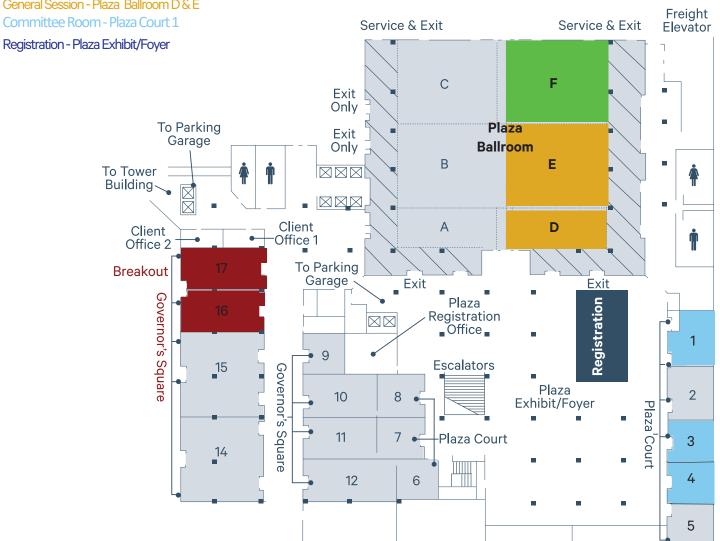
Breakouts - Plaza Court 3 & 4

Lunch - Plaza Ballroom F

General Session - Plaza Ballroom D & E



Meeting Room Locations



^{*} Contact your hotel representative for additional capacities for rounds of 7 and/or 6. This document contains approximate measurements and square footage that are for illustrative purposes only. We cannot guarantee the floor plan accuracy or completeness, therefore encourage you to review the space to make sure it is suitable for your event.

	Monday, June 26, 2017			
8:00 – 17:00	Registration Location: Plaza Exhibit/Foyer			
	SSIV Workshop			
8:30 – 10:00	The 3rd International Workshop on Safety and Security of Intelligent Vehicles	International Workshop on Recent Advances in the Dependability Assessment of Complex systems	A practical view of modeling and quantification of network survivability	
	Location: Governors Square 16	Location: Governors Square 17	Location: Plaza Court 3	
10:00 -				
10:30	Coffee Break <u>Location</u> : Plaza Exhibit/Foyer			
10:30 – 12:00	SSIV Workshop	RADIANCE Workshop	Tutorial 1	
12:00 – 13:30	Lunch Location: Plaza Ballroom F			
13:30 – 15:00	SSIV Workshop	RADIANCE Workshop	Tutorial 1	Tutorial 2 LLFI and the Art of Fault Injection Location: Plaza Court 4
15:00 – 15:30	Coffee Break			
15:30 – 17:00	SSIV Workshop	RADIANCE Workshop	Tutorial 1	Tutorial 2
17:30 – 19:30	Conference Reception Location: Plaza Exhibit/Foyer			

	Tuesday, June 27, 2017			
8:00 – 17:00	Registration Location: Plaza Exhibit/Foyer			
8:30 -	Opening remarks and Jean-Claude Laprie award presentation			
9:15	<u>Location</u> : Plaza Ballroom D & E			
9:15 – 10:15	The Cybersecurity Imperative Farnam Jahanian, University Provost and Chief Academic Officer, Carnegie Mellon University Location: Plaza Ballroom D & E Chair: Paulo Verissimo			
10:15 – 10:45	Coffee Break			

10:45 – 12:15	Session 1: Best Paper Award Candidates Location: Plaza Ballroom D & E Chair: Pascal Felber and Evgenia Smirni Information Leakage in Encrypted Deduplication via Frequency Analysis Jingwei Li (University of Electronic Science and Technology of China); Chuan Qin, Patrick P. C. Lee (The Chinese University of Hong Kong); Xiaosong Zhang (University of Electronic Science and Technology of China) Privacy Disclosure Through Smart Meters: Reactive Power Based Attack and Defense Jingyao Fan (The Pennsylvania State University); Qinghua Li (University of Arkansas); Guohong Cao (The Pennsylvania State University) What Can We Learn from Four Years of Data Center Hardware Failures? Guosai Wang, Wei Xu (Institute for Interdisciplinary Information Sciences, Tsinghua University)
12:15 – 13:45	Lunch
	<u>Location</u> : Plaza Ballroom F

Session 2A: Algorithms and Agreement

 $\frac{Location: Plaza \ Ballroom}{D\&E}$

Chair: Paulo Verissimo

Fast Atomic Multicast

Paulo Coelho (University of Lugano); Nicolas Schiper (EPFL); Fernando Pedone (University of Lugano)

Speeding up Consensus by Chasing Fast Decisions

Balaji Arun, Sebastiano Peluso, Roberto Palmieri, Giuliano Losa, Binoy Ravindran (Virginia Tech)

Secure Causal Atomic Broadcast, Revisited

Sisi Duan (Oak Ridge National Laboratory); Michael K. Reiter (University of North Carolina at Chapel Hill); Haibin Zhang (University of Connecticut) **Session 2B: Hardware**

<u>Location: Governors Square 16:</u> Chair: Devesh Tiwari

Reducing the "Tax" of Reliability: A Hardware-Aware Method for Agile Data Persistence in Mobile Devices Meng Wang, Huxiang Chen (University of Florida); Tao Li

(NSF/University of Florida)

Exploring the Potential for Collaborative Data Compression and Hard-Error Tolerance in Resistive Memories

Amin Jadidi, Mohammad Arjomand (Pennsylvania State University); Mohammad Khavari Tavana, David Kaeli (Northeastern University); Mahmut Kandemir, Chita Das (Pennsylvania State University)

One Bit is (Not) Enough: An Empirical Study of the Impact of Single and Multiple Bit-Flip Errors

Behrooz Sangchoolie (Chalmers University of Technology); Karthik Pattabiraman (University of British Columbia); Johan Karlsson (Chalmers University of Technology) Session 2C: Fast Abstracts
Location: Governors Square
17:

Chair: Matti Hiltunen

Software-Defined HoneyNet: Towards Mitigating Link Flooding Attacks

Jinwoo Kim and Seungwon Shin

TDSC: Two-Stage DDoS Detection and Defense System Based on Clustering

Shuang Wei, Yijing Ding, and Xinhui Han

The Many Conflicting Visions of 'Safety Case'

Patrick J. Graydon

RFID Tag Grouping Protocols Made Private

Yudai Komori, Kazuya Sakai, and Satoshi Fukumoto

Off-Path Caching for File Versioning in Named Data Networking

Mamoru Ohara and Satoshi Fukumoto

Portable SDN Testbed Prototype

Josh Alcorn, Scott Melton, and C. Edward Chow

A Framework for SDN Network Evaluation

Josh Alcorn, Scott Melton, and

C. Edward Chow

Document Faults: An
Extension of the Taxonomy
of Dependable and Secure
Computing

Algirdas Avižienis

Opportunities and Challenges of Third-Party Sustainment of Critical Software in Dependable

Systems

Kate Gill and Rob Ashmore

13:45 – 15:15

15:15 – 15:45	Coffee Break		
	Location: Plaza Ballroom Exhibit/Foyer		
15:45 – 17:15	Session 3A: Symbolic Execution and Synthesis Tools Location: Plaza Ballroom D & E Chair: Gilles Muller StatSym: Vulnerable Path Discovery through Statistics- guided Symbolic Execution Fan Yao, Yongbo Li, Yurong Chen, Hongfa Xue, Guru Venkataramani, Tian Lan, (The George Washington University) Dependability-aware design space exploration for optimal synthesis parameters tuning Ilya Tuzov, Juan Carlos Ruiz, David de Andres (ITACA- UPV) pbSE: Phase-based Symbolic Execution QixueXiao, YuChen (Tsinghua University); ChenggangWu (Institute of Computing Technology Chinese Academy of Sciences); KangLi (Dept. of Computer Science Athens, Georgia)	Session 3B: Trusted Execution Location: Governors Square 16 Chair: Bojan Cukic IM-Visor: A Pre-IME Guard to Prevent IME Apps from Stealing Sensitive Keystrokes Using TrustZone Chen Tian, Yazhe Wang (State Key Laboratory of Information Security, Institute of Information Engineering, Chinese Academy of Sciences); Peng Liu (College of Information Sciences and Technology, Pennsylvania State University, University Park); Qihui Zhou, Chengyi Zhang (State Key Laboratory of Information Security, Institute of Information Engineering, Chinese Academy of Sciences) Rollback and Forking Detection for Trusted Execution Environments using Lightweight Collective Memory Marcus Brandenburger, Christian Cachin (IBM Research - Zurich); Matthias Lorenz, Rüdiger Kapitza (TU Braunschweig) Secure Tera-scale Data Crunching with a Small TCB Bruno Vavala (Carnegie Mellon University (U.S.) & University of Lisbon (Portugal)); Nuno Neves (University of Lisbon (Portugal)); Peter Steenkiste (Carnegie Mellon University (U.S.))	Session 3C: Industry Track I: Architecture and Evaluation of (Dependable) Systems and Networks Location: Governors Square 17 Chair: Cristian Constantinescu Invited Talk: Robert Baumann, Texas Instruments The Space Radiation Environment and Component Mitigation Techniques for Dependable Space Systems RT Level vs. Microarchitecture Level Reliability Assessment: Case Study on ARM Cortex-A9 CPU Athanasios Chatzidimitriou, Manolis Kaliorakis, Dimitris Gizopoulos, Maurizio Iacaruso, Mauro Pipponzi, Riccardo Mariani and Stefano Di Carlo. Exact Reliability Computation Thanikesavan Sivanthi, Yvonne-Anne Pignolet and Vincent Débieux.

12:00 -	Lunch			
13:30	<u>Location</u> : Plaza Ballroom F			
13:30 – 15:00	Session 5A: Anomaly Detection Location: Plaza Ballroom D & E Chair: Patrick Lee Athena: A Framework for Scalable Anomaly Detection in Software-Defined Networks Seunghyeon Lee, Jinwoo Kim, Seungwon Shin (KAIST); Phillip Porras, Vinod Yegneswaran (SRI International) Bloom Filters and LSTM Networks For Multi-level Anomaly Detection in Industrial Control Systems Cheng Feng, Tingting Li, Deeph Chana (Institute for Security Science and Technology, Imperial College London) Revisiting Random Walk based Sybil Detection in Online Social Networks Jinyuan Jia, Neil Zhenqiang Gong (Iowa State University)	Session 5B: Wireless and Sensors Location: Governors Square 16 Chair: Saurabh Bagchi Towards Secure and Verifiable Database-driven Spectrum Sharing Zhili Chen (Anhui University); Lin Chen (University of Paris-Sud); Hong Zhong (Anhui University) Sensor-based Implicit Authentication of Smartphone Users Wei-Han Lee, Ruby Lee (Princeton University) REMAX: Reachability- Maximizing P2P Detection of Erroneous Readings in Wireless Sensor Networks Varun Badrinath Krishna, Michael J. Rausch, Benjamin E. Ujcich, Indranil Gupta, William H. Sanders (University of Illinois at Urbana-Champaign)	Session 5C: Industry Track III: Dependability Data and Security Location: Governors Square 17 Chair: Alan Wood Enhancing Anomaly Diagnosis of Automatic Train Supervision System Based on Operation Log Yan Li, Binbin Chen, Vincent W. Zheng, William Temple, Zbigniew Kalbarczyk and Yue Wu. Automating DRAM Fault Mitigation By Learning From Experience Elisabeth Baseman, Nathan Debardeleben, Kurt Ferreira, Vilas Sridharan, Taniya Siddiqua and Olena Tkachenko. HYDRA: HYbrid Design for Remote Attestation (Using a Formally Verified Microkernel) Karim Eldefrawy, Norrathep Rattanavipanon and Gene Tsudik. MAS: Mobile-Apps Assessment and Analysis System Chin-Wei Tien, Chia-Wei Tien, Tse-Yung Huang, Ting-Chun Huang, Wei- Ho Chung and Sy-Yen Kuo A Visit to the Jungle of Terminology Algirdas Avizienis	

15:00 -				
15:30	Coffee Break			
13.50				
	Loc	cation: Plaza Ballroom Exhibit/Foy	<u>ver</u>	
15:30 – 17:00	Session 6A: Dependable Systems and Software Location: Plaza Ballroom D & E Chair: Domenico Cotroneo Agora: A Dependable High- Performance Coordination	Session 6B: Measurement Studies Location: Governors Square 16 Chair: Chuan Yue Counting in the Dark: Caches Discovery and Enumeration in the Internet	Session 6C: Student Forum Location: Governors Square 17 Chair: Saurabh Bagchi Modeling Error Propagation in Programs Guanpeng Li,	
	Service for Multi-Cores Rainer Schiekofer (Friedrich- Alexander-Universität Erlangen-Nürnberg); Johannes	Amit Klein, Haya Shulman, Michael Waidner (Fraunhofer SIT)	University of British Columbia, Canada Automated Program	
	Behl (TU Braunschweig); Tobias Distler (Friedrich- Alexander-Universität Erlangen-Nürnberg)	Entropy-Based Security Analytics: Measurements from a Critical Information System Marcello Cinque, Raffaele	Diversity using Program Synthesis Abraham Chan, University of British Columbia, Canada	
	Load-Optimal Local Fast Rerouting for Dependable Networks Yvonne-Anne Pignolet (ABB Research, Switzerland); Stefan Schmid (Aalborg Uni,	Della Corte, Antonio Pecchia (Federico II University of Naples, Italy) Exploring the Long Tail of (Malicious) Software	Evaluation of the dependability of critical infrastructures using hybrid Petri nets with random variables and stochastic	
	Denmark & TU Berlin, Germany); Gilles Tredan (LAAS, CNRS, Toulouse, France)	Downloads Babak Rahbarinia (Auburn University Montgomery); Marco Balduzzi (Trend Micro Inc.); Roberto Perdisci	simulation Carina Pilch, Institute of Mathematics and Computer Science, Munster, Germany	
	JMake: Dependable Compilation for Kernel Janitors Julia Lawall, Gilles Muller (Sorbonne Universites/Inria/UPMC/LIP6)	(University of Georgia)	Enabling Low Degraded Read Latency and Fast Recovery for Erasure Coded Cloud Storage Systems Peng Li, Nankai University, China	
17:30 – 21:00	Conference Banquet Visit to Denver Art Museum and Dinner – Ticket Required Walking departure from hotel (5:15pm)			



Wednesday, June 28 DSN Awards Dinner
Denver Art Museum - Ponti Room (First floor)
100 W. 14th Ave Pkwy, Denver CO 80204
5:30 PM - 9:00 PM
Ticket required

The Denver Art Museum is a short walk from the Sheraton hotel. <u>Please be sure to bring your ticket for the event and make your meal selection in advance.</u> Meet in the hotel lobby at 5:00 PM for on-time walking departure at 5:15 PM. The gallery we will have access to is the American Indian Gallery on the 3rd floor of the North building. Once you arrive at Ponti Hall for the event, see the elevator bank from Ponti Hall and take the elevator to the 3rd floor to access the gallery.



Walking directions from the Sheraton to the Denver Art Museum:

- 1. Head SOUTHWEST on COURT PL toward 15th St
- 2. Turn LEFT onto 15th St
- 3. Turn RIGHT when you hit Colfax, cross Colfax and enter Civic Center Park
- 4. Head SOUTH through Civic Center Park toward 14th Ave
- 5. Cross 14th Ave, you'll see the Denver Art Museum on the RIGHT
- 6. Enter the NORTH Entrance of the Museum (pictured below)



	Thursday, June 29, 2017			
8:00 –	Registration			
16:00	Laa	e e e e e e e e e e e e e e e e e e e	****	
		ation: Plaza Ballroom Exhibit/Foy	<u>/er</u>	
8:30 –	Session 7A: Android	Session 7B: Privacy and	Session 7C: Best of SELSE	
10:00	Location: Plaza Ballroom D&E	Security	Location: Governors Square	
	Chair: Marco Vieira	Location: Governors Square	17	
	Chast Installant the	16 Chaire Sania Dan Malahtan	Chair: Alan Wood	
	Ghost Installer in the Shadow: Security Analysis of	<u>Chair</u> : Sonia Ben Mokhtar	Evaluation and Mitigation	
	App Installation on Android	I know nothing about you	Evaluation and Mitigation of Soft Errors in Neural	
	Yeonjoon Lee (Indiana	but here is what you might	Network-based Object	
	University); Tongxin Li	like	Detection in Three GPU	
	(Peking University); Nan Zhang	Rachid Guerraoui (EPFL);	Architectures	
	(Indiana University); Soteris	Anne-Marie Kermarrec (Inria);	Fernando Fernandes dos	
	Demetriou (University of	Rhicheek Patra (EPFL);	Santos, Lucas Draghetti,	
	Illinois at Urbana-Champaign);	Mahammad Valiyev (TU	Lucas Weigel, Luigi Carro,	
	Mingming Zha (Chinese	Munich); Jingjing Wang	Philippe Navaux, and Paolo	
	Academy of Sciences);	(EPFL)	Rech (Instituto de	
	XiaoFeng Wang (Indiana		Informatica, Universidade	
	University); Kai Chen (Chinese	What You See is Not What	Federal do Rio Grande do	
	Academy of Sciences); Xiaoyong Zhou (Samsung	You Get! Thwarting Just-in- Time ROP with Chameleon	Sul, Porto Alegre, Rio Grande do Sul, Brasil)	
	Research); Xinhui Han (Peking	Ping Chen, Jun Xu	Grande do Sui, Brasii)	
	University); Michael Grace	(Pennsylvania State	DRAM Scaling Error	
	omversity), iviienaer Grace	University); Zhisheng Hu	Evaluation Model Using	
	DyDroid: Measuring	(Pennsylvania State	Various Retention Time	
	Dynamic Code Loading and	University); Xinyu Xing	Seong-Lyong Gong (UT	
	Its Security Implications in	(Pennsylvania State	Austin), Jungrae Kim	
	Android Applications			
			(UT Austin)	
	• / -		D II II DEI	
			•	
			•	
		Omversity)		
		DynaMiner: Leveraging		
	2,	for On-the-Wire Malware	Engineering, University of	
	JGRE: An Analysis of JNI	Detection	Virginia)	
	Global Reference Exhaustion	Birhanu Eshete, V.N.		
		of Illinois at Chicago)		
	, · · · · · · · · · · · · · · · · · · ·			
	• / ·			
	• / .			
	(Chinese Academy of Sciences)			
	Dynamic Code Loading and Its Security Implications in Android Applications Zhengyang Qu (Northwestern University); Shahid Alam (Qatar University); Yan Chen (Northwestern University); Xiaoyong Zhou (Google); Wangjun Hong (Northwestern University); Ryan Riley (Qatar University) JGRE: An Analysis of JNI Global Reference Exhaustion Vulnerabilities in Android Yacong Gu (Chinese Academy of Sciences); Kun Sun (George Mason University); Purui Su (Chinese Academy of Sciences); Qi Li (Tsinghua University); Yemian Lu, Lingyun Ying, Dengguo Feng	University); Xinyu Xing (Pennsylvania State University); Minghui Zhu (Pennsylvania State University); Bing Mao (Nanjing University); Peng Liu (Pennsylvania State University) DynaMiner: Leveraging Offline Infection Analytics for On-the-Wire Malware Detection	Seong-Lyong Gong (UT Austin), Jungrae Kim (Microsoft), and Mattan Erez (UT Austin) Deep Healing: Ease the BTI and EM Wearout Crisis by Activating Recovery Xinfei Guo and Mircea R. Stan (Department of Electrical and Computer Engineering, University of	

10:00 - 10:30	Coffee Break		
10.50			
	Lo	cation: Plaza Ballroom Exhibit/Foy	<u>ver</u>
10:30 -	Session 8A: Analytic Models	Session 8B: Power System	Session 8C: Tool/Demo:
12:00	Location: Plaza Ballroom D &	and Smart Grid	Security and Testing Tools
	<u>E</u>	Location: Governors Square 16	<u>Location: Governors Square</u>
	<u>Chair</u> : Eric Rozier	<u>Chair</u> : Felicita Di	<u>17</u>
		Giandomenico	Chair: Anne Remke
	Statistical Model Checking		
	for hybrid Petri Nets with	Practical Experience Report	Fex: A Software Systems
	multiple general transitions	Smart Maintenance via	Evaluator
	Carina Pilch, Anne Remke	Dynamic Fault Tree Analysis:	Oleksii Oleksenko, Dmitrii
	(Westfälische Wilhelms-	A Case Study on Singapore	Kuvaiskii, Pramod Bhatotia,
	Universität Münster)	MRT System	Christof Fetzer (TU Dresden)
		Yan Liu, Yue Wu (Advanced	
	Deadline-Aware Multipath	Digital Science Center);	Demonstrating a Tool for
	Communication: An	Zbigniew Kalbarczyk	Injection Attack Prevention
	Optimization Problem	(University of Illinois at	in MySQL
	Laurent Chuat, Adrian Perrig	Urbana-Champaign)	Ibéria Medeiros (LaSIGE,
	(ETH Zurich); Yih-Chun Hu		Faculdade de Ciências da
	(University of Illinois at	RL-BLH: Learning-Based	Universidade de Lisboa);
	Urbana-Champaign)	Battery Control for Cost	Miguel Beatriz (INESC-ID,
		Savings and Privacy	Instituto Superior Técnico da
	Attacker-Induced Traffic	Preservation for Smart	Universidade de Lisboa);
	Flow Instability in a Stream	Meters	Nuno Neves (LaSIGE,
	of Semi-Automated Vehicles	Jinkyu Koo, Xiaojun Lin,	Faculdade de Ciências da
	Daniel D. Dunn, Samuel A.	Saurabh Bagchi (Purdue	Universidade de Lisboa);
	Mitchell, Imran Sajjad (Utah	University)	Miguel Correia (INESC-ID,
	State University); Ryan M.		Instituto Superior Técnico da
	Gerdes (Virginia Tech);	Compromising Security of	Universidade de Lisboa)
	Rajnikant Sharma (University	Economic Dispatch in Power	
	of Cincinnati); Ming Li	System Operations	BinWrite: Efficient Static
	(University of Arizona)	Devendra Shelar	Binary Rewriting for
		(Massachusetts Institute of	Security
		Technology); Pengfei Sun	William Hawkins, Jason D.
		(Rutgers University); Saurabh	Hiser, Michele Co, Anh
		Amin (Massachusetts Institute	Nguyen-Tuong, Jack W.
		of Technology); Saman Zonouz	Davidson (University of
		(Rutgers University)	Virginia)
12.00			
12:00 -		Lunch	

Location: Plaza Ballroom F

13:30

13:30 -15:00

Session 9A: Attacks

Location: Plaza Ballroom D &

Chair: Karthik Pattabiraman

ATTAIN: An Attack Injection Framework for Software-Defined Networking

Benjamin E. Ujcich, Uttam Thakore, William H. Sanders (University of Illinois at Urbana-Champaign)

The Balance Attack Against **Proof-Of-Work Blockchains:** The R3 Consortium as an Example

Christopher Natoli, Vincent Gramoli (Data61-CSIRO and University of Sydney)

Voiceprint: A Novel Sybil **Attack Detection Method for VANETS**

Yuan Yao (Northwestern Polytechnical University); Bin Xiao (The Hong Kong Polytechnic University); Gaofei Wu (Northwestern Polytechnical University); Xue Liu (McGill University); Zhiwen Yu, Kailong Zhang, Xingshe Zhou (Northwestern Polytechnical University)

Session 9B: Protocol and **Behavioral Analysis**

Location: Governors Square 16 Chair: Yair Amir

Analysing Selfishness Flooding with SEINE

Guido Lena Cota (Università degli Studi di Milano); Sonia Ben Mokhtar (LIRIS-CNRS-INSA Lvon): Gabriele Gianini (Università degli Studi di Milano); Julia Lawall, Gilles Muller (Sorbonne Universités, Inria, CNRS, UPMC, LIP6); Ernesto Damiani (Università degli Studi di Milano, EBTIC/Khalifa University); Lionel Brunie (LIRIS-CNRS-INSA Lyon)

Detecting Passive Cheats in Online Games via Performance-Skillfulness Inconsistency

Daiping Liu (University of Delaware); Xing Gao (College of William and Mary); Mingwei Zhang (Intel Labs); Haining Wang (University of Delaware); Angelos Stavrou (George Mason University)

Analyzing Operational Behavior of Stateful Protocol Implementations for Detecting Semantic Bugs

Endadul Hoque (Purdue University); Omar Chowdhury (University of Iowa); Sze Yiu Chau (Purdue University); Cristina Nita-Rotaru (Northeastern University); Ninghui Li (Purdue University)

15:15 -16:15

Technical Committee Meeting

Location: Plaza Ballroom D & E