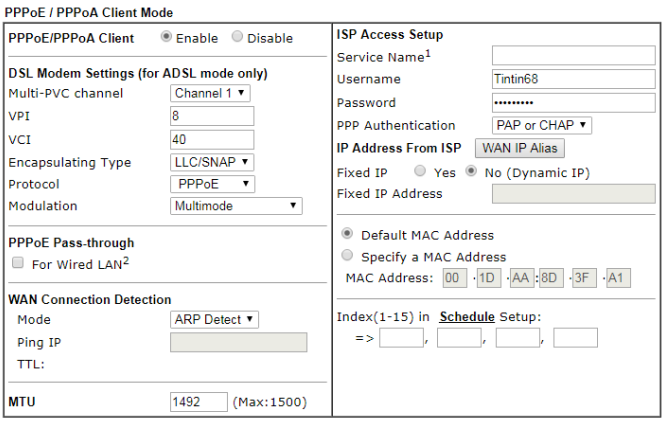
Travaux Dirigés N°3

Les réseaux d'accès : DSL – Les Protocoles

Exercice N°1

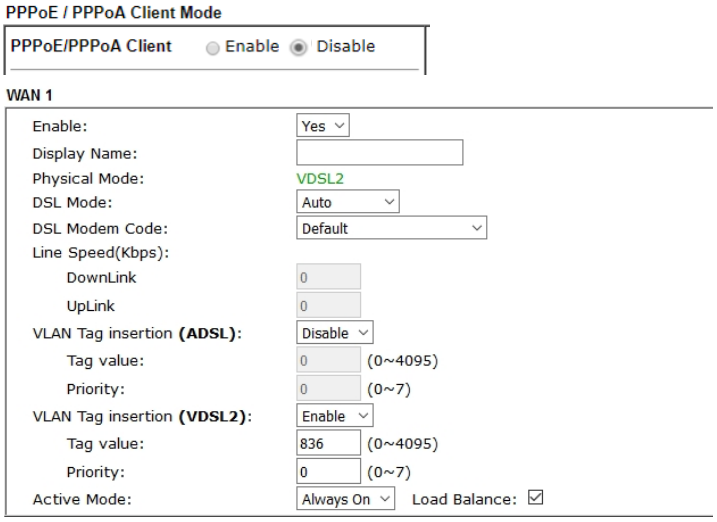
On donne l'écran de configuration WAN principal d'une box (modem/routeur) .

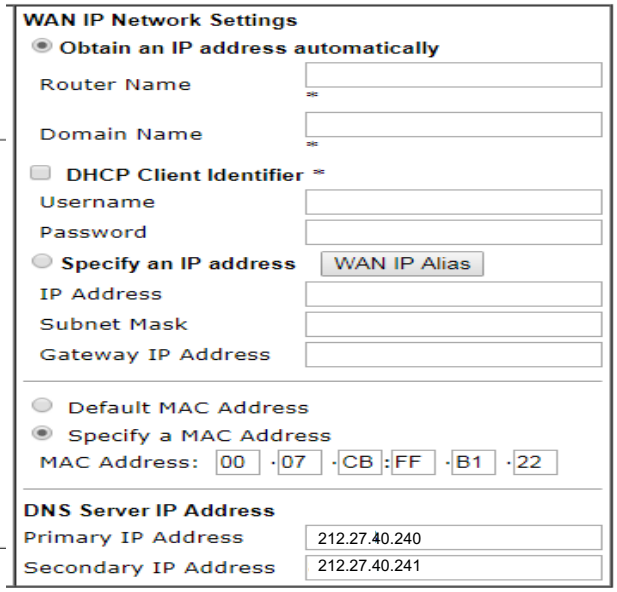


- Quel est le protocole de liaison est-il utilisé sur la modulation DSL (ATM ou Ethernet) ?
- Quel protocole permet au modem/routeur d'obtenir ses identifiants de connexion (@IP publique, DNS…).
- Quelle protocole sécurise l'authentification du client sur la ligne, expliquez son mécanisme.

Exercice N°2

On donne l'écran de configuration WAN principal d'un modem/routeur de marque Draytek. .

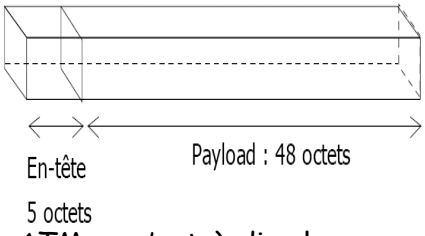




- Ce modem/routeur est il synchronisé sur un lien Adsl ou Vdsl ?
- Quel est le protocole de transport utilisé sur la modulation DSL (ATM ou Ethernet) ?
- Quel protocole permet au modem d'obtenir son @IP publique ?
- D'après vous, que cherche a faire le propriétaire de ce modem ?

Exercice N°3

Dans un transport de trames de type ATM, les trames Ethernet sont encapsulées dans des « cellule » de 48 Octets auquel on ajoute 5 Octets d'entête par cellules.



Les fournisseurs d'accès ont tendance à annoncé au client le débit « ATM » , c'est-à-dire le débit numérique global, incluant les en-têtes ATM.

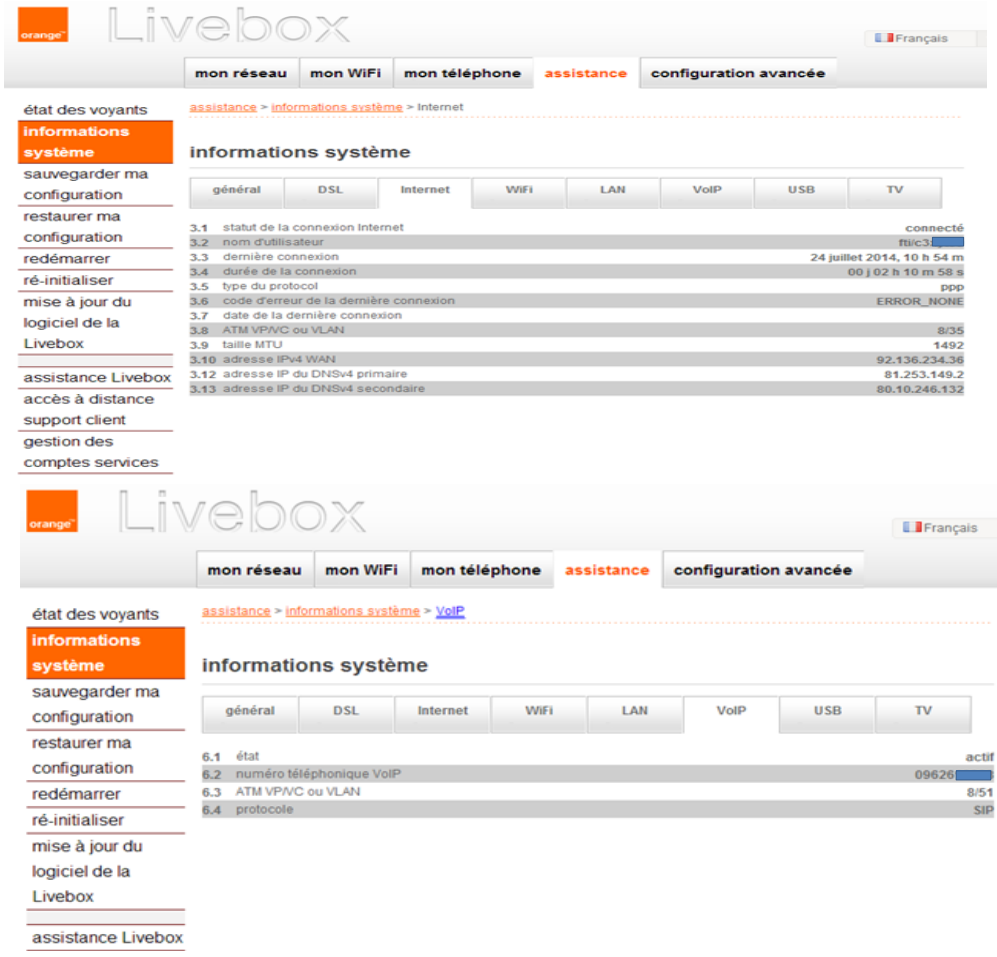
- Calculer le pourcentage que représentent les données utiles au client par rapport au données totales reçu par celui-ci.
- Le fournisseur d'accès indique un débit « ATM » Downlink de 20 Mbits/s.

Cela représente quel débit réel pour le client ?

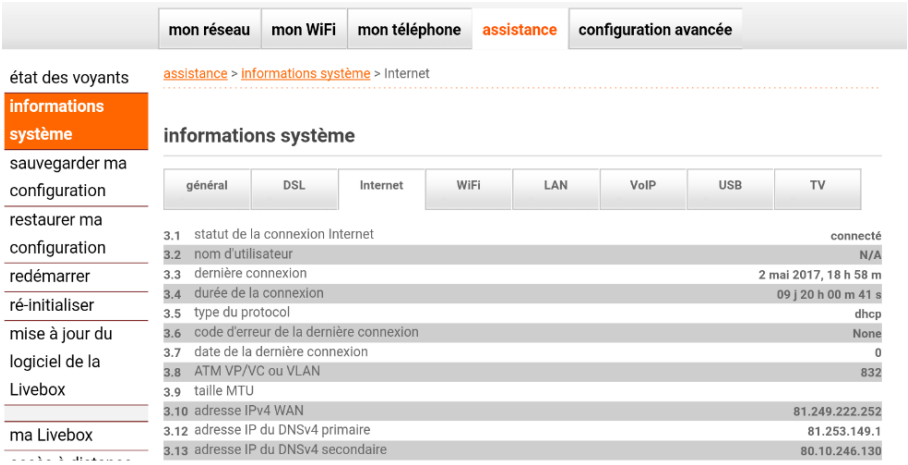
Exercice N°4

1 - Les deux copies d'écrans suivantes ont été faites sur une liveBox Orange.

Expliquez les différents paramètres.



2 – Quel différence faite vous avec la copie d'écran suivante effectuée chez un autre client :



Exercice N°5

Les trames suivantes sont issues d'un relevé WireShark effectué sur un port Ethernet d'un équipement d'un réseau Adsl.

1) Identifiez les équipements concernés par cet échange ?

2) Quel est l'objet principal de ces trames et quels sont les protocoles mis en œuvre ?

3) La trame II est-elle antérieur ou postérieur à la trame I ?

```
Frame 174: 26 bytes on wire (208 bits), 26 bytes captured (208 bits)
Ethernet II, Src: Intel_5c:de:c6 (00:07:e9:5c:de:c6), Dst: ZygateCo_ae:47:16 (00:02:cf:ae:47:16)
  Destination: ZygateCo_ae:47:16 (00:02:cf:ae:47:16)
    Address: ZygateCo_ae:47:16 (00:02:cf:ae:47:16)
    .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
    .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
  Source: Intel_5c:de:c6 (00:07:e9:5c:de:c6)
    Address: Intel_5c:de:c6 (00:07:e9:5c:de:c6)
    .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
    .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
  Type: PPPoE Session (0x8864)
PPP-over-Ethernet Session
  0001 .... = Version: 1
  .... 0001 = Type: 1
  Code: Session Data (0x00)
  Session ID: 0x0003
  Payload Length: 6
Point-to-Point Protocol
  Protocol: Challenge Handshake Authentication Protocol (0xc223)
PPP Challenge Handshake Authentication Protocol
  Code: Success (3)
  Identifier: 0
  Length: 4
```

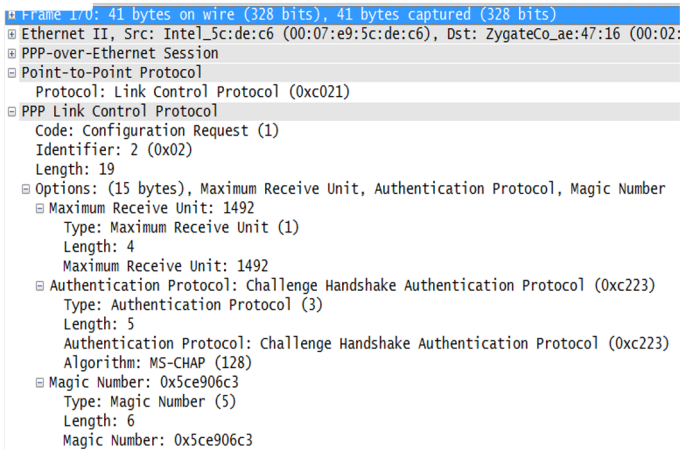
```
Frame 173: 80 bytes on wire (640 bits), 80 bytes captured (640 bits)
Ethernet II, Src: ZygateCo_ae:47:16 (00:02:cf:ae:47:16), Dst: Intel_5c:de:c6 (00:07:e9:5c:de:c6)
  Destination: Intel_5c:de:c6 (00:07:e9:5c:de:c6)
    Address: Intel_5c:de:c6 (00:07:e9:5c:de:c6)
    .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
    .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
  Source: ZygateCo_ae:47:16 (00:02:cf:ae:47:16)
    Address: ZygateCo_ae:47:16 (00:02:cf:ae:47:16)
    .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
    .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
  Type: PPPoE Session (0x8864)
PPP-over-Ethernet Session
  0001 .... = Version: 1
  .... 0001 = Type: 1
  Code: Session Data (0x00)
  Session ID: 0x0003
  Payload Length: 60
Point-to-Point Protocol
  Protocol: Challenge Handshake Authentication Protocol (0xc223)
PPP Challenge Handshake Authentication Protocol
  Code: Response (2)
  Identifier: 0
  Length: 58
  Data
    Value Size: 49
    Value: cc7e79b66e58e2502bdbc8db0f88c6df752fa7549dcc6ff7...
    Name: voip
```

Exercice N°6

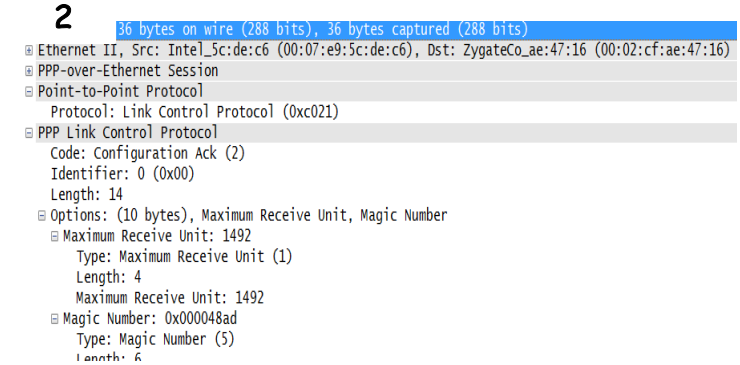
Les trames suivantes sont issues d'un relevé WireShark effectué sur un port Ethernet d'un serveur PPPOE. Elles sont volontairement dans le désordre.

Remettre les trames dans l'ordre chronologique avec un minimum d'explication.

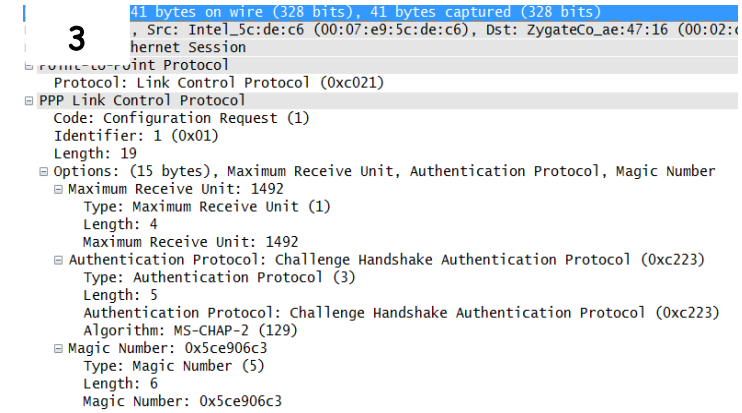
1


Frame 170: 41 bytes on wire (328 bits), 41 bytes captured (328 bits)
Ethernet II, Src: Intel_5c:de:c6 (00:07:e9:5c:de:c6), Dst: ZygateCo_ae:47:16 (00:02:
PPP-over-Ethernet Session
Point-to-Point Protocol
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Request (1)
Identifier: 2 (0x02)
Length: 19
Options: (15 bytes), Maximum Receive Unit, Authentication Protocol, Magic Number
Maximum Receive Unit: 1492
Type: Maximum Receive Unit (1)
Length: 4
Maximum Receive Unit: 1492
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Type: Authentication Protocol (3)
Length: 5
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Algorithm: MS-CHAP (128)
Magic Number: 0x5ce906c3
Type: Magic Number (5)
Length: 6
Magic Number: 0x5ce906c3

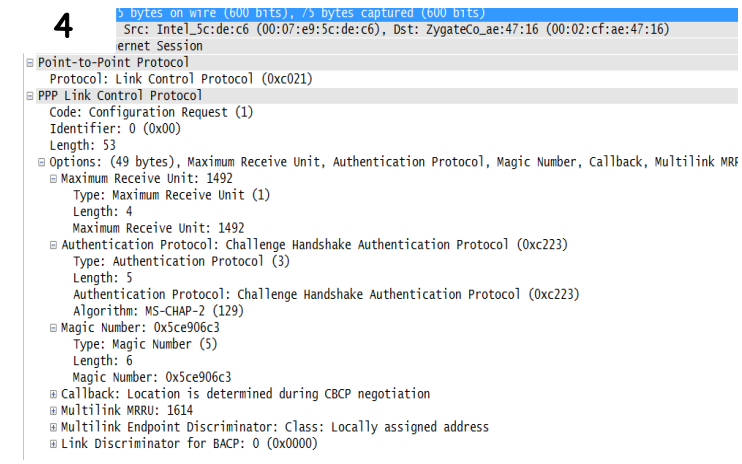
2


36 bytes on wire (288 bits), 36 bytes captured (288 bits)
Ethernet II, Src: Intel_5c:de:c6 (00:07:e9:5c:de:c6), Dst: ZygateCo_ae:47:16 (00:02:cf:ae:47:16)
PPP-over-Ethernet Session
Point-to-Point Protocol
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Ack (2)
Identifier: 0 (0x00)
Length: 14
Options: (10 bytes), Maximum Receive Unit, Magic Number
Maximum Receive Unit: 1492
Type: Maximum Receive Unit (1)
Length: 4
Maximum Receive Unit: 1492
Magic Number: 0x000048ad
Type: Magic Number (5)

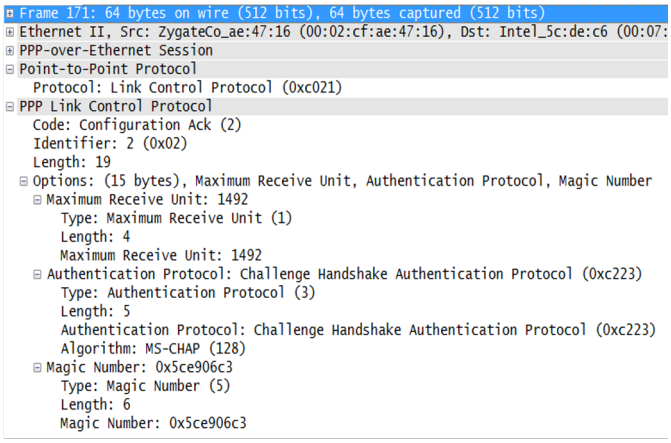
3


41 bytes on wire (328 bits), 41 bytes captured (328 bits)
, Src: Intel_5c:de:c6 (00:07:e9:5c:de:c6), Dst: ZygateCo_ae:47:16 (00:02:
hernet Session
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Request (1)
Identifier: 1 (0x01)
Length: 19
Options: (15 bytes), Maximum Receive Unit, Authentication Protocol, Magic Number
Maximum Receive Unit: 1492
Type: Maximum Receive Unit (1)
Length: 4
Maximum Receive Unit: 1492
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Type: Authentication Protocol (3)
Length: 5
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Algorithm: MS-CHAP-2 (129)
Magic Number: 0x5ce906c3
Type: Magic Number (5)
Length: 6
Magic Number: 0x5ce906c3

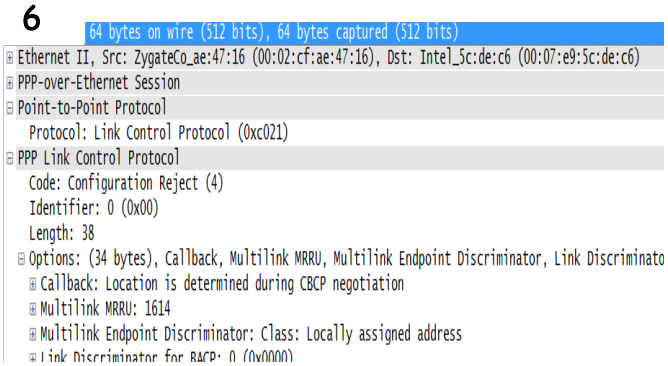
4


5 bytes on wire (600 bits), 75 bytes captured (600 bits)
Src: Intel_5c:de:c6 (00:07:e9:5c:de:c6), Dst: ZygateCo_ae:47:16 (00:02:cf:ae:47:16)
ernet Session
Point-to-Point Protocol
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Request (1)
Identifier: 0 (0x00)
Length: 53
Options: (49 bytes), Maximum Receive Unit, Authentication Protocol, Magic Number, Callback, Multilink MRR
Maximum Receive Unit: 1492
Type: Maximum Receive Unit (1)
Length: 4
Maximum Receive Unit: 1492
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Type: Authentication Protocol (3)
Length: 5
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Algorithm: MS-CHAP-2 (129)
Magic Number: 0x5ce906c3
Type: Magic Number (5)
Length: 6
Magic Number: 0x5ce906c3
Callback: Location is determined during CBCP negotiation
Multilink MRRU: 1614
Multilink Endpoint Discriminator: Class: Locally assigned address
Link Discriminator for BACP: 0 (0x0000)

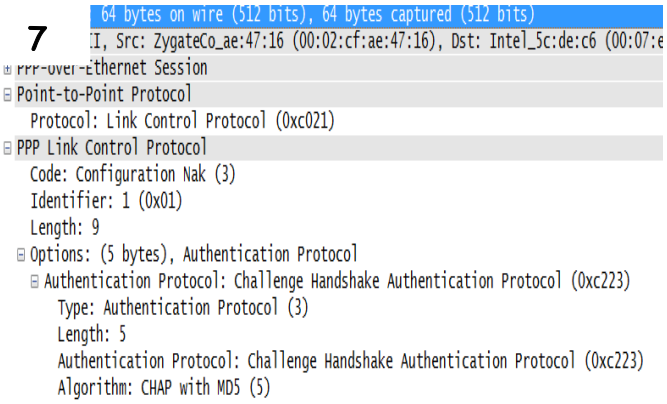
5


Frame 171: 64 bytes on wire (512 bits), 64 bytes captured (512 bits)
Ethernet II, Src: ZygateCo_ae:47:16 (00:02:cf:ae:47:16), Dst: Intel_5c:de:c6 (00:07:
PPP-over-Ethernet Session
Point-to-Point Protocol
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Ack (2)
Identifier: 2 (0x02)
Length: 19
Options: (15 bytes), Maximum Receive Unit, Authentication Protocol, Magic Number
Maximum Receive Unit: 1492
Type: Maximum Receive Unit (1)
Length: 4
Maximum Receive Unit: 1492
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Type: Authentication Protocol (3)
Length: 5
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Algorithm: MS-CHAP (128)
Magic Number: 0x5ce906c3
Type: Magic Number (5)
Length: 6
Magic Number: 0x5ce906c3

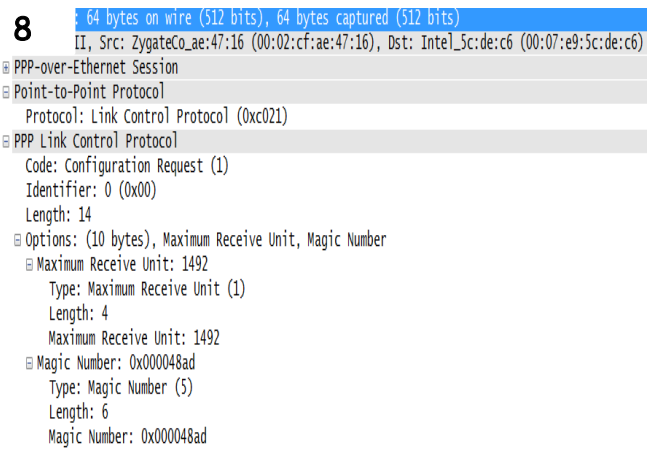
6


64 bytes on wire (512 bits), 64 bytes captured (512 bits)
Ethernet II, Src: ZygateCo_ae:47:16 (00:02:cf:ae:47:16), Dst: Intel_5c:de:c6 (00:07:e9:5c:de:c6)
PPP-over-Ethernet Session
Point-to-Point Protocol
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Reject (4)
Identifier: 0 (0x00)
Length: 38
Options: (34 bytes), Callback, Multilink MRRU, Multilink Endpoint Discriminator, Link Discriminato
Callback: Location is determined during CBCP negotiation
Multilink MRRU: 1614
Multilink Endpoint Discriminator: Class: Locally assigned address

7


64 bytes on wire (512 bits), 64 bytes captured (512 bits)
I, Src: ZygateCo_ae:47:16 (00:02:cf:ae:47:16), Dst: Intel_5c:de:c6 (00:07:e
PPP-over-Ethernet Session
Point-to-Point Protocol
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Nak (3)
Identifier: 1 (0x01)
Length: 9
Options: (5 bytes), Authentication Protocol
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Type: Authentication Protocol (3)
Length: 5
Authentication Protocol: Challenge Handshake Authentication Protocol (0xc223)
Algorithm: CHAP with MD5 (5)

8


64 bytes on wire (512 bits), 64 bytes captured (512 bits)
II, Src: ZygateCo_ae:47:16 (00:02:cf:ae:47:16), Dst: Intel_5c:de:c6 (00:07:e9:5c:de:c6)
PPP-over-Ethernet Session
Point-to-Point Protocol
Protocol: Link Control Protocol (0xc021)
PPP Link Control Protocol
Code: Configuration Request (1)
Identifier: 0 (0x00)
Length: 14
Options: (10 bytes), Maximum Receive Unit, Magic Number
Maximum Receive Unit: 1492
Type: Maximum Receive Unit (1)
Length: 4
Maximum Receive Unit: 1492
Magic Number: 0x000048ad
Type: Magic Number (5)
Length: 6
Magic Number: 0x000048ad