

Day One, April 16 2013

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Introduction - Chairs: Marc Weiss, Kishan Shenoi

| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
|---------|----------|-------------------------------|------------|------------------------------|-------------------------|----------------------------------|
| 8:30 AM | 10 | Welcome, Introduction, Agenda | Marc Weiss | Mathematician and GPS Expert | mweiss@boulder.nist.gov | NIST Time and Frequency Division |

Session 1 - Tutorial

Chairs - Tommy Cook, Kishan Shenoi, Anurag Gupta

| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
|----------|----------|---|-----------------------------|--|---|----------------------------------|
| 8:40 AM | 5 | Introduction by session chairman | | | | |
| 8:45 AM | 30 | Clocks, Oscillators, and PLLs | Kishan Shenoi | CTO, Qulsar, LLC | kishan.shenoi@gmail.com | Qulsar |
| 9:15 AM | 20 | Primary Sources for Time and Frequency | Marc Weiss | Mathematician and GPS Expert | mweiss@boulder.nist.gov | NIST Time and Frequency Division |
| 9:35 AM | 20 | Distribution of Timing across a Telecom Network | Chris Farrow | Technical Services Manager | chris.farrow@chronos.co.uk | Chronos Technology Ltd |
| 9:55 AM | 10 | Questions | | | | |
| 10:05 AM | 20 | Coffee Break | | | | |
| 10:25 AM | 30 | Impairments in Timing Signals and Clock Quality Metrics | Anurag Gupta, Kishan Shenoi | Principal Systems Engineer; Principal Consultant, Shenoi Consulting; | anurag.gupta@aviatnet.com ; kishan.shenoi@gmail.com | Aviat Networks, Inc; Ixia |
| 10:55 AM | 20 | Evolution of the need for Sync to the Base-stations | Anand Ram | VP of Sales & Marketing | anand.ram@calnexsol.com | Calnex |
| 11:15 AM | 15 | Questions | | | | |
| 11:30 AM | 60 | Lunch | | | | |

Introduction - Chairs: Marc Weiss, Kishan Shenoi

| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
|----------|----------|-------------------------------|------------|------------------------------|-------------------------|----------------------------------|
| 12:30 PM | 10 | Welcome, Introduction, Agenda | Marc Weiss | Mathematician and GPS Expert | mweiss@boulder.nist.gov | NIST Time and Frequency Division |
| 12:40 PM | 15 | Summary of WSTS'12 | Marc Weiss | Mathematician and GPS Expert | mweiss@boulder.nist.gov | NIST Time and Frequency Division |

Keynote Speaker Day 1

Chair: Marc Weiss

| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
|----------|----------|--------------------|---------------|---------------|--|---------|
| 12:55 PM | 45 | Connected Vehicles | Flavio Bonomi | Cisco Fellow | flavio@cisco.com | Cisco |

Session 2 - The need for sync

Chairs - Bill Powell, Adam Wertheimer

| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
|---------|----------|--|--------------------------------|--|--|------------------------------|
| 1:40 PM | 5 | Introduction by session chairman | Adam Wertheimer Bill Powell | Systems Architect and Fixed Access Systems Engineering | | Microsemi and Alcatel-Lucent |
| 1:45 PM | 20 | Architecture for the transport of timing | Michael Mayer | Vice chairman | mgmayer@gmail.com | ATIS COAST-SYNC |
| 2:05 PM | 15 | Need for Synchronization for Wireless | Stefano Ruffini | Expert R&D | stefano.ruffini@ericsson.com | Ericsson |
| 2:20 PM | 25 | Synchronization in Location Based Services (LBS) | Leon Goldin | Technical leader | lgoldin@cisco.com | Cisco |
| 2:45 PM | 25 | Mobile Backhaul and Synchronization for Heterogeneous Networks | Marie Hogan | Strategic Product Manager for LTE | marie.hogan@ericsson.com | Ericsson |
| 3:10 PM | 30 | Coffee Break | | | | |
| 3:40 PM | 25 | Network Time Distribution for Small Cells | Tim Frost | Principal Technologist | tfrost@symmetricom.com | Symmetricom |
| 4:05 PM | 25 | Ethernet Time & Sync in Telecoms, Finance, Power, Broadcast | Anand Ram | Vice President of Sales & Marketing | anand.ram@calnexsol.com | Calnex |

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| 4:30 PM | 20 | Audio Video Sync | Kishan Shenoi | CTO, Qulsar LLC; | kishan.shenoi@gmail.com | Qulsar |
| Panel Discussion - Can Sync Support Hybrid Small Cells in Dense Metro Areas? Chairs: Pat Diamond, Don Kurt | | | | | | |
| 4:50 PM | 80 | Can Sync Support Hybrid Small Cells in Dense Metro Areas? | Martin Nuss Chip Webb Anurag Gupta Ron Evans | CTO; VP Technology; Principal Systems Engineer; | | Vitesse Semiconductor Ixia Aviat Networks, Inc FEI |
| 6:10 PM | | | | End of day 1 | | |
| 7:00-9:30 PM | | | | Evening Reception in Hotel Sponsored by | | |
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| Day Two, April 17, 2013 | | | | | | |
| 7:00-8:20 AM | | | | Breakfast Sponsored by | | |
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| Keynote Speaker Day 2 Chair: Marc Weiss | | | | | | |
| 8:30 AM | 5 | Welcome, Introduction, Agenda | Marc Weiss | Mathematician and GPS Expert | mweiss@boulder.nist.gov | NIST Time and Frequency Division |
| 8:35 AM | 45 | Keynote Speaker | John Eidson | | | |
| Session 3 - Standards Chairs - Stefano Ruffini, Michael Mayer, Silvana Rodrigues | | | | | | |
| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
| 9:20 AM | 5 | Introduction by session chairman | | | | |
| 9:25 AM | 15 | ITU standardization and coordination | Greg Jones | Counsellor, ITU-T Study Group 15 | greg.jones@itu.int | ITU |
| 9:40 AM | 20 | Status of ITU-T SG15 synchronization standards | Jean-Loup Ferrant | Rapporteur, ITU-T Q13/15 | Jean-Loup.ferrant@calnexsol.com | Calnex Solutions |
| 10:00 AM | 20 | Coffee Break | | | | |
| 10:20 AM | 20 | Progress in time synchronization in Q13: G.8271 & G.8271.1 | Stefano Ruffini | Expert R&D | stefano.ruffini@ericsson.com | Ericsson |
| 10:40 AM | 20 | 1588 Frequency and Time & phase profiles at ITU-T | Silvana Rodrigues | Director of System Engineering | silvana.rodrigues@idt.com | IDT |
| 11:00 AM | 15 | ATIS COAST-SYNC Update | Lee Cosart/Michael Mayer | Senior Technologist Consultant | lcasart@symmetricom.com mgmayer@gmail.com | Symmetricom Mayer Consulting |
| 11:15 AM | 15 | IETF - TICTOC | Doug Arnold | Principal Technologist | darnold@symmetricom.com | Symmetricom |
| 11:30 AM | 15 | Synchronization Standardization activities within the IEEE | Pat Diamond | Principal | pdseeker@msn.com | Diamond Consulting |
| 11:45 AM | 60 | Lunch Break | | | | |

Session 4 - Talks from Operators
Chair: Tommy Cook, Joe Neil, D Kurt

| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
|----------|----------|---|--------------|-----------------------------|--|-----------------------|
| 12:45 PM | 5 | Introduction by chairman | | | | |
| 12:50 PM | 25 | Advanced Cable System Services and Synchronization Requirements | Ed Mallette | Distinguished Engineer | edwin.mallette@bhnis.com | Bright House Networks |
| 1:15 PM | 25 | PTP Frequency/Phase Proof-of-Concept and a Service Providers Challenges for Concatenated Networks | Tim Pearson | Technology Strategist | Tim.H.Pearson@sprint.com | Sprint |
| 1:40 PM | 25 | Evaluation of Packet Network for PTP Synchronization | Edgar Santos | Design Specialist | Edgar.Santos@telus.com | Telus |
| 2:05 PM | 25 | MTS Allstream Synchronization Network Status | Don Kurt | Senior Technical Specialist | Don.Kurt@mtsallstream.com | MTS Allstream |

Session 5 - Sync Implementations
Chair: Stefano Ruffini, Michael Mayer, Lloyd Green, Silvana Rodrigues

| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
|---------|---------------------|---|-------------------|----------------------------|--|------------------------|
| 2:30 PM | 5 | Introduction by chairman | | | | |
| 2:35 PM | 25 | Describing the ITU-T G.8265.1 Telecom Profile and PTP Protocol through the use of Ladder Diagrams | Michel Ouellette | V.P. Engineering | michel@iometrix.com | iometrix |
| 3:00 PM | 25 | A Meta-analysis of PTPv2 Technology Rollouts In UK and Scandinavia | Chris Farrow | Technical Services Manager | chris.farrow@chronos.co.uk | Chronos Technology Ltd |
| 3:25 PM | 20 | Coffee break | | | | |
| 3:45 PM | 25 | Mitigation of GPS vulnerability using time transfer over microwave systems | Anurag Gupta | Principal Systems Engineer | Anurag.Gupta@aviatnet.com | Aviat Networks, Inc |
| 4:10 PM | 25 | Developing and deploying PTP now. | Tommy Cook | CEO | tommy.cook@calnexsol.com | Calnex |
| 4:35 PM | 25 | Gateway/Hybrid Clocks | George Zampetti | Chief Scientist | gzampetti@symmetricom.com | Symmetricom |
| 5:00 PM | 25 | Comparison of Partial on-path support to other methods for Precision Timing Protocol | Adam Wertheimer | Systems Architect | Adam.wertheimer@microsemi.com | Microsemi |
| 5:25 PM | 25 | Time synchronization with partial on-path support | Antti Pietiläinen | Senior Specialist | antti.pietilainen@nsn.com | NSN |
| 5:50 PM | End of day 2 | | | | | |

6:00 PM **WSTS Steering Committee meeting**

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| 7:00-9:30 PM | Conference Dinner Sponsored by | | | | | |
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Day Three, April 18, 2013

Keynote Speaker Day 3
Chair: Marc Weiss

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| 8:30 AM | 5 | Welcome, Introduction, Agenda | Marc Weiss | Mathematician and GPS Expert | mweiss@boulder.nist.gov | NIST Time and Frequency Division |
| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
| 8:35 AM | 45 | The Path towards Accurate and Reliable Timing for TD-LTE & LTE-Advanced | Martin Nuss | CTO | nuss@vitesse.com | Vitesse Semiconductor |
| Session 6 - Sync Testing, Metrics and Measurement Chair: Lee Cosart, Charles Curry, Chip Webb | | | | | | |
| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
| 9:20 AM | 5 | Introduction by chairman | | | | |
| 9:25 AM | 25 | Measurement metrics intro | Lee Cosart | Senior Technologist | lcosart@symmetricom.com | Symmetricom |
| 9:50 AM | 25 | A Tutorial Introduction to Floor Metrics and MAFE | Chip Webb | Vice President, Technology | cwebb@ixiacom.com | Ixia |
| 10:15 AM | 25 | Proving performance of Packet-Sync Equipment and Networks | Tommy Cook | CEO | tommy.cook@calnexsol.com | Calnex |
| 10:40 AM | 20 | Coffee break | | | | |
| 11:00 AM | 25 | SLA Tools | Gil Biran | SVP Corporate Development and Strategy | gil@biranadvisors.com | Adva |
| 11:25 AM | 25 | Testing Challenges for Packet-based Timing | Josh Karnes | Technical Marketing Engineer | jkarnes@ixiacom.com | Ixia |
| 11:50 AM | 60 | Lunch Break | | | | |
| Session 7 - Emerging Topics Chair: Leon Goldin, Pat Diamond, Anurag Gupta | | | | | | |
| Time | Duration | Paper | Speaker | Speaker Title | Speaker email | Company |
| 12:50 PM | 5 | Introduction by Chairman | | | | |
| 12:55 PM | 20 | Probabilistic Secure Time Transfer | Kyle Wesson | Ph.D Candidate in Electrical and Computer Engineering | kyle.wesson@utexas.edu | U of Texas |
| 1:15 PM | 20 | GPS Jamming – Quantifying the Threat | Charles Curry | Managing Director | charles.curry@chronos.co.uk | Chronos Technology Ltd |
| 1:35 PM | 20 | Interference of GPS anti-jam techniques with accurate time determination | Gordon Jolly | Chief Engineer, GNSS Anti-Jam Technologies | Gordon.Jolly@novatel.ca | Novatel Inc. |
| 1:55 PM | 20 | Handling Network Asymmetry with a Hybrid PTP / GNSS Architecture | David Spencer | Product Marketing Manager | DSpencer@semtech.com | Semtech |
| 2:15 PM | 20 | Real-Time End-to-End Network Analytics Globally Synchronized by 1588v2 | Dr. Charles Barry | CTO | charlesbarryphd@hotmail.com | Jolata Analytics |
| 2:35 PM | End of Workshop - Final Remarks by the Chairman and Networking Coffee Break | | | | | |
| Tour, April 18, 2013 - Day 3 afternoon | | | | | | |
| 3:00-7:00 PM | Tour | | | | | |