

IN THIS ISSUE

FEATURED INITIATIVES

- [ATIS' Innovation Agenda](#)
- [5G Initiative](#)
- [Cybersecurity](#)
- [NFV Forum](#)
- [ATIS and SIP Forum IP-NNI Task Force](#)

TOPS COUNCIL INITIATIVES

- [IP for Public Safety](#)
- [Intelligent Programmatic Peering](#)
- [Testbeds](#)
- [New TOPS Council Priorities](#)

STANDARDS AND SOLUTIONS

- [Emergency Services - Location Accuracy](#)
- [Emergency Services - Wireless Emergency Alerts](#)
- [Caller ID Spoofing/Robocalling](#)
- [Mobile Device Theft Protection](#)
- [Real Time Texting](#)
- [Energy Efficiency](#)
- [IP NGN Enhanced Calling Name \(eCNAM\)](#)

NEWS

- [oneM2M](#)
- [5G Cooperation](#)

INDUSTRY EVENTS

PRESIDENT'S MESSAGE



Welcome to this issue of the *ATIS Update*. In it you'll learn about ATIS' new Innovation Agenda, which is spawning a host of new projects — most notably an initiative that is mapping the path to the 5G future and creating the solutions to get there. Designed to identify the business opportunities inherent in the new architecture, ATIS' 5G Initiative builds on our

long-standing success in technical analysis and an extensive track record in developing solutions for previous generations of wireless technology. Already it has produced an analysis to better understand, define and advance the North American requirements for 5G.

In this issue of the *Update*, you'll also be introduced to our emerging plans for initiatives leveraging open source to deliver service provider solutions in key areas, our accomplishments to advance inter-provider NFV, as well as the work that is improving the location accuracy of our 9-1-1 networks and technologies. As you can see the work is comprehensive, focused, and is delivering the solutions the ICT industry needs timed to market demands. Thank you for taking the time to learn of ATIS' contributions — **the work that is advancing ICT industry transformation.**

Sincerely,

President & CEO
Susan M. Miller

FEATURED INITIATIVES

ATIS' Innovation Agenda. *Collaboration for solutions to emerging industry challenges.*

Earlier this year, the ATIS Board of Directors set into action an Innovation Agenda, designed to foster member education and idea sharing, as well as the potential for industry alignment on key priorities. The agenda is also the means by which ATIS is fast-tracking these emerging priorities into action. The 5G Initiative is the first to come out of this process. Other topics being addressed include cybersecurity and open source. Future topics slated for engagement: service delivery scale, service assurance, enhancing network value, solutions development process and emerging technologies.

ATIS Innovation Agenda

Actionable answers to questions such as:

1. What do we see the state of industry and technology to be in the next two years, by 2020, and beyond?
2. What do we see that could happen that is not obvious now?
3. What will be the impact on the marketplace?
4. What actions should be taken, if any?

5G Initiative. *Identifying the new business opportunities inherent in a new architecture.* ATIS' 5G Initiative builds on our long-standing success in technical analysis and developing solutions for previous generations of wireless technology and our extensive involvement in carrier and cable networks. The Initiative is taking a unique approach by launching two parallel efforts to progress this work from different perspectives:

1. **The evolution of 4G/LTE to 5G and North American regulatory requirements.** A main ATIS goal is to enable service providers to leverage their existing and planned LTE investments to ensure 5G's success. In partnership with members and colleague organizations, ATIS' 5G initiative is assessing use

cases that are focused on the North American market, and will contribute the corresponding requirements to global 5G efforts. This work will ensure that global solutions are leveraged wherever possible, while ensuring that North American market needs are met.

2. **The 5G Initiative also encompasses a "disruptive" perspective that considers solutions not constrained by existing service requirements or architecture.** Here, ATIS will conduct an assessment of more disruptive 5G models based on alternative business models and simplified service definitions. This work will leverage North America's recognized role as the incubator of new business models.

White papers will be published by year-end that incorporate conclusions from both work teams. An initial paper is currently complete, which provides detailed use cases from both 5G work teams. A second will follow, which will provide more detailed analysis and recommendations.

As a part of its 5G Initiative kick-off activities, ATIS held a 5G Symposium in June. Featuring presentations from ATIS member representatives, the Symposium focused on the North American as well as the international opportunity 5G presents. The event was co-located at *LightReading's* Big Telecom Event (BTE) 2015. Click [here](#) to access the insights delivered. An overview of ATIS' 5G program was also presented at the 3GPP Workshop on 5G in Phoenix in September.

Cybersecurity. *Leveraging existing frameworks to make them more effective for service providers.*

The Innovation Agenda has also set into motion a Cybersecurity Ad Hoc Group, with a mission that is both strategic and tactical, and an approach that has been described as not a technology-centric process, but a business-centered one. Already, the Ad Hoc has completed an analysis of current cybersecurity-related regulatory activities. It is examining the cybersecurity frameworks that currently exist and determining how to best apply them to the communications industry. This work will provide an overview of the [Cybersecurity](#)



[Framework](#) developed by the National Institute for Standards and Technology, contribute best practices for application in large organizations with complex supply chains, as well as recommendations to adapt and improve these, as appropriate, from a carrier perspective. Another main impetus is to better understand the environment, emerging threats and association use cases. The Group's overarching goal is to create an ongoing forum for exchange of threat information and best practices as well as strategies to address these threats, and to reach consensus on form and mechanisms for dialogue outside of ATIS. The ATIS Cybersecurity Ad Hoc differs from most other cybersecurity initiatives by providing a unique opportunity to share cybersecurity information in a safe environment, and then decide what information needs to remain private, and what information should be shared with the broader industry.

NFV Forum. Defining NFV business requirements.

Earlier this year the Network Functions Virtualization (NFV) Forum completed [eight inter-provider use cases](#) designed to enable new service provider business models and improve customer services by dynamically combining NFV resources from several providers. These inter-provider use cases are helping the industry better understand how NFV will address operators' challenges including ever-growing mobile data demand and the need to increase service velocity.

At an October 7 meeting at ATIS headquarters, the NFV Forum advanced the issue of *Standardized Service Function Catalog of Unique Identifiers & Attributes for Inter and Intra Domain*. The availability of a standardized service function catalog is a key enabler for inter-provider NFV. The group sketched a framework for how the three defined catalogs (global service catalog, network provider catalog and service provider catalog) would interact. The CDN use case completed earlier this year was used as an example to demonstrate the proposed flow of data through a global service catalog framework. This allowed participants to specifically target areas that need further discussion and definition. At its meeting, the Forum reached an understanding regarding next steps to develop the baseline document for service

catalog, and it will be working with ATIS staff to ensure the development of this document is aligned with the Requirements document (Issue 3) already in progress. Input on NFV Forum work is being developed for inclusion in the ETSI EVE Document 006. Forum members have emphasized that the NFV Forum work on service catalog framework and interconnection is significantly different than ETSI's work. This provides a prime opportunity for ATIS to continue to take an industry leadership role in the NFV space.

ATIS and SIP Forum IP-NNI Task Force. Delivering the first consensus-driven standardized IP NNI. In July, the [ATIS/SIP Forum Joint Task Force](#) announced completion of the first standardized IP-based network-to-network interconnection (NNI) with consensus across North American Service providers. This accomplishment enables a major objective identified in the [United States National Broadband Plan](#), to ensure that all service connections between providers occur at the Internet Protocol (IP) level. Two completed documents provide a detailed, protocol-level IP-NNI specification for one service - voice. From this initial profile, further specifications can more easily be developed. The two ratified documents are (1) [IP Interconnection Profile](#), which describes a reference architecture and specifications for both the protocol and media as it appears "on-the-wire" at interconnect points; and (2) [IP Interconnection Routing Report](#), which documents mechanisms for identifying the preferred IP interconnection point for a given phone number. By simplifying IP interconnection for voice and making it easier to set up IP services, the groundwork is in place for delivering ubiquitous advanced real-time communications. Learn more in the *Light Reading* coverage on this topic, [Industry Coalition Agrees on IP Interconnection](#). The IP-NNI Task Force is now specifying a "verified token" that will provide a mechanism for service providers to verify calling party information. This will be an important mechanism to reduce caller-ID spoofing.

TOPS COUNCIL INITIATIVES

IP for Public Safety. Advancing public safety applications into the all-IP age. Converting critical public safety-related applications to all IP is a main focus of ATIS' IP-transition leadership activities. In July, the TOPS Council's Public Safety Related Applications Task Force (PSRA-TF) delivered its findings to advance the all IP transition in critical infrastructure communications networks. Its findings will help advance the all-IP transition in critical public safety-related applications provisioned on legacy copper networks. These include alarm circuits to local fire and police departments, circuits to airport towers and alarms, circuits monitoring railroad crossings, as well as for sensors at gas and power company locations. The PSRA-TF's findings offer insight into the solutions needed to advance these technologies into the all-IP future and were presented in a webinar, now available for [on-demand viewing](#). You can also access a copy of the [presentation slides](#).

ATIS also has released a recently developed roadmap of IP-enabled solutions to more rapidly advance the transition of specific public safety applications to all-IP media, products and services. This new ATIS resource takes a broad view of the current public safety requirements and identifies current and future solutions available across the industry. From there, it provides an overview of the new capabilities that could be implemented to speed and streamline the adoption of all-IP within technologies essential to saving lives and property. Access the new report, [Developing a Roadmap for the Migration of Public Safety Applications During the All-IP Transition](#), in the ATIS White Paper Center.

Intelligent Programmatic Peering. Mitigating DDoS attacks — and more. The Intelligent Programmatic Peering Landscape Team (IPLT) was convened to create industry solutions to identify mechanisms to leverage SP to SP communications to better mitigate DDoS attacks. The IPLT has specifically addressed the fact that existing DDoS mitigation techniques do not use real-time information exchange between SPs. The IPLT has assessed available mechanisms for addressing the

problem including RTBH Filtering (Remotely Triggered Black Hole), Policy Based Routing, and BGP FlowSpec. It is currently reviewing these mechanisms with an eye toward understanding the need for best practices and who should define these in the industry. The Landscape Team is currently posing critical questions to service providers, and developing a template for a "DDoS Mitigation Peering agreement." Its conclusions will be validated with service providers. A white paper will be published in November 2015.

Testbeds. The Testbeds Landscape Team is furthering a major industry objective of providing the critical testbeds needed to validate solutions needed to advance the all-IP transition, identifying common requirements and using findings to recommend a path forward. Three key areas for this work are numbering evolution, IP-NNI routing, and authenticated caller-ID. Thus far, the Landscape Team has identified nine use cases of interest, involving number provisioning, IP-NNI routing and secure caller-ID. It is currently developing detailed test scenarios for each and will make comprehensive recommendations for conducting testing. Final reports from this testing are expected to be issued in late 2016 into 2017, depending on lab availability. This work takes place in close collaboration with the ATIS-SIP Forum IP-NNI Task Force and other ATIS groups.

New TOPS Council Priorities. Emerging industry priorities slated for advancement. At the most recent face-to-face meeting of the Council held October 8 in Washington, DC, the Council discussed and prioritized its priorities slated for 2016:

- Number Assignment/Distributed Registry (Open Source)
- oneM2M Open Source Community
- Neutral Host
- WiFi Emergency Calling
- Calling Party Anti-Spoofing
- WebRTC Signaling Server (Open Source)

The oneM2M Open Source Community, calling party anti-spoofing and wifi emergency calling initiatives are already underway—with the rest soon to follow in the upcoming year.

STANDARDS AND SOLUTIONS

Emergency Services - Location Accuracy. Leadership to improve the location accuracy of 9-1-1 networks and technologies:

- **CTIA Names ATIS Program Manager** for two critical initiatives designed to improve indoor wireless 9-1-1 location accuracy:
 - **Location Accuracy Test Bed.** ATIS has been chosen by the 9-1-1 Location Technologies Test Bed, LLC, to [serve as the Program Manager for the upcoming test beds](#). At the onset, these will test existing indoor location technologies; future test bed efforts will test emerging wireless location technologies. This test bed has been established consistent with the [FCC's Fourth Report & Order on Wireless E911 Location Accuracy Requirements](#), which prescribed various timelines and compliance measures that carriers must meet. Serving as the Program Manager will require ATIS' oversight and supervision of the company that will execute the requisite location technology test plans. ATIS is well-suited for the task since much of the testing will be based upon both existing and planned work by the Emergency Services and Methodologies (ESM) subcommittee of ATIS' Emergency Services Interconnection Forum (ESIF). [Learn more](#).
 - **National Emergency Address Database (NEAD).** ATIS has also been chosen by the NEAD LLC, to serve as the Program Manager in the development of the NEAD. The primary function of the NEAD will be to store the location of a "beacon" device (e.g., WiFi or Bluetooth), and upon being queried, enable wireless providers to deliver a 9-1-1 caller's dispatchable location (e.g., a street address of the calling party, plus additional information such as suite, apartment or similar information necessary to adequately identify the calling party's location). The ATIS Emergency Location Task Force (ELOC) is developing the requirements for the NEAD and the management functions required to support it.
- **Other 9-1-1 Location Accuracy Initiatives.** Recent ESIF ESM activities to advance location accuracy include:
 - **Vertical axis measurement test methodology.** This work will contribute a vertical axis measurement test methodology, description of sources of error and their preferred test methods.
 - **Determination of Test Bed Location(s) and Blending Methodologies for Assessing Accuracy Compliance.** The [FCC's 4th Report & Order](#) requires a test bed be established that will test carrier-deployed location technologies used to provide location for 9-1-1 calls placed indoors and outdoors. In response, ESM is addressing 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 the different morphologies and regions will be combined into a comprehensive accuracy performance metric; and more.
 - **Identify Unique Considerations and Methodologies for Crowd-Sourced and Dispatchable Location Technologies.** ESM will address the unique considerations and methodologies to be applied to testing crowd-sourced (e.g., Wi-Fi and Bluetooth) location technologies, the unique considerations and methodologies to be applied to testing dispatchable location methods, as well as determining veracity of the location.

Emergency Services - Wireless Emergency Alerts.

ATIS undertook a series of new feasibility studies on potential technology solutions for enhancing wireless emergency alerts (WEAs). This work will address recommendations set forth in the 2014 FCC Communications Security, Reliability and Interoperability Council Working Group 2 report. Specifically, ATIS will:

- Investigate enhanced cell broadcast geotargeting for WEA alerts.
- Examine the feasibility and impacts of enabling a mobile device to display a map that shows the threat area for imminent threat alerts as well as the recipient's location in relation to that area.

- Study the capability to display a photo, such as that of a suspect, missing child, or abductor for Amber Alerts.

Already, ATIS has performed a feasibility study that provides a maximum WEA message length given capabilities of the LTE technology.

Caller ID Spoofing/Robocalling. Addressing consumer issues. As robocalling and spoofing rise in pre-eminence on the list of consumer concerns being addressed by the FCC, ATIS is developing industry solutions on several critical fronts:

- **Caller ID Spoofing, Robocall Mitigation Techniques.** On October 19, ATIS submitted to the FCC an overview of its comprehensive work program related to caller ID spoofing and robocall mitigation techniques. The document covers the active work programs of ATIS' Packet Technologies and Systems Committee (PTSC), Next Generation Interconnection Interoperability Forum (NGIIF), and other ATIS initiatives. ATIS' report to the FCC also covers the timeline for delivery of the ATIS industry solutions mentioned.
 - The PTSC program is specifically aimed at addressing caller ID spoofing events in IP networks, noting that spoofing of the originating (calling party) identity is used for vishing, robocalling, swatting, and anonymity breaking. PTSC is developing a technical report that will review the problems associated with originating party spoofing in IP communication networks and analyze mitigation techniques to better assess their applicability in the converged IP communication network environment.
 - ATIS NGIIF is developing a baseline document that discusses caller ID spoofing issues and methodologies to mitigate the impact of inappropriate caller ID spoofing. The work's purpose is to offer operational strategies that enhance the integrity of caller ID services. Expected to be completed in 2016, the work program will examine types of caller ID services, examples of caller ID spoofing and the use of auto dialers for purposes such as telemarketing, public service and/or political messages, and

security. The deliverable will also address the need to maintain the integrity of caller ID services, the impact of caller ID spoofing and relevant regulatory issues. NGIIF has published a number of documents that are also relevant to the examination of caller ID spoofing and robocalling. These include [Best Practices for Emergency Notification System \(ENS\) Call Volume Testing Procedure: Wireline \(ATIS-0300098\)](#) and [NGIIF Auto Dialers Reference Document - Auto Dialers Basics \(ATIS-0300105\)](#).

- **Speaking at the FCC Robocall and Caller ID Spoofing Workshop.** Martin Dolly, Technology Lead Member of the Technical Staff, AT&T, and Chair of ATIS PTSC, represented ATIS at the FCC Robocall and Caller ID Spoofing Workshop held on September 16, 2015, at the FCC headquarters in Washington, DC. The event was held to advance the agency's recent work in helping consumers fight unwanted robocalls by examining the current state of robocall-blocking and call-filtering solutions, steps industry is taking to protect consumer from these unwanted calls, and more. Dolly covered ATIS work programs, recent accomplishments and future work to address the challenge. His insights are available in the [full video coverage](#) of the event, and are best summed up as follows: There is no single solution to this problem. A layered approach implementing multiple mitigation techniques will be required. Read [Communications Daily coverage of the Workshop](#).

Mobile Device Theft Protection. Delivering best practices addressing a rising threat to mobile device users. ATIS recently published its best practices on mobile device theft protection, which directly addresses an FCC Technological Advisory Council objective to develop solutions to easily obtain the International Mobile Station Equipment Identifier (IMEI) from a mobile device. Providing such quick IMEI access, a key step in determining if a mobile device has been reported as stolen, will help ensure stolen devices are blocked from being placed back on the network. Implementation of the ATIS best practices will provide the quick, simple and consistent solution



to obtain the IMEI from disabled, locked or unlocked mobile devices. They are developed to help law enforcement, carriers, and third-party resellers obtain the IMEI by inputting a string of characters on the screen of a smartphone—even if the device has been locked or disabled.

Real Time Texting. Solutions advancing real time texting. ATIS is involved in several activities related to Real-Time Text (RTT). RTT, which can now be signaled over IP networks, is a term used to define the ability to instantly communicate text as it is typed, as opposed to after a sentence or thought is completed, in the manner of instant messaging. ATIS has recently completed a *Technical Report on Support of TTY Service over IP using Global Text Telephony*. This Report describes the means that the Teletypewriter (TTY) service can be provided over IP between operators' networks through the use of the Global Text Telephony capability, which enables simultaneous audio and/or video with text media stream. TTY service allows real time conversation in text between two persons having a TTY device. This service is supported through the circuit switched public network. While new Internet technologies have reduced the need for this service, it still plays an important role, especially for emergency 911 calls.

In support of the IP transition to facilitate a consistent use of RTT across multiple Commercial Mobile Service Providers, ATIS is also developing:

- (1) An RTT Mobile Device Behavior Specification, which standardizes the mobile device behavior for the handling RTT.
- (2) An RTT End-to-End Service Description specification, which defines the RTT end-to-end service behavior for handling RTT.

Energy Efficiency. *The metrics needed to better understand power consumption.* The Sustainability in Telecom: Energy and Protection Committee (STEP) recently released a new American National Standard, [*Energy Efficiency for Telecommunication Equipment: Methodology for Measurement and Reporting of Base Station Metrics \(ATIS-0600015.09.2015\)*](#). As service providers strive to optimize their equipment's energy

efficiency, they need a consistent methodology that vendors and third-party test laboratories can use to determine base station input power and energy. This new standard delivers a base station input power metric that is reported in Watts and is based on radio resource usage. Recognizing that no two base stations are used in the same way, it allows for other markets to create a customized and regionally relevant metric from the raw measurement data collected. The standard is unique in that it produces a single set of measurements that can be re-used by any jurisdiction both within and outside of North America to characterize base station input power.

Intercarrier Call Completion/Call Termination Handbook. *Industry resources addressing rural call completion challenges.* This October 2015, ATIS released its newly revised *Intercarrier Call Completion/Call Termination Handbook*. This latest version now includes important information about regulatory activity associated with rural call completion that has occurred since the Handbook's initial publication date in 2012. Recognized and valued by the FCC, the Handbook is a resource to carriers for addressing issues as encountered related to long distance call completion/call termination. It seeks to assess the challenges associated with the completion of long distance calls to rural telephone company customers and discusses industry standards and best practices relevant to ensuring call completion. Access the *Intercarrier Call Completion/Call Termination Handbook* [here](#).

IP NGN Enhanced Calling Name (eCNAM). *Defining a CNAM for all-IP.* In August, PTSC published a new standard, *IP NGN Enhanced Calling Name (eCNAM) (ATIS-100067.2015)*. This American National Standard defines a Calling Name Delivery service in the IP-based Next Generation Network (NGN). The enhanced CNAM (eCNAM) service includes a mandatory longer name field and optional additional information about the caller. This new North American standard focuses on service offerings where: (a) both calling and called parties are in the IP-based NGN network, and (b) the name and related information are obtained from a database. It delivers names in the extended ASCII

set2 supporting English and French characters. Access *IP NGN Enhanced Calling Name (eCNAM)* (ATIS-100067.2015) [here](#).

NEWS



oneM2M **ATIS and iconectiv Awarded Lead Management Roles in the New M2M Registry.**

ATIS and iconectiv have been awarded lead management roles in the development of the new Application Identifier (App-ID) Registry for oneM2M, the global standards initiative for M2M communications and the Internet of Things (“IoT”). oneM2M has designated ATIS, a oneM2M founding Partner, as the initial and exclusive App-ID Registry Management Authority. In this role, ATIS will oversee the launch of the official oneM2M App-ID Registry to ensure globally unique registered App-IDs are openly available to developers based upon oneM2M specifications. The App-ID Registry will be a critical industry resource given the number of applications and developers in areas such as eHealth and telemedicine, industrial automation, home automation and more — reaching potentially millions of records. ATIS has contracted iconectiv to establish and maintain the Registry and will create the underlying database to support and manage the issuance of unique App-IDs. With establishment of the Registry, implementation of key security processes can be put in place and App-IDs can be used to streamline oneM2M deployments across service provider and vendor platforms.

Multi-Vendor Interoperability Event Validates oneM2M Standard for IoT. oneM2M held an interoperability testing event from September 14-16, 2015. This was an important milestone to validate interoperability and end-to-end functionality of the oneM2M Release 1 Specifications. Twenty-nine organizations and companies came together to test their equipment against each other. The result was a resounding success: the participants successfully demonstrated interoperability of their oneM2M

implementations across a number of different use cases. Participants also fed back clarifications and enhancements to the oneM2M specifications - another important outcome.



5G **ATIS and NGMN Alliance Cooperation to Advance 5G Innovation.**

In September, ATIS and the Next Generation Mobile

Networks (NGMN) Alliance announced that they will strengthen their relationship and foster closer co-operation in the area of 5G. The newly signed co-operation agreement brings together two widely recognized industry organizations in the field of next generation mobile broadband technology. ATIS and NGMN aim to enable and support the timely delivery of 5G to the market. In the coming years, both parties intend to achieve this by working together in projects on 5G related issues and by carrying out joint 5G public relation measures. ATIS sees its agreement with NGMN as important to its leadership role in delivering 5G requirements focused on the North American market and contributing them to global efforts. The goal is to deliver the long-promised convergence of all services onto a common framework, with corresponding enhancements to efficiency, security and service velocity.

ATIS PRESENTS



5G REIMAGINED: *NEW BUSINESS MODELS AND ENHANCED USER EXPERIENCES*

WEBINAR

Wednesday, December 2, 2015

1:00 - 2:00 p.m. ET

Webinar Summary:

As 5G use cases and requirements are addressed globally, consensus is emerging around 5G's performance requirements and what it will take for the new networks to deliver an unsurpassed user experience. Providing a North American perspective, ATIS is not only advancing global 5G requirements, but it is taking them a step beyond their traditional scope.

ATIS' approach challenges traditional thinking by introducing 5G use cases with a focus on maximizing the Quality of Experience (QoE). It also seizes the opportunity that 5G presents for innovative new business models. These include sponsored data subscription models, leveraging the strengths of some of the biggest innovators in today's market. Both the QoE focus and these new business models have the potential to dramatically re-architect wireless network operation.

Panelists



Brian Daly

Director- Core Network &
Government/Regulatory Standards
AT&T



Fred Kemmerer

President & CEO
Strategic Options Business Consulting

Moderator



Jim McEachern

Senior Technology Consultant
ATIS

Register at <http://www.atis.org/newsandevents/webinars.asp>

INDUSTRY EVENTS

5G WORLD NORTH AMERICA

**5G WORLD NORTH AMERICA
Co-located with LTE North America**

November 18 - 19, 2015 | Dallas, Texas

Must see session:

Roadmap of Innovation, LTE-Advanced to 5G
Thursday, November 19, 2015
1:00 - 2:00 p.m.

Featuring Brian Daly,
Director Core & Government/Regulatory Standards
AT&T and ATIS Representative

[Conference Website](#)



December 6 - 10, 2015 | San Diego, California

ATIS is an Association Supporter of GLOBECOM 2015

For more information, [click here](#)



January 6 - 9, 2016 | Las Vegas, Nevada

ATIS is a CES 2016 Allied Association Partner

For more information, [click here](#)



**January 26 - 27, 2016
San Francisco, California**

Must see sessions:

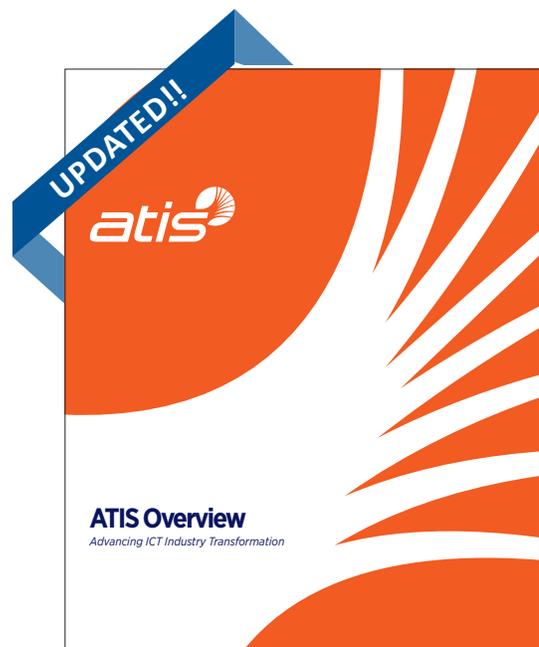
ATIS 5G Update and 5G Workshop
Wednesday, January 27, 2016

Featuring Jim McEachern, Senior Technologist, ATIS

ATIS is an Association Partner of RAN USA
For more information, [click here](#)

ATIS OVERVIEW

Get the specifics on how ATIS' work is advancing the future of ICT in the *ATIS Overview*. The report highlights ATIS' many accomplishments and gives a glimpse of ATIS' current future-focused priorities.



Download your copy TODAY!

Visit www.atis.org/about