

INSTOOLS:
Instrumentation Tools for A
ProtoGENI Prototype
(IM Tutorial GEC9)

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Project Participants

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- Xiongqi Wu (Research Assistant)
- Jeremy Reed (Research Assistant)
- Lowell Pike (Network Administrator)
- Woody Marvel (Technical Support)

Talk Outline

- INSTOOLS Goals and Objectives
- INSTOOLS Architecture
- INSTOOLS Demonstration
- Using INSTOOLS in your experiments
- Future Directions

Project Goals/Objectives

- The ultimate objective is to
 - Automate the task of deploying an instrumentation and measurement infrastructure within a GENI slice.
 - Provide users with a convenient and simple-to-use interface to the measurement infrastructure.
- Preliminary steps toward this objective included:
 - Integrating the UK Emulab resources into ProtoGENI
 - (Re)implementing and extending UK Edulab instrumentation and measurement tools to work in the ProtoGENI environment.

INSTOOLS Architecture

(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

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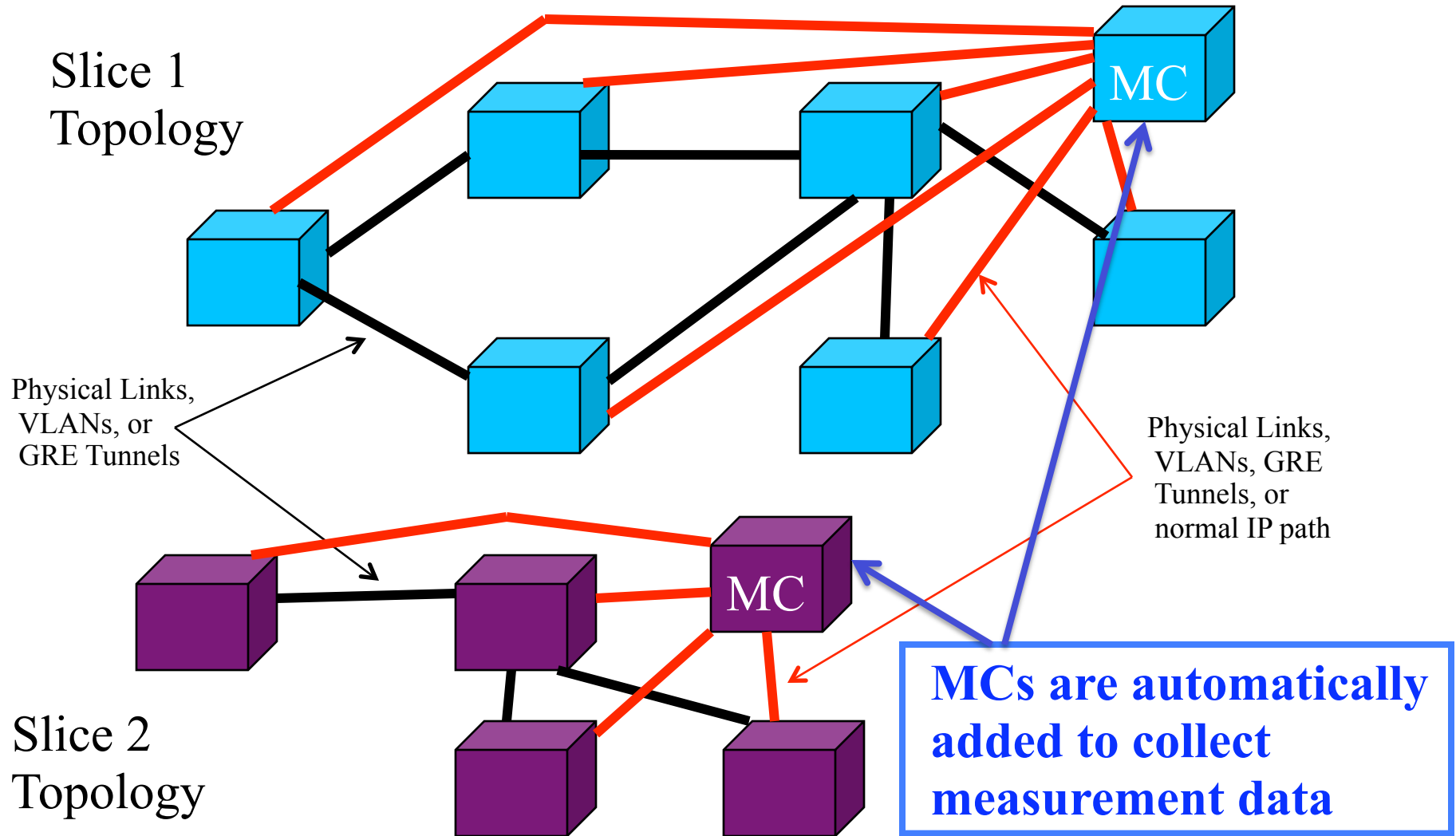
6. Presentation: present data to users in meaningful ways

7. Access Protection: protect resources and data

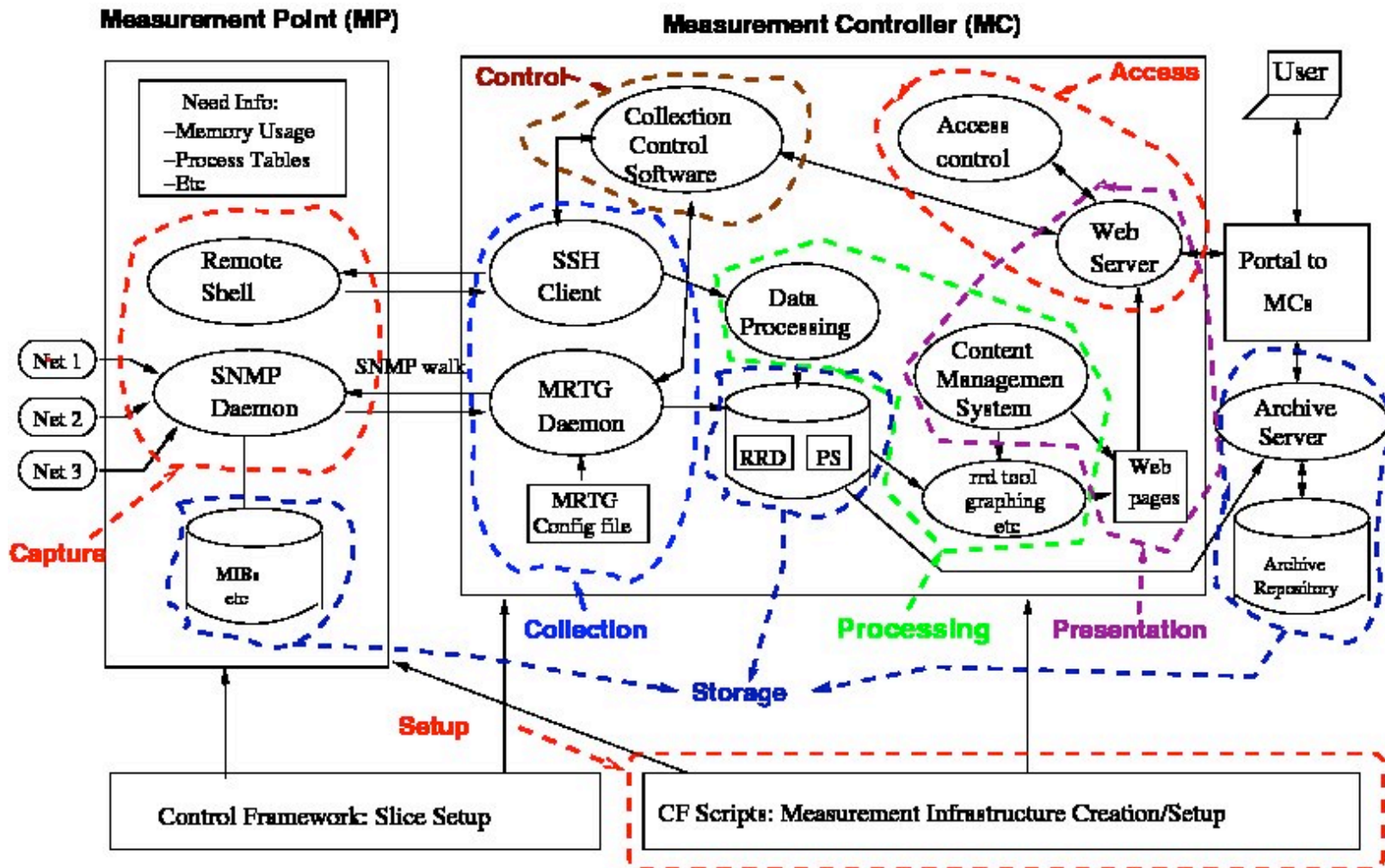
8. Measurement Control: Dynamically control the above components

Conventional network management solutions exist

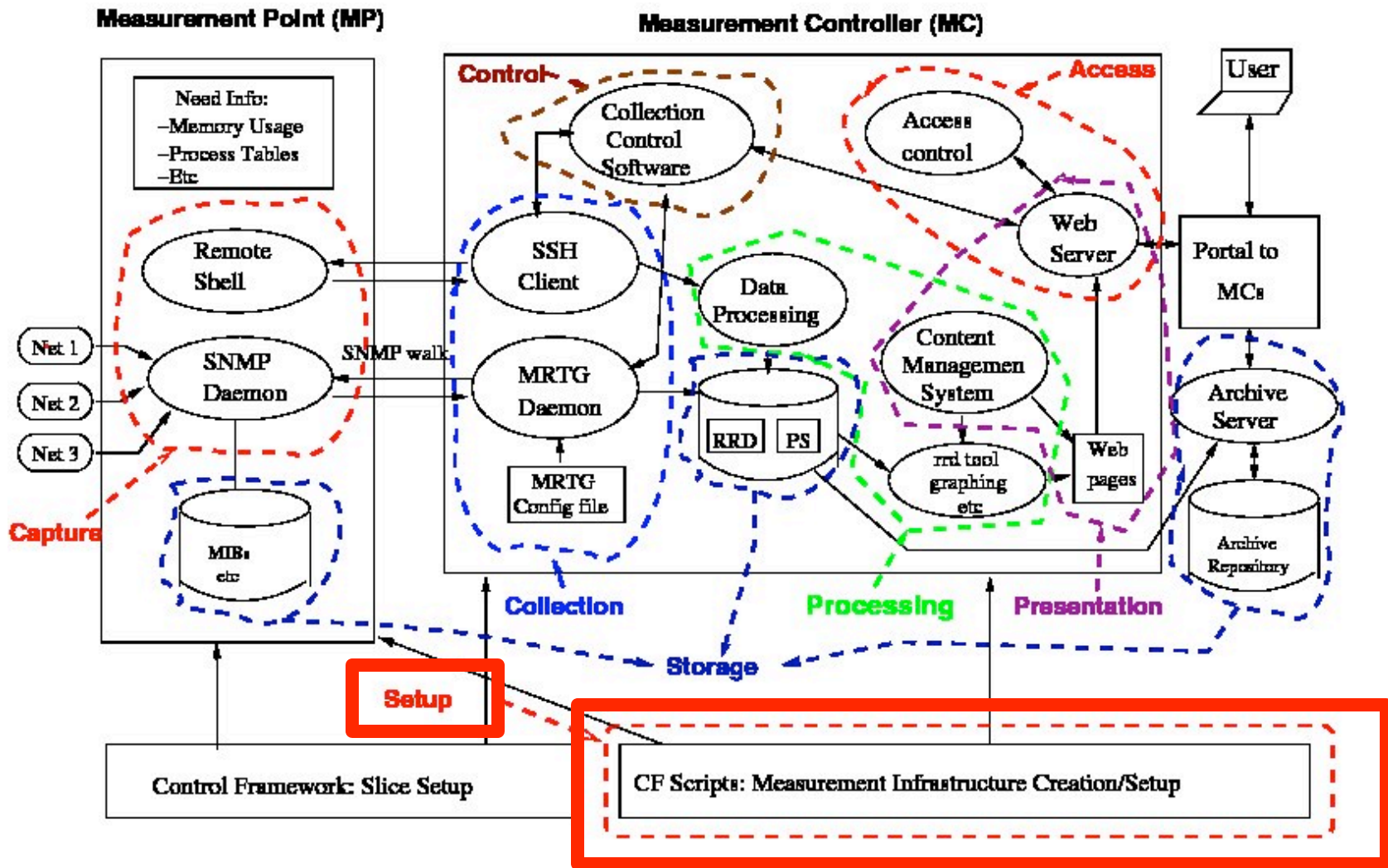
INSTOOLS Architecture: (Automated Setup)



Implementation Approach

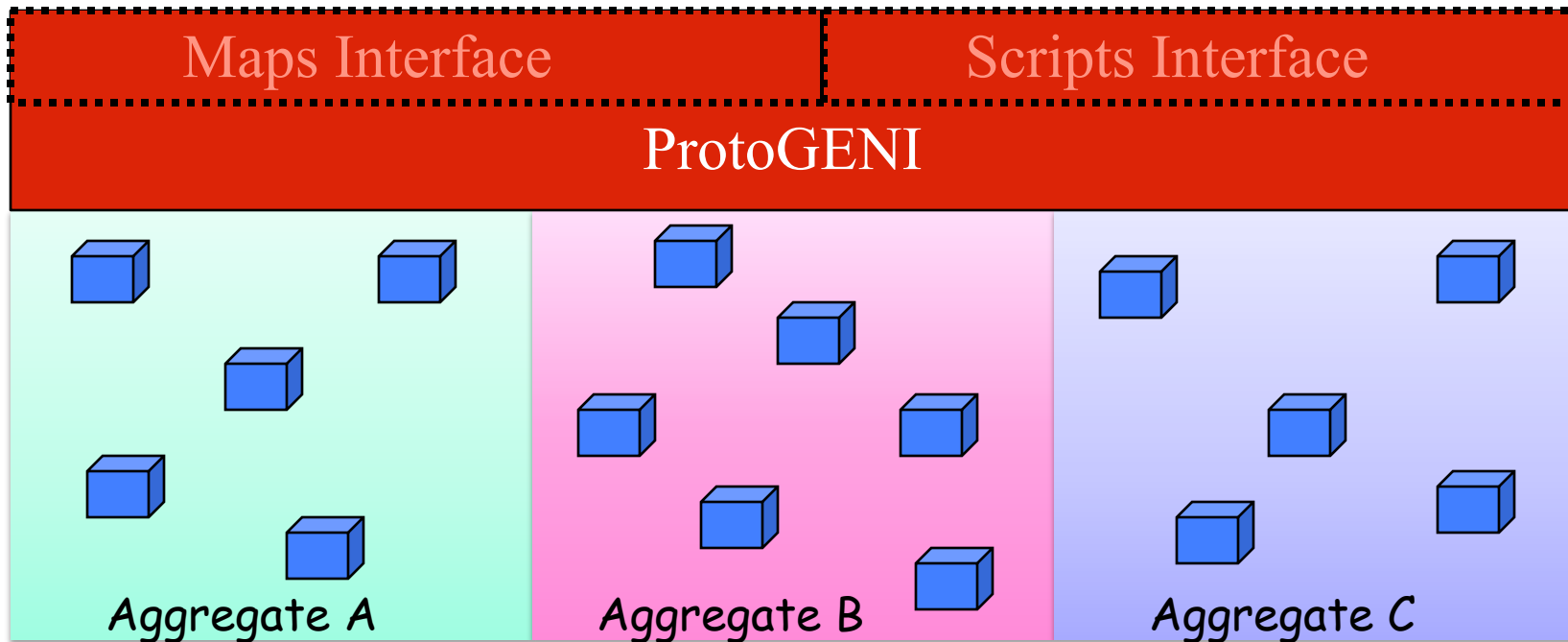


Implementation Approach

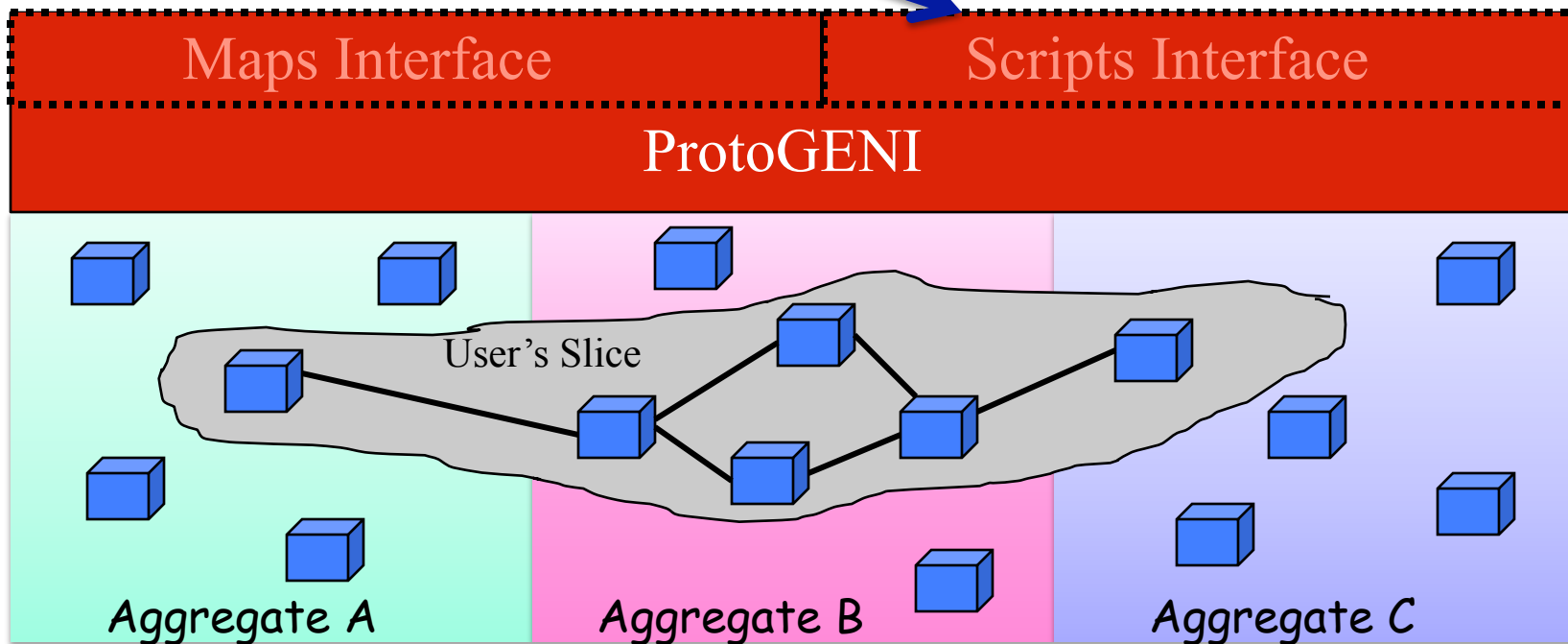


ProtoGENI and INSTOOLS (Separation of Functionality)

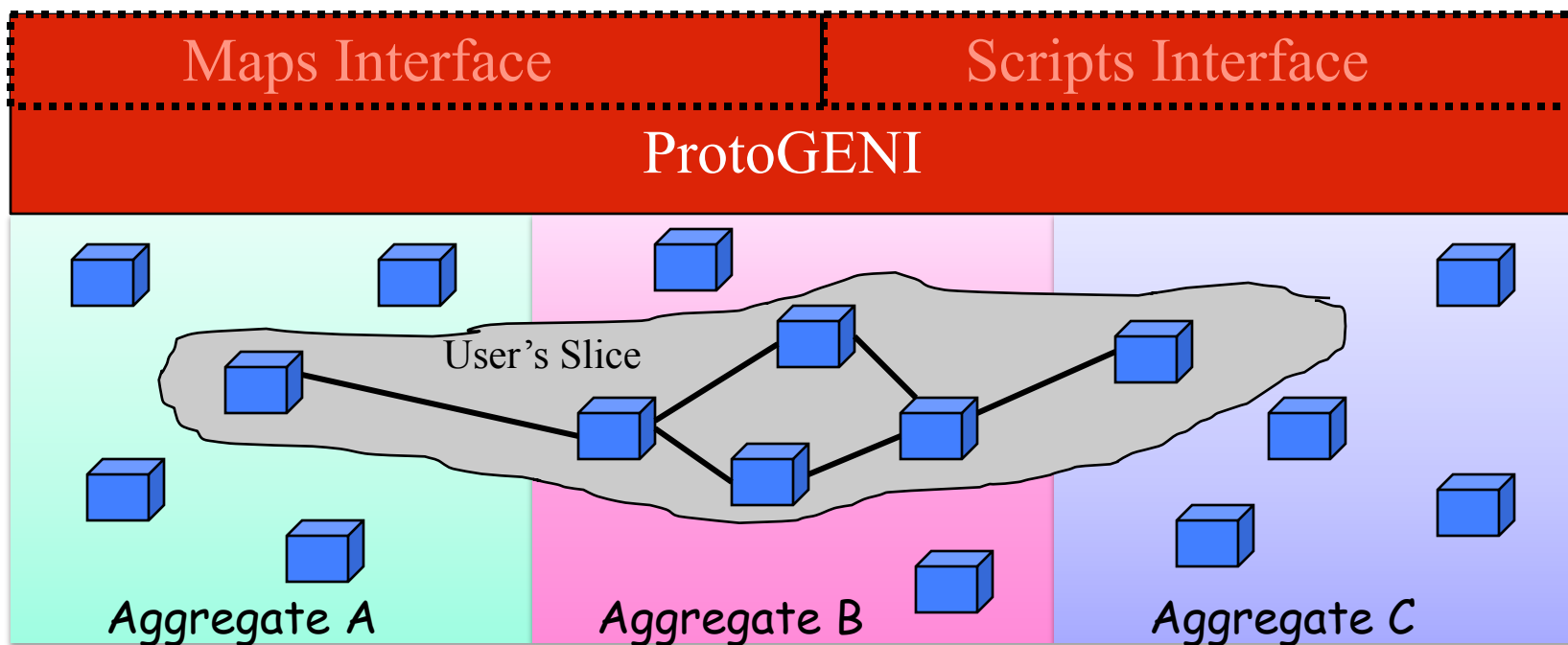
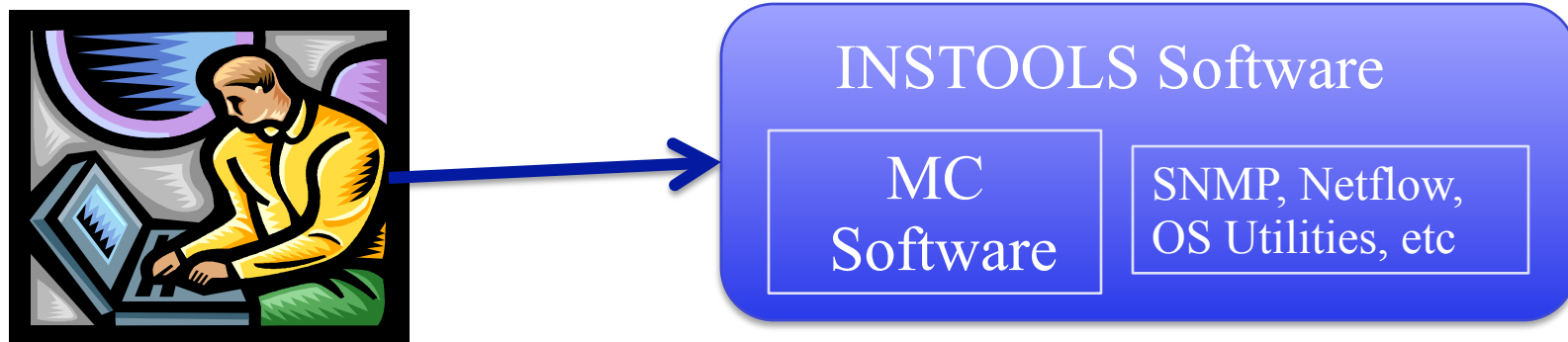
ProtoGENI System



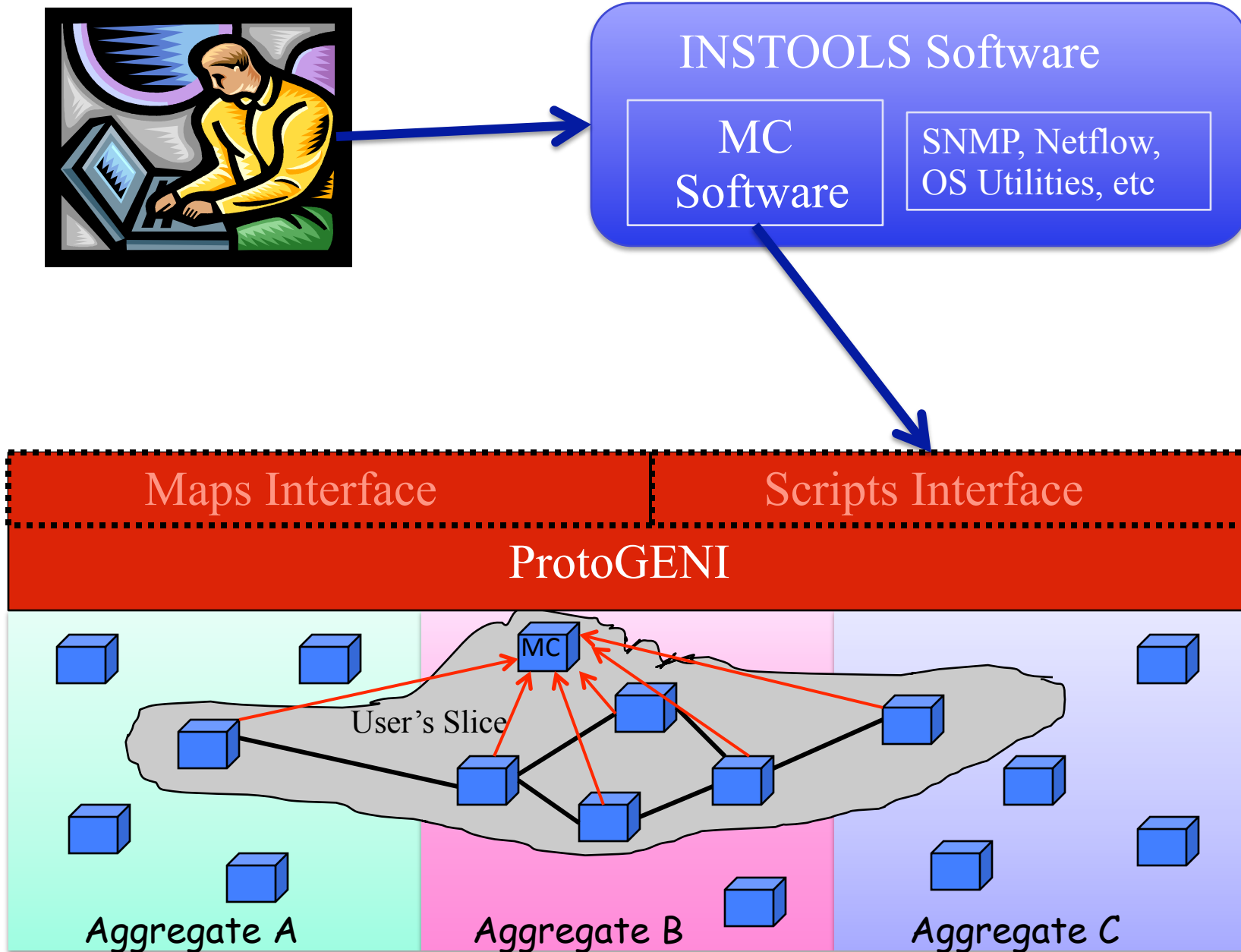
User creates a “slice” using one of the ProtoGENI APIs.



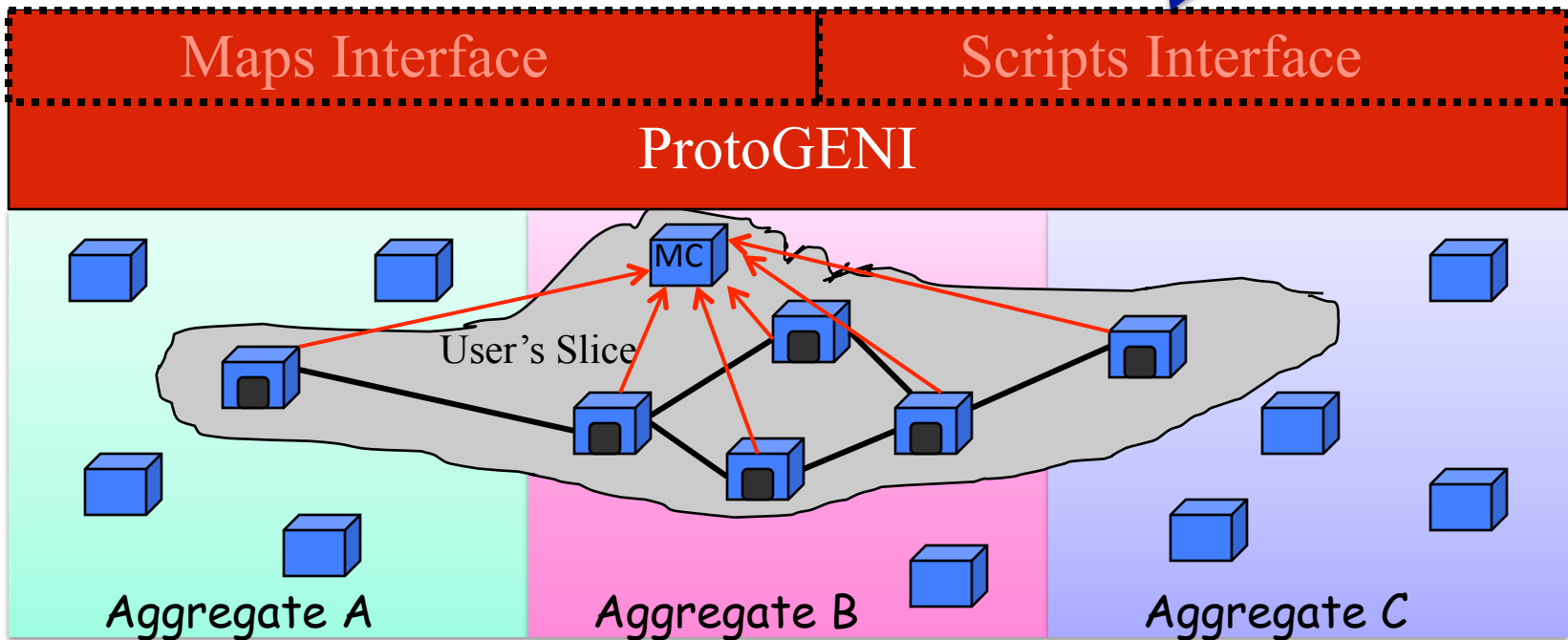
User instruments the slice



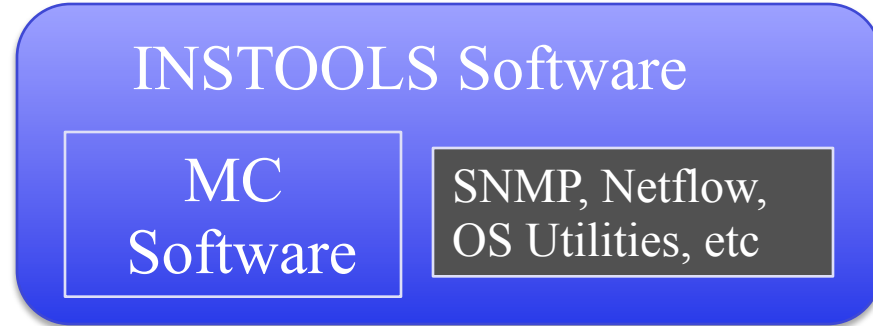
INSTOOLS adds MC to slice



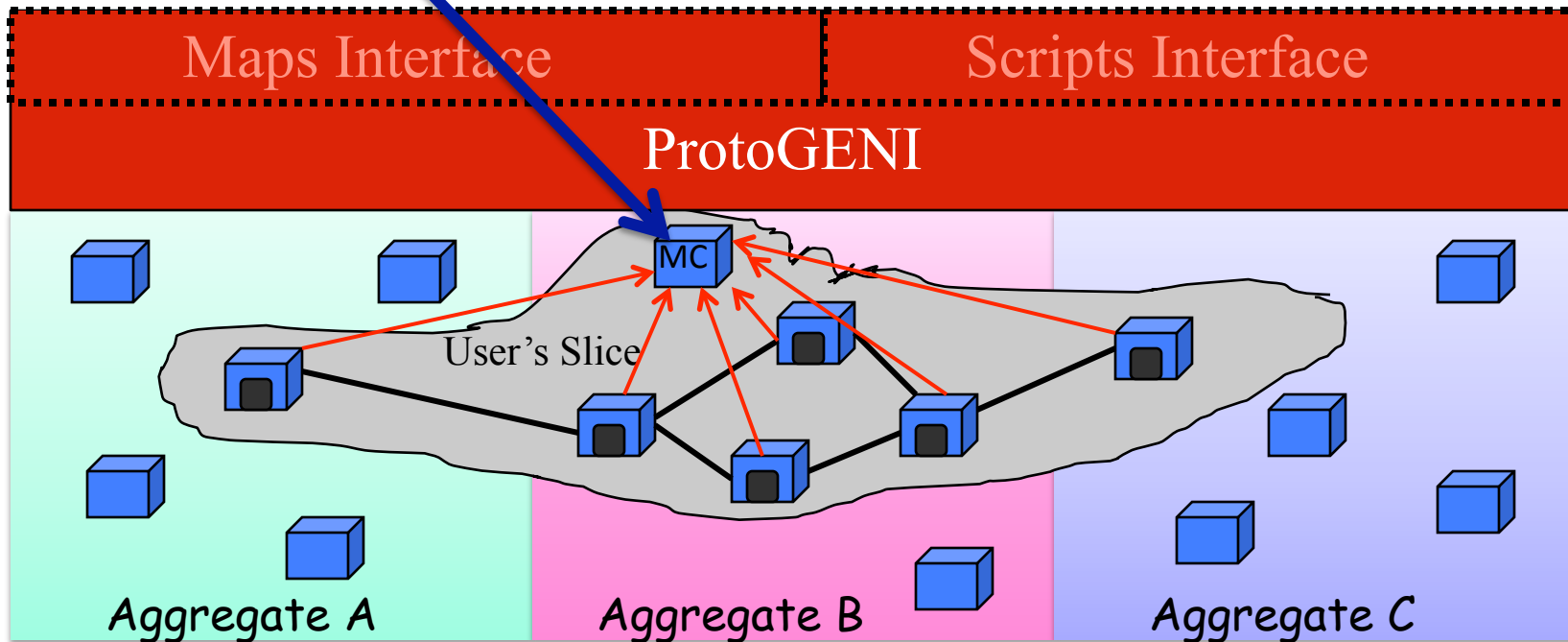
INSTOOLS adds monitoring software to slice resources



User views measurement data on the MC.



Web Server
Access to MC



Setup Steps

1. Create ProtoGENI slice
2. Instrument ProtoGENI slice with the INSTOOLS "instrumentize" script.
3. Setup/Run experiment
4. Configure/View web pages.

Setup Steps

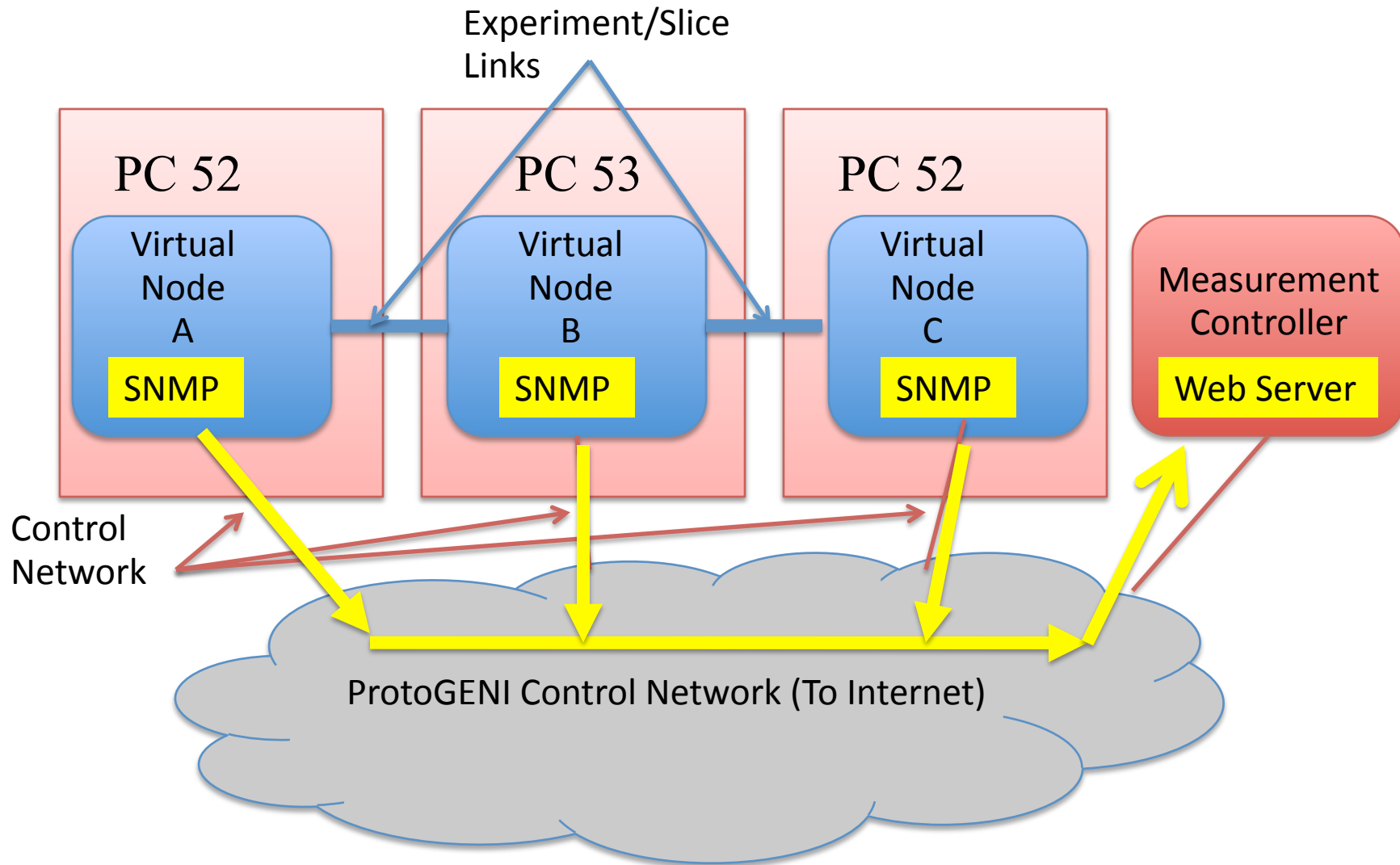
1. Create ProtoGENI slice (ProtoGENI)
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Setup Steps

1. Create ProtoGENI slice (ProtoGENI)
2. Instrument ProtoGENI slice with the INSTTOOLS "instrumentize" script. (INSTTOOLS - Automated)
3. Setup/Run experiment (e.g. Gush)
4. Configure/View web pages. (INSTTOOLS - Manual)

INSTOOLS Demonstration

Demonstration Topology



Demonstration Steps

- Create a ProtoGENI slice
- Instrumentize the slice
- Access the slice and generate traffic
- View measurement data
 - Link traffic
 - Node traffic
 - Flow traffic
 - Node tables
 - User-defined views
 - Packet capture/analysis
 - Interacting with nodes

Using INSTOOLS in Your Slice

- Download the instrumentize script.
- Run the instrumentize script on your (existing) slice. We suggest running it from ops.
 - Wait for it to complete
 - Establish passwords for the MC web server
- Visit the MC web server.
- Customize the view as needed.

Future Directions

- Addition of a “portal” for easier access to measurement that spans aggregates.
- Dynamic control of capture and display.
- Support for other control frameworks.
- Support for archival services.

Thank You!

Questions?

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