Ack

• Thanks for the comments sent, we are planning to incorporate them
  – Wes George
  – John Heasley
  – Nick Hilliard
  – Andrei Robachevsky
What’s our point?

• Catalog past issues influencing the efficacy of Internet Routing Registries (IRR) for inter-domain routing policy specification
  – and application in the global routing system over the past two decades

• Additionally, a discussion of which are *still* problematic in practice
  – Versus which are simply artifacts that are no longer applicable
Outline

• Background
• Accuracy and Integrity of Data Contained within the IRR
• Operation of the IRR Infrastructure
• Historical BGP Protocol Limitations
• Historical Limitations of Routers
Background

• One of the stated goals of IRRs:
  – Section 7 of [RFC1787]: stability and consistency of the Internet-wide routing could significantly benefit if the information about routing requirements ... could be shared across organizational boundaries

• So, we look at what may have led to the current eroded confidence in IRRs and their data

• Note: when many say ``IRR’’ they often conflate RPSL data and the operational IRR systems that serve it
  – These two facets of the IRR ecosystem have different issues
Accuracy and Integrity of Data Contained within the IRR

• Lack of Resource Certification
  – No way for an RP to determine authenticity of RPSL... Still an open issue

• Incentives to Maintain Data within the IRR
  – Not clear when/if data is being maintained (and where, re: above)

• Inability to remove old data
  – There are semantics to identify ownership, but this leaves the risk that removing objects affects reachability

• Lack of authoritative IRR for data
  – Without resource certification, it is hard to know which (of potentially many) versions of data authentic
Operation of the IRR Infrastructure

• Replication ushers in lots of issues:
  – Freshness, authenticity, etc
Historical Limitations

• Incremental updates to prefix filters
  – In the 90’s support was uncommon, but today it is wide

• Storage
  – Used to be small and slow, today it is common to find non-volatile storage on routers that is significantly larger, faster, and with much longer MTBFs

• Updating configs
  – Has historically been rough, vendor dependent: telnet, ssh
  – Today we have efforts like NETCONF on the way (maybe RPKI to RTR)
Adoption?

• Can we make this a wg document and refine?