

# Modeling the Past and Future of Identity Management for Scientific Collaborations

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Over its 3 year funding period, the eXtreme Science Identity Management (XSIM) research project collected and analyzed real world data on identity management (IdM) implementations in virtual organizations (VOs) representing the last 15+ years of collaborative DOE science. Based on that data, we constructed a descriptive VO IdM model. We used the model and existing trends to project the direction for IdM in the 2020 timeframe; and provided guidance to scientific collaborations and resource providers that are implementing or seeking to improve IdM functionality.

XSIM conducted over 20 semi-structured interviews of representatives from scientific collaborations and resource providers, both in the US and Europe; the interviewees supported diverse set of scientific collaborations and disciplines. We developed a definition of “trust,” a key concept in IdM, to understand how varying trust models affect where IdM functions are performed.

We searched for a descriptive IdM model sufficiently complex to produce accurate, useful descriptions of the observed trust relationships and technical implementations, but still simple enough to explain and use in novel situations. It was important that the model be comprehensible to both scientists and IT/Cyber security experts to support a dialog between stakeholder groups with different lexicons. The resulting model identifies how key IdM data elements are utilized in collaborative scientific workflows, and it has the flexibility to describe past, present and future trust relationships and IdM implementations.

In this talk, we will discuss the VO IdM model in depth, including the barriers, motivations, and enablers to IdM delegation and trust we uncovered in our interviews, as well as lessons learned in the process of conducting socio-technical research in this interdisciplinary space and utilizing the model to provide guidance to specific communities. Finally, we describe areas of needed or potentially fruitful research that would enhance the adoption of advanced IdM technologies in future scientific collaborations.

## Summary

We discuss a Virtual Organization (VO) Identity Management(IdM) model in depth, including the barriers, motivations, and enablers to IdM delegation and trust we uncovered in our interviews, as well as lessons learned in the process of conducting socio-technical research in this interdisciplinary space and utilizing the model to provide guidance to specific communities. Finally, we describe areas of needed or potentially fruitful research that would enhance the adoption of advanced IdM technologies in future scientific collaborations.

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