GENI Instrumentation and Measurement WG: GENI I&M Capabilities Catalog (v0.1)

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www.geni.net

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Instrumentation and Measurement WG

- Scope:
  - Discuss, develop and build consensus around the architectural framework for the instrumentation and measurement infrastructure that will be deployed and used in GENI
  - Deploy basic instrumentation and measurement capabilities in GENI Spiral 2

GENI I&M Projects: Capabilities Catalog

- For each GENI I&M project, and other selected projects, list:
  - Architecture components addressed or implemented
  - Implementations in GENI, or elsewhere
  - Uses in GENI, or elsewhere

- Purpose:
  - To identify projects that can best contribute to architecture topics
  - To identify projects that can implement enhanced GENI capabilities in Spiral 2

- Plan:
  - Now : v0.1 completed, by GPO; see http://groups.geni.net/geni/wiki/GENIIandMCAPCAT
  - By GEC8: v1.0 draft, by GPO with contributions from WG
  - By GEC9: v2.0 draft, reviewed by WG

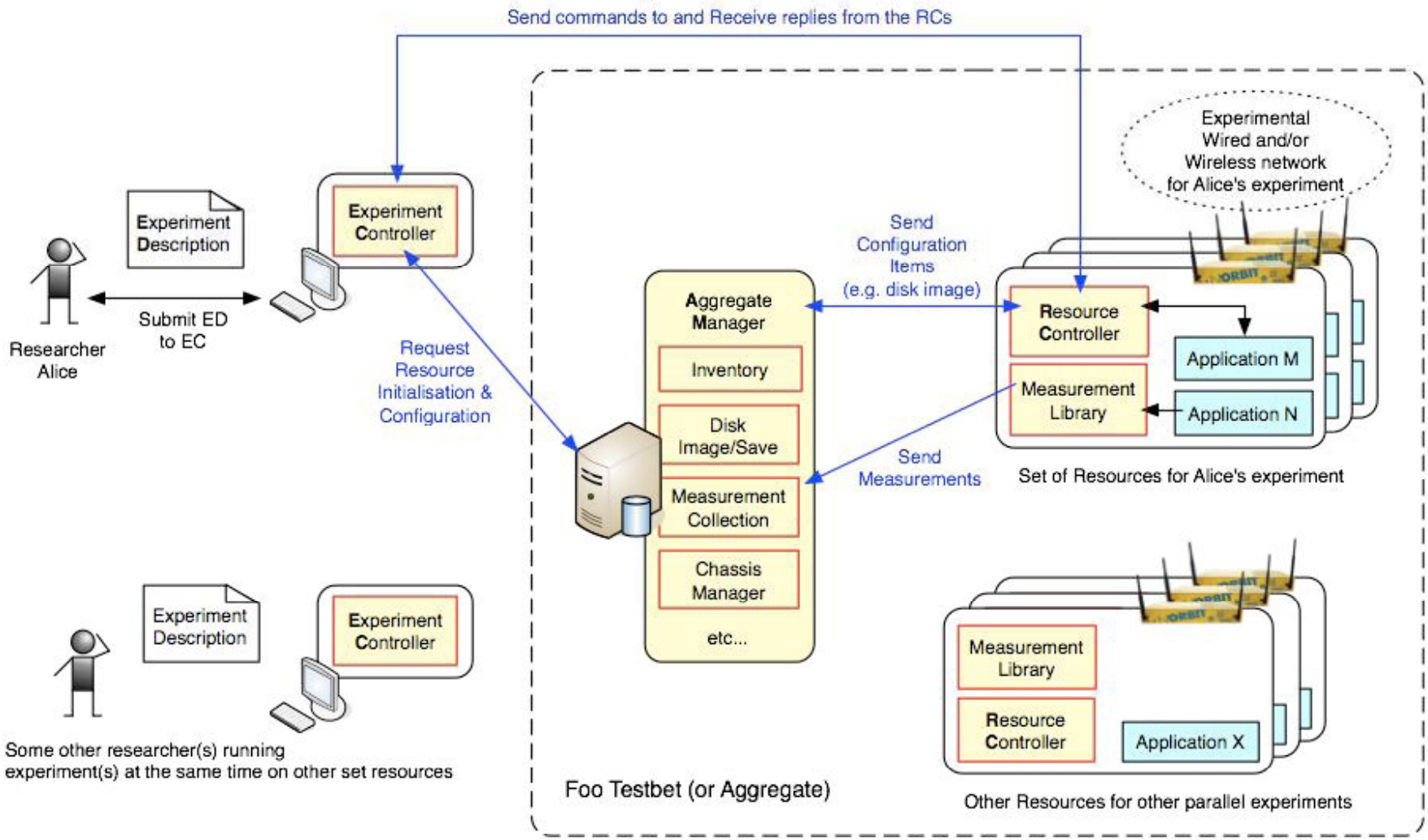
GENI I&M Capabilities Catalog (v0.1): First Results

- Based on GENI I&M Capabilities Catalog (v0.1), have identified:
  - GENI projects with comprehensive, end-to-end capabilities
  - GENI projects working on measurement data schema
  - GENI projects (and others) working on measurement data archives, and thus measurement data schema

GENI I&M Capabilities Catalog (v0.1): Projects with comprehensive, end-to-end capabilities

- Based on GENI I&M Capabilities Catalog (v0.1), have identified these GENI projects with comprehensive, end-to-end capabilities:
  - OML (ORBIT Measure Library) in OMF (ORBIT Mgmt Framework)
    (Ott, NICTA and Gruteser, WINLAB/Rutgers, 1660)
  - Instrumentation Tools
    (Griffioen, Univ Kentucky, 1642)
  - perfSONAR for network measurements
    (Zekauskas, I2 and Swany, Univ Delaware, 1788)
  - Scalable Sensing Service
    (Fahmy, Purdue and Sharma, HP Labs, 1723)
  - OnTimeMeasure
    (Calyam, Ohio Super Ctr, 1764)
  - others?

OML in OMF (Ott and Gruteser, 1660): Architecture



Instrumentation Tools (Griffioen, 1642): Architecture

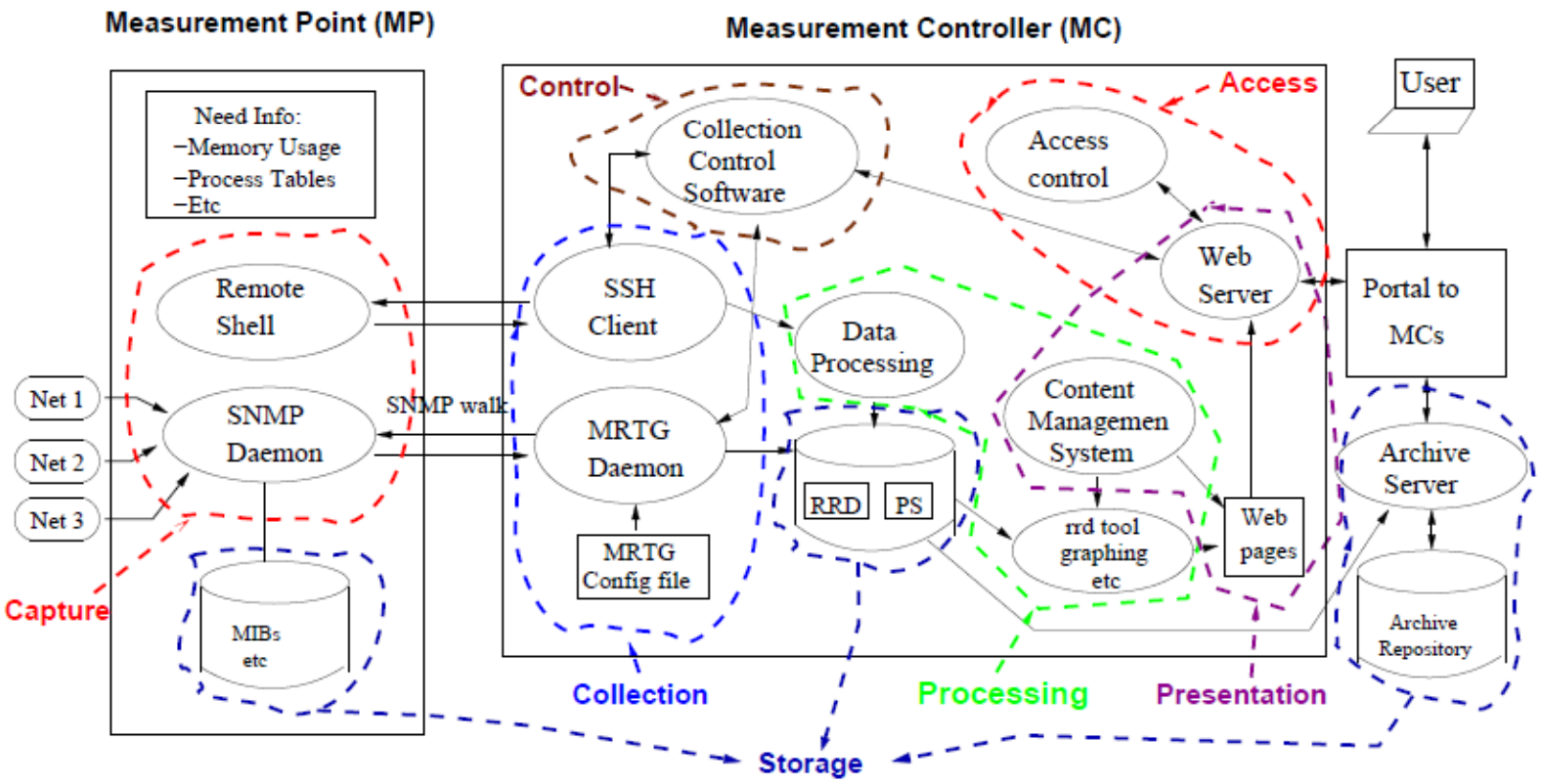
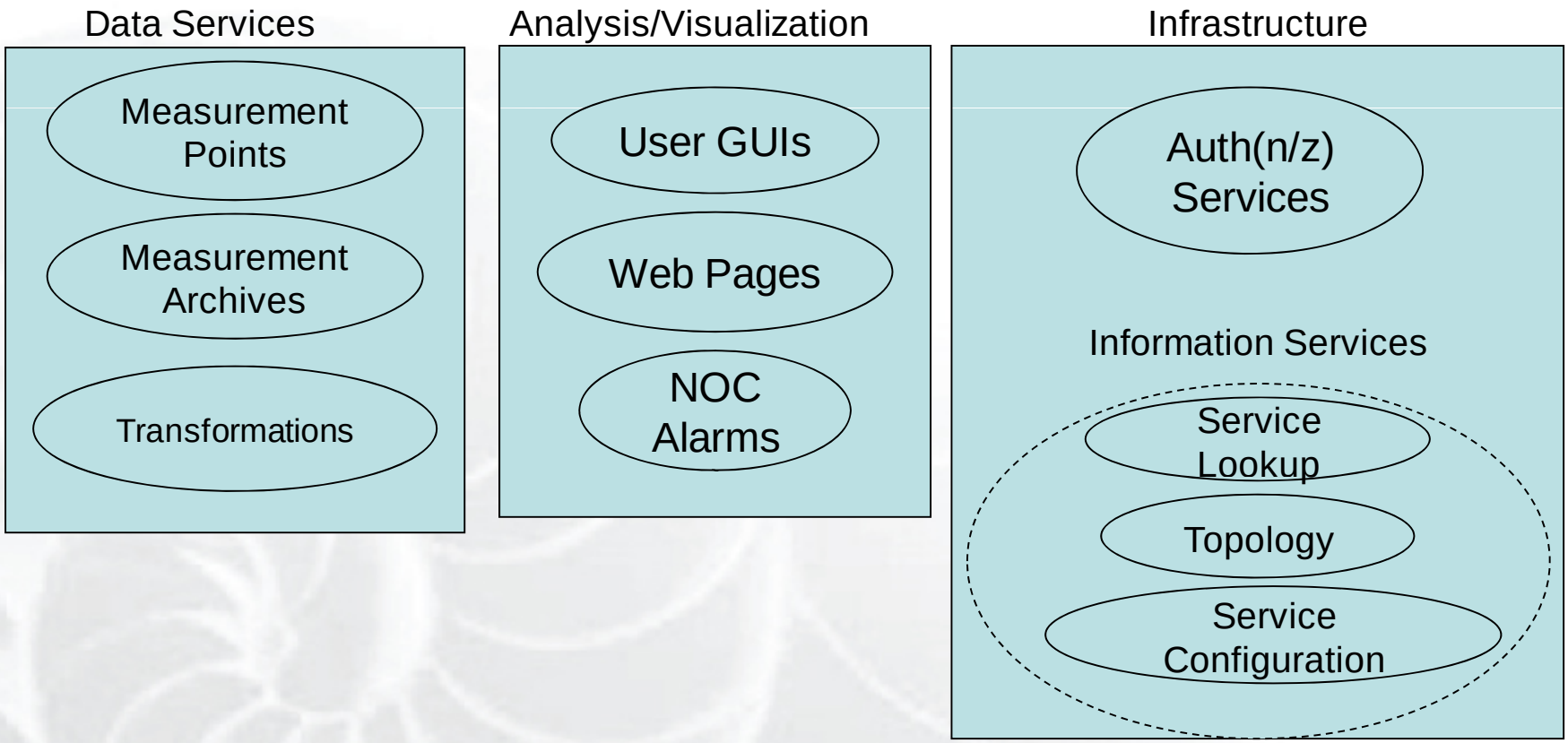


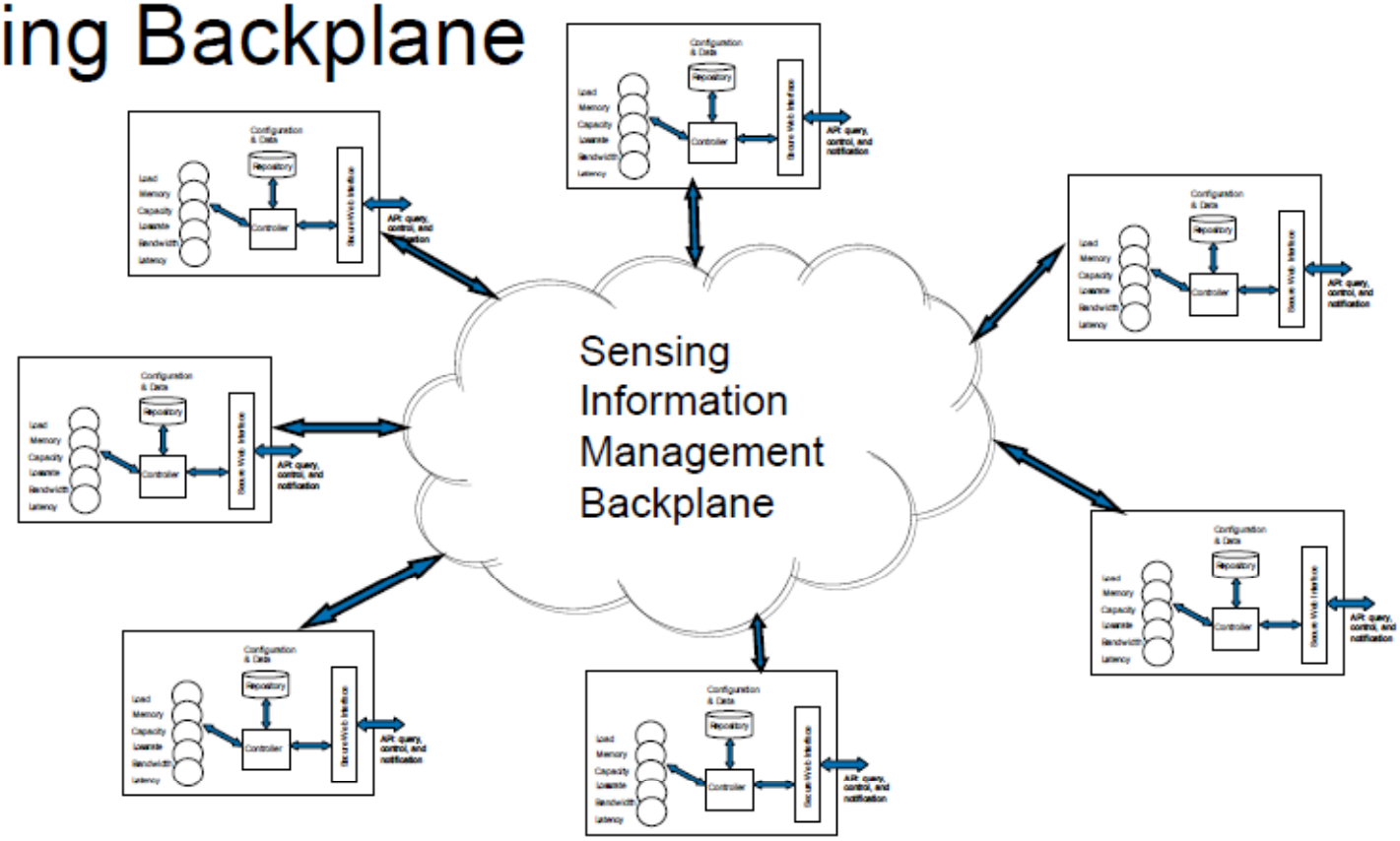
Figure 3: The Architectural Components of the INSTOOLS Toolset

perfSONAR Architecture



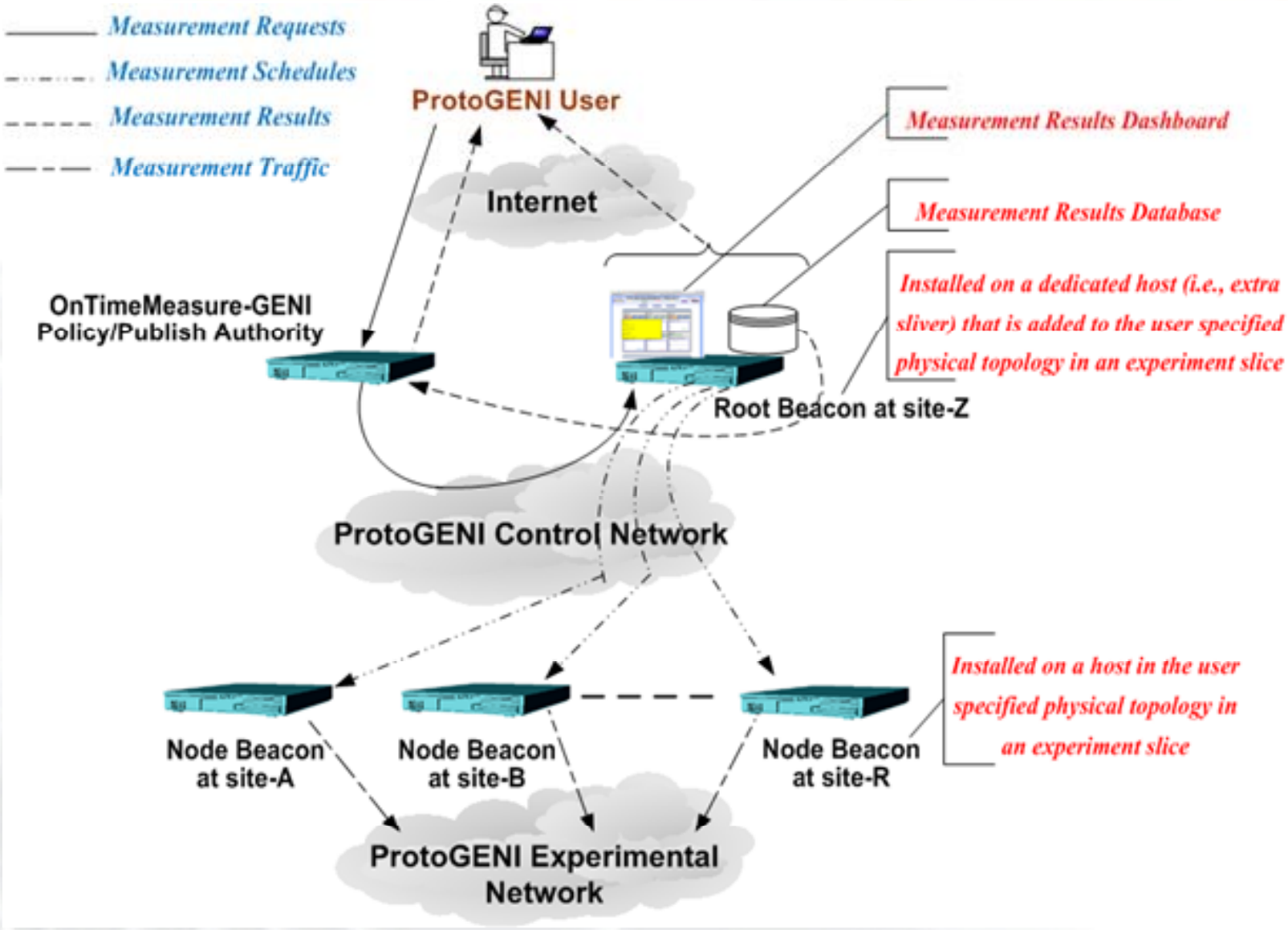
Scalable Sensing Service (Fahmy and Sharma, 1723): Architecture

Sensing Backplane



- Aggregate data from end-points
- Configurable and self-managing
- E.g., SDIMS [SIGCOMM 2004]

OnTimeMeasure (Calyam, Ohio Super Ctr, 1764): Architecture



- Based on GENI I&M Capabilities Catalog (v0.1), have identified these GENI projects working on measurement data schema :
  - perfSONAR for network measurements
    (Swany, Univ Delaware, 1788)
  - IMF project
    (Dutta, NC State, 1718)
  - Embedded Real-Time Measurements
    (Bergman, Columbia, 1631)
  - GENI Meta-Operations Center
    (Herron, Indiana Univ, 1604)
  - netKarma: GENI Provenance Registry
    (Pale and Small, Indiana Univ, 1706)
  - others?

- Based on GENI I&M Capabilities Catalog (v0.1), have identified these GENI projects (and others) working on measurement data archives, and thus also on measurement data schema:

  - DatCat project at http://www.datcat.org/ that provides a catalog that indexes Internet measurement data, which you can then find, annotate, and cite.
    (Klaffy, CAIDA)
  - Crawdad project at http://crawdad.cs.dartmouth.edu/
    (Kotz, Dartmouth)
  - Amazon Simple Storage Service
  - Data-Intensive Cloud Control
    (Zink and Cecchet, UMass Amherst, 1709)
  - Experiment Mgmt System from DOR project
    (Lannom and Manepalli, CNRI, 1663)
  - others?