FACTOIDS

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A Little About Me...

- I have been involved in incident response since 2005
  - So i have suffered all of the problems I'm going to talk about today
- This work is still a work in progress so any:
  - Criticism
  - Comments
  - In fact, anything you have to say about it
  - is very welcome!

The Problem

- "*How (this or that network activity) is seen from other networks?*"
  - Many times, when responding to computer security incidents this question pops up
- Other people (researchers, software developers) often face similar problems
  - How to obtain datasets of network activity from other groups?

The Problem (II)

- How do we "solve" it today?
  - Public domain datasets
    - CAIDA
    - Others
    - Limited, many times outdated
  - Try to generate data ourselves
    - Limited view, can be "expensive"
  - Get data from other groups
    - A trust relationship must be in place
    - There are regulations that must be taken into account

Datasets

- Research and CSIRT groups build datasets that can be of great value to other groups
  - Data collected by sensors (honeypots, IDSs)
- However, multiple issues make the exchange of these datasets difficult
  - Trust
    - Do you trust your peer to share data?
  - Local and regional regulations
    - Personal data protection laws
  - Information Security policies within each organization

Trust - How do We Manage It Today?

- We do what we are doing here today at this FIRST event. We meet and get to know each other...
- We establish some framework
  - MoUs (memorandum of understanding)
  - NDAs (non-disclosure agreements)
- We then filter the data we decide to share
- Problems:
  - Not very flexible, once an MoU is in place it's very hard to modify
  - Language barriers, different laws make compatibility difficult

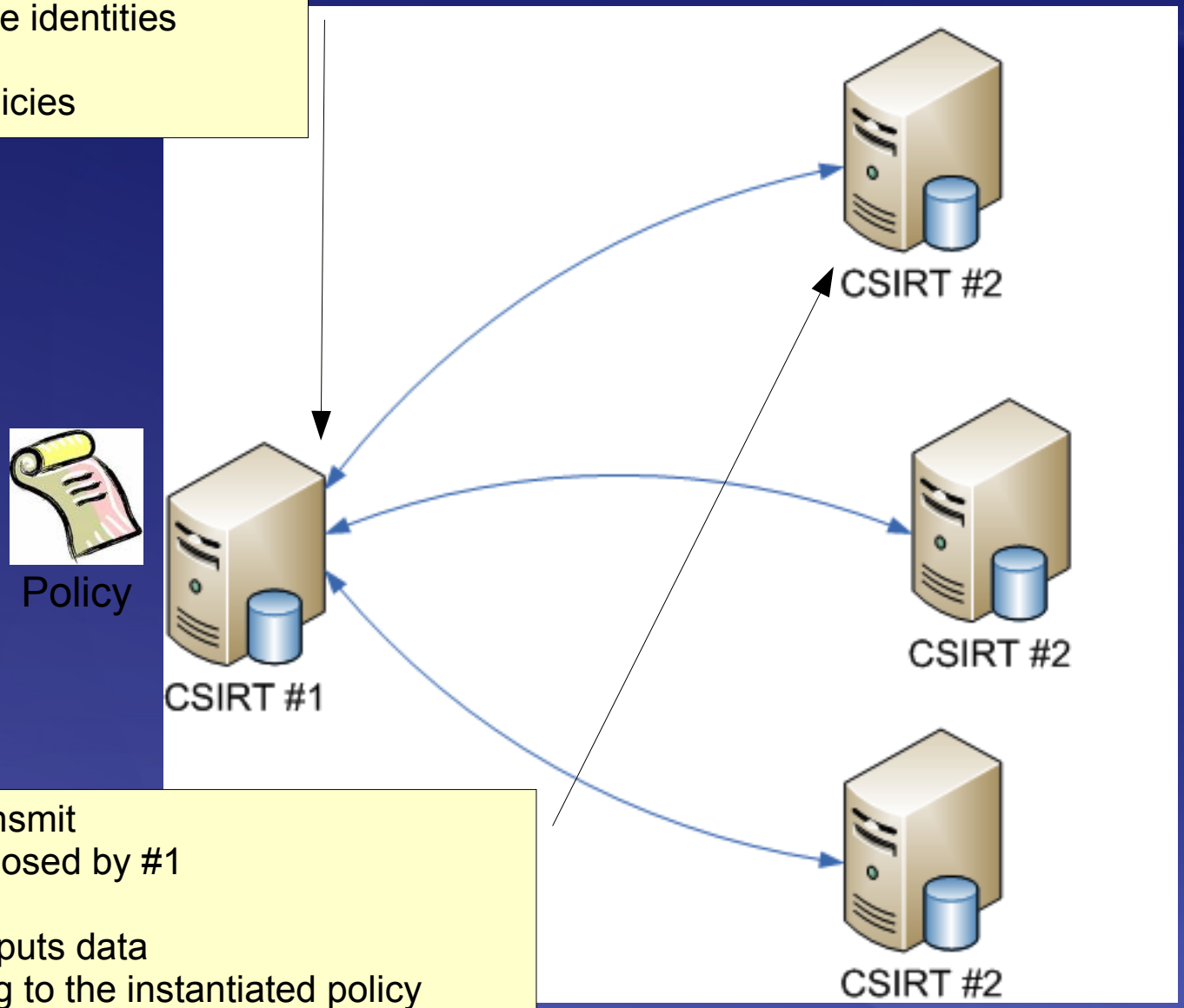
Is There a Better Way?

- What if?
  - Many groups (CSIRTs) exposed at least a *sanitized* view of their sensor data for other groups to use?
  - Sanitization
    - *Hide what you don't want other people to see*
    - Tipically
      - Internal IPs / hostnames
- Then...
  - Incident responders / researches would then be able to tap on these sources of data
    - Downloading only the data they need, maybe using a specialized query language

A Better Way...

1. Mutually prove identities

2. Intantiate policies



3. CSIRT #2 transmit
uses an API exposed by #1

4. CSIRT #1 outputs data
filtered according to the instantiated policy

What Do We Need to Make this Possible?

- Data models
  - We need to represent sensor data in an uniform way
- Automatic sanitization
  - The data each group sends to another must be automatically sanitized (no human intervention)
- Query languages / APIs
  - Efficient transport
- A *directory* of available information
  - Which group has which kind of information?

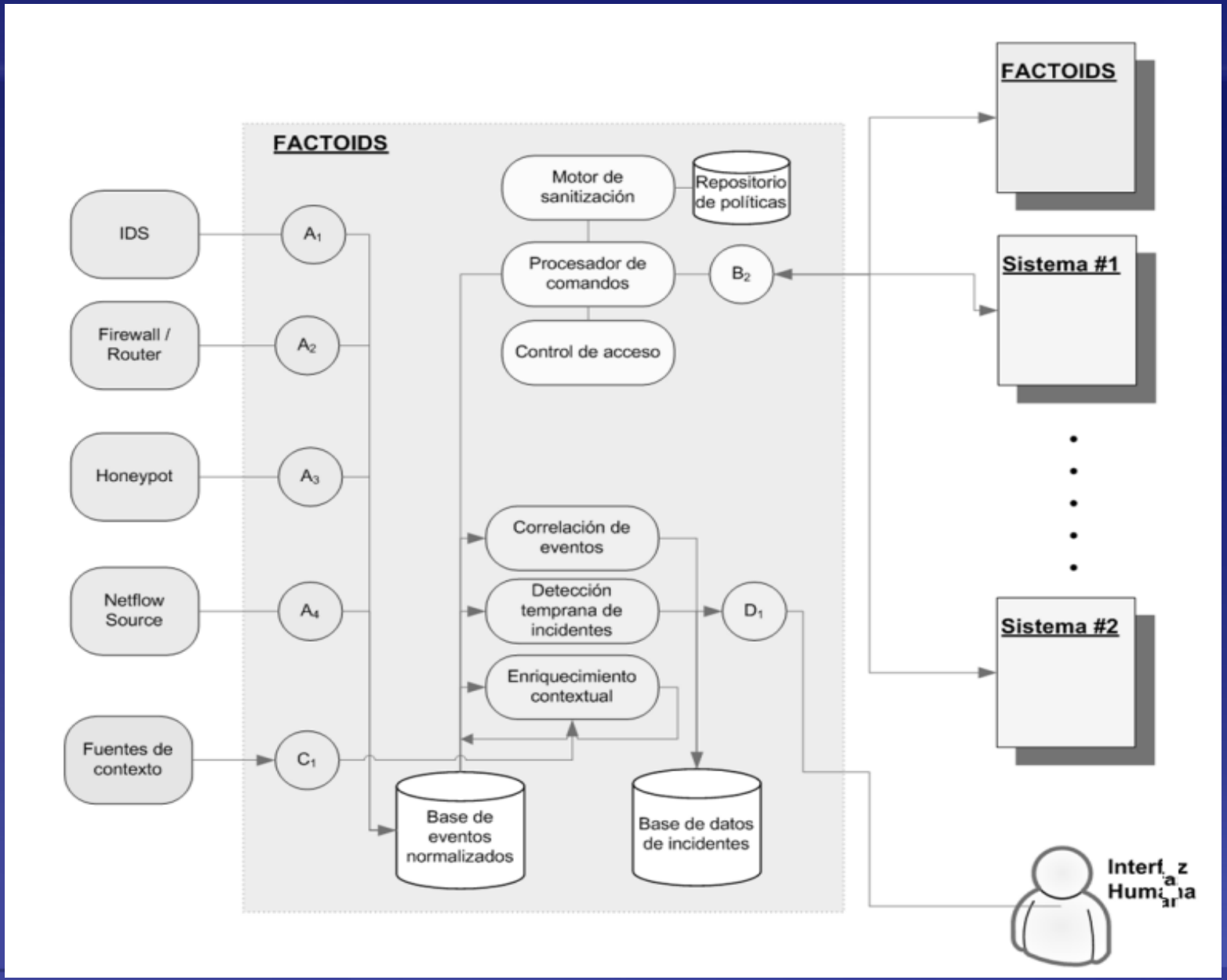
FACTOIDS – Vision

- FACTOIDS: "*Models and Tools for Analysis and Secure Exchange of Sensor-Collected Data*"
- Vision:
  - Efficient creation and management of *trust relationships* between groups who need to share security event data
    - Have control over which data is shared with whom
  - Improve transport efficiency of large sets of related data (*datasets*) regarding security events
    - Transport only what is needed

FACTOIDS – Potential Uses

- Real-time data exchange when responding to incidents
- Current and "real" datasets for research purposes
- *Law enforcement* agencies
- Software developers

FACTOIDS – Architecture

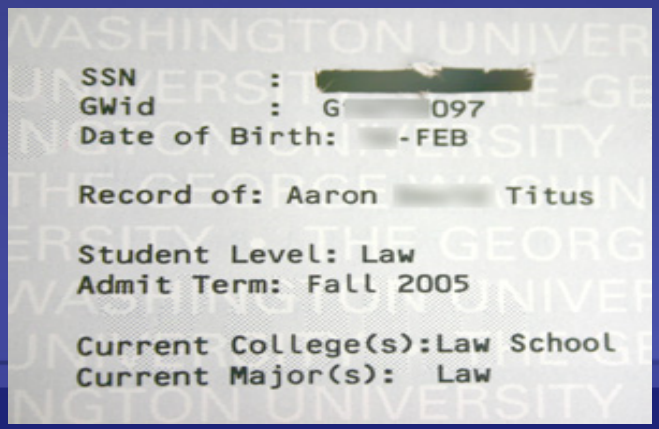


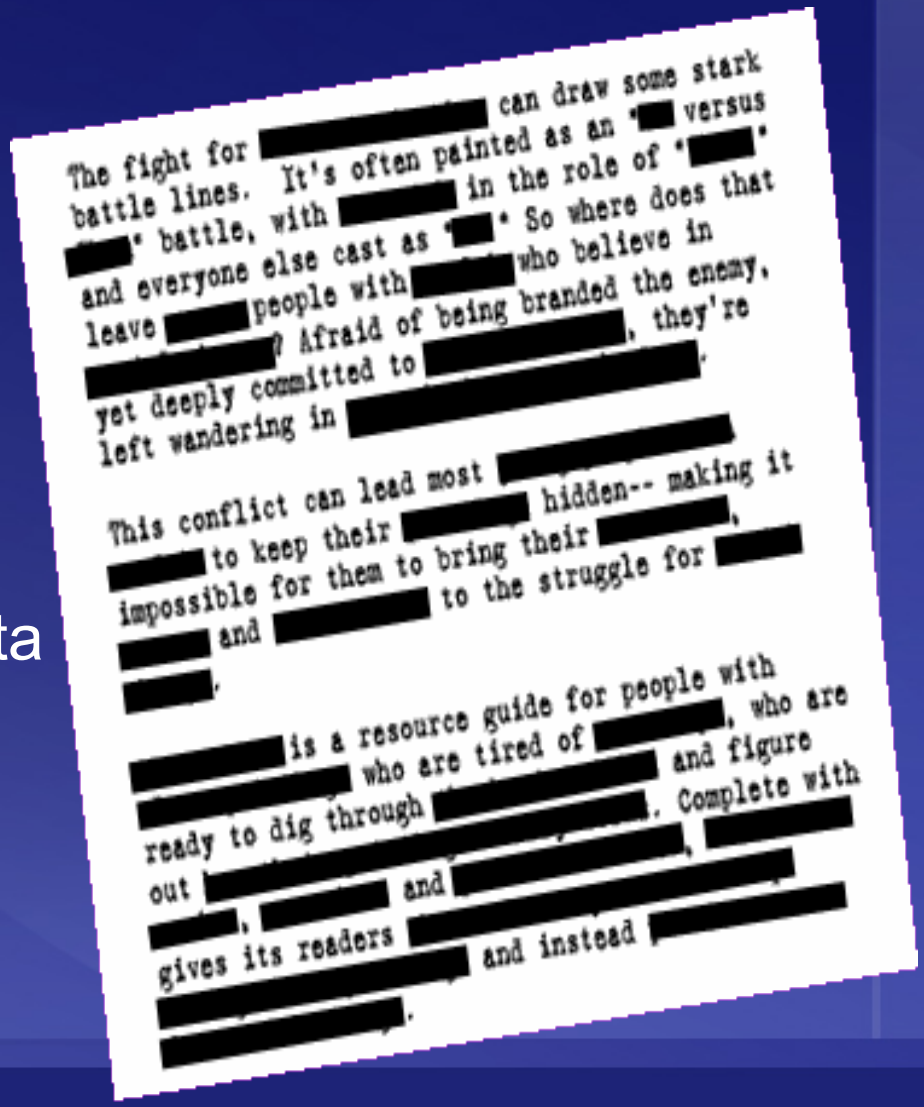
Dataset Transport

- Normalization
  - The same event is almost always detected by several sensors
  - We must normalize our dataset to avoid duplicates
- Size
  - A honeynet, firewall or IDS can by itself generate large-size datasets
  - Instead of moving huge files back and forth, why not expose an API and/or a query language?

Sanitization Policies

- Sanitization: output data filtered according to a policy
- Techniques:
  - Non-property preserving
    - "Black Marker"
  - Property preserving
    - Depending on the type of data





Conclusions

- We believe there is a need for a set of models and techniques to enable more data sharing among groups
- Many stand to benefit from a more open data sharing environment
- Roadblocks need to be overcome
  - Comply with regulations
  - Ensure groups control what information gets shared

FACTOIDS – Next Steps

- Implement a sub-set of the system
  - Representing events as XML documents using IODEF (RFC 5070)
  - Implement a proof-of-concept sanitization engine and policy repository
  - Implement event loading from our honeypot network

Thank you for your patience!

¿Questions?

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