SUPPORTING GENERAL FEDERATION FOR LARGE-SCALE COLLABORATIONS

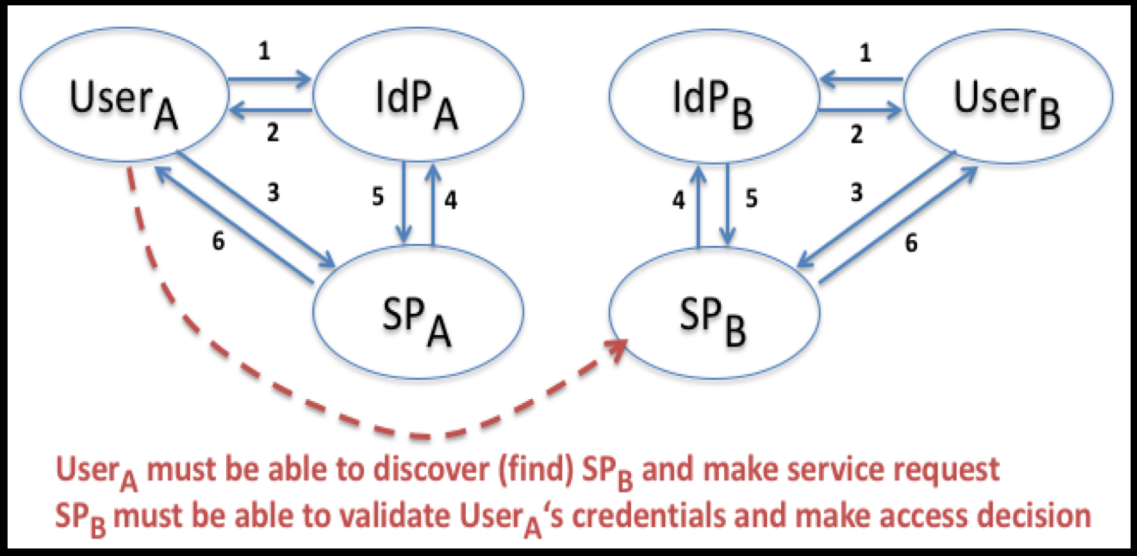
Dr. Craig A. Lee, NIST/IEEE Joint WG on Federated Cloud
Dr. Martial Michel, Data Machines, Corp.
Dr. Khalil Yazdi, Yazdi and Associates
Dr. Robert Bohn, NIST

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

Aug. 31 2017

- *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*

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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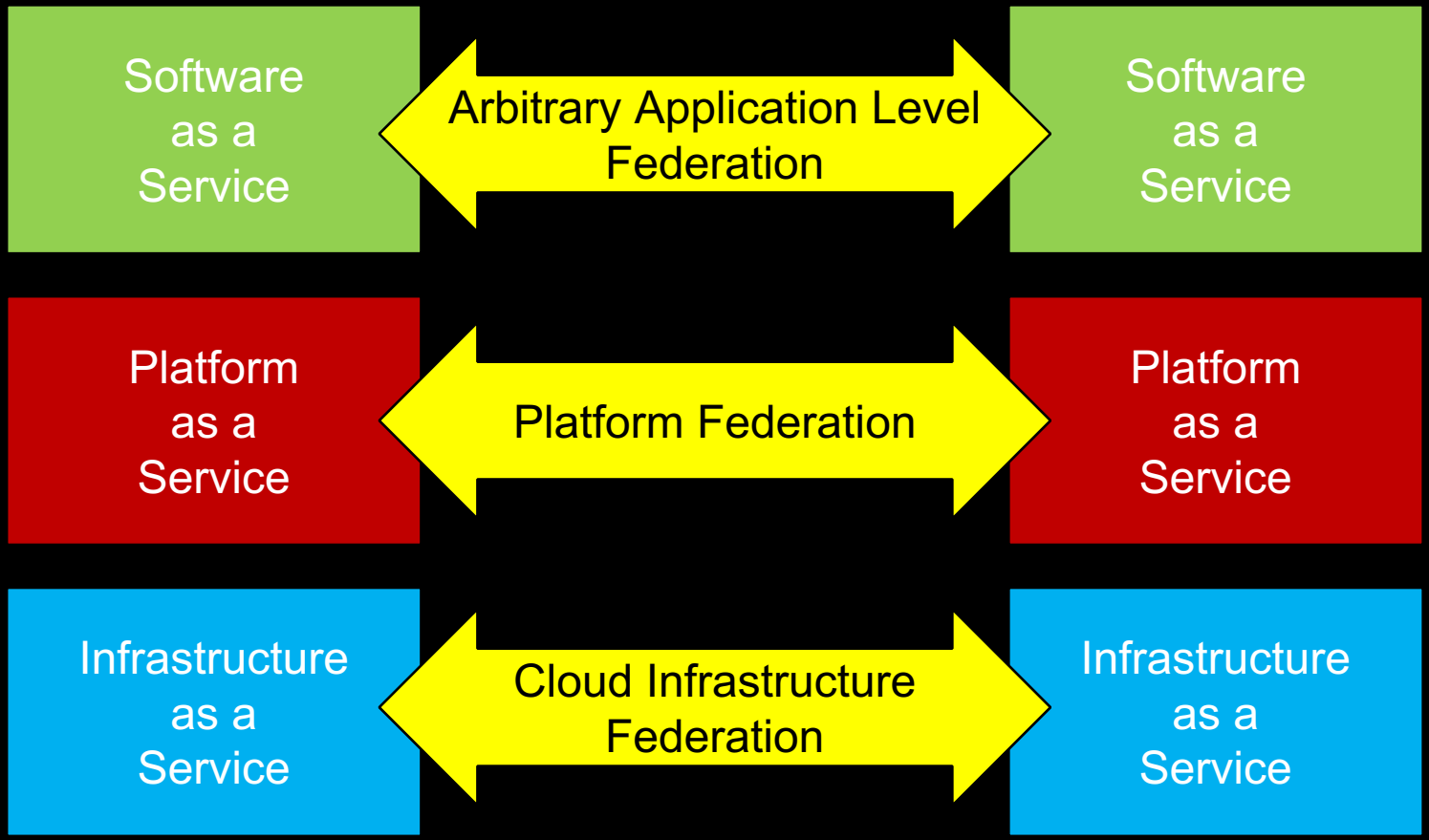
THIS IS NOT JUST "CLOUD" FEDERATION!

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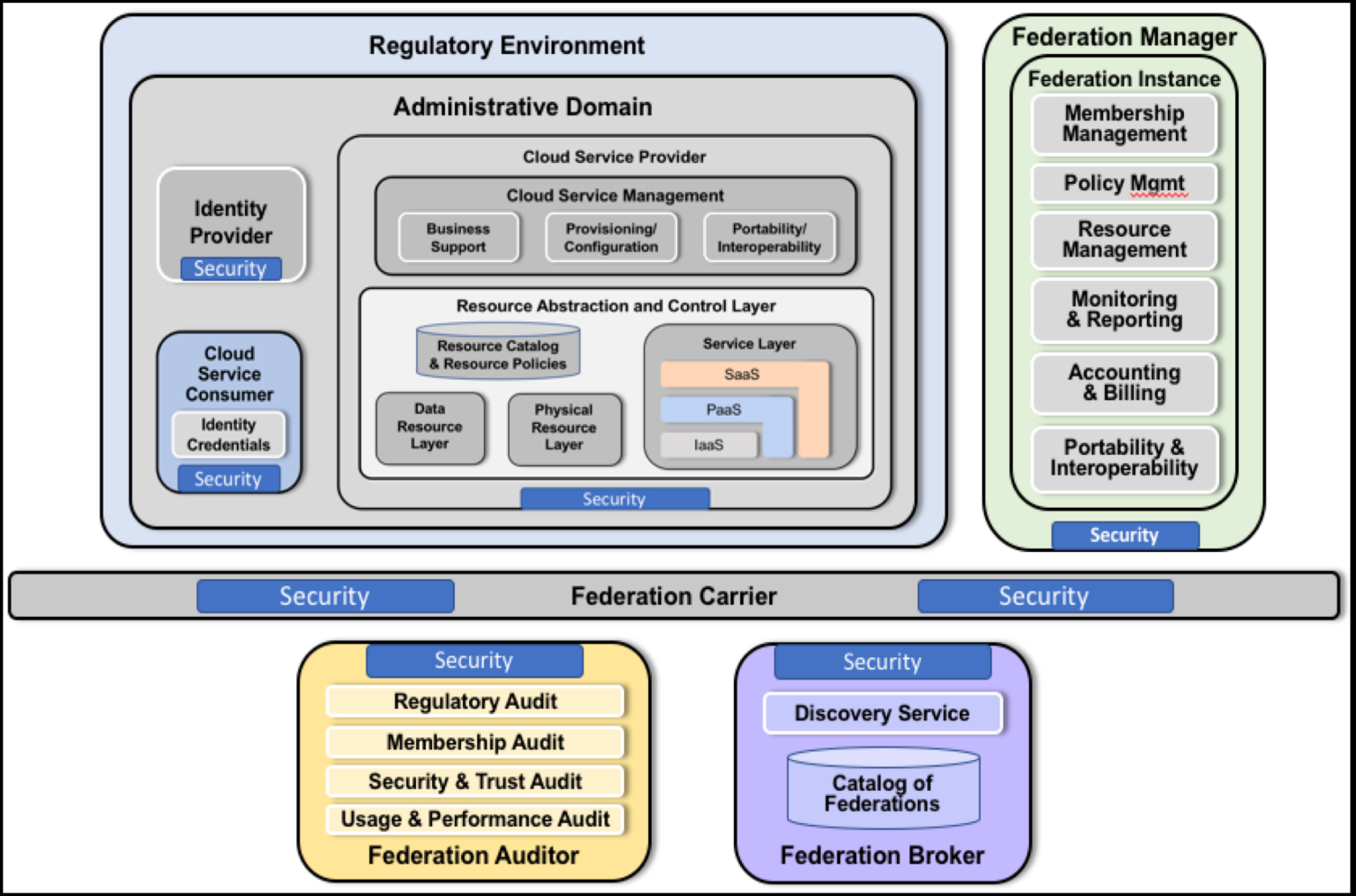
A VERY PARTIAL LIST OF APPLICATION DOMAINS (CANDIDATES FOR APPENDIX B)

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

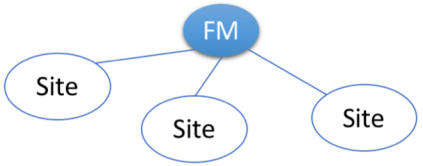
THE NIST CLOUD FEDERATION REFERENCE ARCHITECTURE (DRAFT)



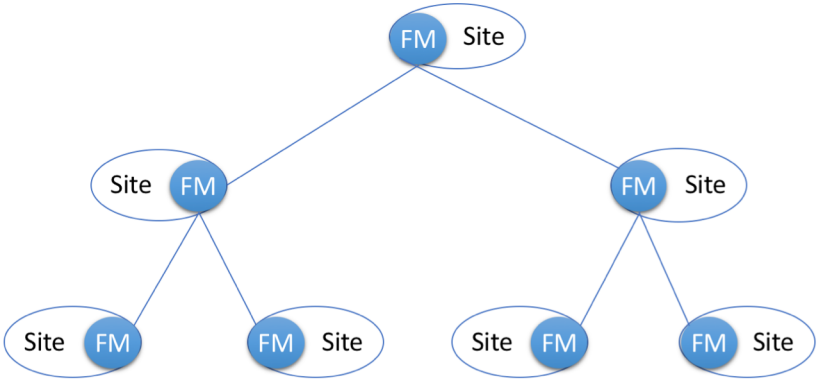
https://drive.google.com/drive/search?q=nist%20cloud

DEPLOYMENT AND GOVERNANCE MODELS

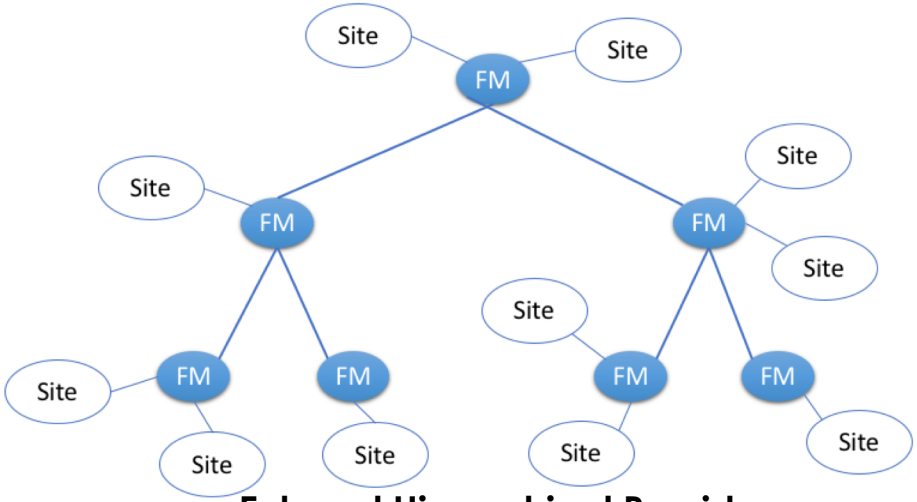
Simple, Pair-wise



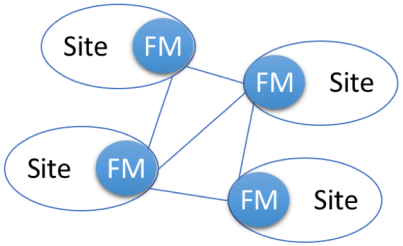
Centralized, Third-Party



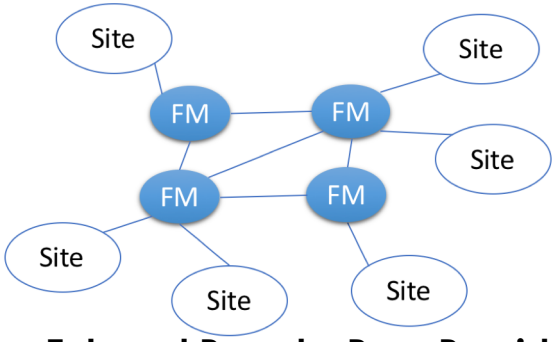
Internal Hierarchical



External Hierarchical Provider

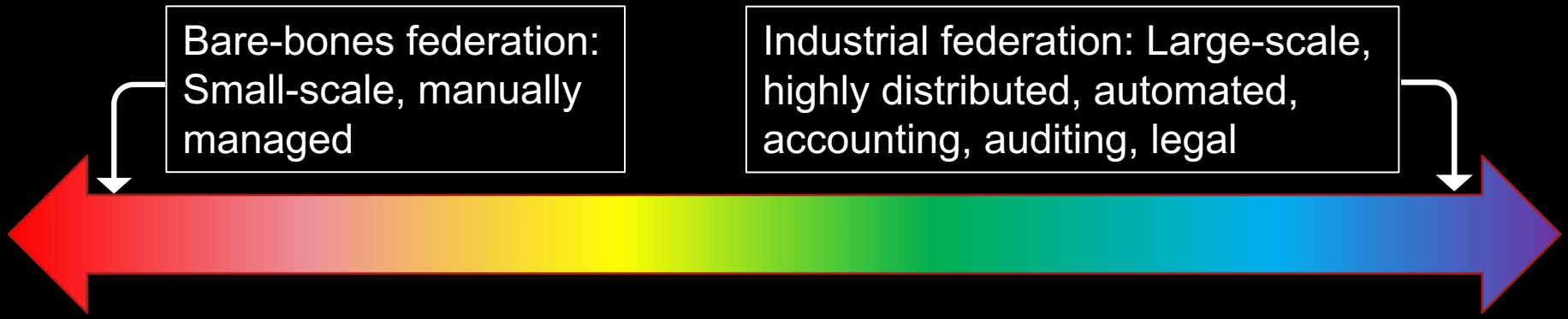


Internal Peer-to-Peer



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
  - http://collaborate.nist.gov/twiki-cloud-computing/bin/view/CloudComputing/FederatedCloudPWGFC
- Request to be on NIST PWGFC Mailing List
  - fedcloud@nist.gov
- IEEE P2302 Intercloud Working Group URL
  - http://sites.ieee.org/sagroups-2302/
- Request to be on IEEE P2302 Intercloud Working Group List
  - STDS-P2302@ieee.org

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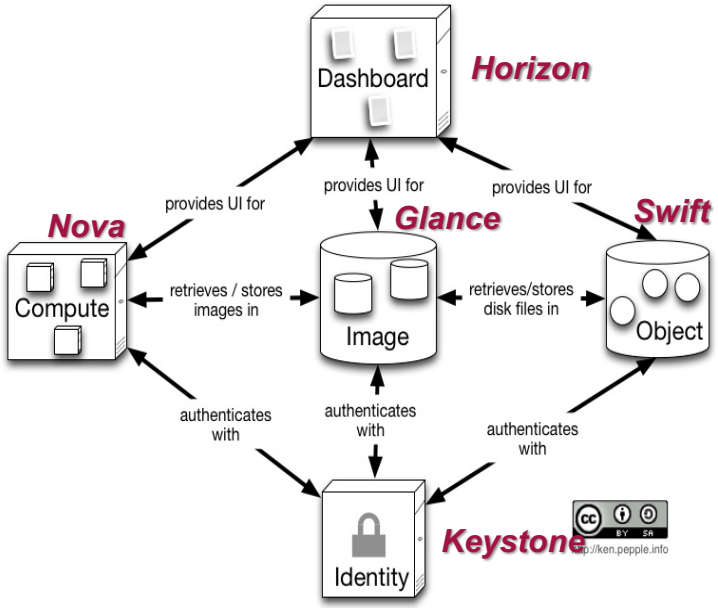
NIST IEEE

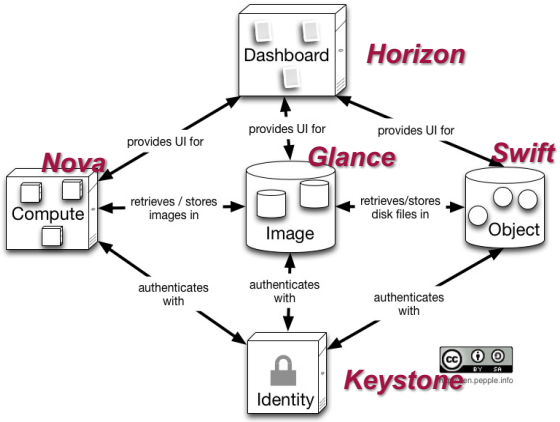
Emerging Support for Hybrid Clouds in OpenStack

- 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



Federate In:
Trust external IdP

Federate Out:
Act as trusted SP



External OpenStack

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