GENI Network Stitching Engineering Meeting

Leads: Tom Lehman, Aaron Helsinger

July 27, 2011

www.geni.net

Agenda

- Introduction – Aaron Helsinger
- Stitching Architecture – Tom Lehman
- Stitching Schema and Workflows – Tom Lehman
- Demonstration
- Discuss Schema
- Stitching APIs – Tom Lehman
- Discussion – All
- Summary & Wrap Up – Aaron Helsinger

GENI Network Stitching: Introduction

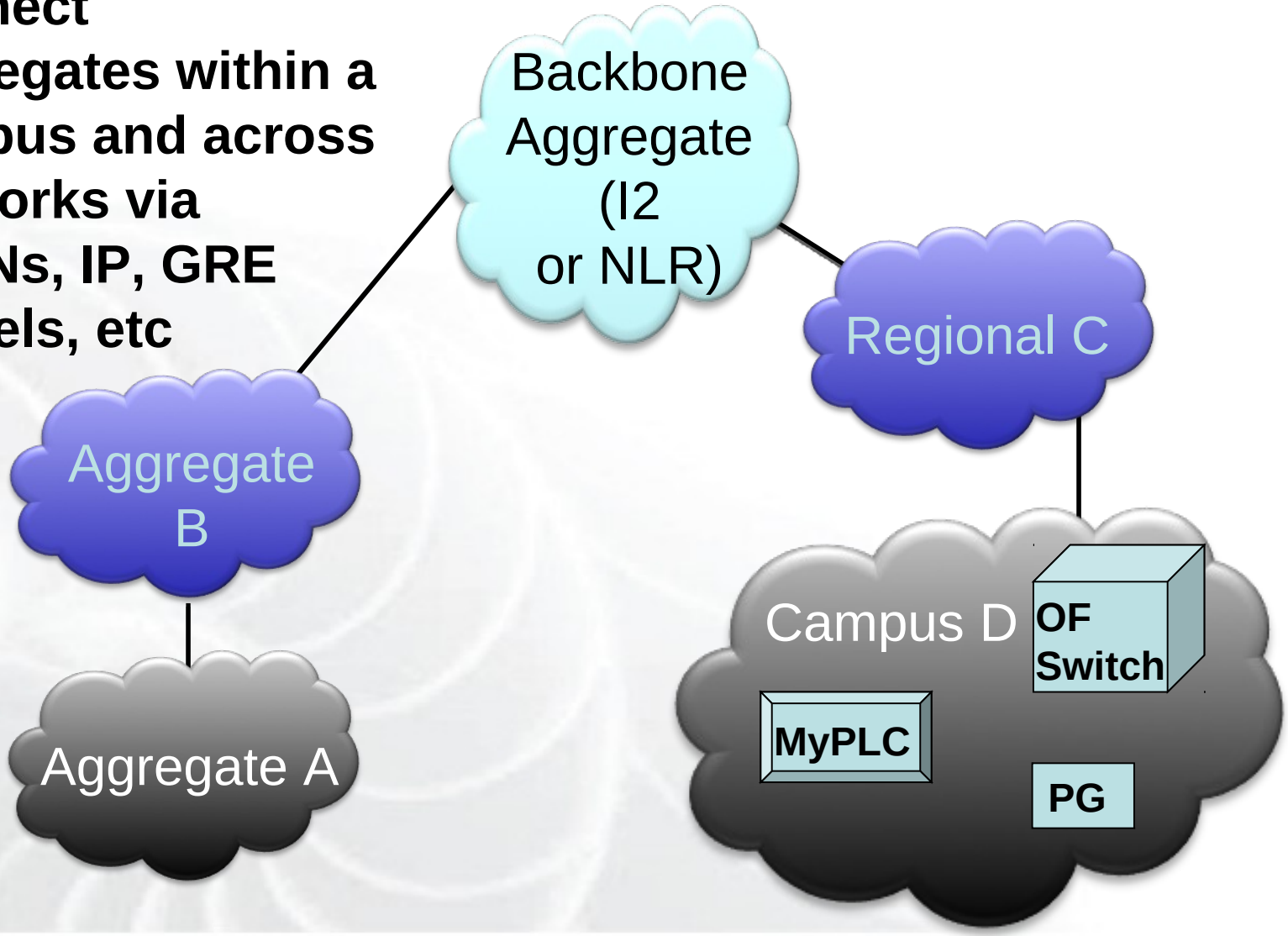
Aaron Helsinger – ahelsing@bbn.com

July 27, 2011

www.geni.net

What is Stitching?

Connect aggregates within a campus and across networks via VLANs, IP, GRE tunnels, etc



Stitching: Scope

- Campus track addressing physical connectivity
- Others addressing programming switches
- OSCARS, DYNES, etc have paved the way for dynamic optical circuits
  - We will aim for compatibility
- Our goal: GENI APIs and data formats for advertising, requesting and reserving circuits across GENI

Stitching Status

- Current GENI cross-aggregate stitching is manual
- At GEC10 GENI adopted an architecture inspired by and compatible with others in the industry
  - http://geni.maxgigapop.net/twiki/bin/view/GENI/NetworkSti
- Schema: works at ProtoGENI (demo today), ready for adoption
- API: Need to discuss today

The GEC10 Proposal

- Common GENI Stitching architecture
  - Influenced and shaped by Orca, OpenFlow and ProtoGENI
- Scope of effort
  - Finding network paths in GENI
  - Reserving network stitching resources
  - Stitching with VLANs (because it is a difficult and common case)
    - Tunnels, OpenFlow may follow
- Starts from existing work
  - Supports the way CFs & networks do business already
  - Leverages the experience of the broader community
  - Satisfies the 90% case, while leaving room to add support for harder cases

The GEC10 Agreement

- Architecture as in the Overview document
  - Use a common schema
  - Several key functions
  - Use a common API
- Details to work out
  - Draft schema proposed for discussion
  - Common Stitching API
  - Actively discuss via email and phone between GECs

Discuss today!

Selected GEC10 Discussion Points

- Not all functions are mandatory
  - Don't make use of all functions mandatory.
  - Functions are not necessarily new architectural boxes
  - Tom suggested some functions could have an implementation which exists as a central GENI service (eg Topology Service), available to all for use as desired. Although use would not be required.
- The architecture should not force CFs to redo work they've already done
- Support both chain and tree workflows
  - Can they work together? Is 1 a subset of the other, modulo security?
- Negotiation and VLAN translation
  - Without translation we need negotiation
  - How much direct negotiation between aggregates is required? This adds complexity, but without VLAN translation may be necessary.
  - How prevalent should we expect translation to be? do we optimize for it?

Agenda

- Introduction – Aaron Helsinger
- Stitching Architecture – Tom Lehman
- Stitching Schema and Workflows – Tom Lehman
- Demonstration
- Discuss Schema
- Stitching APIs – Tom Lehman
- Discussion – All
- Summary & Wrap Up – Aaron Helsinger