L2VPN Interworking

draft-sajassi-l2vpn-interworking-00.txt

Ali Sajassi

Cisco Systems

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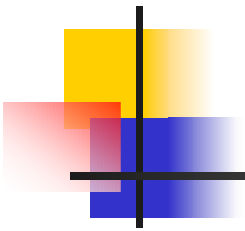
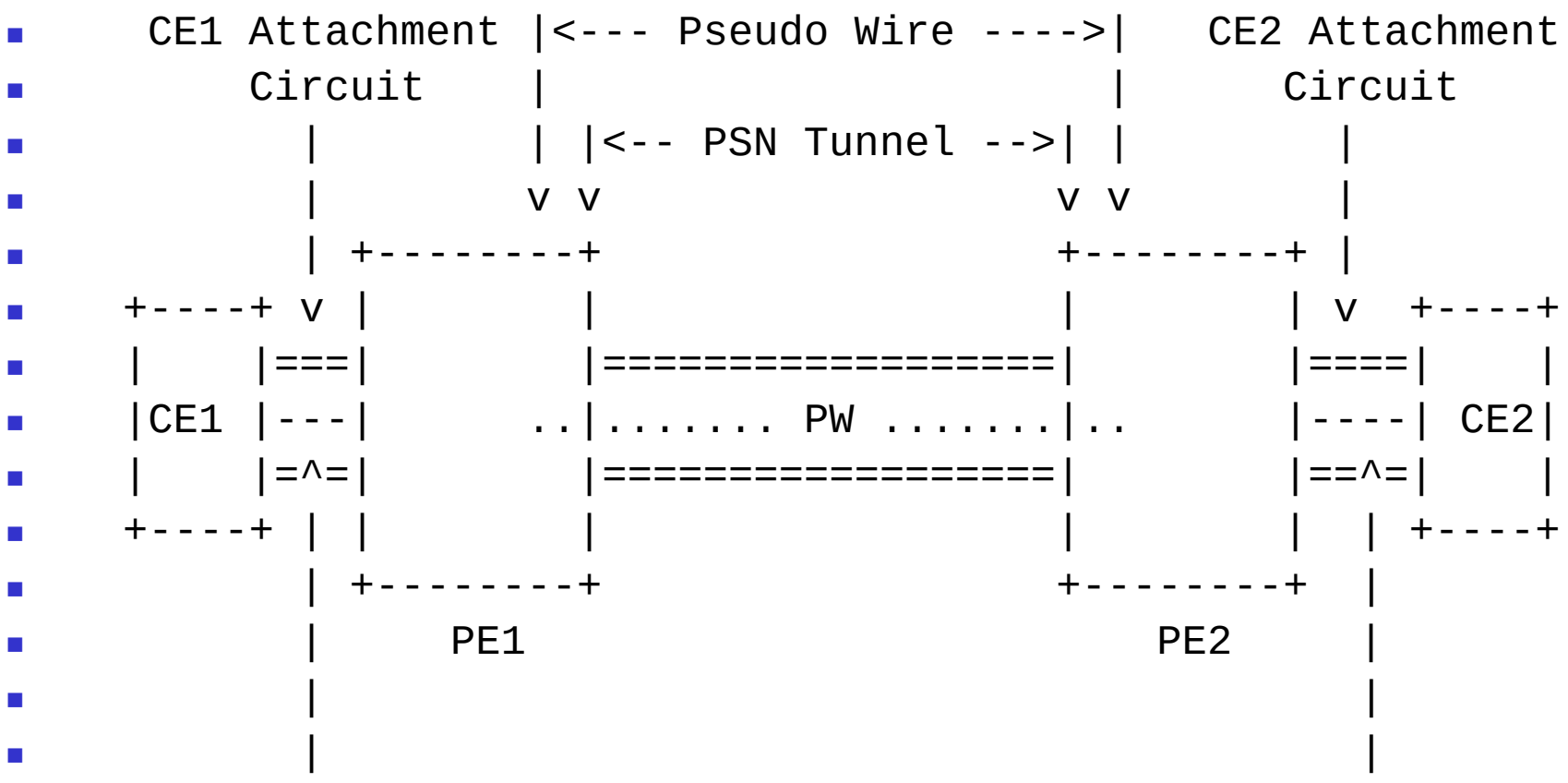


Problem Scope

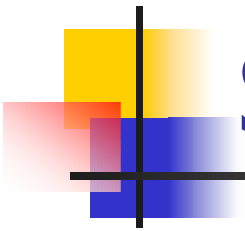
PPVPN L2 Framework:

"If these ACs are of the same technology the PW is said to provide "homogeneous transport"; otherwise it is said to provide "heterogeneous transport". Heterogeneous transport requires that some sort of interworking function be applied."

PWE3 Network Reference Model

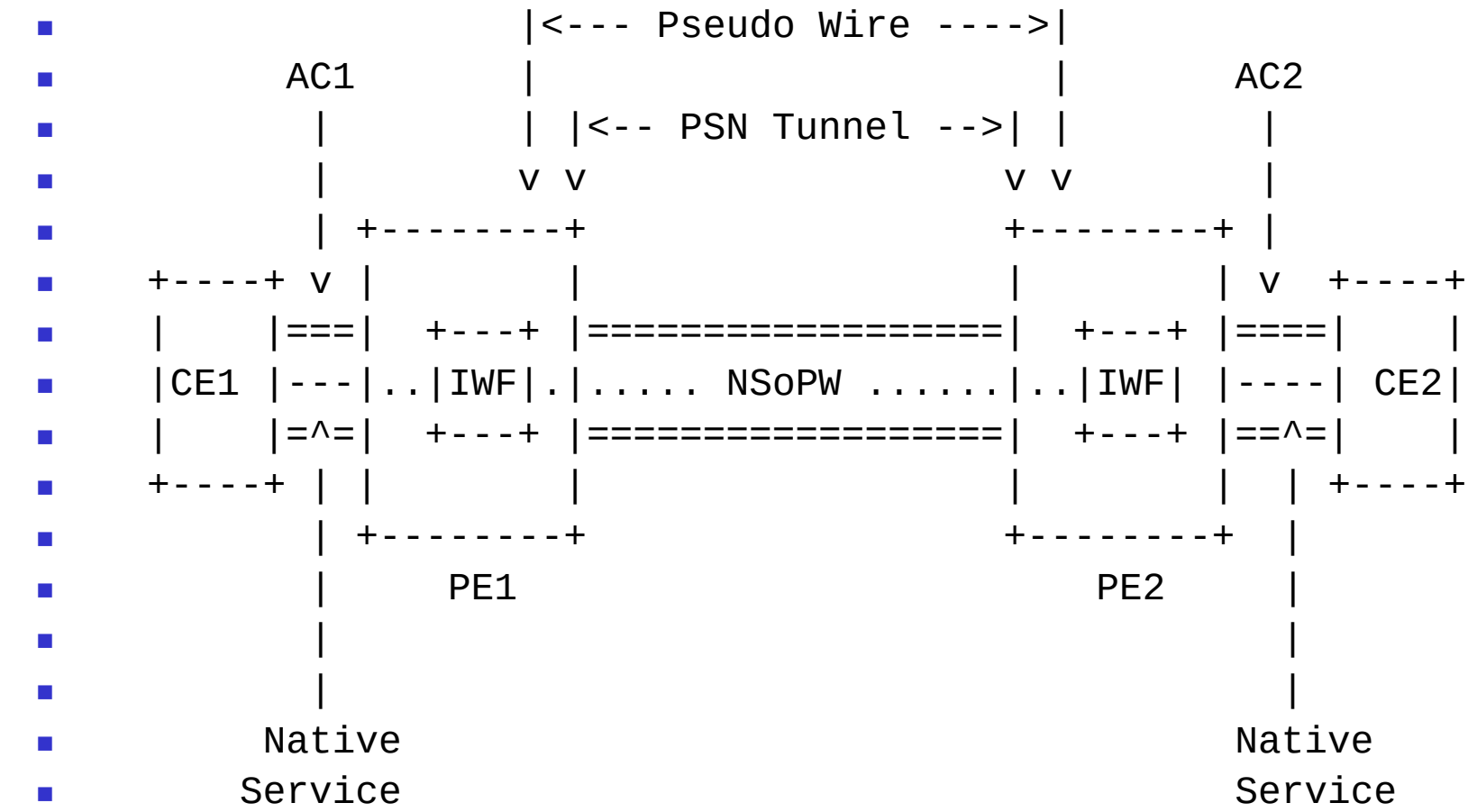


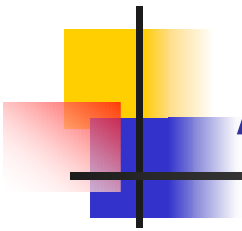
Attachment Circuit v.s. Native Service



- Attachment Circuit (AC) is the VC between a CE and its PE – e.g., ATM or FR AC
- Native Service is the service that gets carried over AC – e.g., Ethernet over ATM or Ethernet over FR
- In some IW scenarios, AC and NS are the same on one side – e.g., Ethernet AC and Ethernet NS
- If ACs are the same on BOTH sides, then no interworking is needed
- It is assumed that NS is the same on both sides for all scenarios

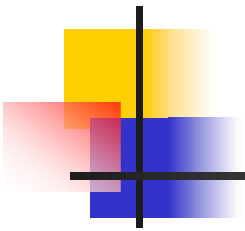
Solution: Local-AC-Termination





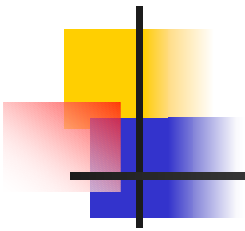
Attachment Circuit Types

1. Ethernet/VLAN
2. ATM
3. FR
4. PPP
5. HDLC



Native Service Types

1. Ethernet
2. IP
3. PPP
4. Multi-protocol

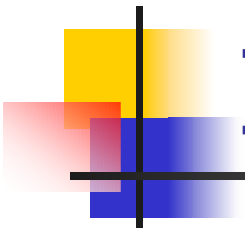


Ethernet Encapsulation

- CEs: need to be configured for Ethernet encapsulation
- PEs: only need to support EoPW and the RFC corresponding to Ethernet over AC
- Two options
  - Configure CE port as bridged interface
  - Configure CE port as routed interface with Ethernet encapsulation

Ethernet Encapsulation - Continue

	AC-1	AC-2	IWF-1	IWF-2
1	Ethernet	ATM	NULL	RFC 2684-B
2	Ethernet	FR	NULL	RFC 2427-B
3	Ethernet	PPP/HDLC	NULL	RFC 2878
4	FR	ATM	RFC 2427-B	RFC 2684-B
5	FR	PPP/HDLC	RFC 2427-B	RFC 2878
6	ATM	PPP/HDLC	RFC 2684-B	RFC 2878

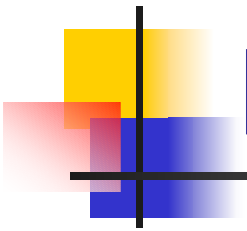


IP Encapsulation

- Supposedly least changes to CE's configuration
- CEs: configuration sometimes needs to be changed (e.g., OSPF routing protocol between ATM-Ethernet)
- PEs: needs to support IPoPW and the RFC corresponding to IP Routed over AC PLUS the need for ARP mediation
- Limited to IP protocol only
- Sometime can simplify ARP mediation to ARP proxy

IP Encapsulation - Continue

	AC-1	AC-2	IWF-1	IWF-2
1	Ethernet	ATM	RFC 894	RFC 2684-R
2	Ethernet	FR	RFC 894	RFC 2427-R
3	Ethernet	PPP/HDLC	RFC 894	RFC 1332
4	FR	ATM	RFC 2427-R	RFC 2684-R
5	FR	PPP/HDLC	RFC 2427-R	RFC 1332
6	ATM	PPP/HDLC	RFC 2684-R	RFC 1332

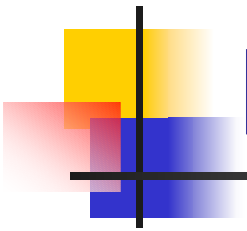


PPP Encapsulation

- CEs: Need to support PPP
- PEs: Need to support PoPW and the RFC corresponding to PPP over AC.

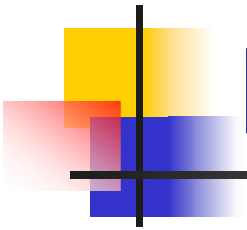
PPP Encapsulation - Continue

	AC-1	AC-2	IWF-1	IWF-2
1	Ethernet	ATM	RFC 2516	RFC 2364
2	Ethernet	FR	RFC 2516	RFC 1973
3	Ethernet	PPP/HDLC	RFC 2516	NULL
4	FR	ATM	RFC 1973	RFC 2364
5	FR	PPP/HDLC	RFC 1973	NULL
6	ATM	PPP/HDLC	RFC 2364	NULL



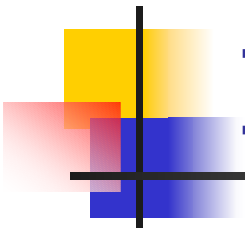
Multi-Protocol Encap

- Needed if multiple protocol need to be transported over the same Attachment Circuit (e.g., CEs want to send both Routed and Bridged packets over an ATM VC at one end and Ethernet connection at the other end)
- Since procedures for L3 protocol has dependency on type of L2 links (e.g., PtP versus Broadcast), can not assume that all routed encapsulation are supported
- Need to support IP+Ethernet at the minimum



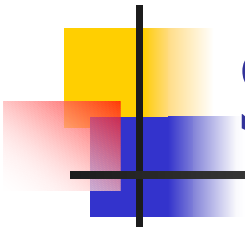
Multi-Protocol Encap

- Need to define a new PW type
  - Identify the payload using two-byte GRE protocol type id
- CEs: Need to be configured for MP operation
- PEs: Need to support MPoPW



Issues

- Need to have two new PW types for
  - IP
  - Multi-Protocol



Summary & Recommendations

- Draft proposes comprehensive interworking solution for heterogeneous transport of L2VPN
- Further discussion