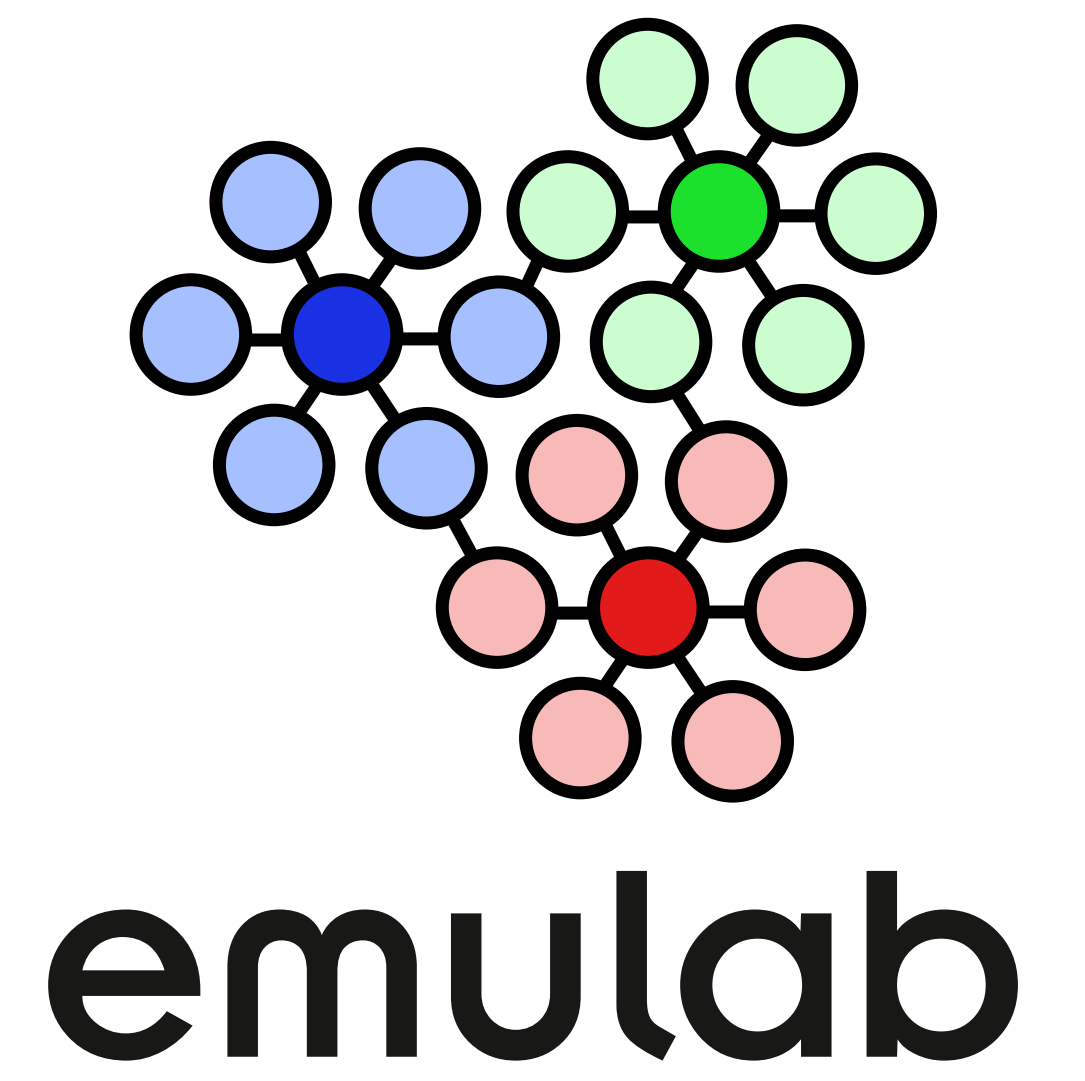




# ProtoGENI

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## Emulab

Testbed management software

- In development for 8 years
- Hundreds of thousands of LOC

Now runs

- Two dozen testbeds
- Hundreds of projects
- Thousands of experimenters
- Tens of thousands of experiments

Supports a variety of environments:

- Configurable clusters
- Wireless (802.11, sensors, SDR)
- Wide-area distributed nodes
- VLANs
- Tunnels
- Network Processors / NetFPGAs
- Sliced PCs

## ProtoGENI

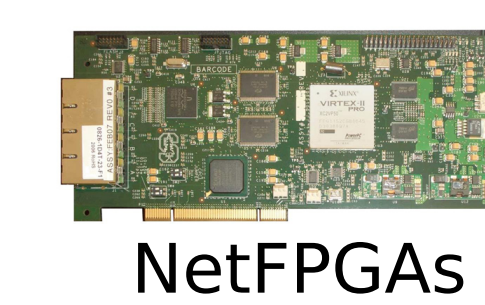
Consists of:

- Control Framework
- National Backbone
- Diverse collection of components
- Integrated projects

Control framework software:

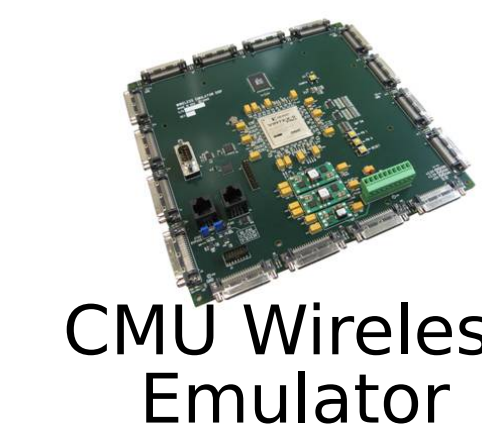
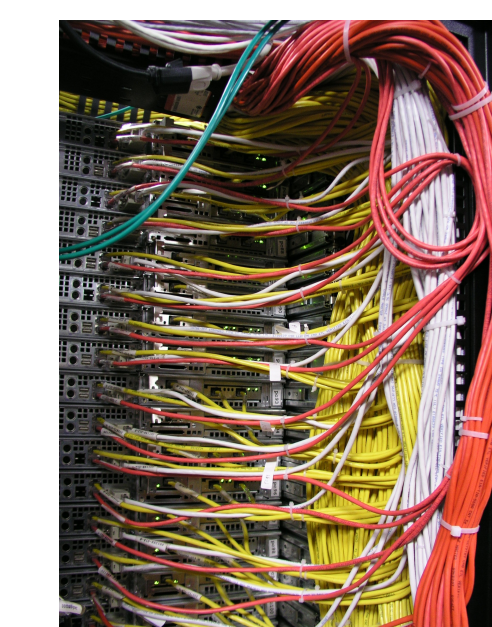
- Clearinghouse
- Security Model
- Aggregate Component Managers
- Operations and Management
- Data Structures and Wire Formats
- Based on Emulab
- Significant portions from PlanetLab and VINI

## Components

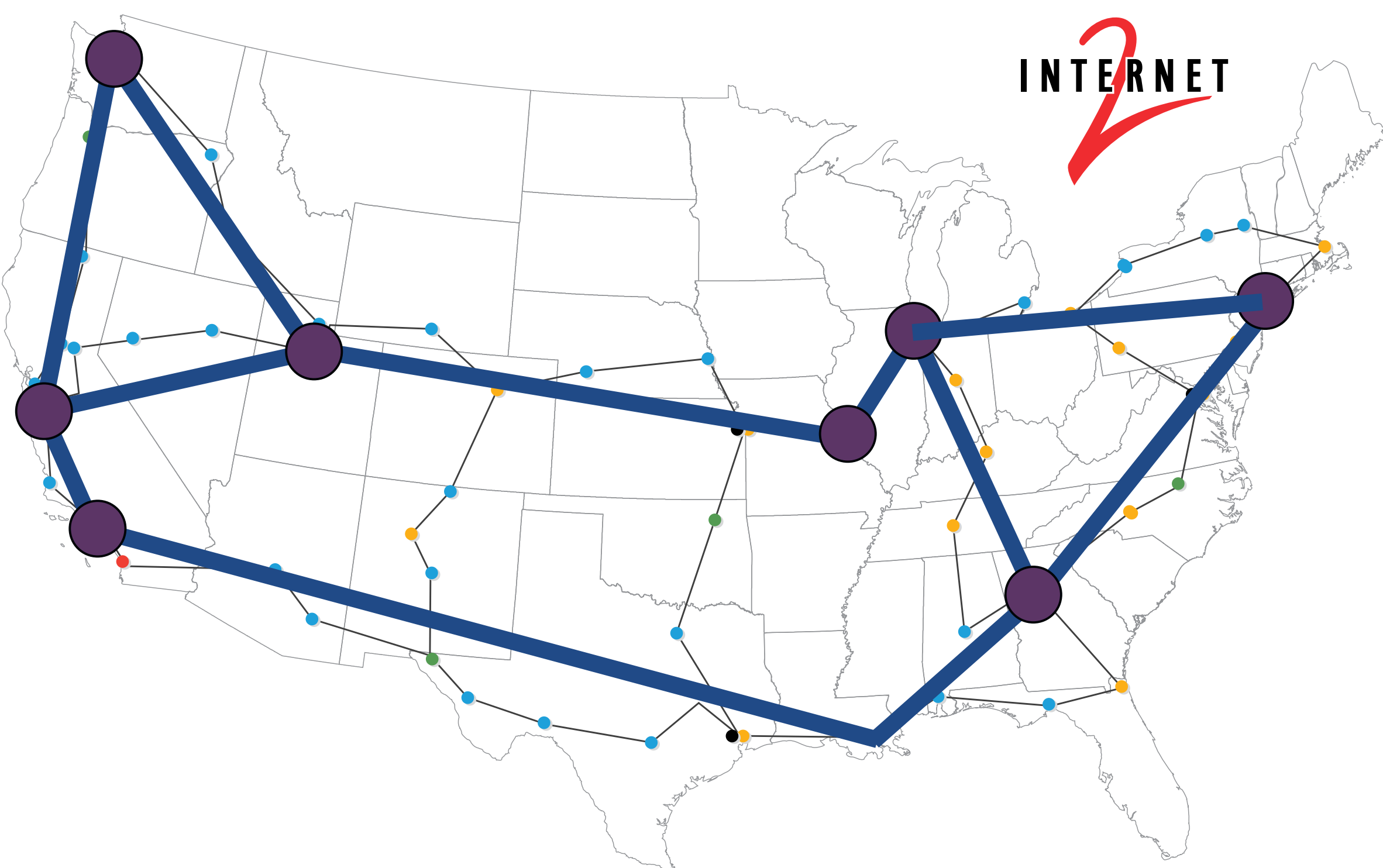


Residential Broadband

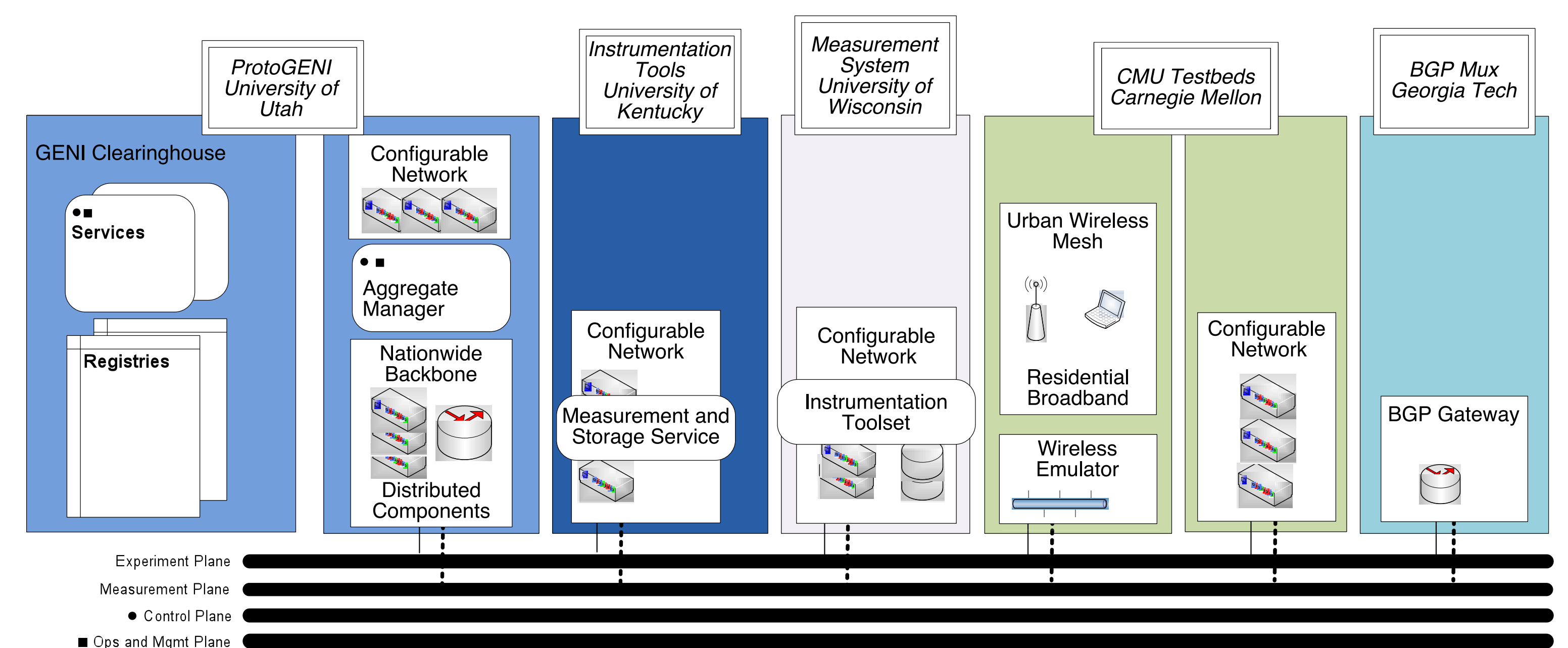
Urban Wireless Mesh



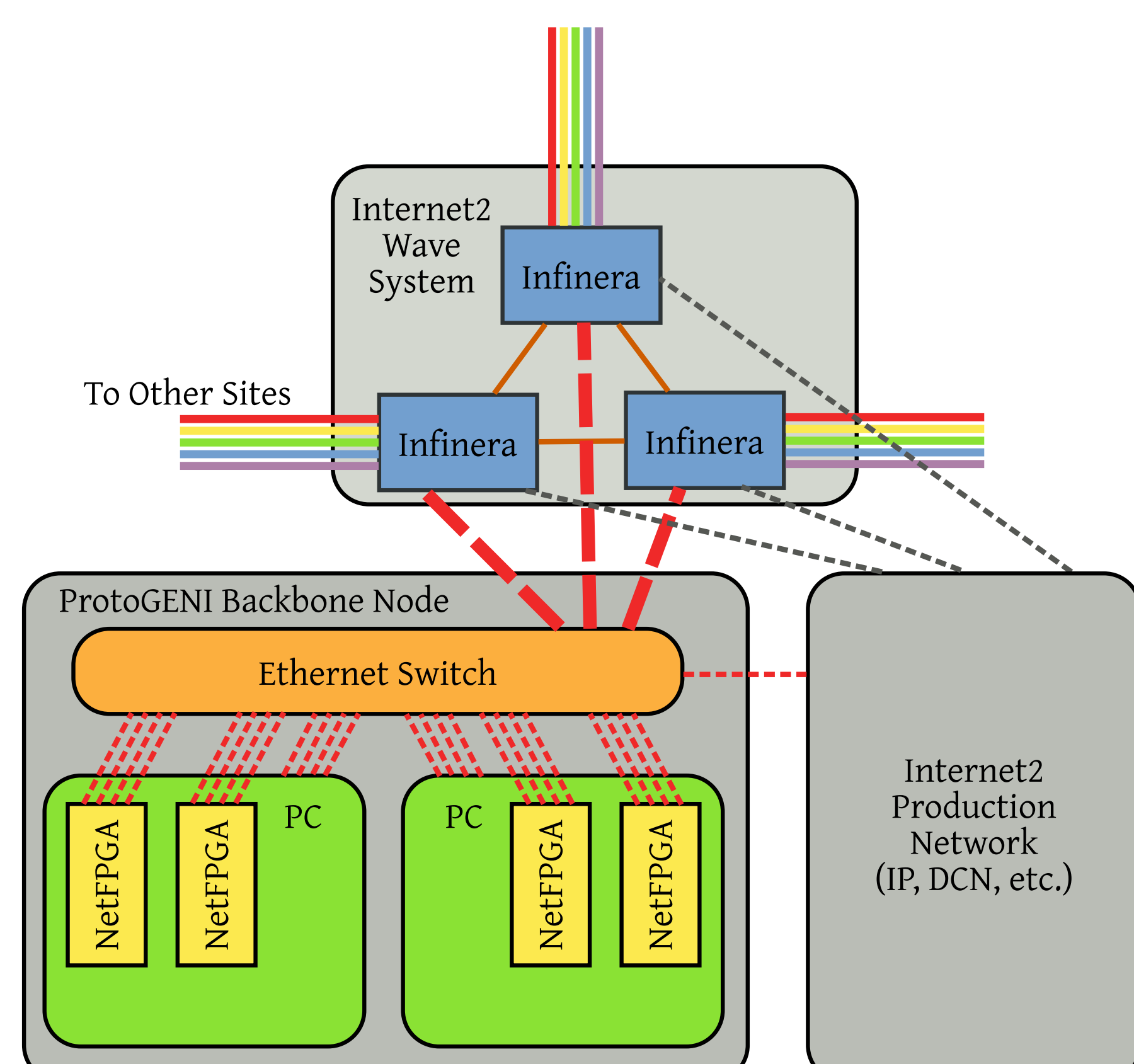
## National Backbone



## Integrated Projects



## Backbone Nodes



## ProtoGENI Progress

Simple but functional prototype up and running today

- One clearinghouse with registries and Slice Authority
- Creates slices and slivers
- Multiple aggregate managers
- Simple RSpec and tickets, including links between components
- Basic certificates for authentication
- Software released

Component and link support:

- Exclusive-access nodes
- Sliced PCs via vservers
- PlanetLab slivers
- VLANs
- IP-in-IP tunnels
- Component types listed above

Deployment tasks:

- Start deploying backbone nodes
- Bring in aggregate managers from other sites
- More edge nodes

Software tasks:

- Flesh out security model (GIDs, etc.)
- Hierarchical authentication
- More formalized O&M interfaces
- Improve robustness
- Revocation
- Slice embedding service (progress already)
- Accountability / logging
- Improved slice updating
- Integrate VINI support