Plans to Re-Organize Sub-IP Technologies in the IETF

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Motivation

- IEEE 802 develops standards for LANs and MANs, mainly for the lowest two layers of the OSI Reference Model.
- Recent work items present challenges that seem to extend the problem space of IEEE 802 activity further than before
  - 802.3ae develops interfaces that allow for WAN deployments and SP applications
  - Ethernet in the First Mile (EFM) Study Group extends to the residential applications space
  - 802.17 – Resilient Packet Rings (RPR) targets availability, user separation and QoS capabilities that are new in the 802 space
- The new functional and Operations, Administration, management and Provisioning (OAM&P) requirements challenge the current standards model and seem to hint that 802 activity needs to develop awareness for ‘over-L2’ aspects
- Amazingly (or not) the IETF – traditionally a layer 3 and above standards body agonizes about similar issues coming from the complementary direction
- This presentation is part of an effort to enable communication and try to learn from each other group concerns and model of dealing with the problems

Above and below

- traditionally the IETF has been:
  - “above the wire and below the application”
  - not (often) defining user interfaces
  - not defining physical wire types
- while doing “IP over foo”
  - “foo” has been types of networks
  - Ethernet, Token Ring, ATM, SONET/SDH, ...
  - but foo has been changing

IP over “trails”, “circuits”, “paths”, …

- what looks like wires to IP may not be physical wires
  - may instead be something where paths can be configured
  - where a path looks like a wire to IP
    - e.g. ATM VCs
  - might also be routed datagrams another layer down
    - e.g. IPsec tunnels
- and then there is MPLS
  - a progressively more important “foo”

Layer Violations

- there is another complexity when the sub-IP technology is configurable
  - e.g. MPLS, ATM, Frame Relay, ...
- how should the sub-IP technology be controlled?
  - what information should be taken into account?
  - question may be “could a new path exist with certain characteristics”
  - not just “can a path exist?”

A New Area

- a systematic approach to sub-IP issues would be nice
  - but exact scope is not clear
- IESG has created a temporary area for sub-IP
  - like what was done for IPng
- to be short lived (1-2 years)
  - 2 current Area Directors have been appointed to run the area

What's In and Out?

- boundaries of IETF work have been blurry
  - the sub-IP area will not help clarify this
- basic concept:
  - the IETF works on IP-related technology
  - if something does not have a relationship to IP networks then the work should be done elsewhere
- but since many networks (e.g. all-optical) carry IP, control of those networks may be IP-related

Non-Objectives

- the IETF is not expanding into standards for physical or virtual circuit technologies
  - no new circuit switch architecture from IETF
  - leave them to others
- but may form Working Groups to help advise other standards organizations on how to make things IP-friendly
  - e.g. iporpr
- need to communicate with other standards organizations on what we are actually doing

Area Objectives

- “Layer 2.5” protocol: MPLS
- protocols that monitor, manage or effect logical circuit technology
  - e.g. IP Over Optical, Traffic Engineering, Common Control and Management Protocols
- protocols that create logical circuits over IP:
  - e.g. Provider Provisioned VPNs
- protocols that interface to forwarding hardware
  - General Switch Management Protocol

IP over X Working Groups

- IP over Optics (ipo)
  - framing methods for IP over optical data plane and control channels
  - identify characteristics of the optical transport network
  - define use of ccamp protocols for optical networks
- IP over Resilient Packet Rings (iporpr)
  - input to the IEEE 802.17 WG to help it formulate its requirements

Label Switching and Virtual Private Networking Working Groups

- Multiprotocol Label Switching (mpls)
  - label switching technology
  - RSVP & CR-LDP signaling to establish LS paths
  - MPLS-specific recovery mechanisms
- Provider Provisioned Virtual Private Networks (ppvpn)
  - detail requirements for ppvpn technologies
  - define the common components and pieces that are needed to build and deploy a PPVPN
  - BGP-VPNs, virtual router VPNs, port-based VPNs
  - security

Control Plane Working Groups

- Common Control and Management Protocols (ccamp)
  - measurement & control planes for ISP core tunnels
  - info collection via. link state or management protocols - e.g. OSPF, IS-IS, SNMP
  - protocol independent metrics to describe sub-IP links
  - signaling mechanisms for path protection
- Internet Traffic Engineering (tewg)
  - principles, techniques, and mechanisms for traffic engineering in the internet
- General Switch Management Protocol (gsmp)
  - label switch configuration control and reporting

Summary

- created temporary area to coordinate IETF sub-IP work
  - area to last a year or two
- big immediate task
  - evaluate, distribute & dispose of hundreds of ID
- will reevaluate experience after London IETF
- most work of the sub-IP WGs should be done by the time the area is closed
- any remaining working groups will be distributed to existing IETF areas
- looking for a name (and acronym) for the area (SIP taken!)

VIPs and URLs

- two current IESG members appointed to be ADs for new area
  - Bert Wijnen (O&M) – bwijnen@lucent.com
  - Scott Bradner (Transport) – sob@harvard.edu
  - will continue current responsibilities
- Working group Charters can be accessed at http://www.ietf.cnri.reston.va.us/html.charters/wg-dir.html#Sub-IP_Area
- General Discussion list
  - subip-area@subip.ietf.org
  - To subscribe: majordomo@subip.ietf.org
  - in body: subscribe subip-area