

# PWE3 PW/VCCV User Implementation Survey Results

draft-delregno-pwe3-pw-vccv-impl-survey-results-01

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IETF 80, Prague

# Question 1 – Contact Info

- Name
- Company
- Address
- Address 2
- City/Town
- State
- ZIP
- Country
- Email Address
- Phone Number

Valid Email Address Required

# Question 2 – Encapsulation Implementation

- In your network in general, across all products, please indicate which Pseudowire encapsulations your company has implemented.
  - Ethernet Tagged Mode - RFC 4448
  - Ethernet Raw Mode - RFC 4448
  - SAToP - RFC 4553
  - PPP - RFC 4618
  - HDLC - RFC 4618
  - Frame Relay (Port Mode) - RFC 4619
  - Frame Relay (1:1 Mode) - RFC 4619
  - ATM (N:1 Mode) - RFC 4717
  - ATM (1:1 Mode) - RFC 4717
  - ATM (AAL5 SDU Mode) - RFC 4717
  - ATM (AAL5 PDU Mode) - RFC 4717
  - CEP - RFC 4842
  - CESoPSN - RFC 5086
  - TDMoIP - RFC 5087
  - Fiber Channel (Port Mode) - draft-ietf-pwe3-fc-encap

# Question 3 – Quantities of Encapsulations Deployed

- Approximately how many Pseudowires are deployed of each encapsulation type. Note, this should be the number of pseudowires in service, carrying traffic, or pre-positioned to do so. \*\*\*Note, please indicate "In-Use" for any PW Encap Types which you are using but cannot provide a number.
  - Ethernet Tagged Mode - RFC 4448
  - Ethernet Raw Mode - RFC 4448
  - SAToP - RFC 4553
  - PPP - RFC 4618
  - HDLC - RFC 4618
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  - TDMoIP - RFC 5087
  - Fiber Channel (Port Mode) - draft-ietf-pwe3-fc-encap

# Question 4 – VCCV Control Channel Use

- Please indicate which VCCV Control Channel is used for each encapsulation type. Understanding that users may have different networks with varying implementations, for your network in general, please select all which apply.
  - Ethernet Tagged Mode - RFC 4448
  - Ethernet Raw Mode - RFC 4448
  - SAToP - RFC 4553
  - PPP - RFC 4618
  - HDLC - RFC 4618
  - Frame Relay (Port Mode) - RFC 4619
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  - CEP - RFC 4842
  - CESoPSN - RFC 5086
  - TDMoIP - RFC 5087
  - Fiber Channel (Port Mode) - draft-ietf-pwe3-fc-encap
- CC Choices
  - Control Word (Type 1)
  - Router Alert Label (Type 2)
  - TTL Expiry (Type 3)

# Question 5:

## Connectivity Verification Use

- Please indicate which VCCV Connectivity Verification types are used in your networks for each encapsulation type.
  - Ethernet Tagged Mode - RFC 4448
  - Ethernet Raw Mode - RFC 4448
  - SAToP - RFC 4553
  - PPP - RFC 4618
  - HDLC - RFC 4618
  - Frame Relay (Port Mode) - RFC 4619
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  - CEP - RFC 4842
  - CESoPSN - RFC 5086
  - TDMoIP - RFC 5087
  - Fiber Channel (Port Mode) - draft-ietf-pwe3-fc-encap
- CV Choices
  - ICMP Ping
  - LSP Ping

- Please indicate your network's support of and use of the Control Word for encapsulations for which the control flag

Word is optional.

- Encapsulation Choices
  - Ethernet (Tagged Mode)
  - Ethernet (Raw Mode)
  - PPP
  - HDLC
  - ATM (NR1 Cell Mode)
- Support/Use Options
  - Supported by Network/Equipment
  - Supported by Network/Equipment

# Open Question

interoperability challenges, this survey or any network/vendor details you wish to share.

- Free form answers.

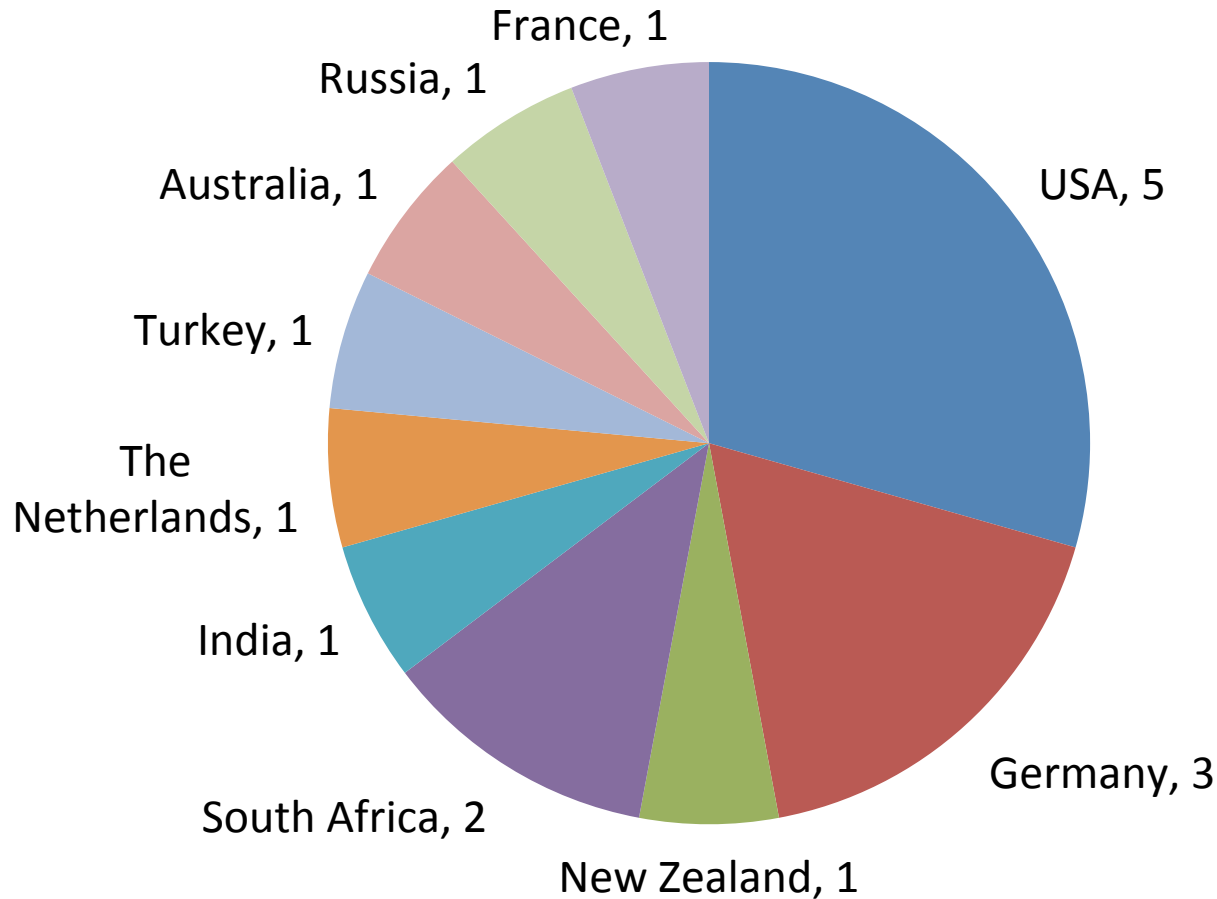
- Free form answers.



# Results

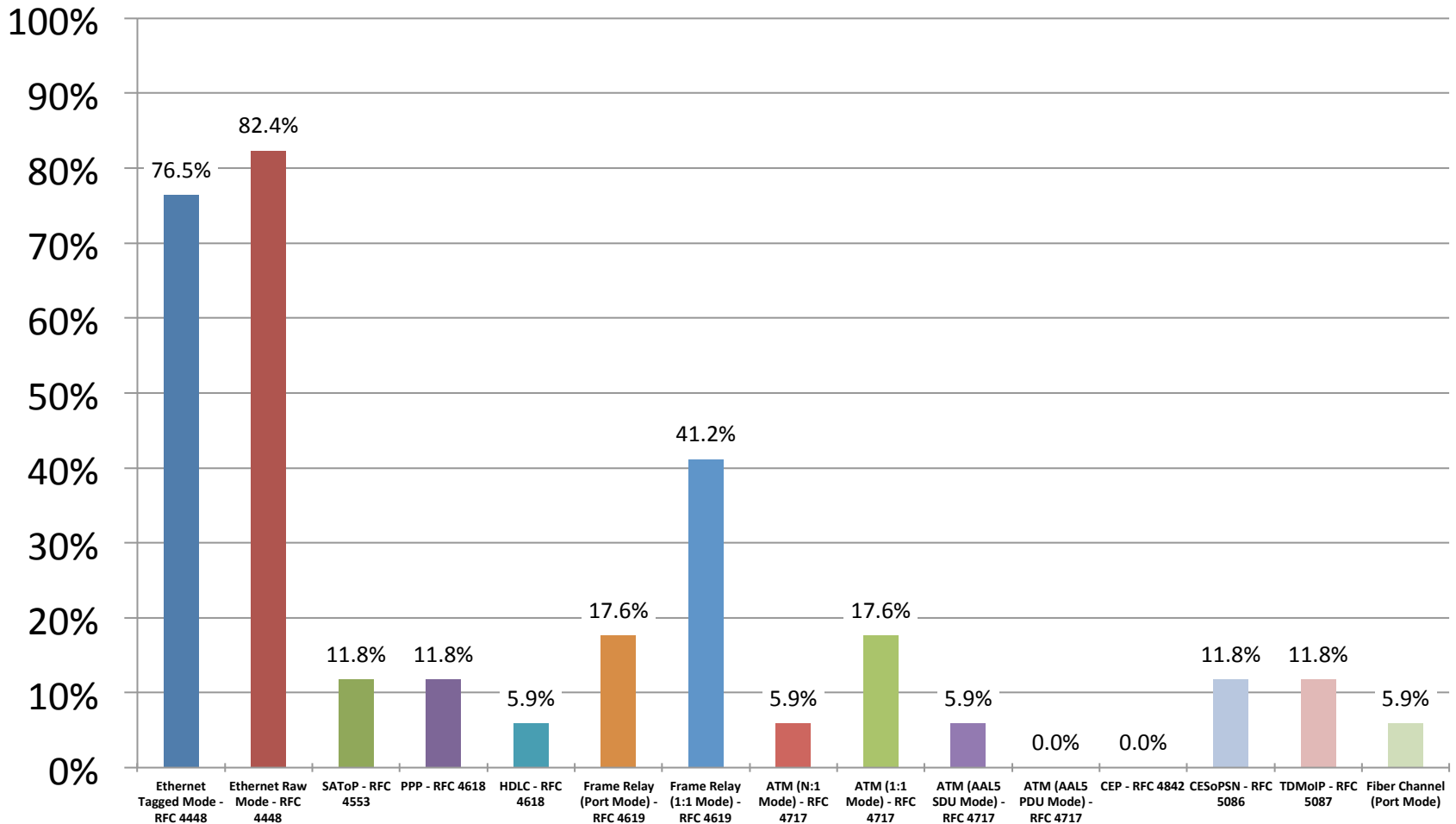
- 17 Participants
  - 17 Participants
    - Time Warner Cable
    - Bright House Networks
    - AboveNet
  
    - Telecom New Zealand
    - Cox Communications
    - MTN South Africa
    - Wipro Technologies
    - Verizon
    - Sprint Online
  
    - Deutsche Telekom AG
    - Easymet Solution  
Global Services
    - CenturyLink

# Respondent Diversity



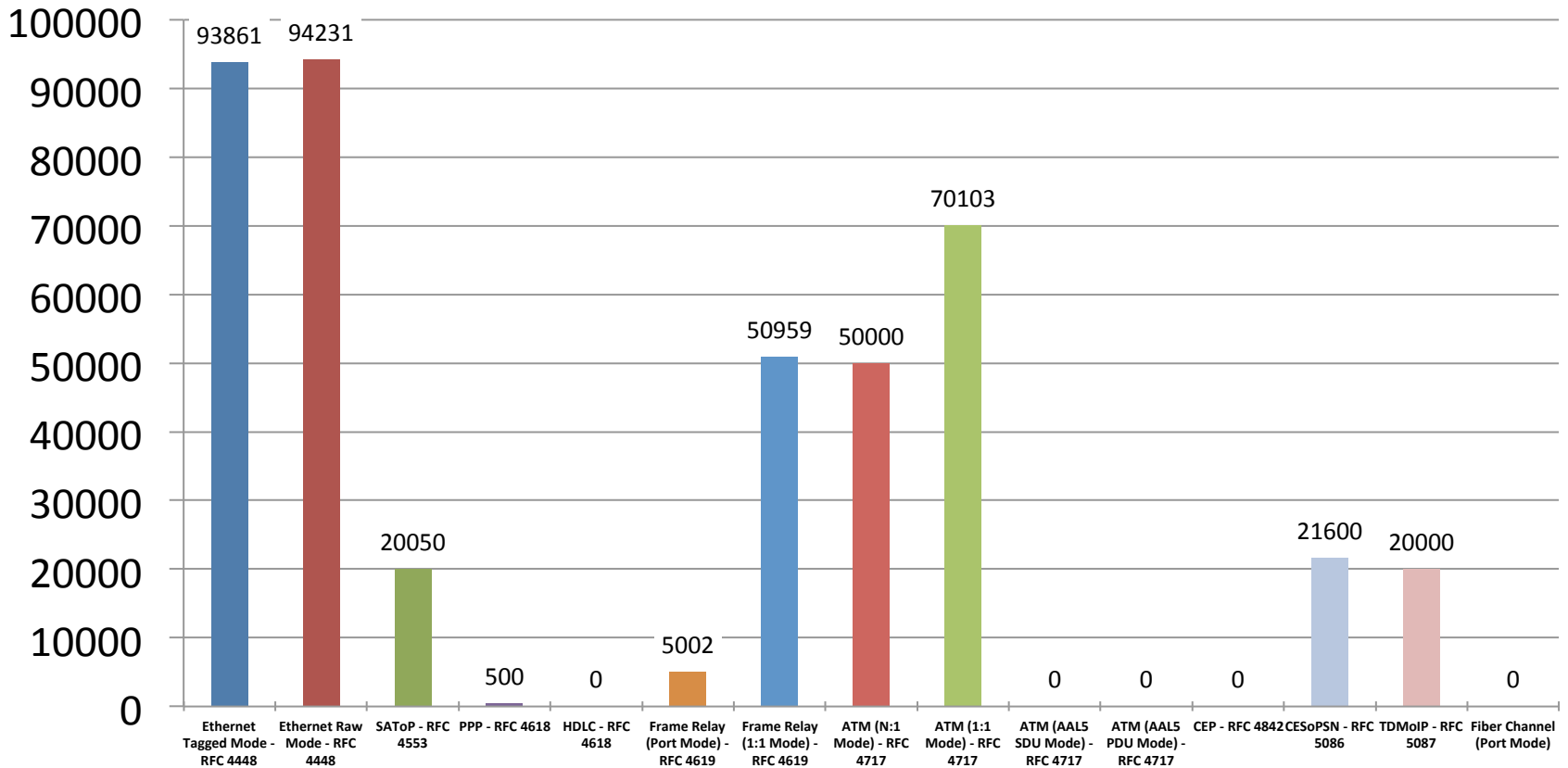
# Question 2

In your network in general, across all products, please indicate which Pseudowire encapsulations your company has implemented.



# Question 3

Approximately how many Pseudowires are deployed of each encapsulation type. Note, this should be the number of pseudowires in service, carrying traffic, or pre-positioned to do so.



## In-Use Responses

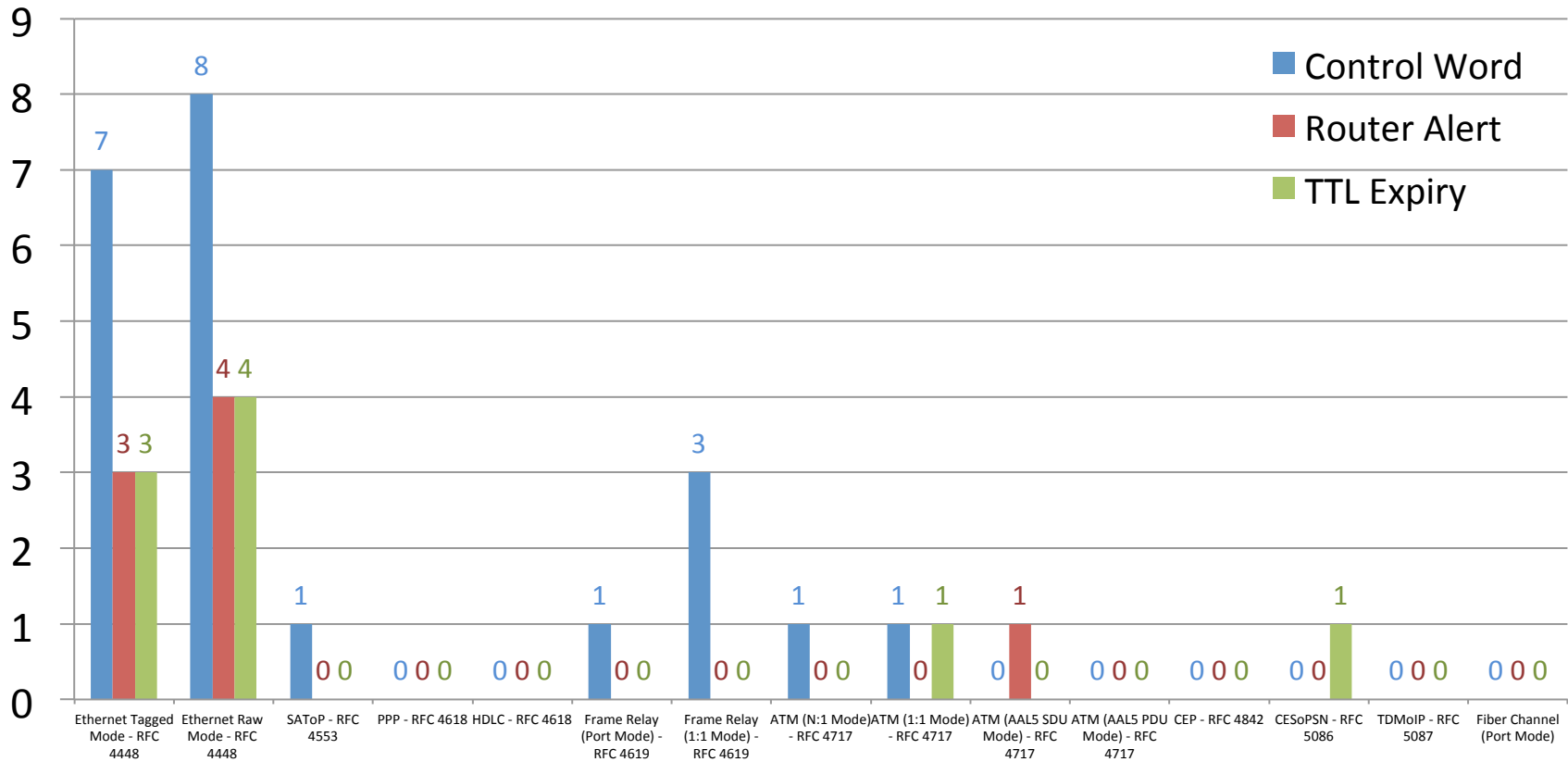
Ethernet Raw Mode: 2

ATM (AAL5 PDU Mode): 1

TDMoIP : 1

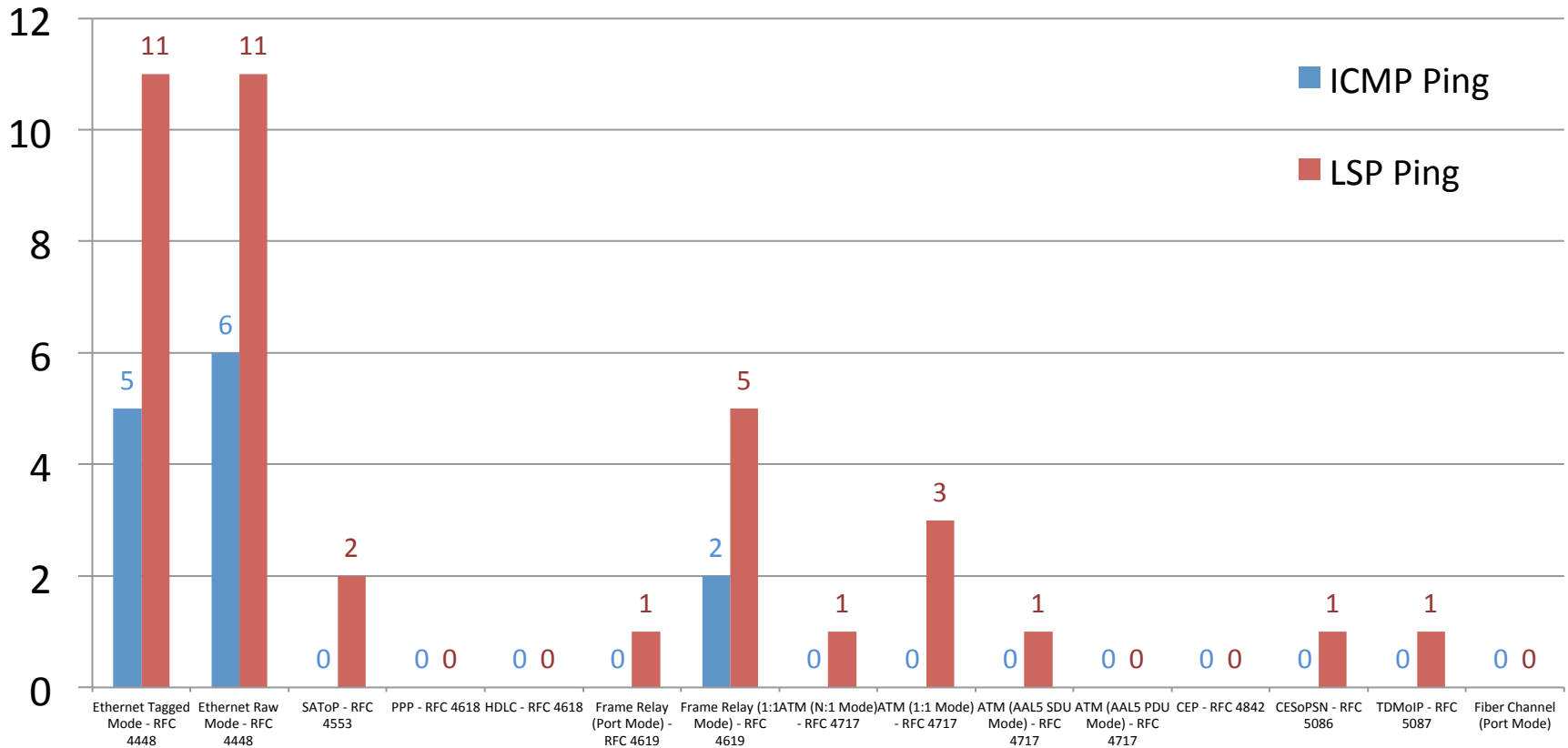
# Question 4

Please indicate which VCCV Control Channel is used for each encapsulation type. Understanding that users may have different networks with varying implementations, for your network in general, please select all which apply.



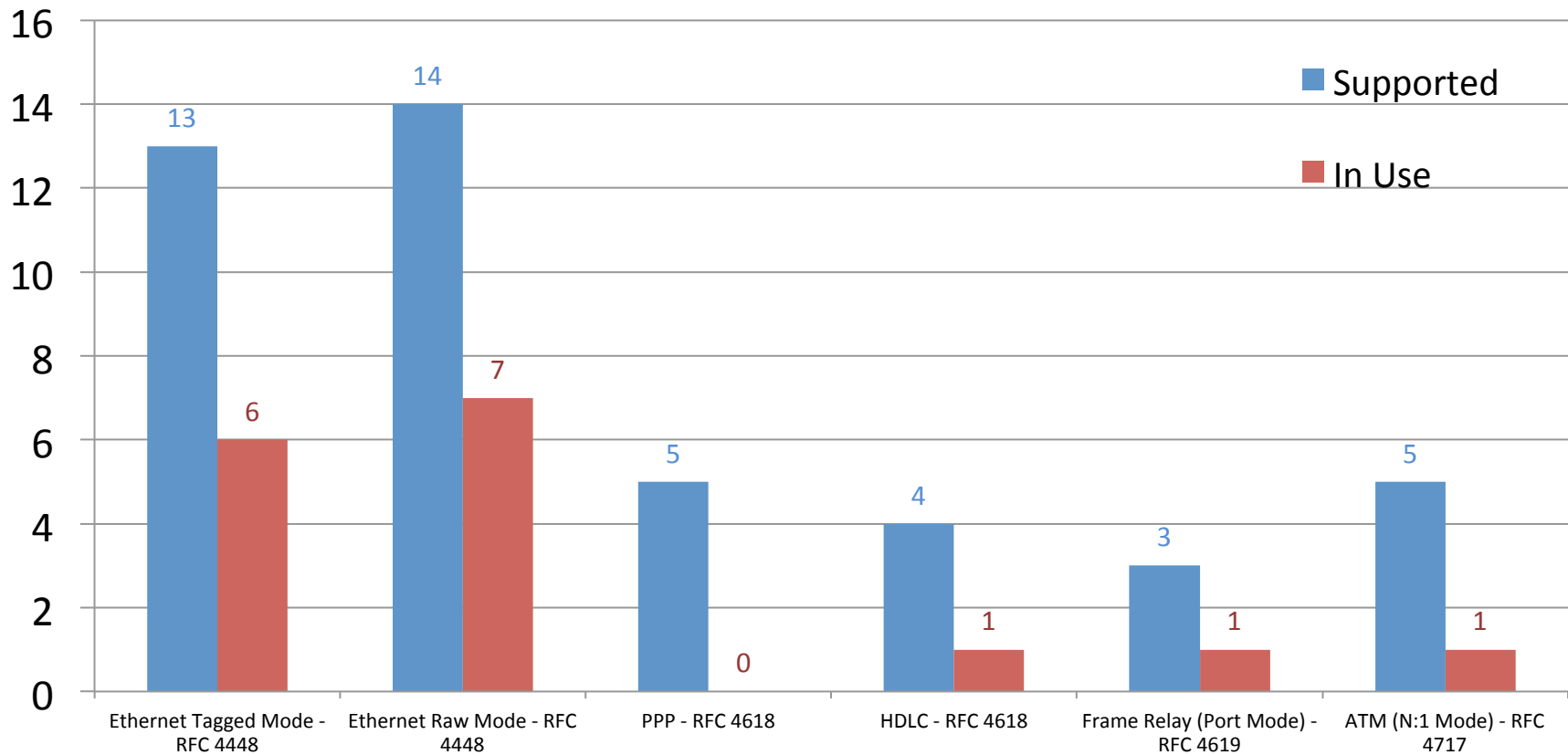
# Question 5

Please indicate which VCCV Connectivity Verification types are used in your networks for each encapsulation type.



# Question 6

Please indicate your network's support of and use of the Control Word for encapsulations for which the Control Word is optional.



# Question 7

- 8 Responses
- See draft-delregno-pwe3-pw-vccv-impl-survey-results-01 for responses
  - Company/User References removed
  - Vendor/Manufacturer References removed



# Findings/Anomalies

- Pseudowires Widely Deployed
- Ethernet Most Used Encapsulation
  - Followed by ATM Variants, Frame Relay and Circuit Emulation Variants
- Only 1 report of ATM N:1 Use
  - Large Number Reported (>50,000 PWs)
  - Control Word CC In Use
- Inconsistent Responses
  - ATM AAL5 SDU vs PDU Modes
  - No HDLC PWs reports, but 1 implementation claimed
  - Many more

# Findings 2

- Of Encaps for which CW is optional
  - Large number of PWs deployed (>243,594)
  - Control Word Use
    - Ethernet Tagged Mode
      - 76% Supported by Network/Equipment
      - Of deployed (13), 46% Used
    - Ethernet Raw Mode
      - 82% Supported by Network/Equipment
      - Of deployed (14), 50% Used
    - PPP
      - 29% Supported by Network/Equipment
      - 0% Used
    - HDLC
      - 24% Supported by Network/Equipment
      - Of deployed (1) , 100% Used
    - Frame Relay (Port Mode)
      - 18% Supported by Network/Equipment
      - Of deployed (3), 33% Used
    - ATM (N:1 Mode)
      - 29% Supported by Network/Equipment
      - Of deployed (1), 100% Used

# Thanks

- Sincere thanks to all who completed the survey
- Thanks to the PWE3 Chairs for direction