



# Internet of Things

Internet2 CINO Initiative Working Group Kickoff Meeting

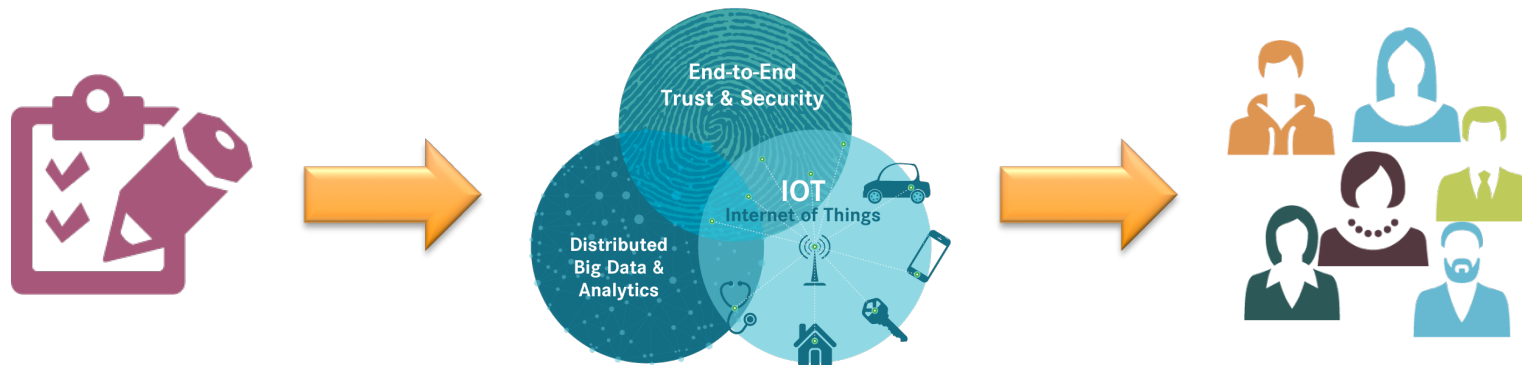
May 27, 2015





# Collaborative Innovation Program

Three new Collaborative  
Innovation Working Groups



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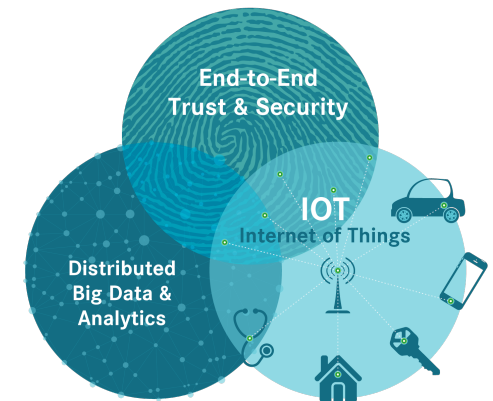
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## Establishing Three New Collaborative Innovation Working Groups



- **Each will formulate specific recommendations for a particular innovation initiative, including scope, value, milestones**
  - Clarify value to members
  - Ensure the innovation is economically viable
  - Develop a scalable model to positively impact a significant segment of Internet2 membership
- **Led by member representatives**
  - May leverage member programs and facilities
  - Participation encouraged for all Internet2 members
- **Coordinated and complementary effort**
  - Working groups will operate within a broader Internet2 Collaborative Innovation Community with representatives from member organizations



New Working Groups will complement other Internet2 activities



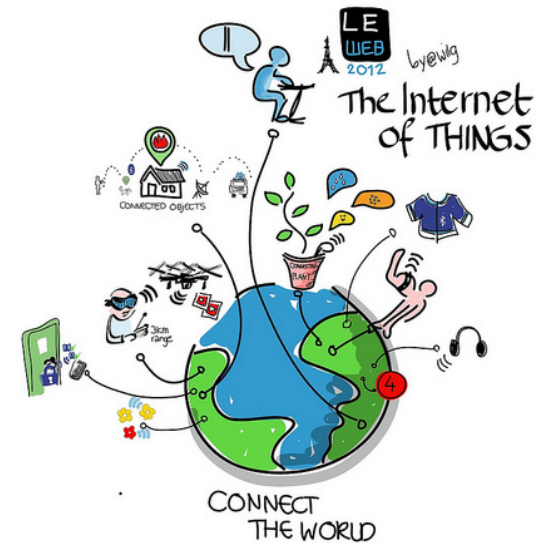
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# The Internet of Things is here, and growing



- **9 billion** devices around the world are currently connected to the Internet, including computers and smartphones
- The number of connected devices is expected to increase dramatically within the next decade, including many *new* types of connected devices, with estimates ranging from **50 Billion devices to 1 trillion**
- The Internet of Things has the potential to create ***economic value of \$2.7 trillion to \$6.2 trillion*** annually by 2025



Source: Disruptive Technologies, McKinsey Global Institute, May 2013

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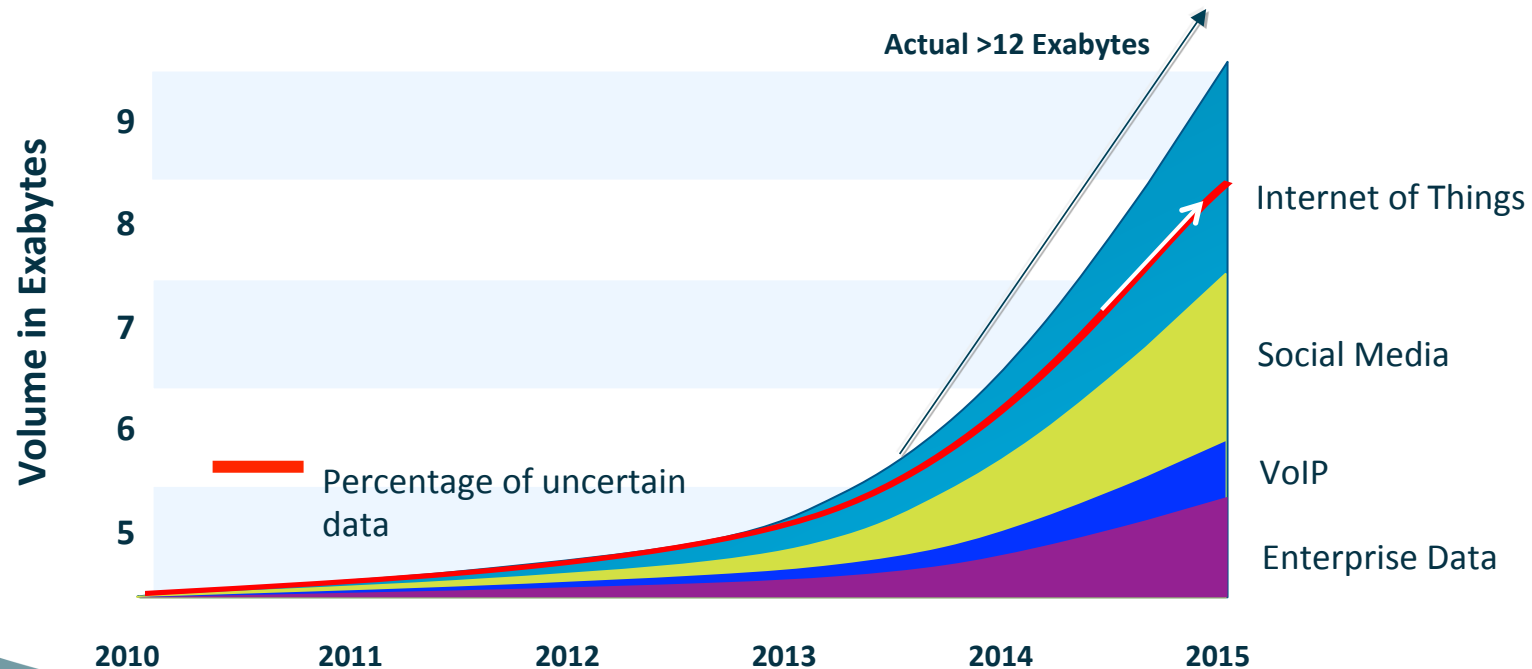
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# IOT is driving Big data

Value is in the insight from the data and how you leverage the data and insights



Sources: IBM Global Technology Outlook – 2012

[http://www.progressivepolicy.org/wp-content/uploads/2013/09/09.2013-Mandel\\_Can-the-Internet-of-Everything-Bring-Back-the-High-Growth-Economy-1.pdf](http://www.progressivepolicy.org/wp-content/uploads/2013/09/09.2013-Mandel_Can-the-Internet-of-Everything-Bring-Back-the-High-Growth-Economy-1.pdf)

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# About IOT working group



**The Internet of Things (IOT) promises to extend the utility of Internet connectivity** to billions of physical objects “i.e., things”.

The **IOT has potential to touch nearly every aspect of life.** Rather than connecting to the Internet with a device such as a cell phone or laptop, people will travel through spaces where the objects themselves are connected.

The **IOT is not a single event, even now there are many connected things around us** (e.g., Fitbit, home automation systems, cars such as the Chevy Volt that report their status, etc.), however, the confluence of wireless technologies, new sensors, and tiny computers, is greatly accelerating its diffusion.

The coming **IOT will impact nearly every aspect of modern society**, and the research and education community has an important role in its development. The Internet was/is the first fully open platform for communications.

While the IOT will use Internet protocols for its underlying communications, the things themselves may communicate in proprietary tongues. **Our community must ensure the IOT is open, secure, privacy preserving, and of great utility to all.**

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# Mission and Scope



The IoT Working Group seeks to:

- **Improve community awareness and understanding** of the IOT, and its implications
- **Identify research gaps and needs** to be addressed, to be a catalyst and enabler for IOT deployment and success worldwide
- **Foster collaboration** worldwide among Internet2 members and international partners to enable a global IOT research and education plan
- **Identify and support the investigation of IOT use cases** that may benefit Internet2 members (e.g., campus operations, health care, teaching and learning, etc.)
- **Identify needs for and assist Internet2 in developing IOT services** that can serve its members for IOT research and deployment
- **Scope of participants includes all interested Internet2 members (universities, affiliates, NRENs, state/regional networks), industry partners, international partners**



# Vision and Value



## The Internet2 IOT Working Group:

- Focuses on the strength of Internet2 which is the collaborative work of member institutions and the advanced research in areas like security & trust, networking and cloud services
- Aims to leverage those Internet2 resources and to provide emphasis on Higher Education applications as well as industry use cases for IOT developments and progress





# Participation and Operations / Approach



## The Internet2 IOT Working Group:

- Is open to the participation of all Internet2 members
- Envisions a range of participants from individuals learning about IOT, to highly structured collaborations that may include teams from multiple members
- Will conduct open meetings for Internet2 members, with open source results



# Communications Plan



- **Email:** The IOT WG uses a mailing list for communication “[cino-iot@internet2.edu](mailto:cino-iot@internet2.edu)” and an archive of previous discussions is available on the web though the wiki.
- **Web:** The WG maintains a Wiki webpage at <https://spaces.internet2.edu/x/n4dHBQ> hosted by Internet2 and available for the public.
- **Conference Calls:** The IOT Working Group meets over the phone on a monthly basis.
  - The IOT WG will be invited to bi-monthly meetings of the Internet2 Collaborative Innovation Community for sharing of best practices, learnings and content with the other CIC working groups - End to End Trust & Security and Distributed Big Data & Analytics.
- **Face-to-face meetings:** Occasionally and in conjunction with other events, the WG organizes face to face meetings of its members 2 - 4 times a year. This could include meetings at the Internet2 TechEx and Internet2 Global Summit.
- **General public presentations:** The WG aims to establish presence in relevant conferences and meetings and present its progress to the public.



# Timeline - Schedule



- **May - Initial Actions**
  - Group organization
  - Complete scope definition
  - Finalize schedule, milestones, and deliverables
- **June - Group Discussions and Drafts**
  - Establish any sub-groups like use-case specific or focus areas
  - Establish monthly calls
- **July**
  - Identify meetings and conference to have presence
  - Report to other Collaborative Innovation Community working groups on progress
- **August**
  - Draft presentations for TechEx
  - Plan for face-to-face meeting at TechEx
- **September**
  - Finalize presentations for TechEx
  - Plan for Educause presence
- **October**
  - Present initial recommendations at TechEx
  - Post-TechEx meeting actions and revisions
  - Collaborations with other organizations
- **November**
  - Publish first white paper on IOT Point-of-View, definition and key technologies
- **December**
  - IOT World Forum in Dubai



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# Major Milestones



- **May 4** Initial co-leaders conference call
- **May 27** first face-face meeting and conference call for the WG
- **Oct 4-7** presentation and workshops at Internet2 TechEx, Cleveland, Ohio
- **Dec 6-8** IOT World Forum in Dubai, Innovation and Research Symposium



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# Outcomes and Deliverables



The WG will develop and communicate to the IOT Working Group and Internet2 members:

- A **list of projects** including their owners, expectations, and timeline
- Develop and publish **white papers and recommendations for standards** related to the IOT use cases, research and implementation of IOT
- Become a valuable resource to **enable the development of IOT research** in our member organizations, including connections between experts and resources to support IOT research
- Engage in **formal and informal collaborations with Internet2 members**, such as research, pilot implementations, test-beds, standards development, policy development, etc.
- Engage in **formal and informal collaborations with outside organizations** that are engaged with IOT activities that may usefully complement the activities of Internet2 members
- **Work with organizations that are developing IOT standards and POVs** (e.g., NIST, IEEE, etc.) to enable a global view of these elements for consistent IOT enablement



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## Potential Use-Case sub-working-groups

- Smart homes
- Connected Vehicles
- Smart Campus (Smart Communities)
- Facility Utilization
- Connected healthcare
- Multi-sensor monitoring devices



# Next Steps



## Call to Action for IOT Working Group

Send a note to the IOT Working Group leadership team [iotchairs@internet2.edu](mailto:iotchairs@internet2.edu) with your interest areas in IOT related to this working group. e.g.,

- IOT use cases you are working on or are interested in
- IOT standards
- IOT reference architectures
- Work you already are doing with standards groups on IOT (e.g., IEEE P2413, NIST)
- Research expertise on your campus / in your organization in IOT

**Monthly team meeting – next one late June**

**Joint Collaborative Innovation Community call with all 3 working groups bi-monthly**





**Thank You**



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