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Shared Darknet Development

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Who ?

- Under the auspices of the REN-ISAC
  - http://www.ren-isac.net
- Policy guidance and co-ordination provided by SALSA-CSI2
  - http://security.internet2.edu/csi2/
- Logistic, development and technical support provided by the IU's Advanced Network Management Laboratory.
  - http://anml.iu.edu
- Data, requirements (and additional development) provided by the community
  - For certain values of "community."
  - Participation in development potentially driven by requirements. (Scratching your own itch.)

What ?

- A darknet reporting, querying and analysis system.
  - spanning multiple IP spaces
  - distributed across multiple continents, countries, institutions (Multiple sensors per institution.)
  - Specific to the .edu world for now(?)
    - No technical reason for that.

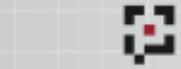
What Part 2 / Why ?

- "Wide-Aperture" sensor
- Large, distributed IP space
  - More representative data.
  - Better statistics.
  - More difficult for bad people to avoid being seen.
- More potential for sharing
  - Sharing of infrastructure.
  - Sharing of aggregated information (reports)
  - Sharing of site-specific information.

How ?

Four components:

1. Site-specific sensors
   - Optionally/preferably with data storage, if only short-term
2. Data collection and aggregation
3. Analysis and reporting
4. Direct data access and querying (maybe)



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Site Sensors and Data Sources

- Sites have their own sensors
  - "Site" is open to interpretation
  - May have multiple sensors per site
  - Sensors can be anything that generates appropriate data
    - Netflow exports from routers
    - UMich Internet Motion Sensor
    - Firewall logs (pf, netfilter)
    - Anything else…

Data Collection and Aggregation

- Central collection & Analysis host(s)
  - Collect data from individual sites
  - Batched or real time
  - Pushed or pulled
  - Protocol agnostic
  - Batched:
    - ssh, http(s) ftp(!) - authenticated or not.
  - Real-time
    - GRE, ssh port forwarding.

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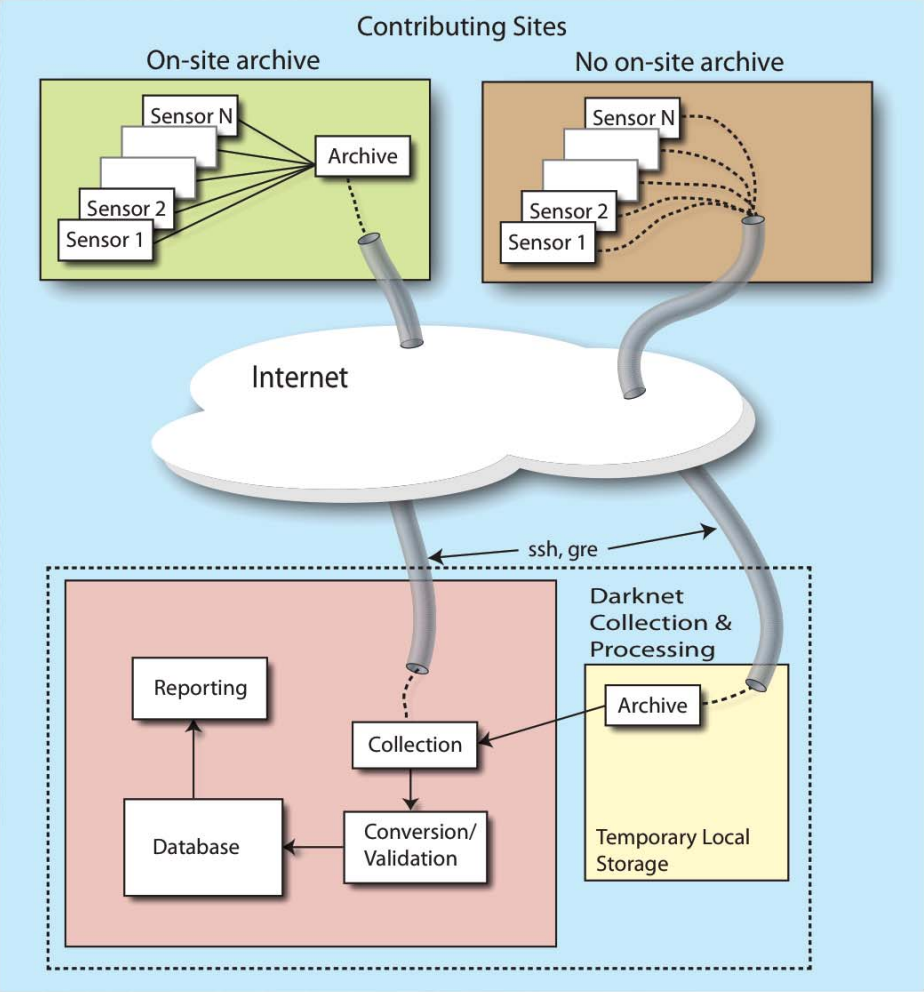
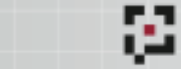
Data Collection and Aggregation 2



Reporting

- Report definitions consist of scope, recipients, information to be generated
  - Modular architecture for reported information
- Automatic generation of reports
  - Based on REN-ISAC registry or similar information base.
- Manual report definition
  - Defined by individuals?



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Reporting 2

- Example of report definition generation:
- Registry ties people to netblocks, netblocks to institutions, people to institutions.
- People for a given institution receive a standard set of reports for their netblocks.
  - Per port counts, total traffic, etc.
- Depending on information in registry, all kinds of reporting relationships can be defined.

Reporting 3

- Custom reports possible.
  - There are going to be data-sharing/ administrative/technical relationships not defined by the registry.
  - Some may be temporally limited.
  - “Hey, can Bob see my stuff for the next two months?”

Reporting 4

- Report definition (auto or manually generated) is likely to contain:
  - Recipients
  - Netblocks of interest
  - List of reporting modules
    - e.g. top ten destination ports
      top ten hosts by # of flows
      % change in total traffic vs. last day/week/month.
    - (This is all pluggable.)

Querying?

- Possibility of access to raw data
  - Data sharing policies?
  - Authentication & access control
  - Masking/Anonymization (explicitly provided for already.)

The Awful Truth

- Difficult to implement, but not just for technical reasons.
- People are generally willing, but…
  - Everyone is busy
  - Hardware, operating system, data format, architecture, firewall, policies etc are *all different*.
  - Surely some sites have something in common?
    - (Not yet they don't)

The Awful Truth

- Do we:
  - Send people hardware?
  - Try and gain access to their systems?
  - Persuade them to do more work?
  - Persuade them to change their infrastructure?

The Awful Truth Part 2

- How can we make participation desirable?
  - Even better, how can we make it compelling?
- It's not enough for it to be easy
  - Although that's a big part of the problem.

The Awful Truth Part 3

- Making it easy to join in isn't enough.
- It has to be easy to *keep* participating.
  - Everything has to be reliable; maintenance is a drag.
    - Like I already said – everyone is busy.

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The Awful Truth Never Ends

- It’s hard to make projects that rely on the participation of large numbers of people to deliver any value a compelling prospect for the early participants.

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Questions? Comments? Want to Participate?

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This could be you!