

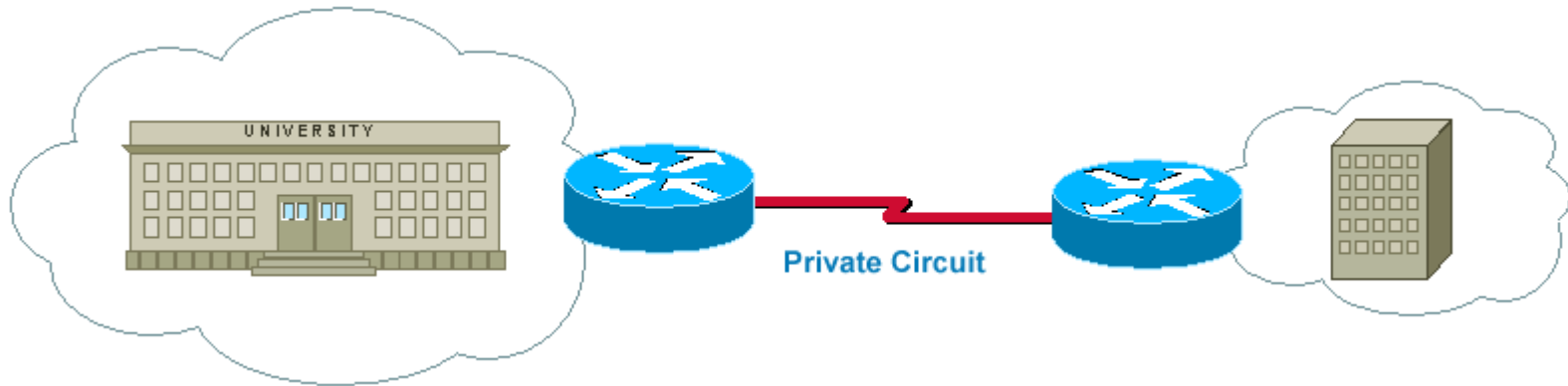
Network Access for Remote Users

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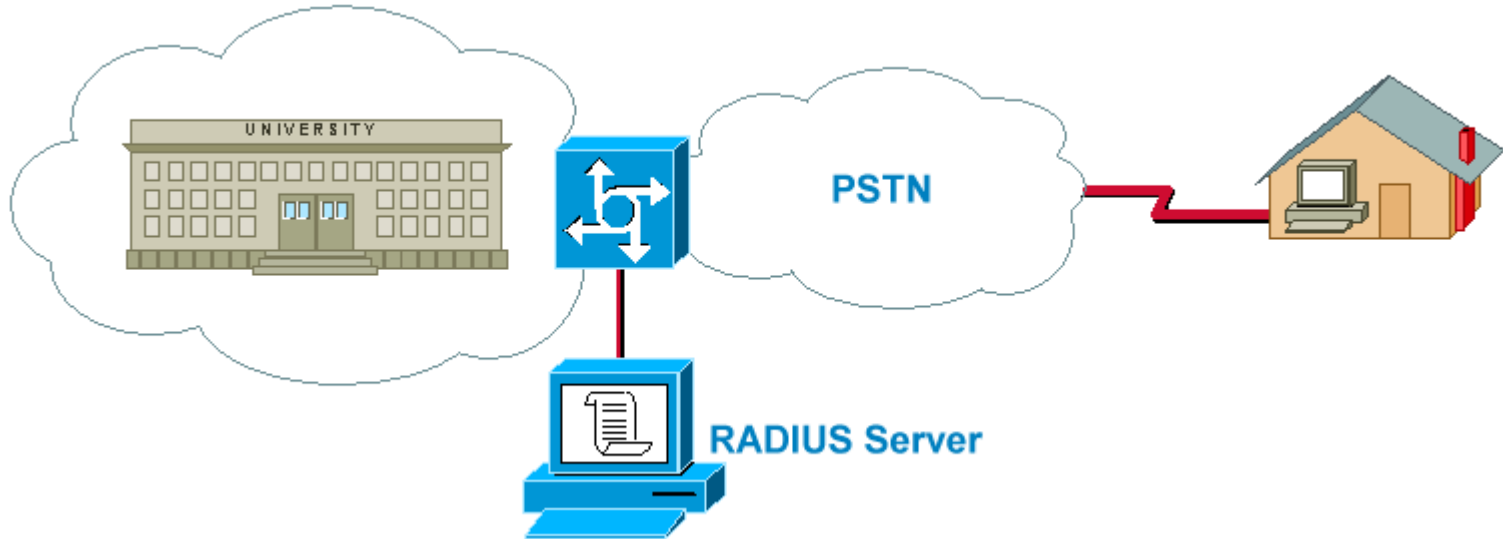
Review of Technologies

- Remote Site
 - Private Leased Lines
 - Kilostream or Megastream Circuits
 - LES
 - ISDN
 - EPS9
 - ISP
- Remote User
 - Private Dialup Service
 - ISP

Site-to-Site Private Infrastructure



Traditional Dialup Service



☹️ High Costs

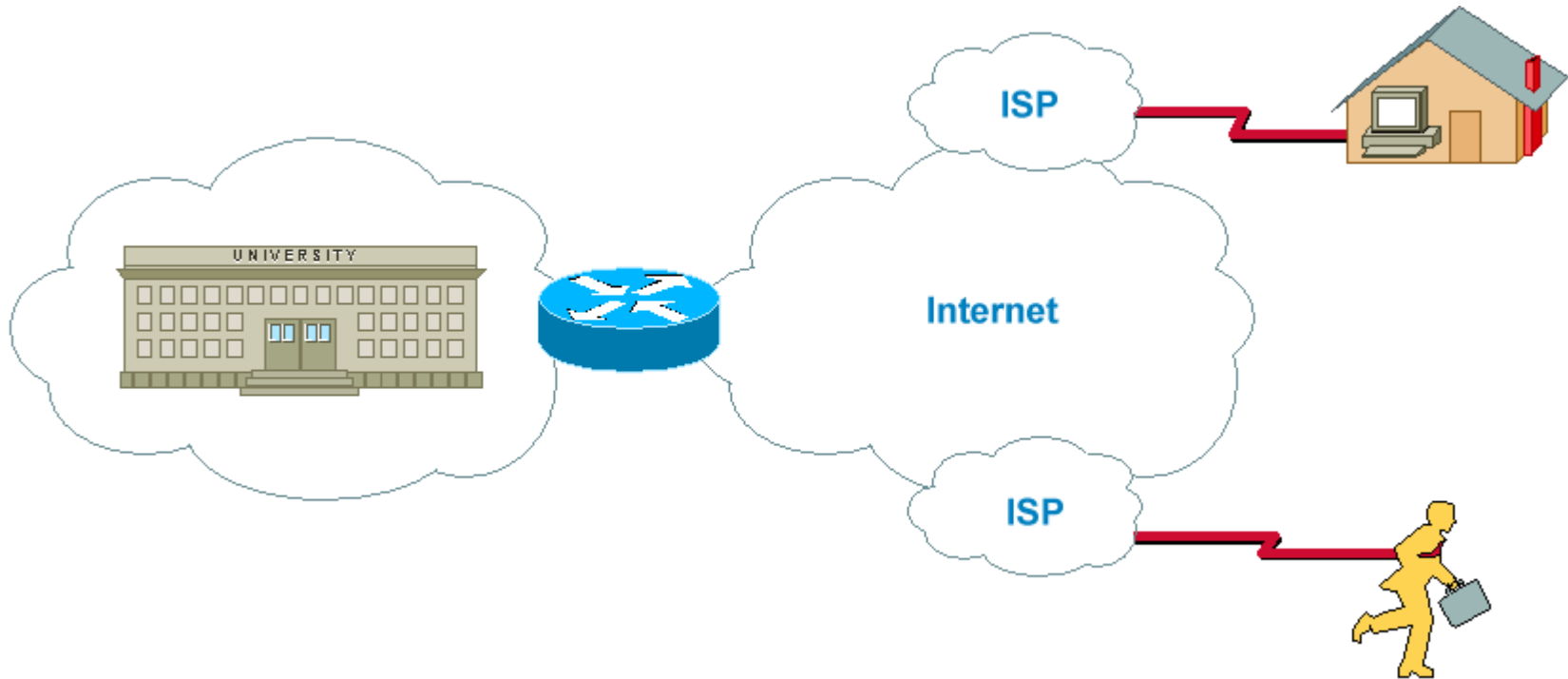
☹️ Support Burden

☹️ Limited to 56K Analogue Dialup

☹️ Limited Service

☺️ Security Guaranteed

Virtual Private Network

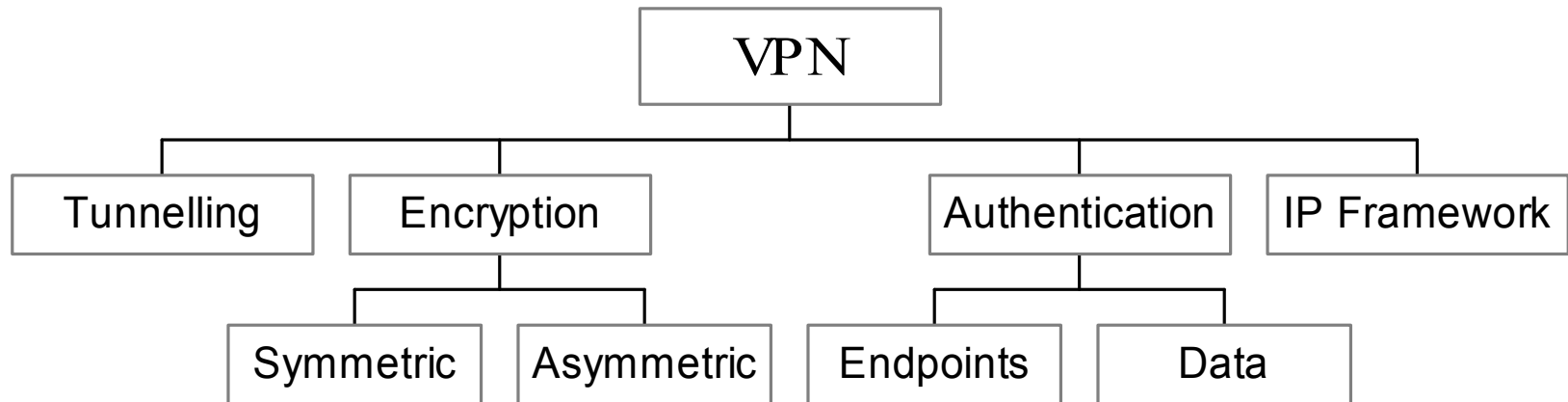


☺ Highly Flexible Solution

☹ Complex Security Issues

☺ Uses Existing Infrastructure

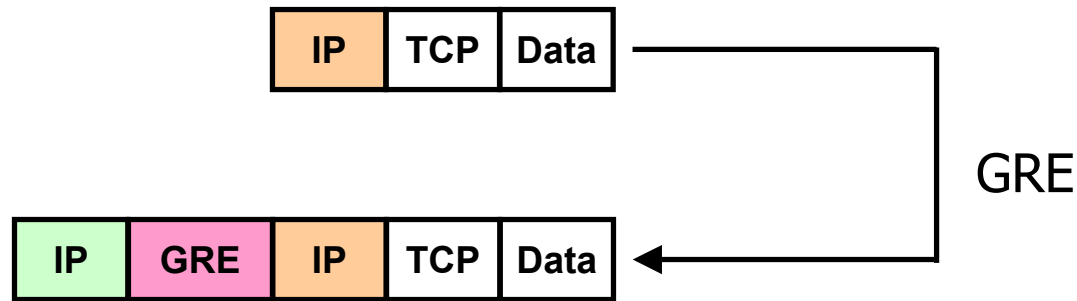
VPN Roadmap



Tunnelling Methods

- Layer III
 - GRE
 - IPSec
- Layer II
 - L2F
 - PPTP
 - L2TP

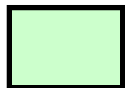
Layer 3 Tunneling (GRE)



passenger protocol

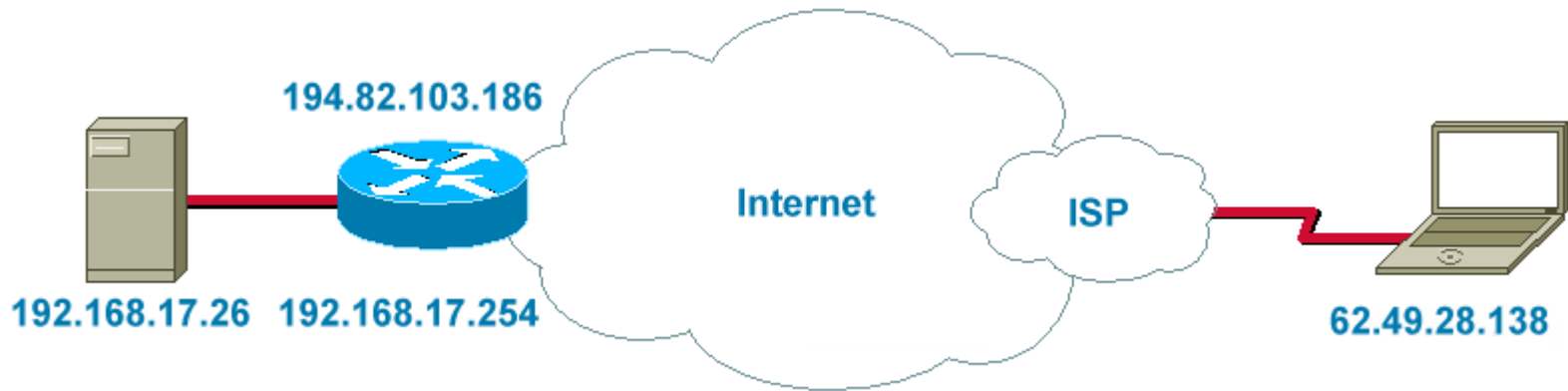


encapsulating protocol



carrier protocol

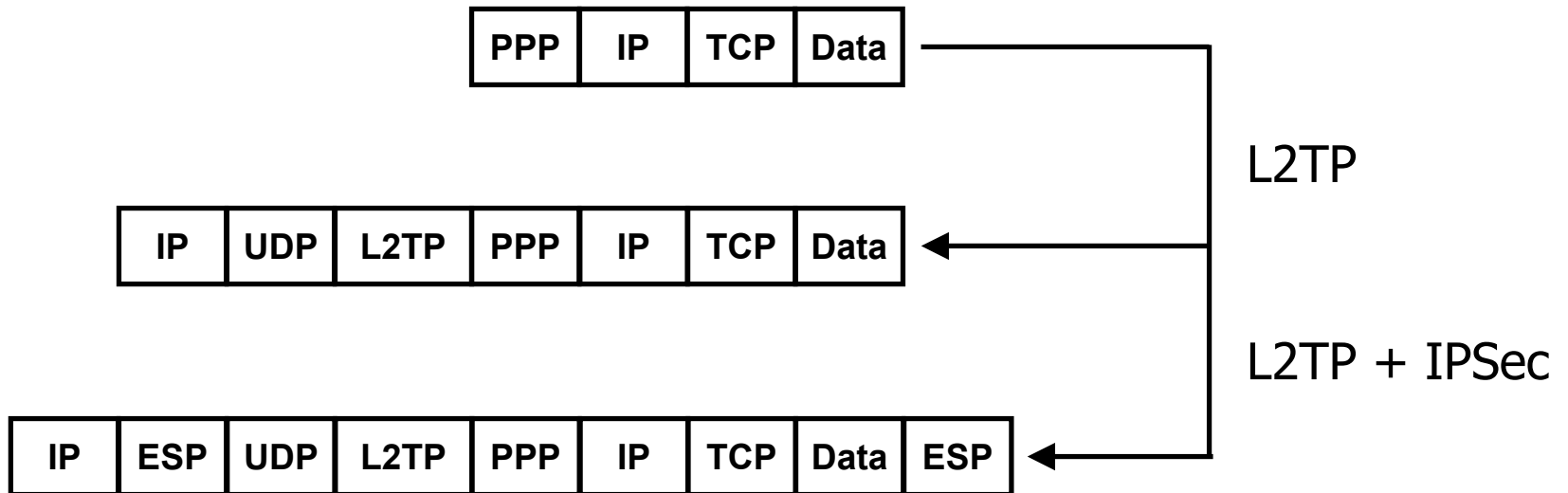
Tunnelling In Action



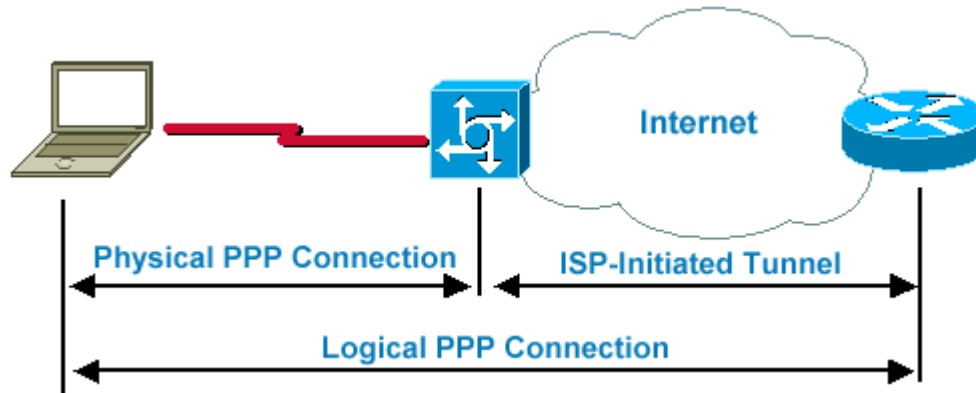
IP	TCP	Data
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Source	62.49.38.138
Destination	192.168.17.26

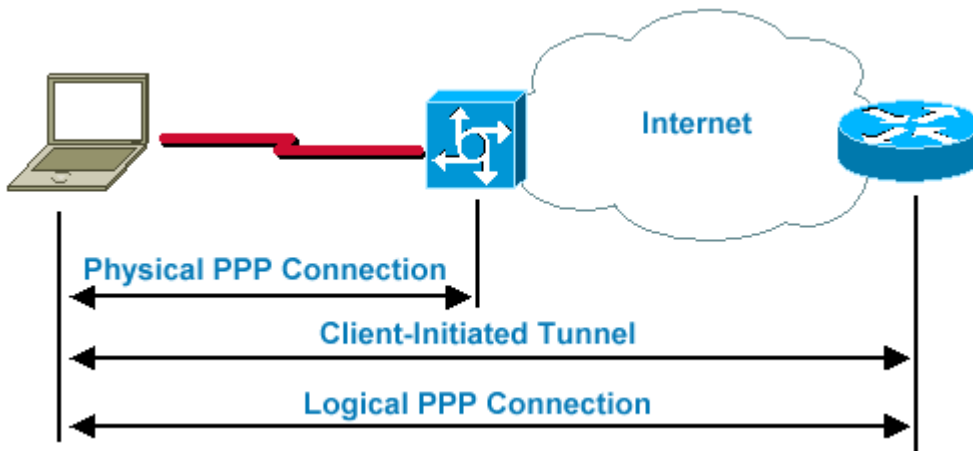
Layer 2 Tunneling (L2TP)



Layer 2 Tunnelling Modes



Compulsory L2 Tunnelling



Voluntary L2 Tunnelling

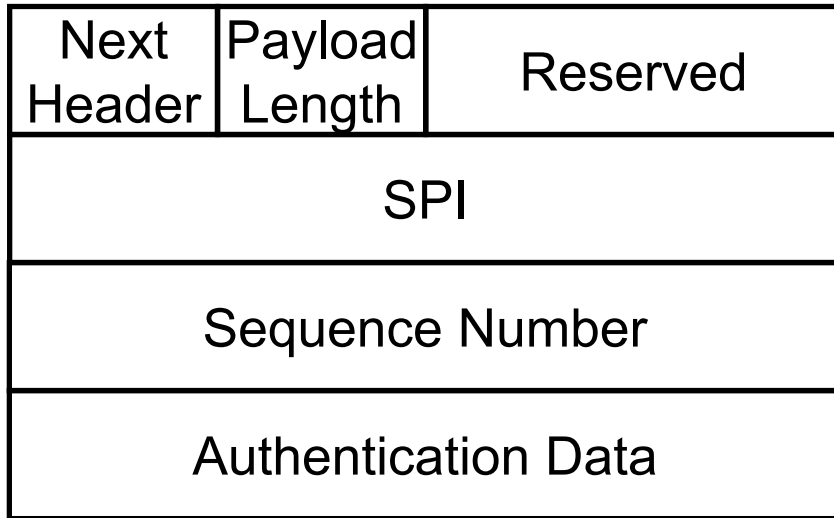
Authentication

- Peer Identity
 - Shared Secret
 - Digital Certificate
- Data Integrity
 - Digital Signatures
- User Identity
 - Kerberos
 - RADIUS

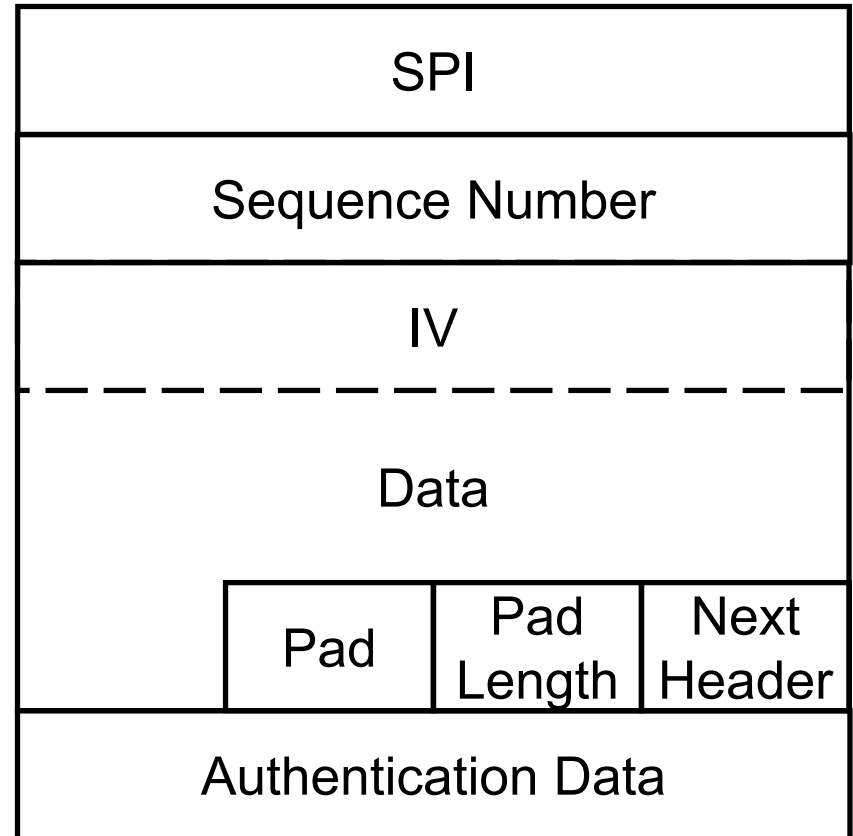
IP Security (IPSec)

- Protocols
 - Authentication Header
 - Encapsulating Security Payload
 - Internet Key Exchange
- Modes
 - Tunnel
 - Transport

IPSec Protocols



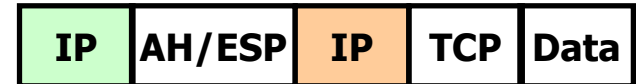
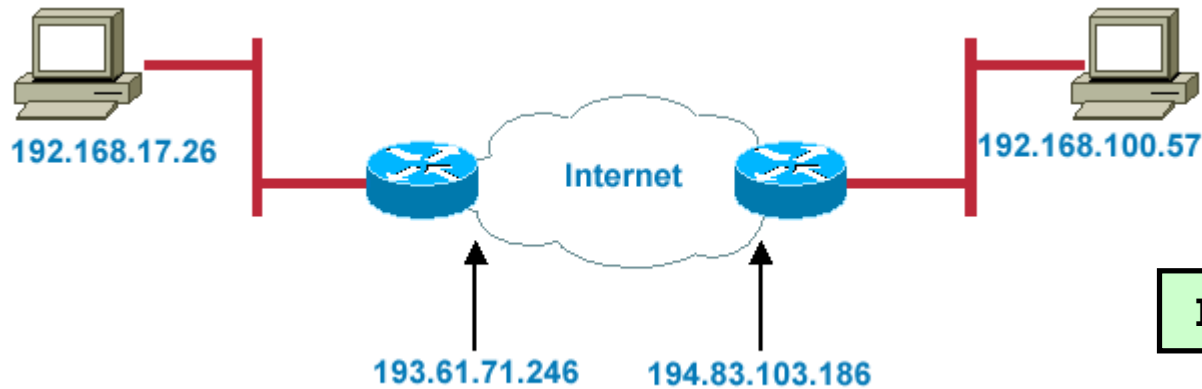
Authentication Header (51)



Encapsulating Security Protocol (50)

IPSec Modes

Tunnel Mode



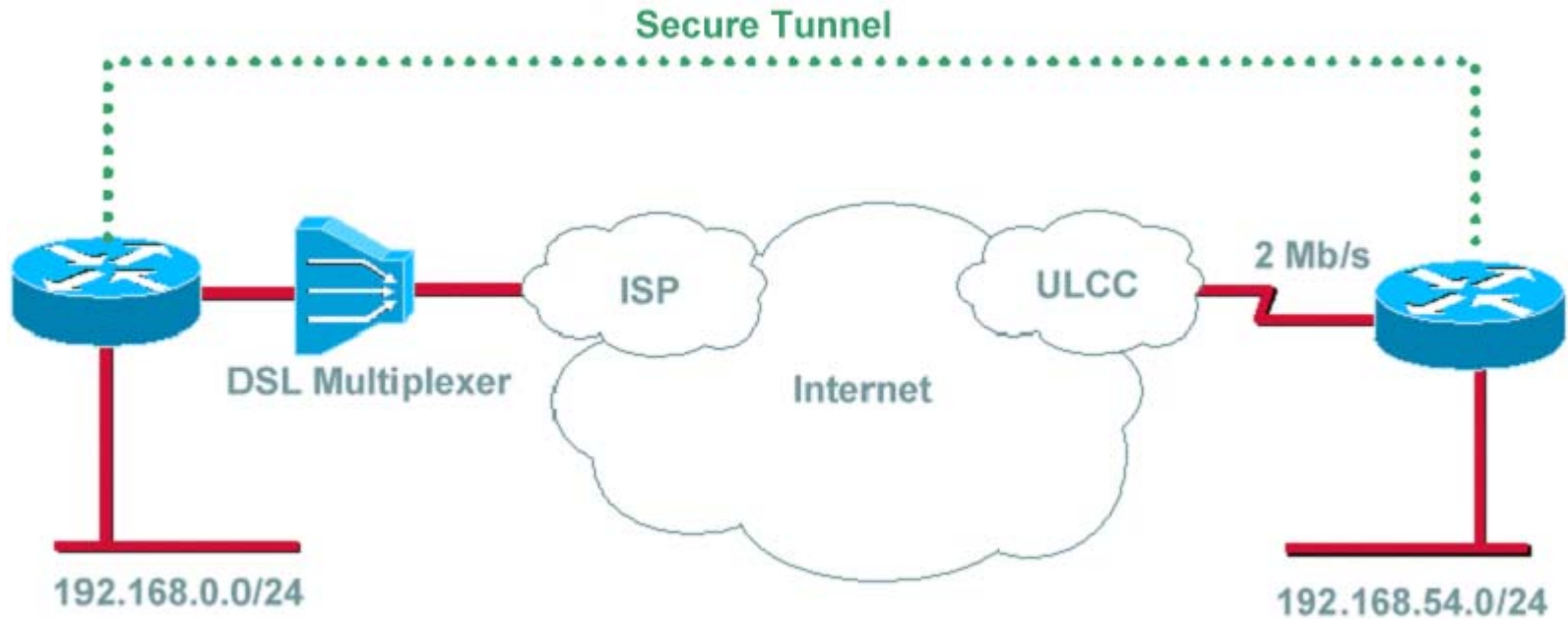
Transport Mode




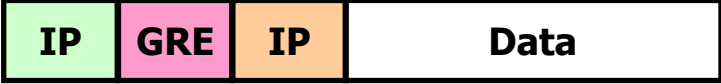



Equipment at Remote Site

- 'Wires Only' ADSL Connection
 - One Static IP Address
- Splitter
- Cisco 827H Router
 - Ethernet hub (4 ports) plus ATM port

Example Configuration



Fragmentation Gotcha

Initial Packet		1500
Tunnel Encapsulation		1500
		68
Security Encapsulation		1540
		108