2021 OVERVIEW

Advancing ICT Industry Transformation

atis

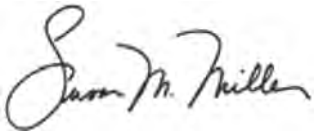
CONTENTS

From the President and CEO

Despite extraordinary challenges shared globally, 2020 was a remarkable year at ATIS. We launched important new initiatives, some of which are slated for completion in 2021. The *ATIS Overview* informs you about our recent successes – and how they are advancing transformation of the information and communications technology (ICT) industry.

- From vision to launch, the Next G Alliance is a key ATIS focus. An unprecedented activity for our organization, it has so far united 44 of the leading companies in our industry together in a shared commitment to advance 5G technology, look ahead to the 6G future and put North America at the fore of technology leadership for the next decade and beyond.
- Outreach to the new political administration on important ICT industry priorities is underway.
- 5G network security is a top industry concern. In close coordination with the Department of Defense and other government agencies, ATIS is applying Supply Chain Risk Management principles to secure the supply chain for trusted 5G networks and services in both the public and private sectors.
- Having developed a solid technical foundation for mitigating illegal robocalling, ATIS ensured that this framework was both fully implemented, stable and ready for the expected growth in service provider participation. A total of 74 service providers have joined the STIR/SHAKEN ecosystem thus far.
- The ATIS membership grew in 2020, becoming ever more diverse – fueling our efforts to achieve our 2021 objectives.

The need for our member-driven solutions has never been greater. That is why the pace of innovation is accelerating at ATIS. We hope you enjoy learning about our work in this *Overview.* Keep up to date at www.atis.org.



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ATIS President & CEO

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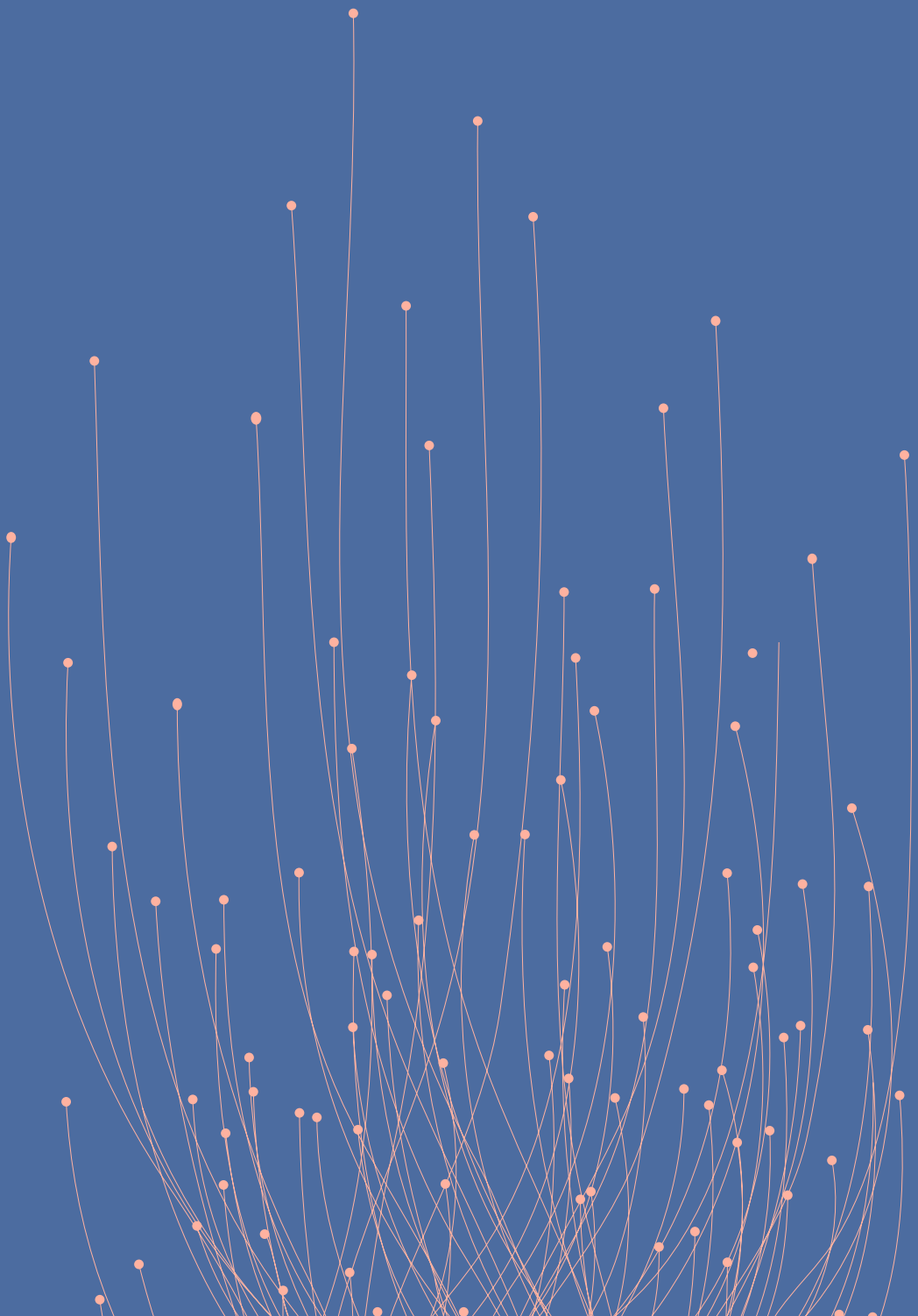


ATIS' VALUE-DRIVEN MISSION

ATIS brings the ICT industry together to address common, critical priorities. Here's how we create value:

- ATIS' strategic initiatives and solutions/standards work progresses new business opportunities, solves common industry challenges, and creates a platform for collaboration with other industries.
- Members innovate and compete "on top of" ATIS' foundational work. Collaborative efforts across industries can lead to greater scale and customer adoption.
- Identifying and defining where and how to align and collaborate; sharing resources, effort and cost to develop large-scale, interoperable solutions for a "common industry good" is both critical and beneficial to the industry.

Our priorities change in line with market and member demands.
Current technology focus areas are shown below:

TECHNOLOGY FOCUS AREAS

NATIONAL AND GLOBAL ACCREDITATION

ATIS is accredited by the American National Standards Institute (ANSI). The organization is the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP); a founding Partner of the oneM2M global initiative; a member of the International Telecommunication Union (ITU); as well as a member of the Inter-American Telecommunication Commission (CITEL).

SETTING OUR PRIORITIES: THE INNOVATION AGENDA

Board-driven industry transformation.

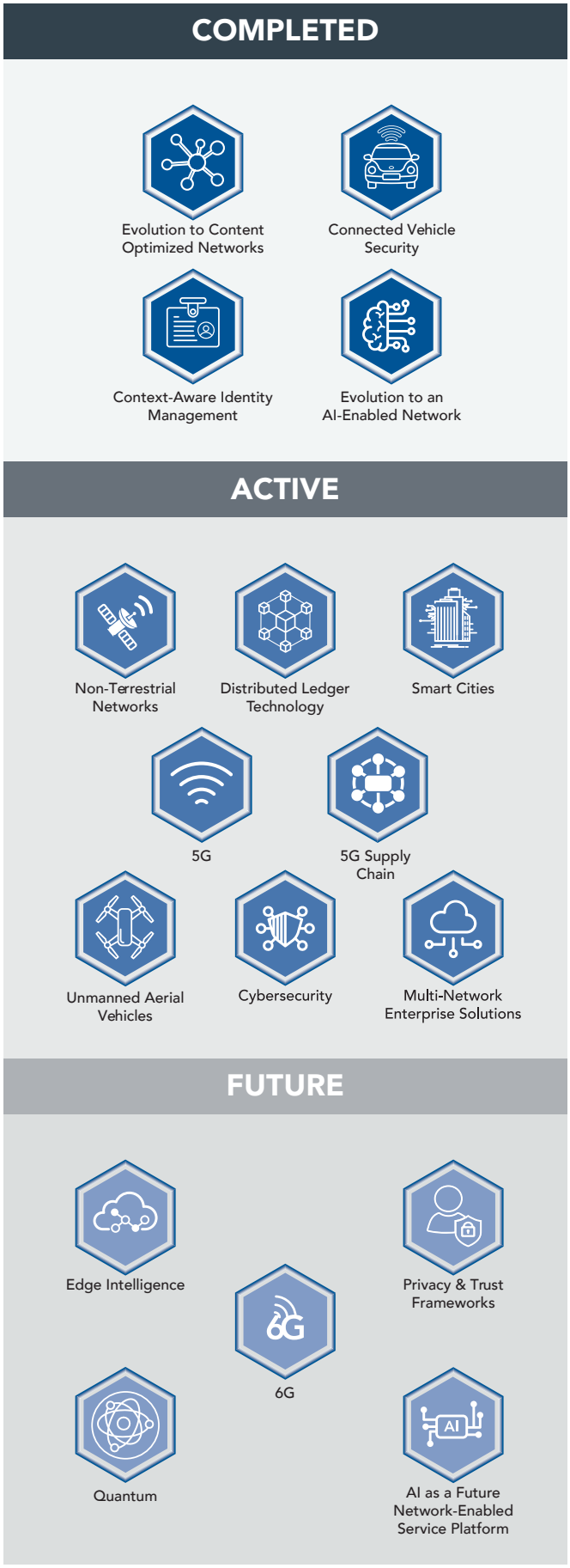
ATIS' Board of Directors, made up of C-level executives from the leading ICT companies, defines ATIS' Innovation Agenda. This sets the overarching technology strategy, direction, and priorities for the organization in line with the future of the industry.

The Innovation Agenda has focused on emerging technologies, including 5G, artificial intelligence, context-aware identity management, cybersecurity, smart cities, distributed ledger technology, unmanned aerial vehicles, among others.

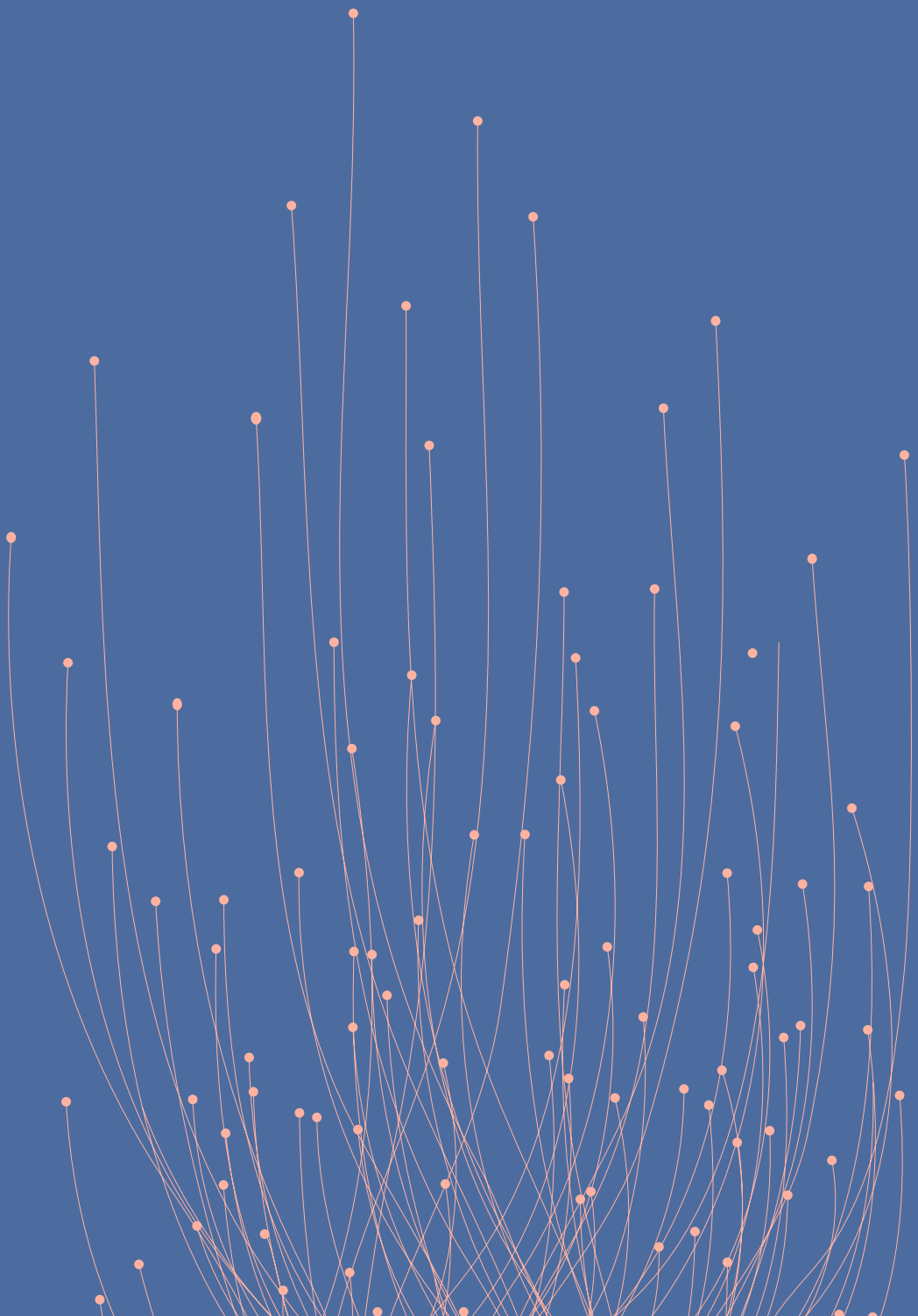
Most recently, it is advancing a range of initiatives to deepen cross-industry collaboration, enable innovations in the network and improve infrastructure and access as mapped out in the graphic shown on the right.

While the work that comes out of our Innovation Agenda is focused on the longer-term future, our Technology and Operations Council focuses on priorities on in the 12 -24 month horizon. The next section of this *Overview* gives the specifics on some of the strategic work coming out of both bodies.

Key accomplishments in the regulatory arena are also covered in this *Overview*. Our standing Standards and Solutions Committees address relevant industry issues as they emerge. Their work is showcased after the Regulatory section. An International Partnerships section closes this piece.



STRATEGIC INITIATIVES



6G - THE NEXT G ALLIANCE

Building the foundation for North American leadership in 6G and beyond.

ATIS is advancing a bold, new industry-driven initiative to establish North American leadership in 6G and beyond: the Next G Alliance. Launched in 2020, the work of the Next G Alliance encompasses the full lifecycle of research and development, manufacturing, standardization and market readiness. The work is setting the foundation for a robust marketplace for U.S. innovation in future generations of wireless technology.

With broad interest from industry, the research community and academia, the Next G Alliance will undertake the creation of a national 6G roadmap as well as the launch of technical working groups and government engagement activities. Entering 2021, 44 organizations have signed on thus far and the list is growing.

NEXT G ALLIANCE

Full Members

Contributing Members

Learn more at: www.nextgalliance.org

5G TECHNOLOGIES

Delivering a detailed analysis and alignment with specific 3GPP activities, highlighting North American priorities.

5G enables a complete mobile communications platform, representing a large body of work that will play out over many releases of 3rd Generation Partnership Project (3GPP) standards. The first full set of 5G specifications was created in 3GPP Release 15 and delivered in 3Q 2019. 3GPP then directed its attention to future releases to further define and enhance the newly established 5G system.

ATIS is the North American Organizational Partner for the 3rd Generation Partnership. In 2020, we delivered a resource to present a long-term and strategic vision of the 5G technology and market landscape as it will evolve in light of 3GPP 5G standards. The report *5G Specifications in 3GPP: North American Needs for the 5G Future* covers the 5G standards now being set into action in the network as well as those on the horizon. It reviews the technology and societal drivers to lay out a vision of the 5G technology and market landscape post Release 16 and identifies areas that will need more in-depth study moving forward.

To ensure North American priorities are part of future 3GPP 5G-related releases, an ATIS Focus Group is considering new requirements and monitoring related 3GPP work in progress for potential gaps in addressing North American 5G needs. This group is a platform for building collaboration on existing and future topics in 3GPP. Topics include the standards impact of U.S. spectrum plans and the 3GPP roadmap for Release 18. In 2021, the group will work on 3GPP Release 17 content and North American needs in Release 18.

Assessment of 5G verticals enablement platforms.

Emerging 5G capabilities coupled with IoT innovations create new business opportunities for communications service providers, enabling them to deliver new forms of value to multiple vertical enterprise industries. ATIS is conducting a data-driven assessment across a selected landscape of 5G-enabled vertical market sectors to identify 5G-specific use cases that identify the need for platform enablement capabilities not yet defined within the scope of 3GPP standardized 5G infrastructure. The objective is to determine where the potential for cross-vertical industry platform needs strongly align so that the industry can strategically prioritize near-term opportunities to address vertical enablement platform requirements.

Verticals targeted for examination include industrial and manufacturing, connected vehicles. smart cities, public safety, remote health care, media/entertainment and remote learning/education. Through initial outreach and research, this initiative has already identified several collaborative platform needs.

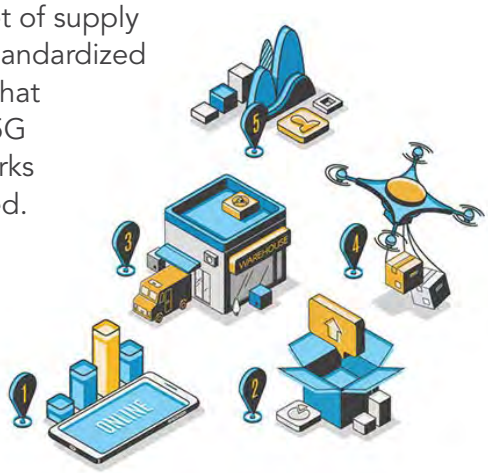
As outreach continues, new use cases are being identified. Alignment of specific platform requirements is also being addressed. Ultimately, an initial framework of 5G enablement platform capabilities will be created that intersects with specific vertical market needs — and drives new forms of 5G adoption.

ATIS will publish the 5G vertical assessment report in 2021 outlining assessment findings together with the identified platform capabilities. It also will make recommendations on advancing this work through inter-industry and cross-industry collaboration. Input to other initiatives within ATIS will be delivered as well as to external industry standards organizations, such as as 3GPP, 5G ACIA for industry and manufacturing, APCO International for public safety, the US Ignite Smart Cities Initiative and others.

Ensuring the integrity of the 5G supply chain.

ATIS is applying Supply Chain Risk Management principles to secure the supply chain for trusted 5G networks and services in both the public and private sectors. This initiative has received a great deal of interest from industry and is being conducted in close coordination with the Department of Defense. It also inludes other government agencies. The goal is to operationalize supply chain requirements into a process that provides assurance and can lead to certifying 5G infrastructure and devices to a common set of standards.

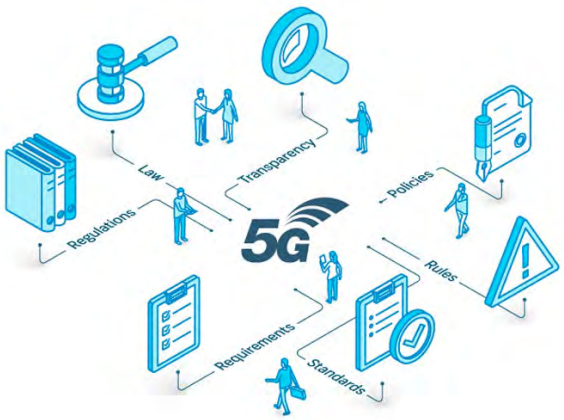
Thus far, this Work Group is assessing key 5G use cases and developing a 5G supply chain reference model. The model provides a layered view of a supply chain flow including the necessary controls to assure that required attributes are addressed in each stage of the supply chain. The goal is to converge on a model and accompanying set of standards that can be applied to an assurance process meeting a wide range of 5G designs and applications. When complete, a set of supply controls and standardized requirements that translate into 5G assured networks will be provided.



Understanding future 5G operational and regulatory requirements.

As 5G innovations are rolled out to serve increasingly broad vertical industry market segments, mobile operators face a wealth of new regulatory requirements. Rapid timelines for mobile standardization and deployment mean that U.S.- specific requirements need to be factored into the global standards process as early as possible. In 2020, ATIS launched an initiative to do just this. It will ensure that all U.S. 5G-related regulatory requirements and operational needs that impact mobile standards are clearly known and that 3GPP and ATIS standards roadmaps allow operators to fulfill these.

The work will specifically examine how innovative 5G services, such as non-public networks, bring new regulatory requirements into scope as the work will also look at new U.S. regulations that impact 5G services. It will assess if 5G standards need enhancement to meet U.S. regulations or operational needs. A roadmap for standards changes will be generated, including candidate work items in 3GPP Release 18 and beyond.



DISTRIBUTED LEDGER TECHNOLOGY

Harnessing the power of distributed ledger technology for the ICT industry.

ATIS is applying distributed ledger technology (DLT) to provide enterprise identity verification to authenticate the originating caller information in IP communication networks. In 2020, *Enterprise Identity on Distributed Ledger for Authenticated Caller Use Cases* covered the "enterprise identity use case" that ATIS identified to study how DLT and its cryptographic principles can be applied to combat illegal robocalling and caller ID spoofing.

The ATIS Enterprise Identity Network using DLT provides an authoritative source of know-your-customer (KYC)-vetted and trusted Enterprise Identities with telephone number right to use allocations. Once a KYC-vetted enterprise has a digital identity on the distributed ledger, it can request a TN from a TN service provider indicating the intended purpose for the use of the number. This way, all stakeholders connected to the ATIS Enterprise Identity Network instantly know the caller's true identity and that they have the authoritative right to place calls using a TN as well as for what purpose. This solution elevates what a "trusted" TN means for all stakeholders. It also helps consumers differentiate between trusted enterprise calls versus spoofed and illegal robocalls. Watch this short video to see how it works.

By November 2020, ATIS members collaboratively demonstrated fully authenticated enterprise SIP calls using the Enterprise Identity Network DLT to support the SHAKEN protocol. This proof of concept is a major success in helping service providers overcome caller attestation issues that may prevent enterprise calls from reaching their intended recipients and instead be treated as illegal robocalls. This contribution ensures that enterprises can continue relying on the phone call as an effective channel for communicating with their customers.

Further work is being considered to incorporate W3C standards for decentralized identifiers and Verifiable Credentials in the next phase of the Proof of Concept. As part of its Innovation Agenda for 2021, ATIS will leverage the Enterprise Identity Network as a starting point to focus on cross-network use cases such as privacy and trust.

DOMAIN NAME SYSTEM

Delivering insights on technical impacts of domain name system (DNS) privacy on network service scenarios.

The 2020 ATIS report, *Technical Impacts of DNS Privacy and Security on Network Service Scenarios* helps service providers address the challenges as well as the opportunities in DNS encryption. It also delivers some of the first-ever industry recommendations to cooperatively improve DNS security and provide the groundwork for future collaboration to address evolving security threats.

DNS is a critical Internet service that resolves understandable domain names, such as "atis.org," to numerical IP addresses. Yet, most DNS signaling today is sent using protocols that do not support security provisions, e.g., cryptographic confidentiality protection and integrity protection.

To address this, new protocols have been specified that implement cryptographic DNS security. While their implementation can have positive benefits, it can also conflict with important and widely implemented network services based on DNS. These include techniques to mitigate malware as well as to fulfill regulatory obligations. ATIS' report describes the technical impacts of DNS security protocols in a range of network scenarios. It also contains a set of talking points that ISPs, as well as other parties, can use to communicate about these topics to end customers, enterprise network administrators and internal stakeholders.

MULTI-NETWORK ENTERPRISE SOLUTIONS

Helping service providers expand their offerings in vertical markets.

How can the complex enterprise network environment be optimized to deliver services and solutions to a diverse and growing set of vertical markets? ATIS' Multi-Network Enterprise Solutions Initiative (MNES) is discovering how. This work supports a standardized industry approach that not only integrates and simplifies the management of today's complex enterprise network environment but also enhances the overall reliability/resiliency, performance, and security of the end-to-end system.

Enterprises utilize a wide variety of networks and network technologies to deliver services and support internal operations. This spans mobile wireless services from multiple mobile operators; public and private (enterprise) Wi-Fi in dedicated enterprise spaces; private 3GPP networks, e.g., LTE, 5G with CBRS and other configurations; wired/fixed access and transport services, to support enterprise VPNs for example; satellite-based communication services; and more. The result is an expensive and complex arrangement with sub-optimal end-to-end network performance.

ATIS' MNES initiative is assessing the emerging enabling technologies in use today to address these challenges (distributed ledger, federated identity, SD WAN, context-aware identity management, among others). With the information gathered, the group will develop use cases that help manage this diverse communication environment to avoid overly complicated, bespoke overlay solutions. The goal is to position operators to offer increasingly advanced services and capabilities that interface directly into the platform and potentially also offer the platform itself as a service to the enterprise.

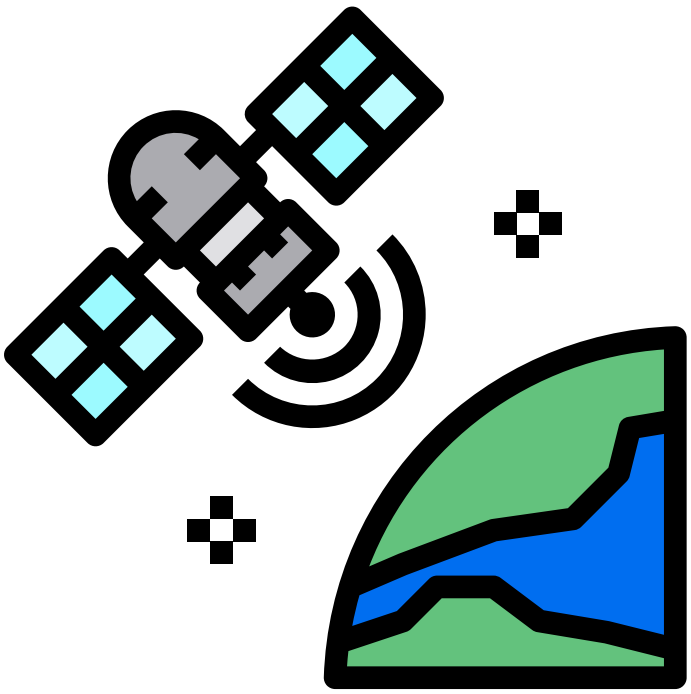
NON-TERRESTRIAL NETWORKS/5G INTEGRATION

Creating standards and solutions to enable a future where global communications and connectivity are seamless and ubiquitous.

ATIS' Non-Terrestrial Networks (NTN)/5G Integration Working Group is advancing the 5G standards that make NTNs, including satellite segments, a recognized part of 5G connectivity infrastructure. Chaired by Intelsat, the Group is driving creation of normative standards for satellite NTNs in 5G. It brings together satellite ecosystem players and terrestrial ecosystem players to develop and coordinate technical positions and create aligned contributions to advance support of NTNs in 3GPP. The goal is to target smooth integration and complementarity with existing terrestrial networks, especially in regions that are not easily accessible by conventional deployments.

Most recently, the Working Group has been tracking the status of the 3GPP Release 17 NTN work items and collaborating to address them. A main focus is coordination between 3GPP Working Groups and ensuring the different pieces work together seamlessly.

The NTN group also provides the forum for emerging 5G integration issues common to both telco and cloud service providers. For example, a proposal currently being reviewed is defining Standard Exclusion Zone Descriptions and Language shared across Terrestrial and Non-Terrestrial Service Providers for consistency and coordination among multiple 5G Terrestrial and Geostationary/ Non-Geostationary-Orbit Satellite Solutions.



NTN/5G INTEGRATION WORKING GROUP MEMBERS

Airbus · ALCAN Systems GmbH · Altran · AST & Science · AT&T · Bell Canada · Communications & Power Industries (CPI) · Comtech EF Data · Comtech Telecommunications Corp. · Department of Defense · EchoStar · Ericsson · Eutelsat · Gilat · GoGo · Hughes Network Systems · Inmarsat · Intel Corporation · Intelsat · Isotropic Systems · Johns Hopkins University Applied Physics Laboratory · Kepler Communications · Kratos · Kymeta Corp · Ligado Networks · Lockheed Martin · Mavenir · Maxar · MITRE Corporation · Nokia · Omnispace · Pivotal Commware Inc. · Qualcomm Incorporated · SES · Skylo Technologies · ST Engineering iDirect · T-Mobile USA · Telesat · Thales Group · TTP

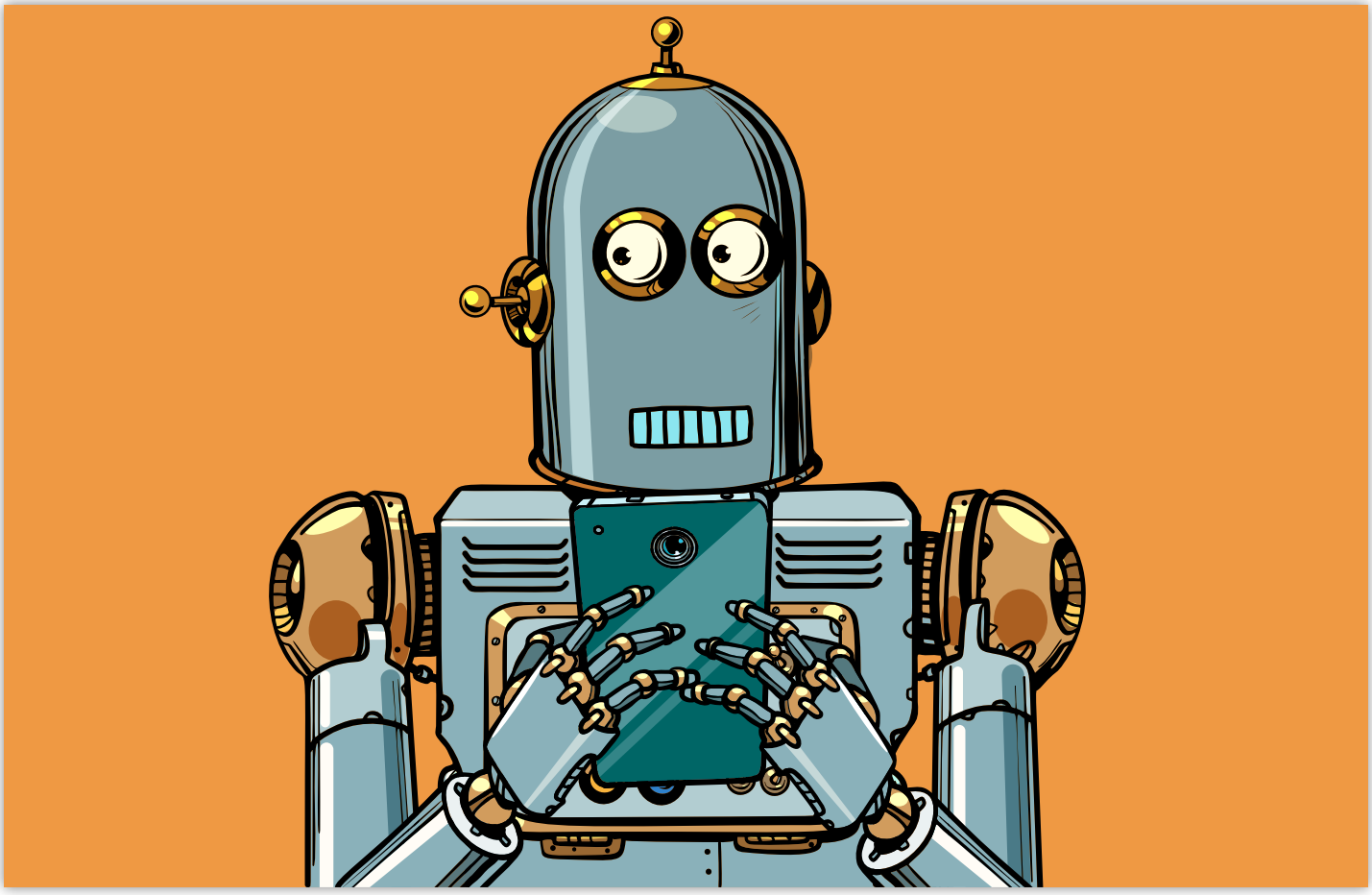
ROBOCALLING AND COMMUNICATION ID SPOOFING

Advancing the search for comprehensive solutions in the fight to mitigate illegal robocalling.

Significant progress has been made in the fight against illegal robocalling through innovations in analytics and addressing caller-ID spoofing and unwanted call traceback through STIR/SHAKEN, yet there is more work to be done. The techniques of the actors that intend to do harm evolve constantly. ATIS is undertaking the work that is needed to drive innovative countermeasures to address these emerging threats. SHAKEN deployment must be advanced. There is also a need for additional mitigation techniques and monitoring.

Through a holistic approach, the ATIS Robocalling and Communication ID Spoofing (RCID) initiative is developing a coordinated landscape view of robocalling and spamming mitigation efforts across the industry and considering the opportunities for further standards development as well as regulatory implications. As one of the first ATIS deliverables in 2021, the RCID group published *Robocalling and Communication ID Spoofing: Better Understanding Illicit and Unwanted Calls and How to Counter Them*. This resource overviews the many types of illicit calling and countermeasures being deployed.

Recognizing that there are no "silver bullets" that will eliminate illicit robocalling, the report shows why the industry must deploy many separate components in combination to maximize mitigation and minimize the blocking of legitimate calls. It also provides a list of the various U.S. actions and select international regulators to help carriers and service providers in this effort. To set the identified needs into motion, the report concludes with recommendations for future action by ATIS and other organizations.



SMART CITIES DATA CATALOG SPECIFICATION

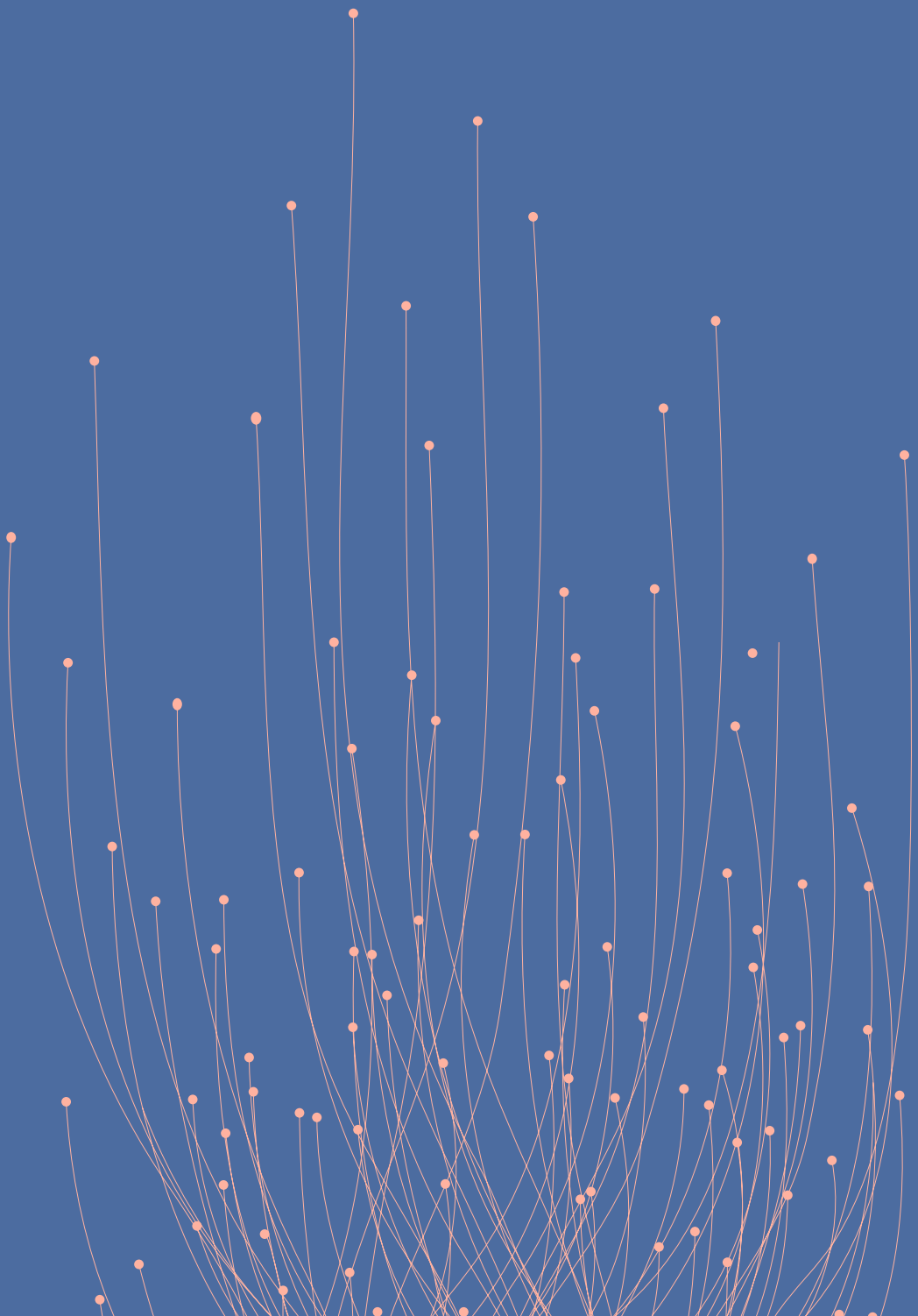
ATIS/US Ignite data exchange catalog specification helps cities create value from smart cities infrastructure investments.

The growing use of Smart Cities technology presents opportunities for the ICT industry, as detailed in ATIS' *Smart Cities Data Catalog Specification*. This resource helps cities leverage data exchanges to achieve greater usability and application of their evolving smart cities infrastructure.

The publication recommends a common data-sharing approach for smart cities to use to enhance the value of city data assets and third-party data. Using the specification, for example, governmental agencies, developers and data partners could easily access data to explore a neighborhood's business development potential. In addition, a blueprint for a common framework to help cities achieve their data-sharing goals is introduced as well as a set of critical components needed for advanced data sharing.

Making smart cities data easily discoverable, usable and more valuable is key to creating opportunities in this area. The *Smart Cities Data Catalog Specification* helps do this by introducing the role of "data enrichers" who put innovation into action through advanced analytics, machine learning and artificial intelligence to increase the value of smart cities data. ATIS and its partner in this work, US Ignite, are engaging in dialogue with city officials seeking opportunities to use the new specification.

REGULATORY INITIATIVES



MITIGATING UNWANTED ROBOCALLING AND CALLER ID SCAMS

Solutions to mitigate the FCC's leading cause of consumer complaints.

In the 2021 *ATIS Overview,* you will learn about the many technical solutions that are advancing the fight against illegal robocalling and caller ID spoofing, and ATIS is also at the fore of managing the Secure Telephone Identity Governance Authority (STI-GA), which is getting these solutions into action in the network. STIR/SHAKEN is the solution to authenticate calling telephone numbers that was first selected by the industry and later mandated by the FCC. As the STI-GA, ATIS developed the STIR/SHAKEN framework and set it into action in 2019.

Once this base framework was set, the STI-GA's 2020 focus was to ensure that it was both fully implemented and ready for the expected growth in service provider (SP) participation. This involved continued development of the technical framework, the Secure Telephone Identity Policy Administrator (STI-PA) systems used by service providers to join the ecosystem, and the approval of the STI Certification Authorities (STI-CAs) required to assign certificates used by SPs to authenticate calls.

The STI-PA systems were fully accepted as complete by the STI-GA in February 2020. Using those systems to verify SP authorization and test SP capabilities, a total of 74 SPs were cleared to join the STIR/SHAKEN ecosystem in 2020. With the FCC STIR/SHAKEN mandate for June 30, 2021, having this many providers register early is evidence of the tremendous industry interest in the viability and effectiveness of the SHAKEN solution and Governance Authority.

As the STI-CAs play a critical role in the ecosystem, assigning certificates used by SPs to sign calls, the approval process for becoming an authorized STI-CA is a significant undertaking. Even so, the number of STI-CAs doubled from four to eight by year's end.

As the framework continues to grow, the industry's ability to use STIR/SHAKEN to help mitigate illegal caller ID spoofing will only increase. Both in terms of full implementation and stability, the STIR/SHAKEN framework enters 2021 ready for broader industry use.

EXAMINING HEARING AID COMPATIBILITY IN MOBILE HANDSETS

Industry-driven advancement of the hearing aid compatibility of wireless devices.

With a long-standing track record serving as a key focal point for ICT industry collaboration with the deaf and hard of hearing community, ATIS is the administrator managing the Hearing Aid Compatibility (HAC) Task Force (TF). The TF brings together key stakeholders to make recommendations to the FCC on its proposed requirement that 100% of covered wireless handsets be hearing aid compatible.

Since inception, the HAC TF has established the body's leadership structure, operating procedures, working groups, and its work plan for initial research projects. The Working Groups (WGs) are:

- WG1 - Available and Alternative HAC Technologies established to study available and evolving HAC technologies.
- WG2 - Consumer Usage of HAC Technologies and Alternatives to study consumer usage of HAC technologies and alternatives.
- WG3 - Analysis of Changes to C63.19 to determine the impact on the HAC TF's work.

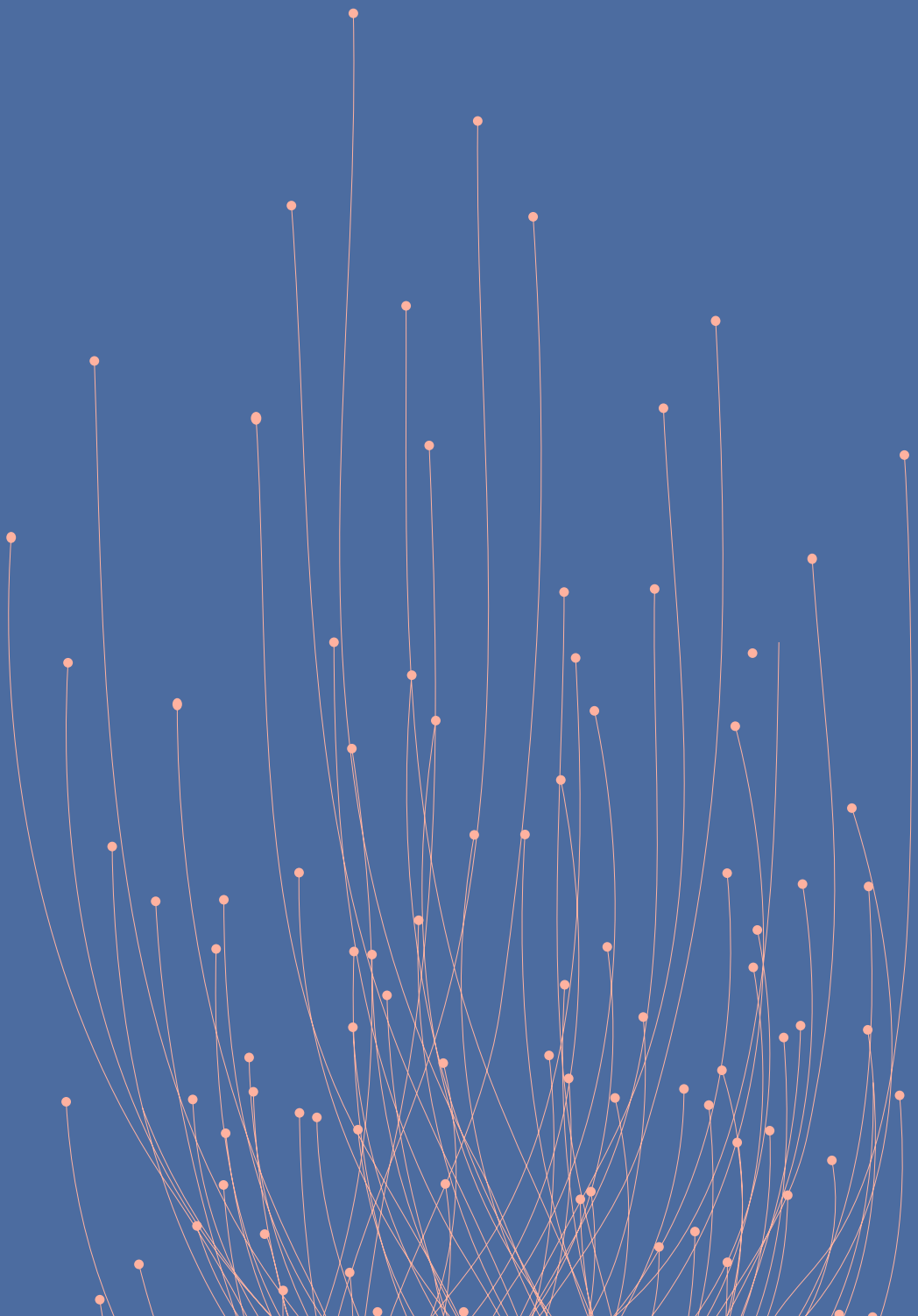
WG1 has already compiled data on HAC-rated device offerings and cross-referenced it with hundreds of HAC-rated devices such as wireless handsets with the voice service providers offering those devices and with hearing devices with means of coupling.

With completion of this data collection, WG2 has launched. It is gathering data to determine whether the existing definition of hearing aid compatibility is the most effective means for ensuring access to wireless handsets for consumers who use hearing aids and is also effective for encouraging technological innovation and advancement.

WG3 has also launched and has begun gathering data to understand the changes between the 2011 and 2019 versions of the ANSI hearing aid compatibility standards C63.19, and new equipment required to test according to the 2019 version of the standard. In 2021, the group will collect information on the current status of mobile devices and hearing aids to pass the C63.19-2019 standard, as well as evaluate the final FCC decision on the adoption of C63.19-2019 once it is issued. WG3 expects to complete its work in the second half of 2021.

HEARING AID COMPATIBILITY
TASK FORCE

STANDARDS AND SOLUTIONS



ATIS Committees and Forums

ACTA		Administrative Council for Terminal Attachments
AIDC		Automatic Identification & Data Capture Committee
ESIF		Emergency Services Interconnection Forum
INC		Industry Numbering Committee
IOC		International Mobile Subscriber Identity Oversight Council
NGIIF		Next Generation Interconnection Interoperability Forum
NRSC		Network Reliability Steering Committee
OBF		Ordering and Billing Forum
PTSC		Packet Technologies and Systems Committee
SNAC		SMS/800 Number Administration Committee
STEP		Sustainability in Telecom: Energy and Protection Committee
SYNC		Synchronization Committee
TMOC		Telecom Management and Operations Committee
WTSC		Wireless Technologies and Systems Committee

ADVANCING ROBOCALLING MITIGATION

Technical solutions enabling mitigation.

ATIS' robocalling mitigation work is comprehensive in nature and our progress has been cited extensively in the *FCC's Wireline Competition Bureau's Report to Congress on Caller ID Authentication Implementation Progress*, published at the end of 2020. In addition to the work of the STI-GA, several ATIS technical committees are actively advancing solutions in this area. The breadth of this work shows the issue's complexity and validates ATIS' initial assumption that an innovation-focused, industry-driven approach will best support robocalling mitigation.

The ATIS/SIP Forum IP-NNI Task Force and the Packet Technologies and Systems Committee (PTSC) are key ATIS Committees carrying out this work.

ATIS/SIP Forum IP-NNI Task Force

Recent robocalling-related deliverables from the IP-NNI Task Force include:

- *ATIS Standard on Toll-Free Numbers in the SHAKEN Framework* - This extends the SHAKEN framework to include calls from toll-free numbers. (Technically, these are calls where the caller ID is a toll-free number.) It is important to ensure that these numbers can receive full SHAKEN attestation to allow consumers to confidently answer calls from banks, airlines, help desks, and the many other corporate callers who use a toll-free callback number.
- *Signature-based Handling of Asserted information using toKENs (SHAKEN): Delegate Certificates* - This provides an important mechanism to allow enterprise customers to directly provide full attestation for calls in scenarios where the service provider might not be able to provide full attestation. ATIS' Distributed Ledger Technology Initiative is also addressing potential approaches to this problem. The DLT work is another example of how ATIS is setting innovative means into action to address network issues.
- *Mechanism for International Signature-based Handling of Asserted information using toKENs (SHAKEN)* - ATIS continues to be a thought leader in extending SHAKEN to cover calls internationally.
- *A Framework for SHAKEN Attestation and Origination Identifier* -This report offers important guidance to implementors and service providers deploying SHAKEN.

Packet Technologies and Systems Committee

- *National Security Emergency Preparedness Next Generation Network Priority Service (NS/EP NGN-PS): Transport Level Packet Marking and Packet Scheduling in 5GS.* This will ensure that 5G networks can fully support National Security Emergency Preparedness Next Generation Priority Service (NS/EP NGN-PS) traffic.

Another major PTSC effort is advancing the goals of the Non-IP Call Authentication (NIPCA) Task Force.

The Task Force started work with certain segments of the industry assuming non-IP call authentication could not be accomplished economically. With the NIPCA Task Force, however, four approaches were proposed, with two being agreed upon for advancement.

These may deliver a consensus approach for "out-of-band SHAKEN" and produce a standard that will work for non-IP networks, and fully interwork with SHAKEN. This work is underway in NIPCA and the result will likely go to letter ballot in 1Q2021.

EMERGENCY COMMUNICATIONS

Advancing innovation in the Wireless Emergency Alerts system.

In 2020, then FCC Chairman Ajit Pai commended ATIS' progress on the Wireless Emergency Alert (WEA) system and requested the development of best practices to further support the system. In October 2020, ATIS' Wireless Technologies and Systems Committee agreed to work on the development of WEA best practices. This work is expected to be completed in 2Q 2021.

The WEA system is a critical tool for federal, state and local officials to warn the public about imminent threats. ATIS' WEA standards, among other things, specify a range of permissible values for wireless providers and equipment manufacturers to use as parameters for enhanced WEA geo-targeting, particularly when mobile devices are in motion. Chairman Pai had requested that ATIS refine discretionary parameters to further improve enhanced WEA geo-targeting.

In December 2020, ATIS delivered a *White Paper on the Impacts of Cell Selection for WEA Geo-Targeting,* which covers the means to improve the geographic accuracy of Wireless Emergency Alerts (WEA). The paper presents a detailed explanation, accompanied by illustrations, of the broadcast characteristics and other factors that drive the results of the cell/sector selection by the Commercial Mobile Service Providers when building the broadcast for a given alert. Due to the sensitive nature of the content, this white paper is not being shared publicly. It has, however, been shared with industry stakeholder associations.

The white paper is part of a robust standardization effort around WEAs that ATIS is leading. ATIS' Wireless Technologies and Systems Committee continues to address new and emerging issues related to WEA. ATIS looks forward to expanding upon the innovations already delivered.

EMERGENCY PREPAREDNESS

Helping service providers prepare and respond.

ATIS' Network Reliability Steering Committee (NRSC) offers a list of proactive steps that telecommunications service providers can take to prepare for and respond to a wide array of emergency situations. In early 2020, as the Coronavirus spread globally, the NRSC reached out to the provider community reminding it of the *Pandemic Checklist*, which contains voluntary industry Best Practices and relevant links as a reference in preparation for such an event.

The *Checklist* supports industry efforts to ensure network stability while minimizing the impact of a pandemic on the workforce. It contains targeted activities to help safeguard communications infrastructure addressing human and environmental factors as well as power, software, payload, hardware, network and policy considerations.

The NRSC reviewed this document, in light of industry response to the COVID-19 pandemic. A revision based on lessons learned was delivered in February 2021. The updated *Pandemic Checklist* incorporates additional best practices derived from industry response to the COVID-19 pandemic. These practices have been particularly vital in efforts to slow the virus' spread by enabling increased telework, telehealth, and online learning initiatives.

Also in 2020, the NRSC reminded the community on availability of the *Network Reliability Steering Committee Emergency Preparedness and Response Checklist* created by service providers responding to actual emergency situations, and most recently updated in 2019. Comprehensive in nature, this resource addresses the areas of: Pre-Event, Restoration, and Non-Event Specific activities that service providers should complete throughout the year to be prepared to handle emergency events in the physical environment. Featuring an easy-to-use layout, the *Checklist* cross-references Best Practices in many of the key areas addressed. As with the *Pandemic Checklist*, a review of this document is planned for 2021 to ensure industry response to the pandemic is incorporated.

Educating Public Safety Answering Points on outage contact information data collection policies.

A video tutorial created by the NRSC educates Public Safety Answering Points (PSAPs) on service providers' use and maintenance of PSAP contact information. The presentation provides a concise synopsis of recommended critical PSAP data that service providers should be collecting, best practices for the data collection process, and education about the outage notification information.

This tutorial follows the completion of two related documents which reflect industry consensus on improvements in collection information as well as providing outage notifications. These are: *Standard Operating Procedures (SOP) for Updating Public Safety Answering Point (PSAP) Outage Contact Information)* and *Technical Report on Service Providers: Outage Reporting Structure and Potential Types of 9-1-1 Outages.* Both were published by ATIS NRSC's Situational Awareness for 911 Outages Task Force in 2019 and 2018, respectively.

ATIS NRSC expects that both service providers and PSAPs can benefit from this tutorial and the accompanying documentation. Specific recommendations include updating contact information in May and November to bookend hurricane season and utilizing specific, dedicated email addresses to ensure continuity in receipt of outage notifications. Access the *Standard Operating Procedures (SOP) for Updating Public Safety Answering Point (PSAP) Outage Contact Information Video Tutorial.*

Strengthening situational awareness during 9-1-1 outages.

ATIS has published the Standard Operating Procedures (SOP) for *Updating Public Safety Answering Point (PSAP) Outage Contact Information*, which provides information on how Public Safety Answering Point (PSAP) contact information is to be collected and documented. This new process addresses the challenges associated with identifying PSAP and 9-1-1 authority recipients of outage notifications and the mechanisms for collecting and standardizing contact information. It is a major contribution toward strengthening situational awareness during 9-1-1 outages — another of the many industry resources ATIS delivers to advance communications during times of emergency.

NUMBERING

Reassigned numbers database.

As it advances the fight to mitigate illegal robocalling on all fronts, ATIS is also addressing the numbering-related aspects for this issue. In late 2019, then FCC Chairman Ajit Pai noted that the establishment of a national Reassigned Numbers Database (RND) will provide "a solution that will reduce the number of mistaken calls to reassigned numbers." In response to these recommendations, ATIS reviewed the Commission's Second Report and Order establishing the RND (FCC 18-177) and recognized the need for Guidelines related to the service providers' responsibilities to collect and provide disconnected number data into the RND.

Sunset of 800-855 Number Assignment Guidelines.

In August 2020, ATIS informed the FCC (Commission) that it has sunset the 800-855 Number Assignment Guidelines created in 1994 to provide guidance to the NANPA and applicants regarding the assignment of the 800-855 numbers for services for the deaf, hard of hearing or speech impaired. In 2008, the Commission ordered the adoption of a uniform Ten-Digit Telephone Numbering System for Internet-based TRS (iTRS), making the assignment of these resources no longer necessary. ATIS' Industry Numbering Committee (INC) had noted that the NANPA had assigned a total of 93 800-855 line numbers since the creation of the guidelines, but none in the last seven years. Thus, INC agreed to formally sunset the 800-855 Number Assignment Guidelines.

ORDERING AND BILLING

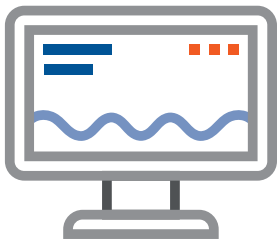
Better identification of fradulent port requests.

In 2020, ATIS Ordering and Billing Forum (OBF) published *Supplement A to the Unified Ordering Model (UOM) Volume II – Analysis – Wireless Intercarrier Communications Interface Specification (WICIS) for Local Number Portability Version 5.0.0*, which allows service providers to better identify port requests that may be fraudulent. This accomplishment was another of ATIS' contributions to mitigate illegal use of our communications infrastructure.

This action addresses the rise of unauthorized number porting, including impacts to intermodal porting. In Supplement A to WICIS Version 5.0.0 takes RCODE 6B, previously reserved to indicate "same new and old network provider" and repurposes the usage to indicate "Fraud Prevention/Customer Action Needed." The WICIS defines the operational requirements and technical specifications for the exchange of information needed for the Intercarrier Communication Process.

Successfully managing implementation adjustments in light of COVID-19.

OBF creates the collaborative standards and solutions that ensure accurate billing for the industry's core services as well as emerging innovations. One of its major deliverables is the Access Services Ordering Guidelines, a valued industry resource to facilitate service orders between ICT service providers. In 2020, OBF delayed implementation of the Access Service Ordering Guidelines (ASOG) Version 60. The implementation was successfully rescheduled for September 19, 2020. ASOG V60 was implemented concurrently with ASOG V61 on September 19. ASOG V60 had already been published and was set to be implemented in March. These delays were to ensure IT systems remain stable to continue to electronically process high-priority orders related to the activities brought about by COVID-19.



TERMINAL ATTACHMENTS

A new database for an important industry function.

ATIS is a joint sponsor of the Administrative Council for Terminal Attachments (ACTA) along with TIA. The ACTA coordinates and manages the adoption of technical requirements for terminal equipment and HAC-compliant ACS telephonic CPE, and the associated database.

In 2020, the ACTA updated its Operating Procedures and Principles to streamline and remove unnecessary and duplicative text, clarify use of electronic tools, and clearly reflect other current ACTA processes.

Also last year, ATIS began the process of developing a new ACTA database, set to launch in 2021.

Membership in the ACTA is open to any organization, company or group having an interest in the business of the ACTA.

PROTECTION ENGINEERING

Convening the industry experts.

The leaders of ATIS' Sustainability in Telecom: Energy and Protection Committee are instrumental in the hosting of the annual ATIS Protection Engineers Group (PEG): Electrical Protection of Communications Networks Conference, which presents solutions based on the latest electrical protection practices and applications in today's networks. This includes changes in standards and technologies needed to meet ongoing challenges of providing reliable voice, data and video services in decentralized networks.

Most recently, in its quest to deliver attendees the latest information on leading topics in protection engineering from the field's top professionals, the PEG Conference has covered 5G, network termination equipment, wireless access points, PoE, code and standards updates, deployment of emerging technologies and more.

PEG PROTECTION ENGINEERS GROUP

SYNCHRONIZATION AND TIMING SYSTEMS

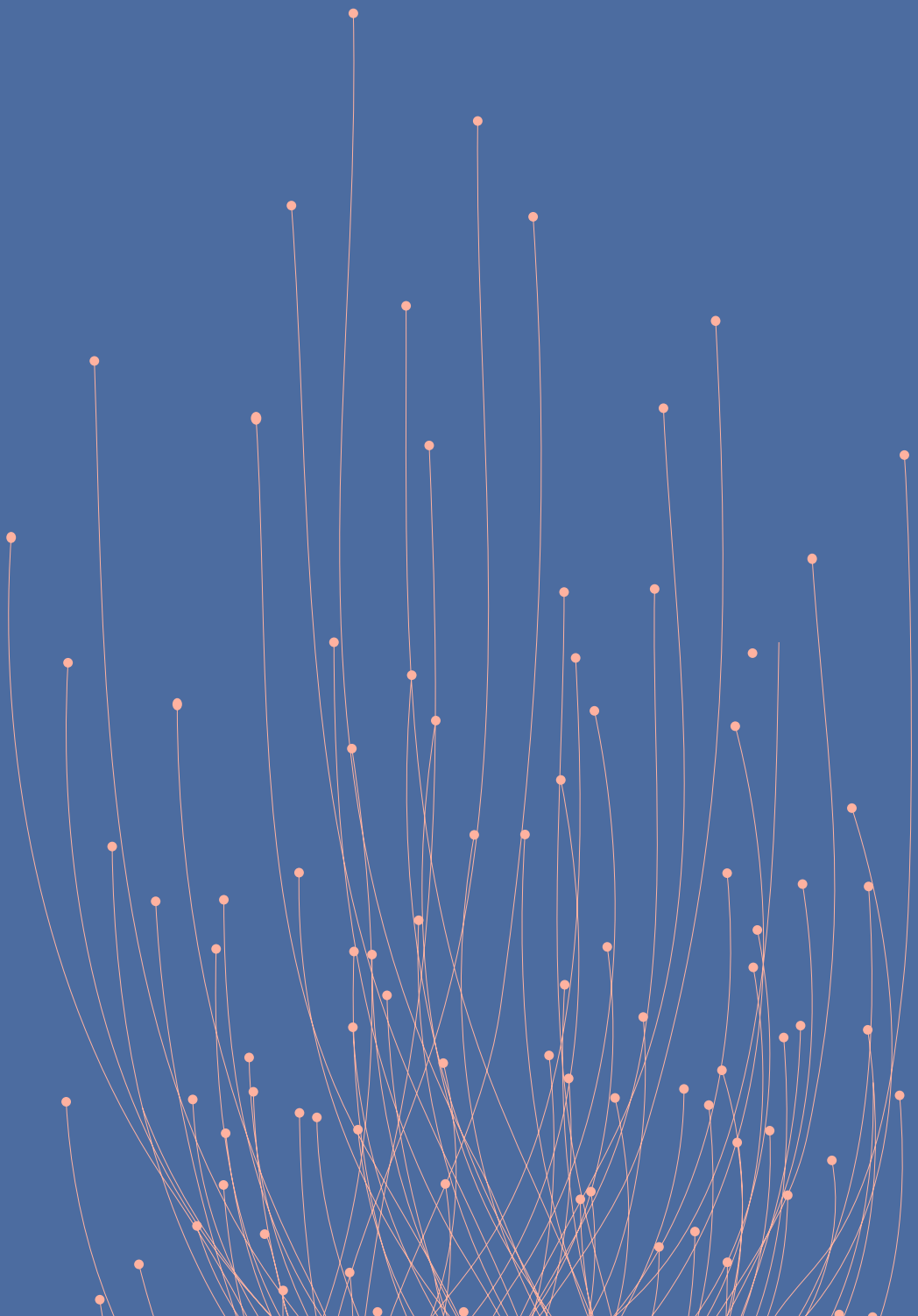
Insight for government decision-makers.

ATIS' SYNC Committee (SYNC) develops and recommends standards and prepares technical reports related to telecommunications network synchronization interfaces. SYNC actively provides input into high-level governmental decision-making regarding timing and sync issues. Most recently, it offered comments in response to the Office of Science and Technology Policy Request for Information seeking input on the creation of a National Research and Development Plan for Positioning, Navigation, and Timing (PNT) Resilience. This input addressed issues including how PNT services will be used over the next ten years, and their role as a necessary and enabling technology of advanced telecommunications technology and deployments.

Global Navigation Satellite Systems (GNSS) security and vulnerability and its impact on network timing is another SYNC focus. SYNC has provided commentary when the National Institute of Standards and Technology (NIST) sought input on public and private sector use of PNT services as well as the standards, practices, and technologies used to manage cybersecurity risks to systems, networks, and assets dependent on PNT services.

As another major industry contribution in this area, ATIS hosts the Workshop on Synchronization and Timing Systems (WSTS). Highly relevant now as there is currently a growth surge in the applications that depend on precision timing to deliver services. Beyond the telecom industry, synchronization and timing systems are a critical factor in many industries' success. WSTS is the premier North American event that brings together leading experts to address timing and sync issues in telecom, financial services and data centers, the electric sector, smart cities, the automotive sector, industrial automation; defense systems, radio astronomy and more.

INTERNATIONAL PARTNERSHIPS



ATIS 3GPP

As the global standards body developing mobile telecommunications protocols, the 3rd Generation Partnership Project (3GPP) is responsible for the specification of 5G radio and systems. ATIS is the founding Organizational Partner representing North American interests in 3GPP, including North American 5G requirements. ATIS' many innovations have been instrumental in moving the industry into the 5G era, and our contributions serve to publicly position our members as leaders in the 5G space – critical work as 5G is predicted to contribute more than $750B to the U.S. economy alone by 2035.

Currently 3GPP is developing new standards releases to enhance the capabilities of 5G for mobile broadband, massive IoT and ultra-reliable low latency-use cases. 5G standards in progress will further optimise 5G to address important market requirements in healthcare, smart cities, transport, smart agriculture and Industry 4.0. 3GPP also continues to modernize LTE to maximize the value and lifetime of that technology.

In addition to ATIS, 3GPP unites six other regional standard development organizations (ARIB, CCSA, ETSI, TSDSI, TTA, TTC), known as Organizational Partners, and provides their members with a stable environment to produce the specifications that define a fully interoperable global standard for mobile communications. This global partnership provides user benefits in the form of international mobile roaming and creates a global device and network market with excellent economies of scale.

oneM2M

ATIS is a oneM2M founding Organizational Partner, a global standards initiative that is helping to unlock the potential of Machine-to-Machine (M2M) technology and the Internet of Things (IoT).

oneM2M technical specifications address the need for a common M2M Service Layer that provides interoperability for Machine-to-Machine and end-to-end IoT systems application services worldwide. The standardization of this common service layer covers requirements, architecture, APIs, security and interoperability testing. The oneM2M technical specifications have been developed in an open and collaborative environment, with a clear governance framework. These factors facilitate trust in its specifications, cross-vendor interoperability tests and certification efforts.

oneM2M brings together eight of the world's preeminent standards development organizations: ARIB, ATIS CCSA, ETSI, TIA, TSDSI, TTA and TTC, together with industry fora or consortia and over 250 member organizations.

To learn more about ATIS' initiatives, contact
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