proto-SDNRG
Introduction

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proto-SDNRG Meeting
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Diverse views as to what “SDN” is

• Separation of control and data planes (or not)

• Control: Centralized, Distributed, Both
  – Proactive vs. Reactive control models

• {Over,Under}lay

• Interfaces to the forwarding plane
  – OpenFlow, Forces, MPLS, DiffServ, conex,…

• Interfaces to the control plane/routing system
  – ALTO, CDNi, XMPP, IRS, ONF Hybrid,…

• Data and Information Models
  – Yang, ….

• Config/Orchestration
  – Netconf, SNMP, OF-Config, OpenStack, Cloudstack, …

• …
And Lots of Open Questions (1)

• Architecture
  – Centralized vs. Distributed, Separation of Control and Data planes, ...
  – Scalability

• APIs
  – OSFN (One Size Fits None)
  – Northbound/southbound
  – Data models, state persistence, state injection/extraction
  – Multi-layer feedback systems (control theoretic implications?)
  – Event based network control
  – “Abstractions”

• Protocols
  – OpenFlow, ForCES, PCE, ...

• Network Programming Languages
  – Holy Grail (e.g., Frenetic, Nettle, Coolaid, ...)
  – Reliable “Network Compilers”
Lots of Open Questions (2)

• Complexity
  – http://www.1-4-5.net/~dmm/an_and_antifragility.pdf
  – We observe that scalable and robust systems are both highly layered and distributed
    • But not everywhere....statefull PCE,
    • What does this tell us about SDN architectures, if anything?
  – Control theoretic considerations (optimal vs. robust control models?)
    • IRS → ? (e.g., new relationships between dynamic (routing) system and off-board agents)
  – Related: Theoretical Foundations

• Optimality vs. Fairness
  – And by which metrics (and who cares)?
  – Multicast Replication Engineering

• Instrumentation and measurement

• Security
  – Effects on provenance, new DoS vectors, privacy, ...

• And what about operational considerations?
  – Simplicity (again), manageability, optimization,...
  – New operational models?
  – NPLs

• ...
With that, let’s get going