

IEEE Intercloud Testbed (ICTB)
Industry Connections Activity Initiation Document (ICAID)
Version: 0.2, 25 August 2014

IC12-003-02 Approved by the IEEE-SASB 10 December 2014

Instructions

- Instructions on how to fill out this form are shown in red. It is recommended to leave the instructions in the final document and simply add the requested information where indicated.
- **Shaded Text** indicates a placeholder that should be replaced with information specific to this ICAID, and the shading removed.
- Completed forms, in Word format, or any questions should be sent to the IEEE Standards Association (IEEE-SA) Industry Connections Committee (ICCom) Administrator at the following address: industryconnections@ieee.org.
- The version number above, along with the date, may be used by the submitter to distinguish successive updates of this document. A separate, unique Industry Connections (IC) Activity Number will be assigned when the document is submitted to the ICCom Administrator.

1. Contact

Provide the name and contact information of the primary contact person for this IC activity. Affiliation is any entity that provides the person financial or other substantive support, for which the person may feel an obligation. If necessary, a second/alternate contact person's information may also be provided.

Name: Joe Weinman

Email Address: joeweinman@hotmail.com

Phone: +1 908-432-9870

Employer: Joe Weinman Consulting

Affiliation: Joe Weinman Consulting

2. Type of Activity

Specify whether this activity will be entity-based (participants are entities, which may have multiple representatives, one-entity-one-vote), or individual-based (participants represent themselves, one-person-one-vote).

Entity-based.

3. Purpose

3.1. Motivation and Goal

Briefly explain the context and motivation for starting this IC activity, and the overall purpose or goal to be accomplished.

This “IEEE Intercloud Testbed” is a non-trivial distributed computing platform beyond the investment of a typical single company or university. The idea that several companies and universities can pool their efforts together, under a single governance umbrella, is compelling and has caused the P2302 Standard for Intercloud Interoperability and Federation (SIIF) working group (“Intercloud Standard” for short) working group leaders to seek such a “vehicle.” Having a structure which can be in parallel as much as possible with the standards working group is of high importance, as the need for consistent policies and procedures, intellectual property handling, and membership requirements would greatly simplify the overhead.

Thus, this proposal uses the IEEE Industry Connections mechanism, involving the facilitation and oversight of a live, cloud- and global-scale testbed, where researchers from academia and industry could actively collaborate in the development, test, and refinement of technologies developed to accomplish Intercloud interoperability and federation, where in parallel real-world application of the emerging SIIF would be accomplished, adapted to several cloud computing platforms, and promotion of such results through open source collaboration on the actual resulting implementation.

3.2. Related Work

Provide a brief comparison of this activity to existing, related efforts or standards of which you are aware (industry associations, consortia, standardization activities, etc.).

The IEEE P2302 working group need to be able to develop and test final details for various proposals relating to the protocols and formats for the proposed standard. There needs to be a development and test platform, then, which includes a full Intercloud topology of systems. This implies several clouds of different code bases, some root clouds, and some exchange clouds, separated by a high speed network over a geographically dispersed—even global—area.

3.3. Previously Published Material

Provide a list of any known previously published material intended for inclusion in the proposed deliverables of this activity.

1. D. Bernstein, D Vij, “Using Semantic Web Ontology in Intercloud Directories and Exchanges”, *ICOMP'10 - International Conference on Internet Computing, Las Vegas, NV, July 2010*

2. D. Bernstein, D. Vij, "Intercloud Directory and Exchange Protocol Detail using XMPP and RDF", *1st Workshop on Cloud-based Services & Applications (CBSA/IEEE 2010), Miami Florida, USA, July 2010*
3. D. Bernstein, N. Vidovic, S. Modi, "A Cloud PAAS for High Scale, Function, and Velocity Mobile Applications", *The Fifth International Conference on Systems and Networks Communications - IEEE/IARIA ICSN 2010, Nice, France, August 2010*
4. D. Bernstein, D. Vij, "Simple Storage Replication Protocol (SSRP) for Intercloud", *The Second International Conference on Emerging Network Intelligence – IEEE/IARIA EMERGING 2010, Florence, Italy, October 2010*
5. D. Bernstein, D. Vij, "Intercloud Security Considerations", *The Second International Conference on Cloud Computing – IEEE CloudCom 2010, Indianapolis, Indiana, December 2010*
6. D. Bernstein, D. Vij, S. Diamond, "An Intercloud Cloud Computing Economy - Technology, Governance, and Market Blueprints", *IEEE Service Research and Innovation Global Conference – SRII 2011, San Jose, California, March 2011*
7. D. Bernstein, D. Vij, "Intercloud Exchanges and Roots Topology and Trust Blueprint", *WORLDCOMP11 - The 2011 World Congress in Computer Science, Computer Engineering, and Applied Computing, Las Vegas, NV, July 2011*
8. D. Bernstein, Y. Demchenko, "The IEEE Intercloud Testbed – Creating the Global Cloud of Clouds", *IEEE CloudCom 2013, Bristol, UK, December 2013*
9. E. Lim, P. Thiran, "Communication of Technical QoS among Cloud Brokers", *Third International IEEE Intercloud 2014 Workshop, Boston, March 2014*
10. Joseph Hurley, Dag Johansen, "Self-Managing Data in the Clouds", *Third International IEEE Intercloud 2014 Workshop, Boston, March 2014*
11. Craig Lee, Nehal Desai, "Approaches for Virtual Organization Support in OpenStack", *Third International IEEE Intercloud 2014 Workshop, Boston, March 2014*
12. Yuri Demchenko, Craig Lee, Canh Ngo, "Federated Access Control in Heterogeneous Intercloud Environment: Basic Models and Architecture

Patterns", *Third International IEEE Intercloud 2014 Workshop, Boston, March 2014*

13. D. Bernstein, D. Vij, "Intercloud Federation using via Semantic Resource Federation API and Dynamic SDN Provisioning", *IEEE 1st Workshop on Smart Cloud Networks & Systems. Paris, France, December 2014*
14. Craig Lee, "A Design Space Review for General Federation Management Using Keystone", *IEEE 1st Workshop on Cloud Federation Management. London, December 2014*
15. Marco Fargetta, Salvatore Monforte, Giuseppe Andronico, Maurizio Paone, Massimo Villari, "A Model for Accomplishing and Managing Dynamic Cloud Federations", *IEEE 1st Workshop on Cloud Federation Management. London, December 2014*
16. D. Bernstein, "An Autonomous System like Naming Scheme for Public and Private Cloud Federations", *for submission to Fourth International IEEE Intercloud 2015 Workshop, Tempe, AZ, March 2015*
17. A. Willner, B. Di Martino, G. Cretella, A. Esposito, J. Weinman, D. Bernstein, and D. Vij, "Towards an Ontology-based Intercloud Resource Catalog", *for submission to Fourth International IEEE Intercloud 2015 Workshop, Tempe, AZ, March 2015*

3.4. Potential Markets Served

Indicate the main beneficiaries of this work, and what the potential impact might be.

Cloud Computing is proving to be a cost effective, elastic and scalable, and easy to use platform for web or mobile applications. If one follows some basic design blueprints, the "cloud side" of your web or mobile applications can handle the sudden explosion of subscribers that every application author hopes for. Cloud Computing platforms are proving, especially to the mobile developer, to offer more than just an easy to use, scalable platform. Application capabilities using advanced analytics, predictive modeling, and "big data" can't do without a cloud platform. Search, speech recognition, and location based services are all cloud-based now due to the data and processing requirements. And the newest communications platforms implementing rate adaptive codecs, multi-device transcoding, and multi-participant conferences and rooms are all using cloud techniques.

Furthermore, users have become accustomed to the "infinity" of the cloud - as much storage as they ever need, without the need to delete anything, and search

working perfectly fine on a lifetime of data - even if it is multimedia. Wherever a user is, they expect their data to be fast in arriving to them, fast in streaming up to the cloud, and fast showing up in their blog, on their Facebook page, or in their mobile storage folder. They expect access to "their" cloud world, their data, their history, their preferences; and they expect the cloud to be smart and adapt to where they happen to be at the time.

Of course, users will be subscribers of a carrier, and use directly, or over the top, many of these cloud capabilities. Carriers will capture more and more revenue per subscriber as they become more and more involved in providing the cloud infrastructure upon which all this runs. From this subscriber perspective, they will expect roaming of all these new services to "simply work." The bar has been set quite high by today's mobile industry, where enumeration, text, voice, and data roaming are all implemented - at a price - in today's global mobile network. It is easy to see, that "everything cloud" will also need to support roaming - in a "global mobile Intercloud".

4. Estimated Timeframe

Indicate approximately how long you expect this activity to operate to achieve its proposed results (e.g., time to completion of all deliverables).

Expected Completion Date: mm/yyyy

IC activities are chartered for two years at a time. Activities are eligible for extension upon request and review by ICCom and the IEEE-SA Standards Board. Should an extension be required, please notify the ICCom Administrator prior to the two-year mark.

An initial, limited Testbed is expected to be operational by 31 December 2014. Beyond that, the activity will continue as an ongoing operation with iterative enhancement of the Testbed going forward.

5. Proposed Deliverables

Outline the anticipated deliverables and output from this IC activity, such as documents, proposals for standards, conferences and workshops, databases, computer code, etc., and indicate the expected timeframe for each.

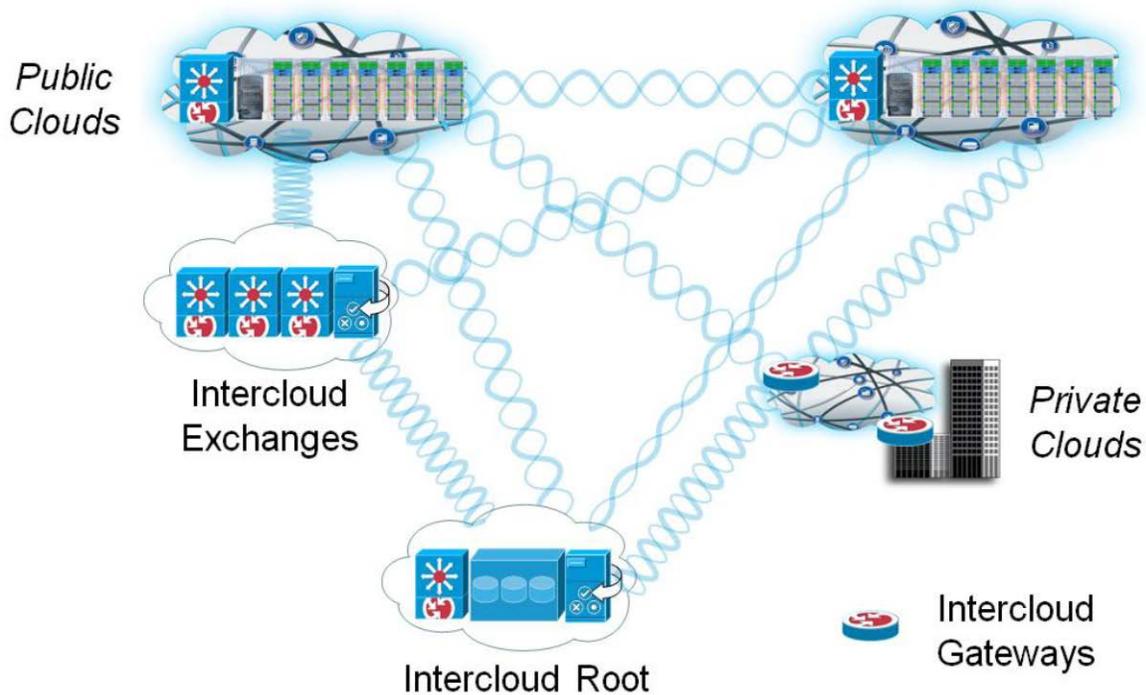
The activities for the IEEE Intercloud Testbed will be:

- Participants place cloud implementation of their choice in well-connected datacenter in a geography;
- Researchers to contribute to the open source implementation of the Intercloud protocol suite;
- While adapting the protocols to the cloud in use;
- Connecting to the reference Intercloud Root and Exchange IEEE are running;
- Explore the applicability of the governance mechanisms of International Grid Trust Federation (IGTF);
- Experiment with cloud federation through these services, further develop protocols, ontologies, and explore the topology issues for scalability;
- Feed results to IEEE Standard project.

Key deliverables for the Intercloud Testbed will be:

- Intercloud root
- Intercloud exchange
- Intercloud testbed registration authority
- Initial operational Intercloud Testbed with 3 clouds
- First report on usage experience to constituencies

A set of protocols and root services for Cloud to Cloud interoperability



6. Funding Requirements

Outline any contracted services or other expenses that are currently anticipated, beyond the basic support services provided to all IC activities. Indicate how those funds are expected to be obtained (e.g., through participant fees, sponsorships, government or other grants, etc.). Activities needing substantial funding may require additional reviews and approvals beyond ICCOM.

The IEEE Intercloud Testbed activity will primarily hold virtual meetings for purposes of technical activities and governance. In support of those meetings, IEEE IT support would be helpful for the following:

- Email distribution list
- Audioconferences
- Central Desktop
- Atlassian
- JoinMe web conferencing

It is not envisioned that IEEE will pay for equipment or connectivity of the Testbed; these are to be contributed by participants.

7. Management and Procedures

7.1. IEEE Sponsoring Committee

Indicate whether an IEEE sponsoring committee of some form (e.g., an IEEE Standards Sponsor) has agreed to oversee this activity and its procedures.

Has an IEEE sponsoring committee agreed to oversee this activity?:

Yes.

If yes, indicate the sponsoring committee's name and its chair's contact information, and skip the remaining parts of this section (skip 7.2 and 7.3, below).

Sponsoring Committee Name: IEEE Cloud Computing Standards Committee

Chair's Name: Stephen L. Diamond

Chair's Email Address: s.diamond@computer.org

Chair's Phone: +1 650-570-6060

The activity will use the ICom baseline *Industry Connections Activity Policies and Procedures*.

7.2. Activity Management

If no IEEE sponsoring committee has been identified in 7.1 above, indicate how this activity will manage itself on a day-to-day basis (e.g., executive committee, officers, etc).

Briefly outline activity management structure.

7.3. Procedures

If no IEEE sponsoring committee has been identified in 7.1 above, indicate what documented procedures will be used to guide the initial operations of this activity (e.g., the baseline *Industry Connections Activity Policies and Procedures*).

Specify policies and procedures document to be used.

8. Participants

8.1. Stakeholder Communities

Indicate the stakeholder communities (the types of companies or other entities, or the different groups of individuals) that are expected to be interested in this IC activity, and will be invited to participate.

Specify types of entities or groups of individuals.

8.2. Expected Number of Participants

Indicate the approximate number of entities (if entity-based) or individuals (if individual-based) expected to be actively involved in this activity.

Number of entities or number of individuals.

8.3. Initial Participants

Provide a list of the entities or individuals that will be participating from the outset. It is recommended there be at least three initial participants for an entity-based activity, or five initial participants (each with a different affiliation) for an individual-based activity.

Use the following table for an entity-based activity:

Entity	Primary Contact	Additional Representatives
Entity Name	Contact Name Email Address Phone Number	Name, Email Address Name, Email Address

Entity	Primary Contact	Additional Representatives
6Fusion	Ryan Kraudel rkraudel@6fusion.com +1 919 706 4783	
Centre for Development of Advanced Computing (CDAC)	Dr. B. B. Prahlada Rao prahladab@cdac.in +91 80 25261261	
Citic Telecom Internactional CPC Ltd.	Stephen Ho Stephen.ho@citictel-cpc.com 2170 7500	
Cloudscaling	Randy Bias randyb@cloudscaling.com +1 415 787 2253	
ComputeNext Inc.	Sundar Kannan sundar@computenext.com +1 425 985 9960	
FOKUS Fraunhofer-Institut fur Offene Kommunikationssysteme	Dr. Niklas Blum Niklas.blum@fokus.fraunhofer.de +49 30 3463 1	
Global Intercloud Technology Forum	Tomonori Aoyama aoyama@dmc.keio.ac.jp +81 45 563 1151 40126	
Trust-IT Services	Silvana Muscella s.muscella@trust-it-services.com 0039 050 28359	
JT (Jersey) Limited	Mark Stuchfield Mark.stuchfield@jtglobal.com +44 1534 882645	
Juniper Networks	Jennifer Lin	

	jenlin@juniper.net +1 408 936 5723	
DOCOMO Innovations Inc.	Takayuki Inagawa +1 650 493 9600	
Orange Silicon Valley	Gabriel Sidhom Gabriel.sidhom@orange.com +1 650 269 6385	
Second University of Naples	Beniamino Di Martino Beniamino.dimartino@unina.it +39 3470461656	
ServiceMesh Inc.	James Houghton Jim.houghton@servicemesh.com +1 845 494 9419	
Technische Universitat Berlin	Prof. Dr. Thomas Magedanz Thomas.magedanz@tu-berlin.de +49 303 463 7229	
Telx Group Inc.	Chris Downie cdownie@telx.com +1 347 562 0206	
University of Ulster	Prof. Gerard Parr Gp.parr@ulster.ac.uk 0044 2870 124131	
Hong Kong Polytechnic University	Jiannong Cao Jiannong.cao@polyu.edu.hk 852 2766 7275	
University of Melbourne	Rajkumar Buyya rbuyya@unimelb.edu.au 61 3 8344 1344	
University of Essex	Kun Yang kunyang@essex.ac.uk +44 1206 872449	
University of Illinois at Chicago	Mark Grechanik drmark@uic.edu +1 512 736 6275	
University of Stavanger	Chunming Rong Chunming.rong@uis.no +47 40889897	
Virtustream, Inc.	Cori Franco corifranco@yahoo.com +1 240 252 1007	
Universite Pierre et Marie Curie – Paris 6 (UPMC)	Jean Chambaz Jean.chambaz@upmc.fr +33 144273210	
University of Surrey	Dr. Anil Fernando w.fernando@surrey.ac.uk +44 1483 68 4726	

Revision History