Protocol Deep Dive: IPsec

LEARNING IPSEC FUNDAMENTALS

Joe Abraham
NETWORK SECURITY CONSULTANT
@joeabrah www.joeabrahamtech.com

How We'll Conduct This Course

Focus on the building blocks of the IPsec protocol suite

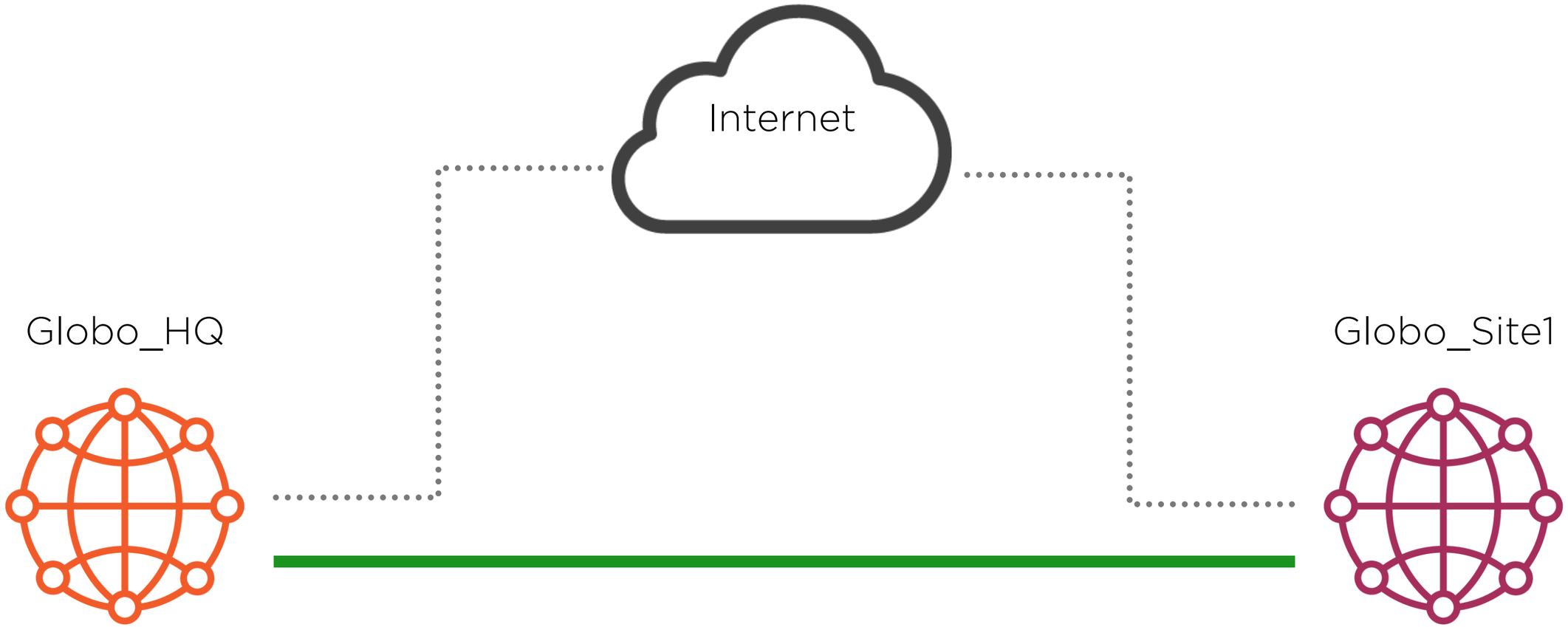
Break it down to a low level, then build it back up

Use implementations such as Dynamic Multipoint VPN (DMVPN) and dynamic Virtual Tunnel Interfaces (dVTI)

Globomantics wants to change their infrastructure

- Remote site users need access to corporate resources
- IPsec is one of the standards for VPN traffic

Globomantics' Network



Overview

What is IPsec?

- History, uses, modes

Building IPsec

- Building blocks, components, authentication

IPsec use cases

IKEv1

IKEv2

IPsec with IPv6

Course Prerequisites

Have good understanding of:

Routing and Switching

Security Threats

Desire to learn about IPsec!

How You Can Follow Along

What is in the course materials?

- Initial lab configurations
- Packet captures

What should you have?

- Equipment/virtualization
- Wireshark for analysis

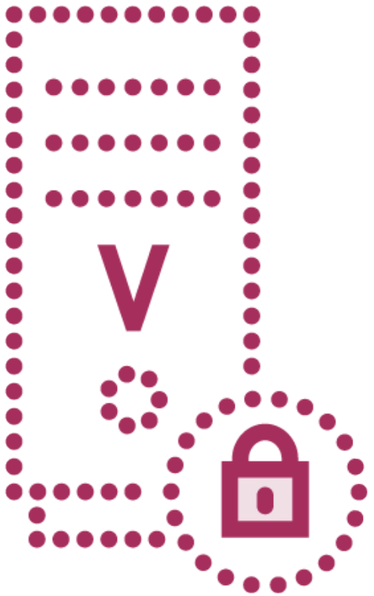
Virtualization Options:

Cisco VIRL

GNS3

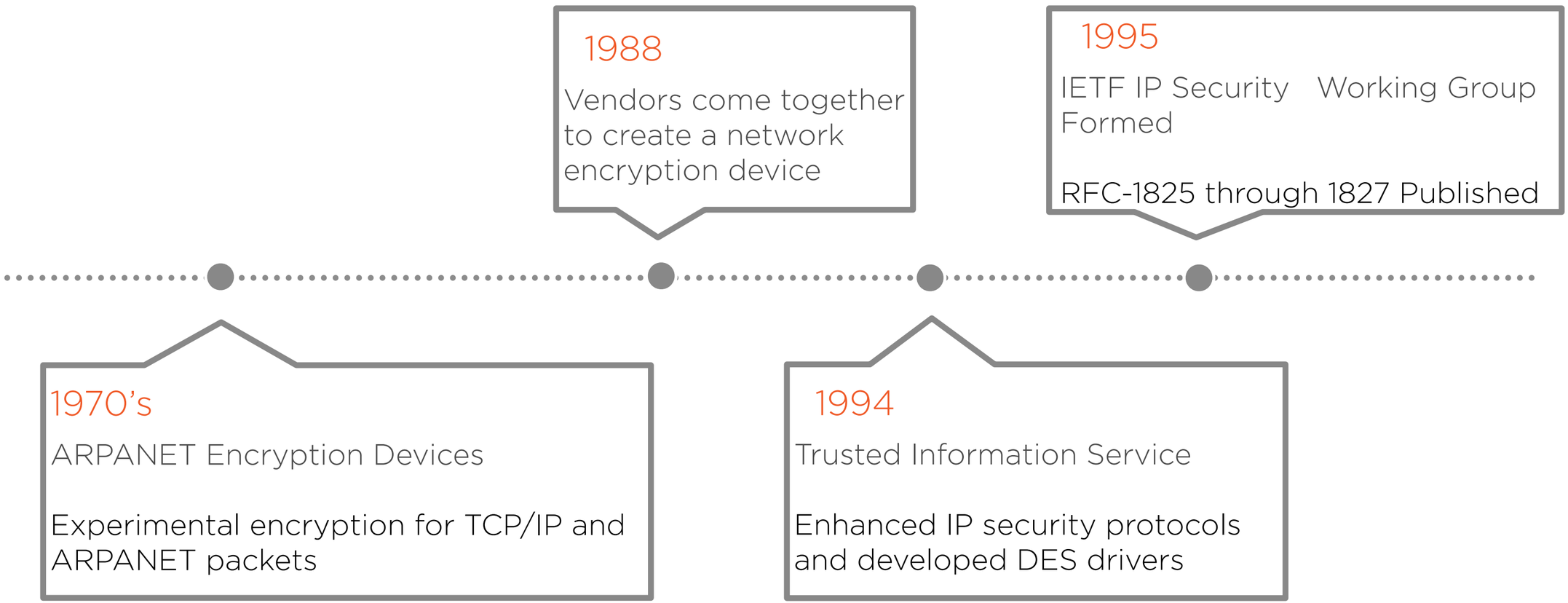
EVE-NG

Virtual Box



What Is IPsec?

Short IPsec History



IPsec Information

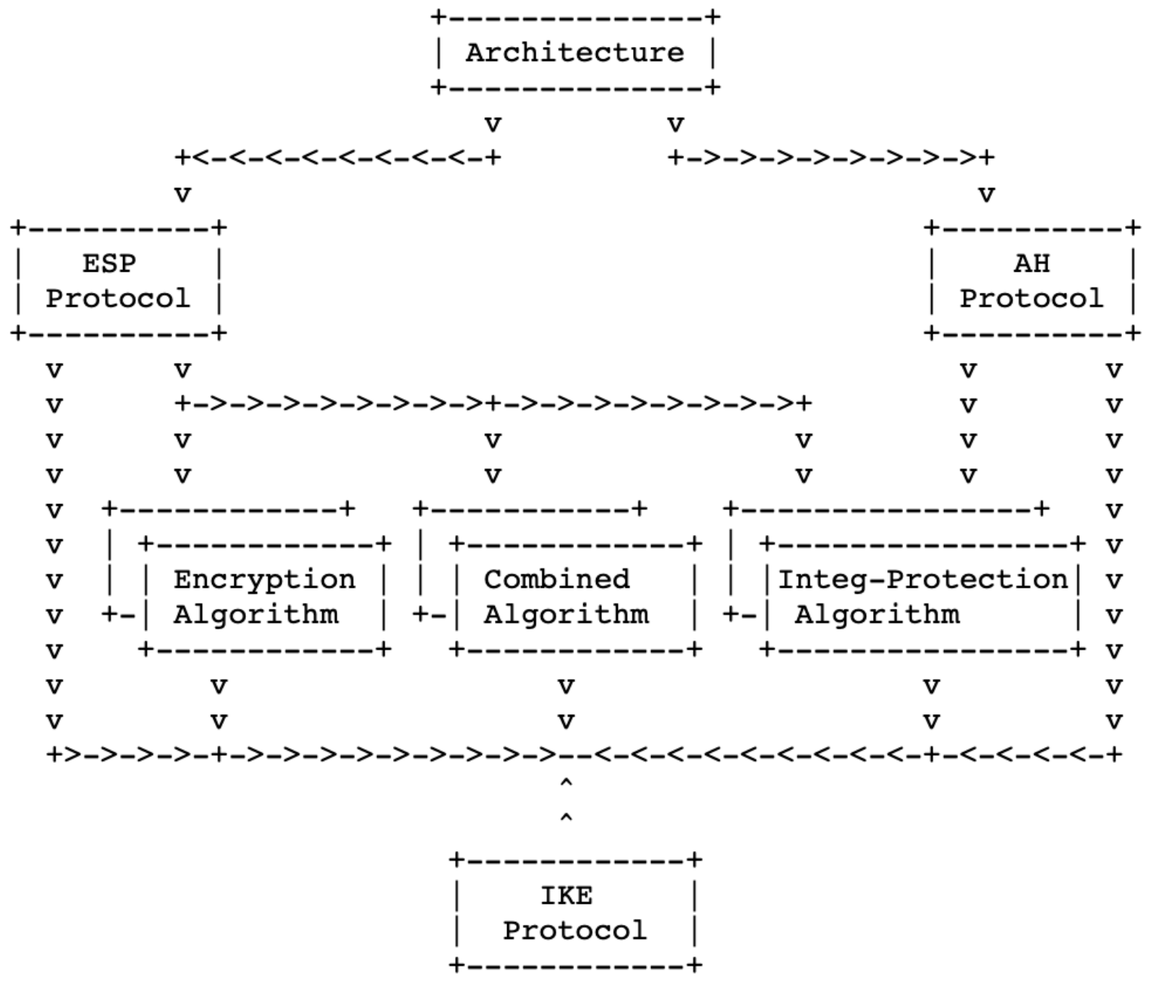
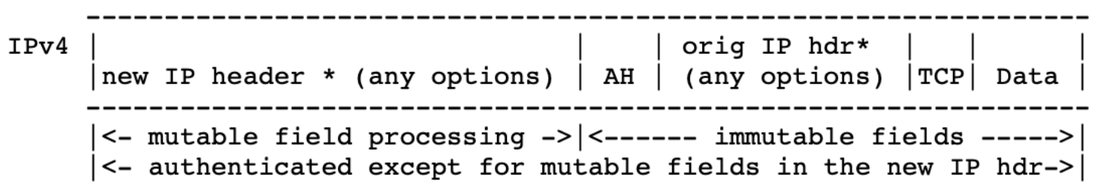


Figure 1. IPsec/IKE Document Interrelationships

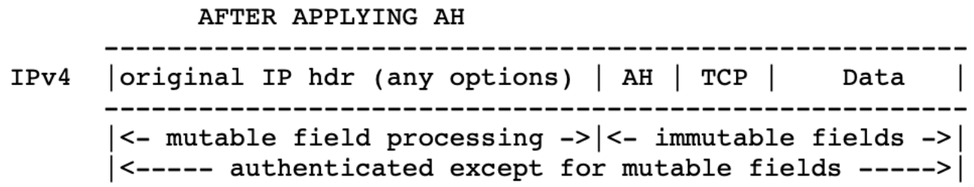
IPsec Datagrams

AH Tunnel Mode



ESP Tunnel Mode

AH Transport Mode



ESP Transport Mode

Why IPsec?

Attack Mitigation

Data Corruption

Theft

Replay Attacks

Eavesdropping

CIA Triad

The combination of the principles of confidentiality, integrity, and availability that must be maintained to ensure an adequate security posture for organizations.

IPsec RFCs

RFC 6071 (IP Security and Internet Key Exchange Document Roadmap)

Summary

Course introduction and overview

What is IPsec?

Why use IPsec?

RFCs

Lab exploration