

Hands-on Workshop on Open vSwitch and Software-defined Networking

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Overview of Virtual Private LAN Service (VPLS)

The Needs for VPLS

- Multiprotocol Label Switching (MPLS) Virtual Private Network (VPN) is an IP-centric service; no other Layer 3 traffic can be carried
- Other services, such as Any Transport over MPLS (AToM) can carry all Layer 3 protocols, but it is point-to-point
- Customer wants to connect his/her Ethernet segments from different sites across an MPLS backbone from a service provider
 - Ethernet over MPLS (EoMPLS) transport Ethernet frames across the MPLS backbone, but it is point-to-point

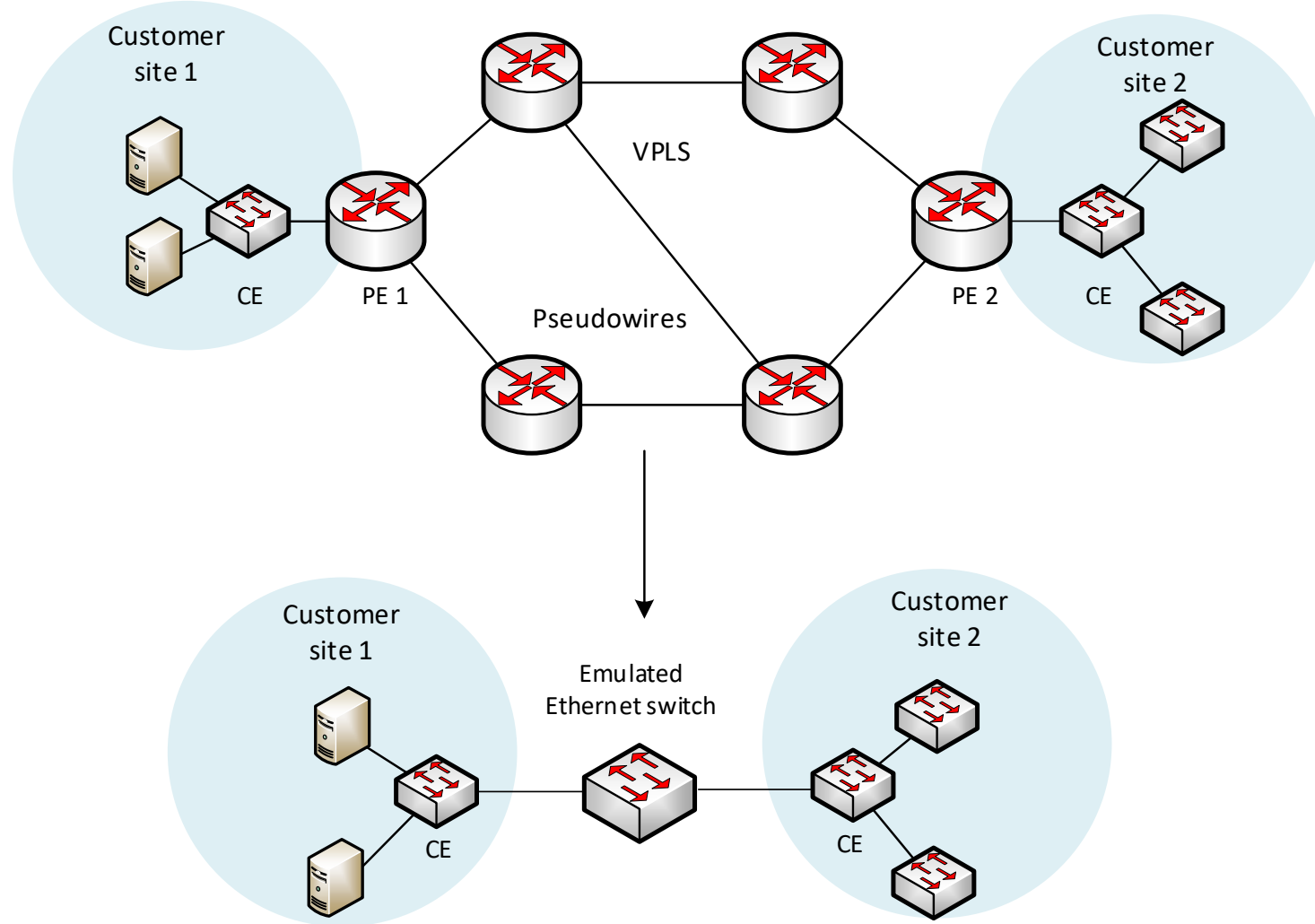
L. De Ghein, "MPLS Fundamentals", Cisco Press, CCIE No. 1897, 2016.

VPLS Architecture

- A VPLS emulates a Local Area Network (LAN) and provides Layer 2 functionalities by acting as an emulated Ethernet switch within a Wide Area Network (WAN)
- An Ethernet switch can:
 - Forward of Ethernet frames
 - Replicate and forward broadcast and multicast frames
 - Forward of unicast frames with an unknown destination MAC address
 - Prevent loops, etc.

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VPLS Architecture



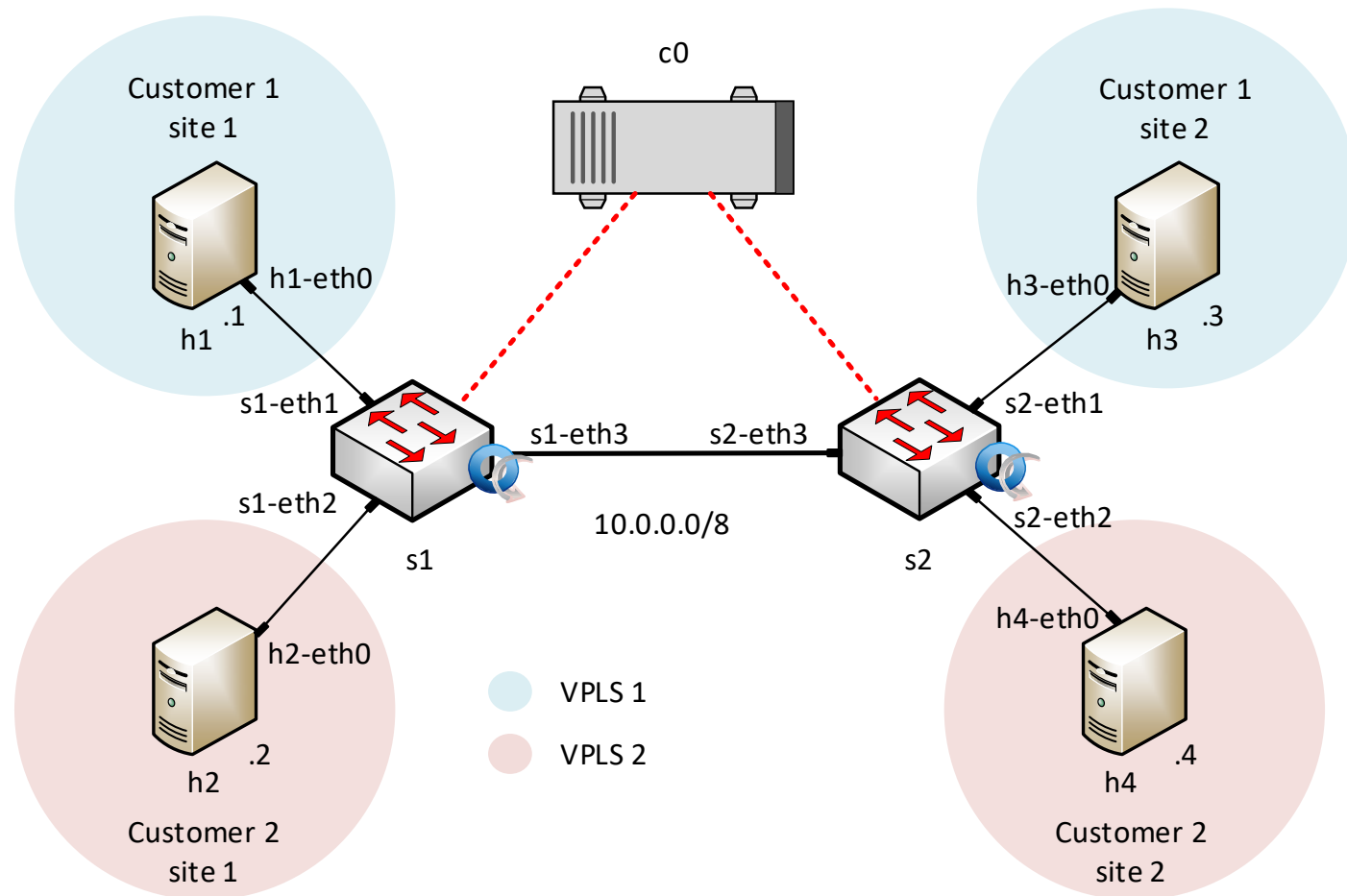
VPLS in SDN

- VPLS is implemented as an ONOS application
- It provides multi-point broadcast Layer 2 circuits between multiple endpoints in an OpenFlow network
- To establish VPLS connectivity between two or more end-hosts, they must fulfill the following conditions:
 - At least one VPLS must be defined
 - At least the interfaces of two end-host must be configured
 - At least two interfaces must be associated with the same VPLS

Lab 9: Configuring Virtual Private LAN Service (VPLS)

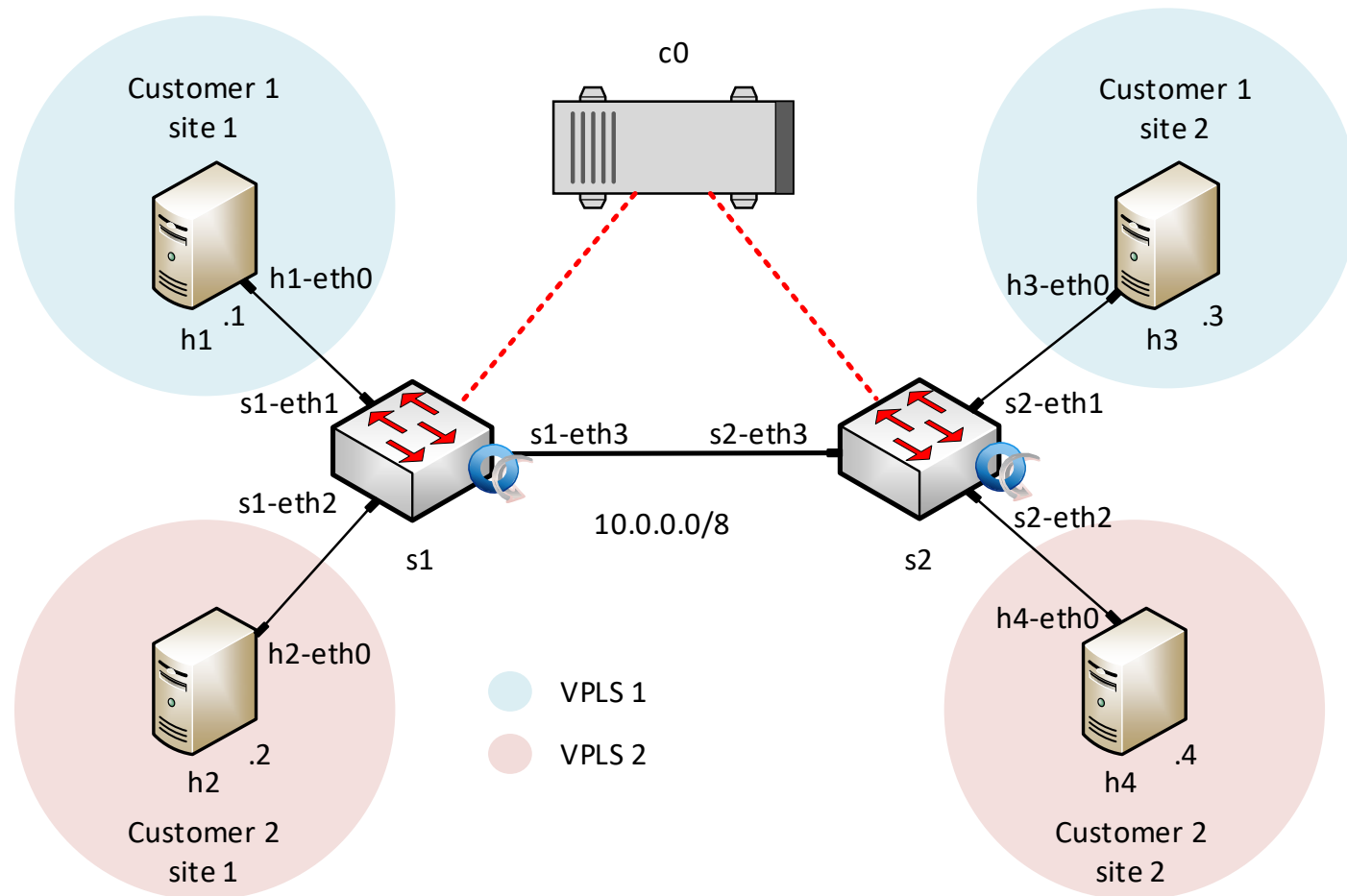
Lab 9: Configuring Virtual Private LAN Service (VPLS)

- Topology consists of four end-hosts, two OpenFlow switches, and a controller



Lab 9: Configuring Virtual Private LAN Service (VPLS)

- Two remote customers have two remote sites



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