

IEEE Standards: Cloud Computing

Initiative and Standards Sponsorship

- IEEE ran a Cloud Computing Initiative from 2012-2014
- Moved to IEEE Computer Society management at the beginning of 2015 as Cloud Computing Initiative comes to an end
- All standards projects sponsored by IEEE Computer Society

Standards Working Groups

- IEEE P2301, Cloud Profiles, led by John Messina (NIST): monthly meetings
 - http://ieee-sa.centraldesktop.com/p2301public/
- IEEE P2302, Intercloud, led by Deepak Vij: bimonthly meetings
 - Draft development underway
 - http://grouper.ieee.org/groups/2302/
- Study group led by Joel Fleck of HP covering adaptive management of cloud computing
 - Expecting to submit official project startup request in 1Q15

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Intercloud Testbed

IEEE Standards Association Industry Connections Program for pre-standards work

- Intended to complement work of IEEE P2302 Working Group
- Providing a reference model to allow design verification, support feedback based on findings, and provide enhancement recommendations to the standards working group

CLOUD COMPUTING

Participants

- Executive committee of 6 members
- Hong Kong Polytechnic University
- Telx Corporation
- University of Essex
- Dell Software
- University of Colorado
- University of Calgary
- 21 Founding Members:
 AT&T, Centre for Development of
 Advanced Computing (C-DAC),
 CITIC Telecom International ,
 Cloudscaling, ComputeNext,
 DOCOMO Innovations, Fraunhofer,
 Global Intercloud Technology Forum
 (GICTF), Hong Kong Polytechnic
 University, JT Global, Juniper
 Networks, Orange, Second
 University Naples,
 ServiceMesh/CSC, 6fusion, Telx
 Group, University of Essex,
 University of Melbourne, University
 of Stavanger, University of Ulster,
 Virtustream

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6 Working Groups have been meeting regularly (mostly weekly)

- Ontology/Resources
- Federation Protocol
- Conversational Protocol
 - SecurityNaming
 - Architecture

Detailed specifications from each working group are being formally proposed back into P2302

Engineering collaboration/code site (Wiki/Jira/Git) in regular use

Timeline:

Selected code modules in prototype and network functioning in 2015

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Initiative Highlights

CLOUD COMPUTING

Conferences

- Creation of annual IEEE Cloud Computing for Emerging Markets (CCEM), India, and leveraging IEEE's cloud presence in India
- Complimenting existing conferences with regional cloud congresses, subject matter experts, organizing tracks and panels

Digital Presence & Outreach

- Cloud portal is highly successful, averaging 5K 6K visitors monthly
- Volunteermanaged digital bi-monthly newsletter: Cloud-Link, blog posts
- Active social media: >1,400 Twitter, >5,200 Facebook, >3,900 LinkedIn
- Wikipedia page
- •Technical community ~6K

Education

- Development and delivery of 40 high quality advanced e-Learning curriculum modules
- Introductory video series on big data
- First use case (Vcopious™) for virtual CCEM conference with Educational Activities and IEEE MCE (Meetings, Conferences & Events)

Publications

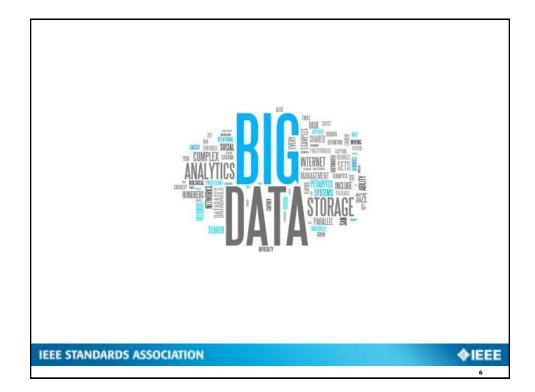
- Drove creation of 3 new publications for IEEE
- •Transactions on Cloud Computing (TCC), launched 2013
- Cloud Magazine, launched 2014

cloudcomputing.ieee.org

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Big Data: Elements Collection Security & Storage/ Databases **Processing Analytics** Privacy (example sources) Sensor data Relational Filtering Monitoring, Encryption databases exception Categorization • Web: text, Access control (SQL) images, video reporting Extraction Anonymization • noSQL Visualization Email Graphs Prediction Location data Documents • Telephone calls Reports Databases **Big Data: Analytics — Use Examples** Communications Purchasing People networks; -Amazon calling patterns Crime & Terrorism **Power Outages** -Device readings **IEEE STANDARDS ASSOCIATION** ◆IEEE

IEEE Big Data Interested IEEE Societies, Councils, & OUs IEEE new initiative on Big Data Biometrics Council Power & Energy Funded by IEEE Technical Activities in 2014 and NIC in 2015 Society Circuits and Photonics Society • Big Data portal, social media presence, and technical community Systems Society • Jose' Moura (SPS) and David Belanger (Comsoc) appointed as Council on EDA Reliability Society initiative leaders • Oct 1-2, 2014 workshop at Stevens Institute of Technology • Rob Fish and Cherry Tom attended from IEEE-SA Consumer Sensors Council Electronics Society • The Institute September 2014 issue on Big Data Computational Signal Processing Seeking SA volunteer standards experts to provide direction Society Intelligence Society for IEEE standards Computer Society Society on Social Implications of Technology IEEE-SA Big Data-related standards activities ComSoc Standards IoT + sensors + networks Association • E health - Mobile health Control Systems Systems, Man, and • Cloud Computing - Intercloud Society Cybernetics Society Educational Systems Council • Smart Grid & Smart Home Activities · Internet Trust, Security, and Privacy Engineering in Technical Activities Medicine and Other IEEE activities Biology Society • IEEE Big Data Congress, June 27 - July 2, 2014 Geoscience and Vehicular • IEEE BigData 2014, Oct 27-30 Remote Sensing Technology Society • Big Data & Smart Devices conference, 20-21 Nov, Bangalore, India Society • New publication in 2015: Transactions on Big Data Oceanic Engineering Society bigdata.ieee.org **IEEE STANDARDS ASSOCIATION** ◆IEEE

2015 Considerations

- Development of a well-coordinated technical community in big data
 - All (IEEE and non-IEEE) welcome to join, participate, and contribute to its activities, and contribute to growth in IEEE membership
- Outreach to industry, government, and academia to collaboratively identify, develop, and advance policies and practices, and standards
- Creation of training opportunities and educational initiatives ranging from basics of big data and why everyone should care about data to advanced training for the practitioner
- Launching new conferences or workshops, or augmenting existing ones for maximum coverage on big data and more effectively identify and pull together through its many experts more focused tracks, papers, and keynote speakers
- Launching of new Journals or augmenting existing ones

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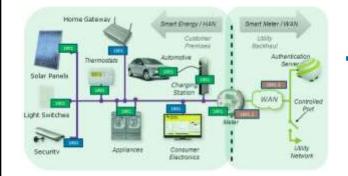
data => information => knowledge => wisdom => action

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IEEE Standards Related to Big Data

Smart Grid and Digital Energy Management

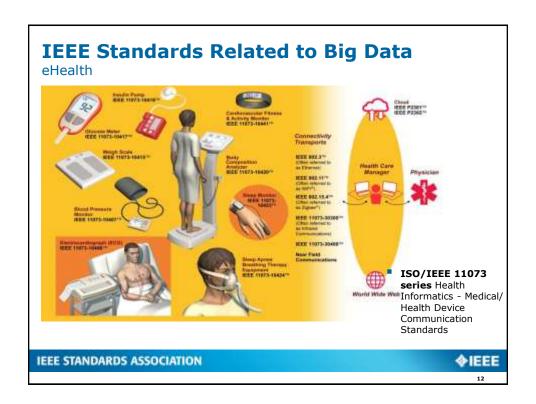


- IEEE 1901 Series
- Powerline Communication
- IEEE 2030 series on the smart grid, including electric vehicle infrastructure
- IEEE 1547 series on handling distributed resources in electric power systems
- **IEEE 1815 series** on electric power systems communications

Find more smart grid standards and projects at http://smartgrid.ieee.org/standards

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Big Data & Cloud Computing

- Cloud Computing an enabler of Big Data
 - Variety of sources
 - Distributed computing for large volumes of data
 - Remote access by data user
 - Elastic resources for variability and high velocity of data
- Is it possible to have Big Data without cloud computing?
 - Yes, e.g. existing high performance computers and simulations

Big Data & Open Data

- Open Data one source of Big Data
- Initiative of cities and governments to provide data to citizens
 - Personal or social use
 - Entrepreneurial use
 - An aspect of smart cities
- Data is in various forms, standards would be useful for uploading, storage, access

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IoT, including many types of sensor data, is a key source of Big Data

Web area devoted to IEEE-SA's work in IoT

Highlights IEEE existing standards and projects that relate to IoT

Promotes IEEE P2413 and CSHBA Industry Connections projects

Promotes workshops and panel discussions

Includes links to relevant IoT materials on the web



http://standards.ieee.org/ innovate/iot/

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