ROUTED SERVICES FUTURES GROUP REPORT

PRESENTERS:
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NEXT GENERATION INFRASTRUCTURE

2018 TechEX
Orlando, FL
• Background on Routed Services Futures group
• Recommendations from Routed Services Futures group
Background on Routed Services Futures Group
Routed Services Futures Group

- Formed from discussion at January 2018 Tempe Connector/Network Member Principals Meeting
- Recognition of changing Layer 3 needs of the community
- Recommended that Internet2 Routed Services be revisited since last time was 2013-14
Charter for Routed Services Futures Group

As Internet2 plans the Next Generation Infrastructure, Layer 3 routed services are critical to the planning. The Routed Services Futures Group was asked to review data and create a framework for the future routed services, envisioning how to meet the routed services needs of the community for the next three to five years. The group focused on support for:

- Classic R&E
- Peering
- Cloud
- Research
Meetings for Routed Services Futures Group

• 3 Calls
  – July
  – August
  – September
• Face-to-face Meeting in October
Members of Routed Services Futures Group

- Jeff Bartig, Internet2
- James Deaton, GPN
- Andrew Gallo, George Washington University, CAAREN
- Chris Griffin, FLR
- Jonah Keough, PNWGP
- Ryan Kocsondy, CEN
- Dave Lois, WiscNet
- Linda Roos, Internet2
- Paul Schopis, OARnet
- Scott Taylor, Internet2
- Rob Vietzke, Internet2
- Chris Wilkinson, Internet2
Recommendations from Routed Services Futures Group
Recommendations Routed Services Futures Group

• Overarching goals
  – Uniform availability of services across the community
  – Seek opportunities to share people as well as technology
  – Decisions aren’t just technical; there are policy/economic/(political optics) that could enhance and/or complicate the technology choices
Recommendations Routed Services Futures Group

• Specific recommendations on:
  – Routing Table Configuration
  – Cloud
  – Automation
  – Security
  – Performance
  – Other Community Collaborations
Routing Table Configuration

• Group desires simplification of the routing table with both policy and technical considerations
• Realign the two Internet2 AS along the following guidelines:
  – New Cloud Exchange, combining existing Content/Cloud/NET+ Providers and TR-CPS
    Continue to use BGP community strings to tag NET+ providers
  – Existing Campus-to-Campus/Community Anchor Institution/International R&E Network
    (removing NET+)
• Routed Services Network should also be architected to support a variety of specialized layer two and layer three services, with a specific focus on:
  – Cloud Connect Private/Dedicated Services
  – Ad Hoc such as XSEDEnet, LHCONE, transport to full transit providers, etc.
  – Secure Science Network--may be a subset of today’s R&E network
Cloud

• Group recognized the competitive market emerging for cloud connect services
• Regionals and Internet2 have a superior service for our campuses that leverages their existing investments
• Focus on
  – community-wide branding/messaging/communications
  – self-service/deterministic capabilities for end users (portals)
Automation

• Focus on improved automation and orchestration with the goal of accelerating service provisioning, removing barriers to infrastructure sharing and reducing community costs
• Internet2 should investigate open-source tools allowing implementation of self-service network automation and providing a platform that regionals can adopt and extend
• Existing inter-domain networking tools to support end-to-end VLAN provisioning and automation should be explored by the community (NTAC), including NSI, MVPN, EVPN and pre-provisioning of VLAN blocks
Security

• R&E community should be at the forefront of driving improvements in the security of the global Internet infrastructure including
  – identifying routing best practices including MANRS
  – listing/promoting regionals and campuses that have adopted these

• Community should lead an effort to bootstrap implementation of a routing security strategy including
  – Using Internet Routing Registries (IRRs)
  – Investigating future RPKI
  – Adopting strategies to validate routes we accept (other NREN routes, commercial and R&E)
  – Ensuring that participant routes that we offer to each other are valid
Performance

- Internet2 infrastructure is architected to provide high performance non-blocking network paths
- Community doesn’t drop packets so need for QoS is only in places where bandwidth can’t be readily augmented
- Use link augmentation where possible
- Community should build measurement infrastructure that allows it to validate QoS decision
- Community should be strongly encouraged to participate in BGP data collection projects with a goal of providing a community-wide database of the best-paths between members of the community
  - Example: CAIDA's BGPStream BMP collector
Other Community Collaborations

- A community approach to hosting CDN’s should be considered, where national-scale acquisition of CDN/Caching via Internet2 could be delivered through partnerships with regionals.
- Establish a best practice for QnQ tunnels or blocks of VLANs from the OESS edge to the campus border speeding time to production/provision.
- Seek education and workshop opportunities to share these.
Questions? Comments?