

TURMOIL VPN PROCESSING

27 October 2009

The overall classification for this brief is: [TOPSECRET//COMINT//REL TO USA, FVEY]



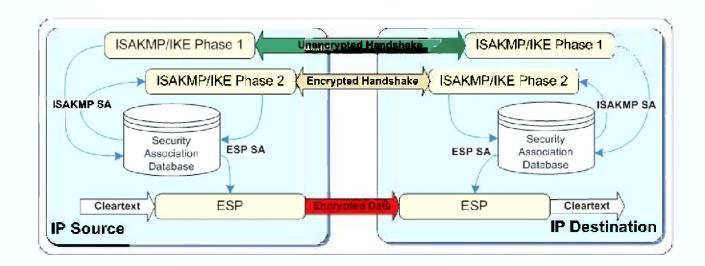
- VPN Technology Overview
- Dataflows and Interfaces
- LPT Implementation
- Metrics



Overview - VPN Mission Opportunity

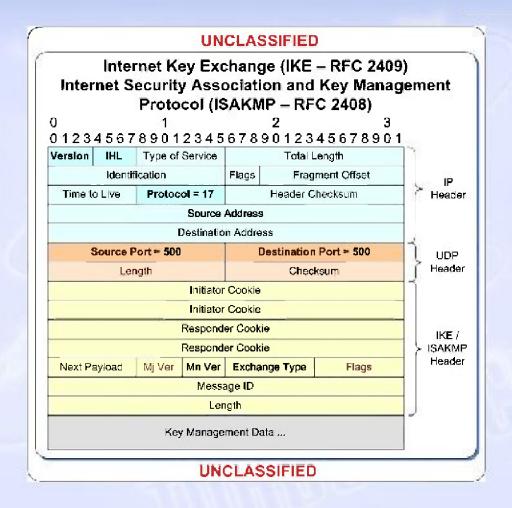
(S//SI//REL) Exploit Virtual Private Network (**VPN**) communications that use IP Security (**IPsec**) algorithms and protocols:

- (U) ISAKMP Internet Security Association and Key Management Protocol (RFC2407, RFC2408) provides an authentication and key exchange framework.
- (U) IKE Internet Key Exchange (RFC2409) provides authentication and key exchange mechanisms.
- (U) ESP Encapsulating Security Payload (RFC2406) provides traffic confidentiality (encryption) and optional integrity protection.
- (U) AH Authentication Header (RFC2402) provides integrity protection that includes IP Header.
 Sometimes AH is used to wrap ESP for additional integrity.

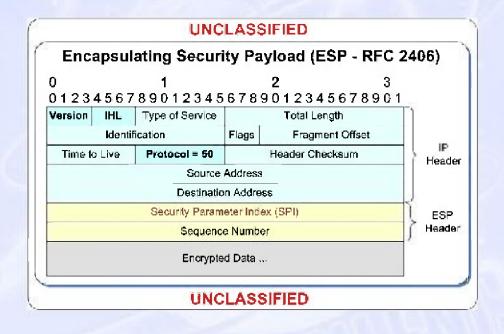




IKE-ISAKMP Protocol

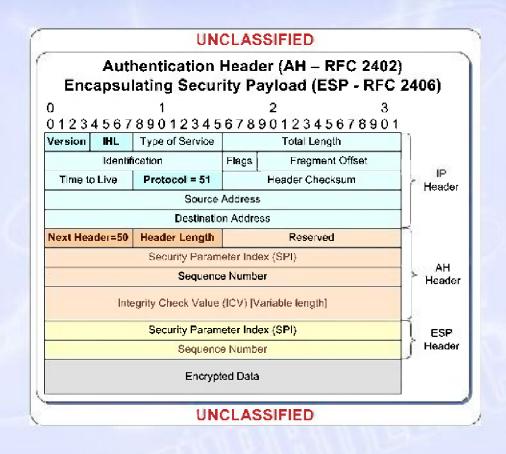


ESP Protoco k-13-3-n.pdf, Blatt 5



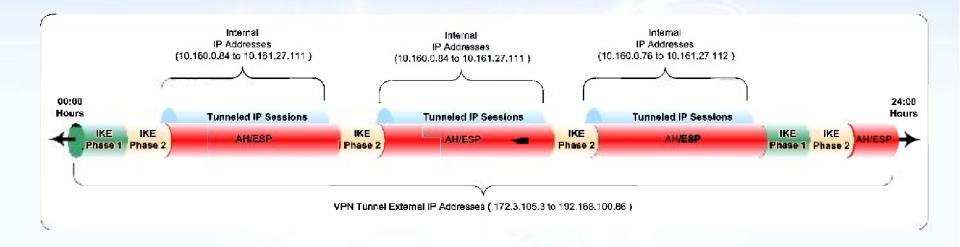


AH-ESP Protocol





Overview - VPN Psec Collection

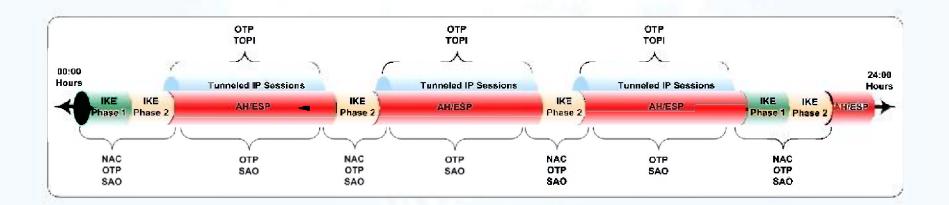


- (TS//SI//REL) Collection requires dwell time to capture IKE associated with ESP
- (TS//SI//REL) Collection requires *link diversity* to capture IKE associated with ESP (S//SI//REL) There is no guarantee that IKE and ESP will use the same link.
- (S//SI//REL) Collection requires multiple selectors to target external and tunneled sessions
 (S//SI//REL) VPN Tunnel External IP Addresses To Target Decryption
 (S//SI//REL) Strong Selectors on Internal IP Links To Target VPN Content



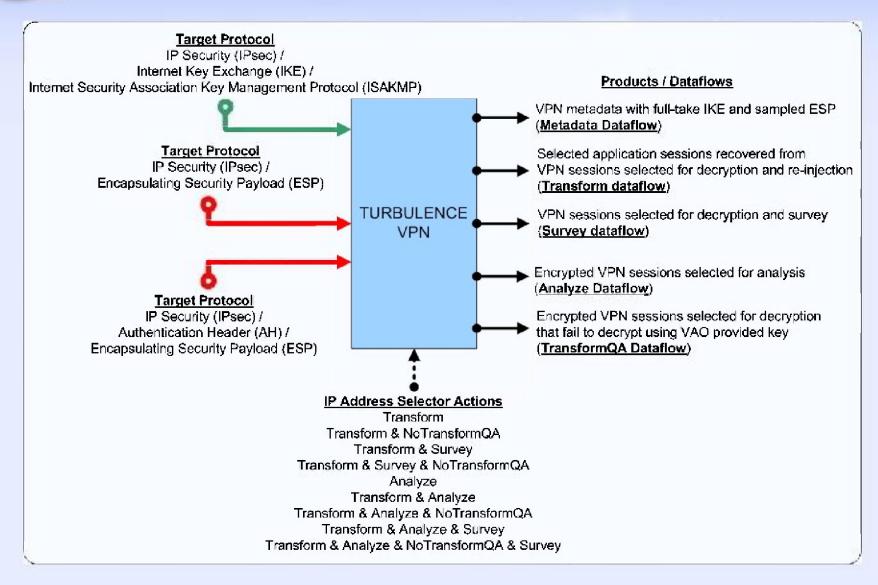
Overview - Customer Needs

Customer	Functions	Needs	
SIGINT Analyst (TOPI)	•Target and Analyze Traffic •Report SIGINT	Target IDs, Target Links, Target ValueUnencrypted Targeted Traffic	
Network Analysis Center (NAC)	Identify target VPN'sReport VPN Target IDs and Links	•VPN IKE and ESP Metadata	
Office of Target Pursuit (OTP)	•Search and survey for VPN's of interest •Report VPN Traffic Intelligence Value	VPN IKE and ESP MetadataVPN Encrypted SurveysVPN Unencrypted Surveys	
Systems Analysis Office (SAO)	Identify VPN TechnologiesIdentify VPN VulnerabilitiesSupport VPN Exploitation	VPN IKE and ESP MetadataVPN Encrypted SurveysVPN Decryption Quality	



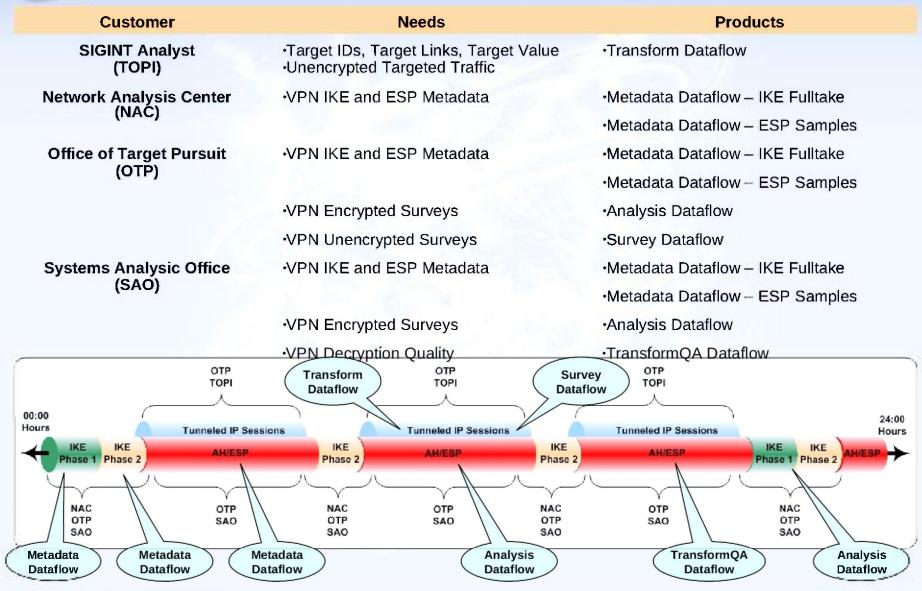


Overview - VPN Products





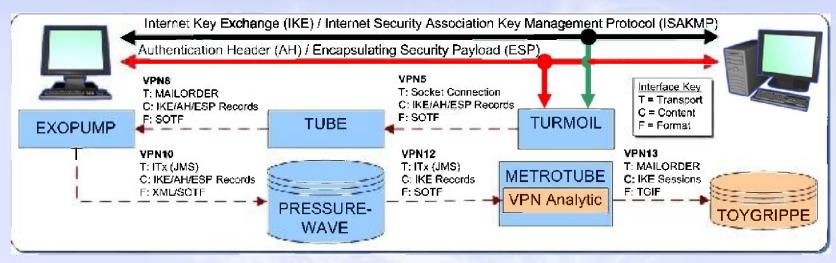
Overview - Needs and Products





Dataflows and Interfaces - Metadata

(Classic)

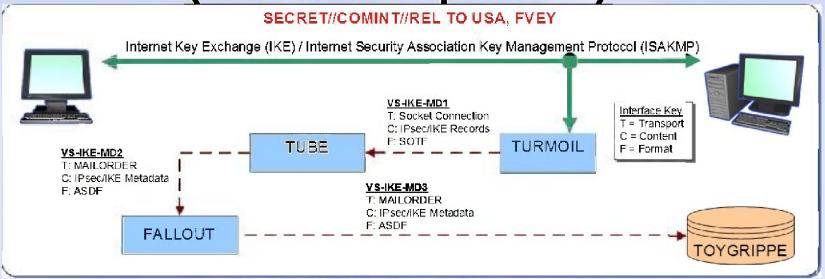


- (S//SI//REL) VPN IKE/ISAKMP Metadata in TOYGRIPPE is full-take
- (S//SI//REL) VPN ESP Metadata Sessions in PRESSUREWAVE is sampled (1/16th)
- (S//SI//REL) <u>VPN AH/ESP Metadata Sessions</u> in PRESSUREWAVE is **sampled** (1/16th)



Dataflows and Interfaces - IKE Metadata

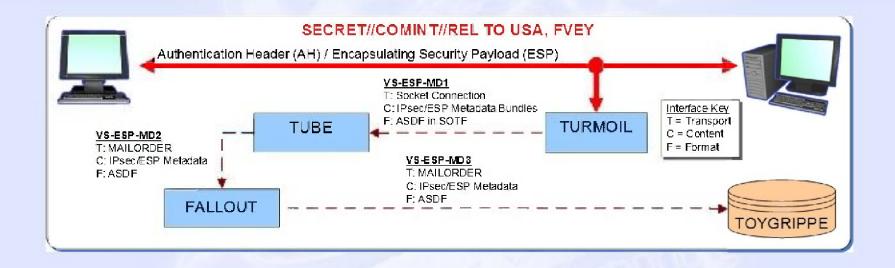
(New and Improved!)



- (S//SI//REL) <u>VPN IKE/ISAKMP Metadata</u> in TOYGRIPPE is *full-take*
- (S//SI//REL) VPN ESP Metadata Sessions in PRESSUREWAVE is sampled (1/16th)
- (S//SI//REL) VPN AH/ESP Metadata Sessions in PRESSUREWAVE is sampled (1/16th)

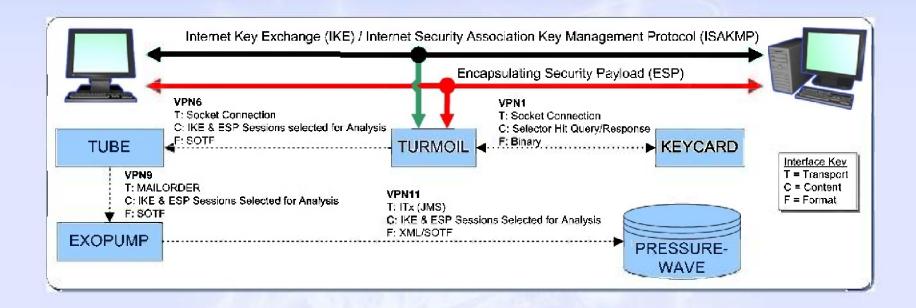


Dataflows and Interfaces - ESP Metadata





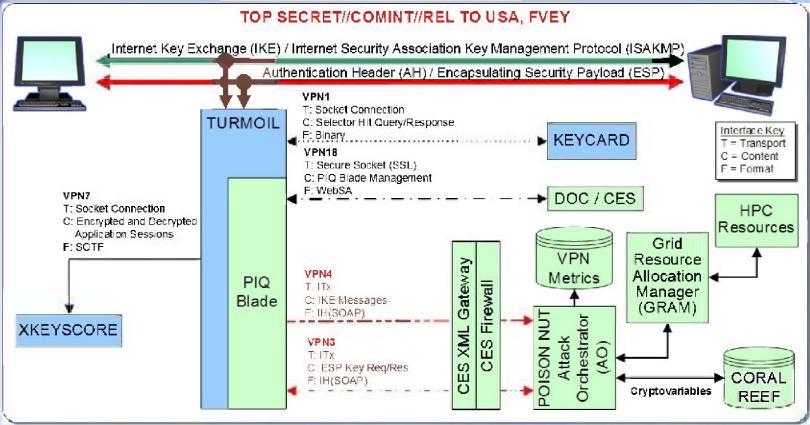
Dataflows and Interfaces - Analyze



- (U//FOUO) KEYCARD IP Target Action must be ANALYZE
- (U//FOUO) Full-take of IKE/ESP Sessions.
- (U//FOUO) No Analytic at this time



Dataflows and Interfaces - Survey



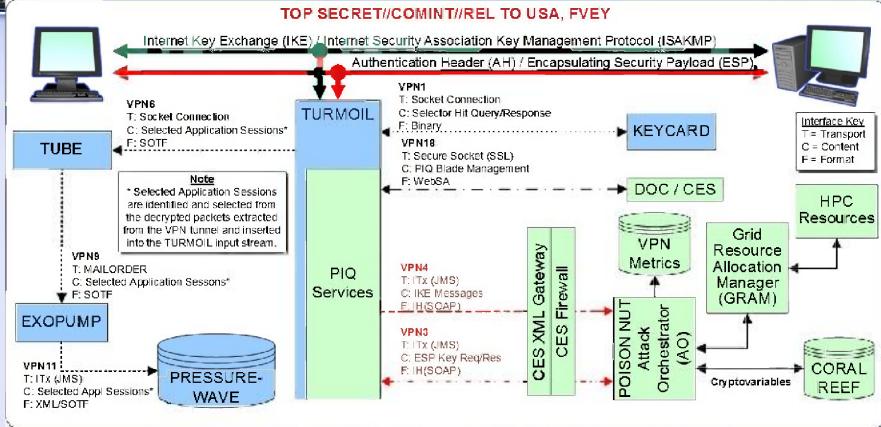
- (U//FOUO) KEYCARD IP Target Action must be <u>TRANSFORM</u> & <u>SURVEY</u>
- (TS//SI//REL) Candidate Sessions for Decryption include BME:

(TS//SI//REL) Decrypted Sessions include BME:

vpnID ≠ "08000000-0000-0000-0000-00000000001"



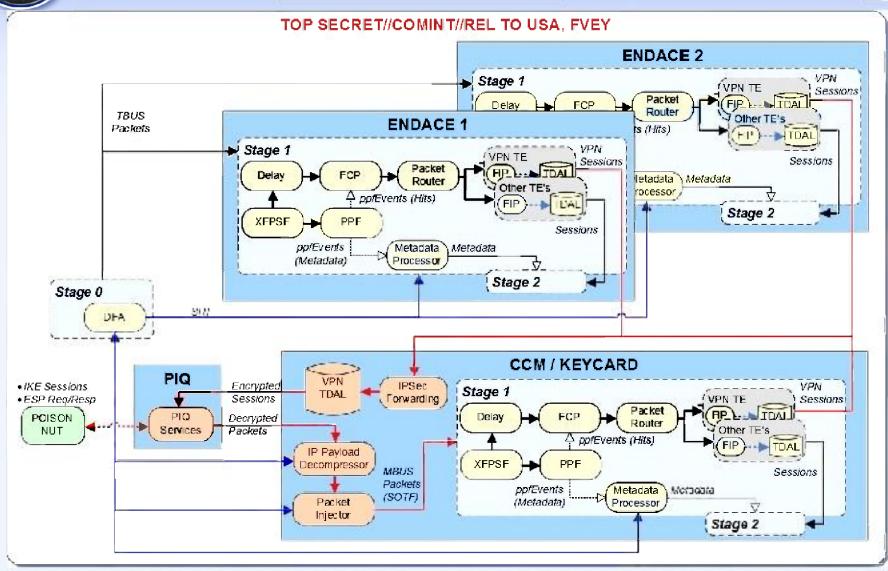
Dataflows and Interfaces - Transform



- (TS//SI//REL) PIQ Blade provides PIQ-Services, PICARESQUE ECI Compartmented
- (TS//SI//REL) <u>Transform</u> is Sanitization of <u>Decrypt</u>
- (S//SI//REL) VPN AH/ESP Session Transform capability is not available in Spin 12
- (U//FOUO) KEYCARD IP Target Action must be TRANSFORM
- (TS//SI//REL) Decrypted sessions have BME vpnID ≠ "08000000-0000-0000-0000-000000000001"

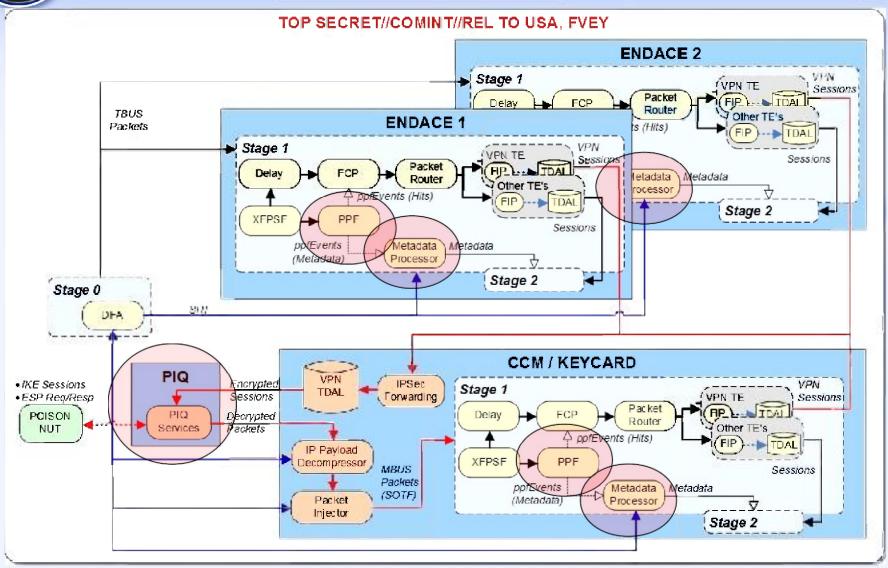


VPN on De MT A ek-13 Podf, Tatt 17





VPN on Del A ek-13 Pdf, Tatt 18





Sample stats 4-22 Oct 2009

System	KeyRequests	KeyResponses	KeyNotRecovered	Packets Decrypted
MHS_DEV	8076	0	0	0
MHS_LIVE	26501	12200	0	8041883
MHS_LPT	1725	0	0	0
SMK6	43087	4755	0	1413532



IKE Metadata Sequence

