Integrating the ProtoGENI Reference CM in ETRI Platform (FiRST@ETRI)

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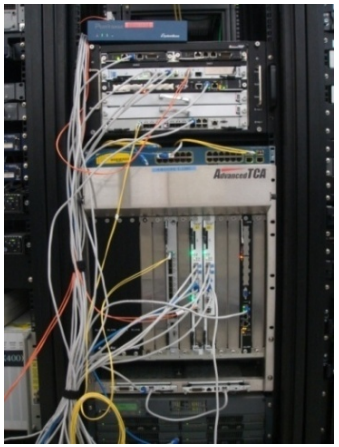
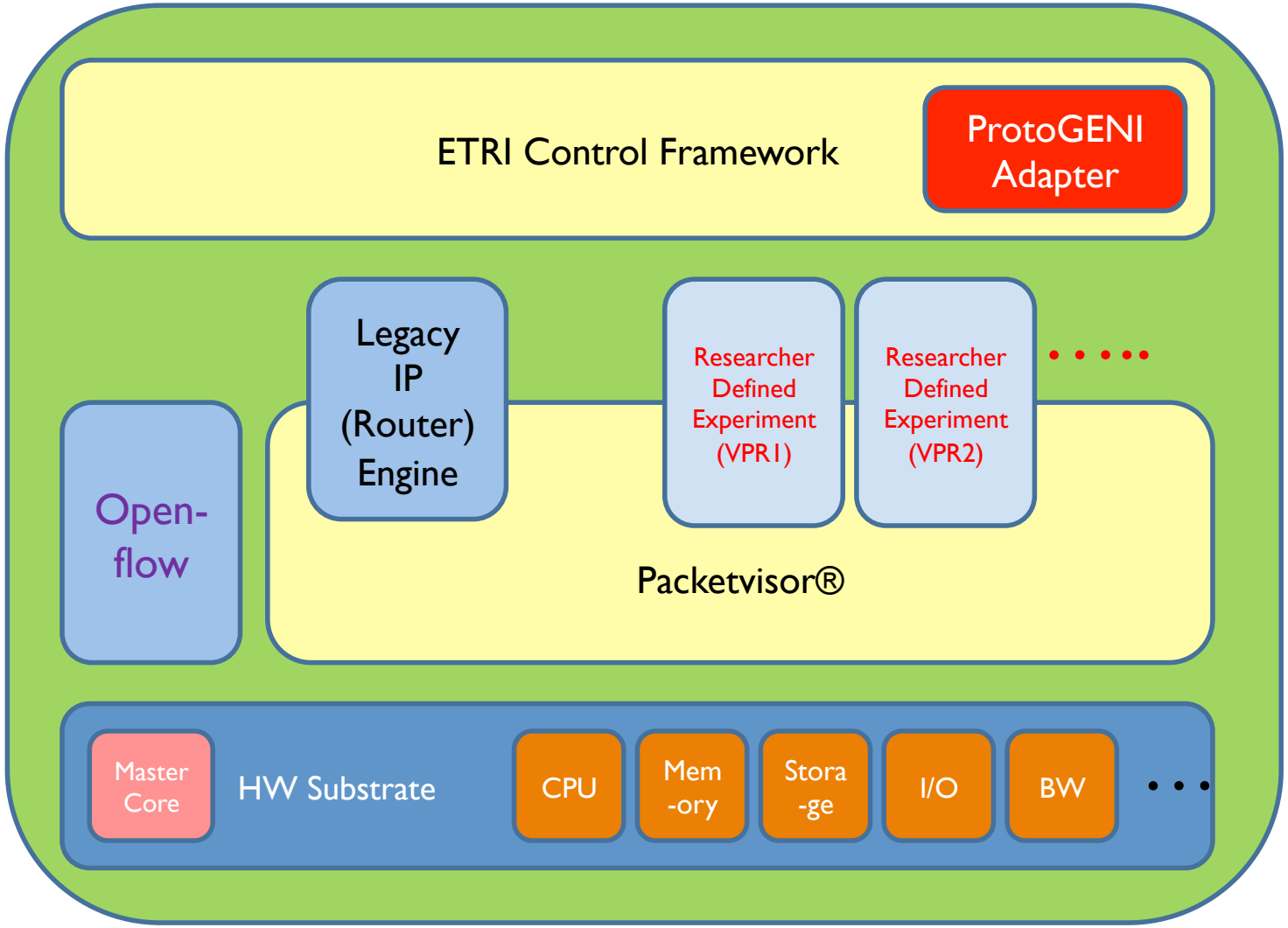
ETRI Platform Specification

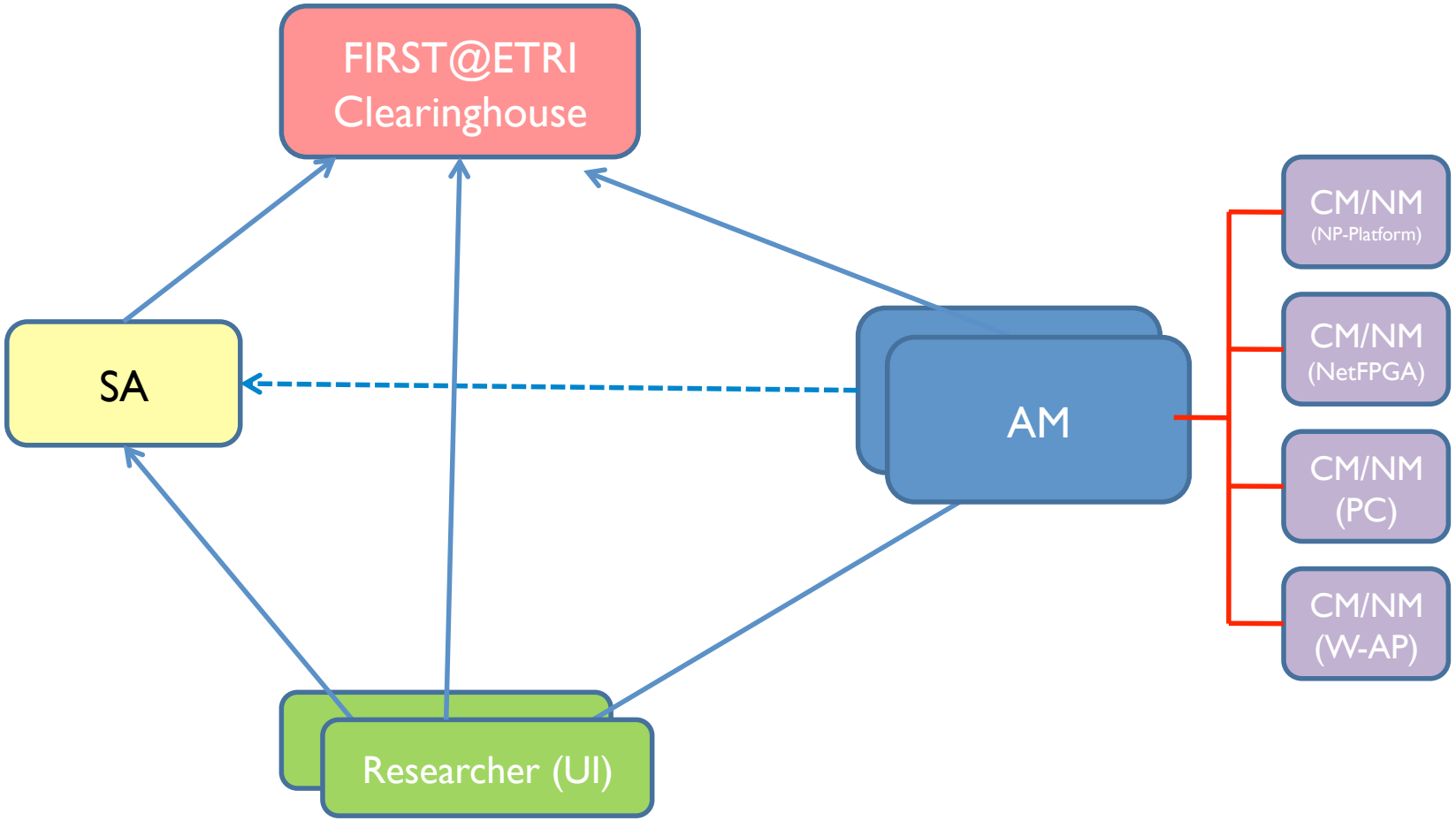
- Multiple Substrate Support
  - NP-based hardware Platform
    - Virtualized programmable substrate that operate at high speed (ATCA hardware)
  - NetFPGA/PC, Wireless AP, etc.
- Virtualized programmable routers
  - Researcher-defined "Silver-based Virtual Routers"
- Common Platform APIs
  - Programming APIs for Researchers
  - Open substrate interfaces
- Capabilities and functions
  - Dynamic End-to-end Slice Operations
    - Control Framework APIs (protoGENI-compatible)
  - Openflow enabled



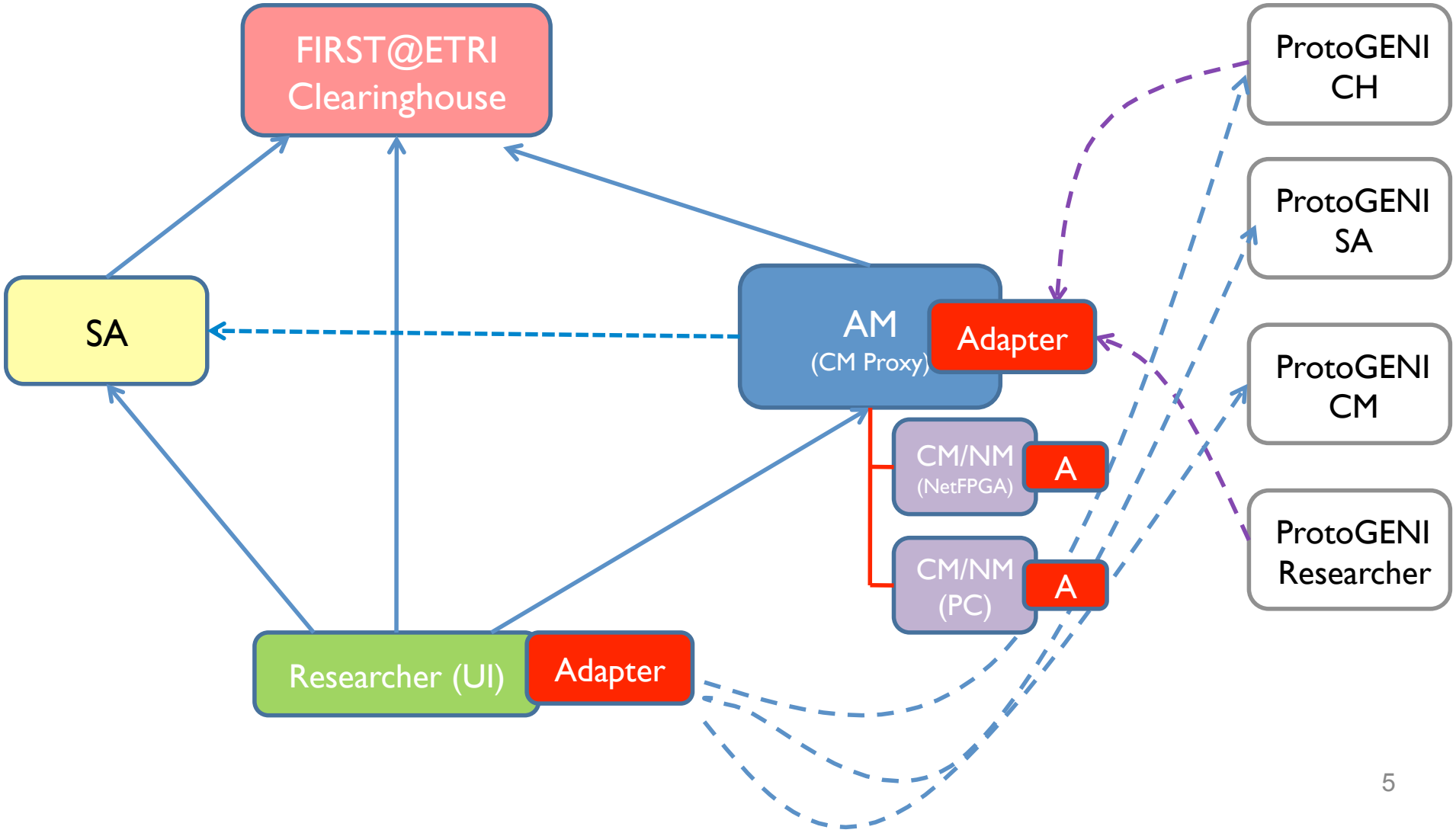
NP Platform Architecture



ETRI Control Framework Entities

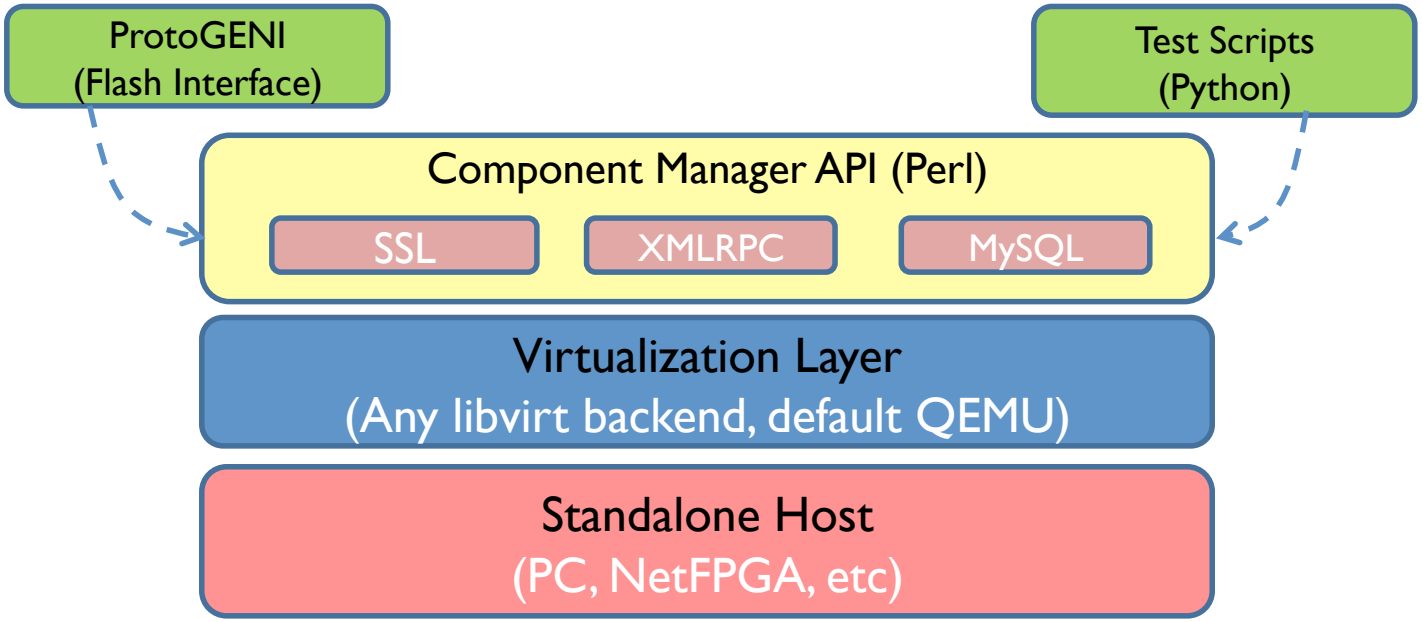


Adding ProtoGENI Adapter



ProtoGENI Reference CM

- Abstraction of Emulab-based ProtoGENI
- Demonstrate overall behavior of ProtoGENI S/W
- Good starting point for control integration & federation

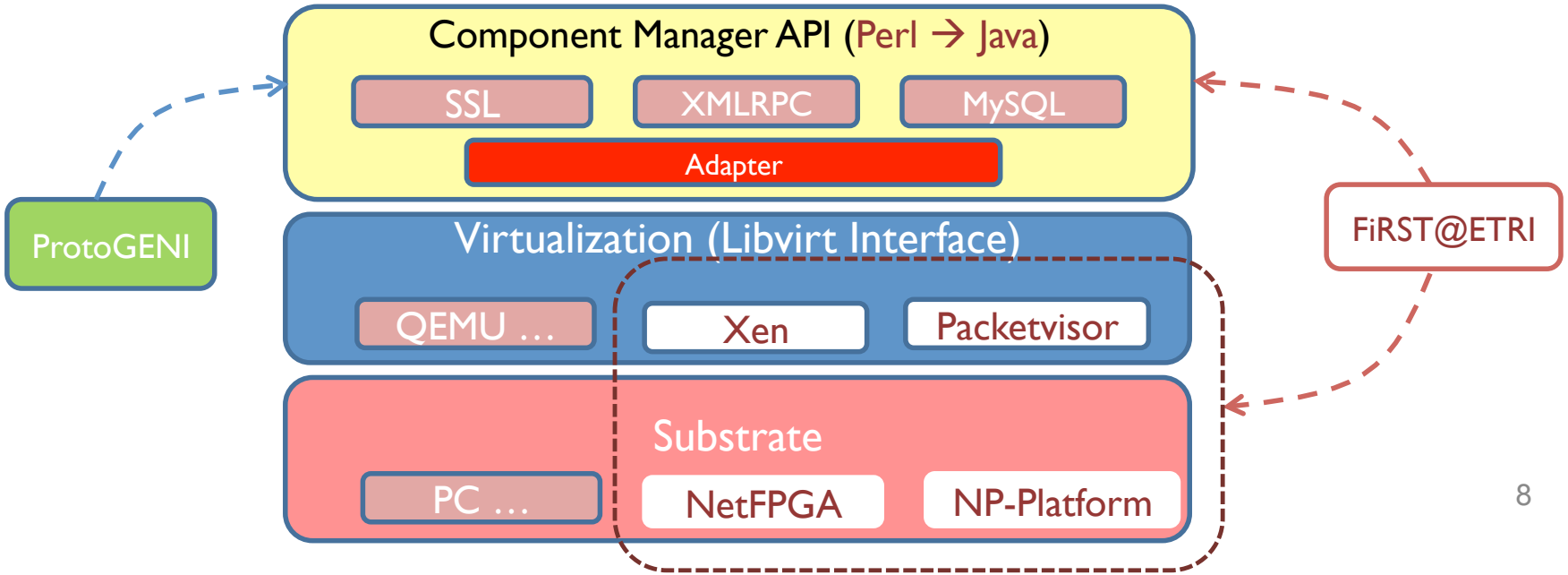


Reference CM Installation

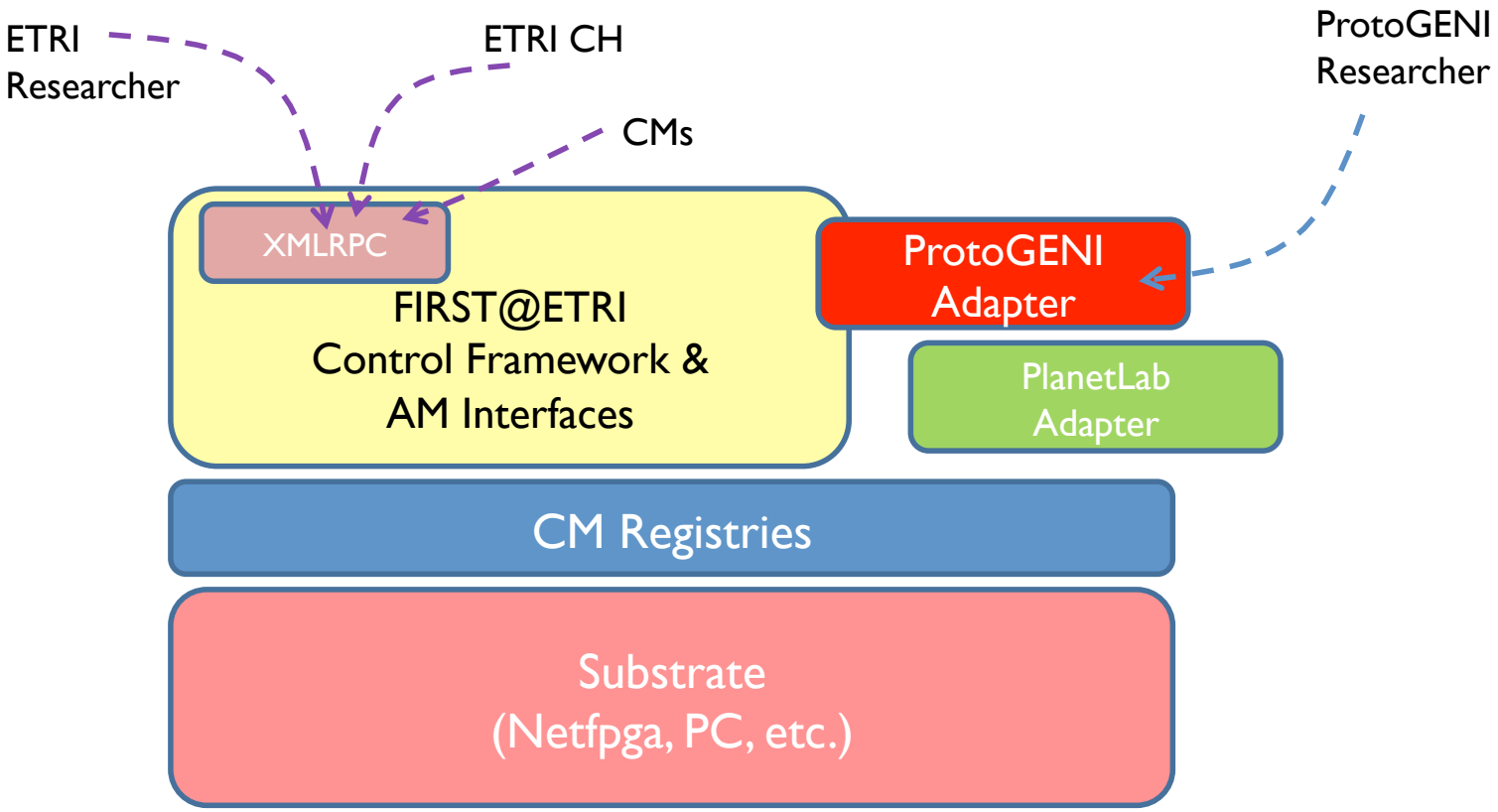
- Easy to install on CentOS 5.x
  - Just follow the Wiki page
  - Some manual configs: M2Crypto, OpenSSL
- Some Difficulties
  - Manual registration of SSL Certificates
  - Perl looks cryptic to us (?)
  - Default QEMU doesn't work well for test
  - Our CMs had appeared on wrong location (e.g., Pyongyang :-)

Initial Thought on Using Reference CM

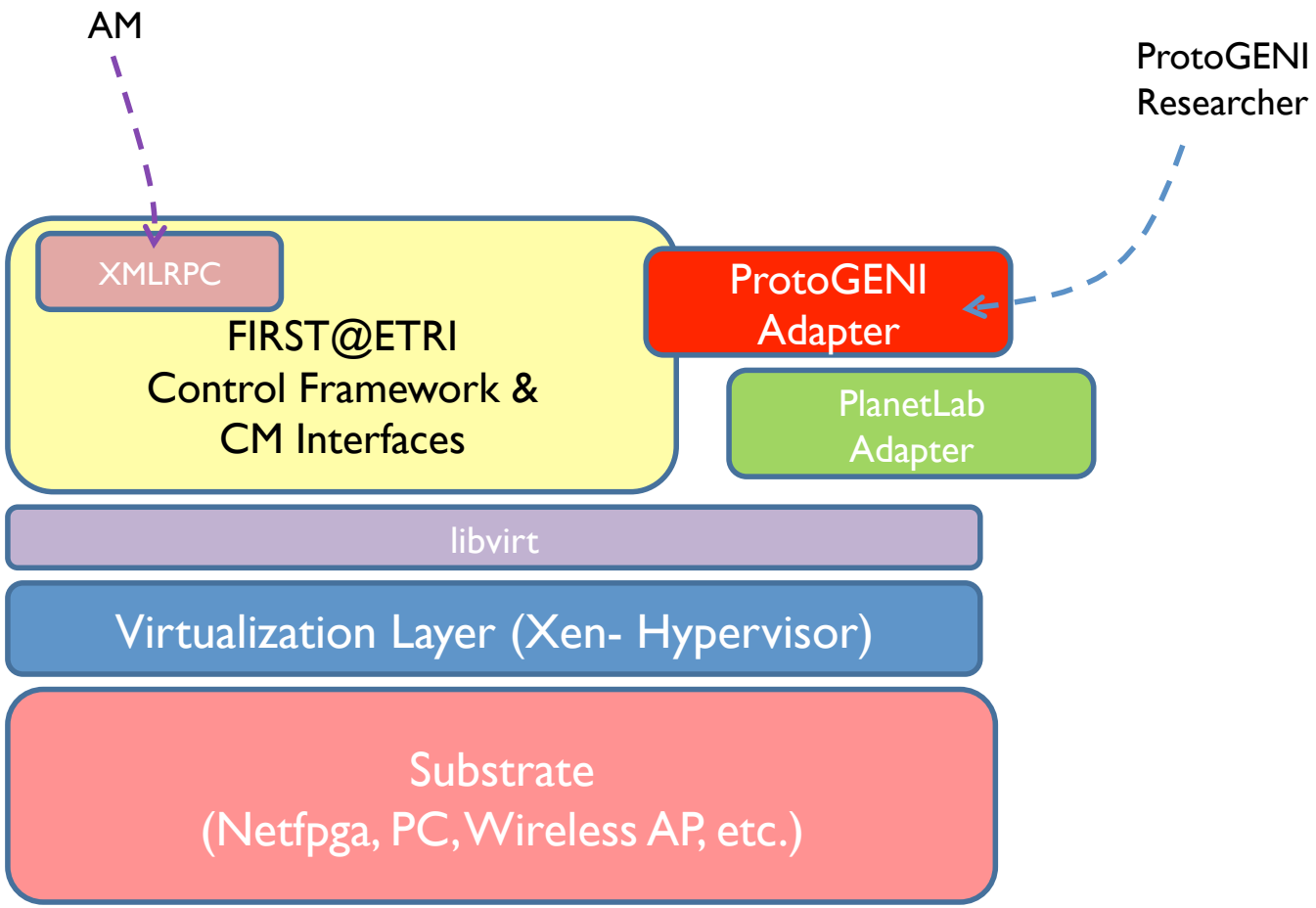
- Monitor Status of ProtoGENI - ETRI CM
  - Resource Advertisement, Managing Slivers, etc.
- Development of Control Adaptor
  - Starts from Brute-force interconnection
  - Build up the adaptor from the CM codes



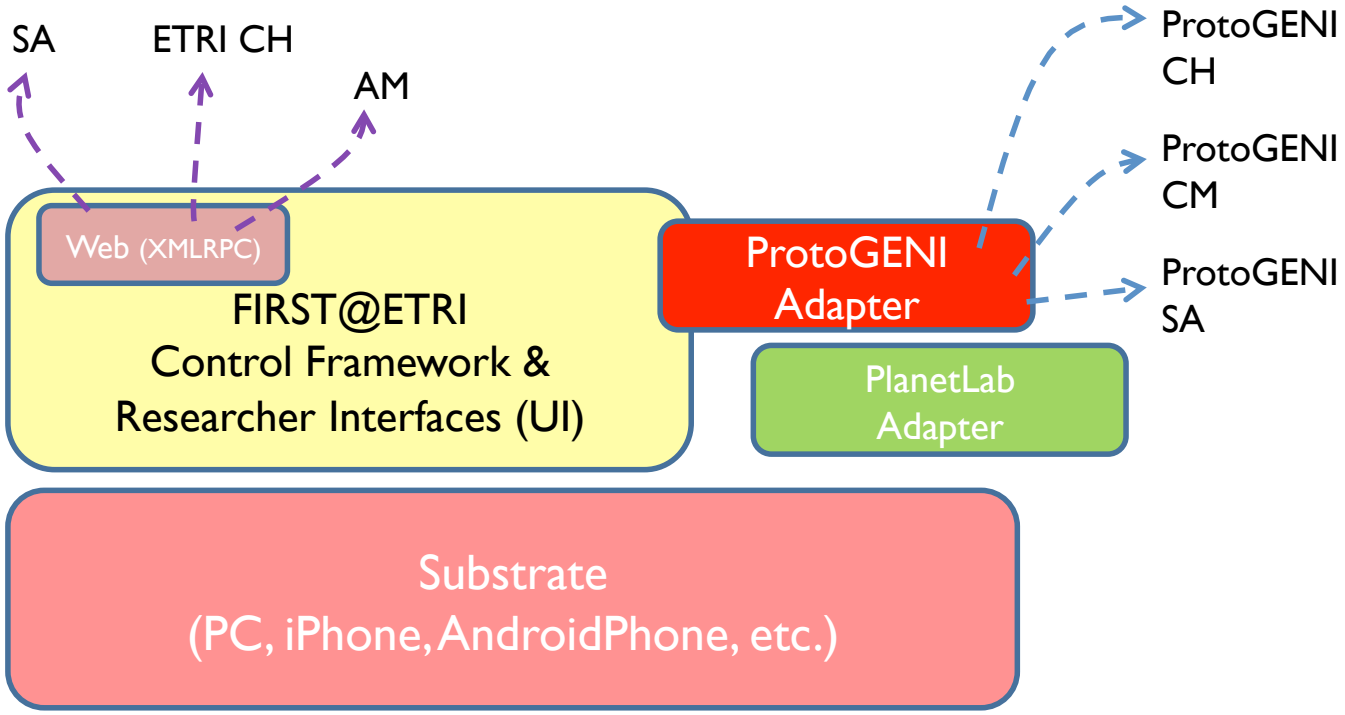
Aggregate Manager



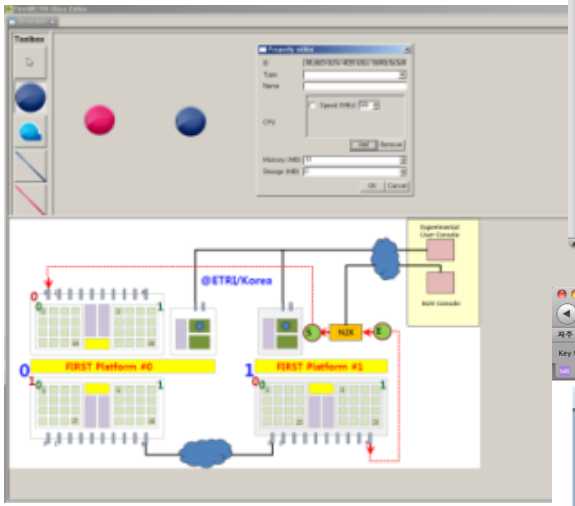
NetFPGA/PC Node (CM/NM)



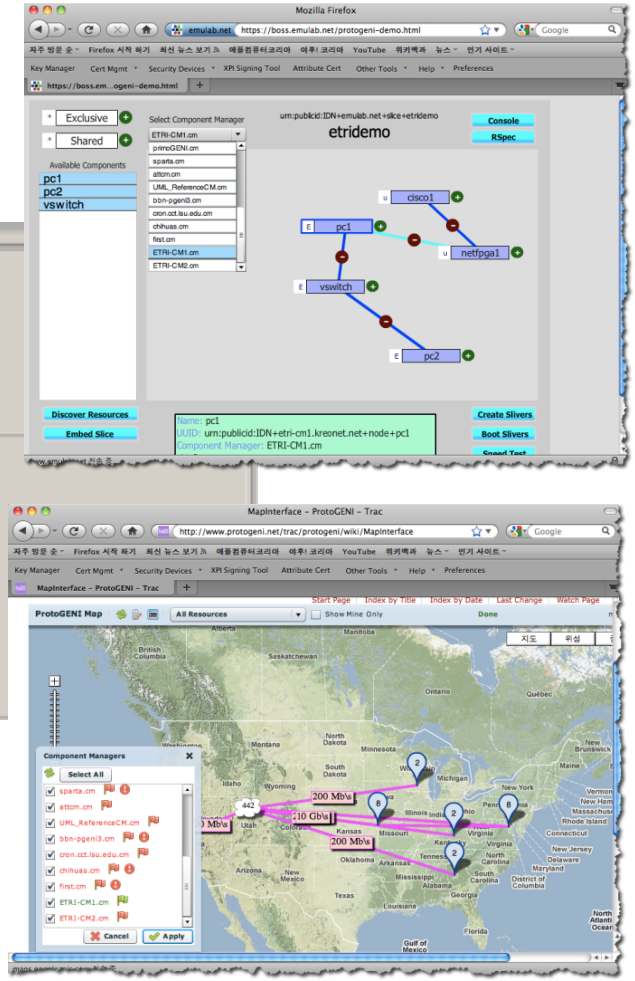
Researcher/UI



Graphical Interfaces for Researcher



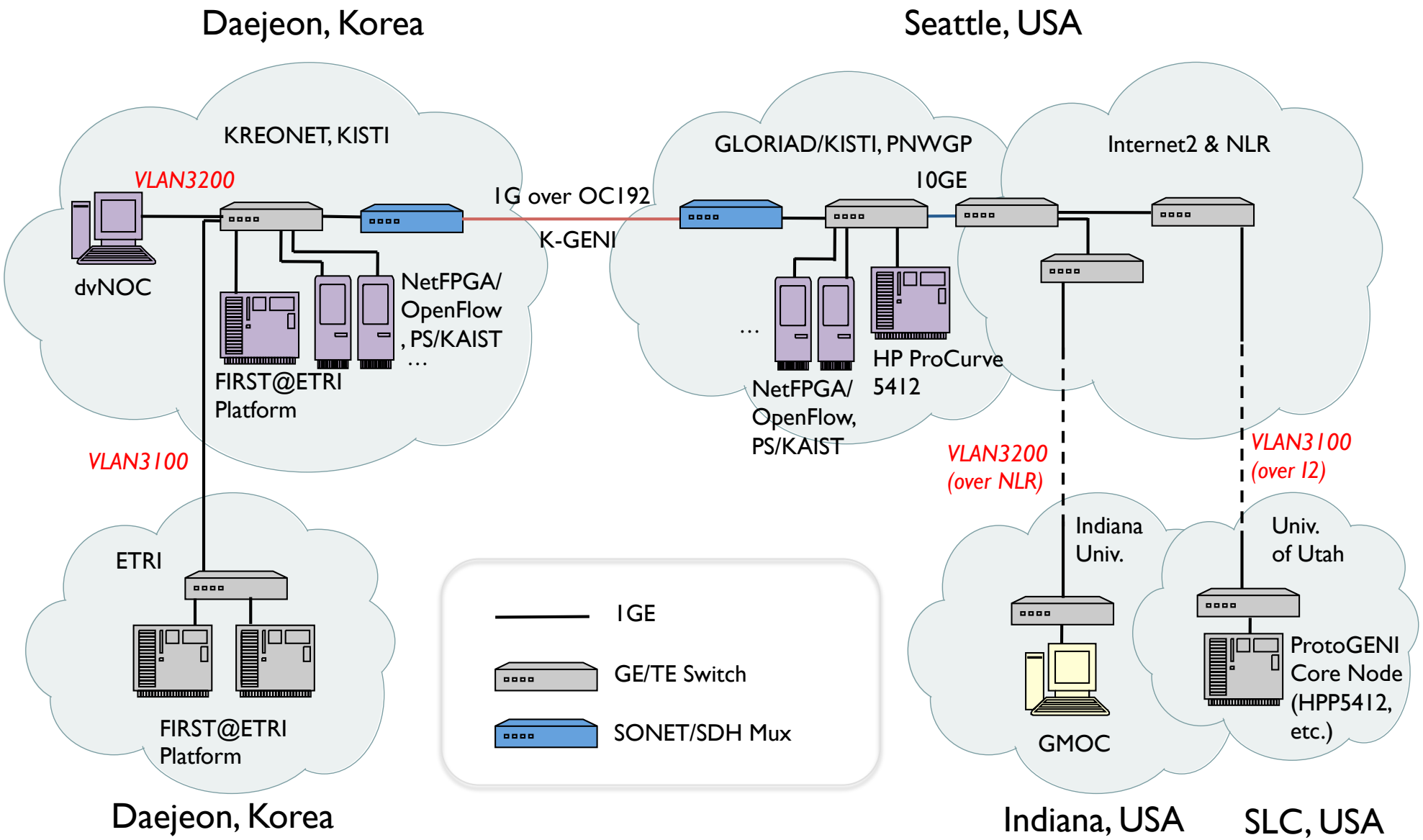
ETRI Java Interface



ProtoGENI Interface

iPhone /Android Interface

Korea – GENI Interconnection and Trial



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Next Step and Plan

- Complete this ProtoGENI Adapter by this fall or winter, hopefully
  - NetFPGA CM/NM (Xen)
- Trial on GEC9
  - Dynamic end-to-end slice operation
  - Run real experiments
- iPhone/Android Interface (GEC10)
  - Using mobile researcher location information
    - Augmented Reality