INSTOOLS: Instrumentation Tools for A ProtoGENI Prototype (IM WG GEC7 Presentation)

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Talk Outline

- Project overview
- Short Demo
- General instrumentation and measurement infrastructure issues

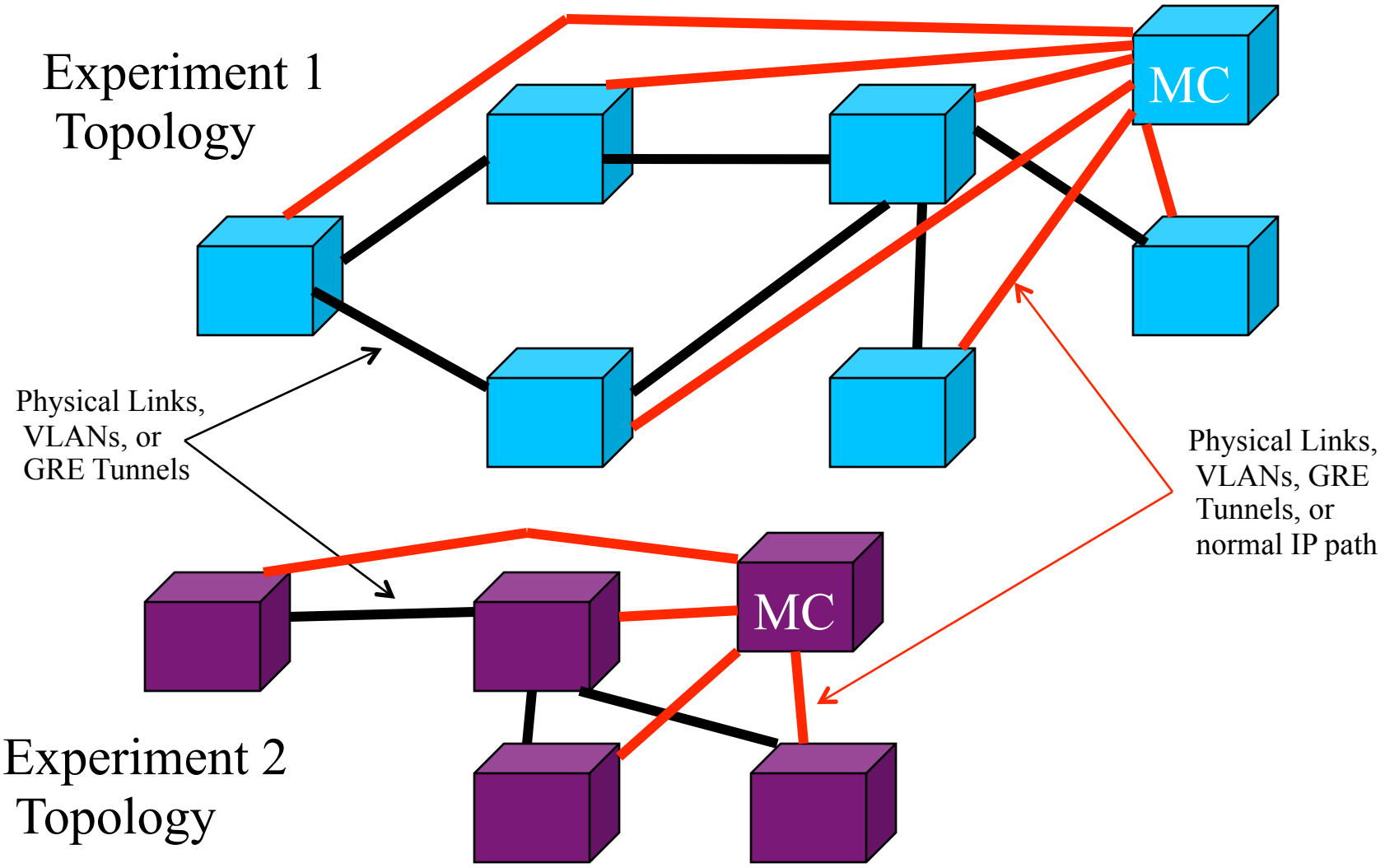
Project Participants

- James Griffioen (PI)
- Zongming Fei (Co-PI)
- Hussamuddin Nasir (Lead Programmer)
- Xiongqi Wu (Research Assistant)
- Jeremy Reed (Research Assistant)
- Lowell Pike (Network Administrator)
- Woody Marvel (Technical Support)

Project Goals

- Integrate UK Emulab into ProtoGENI (completed in year 1)
- Reimplement UK Edulab instrumentation and measurement tools to work in the ProtoGENI environment.
- Support automatic generation of instrumentation and measurement infrastructure on a per-slice basis.

Measurement Controller in ProtoGENI



Demo

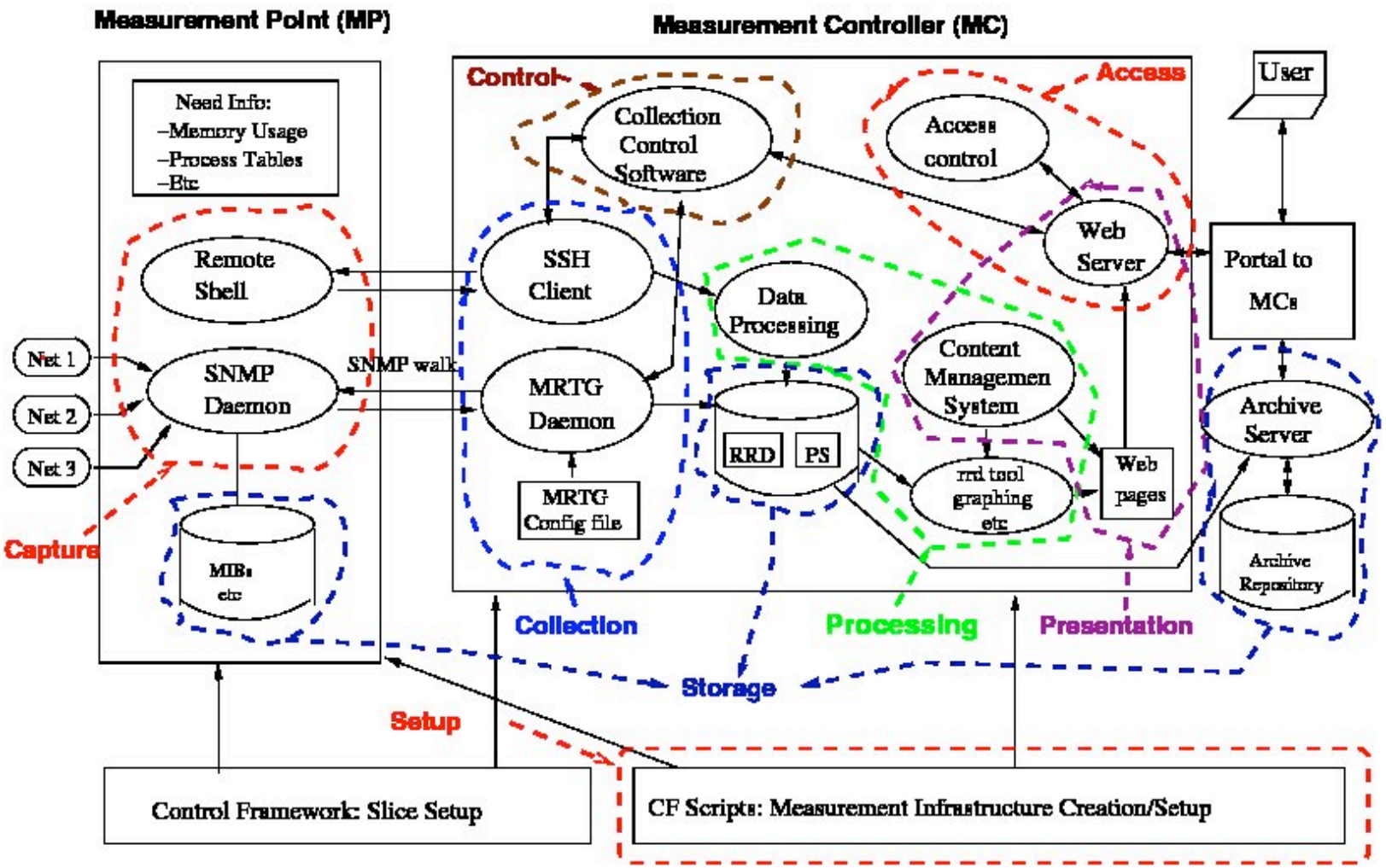
Need Common Terminology For:

- What needs to be done? (functional view)
- What resources are available? Which are static and which are dynamic?
- What is the mapping function and the terminology for the resulting things (servers)?

INSTOOLS: Functional Components

1. Setup: deploy and initialize topology-specific software and services
2. Capture: capture measurement data
3. Collection: move data to processing/storage environments
4. Storage: store data on a temporary, short term, long term, and archival basis
5. Processing: filter, convert, aggregate, summarize, etc., data
6. Presentation: present data to users in meaningful ways
7. Access Protection: protect resources and data
8. Measurement Control: Dynamically control the above components

Implemenation Approach



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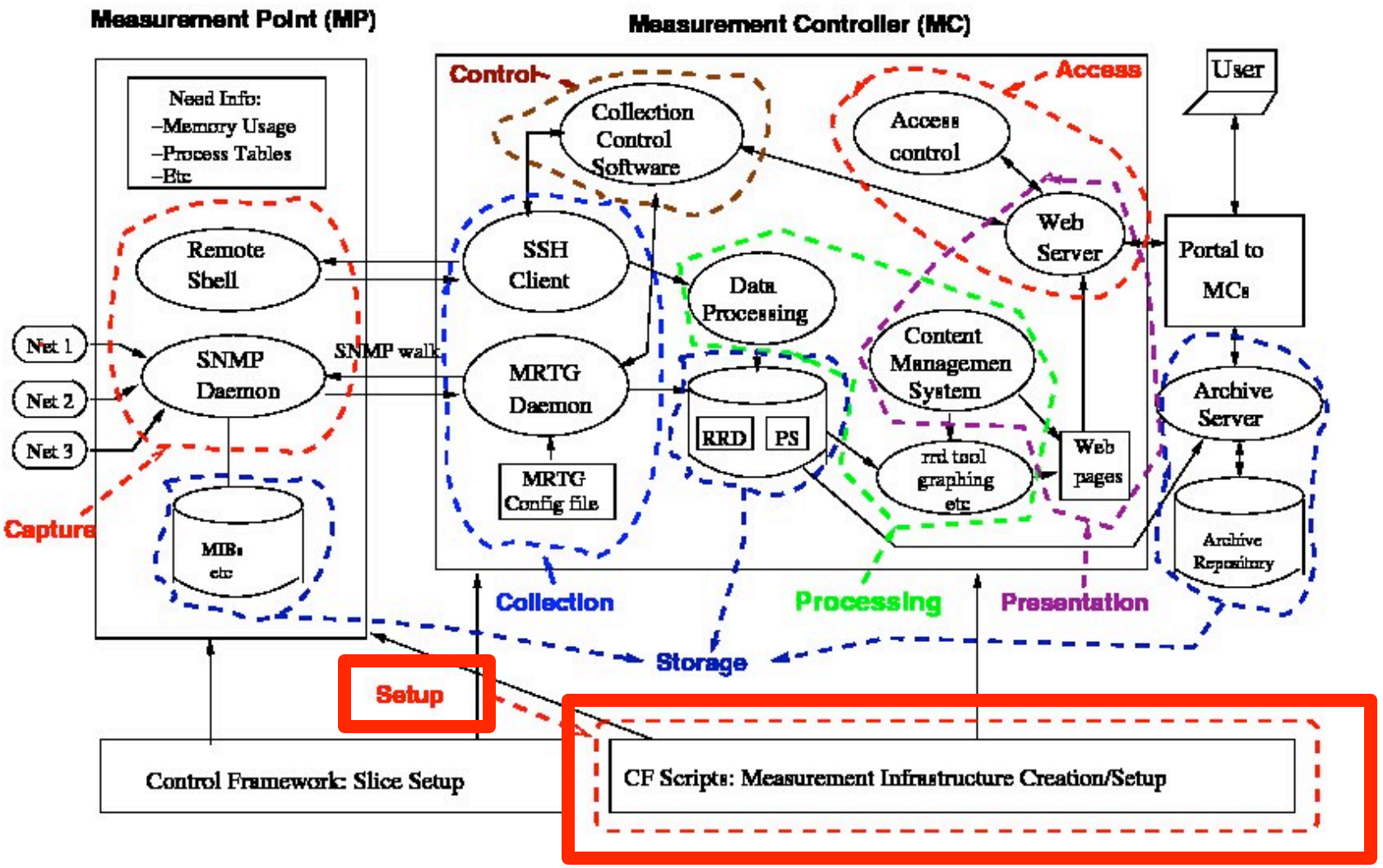
Conventional network management solutions exist

Implemenation Approach



I&M Doc: Proposed Services

- Measurement Orchestration Service
- Measurement Point Service
- Measurement Collection Service
- Measurement Analysis and Presentation Service
- Measurement Data Archive Service

Functionality

1. Setup – MO?
2. Capture - MP
3. Control – MO?
4. Collection - MC
5. Storage - MDA
6. Processing - MAP
7. Access Control – MO?
8. Presentation - MAP

Measurement Data Schema

- Proposed questions:
  - Common after MPs?
  - Common before and within MCs, and MDAs
- The question should not be *when*, but rather *what* is in the common format.
  - Data-specific formats will exist at multiple times and places but should be invisible to the generic measurement infrastructure
  - Should leverage expertise of those with experience in this area (DatCat, PerfSONAR, etc).
- *When* may be important in the context of short-term data; e.g., where the data contains time-dependent information

Measurement Plane

- Proposed questions: 2 or 3 NICs
- Don't think distinct NICs. Think distinct paths.
  - Separate NICS do not guaranteed distinct paths.
  - Virtual interfaces abound in GENI. Unknown how virtual interfaces map to physical NICs.
- Shared paths are OK, but require QoS. Setting up QoS planes is challenging; particularly if planes are per-slice.

Thank You!

Questions?

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