atis
UPDATE

Advancing ICT Industry Transformation SUMMER 2016

PRESIDENT'S MESSAGE

Welcome to *ATIS Update*, which offers highlights of ATIS' recent accomplishments—thereby providing concise, high-level insight into important work shaping the ICT industry's future. This issue comes following ATIS' return from another exciting 5G Symposium, held in Austin on May 23, in conjunction with *Light Reading*'s Big Communications Event. The packed-to-capacity event, our second 5G Symposium, proves that we are building a reputation for bringing together an all-star lineup of subject matter experts—all from ATIS member companies—to promote the work that is shaping the 5G future.

The Symposium closely dovetailed on the ATIS Annual Meeting of Committees held in Baltimore, with more than 200 ATIS member representatives attending. Among other highlights was the first face-to-face meeting of our new Evolution to Content Optimized Networks or "eCON" Initiative, launched as a priority of our board-driven Innovation Agenda. In April, ATIS participated in the Global Standards Collaboration (GSC) meeting in New Delhi, providing North American input into global initiatives on 5G, the IoT and more.

Now, back at home, the work continues at a fast-tracked pace. Our summer issue covers our new initiative on connected car cybersecurity, how ATIS work is mitigating caller ID spoofing, our location accuracy improvements for emergency calls, and more. Also, I am delighted to share that ATIS recently received a "Power of Association" award from the American Society of Association Executives for our wireless emergency alert work, specifically for "positively impacting America and the world" in the "Power to Prepare for the Future" category. These accomplishments are just some of items featured in this issue. Visit www.atis.org to learn about more on an ongoing basis.

Sincerely,

President & CEO
Susan M. Miller

FEATURED INITIATIVES

5G

Advancing the new network — and promoting ATIS members as the experts building the 5G future.

On Monday, May 23, ATIS produced its second 5G Symposium at *Light Reading*'s Big Communications Event in Austin. With more than one hundred attendees, the event audience was a full house throughout the workshop. Following an introductory session led by *Heavy Reading* analyst Gabriel Brown, all remaining speakers represented ATIS member companies—providing a successful showcase and highly interactive dialogue around both ATIS and 3GPP's 5G initiatives. Highlights included keynotes from both AT&T and new ATIS member, Facebook. All sessions were captured on video and are posted at www.atis.org/5g2016. In addition, *Light Reading* and *RCR Wireless* editorial staff provided media coverage of the event. ATIS would like to extend its thanks to all the member companies whose presentations helped to make the 5G Symposium a success: AT&T, Cisco, DISH, Ericsson, Facebook, Qualcomm, TELUS, Verizon, as well as event sponsors Cisco, Ericsson and Qualcomm.

While promoting members' 5G leadership, ATIS is also progressing its 5G work, advancing the business opportunities inherent in the new network. Most recently, the 5G Initiative has focused on further developing the identified breakthrough use cases with an emphasis on Quality of Experience (QoE). Steps are underway to define scenarios, creating a more detailed definition of the capabilities required to implement an Optimized User Experience solution. The goal is to ensure the new network optimizes QoE end-to-end by understanding the user's context, the network constraints, and the service factors that are most important to the user. This requires thinking beyond a narrow, traditional standards process. The work may employ open source solutions, crowd-sourced metrics and an ecosystem that includes both carriers and third-party content providers. The 5G Initiative's overarching approach will eventually include the perspective of the leading organizations that are driving the bulk of

content today, such as major Internet video sites. A white paper on QoE is planned for publication later this year.

CONNECTED CAR CYBERSECURITY

Addressing cyber issues for the vehicle sector. As another board-driven initiative, a new ATIS Ad Hoc group is addressing the importance of cybersecurity issues for the vehicle sector. Consumer confidence in, and, hence the success of, computer- and communications-controlled vehicles depends critically on end-to-end security.

The ICT industry is actively working to enhance security in its networks and devices to offer cyber intrusion detection and prevention functionality to vehicle OEMs, their suppliers, and customers. However, an industry-wide vehicle cybersecurity strategy is needed to ensure a consistent, coordinated approach to vehicle cybersecurity, help organizations avoid duplication of efforts and provide value both to vehicle OEMs and to the operators.

In March 2016, ATIS' Executive Committee identified the need to spearhead direct industry-to-industry dialogue with vehicle OEMs to develop improved cybersecurity standards, protocols, and processes. The ATIS Connected Car-Cybersecurity Ad Hoc is slated to:

- Assess the opportunity of opening the dialogue with the vehicle OEM community to develop a cross industry, connected vehicle cybersecurity strategy (e.g., Global Automakers, Alliance of Automobile Manufacturers), and

- Develop a position paper to identify how the ICT industry can assist the vehicle ecosystem in enhancing cybersecurity, including an assessment of evolving risk factors

ATIS representatives are invited to participate and contribute to this activity, and to assist with contacts and introductions to vehicle OEMs and their suppliers, based on ATIS member organizations' relationships with OEMs.

eCON

Laying the foundation for the network's evolutionary needs. The Evolution to Content Optimized Networks (eCON) Ad Hoc, launched in March, continues to develop a transformative "future state" model that builds upon current research and development efforts around content naming approaches. As part of industry outreach, eCON has received research and testbed presentations from the Center for Applied Data Analysis (CAIDA) on NDN and the Rutgers University WINLAB related to IoT solutions. The goal is to assess evolutionary approaches, like ICN, and develop directional guidance that could operationalize these solutions and lay the groundwork for evolution from host-centric, IP-based networks to networks based on named content, aligning with 5G, IoT and the future content market.

eCON is currently exploring a number of priority use cases and is assessing the most relevant opportunities for content optimization. Early discussions have identified some of the significant needs for the industry, including a security and trust model, user experience requirements, detailed naming structure, and a set of evolutionary steps. An initial outline has been developed to serve as the framework for the eventual report. As part of this work, to be completed later this year, eCON will develop a detailed set of recommendations that can facilitate a future cross-industry collaborative activity focused on an implementation level set of industry requirements for content optimized networks.

NFV FORUM

Defining NFV business requirements. The ATIS NFV Forum is working to develop a common industry framework to support the use of NFV technology to deliver services in scenarios involving more than one administrative domain. At the recent ATIS 5G Symposium at *Light Reading*'s Big Communications Event, this capability was highlighted as an important part of 5G networking. It also has applications in the delivery of Neutral Host wireless services in shared public spaces. (More on ATIS' Neutral Host work in the TOPS Council section of this issue of *ATIS Update*.) The NFV forum's recently published report on *Inter-*

Administrative Provider NFV Technical Requirements defines a basis for further work including security and service discovery requirements. The NFV Forum is collaborating with the ATIS Ordering and Billing Forum to create a framework for ordering NFV services

TOPS COUNCIL INITIATIVES

oneM2M OPEN SOURCE COMMUNITY

Advancing the oneM2M specifications essential to enabling large-scale implementation of the IoT. The oneM2M Open Source Landscape Team was launched in November 2015 to progress the solutions needed to advance IoT services, which are projected to be entering a period of great growth in the coming decade. oneM2M, the global standards initiative for M2M and the IoT, completed Release 1 of its technical specifications in 2014, and is actively working towards subsequent releases including additional technologies. The oneM2M Open Source Landscape Team has evaluated existing open source implementations of oneM2M standards in order to identify possible areas to improve their value to the industry. As a result of this study, the Landscape Team identified that implementation of very lightweight clients (e.g., for Smart Grid and Smart City applications) required work beyond existing oneM2M standards and implementations. The team is now completing an industry survey to assess the demand for such lightweight clients and to establish the industry priorities. This work will direct any future activity in the Landscape Team.

NEUTRAL HOST

Solutions to more effectively deliver carrier wireless in shared public spaces settings. The Neutral Host Landscape Team was launched to address the economic deployment of small cells in an enterprise and other community spaces to provide uniform continuation of licensed cellular coverage for all users, e.g. employees, customers and guests. This business need currently requires small cells from all interested wireless providers to be deployed, creating complex and costly parallel infrastructures. The Landscape Team is developing a white paper to examine and analyze neutral host solutions. They are also working

to catalog and assess the technical, logistic and business barriers to more widespread adoption and generate recommendations to facilitate overcoming these barriers. The white paper will focus on the technical aspects, rather than a business analysis, and is scheduled for completion in the third quarter of 2016.

TESTBEDS

Advancing key industry priorities through coordinated research and action. As the all-IP migration evolves, ATIS is fulfilling a critical need to bring the industry together to test and validate emerging solutions. The TOPS Council's Testbeds Focus Group is evaluating existing testbed activities to identify common requirements and recommend the best path forward in key areas, including: numbering, IP-NNI routing, and authenticated caller-ID. Early this year, work began to: assess the functional use of components of existing test plans such as those from the MultiService Forum; develop detailed test plans; identify dependencies for each test; determine any additional needs for components or required protocols; identify priority areas for testing. These coordinated testbeds are essential in validating solutions or providing proof-of-concept in the all-IP migration and to facilitate interoperability testing between providers. You'll find more on this Focus Group's work to develop test cases involving a variety of resources that validate end-to-end calling scenarios to address mitigation techniques for illegitimate uses of Caller ID spoofing and robocalling in the *Mitigating Caller ID Spoofing* section of this issue of *ATIS Update*.

WI-FI EMERGENCY CALLING

Promoting safeguards for emergency services. In February, ATIS launched the Wi-Fi Emergency Calling Landscape Team to analyze the impact of 9-1-1 calls made over a service-provider-offered "Voice over Wi-Fi" service. These service offerings work fine for normal calls, but emergency calls involve a number of additional functions (i.e., providing location information and supporting call-back). It is not clear the service would provide all required functionality for 9-1-1 calls in a standardized, interoperable manner. This initiative will develop use cases that reflect all aspects of end-to-end 9-1-1 calls, including functions performed solely within

the public-safety answering point (PSAP), to determine if all required functionality is available. Currently, The Landscape Team is surveying to see if additional standards are needed to make VoIP emergency calling more reliable. This work will identify specific needs to support Wi-Fi emergency calling use cases. The proposed initiative will also determine work items for various ATIS committees and/or 3GPP contributions.

TOPS COUNCIL PRIORITY PLANNING

To address the industry's high-priority and emerging technology imperatives in a more organic, timely matter, the TOPS Council is now moving to a six-month planning cycle. The objective is to: focus on fewer priorities at a time; enable more flexibility in dealing with the ATIS membership's evolving business needs; and more effectively utilize valuable resources. The TOPS Council's Planning Team will meet monthly to discuss the first few initiatives identified as "ready now" with additional consideration for those areas suitable for future attention. The goal is to slate topics that would benefit from accelerated activity beginning before the end of this year, as well as those to be revisited again after Q1 2017.

INTER-COMMITTEE AND FORUM ACTIVITIES

MITIGATING CALLER ID SPOOFING

Industry-driven solutions to a high-visibility issue. ATIS' work addressing caller ID spoofing recognizes the high profile of this issue among consumer groups and regulators and is geared toward delivering industry-driven solutions to mitigate the problem. The work addresses the multi-faceted problem from all critical angles, calling on the expertise of multiple working groups and committees:

- The TOPS Council Calling Party Anti-Spoofing Landscape Team undertook a priority activity to consolidate the work underway across ATIS, and to synthesize these efforts into a coherent summary of the industry landscape. In April, the Landscape Team published the white paper entitled *Calling Party Spoofing Mechanisms and Mitigation*

Techniques. This document was distributed to Congressional policymakers, the FCC, and others. It concludes that a layered approach, similar to that used in cybersecurity, provides the flexibility to respond to these evolving threats, and that mandating a single "solution" to Caller ID spoofing would be counterproductive. Every carrier has different network configurations and services, so a single mandated solution would inevitably have ongoing exposures, and fraudulent callers would simply find other ways to exploit existing or future infrastructure. An overview of the paper was presented at a recent M3AAWG workshop organized by the Federal Trade Commission, providing a summary of standards work supporting spoofing mitigation techniques.

- PTSC is developing a report that will provide an analysis of the available and proposed mitigation techniques, and guidance on standard approaches for addressing originating party spoofing. The report recognizes that every carrier has a unique network, which would undermine the effectiveness of a mandated solution. A "safe harbor" approach based on best practices would be a more effective and flexible way to address illegitimate calling party spoofing.

- The IP-NNI Task Force, a joint effort between ATIS and the SIP Forum, is leading an initiative to enhance the IETF Secure Telephone Identity Revisited (STIR) protocol to make it suitable for service providers. The group is also developing an implementation framework (SHAKEN) that will support interoperability and requirements to ensure that validation information is displayed to the user in a consistent and understandable format.

- The TOPS Council Testbeds Focus Group is implementing a plan to validate key network capabilities supporting the IP transition, including number assignment, routing, and spoofing mitigation techniques. As an initial priority, the ATIS testbed will validate the STIR protocol in realistic network configurations to ensure the protocol works as intended and to demonstrate the industry is serious about addressing illegitimate calling party spoofing. A key component of these tests will be provided by another TOPS Council initiative:

an open source number assignment distributed registry.

- The Next Generation Interconnection Interoperability Forum (NGIIF) is analyzing the operational implications of robocalling and caller-ID spoofing and has recently published a document outlining relevant best practices in this area, *Next Generation Network (NGN) Reference Document Caller ID and Caller ID Spoofing*.

- ATIS' Policy efforts have coordinated with the FCC and provided Ex Parte filings and briefings discussing progress and challenges as the industry moves to address this problem.

SOLUTIONS AND STANDARDS

LOCATION ACCURACY IMPROVEMENTS FOR EMERGENCY CALLS

ATIS is an industry focal point for the work that is creating the future of location accuracy technologies. The goal is to help emergency responders more quickly locate wireless 9-1-1 callers. ATIS is developing and implementing many of the requirements set forth in the *FCC's Fourth Report and Order on Wireless E911 Location Accuracy Requirements* (FCC R&O). A few of our recent accomplishments are highlighted here:

New standards to put FCC requirements into action. ATIS' Emergency Location Task Force (ELOC) has already contributed a location accuracy testing methodology in response to the FCC R&O, and in early May, ATIS delivered the first phase of the standards, *Location Accuracy Improvements for Emergency Calls*. The new standard includes specifications for location accuracy improvements for emergency calls specific to North American regulatory policies and practices, and was delivered ahead of the target deadline. It provides the architecture and requirements for the implementation of the Nationwide Emergency Address Database (NEAD), which will store information related to the location of Wi-Fi access points and Bluetooth beacons in an effort to provide dispatchable location information to public safety.

Determination of test bed location(s) and blending methodologies for assessing accuracy compliance. At its May 19 meeting, ATIS' Emergency Services Interconnection Forum (ESIF) reached consensus on major topics involved in the completion of "Test Bed and Monitoring Regions Definition and Methodology." This work comes in response to the FCC R&O, which requires that an independently administered and transparent test bed be established that will test carrier-deployed location technologies used to provide location for 9-1-1 calls placed both indoors and outdoors. It was noted that the test bed must involve testing in representative indoor and outdoor environments and capture certain performance attributes including: location accuracy, latency (Time to First Fix), and reliability (yield). The following will be addressed: the geographic locations (regions and morphologies) that will comprise the test bed; the six geographic regions where live 9-1-1 calls will be monitored; how different morphologies, regions, indoor/outdoor can be combined into a comprehensive accuracy performance metric; and identification of potential methodology differences between testing for compliance and technology evaluation.

Altitude measurement to obtain more accurate and actionable indoor wireless 9-1-1 location. With a growing proportion of callers relying exclusively on wireless in their homes and consumers increasingly using wireless handsets to call 9-1-1 from indoor locations, obtaining reliable caller altitude (z-axis) information and relaying it to emergency dispatchers is more important than ever. New technologies are emerging to try to tackle the challenges of providing accurate z-axis information. The FCC R&O establishes timelines for the wireless industry to define metrics for achievable z-axis accuracy, to be derived from "an independently administered and transparent test bed process" and to be implemented in the indoor wireless location test bed. ATIS, in its traditional role of creating timely consensus solutions to challenging requirements, has tackled this topic. It is creating a standard set of methodology guidelines for testing z-axis solutions, particularly those that are currently the most likely to be deployed, which are based on barometric pressure measurements. The *Guidelines for Testing Barometric Pressure-Based Z-Axis Solutions* (ATIS-0500030) provide

guidance for testing barometric pressure-based z-axis measurement systems, which are being proposed to enable more accurate and more actionable indoor wireless 9-1-1 location. The document covers the various existing ATIS resources tackling indoor wireless location testing, and articulates guidelines specifically targeted to testing the altitude component in the wireless E9-1-1 context.

ATIS supporting 9-1-1 location technologies test bed. In 2015, ATIS was selected as project manager for the 9-1-1 Location Technologies Test Bed, LLC, an independent entity established by CTIA®. An initial accomplishment was to serve as project manager for the RFP process to help select a vendor for the administrator role. In March of this year, LCC Design Services, Inc., a Tech Mahindra Company, was selected as administrator for the indoor 9-1-1 location accuracy test bed. As the independent administrator of the test bed, LCC will develop a process to evaluate the indoor performance of wireless carriers' deployed and new technology vendor's wireless 9-1-1 location accuracy solutions. The test bed results will provide critical information to determine compliance with the FCC's rules requiring wireless carriers to improve 9-1-1 location accuracy when using mobile devices and potential improvements to existing capabilities that will enhance public safety's abilities to respond to emergencies quickly and safely. ATIS will continue to oversee test plan implementation carried out by the test bed administrator, LCC. The two-tiered partnership will ensure the test bed produces unbiased data in a timely manner for the various stakeholders in accordance with the FCC's rule.

ADVANCING THE CALIFORNIA EARTHQUAKE EARLY WARNING SYSTEM

Innovations to help mitigate the impact of natural disaster. Last year, ATIS produced a *Feasibility Study for an Earthquake Early Warning System* (ATIS-0700020). This study evaluated the techniques to distribute Earthquake Early Warning (EEW) notifications to the general public through cell phones via the cellular network in complement with the California Integrated Seismic Network. Among other things, the study concluded that a cellular wireless EEWS is a viable concept for the distribution of time-sensitive EEW

notifications using capabilities on the LTE broadcast channel. This concept has the potential to quickly reach millions of users in an inherently geo-targeted fashion. Since ATIS completed the study, California Gov. Jerry Brown has asked the state to allocate $10 million to the network, which is now set to debut in 2018. Standards development is now needed to progress the EEWS. Therefore, in May, ATIS WTSC initiated a project to develop the requirements and architecture for an LTE-based Earthquake Early Warning System. This work will continue to be progressed in collaboration with the California Office of Emergency Services, USGS, and other EEW stakeholders.

Also, on June 8, ATIS submitted comments to the FCC in response to its *Public Notice on Ways to Facilitate Earthquake-Related Emergency Alerts* (PS Docket 16-32). The comments highlighted some of the challenges with using Wireless Emergency Alerts (WEA) for EEWS, noting that significant work is taking place within the industry to evaluate the technical requirements and architecture associated with the development and deployment of EEWS. ATIS requested that the FCC allow the industry to continue this effective public-private collaborative effort and not to develop any regulatory mandates or requirements at this time.

NATIONWIDE NUMBER PORTABILITY

Advancing numbering solutions that fit how consumers live now. PTSC is in the final stages of completing a study outlining the characteristics of the current U.S. local number portability implementation based on use of the Location Routing Number (LRN) method, exploring different approaches for implementing nationwide number portability (NNP) and their impacts. The report comes in response to the Federal Communications Commission (FCC) asking the industry and the North American Number Council (NANC) to determine what changes are needed to existing infrastructure and procedures to permit users to port an E.164 geographic telephone number beyond current limits to any area of the nation, as well as other related questions. NANC indicated that change to the technical solution for number portability would most appropriately come from the PTSC. The forthcoming PTSC study also contains ATIS' response to these questions, which will be available in the ATIS Document

Center once complete, to help enable widespread adoption and implementation of the solution.

NEW VERSION OF THE ASOG COMING THIS FALL

Further refining this valued industry resource. At its most recent face-to-face meeting from May 16-18 at the ATIS Annual Meeting of the Committees (AMOC), the Ordering and Billing Forum (OBF) Access Service Ordering (ASO) subcommittee addressed the major issues that will be included in the Access Service Ordering Guidelines (ASOG) Version 54. Version 54 will be released on September 23, 2016, and is scheduled for implementation on March 18, 2017.

The OBF Ordering Services (OS) Subcommittee met during AMOC to revise the Joint ATIS OBF/MEF Carrier Ethernet Ordering Framework working draft. The joint OBF OS/MEF group recently agreed to a timeline for completion of the new ASOG specification, including having the framework available for comment by August 2016. Last year OBF and MEF completed joint work to update the Access Service Request (ASR) ordering process to fully support MEF-defined Carrier Ethernet services. These ASR updates have greatly sped up service deployment by giving service providers a standards-based guide to automate and operationalize their carrier Ethernet services.

TELECOM SUSTAINABILITY ENERGY AND PROTECTION

Innovative new industry resources advanced for publication. ATIS' STEP is involved in several forefront initiatives that are enabling vendors, operators and their customers to deploy and operate more reliable, environmentally sustainable, and energy efficient communications technologies. At its recent May meeting, among its many priorities, the following STEP documents were approved for publication:

- *Guidelines for Copper Theft Deterrents in the Telecom Industry*, which is an application guide, including best practices, for the use of materials alternative to traditionally used copper primarily for above grade grounding systems at telecommunication facilities.

- *DC Power Wire and Cable for Telecommunications Power Systems – for XHHW and DLO/Halogenated RHW-RHH Cable Types*, which establishes a minimum requirement for additional single conductor copper DC power cable used to connect telecommunications DC power systems to telecommunications load equipment.

- *UPS TEER Ratings*, which provide the methodology to be used by vendors and third-party independent laboratories in the formation of telecommunications energy efficiency ratios (TEER) for various typical operating modes of Uninterruptible Power Supply/System (UPS) systems.

Other work underway includes developing:

- Method for determining the energy efficiency of router and Ethernet switch products;

- Additional Outside Plant test requirements including, but not limited to, salt, fog and wind driven rain;

- Guidance for fuel cells as backup generators; and

- Methodology to be used by vendors and third party test laboratories in determining base station input power and energy efficiency.

oneM2M

ADVANCING INTERCONNECTION IN THE IOT

Newly updated global IoT standards from oneM2M will enable interconnection across devices and applications.

In March, oneM2M, the global standards initiative for Machine-to-Machine (M2M) and the Internet of Things (IoT), published updated editions of its Release 1 global specifications. This development promises to enable IoT interworking and create a foundation platform to interconnect IoT devices and applications. The standards cover requirements, architecture, application programming interface (API) specifications, security solutions and mapping to common industry protocols such as CoAP, MQTT and HTTP. The updated

specifications, released just one year after initial publication, have incorporated improvements based on early implementation experience and feedback from oneM2M's first Interop event held last year. By building upon well-proven protocols that allow applications across industry segments to communicate with each other, the updated standard enables service providers to combine different IoT devices, technologies and applications, a critical feature in their efforts to provide services across a range of industries. Release 1 has already been used in service provider deployments in South Korea, Asia and Europe for smart city and transport system deployments. The next oneM2M release is to slated to incorporate security and interworking across IoT device ecosystems. ATIS is a oneM2M founding partner.

NEWS

ATIS WINS "POWER OF ASSOCIATIONS" AWARD FROM THE AMERICAN SOCIETY OF ASSOCIATION EXECUTIVES

In early June, the American Society of Association Executive named ATIS a "Power of Associations" Award winner. The award recognizes associations' role in positively impacting America and the world. ATIS was granted this honor in the "Power to Prepare for the Future" category. Our entry featured WTSC's work to deliver consumers life-saving wireless emergency alerts. The Award also recognizes ATIS for bringing together its members in a non-competitive environment for industry collaboration. ATIS will be promoting this news widely.

ATIS PROVIDES INSIGHT TO CANADIAN GOVERNMENT

Advancing ATIS' unique role at the intersection of where technology impacts policy. ATIS has announced it is extending its role with members Bell Canada and TELUS to interface with the Canadian Radio-Television and Telecommunications Commission (CRTC) and provide regular briefings on current and emerging technologies and solutions in the North American ICT industry. On behalf of TELUS and Bell Canada, ATIS will play both an educational and advisory role to facilitate the Canadian

policy makers' understanding of the industry's direction on important matters including network evolution, IP network-to-network interconnection, NFV and SDN technologies, mobile device theft prevention, Wi-Fi emergency calling, Smart Cities and more.

GSC 2016 - NEW DELHI

North American input into the global standards-making process. The Internet of Things (IoT), 5G, security and privacy and the role of small- and medium-sized business enterprises (SMEs) were the focus of the 20th meeting of the Global Standards Collaboration (GSC), hosted by TSDSI in New Delhi, India April 26-27, with an ATIS delegation attending. These topics were chosen due to their significance for the development of future global communications. Approximately one hundred people from the twelve member organizations participated in the event.

- **The Internet of Things (IoT)** remains a key topic for standardization and attracts interest from industry, public authorities and end users. GSC members reviewed current standardization activities focused on specific applications and use cases, such as smart cities and intelligent manufacturing.

- **5G** will be instrumental in driving the ongoing digital transformation, responding to a wide variety of communication needs. GSC members discussed current and anticipated standardization and research activities in the 5G area. They noted the importance of engaging both regulators and businesses in the development of 5G and reiterated the need for continued collaboration among SDOs.

- **Small and Medium-sized Business Enterprises (SMEs)** play a critical role in the growth of the global economy. Standards support innovation, competition and growth by all businesses, particularly SMEs. GSC members shared their experiences on the difficulties and barriers faced by SMEs and discussed ways to foster their involvement in standardization efforts.

Learn more at the ITU repository of information on past GSC meetings at www.itu.int/ITU-T/gsc.

CELEBRATING THE 2016 ATIS AWARD WINNERS

Join ATIS in congratulating the winners of the 2016 ATIS Awards. This year's ATIS Annual Meeting of the Committees took place May 16-20 in Baltimore, Maryland's Inner Harbor, with more than 200 ATIS member representatives attending. With a full slate of meetings and networking events, members have hailed the 2016 gathering as one of ATIS' best meetings ever.

On May 17, during the Member Recognition Luncheon, the 2016 Annual Awards took place. These awards recognized nine technology leaders and industry subject matter experts for their critical contributions to ICT solutions development in support of ATIS' strategic initiatives. Awards were presented in four categories: the ATIS President's Award, Leadership, Distinguished Service and Achievement.

Farrokh Khatibi of Qualcomm received the ATIS' President's Award for his many contributions to ATIS' Wireless Technologies and Systems Committee, its Technology and Operations Council initiatives, as well as 5G Ad Hoc.

The Award for Leadership is given to leaders whose vision and leadership over the past 12 months resulted in the timely creation of one or more of ATIS' industry solutions. This year, two Leadership Awards were presented - to Kelly Springer of AT&T and to Susan Sherwood of Verizon Wireless for their leadership as 2015 co-chairs of the Emergency Services & Methodologies Subcommittee of ATIS' Emergency Services Interconnection Forum.

Martin Dolly of AT&T received the ATIS Distinguished Service Award for his leadership and contributions in ATIS' Packet Technologies and Systems Committee.

Five individuals received an ATIS Achievement Award. This award is presented to those who provided crucial contributions to the completion of ATIS solutions and standards during the past year. The 2016 recipients are: Jim Wiese of ADTRAN, Mark Rubino of Ericsson, Chris Wendt of Comcast, Chris Oberg of Verizon Wireless, and Stephen Edge of Qualcomm.

ATIS WEBINARS

Access the insights of these recent ATIS webinars. Now online for on-demand listening and viewing:

WHY INDUSTRY NEEDS TIME: A POWER INDUSTRY CASE STUDY

Precision Time is becoming increasingly important in many industries. Applications and industries that benefit from accurate time include:

- Mobile Networks
- Power & Smart Grid
- Finance
- Industrial Automation
- Automotive
- Smart Cities
- Audio and Broadcast

This webinar addressed the following topics:

- Why these different industries need time
- How these applications can get precision time across small or large networks
- Power industry case study – Bonneville Power
- The challenges of GPS/GNSS
- Solutions deployed in the market today

This webinar is now available for on-demand viewing. You can also download a copy of the presentation slides.

RECENT ATIS EVENTS

ATIS PROTECTION ENGINEERS GROUP CONFERENCE

ATIS' Protection Engineers Group (PEG) Conference took place April 5-7 at CenturyLink Headquarters in Monroe, Louisiana, with more than 60 participants in attendance. The 2016 PEG Conference promoted discussion on how basic electrical protection principles are applied to today's network, and the challenges of providing media services in more decentralized networks. Glenn Garbelman, Vice President Video Operations and Systems Support, CenturyLink, delivered the keynote address. The full agenda provides an overview of the leading issues in protection engineering today. And vendor demonstrations took place to keep participants up to date on the latest protection engineering technologies, services, equipment and supplies from the field's most-recognized and respected manufacturers. The 2017 PEG Conference will take place March 21 – 23. The location is currently being determined. Learn more about PEG 2016 at www.atis.org/peg.

WORKSHOP ON SYNCHRONIZATION AND TIMING SYSTEMS

The NIST-ATIS Workshop on Synchronization and Timing Systems (WSTS) 2016 took place June 13-16 in San Jose, CA, with more than 140 participants attending, topping last year's attendee count by 40 percent. Time and frequency synchronization are critical enablers of next generation communications systems as well as the Internet of Things. The NIST-ATIS workshop highlighted both developing sync requirements and deployment strategies for new sync systems and standards. The industry views WSTS as an essential primary source for information about the effects of evolving synchronization systems on network operators and equipment manufacturers. Learn more about WSTS 2016 at www.atis.org/wsts.

UPCOMING ATIS EVENTS

2017 ANNUAL MEETING OF THE COMMITTEES

May 7-12 | Bellevue, WA

ATIS' 14th Annual Meeting of the Committees will take place May 7-12 in Bellevue, Washington at the Hyatt Regency Baltimore. Be sure to attend to conduct your committee work and participate in the networking opportunities with some of the forward-looking problem solvers and visionaries in ICT today—ATIS members! Learn more at www.atis.org/amoc.

UPCOMING INDUSTRY EVENTS

5G WORLD

June 28-30 | Kensington Olympia, London

www.5gworldevent.com

ATIS is a Supporting Organization.

WORLD SMART CITY FORUM

World Smart City Forum
13 July 2016
www.worldsmartcity.org

July 13 | Marina Bay Sands, Singapore

www.worldsmartcity.org

ATIS is a Supporting Organization.

NGMN INDUSTRY CONFERENCE AND EXHIBITION 2016

Oct. 12-13 | Frankfurt, Germany

www.ice2016.ngmn.org

ATIS is a Supporting Organization.