

# Implementing IPsec in IPv6

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# Overview

**How IPsec works in IPv6**

**IPsec implementations for IPv6**

**Migrating IPv4 to IPv6 tunnels**

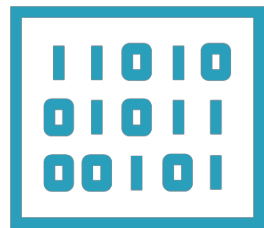
- **Demo**

**IPv6 IPsec site-to-site VPN demo**

# IPsec in IPv6



Creators wanted security to be something easily implemented in the protocol



Extension headers are used to add new services to IPv6, such as IPsec



Requirement is that IPv6 implementations “should” support IPsec now instead of “must”



The functionality of IPsec in IPv6 doesn't change much from IPv4, only some minor changes and the differences in the packet structures

# Extension Headers

**Hop-by-Hop  
Options**

**Destination Options**

**Fragment Header**

**Authentication  
Header**

**Encapsulating  
Security Payload  
Header**

**Mobility Header**

Very similar services and  
functionality for IPsec  
in IPv6 and IPv4



## IPsec in IPv6

IKEv1 must have same address family in the tunnel.

IKEv2 allows multiple address families in same tunnel.

# IPv6 Implementations

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<http://bit.ly/33Dzd1x>



# IPv6 to IPv6 VPN



Site-to-site VPN links currently in use, remote access VPN links still developing



Virtual Tunnel Interfaces (VTI), GRE IPv6 tunnels, etc.



Reachability between IPv6 sites is the key!

# IPv6 with IPv4

Many methodologies to help migrate IPv4 environments to IPv6, some available to use with IPsec for data security

# Migrating IPv4 to IPv6 with IPsec

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# Dual Stack

**Most popular method for migrating to IPv6**

**Still relies on reachability**

**WAN reachability is the big concern**

**IPsec requires reachability!**

# Demo

**Configure and test IPv6 over IPv4**

**Analyze the packets**

# Demo

**Configure IPv6 to IPv6 VTIs with IPsec**

**Test the connection to ensure  
functionality**

**Analyze the packets**

# IPv6 IPsec Summary

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# Summary

**IPv6 protocol and extension headers**

**IPv6 implementations**

**IPv6 transition methods**

**Demoed it twice!**



Let's solidify that knowledge!