SUPPORTING GENERAL FEDERATION FOR LARGE-SCALE COLLABORATIONS

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OpenStack Summit
Vancouver Convention Centre - Level Two – Rm 221-222
3:30pm - 4:10pm, Tuesday, May 22, 2018

https://etherpad.openstack.org/p/Supporting-General-Federation
PURPOSE

Determine how the OpenStack Community can partner with the NIST/IEEE Joint WG on Federated Cloud, and the Open Research Cloud Alliance (ORCA), to develop support for **general cloud federation**, and enable a wide range of collaborative application domains at any level in the software stack: IaaS, PaaS, or SaaS.

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NIST Goals:

• Create a Conceptual Model with Vocabulary
• Identify the federation deployment and governance design space
• Identify all areas of necessary or possible standards

IEEE Goals:

• Work hand-in-glove with NIST WG to identify desirable standards
• Take them through the international standards process

NIST Public Working Group on Federated Cloud (PWGFC)
IEEE P2302 Intercloud Kickoff

Aug. 31 2017
THE OPEN RESEARCH CLOUD ALLIANCE

- ORCA Goal: Support national and international scientific collaborations, i.e., federations
- openresearchcloud.org
- Fourth ORCA Congress
  - 8:30am – 5:00pm, Thursday, May 24
  - Level 3, Room 306

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THIS IS NOT JUST “CLOUD” FEDERATION!

SERVICES CAN BE FEDERATED AT ANY LEVEL IN THE SYSTEM STACK

Cloud federation is a special case of general service federation

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A VERY PARTIAL LIST OF APPLICATION DOMAINS
(CANDIDATES FOR APPENDIX B)

B.1. User-to-Cloud Federation
B.2. Cloud-to-Cloud Federation
B.3. Cloud Wholesaling
B.4. Scientific Data Sharing
B.5. Scientific Compute Sharing
B.6. Government Use Case; Public Safety, Disaster Response
B.7. Business Use Case; Supply Chain Management
B.8. Medicine and Medical Information/Records
THE NIST CLOUD FEDERATION REFERENCE ARCHITECTURE (DRAFT)

https://drive.google.com/drive/search?q=nist%20cloud
DEPLOYMENT AND GOVERNANCE MODELS

Simple, Pair-wise

Internal Hierarchical

Centralized, Third-Party

External Hierarchical Provider

Internal Peer-to-Peer

External Peer-to-Peer Provider
A SPECTRUM OF DEPLOYMENT OPTIONS

- Internal vs. External FMs
- Centralized vs. Distributed FMs
- Simple vs. large/arbitrary communication topologies
- No resource discovery needed – small set of services known out-of-band
- No resource discovery policies needed
- No federated identity necessary – same credential types everywhere
- Common roles known out-of-band
- Common resource access policies known out-of-band
- No federation discovery needed
- No accounting/auditing needed
- New member vetting/on-boarding is informal or known out-of-band
- Informal trust relationships
DISCUSSION QUESTIONS

1) What federation/collaboration use cases are of interest to you?
2) What application domains/user groups do you have that need a federated environment?
3) What federation deployment and governance models do you think are the most relevant?
4) Which one would you build out first?
5) How can we find common ground to build out together these capabilities, best practices, and ultimately international standards?

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SUMMARY, ACTION ITEMS, FUTURE WORK

• Summary

• Action Items

• Future Work

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How to Find Information

- NIST Public Working Group on Federated Cloud (PWGFC) URL

- Request to be on NIST PWGFC Mailing List
  - fedcloud@nist.gov

- IEEE P2302 Intercloud Working Group URL
  - [http://sites.ieee.org/sagroups-2302/](http://sites.ieee.org/sagroups-2302/)

- Request to be on IEEE P2302 Intercloud Working Group List
  - STDS-P2302@ieee.org

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Emerging Support for Hybrid Clouds in OpenStack

- Extending the Keystone API to support simple, manual federation management using two fundamental concepts:
  - **Federate In**: Explicitly specify which external IdPs are trusted
  - **Federate Out**: Explicitly specify which external SPs are trusted
- Enables a user from one cloud to, e.g., instantiate a VM or storage container on another cloud

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