9th Annual

#OSDFCon

OPEN SOURCE DIGITAL FORENSICS CONFERENCE

Messaging App Forensics with Autopsy

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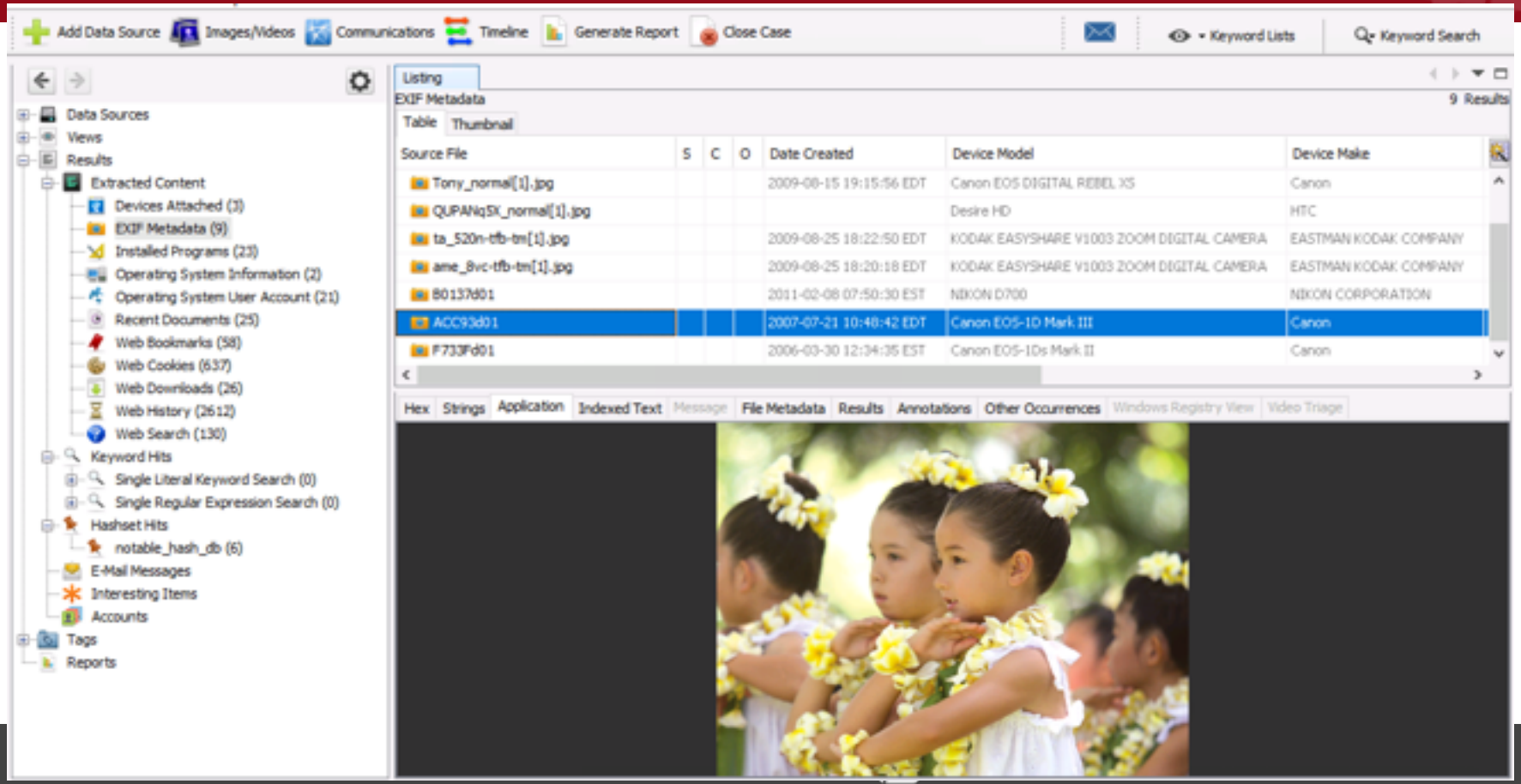
Motivation

Show users new features around messaging, email, and chats.

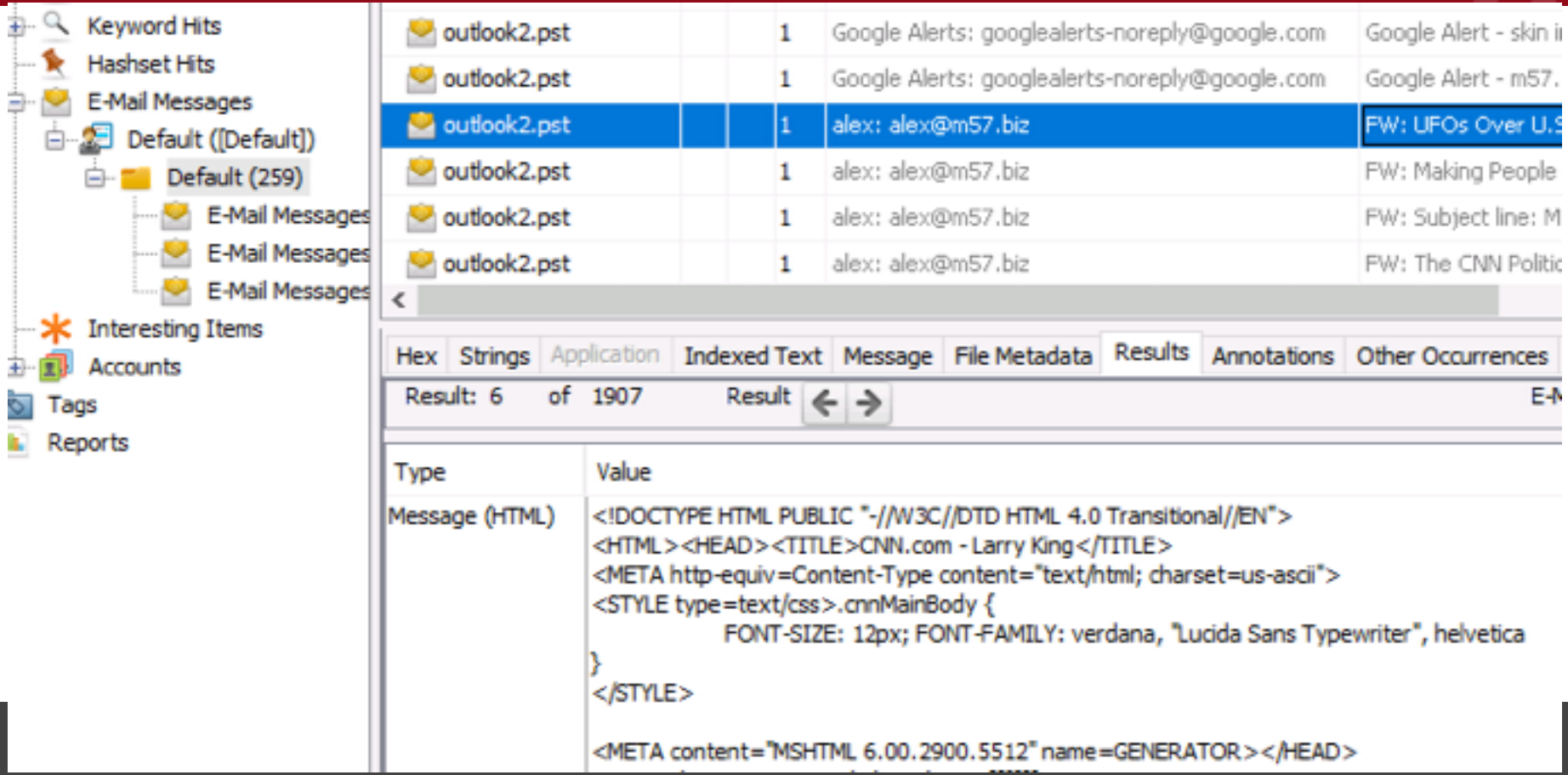
Show developers how to use the new infrastructure.

This work was all funded by DHS Science and Technology (S&T).

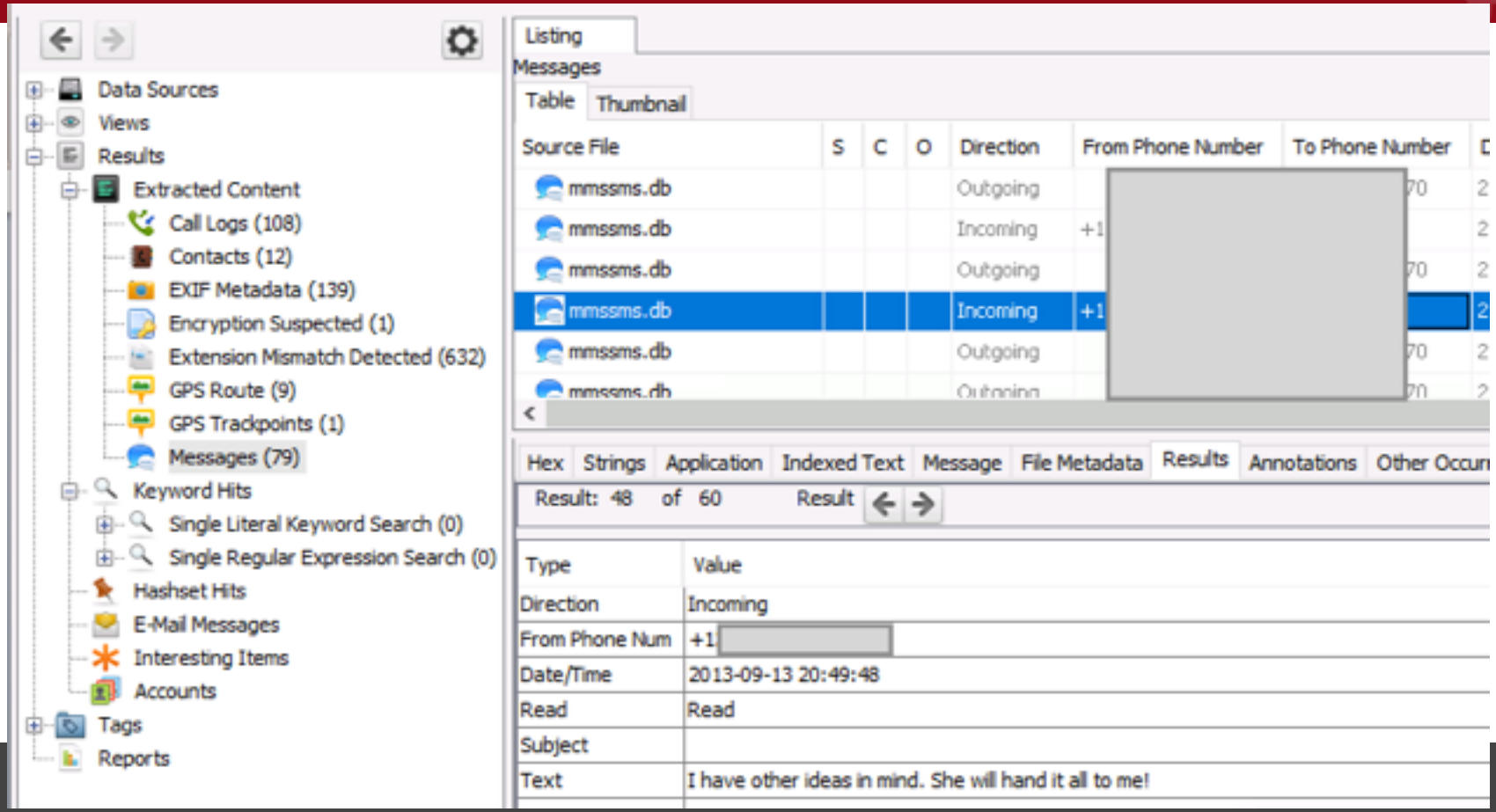
Main Autopsy UI



Email: The Old Way



SMS: The Old Way



Problem / Solution

Problem: Hard to sort through large amounts of messages

Why: Autopsy stores and displays things in generic ways so that it can support unknown data types. It's a general framework.

Solution: Store and display messages in more efficient ways.

What Questions Did We Focus On

Triage

- What are the most communicated with accounts?
- What kinds of media was this person sharing?
- What communication types was this person using?
- What were the most recent conversations?

Deep Dive:

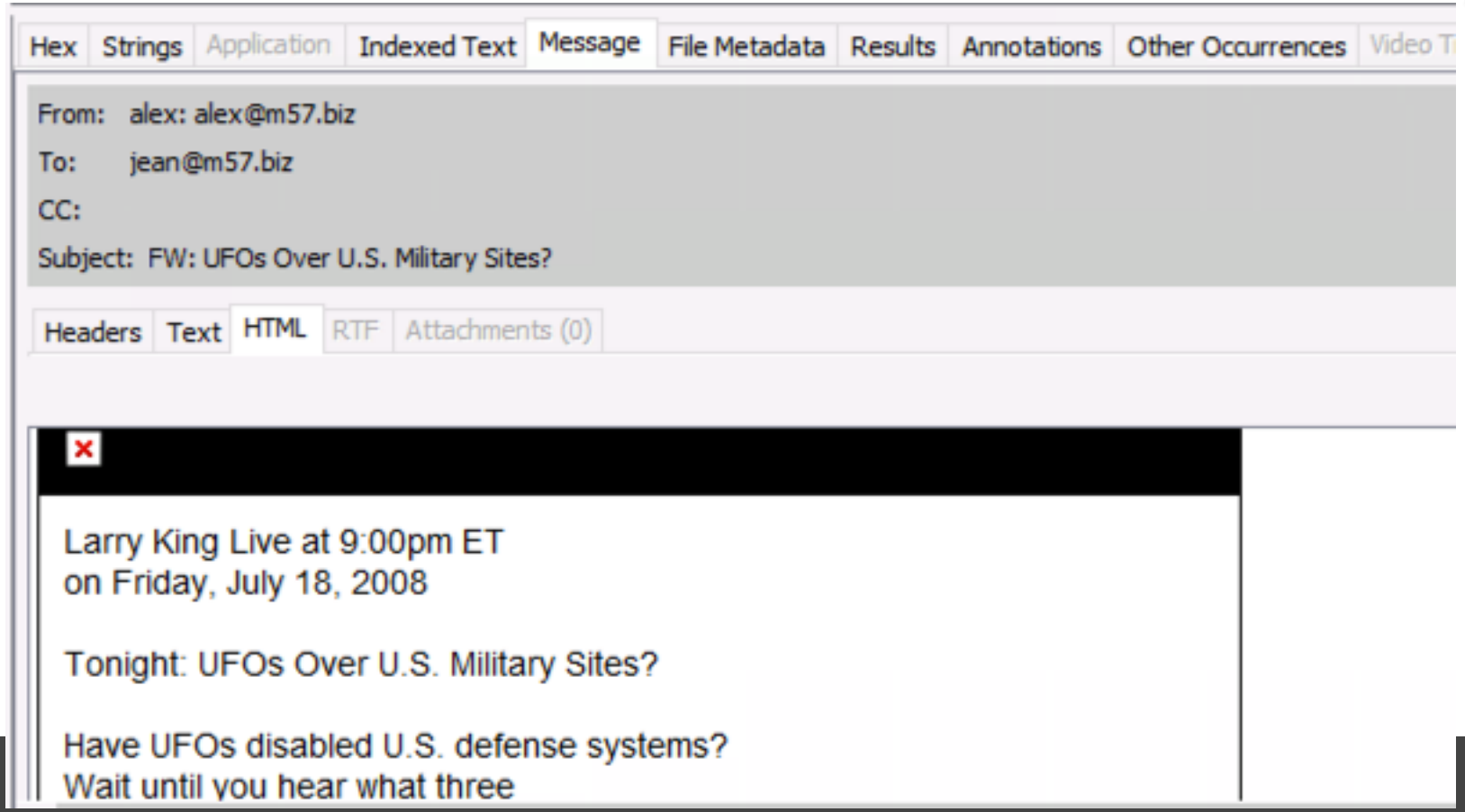
- What is the social network for this device?
- What are the themes and topics in the messages?

Change #1: New Content Viewer

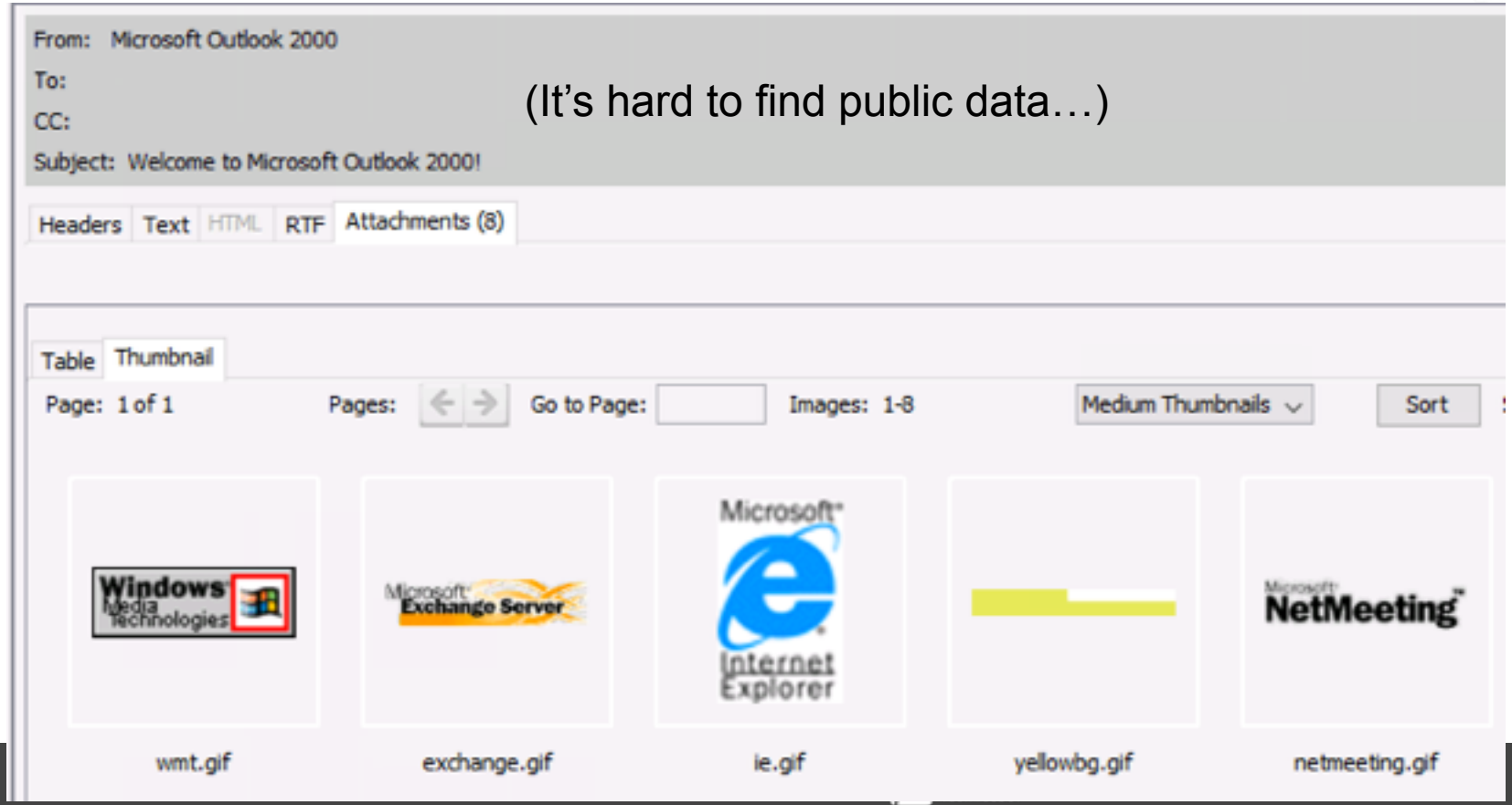
A new Message content viewer exists in the lower right. Shows:

- Headers
- Various formats of emails (HTML, RTF, etc.)
- Attachments
- Can load external images (if you opt-in)

New Content Viewer



New Content Viewer (Attachments)

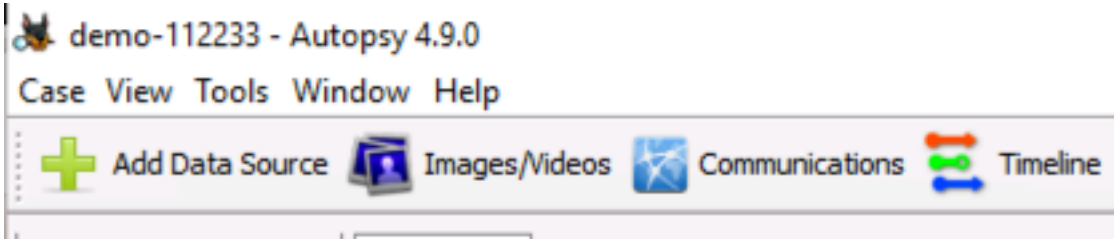


(It's hard to find public data…)

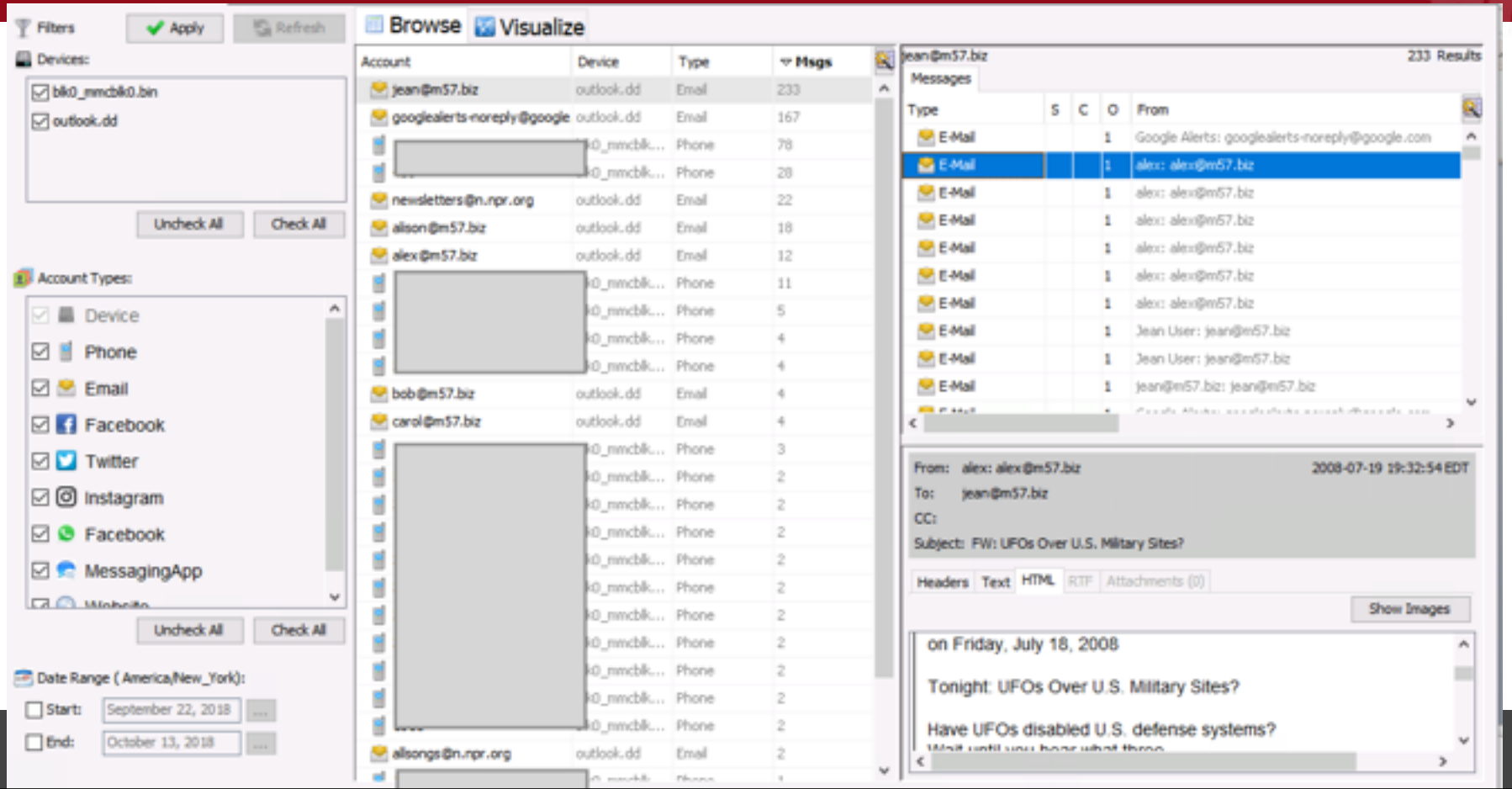
Change #2: New UI

The generic tree interface in Autopsy does not easily answer the previous questions.

So, we made a new one.



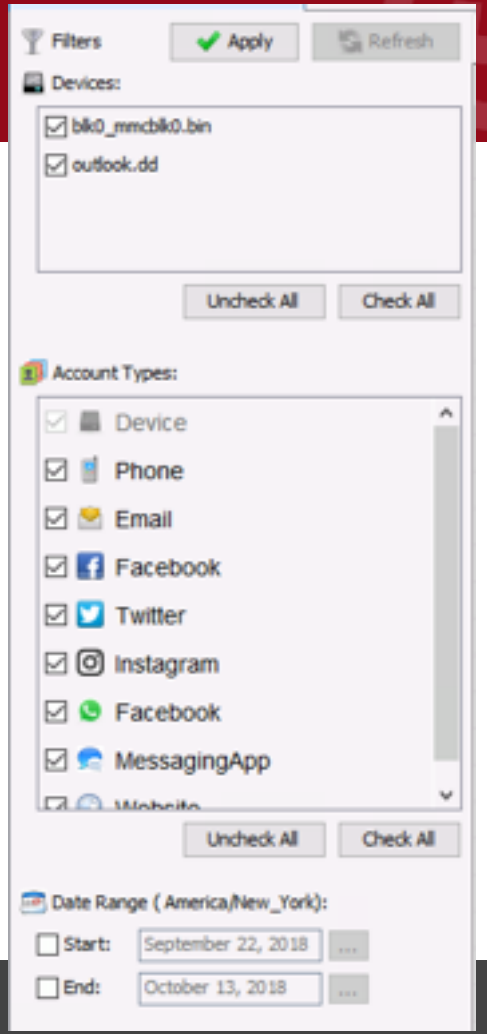
New Communications UI



UI Basics: Filters

Reduce the scope of messages and accounts based on:

- Dates
- Account Types
- Devices



UI Basics: View Accounts

Accounts that meeting filters are shown.

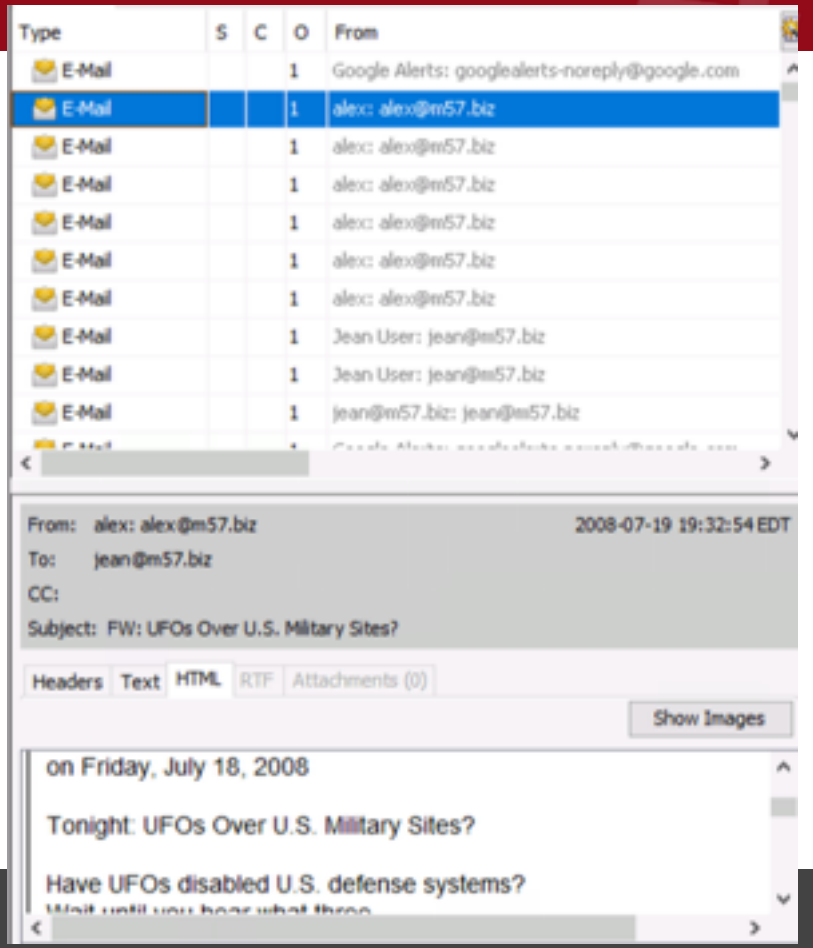
Sorted by number of relationships.

Only accounts with a relationship are shown (not random emails)

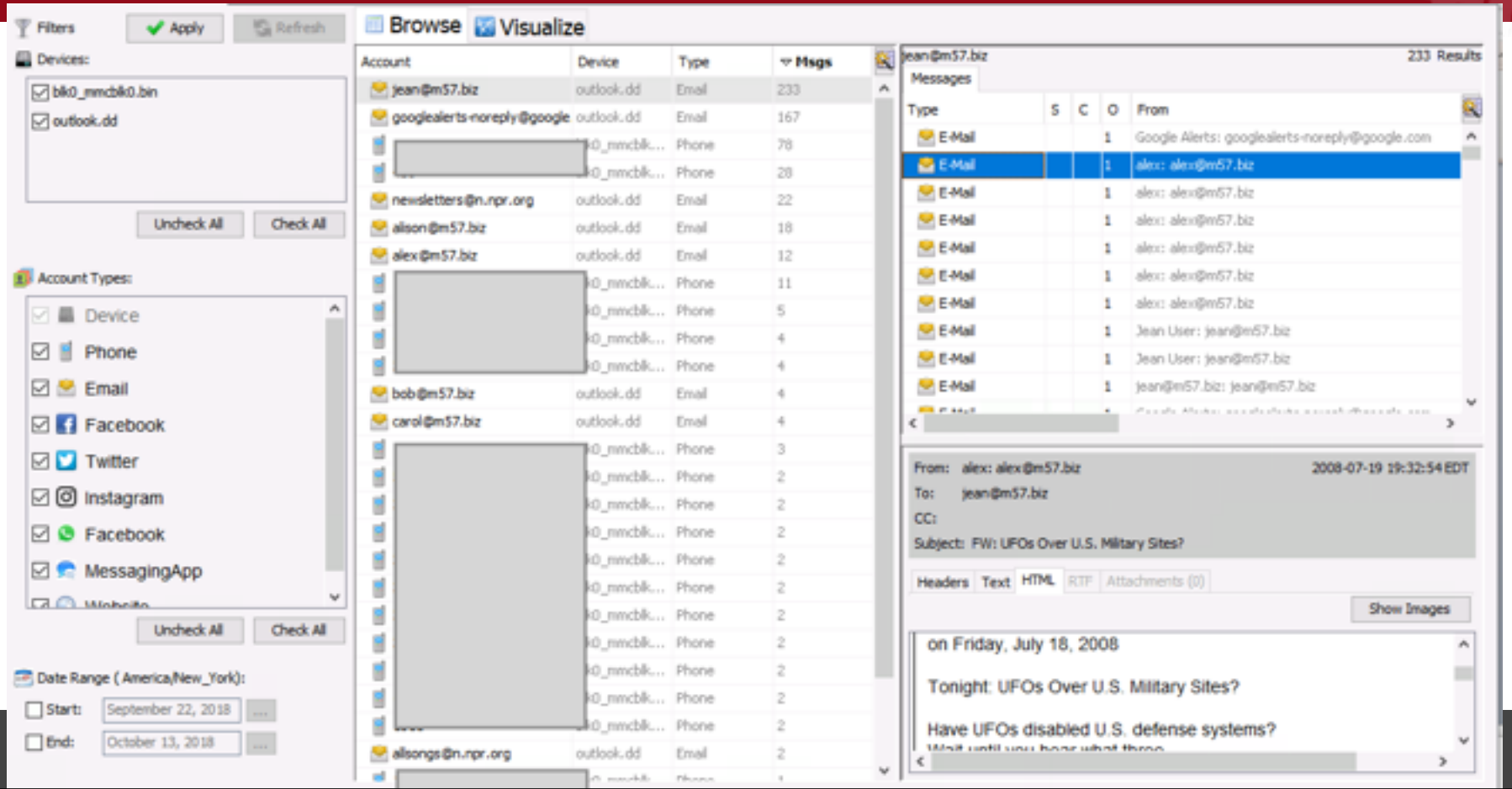
UI Basics: View Messages

Shows all messages to/ from an account.

Bottom shows message contents, attachments, etc.



New Communications UI



UI Basics: Link Analysis

Visualization of the data can be useful.

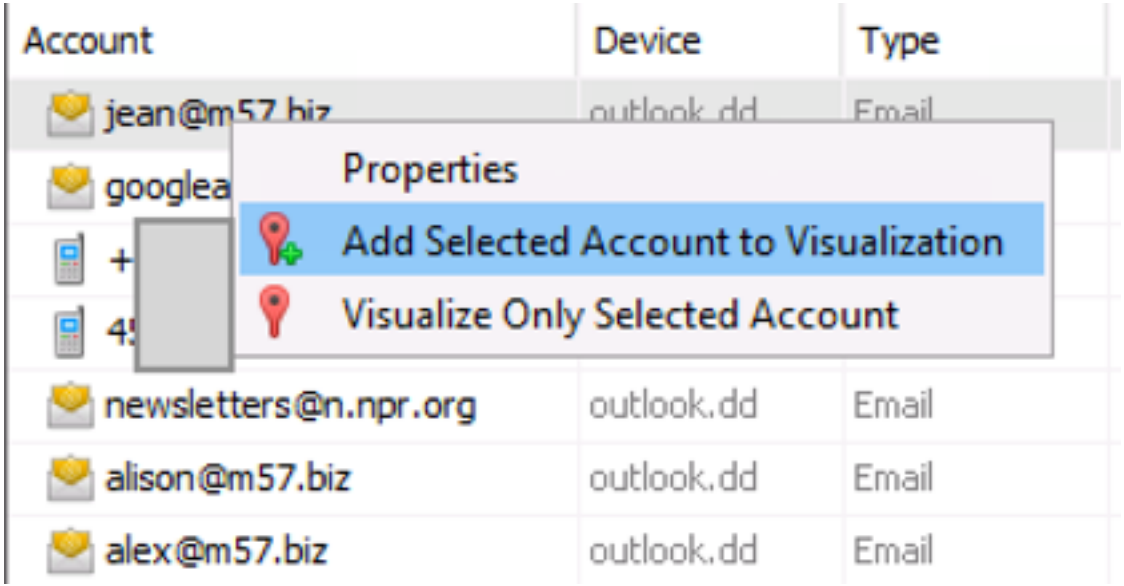
Link analysis diagrams can quickly become overwhelming.

We chose an “Opt-In” method:

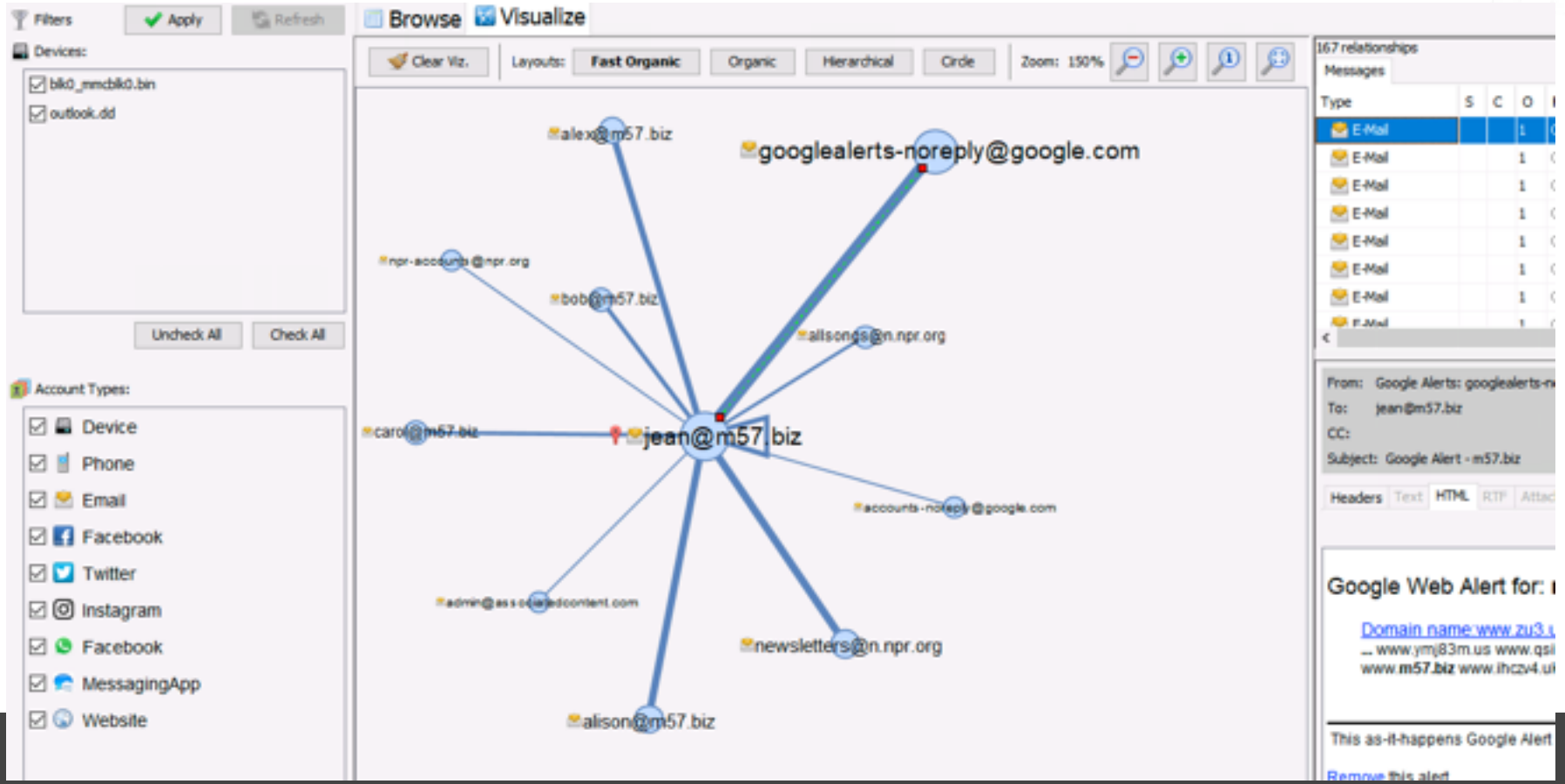
- Right click on an account and choose “Add Selected Account to Visualization”.
- That shows the account and all associated with it.

UI Basics: Link Analysis

Selecting an Account



UI Basics: Link Analysis

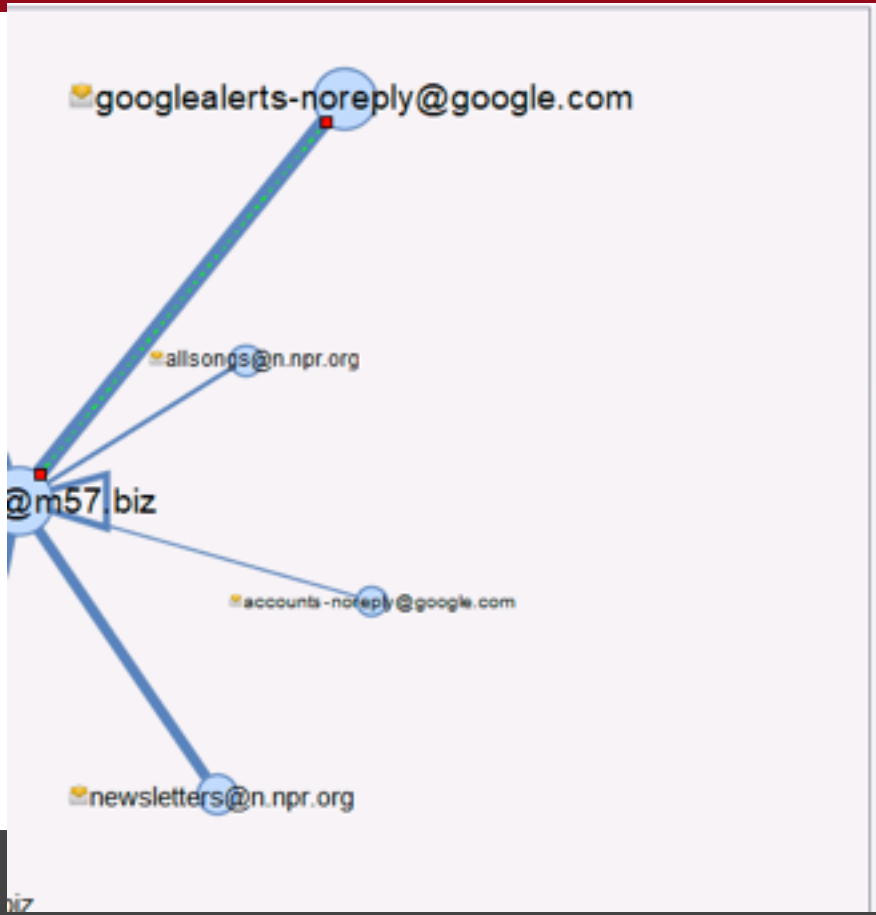


UI Basics: Link Analysis

Selecting a node shows all messages to and from that account.

Selecting an edge shows messages between the two accounts.

UI Basics: Link Analysis



Type	S	C	O	From
E-Mail			1	Google Alerts: googleal
E-Mail			1	Google Alerts: googleal
E-Mail			1	Google Alerts: googleal
E-Mail			1	Google Alerts: googleal
E-Mail			1	Google Alerts: googleal
E-Mail			1	Google Alerts: googleal
E-Mail			1	Google Alerts: googleal

From: Google Alerts: googlealerts-noreply@google.com
To: jean@m57.biz
CC:
Subject: Google Alert - m57.biz

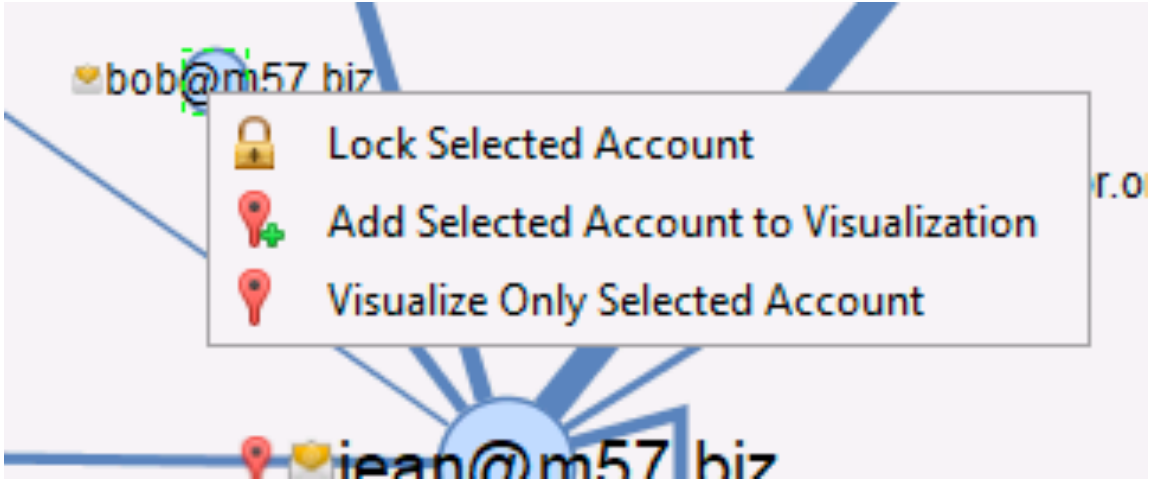
Headers | Text | HTML | RTF | Attachments (0)

Google Web Alert for: **m57.biz**

Domain name:www.zu3.uk The Constellati
... www.ymj83m.us www.qsif.br www.dtnlh.net w
www.**m57.biz** www.ihczv4.uk ...

Visualization: Adding More Accounts

Right click on an account to bring in all of its relationships:



Backend Framework

(Quick Overview For Developers)

Typical Scenario

You write a module to parse some kind of database to pull out messages.

You want to take advantage of this new UI.

Basic Approach

Create a Blackboard Artifact like you would for any other data type.

- Blackboard remains the primary place to store data from modules.

Add communications-specific data that points to the message artifacts.

Messages

Create a Blackboard Artifact

Example:

- Artifact Type: TSK_MESSAGE
- Attributes for recipients, content, headers, etc.

You can put whatever you have in here.

Accounts

Accounts have a type (such as email or Facebook) and an identifier (such as a@b.com)

You need to add an Account Instance for each file the account is found in.

```
senderAcct =
CommManager.createAccountFileInstance(EMAIL,
“a@b.com”, sourceFile);
```

NOTE: exact syntax is slightly more verbose

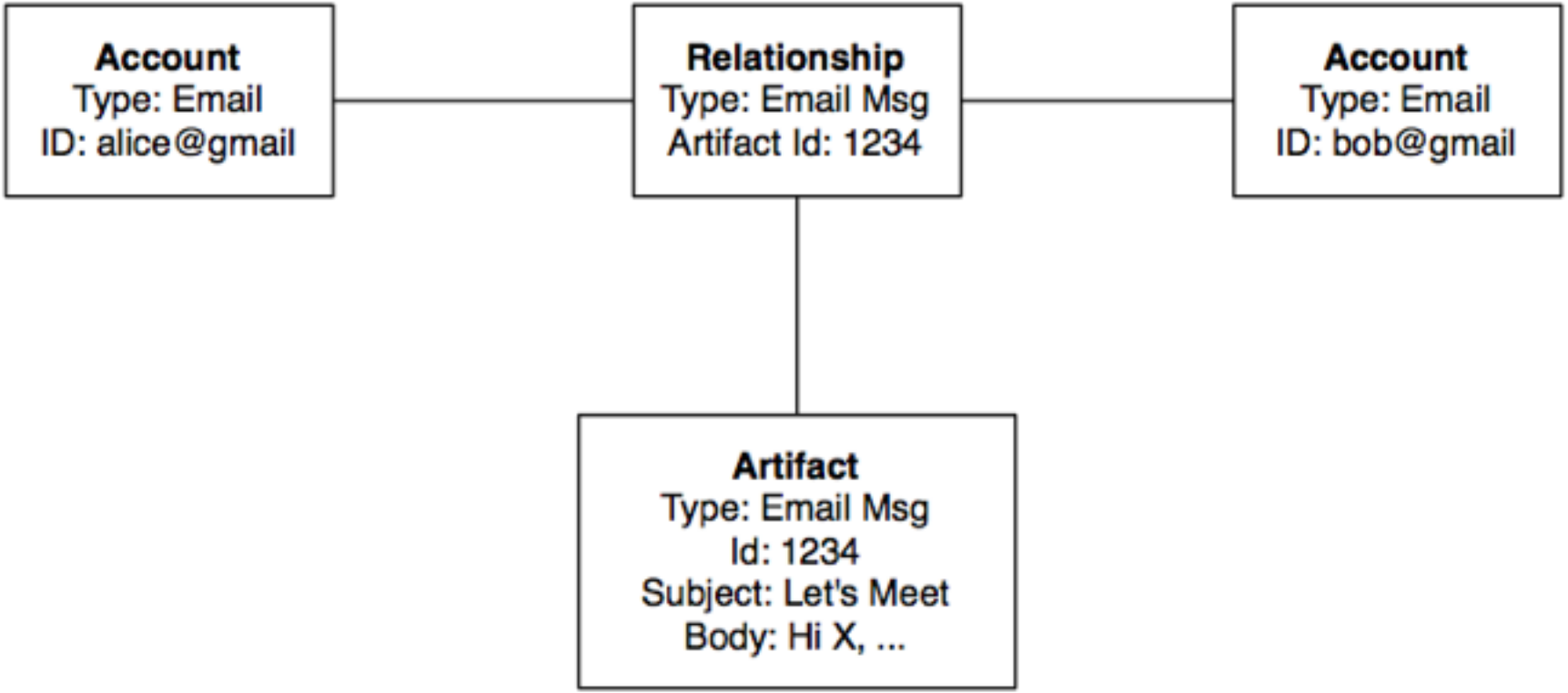
Relationships

A relationship occurs when two accounts “interacted” (i.e. sent message, made a call, in a contact book) at a given time.

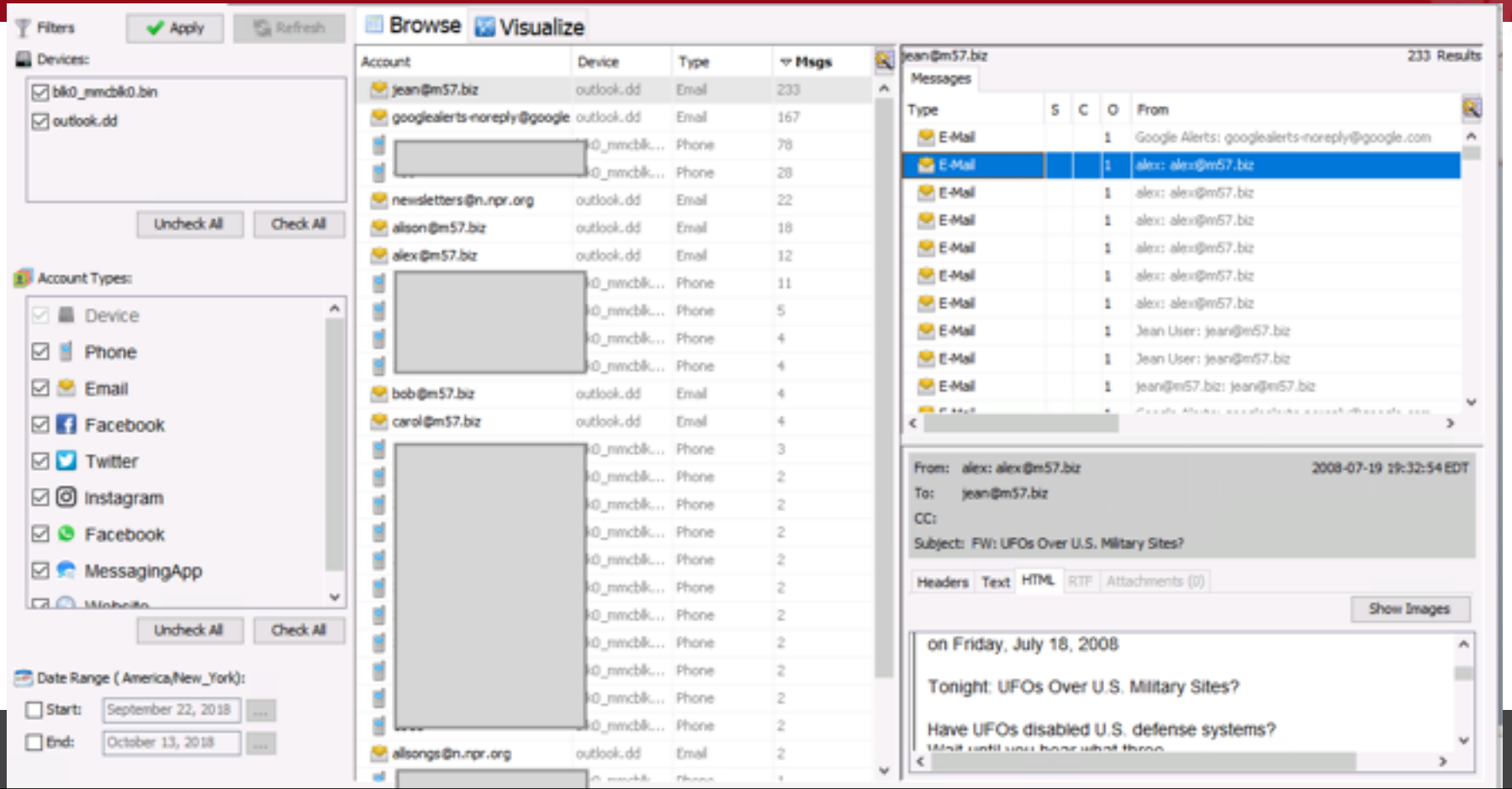
Add to the database with:

CommMgr.addRelationship(senderAcct, List of receiverAccts, messageArtifact, TYPE.MESSAGE, “2018-10-17…”)

Visualization



Viola: They Show Up



Call To Action!

We Need More Messaging Parsers

We built it, now we need more developers to come build parsers.

Build a Python parser for your favorite app.

Use the Android module or tutorials in Autopsy as a reference.

Next Steps

Roadmap

Scaling

Messages:

- Threading
- Thumbnails for attachments

Histogram for filtering

Automatically visualize the most communicated with accounts.

… LOOK AT

Questions?

brianc <at> basistech.com

Connect on LinkedIn

Provide future suggestions now,
during “Needs” session, or in survey.