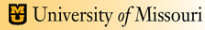# Ontology Integration for Advanced Manufacturing Collaboration in Cloud Platforms
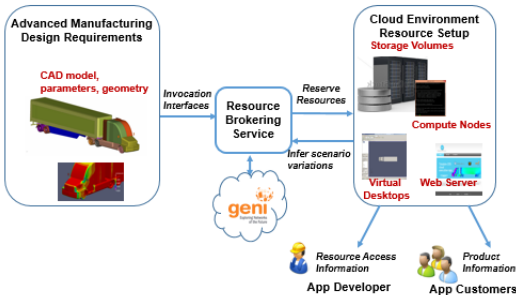
Shravya Ramisetty[1], Prasad Calyam[1], Ray Leto[2], Ronny Bazan Antequera[1], Amit Rama Akula[1]
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University of Missouri

METRO DATA CENTER LLC   TOTAL SIM USA

Advanced Manufacturing and Cloud Computing

- Manufacturing Enterprises can rent cloud platforms for reducing investment in high-performance computing, storage and scalable resources
- Manufacturing App Developer needs a Cloud Engineer to help with:
  - PaaS management capabilities for design and development
  - Delivery of SaaS "Apps" to customers in a marketplace

- *GENI Relevance:* TotalSim, in collaboration with MU is using GENI for PaaS and Cloud networking experiments to study how they can deliver their Apps to their customers with *lower design time and cost/simulation*
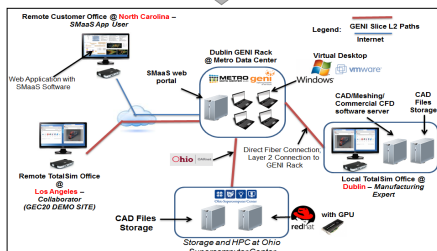
Need for Ontology Concepts for Collaboration

- Semantic translation in collaboration between Manufacturing App Developer and Cloud PaaS Provider is a challenge
- "Ontology Integration" can translate a manufacturing App's collaboration requirements to suitable provisioning of resources in a cloud platform
  - Ontology has been used successfully in many domains to bridge the gap between heterogeneous concepts

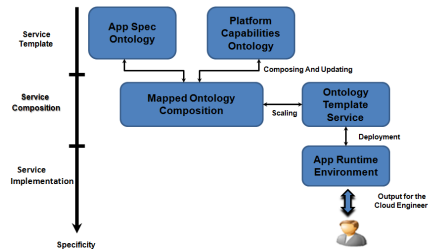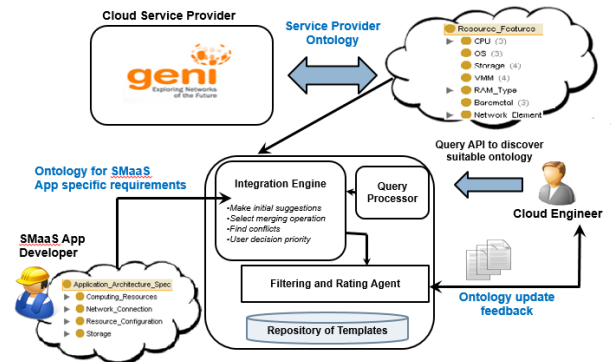**Manufacturing App Ontology**   **GENI Ontology**

App Development & Hosting Environment

Ontology Integration Methodology

Ontology integration framework for Manufacturing Apps

- Driven by an ontology-feedback approach to update 'Spec Templates' for collaborative Simulation-as-a-Service (SMaaS) App workflows

Relevance to an App Marketplace

Multiple Apps exchanging expertise/services

- Our ontology integration framework can foster multiple Apps to co-function (or even bid-on) in an App Marketplace
  - Compatible with hosting with any cloud-platform and tie-in with their accounting/billing services
  - Faster design and quicker revenue generation for advanced manufacturing community!

VIMAN Lab
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