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IPv4 Only Network

ISATAP Router

IPv6 Only Network

IPv6 Transition Protocols

For the free video please see
http://itfreetraining.com/ipv6/transition-protocols

This video will look at transition protocols that are used to communicate between networks when there is not a fully IPv6 ready network between nodes. Until IPv6 is fully deployed across the internet, you may be in a position where you need to use one of these transition protocols.

In This Video

- ISATAP
- Teredo
- 6to4

0:24 In this video I will have a brief look at the transition protocol ISATAP, Teredo and 6to4. This will give you an overview of the protocols. In later videos I will look at how to implement these protocols in more detail.

ISATAP

- Intra-Site Automatic Tunnel Address Protocol
  - Used internally only
- Bridges IPv4 and IPv6 networks

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ISATAP Router

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0:43 ISATAP stands for Intra-Site Automatic Tunnel Address Protocol. The important word to take way from the name is the word Intra. ISATAP is only used on internal networks and is not used to access the internet. If you have an IPv4 and an IPv6 network, they can be joined together using an ISATAP router. The ISATAP protocol will allow the IPv6 nodes to send traffic over the IPv4 network. When they reach the ISATAP router, the IPv4 data will be removed leaving the IPv6 data. The process is called tunneling. Tunneling is like car pooling, the IPv6 packets are incased in an IPv4 packet. Depending on which way the traffic is going, the ISATAP router's job is to remove or add an IPv4 packet. This way, the data can travel over both the IPv4 and IPv6 networks. You would only use ISATAP when you have an IPv4 and an IPv6 network on an internal network that need to communicate with each other.

Teredo

- Allows IPv4 clients to access IPv6 clients
  - IPv6 clients can be on the internet
  - Can travel over NAT
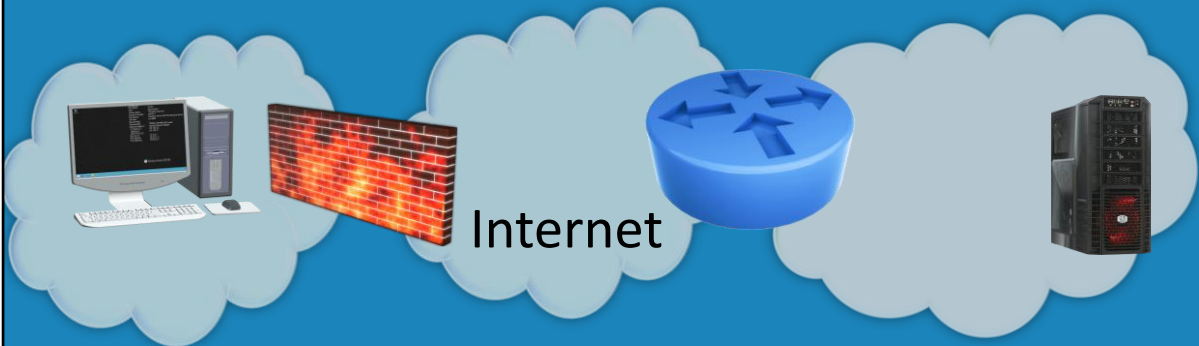
Internet

1:49 Teredo is a transition protocol that allows IPv4 nodes, behind a firewall or NAT device, to access IPv6 nodes on the internet. It uses special addresses that include the port in the address. This is what allows the protocol to know which port to use when it travels across a NAT device. The idea behind Teredo is, that it is a temporary solution to allow IPv4 nodes to access IPv6 nodes while the internet is being made fully IPv6 ready. Once IPv6 is available to the IPv4 node, Teredo is no longer required.

6to4

- IPv6 to IPv6 network communication
  - No native IPv6 internet (Separated by IPv4)
- Nodes have IPv6 and IPv4 address
  - IPv6 starts with 2002
  - IPv4 address is encapsulated in IPv6 address

IPv4 Internet

IPv4 8.8.8.8
IPv6 2002:8.8.8.8::1

IPv4 8.8.4.4
IPv6 2002:8.8.4.4::1
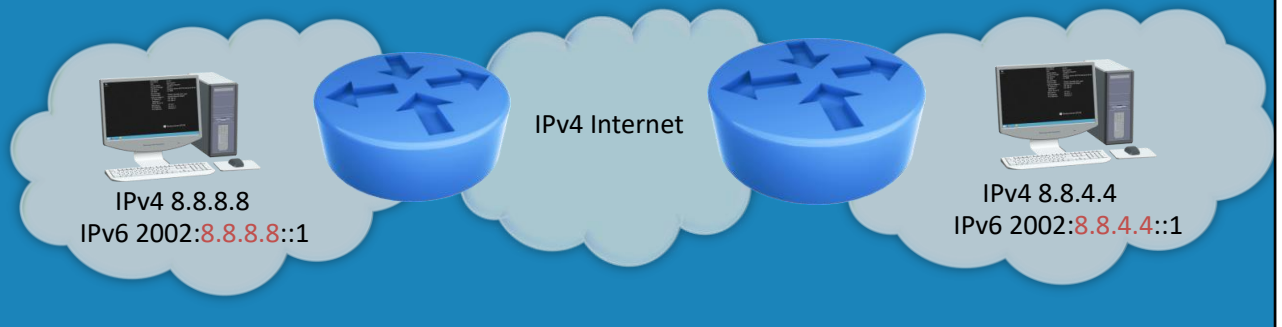
3:08 6to4 is used during the early deployment of IPv6. Even today with the limited number of IPv6 networks that are in use, the need for it should already be reducing. 6to4 should be used when there are two IPv6 networks with an IPv4 network in between them. In order to use 6to4, each node on each network requires a publicly registered IPv4 address. NAT cannot be used with 6to4. 6to4 places the IPv6 packet in an IPv4 packet. This packet can then be routed over the public internet. When the packet reaches its destination, the IPv4 packet is removed.