

## VPRN

Essentials: (1) MP-BGP on PE's; (2) VRPN service; (3) Proto for PE-CE routing

### Agenda

- VPRN configuration & operation – SA Mod 5, slides 55-97
- SA Module 4: OAM & services tools
  - Much of the material on OAM tools have been covered already
  - Overview of Mirror service: like RSPAN but goes across L3 network

### Assignments and Lab work

- Read: NRS-II Ch 20 and SA Module 5 – L3 services
- Post-lab #12: due @ 11:59pm on **Thu Apr 6** for everyone
- Start preparing for SBA on Friday
  - Necessarily includes everything you know about routing protocols, especially OSPF and BGP
  - Really know & understand IPv6 configuration on Nokia equipment
  - LDP, RSVP, and LSPs
  - Direct uses for MPLS: IGP-shortcuts, 6PE, iBGP full-mesh, LDP-o-RSVP
  - Service components:
    - ports pre-configured for SAPs; pre-configured LSPs for SDPs
    - SAPs, and SDPs used in both spoke & mesh mode
    - epipe, VPLS, IES, VPRN
  - Really understand SAPs: what's stripped/added, when, and why
  - Really understand MTU issues and calculations
  - **Lab Exam study guide** is posted on course site with more details

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## OAM Tools

### Customer side:

- ping: can determine path MTU; number of apparent hops
- traceroute: can determine apparent hops
- Both of above may be going through a VPN!

### Provider side:

- ping & traceroute within provider domain
- oam lsp-ping: LDP ("prefix x.x.x.x/32") or RSVP ({lsp-name})
- oam lsp-trace: can determine every P router along path; uni-directional
- oam sdp-ping: tests uni- or bi-directional connectivity; uni-directional
- oam sdp-mtu: convenient tool for testing mtu of SDP
- oam svc-ping: works for all VPN levels (VPWS, VPLS, VPRN)
  - gives complete info on all service parameters, bi-directionally

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- oam cpe-ping: for VPLS, and depending on SR-OS, for VPWS
  - show service fdb-mac: MAC address table(s) for VPLS service(s)
  - **oam vprn-ping**: ping addresses known within the VPRN VRF
  - **oam vprn-trace**: traceroute anywhere known within the VPRN VRF

Items below this line not listed  
in Module 5 on OAM tools;  
VPRN tools never mentioned in NRS-II !