IEEE Internet of Things (IoT) Webinar
Wednesday, 23 October 2013

Featuring Presentations on IoT-related Projects and Innovations by Global Industry Leaders

Participants
Moira Patterson, IEEE
Chuck Adams, Huawei
Oleg Logvinov, STMicroelectronics
Dennis Brophy, Mentor Graphics
Mary Lynne Nielsen, IEEE

Transcript and Slides from the Live Webinar Event
23 October 2013
INTRODUCTION

(SLIDE 1)

Moira Patterson speaks

Welcome everyone.

(SLIDE 2)

(SLIDE 3)

My name is Moira Patterson, and I work for IEEE. My role is to promote IEEE and, more specifically, IEEE standards and their impact globally, with a focus on Europe.

Our speakers today are:

- Chuck Adams from Huawei
- Oleg Logvinov from STMicroelectronics
- Dennis Brophy from Mentor Graphics
- and my colleague, Mary Lynne Nielsen from IEEE

I will give a bit more background on them later.

(SLIDE 4)

We will be talking about the IEEE IoT initiatives today, with a focus on the role of standards and helping industry. A main part of our initiative is to bring together stakeholders from around the world to seek input and identify the needs in key areas of IoT. Through in-person and remote events we engage the local and global communities of stakeholders, and this webinar is one in a series of such events that included a kickoff workshop last November in Milano, a workshop in Beijing, and a future workshop in Silicon Valley. On today’s webinar, we welcome participants from all over the world, many from Europe, but we also have participants from Thailand, South Africa, the United States, India, and elsewhere.
(SLIDE 5)

Here is a brief view of the agenda. We will be moving into Session One shortly, which is an overview of IEEE-SA. Session Two will be an overview of IEEE-SA activities and IoT. And Session Three will talk about how standards accelerate the deployment of IoT technologies.

And then, before we get to the Q&A, we will also introduce our upcoming IoT event

So now, let me introduce our first speaker: Dr. Chuck Adams

SESSION ONE

(SLIDE 6)

Dr. Wilbert Charlton Adams, who we refer to as Chuck, has forty-five years of experience in the information and the communications technology industry.

He currently supports Huawei Technologies as a distinguished Standards Strategist, having joined the Huawei corporate global industry standards team in June 2011. Chuck’s prior experience includes forty-one years of service with IBM where, during his last ten years, he focused on standards management, having IBM corporate responsibilities for worldwide standardization and intellectual property coordination as well as global open source software policy management. His overall experience with IBM involves communications, networking, office automation, and software development, as well as business and strategic process transformation, finance, and marketing.

Chuck is past president of the IEEE Standards Association and has served on the IEEE Board of Directors. He has been a member of the IEEE Standards Board leading several board committees, and he was the first Chair of the IEEE-SA corporate program. Chuck was in on the establishment of the IEEE-SA international strategy and the implementation of IEEE’s international offices. He provides IEEE-SA leadership for the IEEE internal and global Smart Grid and IoT strategy. Chuck has received several IEEE awards for his development of global programs. Chuck also supports the U.S. national representation for JTC1, and he represents the U.S. on the JTC1 Smart Grid and IoT special working group. With this I would like to hand it over to Chuck.
Chuck Adams speaks

Good morning, this is Chuck Adams.

I welcome everyone to our IoT session this morning. And whatever time zone you are in this morning or afternoon, I wish you a good day.

In our session today, we want to share with everyone insight into the IoT strategic activities that are ongoing within the IEEE.

However before we go into some of the specifics, we wanted to kind of share with everyone some insights into the IEEE and specifically the Standards Association, which is a part of, a major part of, the IEEE, which works very progressively and strategically to support all interested parties that have a focus on the standards developments that will relate to future IoT activities. Whether they be in industry, academia, or vested individuals that have an interest in the technology.

So if we move on to our next slide, I'd like to take a few minutes, for those that may not have a great deal of familiarity with the IEEE, for some insights into the organization. It is an organization that is well over a hundred years old, and it is the largest professional organization globally, supporting an area of technical focus.

Globally we have over, well over, 400,000 members, individual members, representing all vested interests and brought together by their career focus and their technology interests. One of the unique things about the IEEE is the broad spectrum of support and activities in technologies that it does address.

And these are actually supported through over forty technical communities within the IEEE, addressing all areas of the engineering disciplines related to electrical engineering from a low level perspective, a high level perspective, and an application perspective, and integration perspective. And the strength of the IEEE is the ability of these technologies and societies and communities to work together and to actually focus their various areas of expertise to move forward the profession. And actually, this is one of the areas, as we get in to our discussion that is, that relates to the
strength of the IEEE as we begin to look at converged areas of technology. Areas like the Internet of Things, as we move forward.

As we said, the IEEE is a global community. The membership resides in most countries in the world, currently that’s over 160 countries.

Now the value of the IEEE, in addition to providing a professional community for folks to come together, is the support structure that it provides to its membership—and to all others that have an interest in the areas that the IEEE supports. The IEEE is very focused in supporting professional development through educational activities, and as a result, supports over 1,200 conferences globally. So at any point in time there are probably three or four conferences ongoing in parallel somewhere in the world.

Another area of strength of the IEEE is the publishing and documentation of material that relates to the profession. As you can see on the chart, the IEEE maintains a database, a registry that can be accessed, of technical documents, standards, and other related materials that has well over three million documents. And the interesting thing is that if one looks at the technical literature that is published in the areas supported by the IEEE, well over a third of that literature is published in the IEEE.

In fact many of its periodicals are well-referenced, well-cited, and many of the patent offices around the world will utilize the IEEE documentation in the review and the citing of references and in the review of these patents and patent applications. So it’s an organization focused on supporting the community, and as I said, the community, whether they be individual, industry, academia and other areas of focus.

(SLIDE 9)

The IEEE, as I said, is very focused globally and maintains a balance of support for all geographical regions. It’s very focused in Europe. And you can see on the chart some of the statistics of those 400,000 plus members, over 13 percent are physically located in Europe.

(SLIDE 10)

The IEEE has been very focused in Europe and it is a very large community, working very closely with academia, industry, standards communities and working with governments in Europe such as the European Commission as they focus on their strategic structure going forward. To support these
activities we actually have an office located in Brussels, Karine Iffour is the director of our office there, and she coordinates the activities we support with our membership and other interested groups within the region. Additionally, the Standards Association, has over 10 percent of its members residing in Europe. And within the IEEE, one of the interesting aspects of the Standards Association, is the Standards Association supports both individual membership as well as industry membership. It’s a unique community in that regard, and about 20 percent of the industry members reside in Europe.

(SLIDE 11)

In terms of the SA, the standards that the SA produces are focused on being globally recognized standards, and with those standards, there are over 900 active standards, and at any point in time there’s usually an average of about 500 standards that are being developed, along with revisions, amendments, and other associated updates. A very active community. And in fact, there’s over 20,000 developers that participate and cooperate in the Standards Association activity, and there are over 200 corporate members that participate. And as we referenced, we mentioned earlier, the real strength of the SA is the ability to leverage the multiple technical areas within the IEEE. And in fact, these technical areas work very closely with the Standards Association in terms of sponsoring and supporting the activities ongoing in the Standards Association.

Another very important part of the Standards Association – is it is an independent global community. While the Standards Association works very closely with other standard communities and national bodies around the world, the community itself is an independent community, independent of government and support, and focused on supporting industry or market requirements.

(SLIDE 12)

One of the unique things about the Standards Association is that it is a totally open environment. In the participation and the development of Open Standards, all communities are welcome to participate; membership is not required. So out of 20,000 participants that are involved in Standards development activities, the vast majority are not members of the IEEE, but are recognized as diligent constituents in the development of the standards. And any individual or organization can participate, and we welcome everyone to be involved in the standards-development activities.
The Standards Association activities are very much aligned with many of the activities that are ongoing in Europe today, supported by the standards communities and the European Commission, and some of these are listed and identified in the chart you see on your screen today. IEEE Standards Association programs are involved in the areas of intelligent transportation, intelligent vehicle, ranging from grid interconnection through vehicle communications, to black box intelligence within vehicles. In the area of e-Health, there’s a lot of work ongoing that is looking at the integrated technologies required to support the e-Health platforms of the future. Many protocol activities that support device interaction are developed within the Standards Association. We’ve been very active in the areas of IoT, Internet of Energy, Smart Grid. In the area of Smart Grid, we’ve been very involved in developing a platform and infrastructure guide for developing standards that can be utilized in the deployment of Smart Grid technologies, looking out to the 2030–2040 timeframe. We work in alignment with many of the governmental strategies in this area, in the U.S., the SGIP, and in Europe the Smart Grid Coordination Project. We are very involved in looking at activities that relate to the myriad of technologies that are necessary to support the Smart Cities of the future as well as focusing on environmental types of programs. The SA is very involved in programs such as the EC program, which looks at the energy consumption technologies in things like TVs, servers, cell phones and PCs from manufacturing to utilization to the disposal of these products. And again, the SA is focused across all levels of technology, low levels of technology, in the level two and level three areas, plus supporting the networking activities up the stack through some of the applications levels, and looking at how we bring together programs to integrate these technologies.

One of the things that’s very important to the Standards Association’s development activities and the related strategic activity is the recognition that, as we move forward, there’s a paradigm shift within our world standards, and that’s the fact that we’re moving towards an area of convergence in technologies. To apply solutions, whether this be reflected in things like IoT, or e-Health, intelligent transportation, we’re no longer looking at vertically structured technologies. And in such an environment, we need to address and look at an ecosystem that supports standards development that enables industry to move the products to the marketplace. As a result, the SA has been working very closely with standards communities around the world to develop alignments, supporting coordinated strategic relationships and developmental activities, to ensure that these coordinated
efforts reflect the requirements identified in various areas within the global market communities. So if we go on to the next chart, we can actually look at some of the communities that are focused on within the European region.

(SLIDE 15)

The IEEE Standards Association maintains a very close alignment with ISO, IEC, ITU, IETF, and ETSI that is not on the chart. In the case of ISO and IEC there is a lot of ongoing work in terms of joint development, joint publishing, and joint dual projects. In the case of ITU, we are in very close alignment there in terms of maintaining sector relationships across all three areas of ITU. We work with them in terms of not only coordination of development activities, but in other activities that accomplish coordinated technology progression. In the case of ETSI, we have a developing relationship where we can work with their community at the workgroup level, where we have a coherent relationship, where we can share materials. And in the case of IETF, we have a very close relationship especially with the 802 community, to ensure that the activities that relate to the protocol development coordinate and align with the networking activities going on within the 802 arena.

Again these are all important relationships, and they are a very important part of the global standards development ecosystem to ensure that we are supporting requirements of industry going forward.

We can view the next chart.

(SLIDE 16)

Another aspect of Standards Association is the recognition and the importance of adhering to the principles associated with the WTO. It’s important to know that the IEEE Standards Association adheres to the principles of the WTO. There are two levels of importance that relate to standards and the transition of standards to the marketplace. One of course is obviously the technology and technical relevance of the standards and ensuring that they are developed in an appropriate environment. And in developing these standards in the appropriate environment, it is necessary to ensure that they can be used in support of global trade. So the SA is very focused on ensuring that it adheres to all these activities, whether they be transparency, openness, consensus, technical relevance, coherence, or ensuring a proper development environment.

All activities within the Standards Association are open to everyone. All activities are fully available. Anyone can participate in an activity and the SA watches very closely to ensure that there’s
impartiality and consensus, and that dominance is avoided within the Standards Association. We follow very closely the area of intellectual property to ensure that we avoid any issues. In fact, one uniqueness of the IEEE is addressing new directions in IPR and the continuing assessment of intellectual property to ensure that all folks are impartially and properly supported in terms of their contribution to the work groups ongoing within the IEEE. And you can find more information on the WTO relevance and how we adhere to it at the URL that’s referenced on the chart that you currently see. http://standards.ieee.org/develop/intl/ieeewto.pdf

So we can go to the next chart.

(SLIDE 17)

Another aspect that is quite important within the SA, the Standards Association, is that supporting industry recognizes that there are multiple phases to standards development, as the role of standards is to ensure transition of technology to the marketplace. And there are multiple phases that go on to support these activities. There are what we call “pre-standards activity,” the actual development of standards, and programs to facilitate the transitioning of these standards into the marketplace.

The Standards Association has a very active pre-standards program. In fact, for proposals that come forward, the Standards Association provides free support for a year for industry to come together to collaborate and in an environment that avoids dominance, to allow industry to address what requirements are necessary to move forward in these areas. There are many programs that are actually initiated in this pre-standards environment. We’ll talk a little later today about energy, work in the area of cloud, work in the area of security activity, as well as many others that have been addressed as pre-standards activities to formulate requirements that industry would need to go into a structured development process.

The SA is very proud of its accelerated standards services, and the support structure that it has for its accelerated standards process. Through the complete cycle of work group activities, the tools the work group needs in development, whether they be project management tools, or the framework providing accelerated approaches supporting global balloting, are provided. The SA strives to ensure proper global oversight, to maintain balloting that is a fair, open, and non-dominating.

And moving to the implementation of industry programs, it is recognized that there are many activities that are required to support the implementation of standards. We have one program called
ICAP which addresses Conformity Assessment. We provide registry support for areas like 802 and others, so that standards can be used in the marketplace.

So that’s a quick overview of the Standards Association. Before we move on to the next chart, I did want to mention the ISTO. Which is another framework that the Standards Association supports. There are activities where the industry comes together and wants to work in an environment that utilizes special interest groups, consortia, to do the development activities that enable them to move on to the standards community, whether they’re in the IEEE or in other communities. The ISTO has been a successful activity and community within the IEEE to enable an alternative approach to standards development.

And the focus of this slide was to provide an overall support structure to meet all the needs within industry, in addressing the standards development activities.

So now I’d like to move on and introduce you to Oleg Logvinov, who’s the Director of Market Development in ST Microelectronics.

**SESSION TWO**

**(SLIDE 18)**

Oleg is going to talk to us a bit today about IoT activities in the Standards Association. You can see his resume and background on the screen. He is a very active individual within the IEEE and the Standards Association, a very long career of active development in technologies that support IoT, IoE going forward. Here you see some of the activities he’s been involved in, like the HomePlug Powerline Alliance, and today he’s actually very active in the governance of that activity. So with that Oleg, I’d like to turn the session over to you, so you can explain the IoT program within the IEEE and in the Standards Association.

And I thank you all very much for your time this morning.

**Oleg Logvinov speaks**

Thank you very much Chuck for that introduction. I really appreciate that.

Good morning. Good afternoon. Good evening everyone.
As you can see, I serve in many capacities beside my day job, where I work for STMicroelectronics. I’m sure some of you know our company. We make a wide range of platforms and devices that pretty much power everything now, starting from automotive, to MEMS, to our smart phones, to our computers, and many other things. I also involve myself in many activities inside IEEE, such as Corporate Advisory Group, Standards Board, and Industry Connections.

So, what are the goals of our involvement in the Internet of Things? Well, we would like to position IEEE Standards Association as a platform for doing business in Internet of Things. Internet of Things is a very complex and very multi-faceted environment, where many activities today get their birth not in a specific silo of a technology implementation, but really on the fringes of multiple disciplines, where the new convergent environment is being born. Wearable computing is becoming quite popular today and can serve as a good example of a new field that can help us to live longer, to essentially provide e-Health services. Certainly we’re talking about MEMS, we’re talking about communication, we’re talking about power, we’re talking about the ability to offer the data to the cloud and take data from the cloud. So no single discipline can address something like that. You really need the collaboration of many genius minds to come up with the solutions and really move the technology to the next level.

The semiconductor players who will be most successful will be those that can build on a corporate culture and proven processes for working effectively with partners, that have the ability to create solutions from a complete portfolio of sense, power and embedded processing components, offer leading-edge expertise in digital security, and have demonstrated the ability and commitment to help drive standards.

The IEEE essentially is working on being able to inform, deliver, and provide the platform that will allow the industry to bring this vision to life. And all of our activities today essentially focus on the development of infrastructure, certain deliverables, which we will talk about later,

And the next slide of course seeks to describe that the proof is in the pudding. And what we have done so far, we have developed this four major building blocks of our strategy, a four block approach, as you can see on the screen. We’re looking to identify various opportunities and not
necessarily only in the standardization domain. As Chuck mentioned, we now have Industry Connections addressing pre-standardization activities, and I will give you an example of how it works later in the presentation. We also have an alliance type of approach through the ISTO. We are really talking about the holistic full-life cycle support in the IoT world.

Of course, the main goal is to grow the IoT market and to create a vibrant ecosystem.

And of course, we would like to allow industry to leverage the IEEE platform of publications, conferences, workshops, and online presence. Have the ability to interact with fellow colleagues across the globe. You probably know that IEEE has over 400,000 members, which is very powerful as Chuck said. Also over 200 corporations are involved through our corporate program.

So really, the goal is to help industry to create a vibrant and active marketplace for the IoT. And what have we done so far? We’ve done worldwide workshops to discuss exactly those types of issues and provide opportunity for the industry to collaborate. In our workshops, the main focus is not really on standards, but rather on how we can create this convergent collaboration among multiple disciplines and entities, and how to leverage the power of the IEEE platform to move industry forward. We had one in, actually we had two already, in China. One of them was in Beijing in the spring of last year. We did just one in the spring of this year in Shenzhen. We did one in November in Milan last year, and all of those workshops were one-day events and were fantastic in terms of the response and multi-dimensional nature of presentations that were introduced at these events. And I strongly recommend being involved with those events going forward.

We’re focused on the next workshop that will take place on the fifth and sixth of November, in Mountain View, California. And the following one will be in Korea in March.

(SLIDE 22)

The event is set for November 5 and 6. So if you are interested, you see the link on the screen, you’re welcome to register, be a part of it, we would welcome your participation.

(SLIDE 23)

And the next slide, talks about IoT World Forum. The IoT World Forum is a very large event that will be held in Korea in the spring of the next year, and this side provides all the details related to the location and timing of the event.
The event will provide a powerful combination of technical presentations, industry focused keynotes and panels, and exhibits. [http://sites.ieee.org/wf-iot/](http://sites.ieee.org/wf-iot/)

(SLIDE 24)

If you look at what IEEE has done with the public presence, the website, twitter and other social media, through the YouTube channel, it’s quite remarkable. And you will see that we have engaged quite broadly everybody from around the world, and today our IoT website is really one of the places where people go to get information and news related to IoT. And you too can become contributor through the presentations and workshops and panels and discussions taking places at our event and online. And your opinion can be reflected in our public presence through your contributions, so get involved. [http://standards.ieee.org/innovate/iot/](http://standards.ieee.org/innovate/iot/)

(SLIDE 25)

This slide summarizes our key areas of interest. And please don’t take this slide literally, because this is not an all-inclusive sample of areas where IEEE is active today. This is just an example of some of the standards that are applicable to the IoT world.

And as you can see, those standards cut across pretty much all of the areas that cover Connectivity, Medical Devices, Sensors, Digital Home Networks, 3D Human Factors, Cloud Computing, Electronic Systems, and Smart Grid. I would like to touch on two of them, because I think those are very important.

Several years ago we launched the effort focused on the development of the first of the kind standard reflecting the system of systems approach in terms of how you can look at Smart Grid.

This approach created a great foundation for IoT related work.

And another interesting development was in the domain of Home Networks. It was IEEE 1905.1 standard, which is also the first of a kind. This standard essentially allowed us to create an abstraction layer that presents, from a system point of view, a single networking interface while integrating multiple communication media, such as Powerline IEEE 1901, Wireless IEEE 802.11, MoCA for coax cable, and of course IEEE 802 Ethernet. And because the system doesn't really know what media it communicates over, the abstraction layer has the intelligence to decide which media is more suitable for that specific communication. This is an important step that enables the Internet of Things to become a reality, this new standard enables the creation of ubiquities network in every home.
We talked about Industry Connections. Industry Connections is the initiative that allows the companies and the individuals to get together and have a flexible platform for activities which may or may not evolve into standards development, but certainly can prove valuable to industry deliverables. I will provide examples of such deliverables a bit later in my presentation.

This example is focused on IoE. IoE stands for Internet of Energy. Energy is a vital driver of everything that surrounds us. And what you don’t know is that architecture of many systems from the energy delivery point of view is very similar. As an example, home entertainment, or home energy management, or home automation, or even your conventional security system are very similar in that regard. But none of those systems talk to each other today. While there are activities driven by isolated companies, there is no unifying standard that would allow a creation of an ecosystem of products from many vendors. On the other hand we see a clear unification of the content representation on multiple screens. Just look at the Smart TV initiative as an example, allowing you to seamlessly experience the same applications in the palm of your hand or on the big screen. We have a convergence of user interfaces and screens that is soon to be followed by the convergence of applications allowing multiple systems to be interconnected at the M2M level. This convergence will allow us to leverage architectural similarities among the systems and is likely to drive a unification of system components. So why not to create a convergent environment that would allow us to combine the development of the future Internet of Energy with the entertainment and other functions within the home? Not to mention the challenge of electrical vehicle charging, where we’ll seem to have the same type of roaming approach as we do today with our mobile phone. So essentially, we’ll be able to use the energy whether we’re home, or when we’re travelling, or we’re going somewhere else. All of that creates an opportunity to create a convergence of Smart Home and building architectures providing us with the platform for new applications and services. This activity under Industry Connections serves as an incubator, where an idea can be tested and verified and later developed into a standard.

In 2012 we had a roundtable that was co-located with our Milan IoT workshop, and during that roundtable, we discussed the Artemis IoE Project. [http://www.artemis-joie.eu/](http://www.artemis-joie.eu/)
This project is focused on electric-mobility, and we identified that the convergence of electric-mobility with other smart home/building applications should be the focus of our work. And now this project is open to anybody who’s interested. Please visit the project website and get involved:
https://standards.ieee.org/develop/indconn/iccshba/index.html

(SLIDE 28)

If you look at the bar chart, it shows the domains that are under consideration in this project, which is comfort, security, fire safety, energy management, etc. They are represented as vertical bars. Those are the domains that we are looking at, but at the same time there are commonalities that can be found in all these domains. Association and Admission Control, Network security and privacy, etc. They are represented as horizontal bars.

(SLIDE 29)

Expected Benefits. Without a doubt this is the area where IoT can help to accelerate the growth of the industry and create new business models resulting into new revenue streams. The elimination of redundant efforts and proliferation of best practices is a valuable contribution the application of the IoT is poised to bring into this space.

I can probably spend hours and hours on this slide, but I’m getting the feeling that I should be concluding my presentation, so if you have questions at the end, please don’t hesitate to ask, but the main point here is interworking among multiple domains has an incredible benefit that it’s nearly impossible to describe it in several hours of conversation The best way of continuing this discussion is being involved in the project.

(SLIDE 30)

And as you can see we have already a host of companies working in this area together and to develop this activity including the company I work for, STMicroelectronics, including the company Chuck works for, and many others. And these activities are pretty much across the globe so companies from all over the world already have gotten involved, and you are welcome to do the same.
And this is a perfect example of what the deliverables are. They include workshops, white papers, requirement documents that can serve as a starting point for a standard, analysis of standardization gaps...

That pretty much takes us over to the end of my presentation, and once again I would like to invite you at our next workshop which is November 5 and 6 in Mountain View, California. It's going to be a two-day event with a pretty vibrant agenda. You can look at the website, and you will see that we have gathered leaders from the industry and we'll be looking at the Internet of Things from many angles. And hopefully, as a result of it, we'll have a pretty interesting synthesis from all of those discussions.

Thank you very much again for your attention, and with that I will hand it over to Dennis.

**SESSION THREE**

I would like to introduce Dennis Brophy to you. Dennis is the Director of Strategic Business Development at Mentor Graphics Corporation. Dennis wears many, many hats in IEEE, and is probably one of the more key members of the IEEE-SA volunteer staff. He serves on the Board of Governors, He even chairs the Corporate Advisory Group that I am also glad to be a member of, and he is the Vice-Chair and Past-Chair of Accellera, an Electronic Design Automation group.

Dennis brings 33 years of experience, and I should tell you, his expertise and wisdom is something that I have not seen yet matched. And of course Dennis’s activities extend pretty much across many, many, standardization bodies focused on EDA tools and EDA technology. So please enjoy Dennis’s presentation.

Dennis Brophy speaks

Thank you. I appreciate your introduction and good afternoon to everybody.

My portion of the presentation is going to be on how standards accelerate the practical deployment of IoT Technologies, and to offer you a glimpse into the conclusion of that is that they are useful and
beneficial to large and small and medium-sized enterprises, and underpin the basic elements that further standards.

(SLIDE 35)

So, in the areas of standards technology deployment, we ask the question of what we can do to help industries benefit from standardization and put into place the necessary things that industry would like to see us usher in with new technologies like IoT. So when you join the standardization bodies and groups, you are able to influence technology development, and you can remain competitive, like a collective sense of development in a community type of way, where the best of all things can come together, and you are able to then network with the other thought leaders in the industry and evolve something into a global standard that you will then have the ability to market, and offer as well globally. Certain companies may wish to just accept and adopt the standards that are made around the world, but we know that with all the different things that have to go into IoT, we have a world of groups that should come together with their standards and help drive things forward.

(SLIDE 36)

To that end, we actually stand with all of the standards organizations under the Open Stand moniker and embrace the numerous team elements of successful standardization. And one of those is the principle of collective empowerment. As we strive to create standards, we know that a standard that’s best is one that is based on technical merit and judged by those that are creating it, the technical experts or the industry that’ve gotten together. They ought to provide global interoperability, scalability, and the like. Standards are not put in place as barriers to trade, but they actually bring barriers down and foster such trade. They also set the stage for building upon them for further innovations, so that when the standards are done one can expect that they will continue to grow and provide for others the ability to build on top of them. And lastly, they ought to contribute to and benefit humanity, the underlying principle that the IEEE holds, and the reason that its technical societies exists around the world as well.

Next slide please.

(SLIDE 37)

In the Internet of Things, the IEEE, and the Standards Association, the Standards Association specifically is establishing industry collaboration to help to drive further industry support that will allow us to drive IoT solutions to the marketplace. And as Oleg has stated, there are obviously a
number of ongoing standards projects that relate well to the Internet of Things which are already active inside of the IEEE. And we have a website, and a reference to go to it, so you can actually see the different activities that are going on inside of the organization as well. Oleg shared quite a few things about the global workshops and shared the details of the work that we’re doing and the upcoming workshop that we have in a few weeks, in the United States, in Mountain View, California. Oleg also shared information on the World Forum in Korea next year.

(SLIDE 38)

So, in these different areas that we’ve talked a bit about, we are driving and establishing industry collaboration to deliver the IoT solution to the marketplace. In the areas of Sensor Networks, our IEEE 1451™ series has been completed and continues to enhance, to evolve with the ISO, ISO adoption of this work.

In the area of RFID a Long Wavelength Wireless Network Protocol and IEEE 1902™ network standard.

And certainly our IEEE 802® standards have played such a key pivotal role in the last decade or more, for moving information around, have also become center for the way mankind expects a lot of information to be easily and completely delivered as well.

In the area of machine interaction, communication, connecting the sensors with the intelligence to help make decisions and inform action on what’s sensed around them are quite a few standards in the 802 as well. And lastly, in the communication area we’re completely on top of the existence of these standards, and others as well such as, the IEEE 1888™ standard, the standard for Ubiquitous Green Community control. The interesting thing to point out here is that these are global activities and the participants of these, from the individual technologists to industry, span the globe. For example, our 1888 work is actually a standardization project that started in China and demonstrates that we are developing standards globally, and deploying them globally as well.

(SLIDE 39)

Oleg talked a bit about healthcare, and he mentioned that there’s a pressing need for health to address ambient assisted living in the future. I think that we’re at the very beginning of exploiting many of the actual standards to help out in the healthcare area. There’s the IEEE Standards Association e-Health. Some have established a healthcare ecosystem today. And you can see a lot of the different groups, and companies, and standards that are evolving around the world that are
working with us to form key partnerships. We continue to forge the relationships that allow us to find all of the standards participants and bring them together. So we are involved with standards quite a bit of the time around the world, as well as with key developers in the e-Health area. And it’s just exciting to see how even some of the standards we thought might have been meant for one application, such as our IEEE 3D standards, might actually have even great application in the medical field, as companies explore ways of outfitting medical doctors with remote 3D devices to help them manage their patients.

(SLIDE 40)
This is an example of how IEEE standards are helping to improve personal health device communications. And as you can see, a lot of standards in terms of data transport, the 802 standards, NFC standards, in the medical area IEEE 11073™ standards provide a good setting for the capture of information and then the sharing of it.

(SLIDE 41)
In the house, you may not know it as well, but there’s also a lot of IEEE Standards at work there too. We talked a bit about whether it’s a 3D video standard, the IEEE 3333™ 3D standard for 3D TV, which is being leveraged by other standards and projects within the IEEE for greater gain, but you can see the ability to connect whether it’s Smart Water, Smart Energy, Smart Home, access to information on the Cloud, Smart Metering, being able to go out to an exchange perhaps, and to buy electricity at the right time. Or perhaps a solar panel is storing energy in your electric car, and if the grid needs more electricity it is waiting there for the right time to sell it into the grid. There is an opportunity there that is fundamentally enabled by a lot of the standards that we have in place today, and we’re building for tomorrow.

(SLIDE 42)
And, if the tomorrow that we know is going to be even a brighter picture than you see here. You can see this picture shows the 802 wireless LAN devices and the number of units that we’re shipping in a year. And in 2006 we were probably sitting at a point in time when we thought that was a lot. We noticed that new devices and electronic elements are being added in to this environment push the number of units being developed daily. So when we talk about connected devices like thirty, fifty, a hundred billion devices, we know, just by the way we’ve been seeing in the last seven years that new devices are exploding into the network whether they be physical devices or in service overlays
that companies are being able to bring things to consumer for free, we see that there will be another evolution, an explosion of devices like this that will be adding another bar on top of the yellow one, where even the pads and the tablets of today will be a smaller number that those in the future.

But how do we make these standards, and how do we keep them relevant to the global market and bring the participation in? I’d like to talk a little bit about that.

(SLIDE 43)

One that’s close to my domain that Oleg talked about is in the electronic design automation domain, and also bring in some geographic standards development, in the global standards development, and I would like to share with you some of the ways we’ve been doing this and what the benefit to industry has been to their participation.

The first one I have up here is the standard that is not the IoT standard, but for everybody that’s building those silicon devices, they probably use this today to design and verify their chips. It started in a consortium outside of IEEE. And IEEE is extremely open to bringing technology in. It’s a very friendly place to other standards development groups out there. It allowed, as well, companies to get together and we’ve exploited that new standards development scheme, where companies could actually come together as a group and bring our body of technologists together and hammer out what ought to be the right content to the standard. A long-standing agreement that the IEEE has with the IEC allowed us also, through the duo-logo process, to drive our standards into the global standardization arena as well. And as you can see in the example in the two bubbles on the bottom, the pre-IEEE Standardization and post-IEEE Standardization went from a few companies committing upfront before they even thought that there might be a market there. However, as you can see, there’s probably one multi-billion dollar company that was on the list, or a couple of them, that said “If you build it, we’ll buy it,” which obviously reduced the risk equation in moving down this path. But rapidly from 2004, the companies and products became prevalent, and we stopped counting after 2007. And through an arrangement with the Accellera Organization we’ve been able to take the Standard that has been developed and make it available to the design and verification community, this last standard, as a no charge option to the user. IEEE does get paid for this, and again, making it appear at no cost for the consumer, we’re lowering the barrier for those that develop against the standard, but also for those that need to know about it to use it.
In terms of what you get out of being connected and involved, here’s one from IEEE 1902.1™. This is on the Long Wavelength Wireless Network Protocol. And it fills some gaps in the non-network-based RFID, and many companies participated in that as well, as you can imagine. The types of things that you’re able to do by being able to monitor, track, and know where things are, to exchange information, from the things that are closely near each other, can be, you know, motivating for business, but it has potentials that we don’t even know into the future, as well. So I think that there’s a whole area that one set of business saw in terms of benefit to them, and because it’s there will open up new realms and new products, and services for users.

Well, Visible Assets is one of the participants in it, and it’s a small company, and is an example of a small enterprise and their engagement in the IEEE, with the primary benefit for them to be able to get government contracts with devices compliant to the standard. As we see, the consumers will reference the IEEE Standard as something that anyone fulfilling product requirements must fulfill, and the government is one example of that, and you can see in the quote from them, they were awarded a multi-million dollar, five-year contract, because they were compliant with the standard that’s called out in a Request for Proposals. So they didn’t have to build the standard, go out and market it, and get agreement on the way they see things. They could actually do this through a collective in a sense, and do what they do best, build the product around it.

In the area of IEEE 1888™ another benefit of involvement, the 1888 Standard, the Ubiquitous Green Community Control Network, is one that has been mostly done in China. One of the set of companies, this again is an entity project and the companies there range not just for commercial concerns, but are open for government participation, universities, trade association, research institutes, consortia, and the like, so the entity doesn’t have to be a multi-billion dollar concern or just a small company starting up. We also are open for research organizations that’d like to join with us. And after that work was completed, they knew they needed to build more on top of the standard. And for other such projects that got initiated after the completion of the first 1888 standard, the dot 1, dot 2, dot 3, dot 4 that you see on the slide here. One was for Control and Management, another was for Heterogeneous Networks Convergence and Scalability, another was on Security, and
another one was on the Green Smart Home and Residential Quarter Control Network Protocol. So that’s the additional work that they were doing.

(SLIDE 47)

But what was the benefit to some of the participants? BII is a small company based in China. It really facilitated their participation in the standardization process. It facilitated networking with experts in energy conservation and emissions reduction. How, can you imagine, would it be possible for a small company to bring all those types of companies together, or that research and knowledge together? Most would probably say you’re too small, too speculative, I won’t join with you. But when they joined with us, and had their experts present, they were actually able to interact with experts like that. Obviously standards allowed BII to track other developments and the work that was going on in related fields, and they gained insight into future technology trends that would help them build around products and services, and in that, they participated at the right time; they garnered the right amount of information, they shared the right information.

(SLIDE 48)

And it allowed them to be competitive early on, at the beginning of the whole process, to have an increased visibility, and establish them as an innovator. Now, they may think we showed them a path forward, but we think as much as well they helped us move forward. In the end we all could hone what the standard ought to have in it, and it was a true win, win for all, and even for the consumers, maybe a win, win, win, all the way around.

Listen to this quote, "Inspired by Chinese innovation and involving global collaboration." This is from BII, “the IEEE 1888 is a remarkable international standards development achievement in the energy sector” And this is, I think one of the, probably the quote that might be able to be used for all the standards that are developed, being able to bring groups together, harvest the local innovation that exists, garner feedback and input and recognition through a global standard-setting operation like the IEEE, and promote its use globally. And the good thing is, for all of these examples, you have the ability to collect the needs locally, and then have industry ready to service products - tangible or intangible - and to help foster and continue the evolution of improving the quality of life and improving the outlook for humanity.
(SLIDE 49)

With that, I think I’m back to the actual title slide that Oleg was referring to in the handoff. We really believe that standards accelerate the deployment of IoT technologies. We believe we’re sitting on an Internet of Things that are the current-day enablers, and we know we’ll need more for tomorrow. And to get to where we are tomorrow, we need to have a global conversation with everyone. And to that end, we’ve been holding this series of workshops around the world, our next to be held in Silicon Valley. And I’d like to introduce Mary Lynne Nielsen to talk about that, so that we can continue to be close and can expand our standards projects to fulfill a wonderful IoT world. Mary Lynne?

(SLIDES 50 – 55)

Mary Lynne Nielsen details information about the IoT Conference that was held on the fifth and the sixth of November 2013, in Mountain View, California. (for information view the slides)

CONCLUSION

(SLIDE 56)

Moira Patterson speaks

Thank you Mary Lynne for this announcement.

It sounds like a great event, and it sounds like it’s going to be held at a great venue.

So, we are almost at the end. We received a question that I would like to share with Dennis Brophy, and then we will have to wrap it up in the interest of time.

When we were showing the slides about the consensus building and about the integrated home, we received a question about how implementable is the model shown on slide 41, and when will we see these integrated homes in real time?

Dennis Brophy speaks

Well, that’s a good question. I think you are seeing them today in a lot of the Smart City projects that are going on around the world. There are many governmental agencies that believe that a lot of what will be happening in the home is critical. And they are either funding small cities today or building from small model cities as examples to actually build out and prove its success.
But, in terms of the standards today, they are here now. The ones that you see on this slide are being used today. There are vehicles today that are collecting energy from the house, that are being driven by solar or wind power. And so in terms of it being ubiquitous and available through all the world, I think you will be able to see an organic growth to these technologies. Our homes in the future will look like this, if you don’t already have a home like this today.

**Moira Patterson speaks**

Thank you very much Dennis.

As I said before, we will address any other questions that we receive directly. We have the list of the people who participated, and we'll try to get back to you with responses to any questions.

Thank you again for attending and for your interest and we look forward to hopefully working with you in the future. Thank you.
IEEE Internet Of Things (IoT) Webinar

Featuring Presentations on IoT-related Projects and Innovations by Global Industry Leaders

Welcome!

The webinar will begin shortly…
Special Requests

- This webinar is being recorded for future use.
- We have muted all attendees and ask that you please stay muted for the duration of the event.
- If you have questions during the presentation, please type them into the lower right-hand Q&A box on your WebEx view. There will be a Q&A session in the last portion of this webinar, where we will address questions posted.
- Thank you very much for your cooperation!

Now, let’s get started!
Today’s Speakers

Wilbert Charlton (Chuck) Adams, Jr.
Distinguished Standards Strategist, Huawei Technologies

Oleg Logvinov
Director, Market Development, STMicroelectronics

Dennis Brophy
Director of Strategic Business Development, Mentor Graphics Corporation

Moira Patterson
Program Manager, Global Activities, IEEE-SA

Mary Lynne Nielsen
Technology Initiatives Director, IEEE-SA
IEEE and the Internet of Things

Global Reach – Local Activities

Information about IEEE activities in IoT can be found at:

All IEEE IoT Activities: [http://iot.ieee.org](http://iot.ieee.org)
Agenda

Welcome & Introductions:
Moira Patterson, IEEE-SA

Session #1:
IEEE-SA Overview, Chuck Adams - Huawei

Session #2:
IEEE-SA IoT, Oleg Logvinov – STMicroelectronics

Session #3:
How Standards Accelerate the Practical Deployment of IoT Technologies, Dennis Brophy – Mentor Graphics Corporation

IEEE IoT Events:
Mary Lynne Nielsen, IEEE-SA

Q&A
(please submit questions via chat)
Session #1: IEEE-SA Overview

Wilbert Charlton (Chuck) Adams, Jr.
Distinguished Standards Strategist, Huawei Technologies

- 45 years of experience in the information and communications technology industries.
- 41 years with IBM with focus on communications, networking, office automation, software development, global open source software policy management, worldwide standardization, and IP coordination.
- Past-President of IEEE-SA. Has served on the IEEE Board of Directors, IEEE Standards Board, and several Board committees. First chair of the IEEE-SA Corporate Program.
- Led the establishment of IEEE-SA international strategy and IEEE’s international offices. Provides leadership for IEEE’s Smart Grid and IoT strategies.
- Represents the US on the JTC1 Smart Grid and IoT Special Working Groups.
IEEE-SA Overview

Wilbert Charlton (Chuck) Adams
Distinguished Standards Strategist, Huawei Technologies

Past-President, IEEE-SA
Past-Member, IEEE Board of Directors and IEEE Standards Board
First Chair of IEEE-SA Corporate Program
IEEE: The World’s Largest Professional Association
Advancing Technology for Humanity

Our Global Reach

- 415,000+ Members
- 45 Technical Societies
- 160 Countries

Our Technical Breadth

- 1,200+ Annual Conferences
- 3,300,000+ Technical Documents
- 160+ Top-cited Periodicals
Collaboration is our *Foundation*

In Academia  In Industry  In The Field

IEEE brings people and technology together for mutual benefit
IEEE in Europe

- Office in Brussels, Karine Iffour Director
- Membership from Europe
  - 13% IEEE members
  - 10% IEEE-SA members
  - 17% IEEE-SA corporate members
- Participation on European groups
  - Multi-Stakeholder Platform for ICT Standardization (MSP)
  - Steering Committee of the European Technology Platform for the Electricity Network of the Future (ETP Smart Grids)
  - Cloud Standards Coordination (CSC)
- Presence at recent events:
  - 3rd Ethernet & IP @ Automotive Day, Germany
  - IEEE-SIIT – The 8th International Conference on Standardization in Information Technology
About IEEE-SA

- Globally recognized standards
- Over 900 active standards
- More than 500 standards under development
- Over 20,000 standards developers worldwide
- 200+ corporate members
- Leverages the breath of 40+ technical areas
- Independent global community
IEEE Standards Association
No Restrictions in Engagement

- Open in membership, participation and governance
- No restrictions
- Any individual or organization
- Any industry or size of company
Key IEEE-SA Programs Supported by European Industry

- Intelligent Transportation
  - e-Health
  - IoT / IoE
  - Smart Grid
  - Smart City

- Environmental focus

IEEE-SA is in a position to address lower level technologies as well as cross technology integration, managing programs from concept to deployment.
Collaboration with Other Global SDOs

- **ISO/IEEE PSDO Agreement** address adoptions and joint development work between the ISO and IEEE
  - Currently covers the following areas:
    - ISO TC 204 — Intelligent transportation
    - ISO TC 215 — Health Informatics
    - ISO/IEC JTC 1 — All subcommittees

- **IEC/IEEE Dual Logo Agreement** was signed in 2002 to approve IEEE Standards are eligible for adoption by IEC

- **IEC/IEEE Joint Development Agreement** was signed in 2008. It provides an IEEE Working Group and an IEC Working Group/Project Team/Maintenance Team the ability to develop one standard with an IEC and IEEE logo

- **The IEEE is a Sector Member of**
  - ITU-R (Radiocommunication)
  - ITU-T (Standardization)
  - ITU-D (Development)

- **IEEE agreement with Internet Engineering Task Force**
  - Close collaboration with IEEE 802 Community
  - Partnering on technology governance issues
The widely respected IEEE-SA standards-development process, which adheres to the WTO/TBT Principles, produces results that reflect the collective consensus view of participants and enable industry to achieve specific objectives and solutions.

IEEE-SA Solutions for Industry

- **PRE-Standards Programs**
  - Industry Connections

- **Accelerated Standards Services**
  - Corporate standards

- **Market Implementation Programs**
  - ICAP
  - Registration Authority
  - IEEE Industry Standards and Technology Organization (IEEE-ISTO)

A framework of solutions to ensure rapid introduction of new technologies to market
Session #1: IoT & IEEE-SA

Oleg Logvinov
Director, Market Development, STMicroelectronics

- Director of Market Development at STMicroelectronics’ Industrial & Power Conversion Division.
- During the last 25 years, has held various senior technical and executive management positions in the telecommunications and networking industry.
- Currently serves on IEEE-SA Corporate Advisory Group and the IEEE-SA Standards Board.
- Actively participates in several IEEE standards development working groups.
- Helped found the HomePlug Powerline Alliance and today serves as the Chief Technical Officer of the Alliance.
- Has 18 patents.
IoT and IEEE Standards Association

Oleg Logvinov
Director of Market Development, STMicroelectronics

Member, IEEE-SA Corporate Advisory Group
Member, IEEE-SA Standards Board
Chair, IEEE-SA Industry Connections Committee
Current Aims

- Inform
- Commit
- Deliver

- Creating a 3-legged footstool
  - Infrastructure
  - Deliverables
  - Presence
Infrastructure and Deliverables

- Worldwide workshops
  - China (Beijing and Shenzhen), Milan
  - Future: 5-6 Nov 2013: multi-day event at Computer History Museum, Mountain View, CA, USA

- Creating structure for SA IoT activities
  - Need to understand ecosystems of areas

- IoT roundtables: Korea in May, California in November

- This webinar
IEEE-SA IoT Workshop

- 5-6 November, Mountain View, CA
- http://iot.ieeesa-events.org/
IEEE IoT World Forum

- 6-8 March 2014, Seoul
- IEEE-wide event
- Will include standards track
Public Presence

- New web area devoted to SA’s work in IoT
- Highlights IEEE existing standards and projects that relate to the Internet of Things
- Presents workshops and panel discussions
- Access to sign up for vertical subgroups

http://standards.ieee.org/innovate/iot/
# Key Interest Areas

## Connectivity
- 802.16: MAN standard, includes machine-to-machine communications
- 802.11, 802.15: fundamental connectivity
- 1901: broadband over power lines

## Medical devices
- 11073: Personal health device communications

## Sensors
- 1451 series of sensor standards now expanding for IoT, Big Data

## Digital Home Networks
- 1905.1 standard creating a common interface for multiple forms of connectivity

## 3D Human Factors
- 3333.1 project on quality assessment of 3D

## Cloud Computing
- 2302 project on cloud-to-cloud communication

## Electronic Systems
- 1856 on framework for prognostics and health management

## Smart Grid
- 2030: ontology standard
IoE Example
IEEE-SA Industry Connections - Convergence of Smart Home and Building Architectures

There are striking similarities among the architectures of the Smart Home/Building environments as described from various points of view including EV, HEM/BEM, Infotainment, etc. But a gap exists for interworking among these various domains.

We are experiencing the unification of user interfaces through our TV and Smart Phones/Tablets, but an effort is needed to enable a seamless experience spanning multiple application domains.
History and Collaboration with Artemis-IoE

- IEEE-SA and Artemis IoE participants first met in October 2012
  - At Roundtable co-located with IEEE-SA workshop on Internet of Things
  - Explored opportunities in the area of the Internet of Energy via a series of teleconferences and meetings
  - Identified the convergence of smart home and building architectures as an immediate opportunity

- Established IEEE-SA Industry Connections project in June 2013
  - Entity-based participation
  - Open to any entity willing to join IEEE-SA
# Domains Under Consideration

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comfort</td>
<td>ehealth, ambient assisted living, light, temperature, air quality, etc.</td>
</tr>
<tr>
<td>Security, Privacy Safety and Access Control</td>
<td></td>
</tr>
<tr>
<td>Fire Safety</td>
<td></td>
</tr>
<tr>
<td>Energy Management</td>
<td>Disciplines such as heat, cold, steam, fossil energy sources, electricity, domestic hot water. Washers, dryers, dishwashers. &quot;Renewables&quot; including PV (photovoltaics), solar collectors and gray water management.</td>
</tr>
<tr>
<td>Maintenance and diagnostics</td>
<td></td>
</tr>
</tbody>
</table>

## IEEE Standards Association

[slide #28]
Expected Benefits

- Interworking among domains application drives these benefits
- Increased granularity, visibility and awareness
- Increased level of usability
- Simplified interaction from operator point of view
- Better coordination among multiple application domains at M2M level
- Platform for virtual aggregation of multiple homes and buildings
- Semantic operability among applications
- Reduced implementation risks
- New business models
- Reduced implementation risks
Member Companies
### Proposed Deliverables

Proposed deliverables are intended to be complimentary to existing activities on IoT, electric mobility, and IoE.

<table>
<thead>
<tr>
<th>Workshops and roundtables providing a platform for industry collaboration</th>
<th>Recommendations that are applicable for new and existing dwellings</th>
<th>Requirements for a method to allow for functional levels (flexible integration of different disciplines and functional levels among disciplines)</th>
<th>Analysis of standardization gaps</th>
<th>White papers related to the gap analysis, and Smart Home and Building architectures</th>
<th>Potential IEEE-SA Project Authorization Request (PAR) proposals for potential IEEE Standards</th>
</tr>
</thead>
</table>
Join Us!

- IEEE-SA IoT Workshop
- 5-6 November, Mountain View, CA
- http://iot.ieeesa-events.org/
Session #3: Standards = Acceleration of IoT Technologies

- Member of the IEEE-SA Board of Governors (BOG) and Chair of the IEEE SA Corporate Advisory Group (CAG).
- Vice-chair and past chair of Accellera, an electronic design automation standardization group.
- Leader in the electronic design automation industry for the past 33 years. Originally with Hewlett-Packard for 5 years, and then joined Mentor Graphics, where he has held several positions over the past 28 years.
- Secretary of the IEEE P1800 SystemVerilog Working Group.
- Member of the American National Standards Institute (ANSI), and member of the United States National Committee for EDA standards.
- Co-convenor of IEC TC91 WG13.
How Standards Accelerate the Practical Deployment of IoT Technologies

Dennis B. Brophy
Director, Strategic Business Development
Mentor Graphics Corporation

Member, IEEE-SA Board of Governors
Chair, IEEE SA Corporate Advisory Group
Standards and Technology Deployment

How can industry benefit from standardization?

Influence technology development
- Incubate new technologies, standards and related services in a rapidly changing environment

Stay competitive
- Shape the direction of technology and its marketplace applications

Network with global thought leaders
- Gain advanced knowledge by engaging in corporate standards projects

Interact with peers in a neutral environment
OpenStand Principle: Collective Empowerment

Striving for standards that:

– are based on technical merit, as judged by the contributed expertise of each participant
– provide global interoperability, scalability, stability and resiliency
– enable global competition
– serve as building blocks for further innovation
– contribute to global communities, benefiting humanity
Internet of Things

- IEEE-SA is establishing industry collaboration to deliver IoT solutions to the marketplace
- IEEE has a number of existing standards and projects that relate to the Internet of Things
  - Topics include
    - Sensor networks: sensors and actuators embedded in common objects communicating through wired and wireless networks
    - M2M: machine to machine communication
    - RFID
    - Underlying protocols for communication, e.g., IEEE 802
- Website for information regarding SA’s work in IoT
  - http://standards.ieee.org/innovate/iot/
- Global Workshops
Establishing Industry Collaboration
Delivering IoT Solutions to the Marketplace

Sensor networks
ISO adopted IEEE 1451 series

RFID
IEEE 802.15.4f-2012, Active RFID physical layer
IEEE 802.11 (WiFi®) components

M2M
Related standards: 802.11 (WiFi®), 802.15.1 (Bluetooth®), and 802.15.4 (Zigbee®)

Communications
IEEE 1888-2011, IEEE Standard for Ubiquitous Green Community Control
IEEE 1901-2010, Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications
IEEE 1905.1-2013, Standard for a Convergent Digital Home Network for Heterogeneous Technologies
IEEE-SA eHealth

IEEE-SA Standards Enhances the Healthcare Ecosystem today…

Standards enabling “On the Go” Mobile Devices Technology

- Used by clinicians and caregivers to help patients live active and independent lives
- Enable personal health devices to plug ‘n play with mobile phones & home hubs, using Bluetooth & USB specifications
- Support mHealth initiatives that couple devices, communication, and health/wellness/medical communities

11073 Family of Standards directly impact healthcare today

- Coordinated across the entire healthcare continuum for personal health device communications for monitors, point-of-care communication foundations, and transport profiles
- Support of patients living independently with chronic diseases like asthma, diabetes, congestive heart failure, chronic obstructive pulmonary diseases, high blood pressure, stroke and atrial fibrillation

Key Partnerships

- IHE
- LOINC
- HL7
- ISO
- CEN
- IEC
- DICOM
- SNOMED
- Continua Health Alliance

Industry leaders have opportunities to develop innovative Healthcare standards that build upon existing IEEE-SA initiatives in mobile technologies (e.g. CPIQ, IEEE P3333, IEEE 1907.1, IEEE P2200, IEEE 1588) as well as developing new ones.
Improving Personal Health Device Communications Through Consensus Building

- Insulin Pump: IEEE 11073-10419™
- Glucose Meter: IEEE 11073-10417™
- Weigh Scale: IEEE 11073-10415™
- Cardiovascular Fitness & Activity Monitor: IEEE 11073-10441™
- Body Composition Analyzer: IEEE 11073-10426™
- Sleep Monitor: IEEE 11073-10423™
- Blood Pressure Monitor: IEEE 11073-10407™

Connectivity Transports:
- IEEE 802.11™ (Often referred to as WiFi™)
- IEEE 802.15.4™ (Often referred to as Zigbee™)
- Near Field Communications (Often referred to as NFC)
- IEEE 11073-30300™ (Often referred to as Infrared Communications)
- IEEE 11073-30400™ & IEEE 802.3™ (Often referred to as Ethernet)

Cloud: IEEE P2301™
IEEE P2302™

Health Care Manager

World Wide Web

Physician
IEEE Standards Drive Markets
IEEE 802.11 (Wireless LAN)

Market size & diversity continues to increase

- Pads/Tablets
- Enterprise APs
- Home/SOHO
- CE
- Phones
- PCs

Source: In-Stat

slide #42
IEEE 1800™ (SystemVerilog): IEEE-SA Corporate Standardization Impact

**Pre-IEEE**
- Accellera consortium created open standard for industry adoption

**IEEE**
- IEEE used consensus process to achieve global approval
- Created stable standard for industry to adopt

**IEC**
- Used IEEE/IEC dual-logo process

**Pre-IEEE Standardization**
- 2003
  - Co-Design, Real Intent, Mentor, Synopsys, Intel & Infineon
- 2004
  - 6 companies with 9 products

**Post-IEEE Standardization**
- 2005
  - 45 companies with 91 products
- 2006
  - 109 companies with more than 280 products
- 2007
  - 137 companies with more than 350 products
Benefits of Involvement: IEEE 1902.1™-2009

• Fills a gap between non-network-based RFID standards (e.g., ISO/IEC CD 15961-3, ISO 18000-6C or ISO 18000-7) and existing high bandwidth network standards such as IEEE Std 802.11trade and IEEE 802.15.4trade

• Companies that participated in the development of the standard: Visible Assets, Epson, Sig Sauer Inc, NexTag Inc., CyVerse Corp., Microsoft, SmartBridge
Visible Assets, Inc., is a privately held small company, based in the US

- “I think that the primary benefit to Visible Assets to have led and participated in the development of IEEE 1902.1-2009 is the ability to get Government contracts with devices compliant to the standard - It would not be possible without IEEE standard” John K. Stevens, CEO of Visible Assets

- “STRATHAM, NH, October 5, 2010: Visible Assets, Inc. is Awarded a $5 Million, Five Year Contract .. from Naval Surface Warfare Center…” compliance with IEEE 1902.1-2009 was a requirement of the Government Request for Proposals (RFP)
Benefits of Involvement: IEEE 1888™-2011

- Companies that participated in the development of the standard: BII Group, Beijing Jiaotong University, Beijing University of Posts and Telecommunications, China Telecom, Intel, Tsinghua University, University of Tokyo

- Four additional follow-up standards and projects:
  - IEEE 1888.1-2013, Standard for a Ubiquitous Community Network: Control and Management
  - IEEE P1888.2- Draft Standard for Ubiquitous Green Community Control Network: Heterogeneous Networks Convergence and Scalability
  - IEEE P1888.3- Draft Standard for Ubiquitous Green Community Control Network: Security
  - IEEE P1888.4- Draft Green Smart Home and Residential Quarter Control Network Protocol
Benefits of Involvement

**BII is a small company, based in China**

**Technical Knowledge**

- Facilitated networking with technical experts in Energy-Conservation and Emission-Reduction
- Helped track latest development in related technology fields, such as BACNet, Zigbee, Smart grid, Smart energy
- Helped BII in gaining insights into future technology trend. For example, BII is now considering expanding the application to Smart Energy Management

**Increase in market share & market recognition**

- Participating in standard development allowed us to network and develop relationship with working group participants including Telecom operators, manufacturers, Technical institutes, and universities
- Creation and development of cooperative projects with our partners

*slide #47*
Benefits of Involvement

Increased competitive edge

- Increased visibility within industry
- Helped to establish BII’s advanced status as an innovator within the industry ecosystem
- Resulted in giving BII an early opportunity to expand its business

“Inspired by Chinese innovation and involving global collaboration, IEEE 1888 is a remarkable international standards development achievement in the energy sector”—LIU Dong, 1888 working group chair
Internet of Things
Silicon Valley Workshop

Mary Lynne Nielsen
Technology Initiatives Director,
IEEE Standards Association
Growing with the Market: Silicon Valley IoT Workshop

5-6 November 2013 in Mountain View, California, in the heart of Silicon Valley

Two-day workshop

A combination of panel sessions and keynote speeches, along with product showcases

Nominal charge for attendees

Free exhibitor space
Goals

To identify collaboration opportunities and standardization gaps related to IoT

To help industry foster the growth of IoT markets

To allow industry to leverage IEEE’s value and platform for IoT industry-wide consensus development

To help industry with the creation of a vibrant IoT ecosystem
IEEE-SA IoT Workshop

- 5-6 November, Mountain View, CA
- http://iot.ieeesa-events.org/
Workshop Agenda (1)

- **Keynote: Making the Home, the Grid, and the World Smarter, Safer, and More Efficient**
  - Luca DiFalco, VP of Marketing, IPG and Strategic Sectors Development, STMicroelectronics

- **Keynote: Sensors and the Internet of Things Can Help Us Live Longer**
  - Oleg Logvinov, Director of Market Development, Industrial & Power Conversion Division, STMicroelectronics

- **Keynote: 802.11ah**
  - Rolf de Vegt, Senior Director in the Technology Office, Qualcomm Atheros

- **Keynote: Cloud Computing and the Internet of Things**
  - Steve Diamond, General Manager, Industry Standards Office and Global Standards Officer, EMC Corporation

- **Keynote: Convergence of Smart Home and Building Architectures**
  - Oleg Logvinov, Director of Market Development, Industrial & Power Conversion Division, STMicroelectronics

- **Keynote: Home Networking Technologies and the Internet of Things**
  - Purva R. Rajkotia, Director, Product Management (Standards & Regulation), Qualcomm

- **Keynote: IoT in the Automotive World**
  - Slav Berezin, Senior Project Engineer, General Motors

- **Keynote: Medical Device Communications and the Internet of Things**
  - Clint McClellan, Senior Director of Strategic Marketing, Qualcomm Life; President and Chairman of the Board, Continua Health Alliance
Workshop Agenda (2)

- **Keynote: IEEE-SA, the platform for the 21st century**
  - Karen Bartleson, President, IEEE Standards Association; Senior Director of Community Marketing, Synopsys, moderator

- **Keynote: Are Commercial & Industrial IoT Requirements the Same as Machine to Machine (M2M) IoT?**
  - Robert Dolin, Chief Technology Officer (CTO), Echelon

- **Panel: Standardization Activities in the IoT Universe**
  - Karen Bartleson, President, IEEE Standards Association; Senior Director of Community Marketing, Synopsys, moderator
  - Erik Gultman, Chairman, 3GPP Service and System Aspects Architecture Working Group
  - Gary Stuebing, Manager Engineering of Global Standardization, Smart Grid Networks, Cisco Systems
  - Manas Saksena, Senior Director of Technology, Marvell

- **Panel: What’s Missing in the Internet of Things?**
  - Edward Sperling, Editor in Chief, Semiconductor Engineering, moderator
  - Naveed Sherwani
  - Oleg Logvinov, Director of Market Development, Industrial & Power Conversion Division, STMicroelectronics
  - Martin Lund, Senior Vice President, IP Group, Cadence

- **Panel: IoT Activities and IEEE Standards**
  - Dennis Brophy, Director of Strategic Business Development, Mentor Graphic Corporation; moderator
  - William J. Miller, President, Maximum Control Technologies (MaCT)
Workshop Agenda (3)

- **Panel: Participant Generated Panel**
  - Oleg Logvinov, Director of Market Development, Industrial & Power Conversion Division, STMicroelectronics; moderator
  - Stan Schneider, CEO, Real-Time Innovations, Inc.
  - Mike Klein, Chief Architect, Virtual Appliance, Inc
  - Dana Blouin, Researcher, SIIT–Thammasat University
  - James Jobin, Ching-Ling Huang, Mobile Solutions Researcher, GE Global Research

- **Panel: IEEE-ISTO Activities on Internet of Things**
  - Don Wright, Chair, ISTO Board of Directors; President, Standards Strategies, LLC; moderator
  - Steve Klos, Executive Director, Tag Vault
  - Yatin Trivedi, Director of Standards and Interoperability Programs at Synopsys
  - Ingo Friese, Research Engineer and Project Manager, Deutsche Telekom; Convener, Identities of Things Discussion Group, Kantara Initiative
Silicon Valley IoT
Venue: **Computer History Museum**

- The world’s leading institution exploring the history of computing and its continuing impact on society
- Holds the most significant and varied collection of computing hardware, software, documents and ephemera in the world
- US$19M renovation in 2011
If you have a question you would like to share with one of our presenters, please type it into the lower right-hand Q&A box on your WebEx view.

Thank you very much for your participation!
Thank you!

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