IRS Obvious Questions

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How big is the community working on IRS?
What about my Use Case?
What about my favorite Encoding?
What about NetConf/Yang?
How big is the IRS community?

• 408 members on list

**Operators:** comcast, ATT, Verizon, Level3, orange/FT, FT, btconnect, telecom italia,

**Vendors:** NEC, Cisco, Juniper, Ericsson, Hitachi, Cariden, Avaya, Cienna, Huawei, Intel, VCE, tekelec, ALU, ZTE, CA, Tellabs, Broadcom, Fujitsu, NSN, Infinera, tail-f, Extreme networks, Microsoft, vmware, rad

**Non-Vendor/Academic/R&D:**
ACM.org, ripe.org, nlnetlabs, cablelabs, Zigsu China, neclabs, buh.org, indiana.edu, jacobs-university, MIT, mesh japan, univie.ac.at, kddilabs, bell-labs, ieee, Yale University
Use Cases

• The number of use cases being written up is greater than one, the counting will not stop at one and there is no limit
• The evaluation of Use Cases is to be considered examples not canonical designs
• They are to make sure we have reasonable targets not the only targets for the technology
• If you think your use is critical then please write a draft
My encoding is the prettiest

• No it isn’t
• None are perfect today
• First we start with the data model and then the encoding

• In the charter == required analysis
IRS and NetConf/Yang
Recap: IRS and Programmability

- IRS is a mechanism to learn state from the network and program state into the network
- Network programmability translates to programming individual devices
- A protocol framework is required to access, learn state from and program state into individual devices
IRS Concerns

• Transport Protocol
• Client Identity
• State Ownership & Management
• Message Encoding
• Message Exchange Patterns a.k.a. Session Protocol
• API Mechanics
• Service Definition and Data Models
• Network Representation and Characterization
• Performance and Scale
• High Availability
• Application Consumption Model
• Operational Requirements
• Security
Role of Netconf/Yang

Netconf and Yang are candidates for the session protocol and data modeling language respectively, but.... we should address gaps between IRS’s requirements and current state of Netconf/Yang
Advantages of Netconf/Yang for IRS

• Single model and protocol for both configuration and operational state manipulation
• Yang—satisfies IRS’s modeling needs for the most part
• Netconf – satisfies IRS’s session protocol needs for the most part
• Yang is modular and extensible
• Active IETF community involved in evolving Yang, Netconf and creating models (netmod)
• Vendor implementations on the rise
IRS – Netconf/Yang Gaps

• Operational State semantics – non-global with the ability to get, set, get-bulk and set-bulk
• State Persistence modes
• State ownership tied to client Identity
• Stronger HA semantics
• Pluggable on-the-wire encoding
• Topology modeling tools
• Multi-client state arbitration
Netconf/Yang applicability to IRS

• Current team investigating Netconf/Yang applicability to IRS:
  – Rex Fernando (rex@cisco.com)
  – Martin Bjorklund (mbj@tailf.com)
  – Bruno Rijsman (brijsman@juniper.net)

• Deliverable is an analysis draft on suggested changes to Netconf/Yang to address gaps by next IETF

• Contributions welcome!
Thank You!