Executive Summary

- Data in the air
  - Snatched by antennas
  - Antennas not protected
  - Antenna Farmers not all spooks
- Data pushed from antennas to Vault
  - Dropped off onto classified network
  - Data cannot come back up from vault
- Data packaged and pushed from vault to The Man
  - The Man wants limited reach into his clubhouse
  - Data becomes classified as it mingles with other packets on the networks

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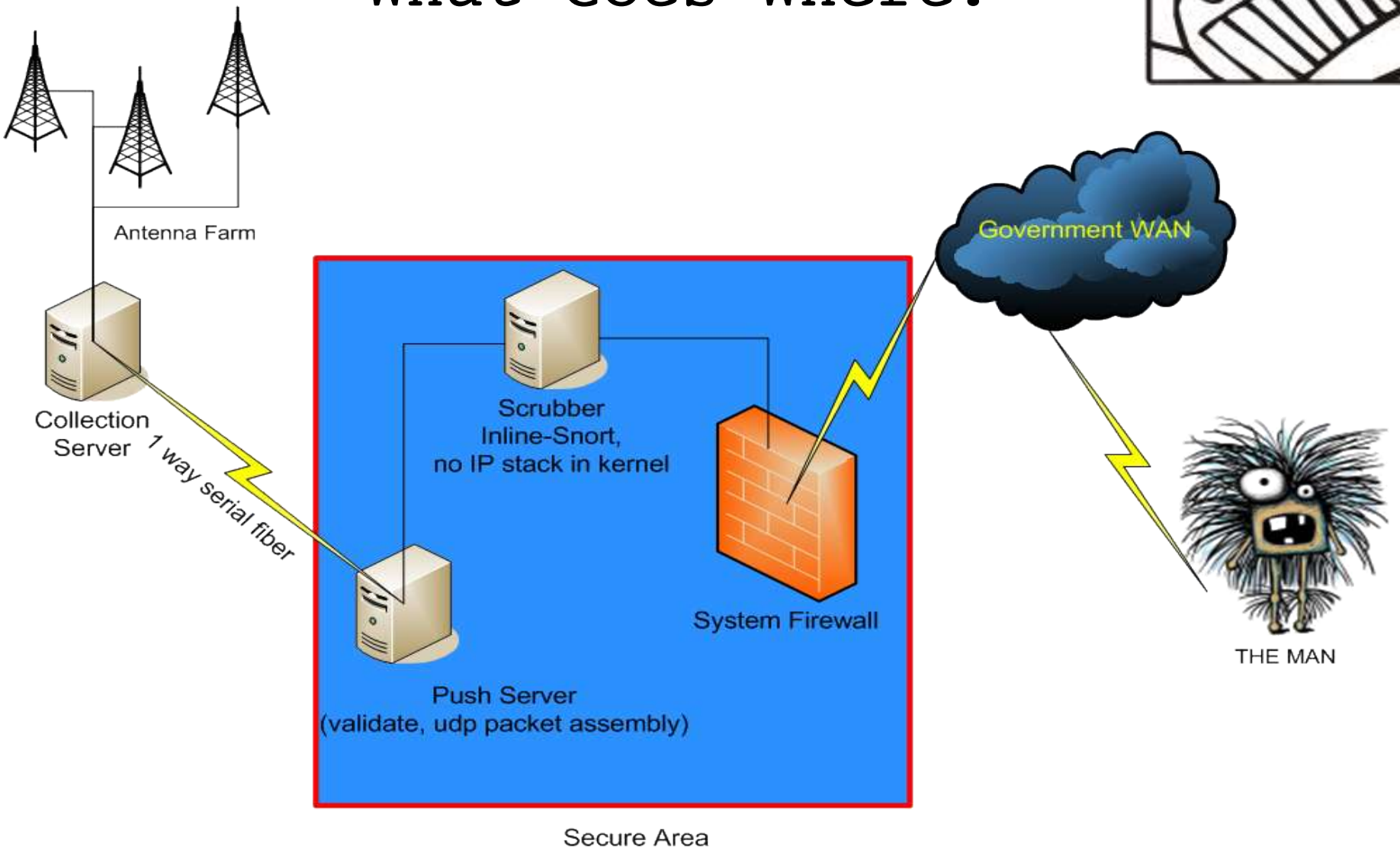
What Goes Where?



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Problem

- Antenna Farm administered by Engineers
  - Not all have a “need-to-know” for each apsect of project
  - Antennas in unsecured location
  - Data collects unclassified
- Collector (Push) system requires *integrity*
  - System is unclassified
  - Must guarantee it has not been tampered with
  - Access to the console requires physical admittance to vault
- Data scrubber requires *integrity*
- Data scrub box is gateway to classified networks
  - Passes acceptable packets onto network through firewall
  - Logs and drops unacceptable packets

Requirements

- Collects need to be as *realtime* as possible
- Must ensure that *no* sensitive data taints the unclass portions
  - Antennas, Push/Packaging system, and internal scrub box are all unclassified
  - Once collated with other downstream data, the collects become sensitive by association
- Only data limited to the collects is allowed to enter the government network side
- Did we mention no data driftback is allowed?
  - Government *very* emphatic on this point
- System must provide extensive test evidence of proper performance before allowed initial run
  - Tedious proof of concept scenarios completed and documented

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Solve The Issues

- Not all involved cleared for access to highest level of data
  - Keep uncleared and DoD personnel out of the vault
  - Ensure data flows in one direction only
- Ensure no data tainting takes place on UNCLASSIFIED systems
  - One-way fiber link between antennas/collect system and packager
  - Inline_Snort system between push system and classified network
- Ensure integrity of packaging system
  - Only accept data from one MAC address on one interface
  - Limit number of accounts on system
  - Highly regulate and document all configuration changes
- Ensure integrity of packet scrubber
  - No IP stack in the operating kernel

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Solve The Issues (Cont'd)

- Limit data entering the far-end network to project data only
  - Scrubber ruleset severely limits what passes through
  - Firewall rules further filter what travels to far-end

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Data Flow Mitigations

- Signal Of Interest intercepted by Antennas
- Antennas' collection system passes the data down to the bespoke data packaging application via one-way fiber transmission
  - Ethernet to Fiber transceivers used with only the receive side connected
  - Beyond this segment of the hardware requires
    - Intel clearances
    - Physical access to the vault
- Package system crafts custom udp packet and passes it along
  - Inserts a numeric code in unused header segment???
  - Ensures data is uncorrupted and packages it for transport
  - Hands packets off to external interface of Inline_Snort system via crossover ethernet cable

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Data Flow (Continued)

- Packet scrubber decides whether or not to pass data onwards
  - Looks over header for numeric trigger
  - If trigger present data is passed out the other interface
  - If trigger not present packet is logged and dropped
- Firewall passes data *only* from classified scrubber interface over to government analysis station at far end
  - MAC filtering used to lower spoofing issues
  - Ruleset *only* passes data from Scrubber MAC to far-end analysis console
  - All other data logged and dropped by firewall

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Testing & Documentation

- Concept of Operations Plan required for approval prior to everything
- Once ConOps approved, Government wanted a Test Plan submitted
- After Test Plan approved, Government attended test run of system without far-end connectivity
  - Send unacceptable packet from foreign system to packager
    - Document rejection
  - Send unacceptable packet to scrubber
    - Document log and reject
  - Send packet back from far-end back to UNCLASSIFIED side
    - Document packet scrubber log and reject
  - Document firewall refusal to communicate with other systems
- Results written up/submitted for final approval of live run

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Credits

- Images
  - Boognish: © Ween <http://www.ween.com/>
  - The Man: © Kristen Ankiewicz <http://www.monsters.net/>
- OSS
  - Snort_Inline – Rob McMillen (Jed Haille introduced me to it.)
    - <http://snort-inline.sourceforge.net/>
  - Iptables/Netfilter – Harald Welte, Rusty Russell & The Netfilter Team
    - <http://www.netfilter.org/>

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