Alias Resolution APIs

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alias resolution

• identify which interfaces belong to the same router

• useful for ...
  – studying redundancy and resiliency of network paths
  – identifying traceroute path anomalies/artifacts
  – producing router-level and pop-level topology
project goals

• provide a community service for performing alias resolution
• focus on techniques that aren't practical for researchers
  - complex software
  - high infrastructure and/or CPU requirements
  - high operational costs dealing with host/network failures
service APIs

- standard web APIs
  - API key for authentication
- two APIs: query and on-demand execution
• query MIDAR aliases from Internet Topology Data Kits (ITDK)
  – 14 ITDKs from April 2011 to Jan 2019
• 3 supported queries: track, find, group
query: track

- **track address**
  - "track a target across datasets over time"
  - list all matching (dataset, alias set) pairs for a target address
  - example: track --all 173.214.129.193

# dataset_id, set_id, dataset_name, timestamp*, datetime
12 3316 itdk-20170828-midar 1503878400 2017-08-28T00:00:00
13 1000 itdk-20180301-midar 1519862400 2018-03-01T00:00:00
• **find address**
  
  - find all aliases of the target address in given datasets
  
  - example: find --dataset=12 173.214.129.193

```plaintext
# dataset_id, set_id, dataset_name, timestamp*, datetime, addr_count, addresses
12 3316 itdk-20170828-midar 1503878400 2017-08-28T00:00:00 15
64.141.10.85 64.141.11.73 64.141.11.145 64.141.17.25
64.141.127.105 64.141.127.109 69.196.87.193 173.214.129.193
208.118.88.217 208.118.88.249 208.118.89.137 208.118.91.9
208.118.91.217 208.118.91.237 208.118.95.77
```
• **group** address₁ address₂ ...
  
  - group given addresses into aliases based on known alias sets
  
  - example: group --dataset=itdk-20170828-midar 64.141.10.85
    173.214.129.193 208.118.91.237 208.118.95.77 65.19.143.137
    65.49.19.161 205.166.205.22

  # dataset_id, set_id, dataset_name, addr_count, addresses
  12 3315 itdk-20170828-midar 2 65.19.143.137 65.49.19.161
  12 3316 itdk-20170828-midar 4 64.141.10.85 173.214.129.193
  208.118.91.237 208.118.95.77
two types of MIDAR executions

- local: probe from one machine locally at CAIDA
- distributed: probe from multiple machines around the world
- type automatically chosen based on target set size

user uploads a file of addresses

- local runs: < 25k addresses
- distributed runs: < 100k addresses (soft limit)

get back alias sets
future work

- **query service**
  - support offline queries: download ITDK alias data and command-line tool
  - provide human-oriented web interface

- **execution service**
  - support parallel execution better
Thanks! Potential user? ark-info@caida.org

query API documentation:
https://www.caida.org/projects/ark/vela/aliasq-api/

MIDAR execution API documentation:
https://www.caida.org/projects/ark/vela/midar-api/