



*Honor the Past, Shape the Future*



# MHS Initiatives

## Maximizing our Access



Internet Development and Exploitation (INDEX)

Technical Director





# Optimizing the Traffic Fairy



*Working across the IC to enhance tools  
with the lessons we learn.*

- **ASPHALT** : *Collect it all*
- **BLACKTOP** : *Survey it all*
- **TARMAC** : *Process it all*
- **GTE / INDEX** : *Exploit it all*

#### MHS Environment

- 102 Satellites visible
- 56 Tasked satellites
- 178 Transponders (800 MHz)
- 51 GHz of Coarse BW
- 17 GHz of Occupied BW
- 8793 Signals
- Source: 2008 ROADBED Pull

*Building Prototypes to Help us “Learn by Doing”*



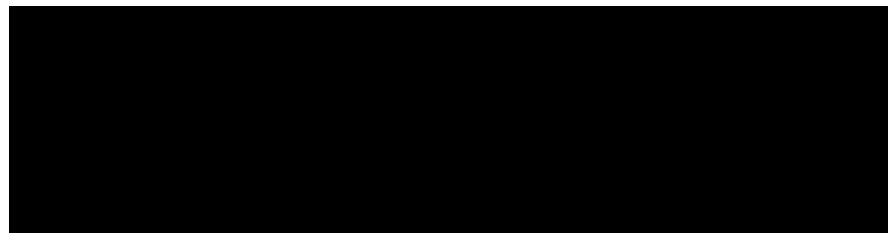
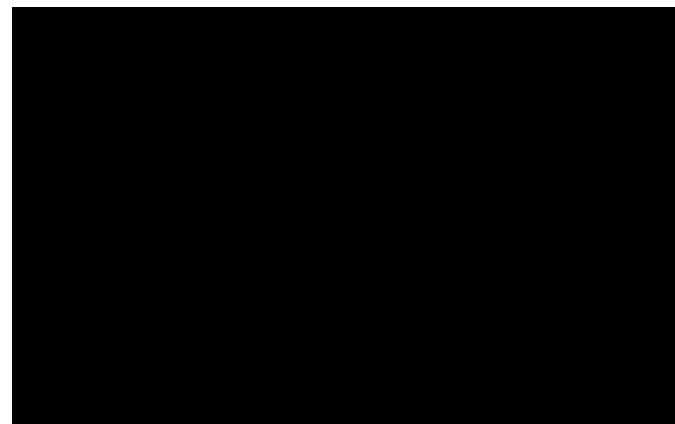
# ASPHALT : “Collect-it-all”



“Why Can’t We Collect All The Signals, All The Time? Sounds like a good summer homework project for Menwith!” - LTG Keith Alexander talking about FORNSAT during a 16 June 2008 visit to MHS

## ASPHALT Approach / Principles

- Focus on the middle 90%
- Attack the Bottlenecks
- Stress Scalability
- Experience to inform
  
- Minimize Complexity
  - Strong Use of Standards
  - Loosely Coupled Components
  - Simplified Deployments, Maintenance, and Operations
  
- Open, Service Oriented Architecture
  - “Best of Breed” component selection
  - Heterogeneous components
  
- Packetized Signal Distribution
  - Near lossless & distortion free distribution
  - Enables a “data center” based solution









# TARMAC: “Process-it-all”



ASPHALT, NOSEYPARKER, Torus antenna & new missions  
will produce more data than ever.

## *How can we scale up our access processing?*

TARMAC is a Study to use Special Source Access Techniques in the FORNSAT / OH Realm:

- Supports GCHQ’s OneIP Initiative
- Produces Single Line Records (SLRs) from MHS IP collection
- SLRs are sent to BLACKHOLE event database at GCHQ
- Query Focused Datasets (QFDs) are derived from this data to support analytic efforts

*It’s all about the metadata!*  
6,000,000 events / day





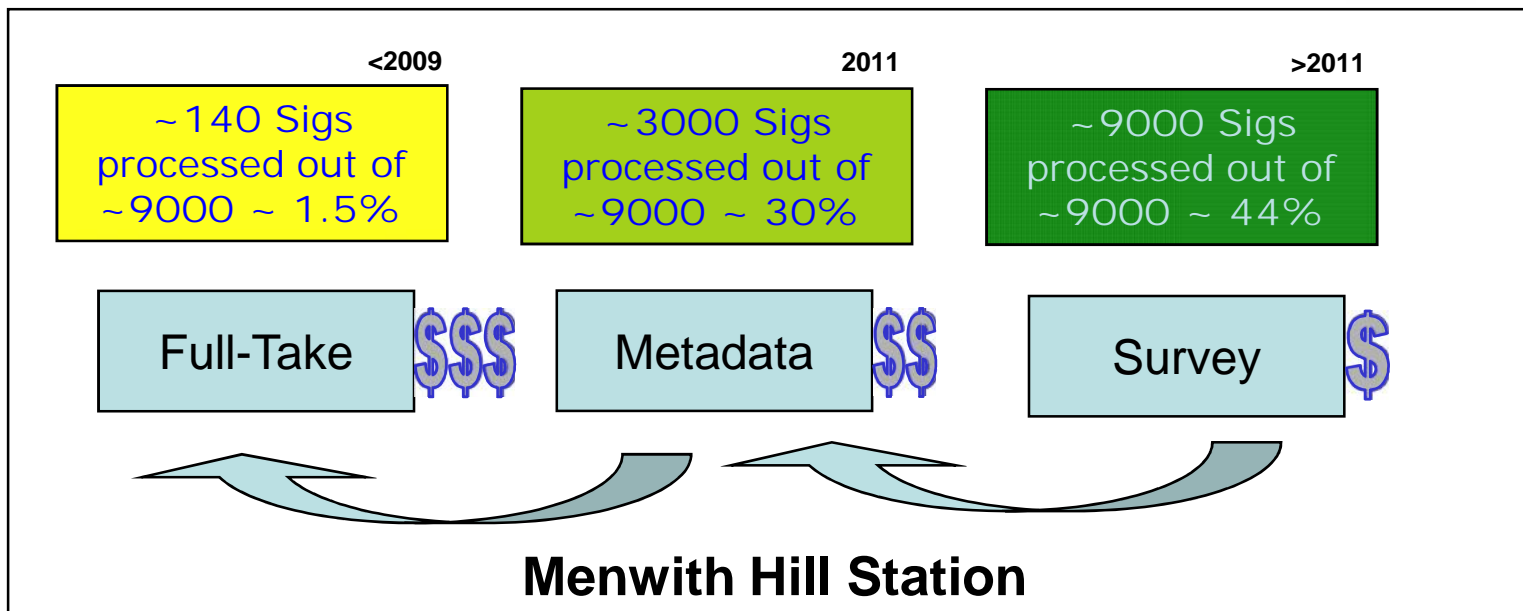
# GTE at MHS : *“Exploit it All”*



- Develop pioneering collection capability across the SIGINT community
- Established at MHS April 2010
- Increase value of MHS access
  - DNR data from NOSEYPARKER & Specials forwarded to Knowledge Bases
  - 175 MHS DNI links surveyed / day
- Protocol exploitation & development
  - Internet Application Protocol analysis
  - 80+ XKEYSCORE Signatures
  - Personal security products
  - Mobile internet applications



# Access - Challenges



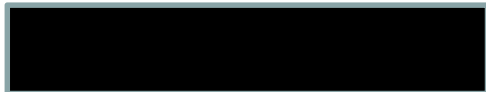
- Automatic promotion of data based on broad tasking authority
- If we can promote internally, why not across access?
- Need visibility of other accesses – does that include health and wealth?



# MHS Initiatives

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# Questions?



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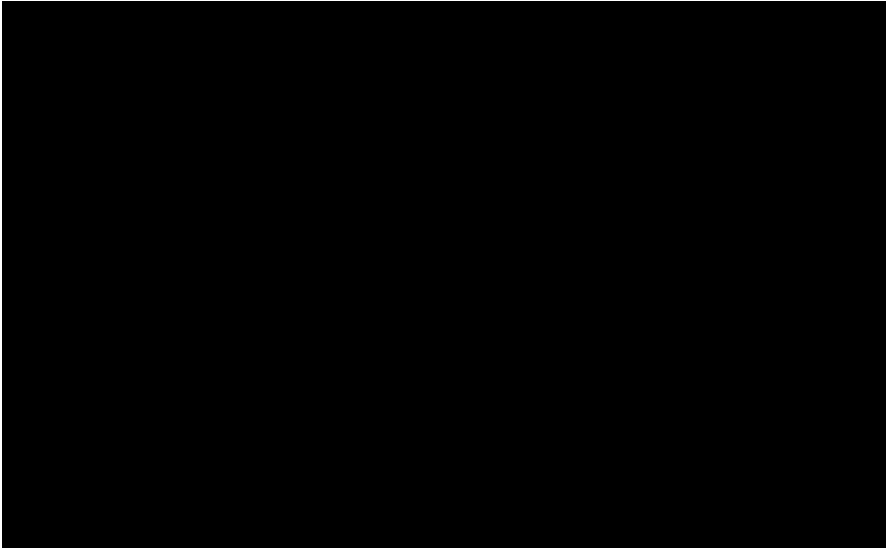
# What's Next for ASPHALT?

## **BASSQUEST Tech Transfer**

- NSA FORNSAT “Access-it-all” Architecture
- Radio service based on ASPHALT principles
- Yakima is the first scheduled deployment

## **Keep Improving the Prototype**

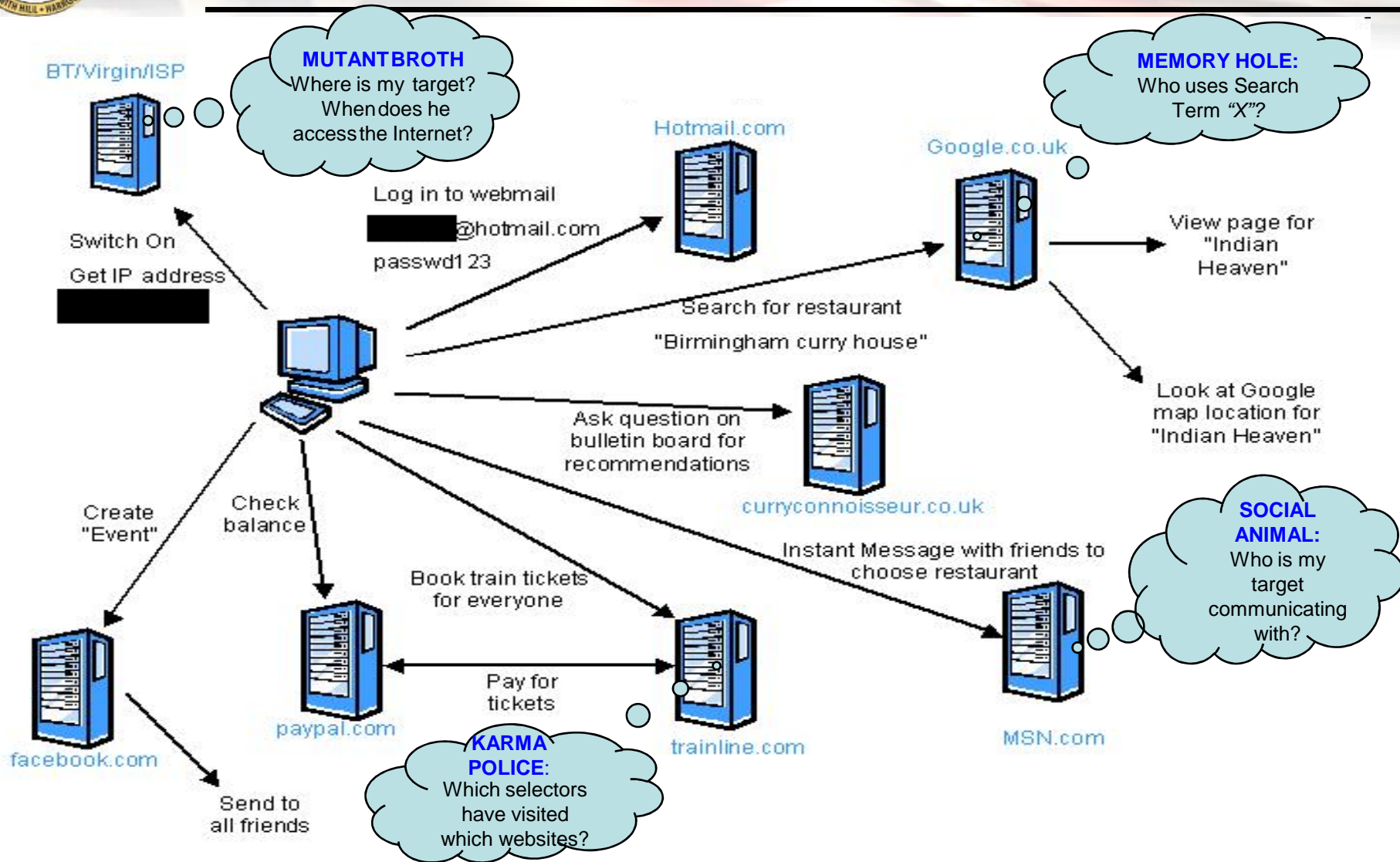
- Add more demodulators
  - R4 GNU Software radio
  - GRANDPIANO (Generic TDMA Architecture)
- Demonstrate cross-access support
  - NOSEY PARKER
  - Overhead
- Incorporate Geolocation Techniques
  - DIRNSA’s VSAT Geolocation Task
  - Coarse OH / FORNSAT Geolocation (FOGHORN)
  - APPARITION Collaboration



***BASSQUEST Architecture***



# Organizing a Night Out





# (U) Finding Targets with Metadata

