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Analytic Challenges from Active-Passive Integration

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DERIVED FROM: NSA/CSS Manual 1-52, Dated: 20070108, Declassify On: 20320108

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Dated: 20070108
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Define shaping, please?

- Working definition: Active implant copies traffic and directs a copy past a passive collector
  - Issues arise when collector is also processing passive traffic simultaneously
- Current: Implants on network infrastructure devices, not user endpoints
- Two types:
  - Physical/link layer:
    - an implant copies and shapes an entire link (E1, STM1) without selection; passive midpoint does selection
  - Network layer:
    - an implant performs *targeted* copying based on IP or application parameters and exfils only the targeted traffic; passive collector may or may not do further selection.

Examples

- Link layer: BRAVENICKEL project (optical Muxes)
  - Copied link is not disguised, just routed on an unused layer 2 path that a passive collector can monitor
  - Selection happens in the passive collector
- Network layer: APEX for HAMMERMILL (routers)
  - Router is tasked to select and exfil targeted traffic (perhaps all of a particular protocol)
  - Exfil is disguised (“munged”, encrypted) to avoid detection
  - Passive collector looks for IP source/destination address in order to detect the traffic
  - If further selection/processing is to be done in collector, the exfil must be “unwrapped” (unmunged, decrypted)
  - *Exfil can be directed to passive or to TAO by changing the destination address*

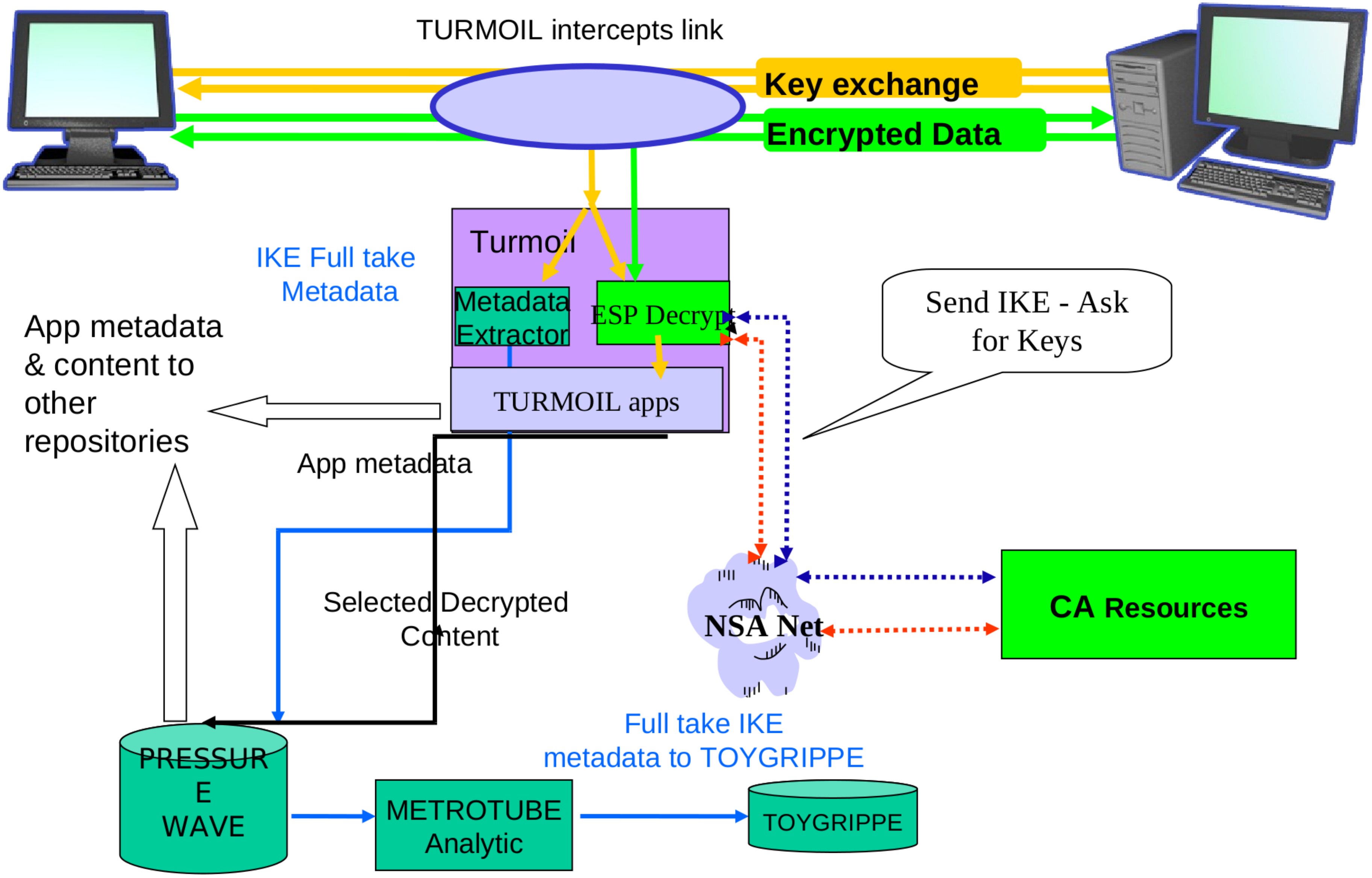
So Why does Jane the Analyst care?

- TAO implants have collection parameters that are put on exfil received thru TAO backend
  - case notation, SIGAD, PDDG, classification/legal authority
- The passive collector has another set of these:
  - Site has a SIGAD, collector has a PDDG, the link it sees the traffic on has a case notation, and the access has a classification floor/legal authority
- Current backend repositories and presenters weren’t designed to expect TWO of these!!!
- Which gets put on the data??? And where?
- And (drum roll) … how do we solve this problem CONSISTENTLY across the enterprise?

Example: APEX IPSEC VPN collection

- IPSEC VPN:
  - First packets between the devices establish the parameters and encryption keys (IKE)
  - Following this setup, “content” packets are encrypted and transmitted packet by packet (ESP)
  - CES wants the IKE exchange and maybe the ESP (content)
- TURMOIL passive capability:
  - Passive capability to detect IKE and ESP
  - Metadata record produced for *every* IKE exchange
  - IKE for *targeted* VPN forwarded directly to CES database
  - For *targeted* VPN, real-time decryption is performed IF CES can provide a key in time
  - Decrypted IP traffic is processed by TURMOIL apps for normal selection (VoIP, webmail, etc, etc)

TURBULENCE Pre-APEX VPN Exploitation



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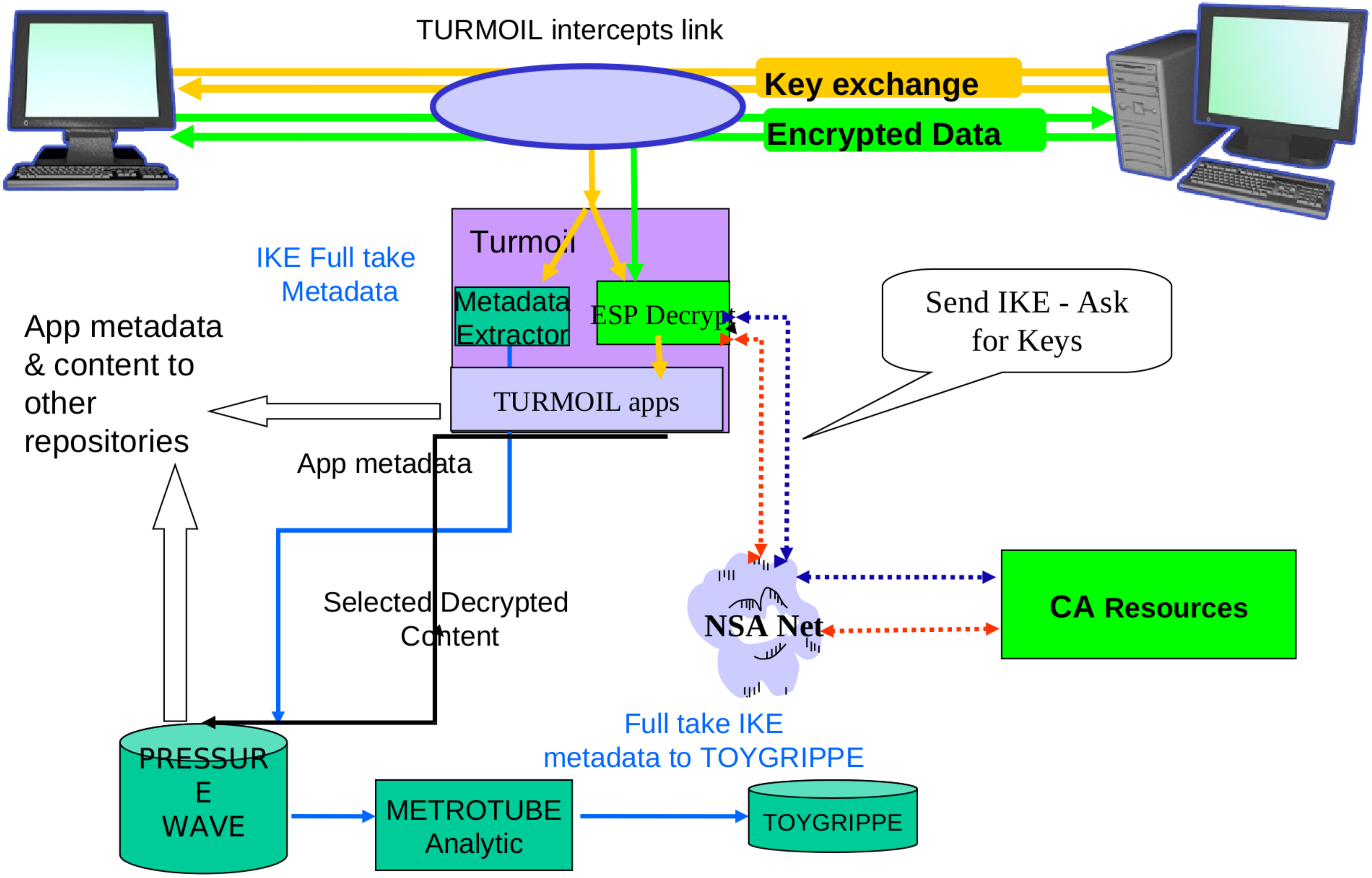


TURMOIL intercepts link

Key exchange

Encrypted Data

Turmoil

Metadata Extractor

ESP Decrypt

TURMOIL apps

IKE Full take Metadata

App metadata & content to other repositories

App metadata

Send IKE - Ask for Keys

NSA Net

CA Resources

Selected Decrypted Content

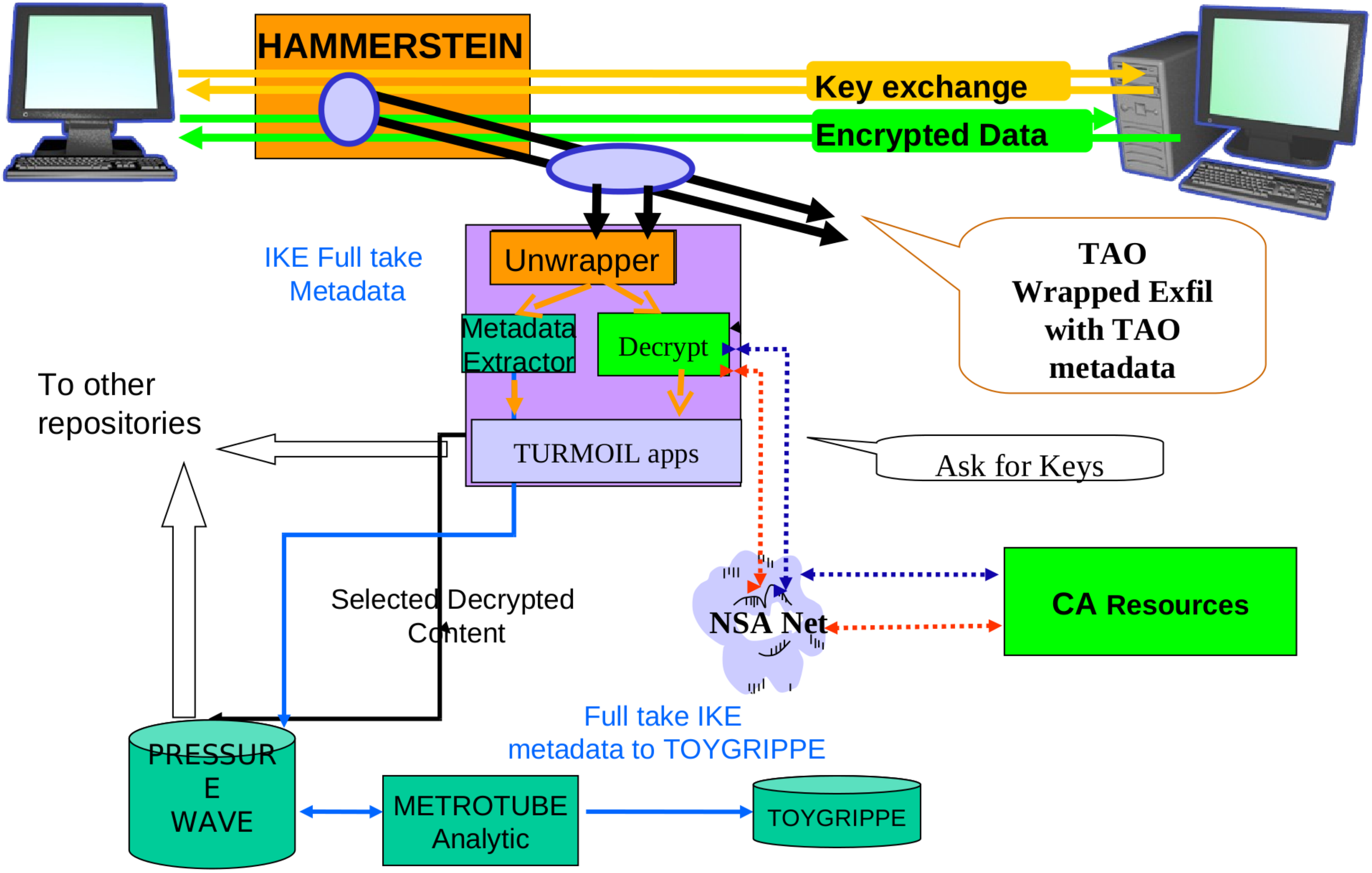
Full take IKE metadata to TOYGRIPPE

PRESSUR E WAVE

METROTUBE Analytic

TOYGRIPPE

TURBULENCE APEX VPN Exploitation



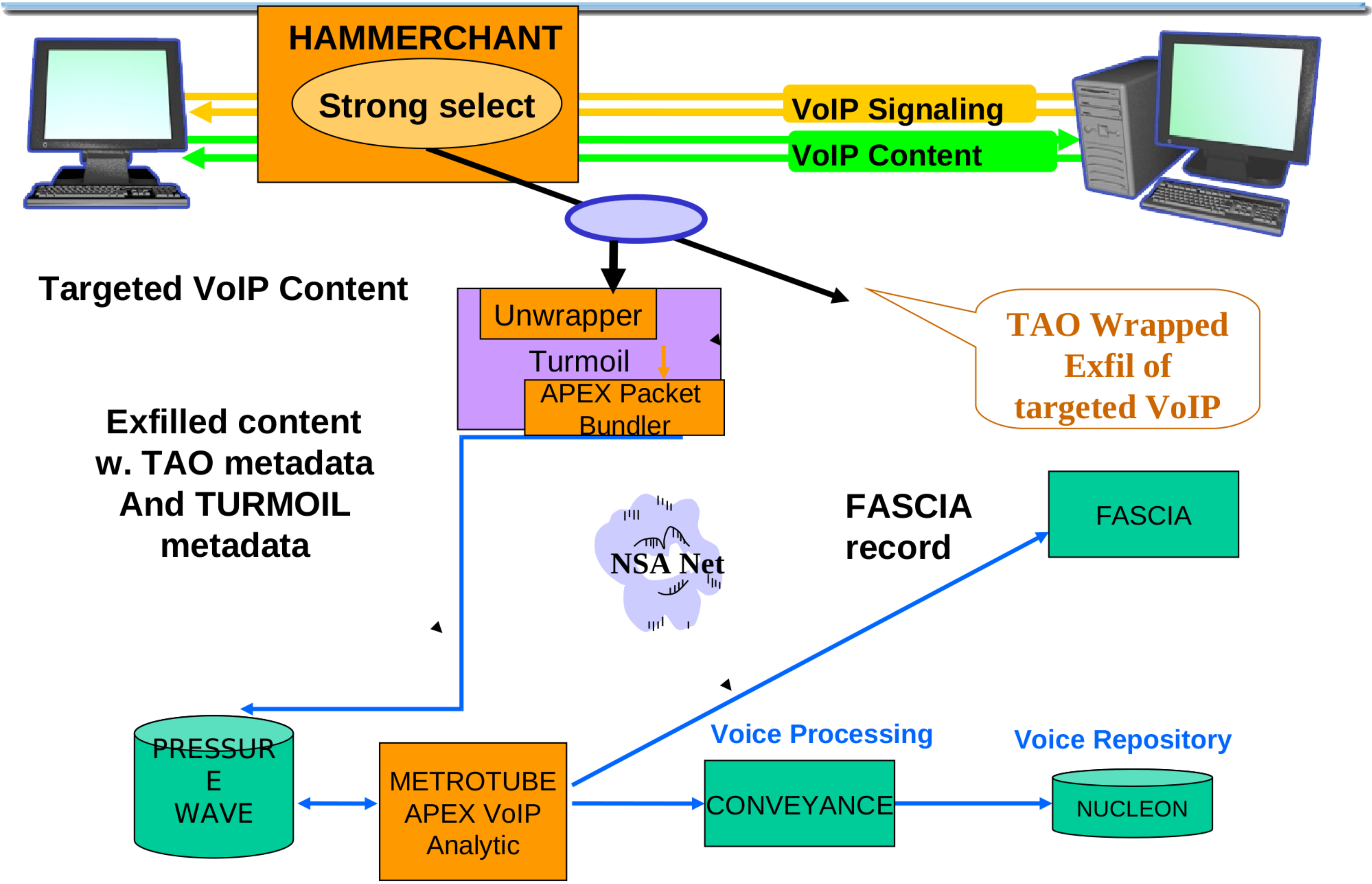
Sounds great, but…

- Now app streams (VoIP, webmail, etc) extracted from the tunnel carry two case notations
- Which gets put into metadata records?
- Both can be carried to PWV – but what happens after that?
- Not to mention…
  - Metadata records about VPN being stored in TOYGRIPPE
  - CES database storing IKE exchange

Example: TOYGRIPPE metadata record

- Current fields:
  - caseNotation – searchable field
  - sourceID – “The SIGAD of the site that provided the data”
- APEX proposed extension: add
  - Agent CaseNotation
  - Agent ID (UUID)
  - Passive CaseNotation
- Which caseNotation goes into searchable field?
  - Passive records won’t have the APEX block
  - TAO-collected records (returned via TAO, not passive) won’t have the APEX block

APEX VoIP Exploitation



HAMMERCHANT

Strong select

VoIP Signaling

VoIP Content

Targeted VoIP Content

Unwrapper

Turmoil

APEX Packet Bundler

TAO Wrapped Exfil of targeted VoIP

Exfilled content w. TAO metadata And TURMOIL metadata

NSA Net

FASCIA record

FASCIA

PRESSUR
E
WAVE

METROTUBE APEX VoIP Analytic

Voice Processing

CONVEYANCE

Voice Repository

NUCLEON

Shaping is happening now

- Operational (or coming soon) shaping:
  - HAMMERSTONE - TCP traffic to FORNSAT, soon SSO
    - No TURMOIL involvement
  - BRAVENICKEL – one operational flow – past SSO site
  - APEX – VPN metadata by end of June
- *Independent* decisions being made about how to stuff the double metadata into legacy databases

So what is your job here?

- How do you want to identify the source of your data?
  - Does CaseNotation still make sense in this new world?
- You need to drive processes, systems, & databases toward a CONSISTENT answer
- Transformed systems and tools (METAWAVE, Marina, etc.) need to be designed to do more than accommodate
  - do “the right thing” (whatever you the analysts think that is)
  - Let me guess – you want everything, don’t you?

Questions?

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