APACHE TRAFFIC CONTROL

Apache Traffic Control

Up and Running

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Traffic Control Slack

https://s.apache.org/atc-slack

#atc-up-and-running

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What is a CDN?

A Content Delivery Network (CDN) is a network of caching proxy servers that are geographically located to optimize content delivery to users for high availability and performance.

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What is a CDN?

Why build a CDN?

Prediction that a tsunami of bits were coming to Comcast platforms and how do we scale that problem?

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What is a CDN?

Why build a CDN?

What is Traffic Control?

Traffic Control is a caching server control plane suite of service-based components which are used to aggregate caching servers into a Content Delivery Network (CDN).

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Traffic Control Story

- 01/2012: Work starts in Comcast
- 10/2012: Comcast Production Deployment

...

- 02/2017: 1st Apache Incubator Release
- 06/2018: ATC becomes a TLP!
- 20 Committers representing 7 different companies

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Traffic Control Story

- Github Project
- Latest Stable Release 2.2

Traffic Control Community

- Latest Dev Release 3.0

(as of Sept 5, 2018)

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Goals

- Everything in the CDN is Open Source
  (and appropriately licensed)
- Use COTS hardware and Cloud
- Loosely coupled components, stateless, scalable

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Goals

Key Features

- Client Routing
- Operations Administration
- Monitoring

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Comcast's CDN Stats

- Multiple Terabits delivered per second
- Multiple Petabits delivered per day
- Billions of transactions at the edge per day
- Multiple Petabytes of cache storage
- Multiple Exabytes total delivered
  - 1^18 or
  - 1,000,000,000,000,000,000

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Traffic Control Components

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Traffic Operations

Config Management

Administration UI/API(s) for operations to control the CDN

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What is a Delivery Service?

A group of settings and options to optimize content delivery for each customer on the CDN.

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What is a Delivery Service?

What are Parameters?

- Configuration settings that are applied to any ATC component.

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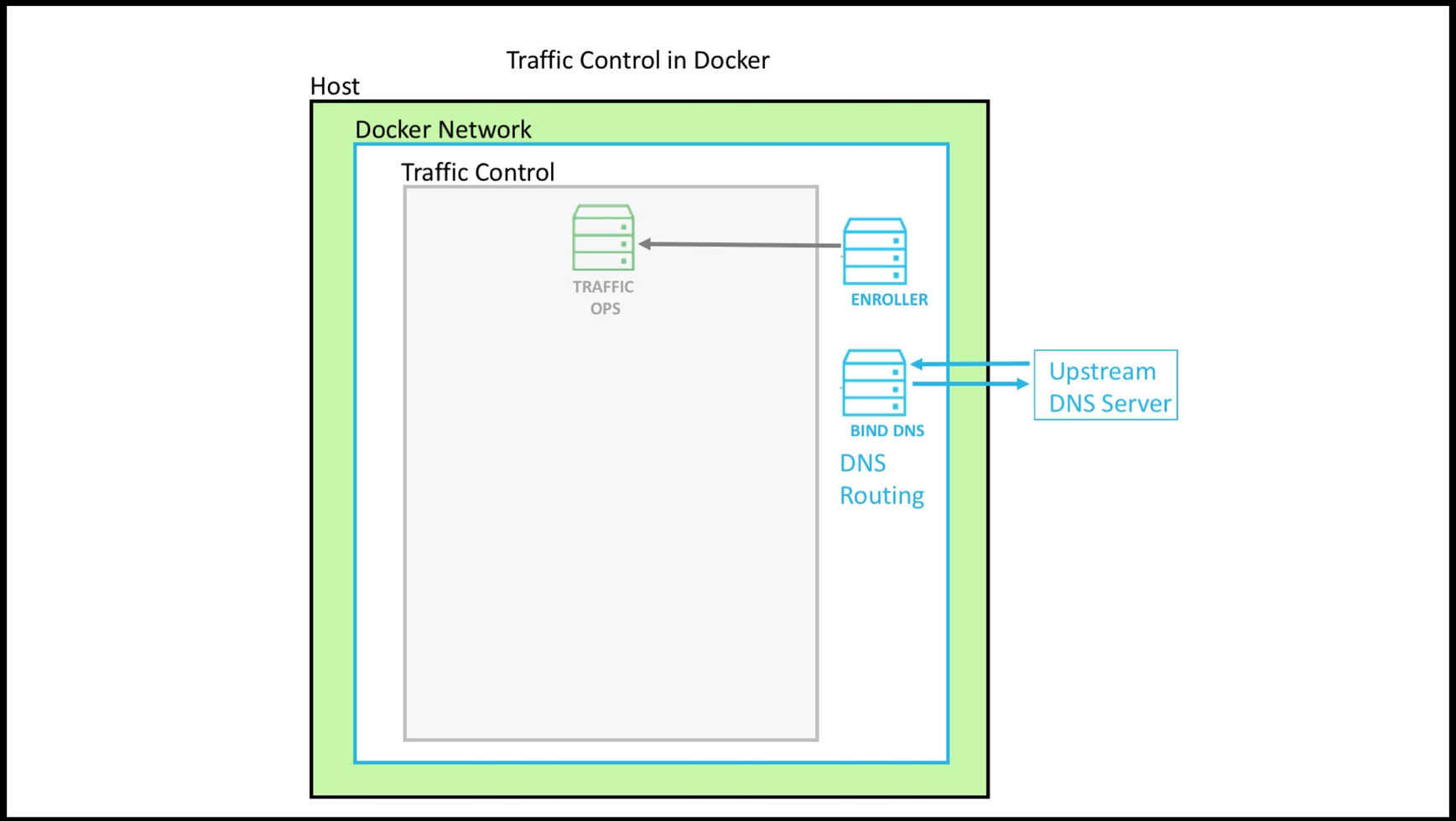
What is a Delivery Service?

What are Parameters?

What are Profiles?

- Parameters that are bundled into groups


Traffic Control in Docker
Host
Docker Network
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TRAFFIC OPS
ENROLLER
BIND DNS
DNS Routing
Upstream DNS Server

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Demo
Docker Container for Traffic Ops

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Traffic Portal

Config Management Improved

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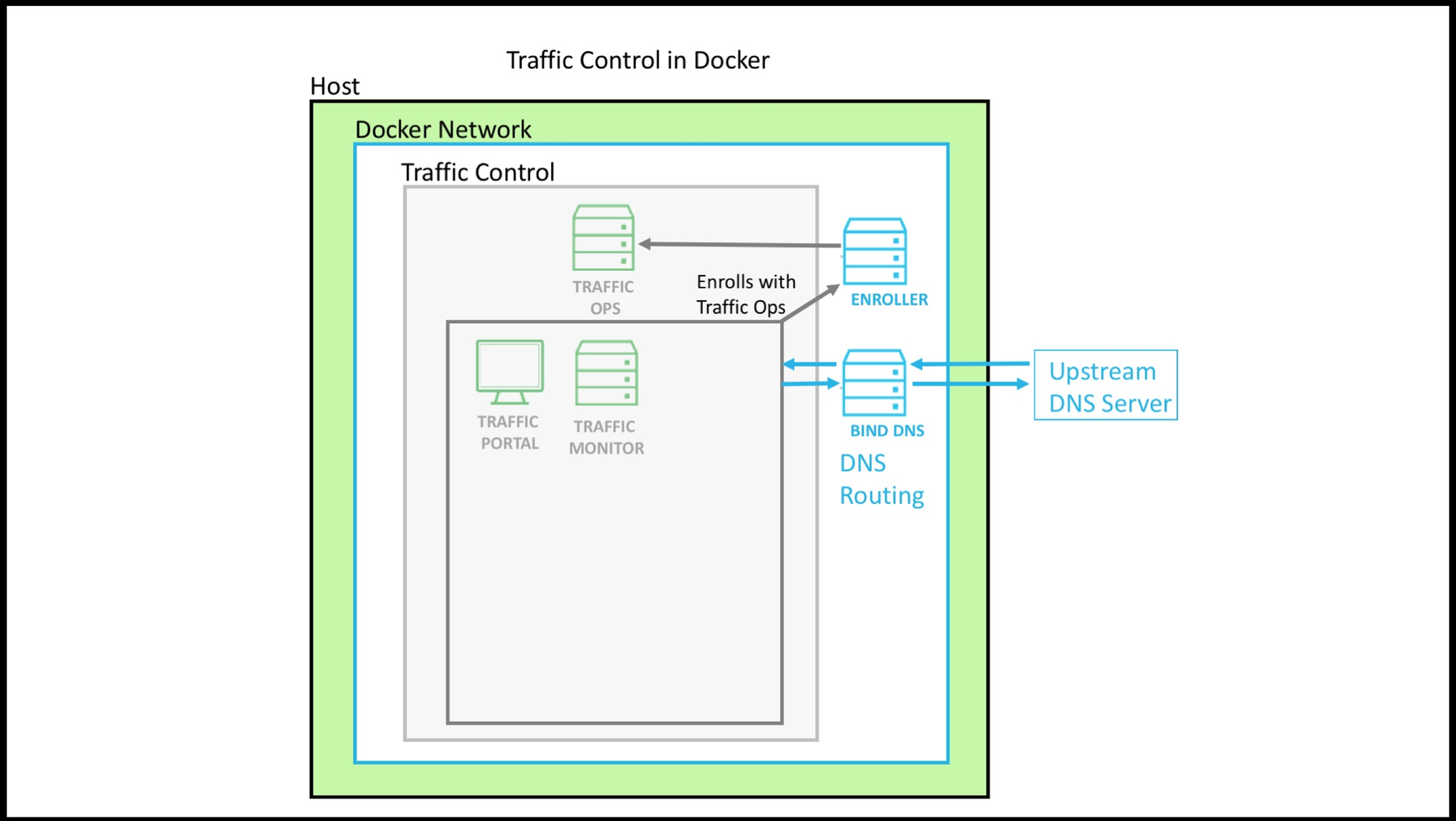

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Demo
Docker Container for Traffic Portal

Dan Kirkwood

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Operational Readiness Test (ORT)

Config File Delivery

Scheduled script for polling Traffic Ops APIs

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Traffic Monitor

Health Protocol

Decider of health for edge caches and delivery services

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Demo
Docker Container
for Traffic Monitor

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What is a Consistent Hash?

- A ring which it then uses to make sure that requests are routed to a target based on the configured weights.

  This consistent hash ring is separate from the consistent hash ring used in cache selection.

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Traffic Router

Content Routing

Client requests dispatcher

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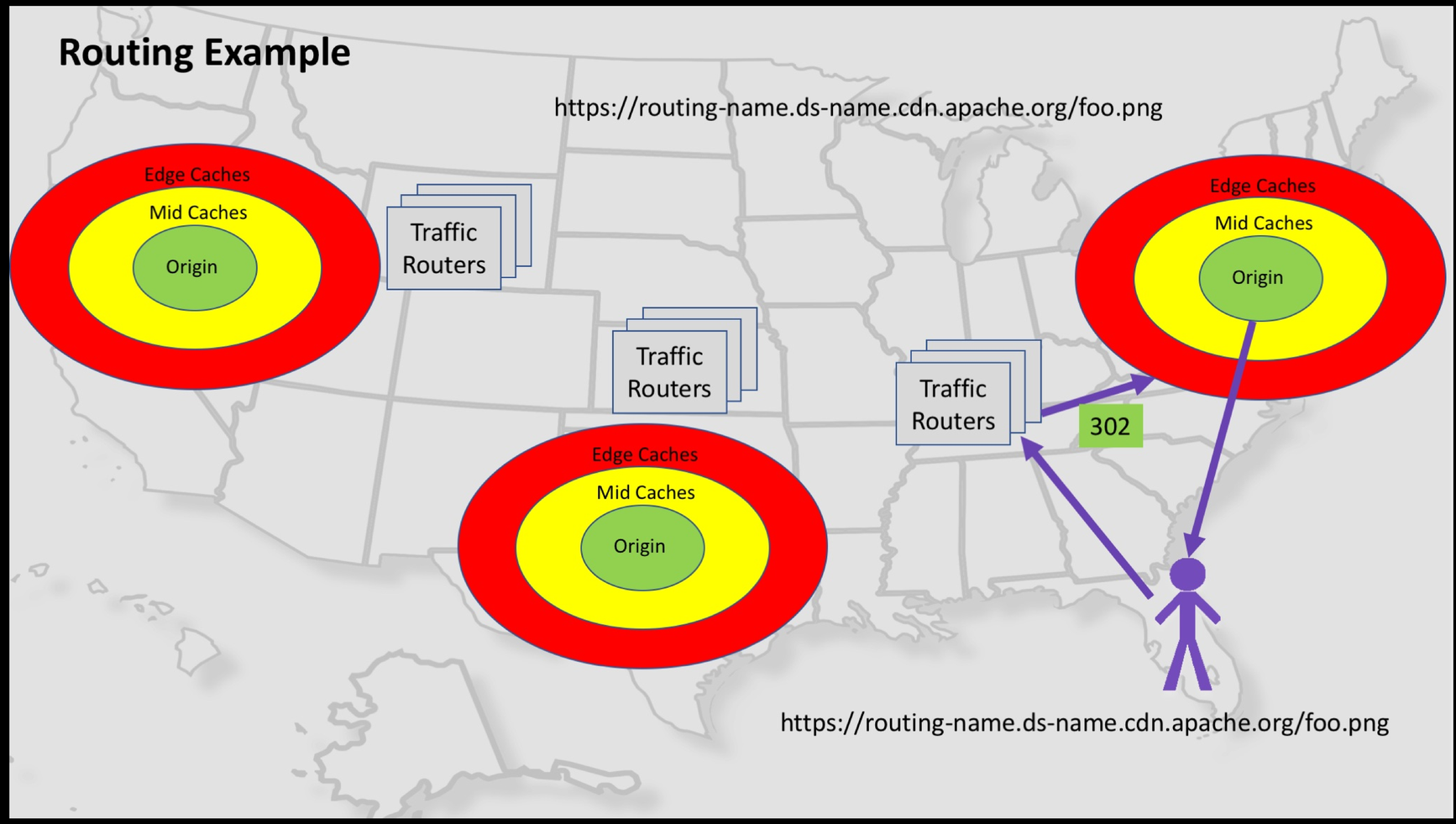

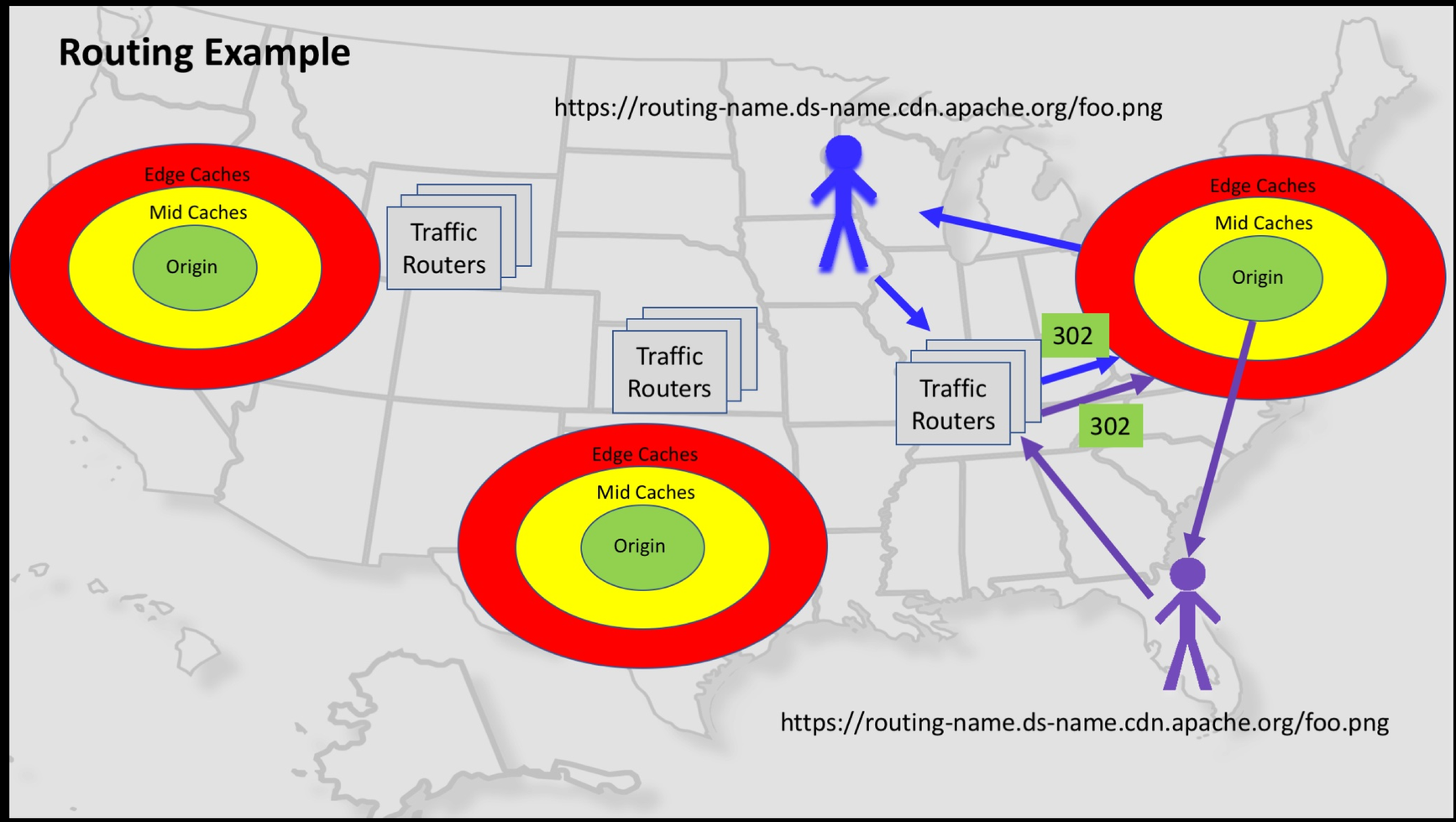
Routing Example
https://routing-name.ds-name.cdn.apache.org/foo.png
Edge Caches
Mid Caches
Origin
Traffic Routers
Traffic Routers
Edge Caches
Mid Caches
Origin
302
Traffic Routers
302
Edge Caches
Mid Caches
Origin
https://routing-name.ds-name.cdn.apache.org/foo.png

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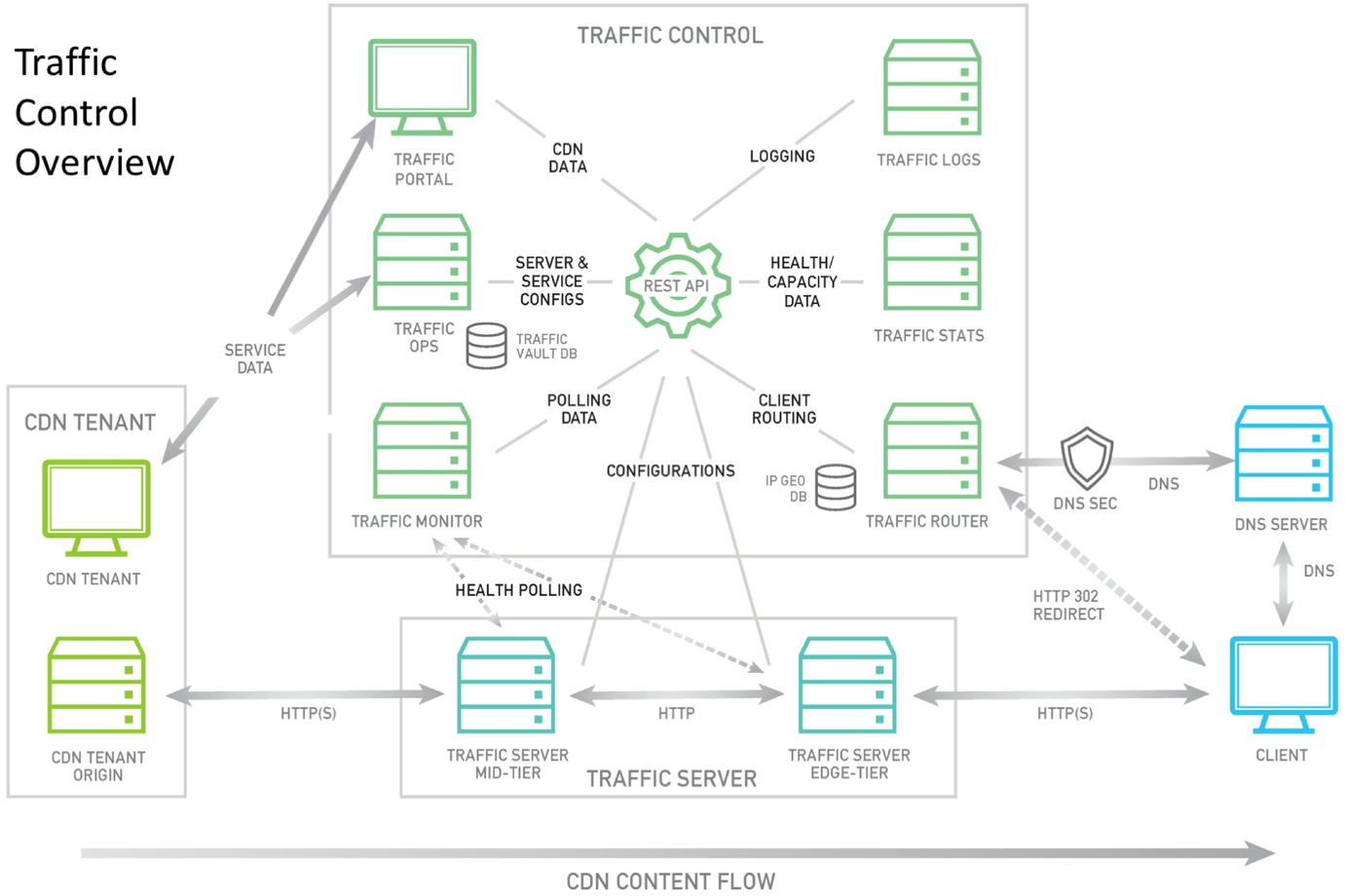
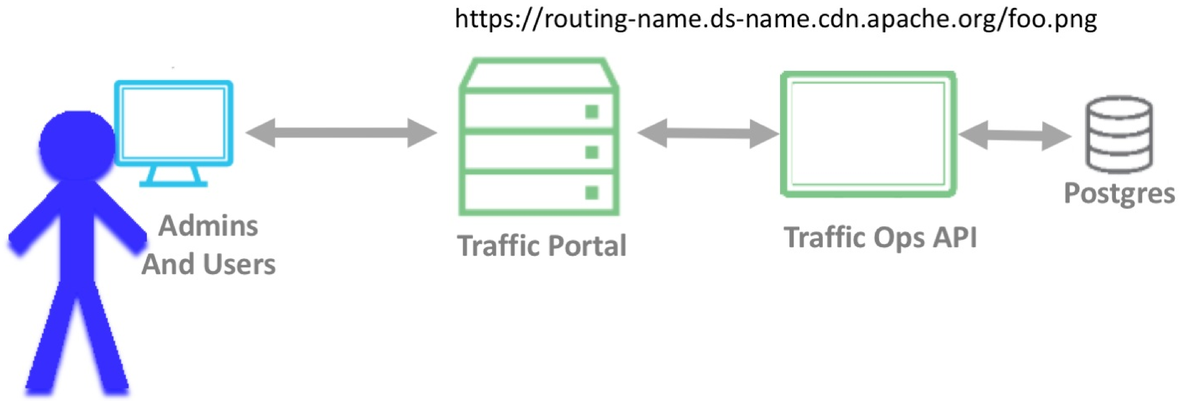
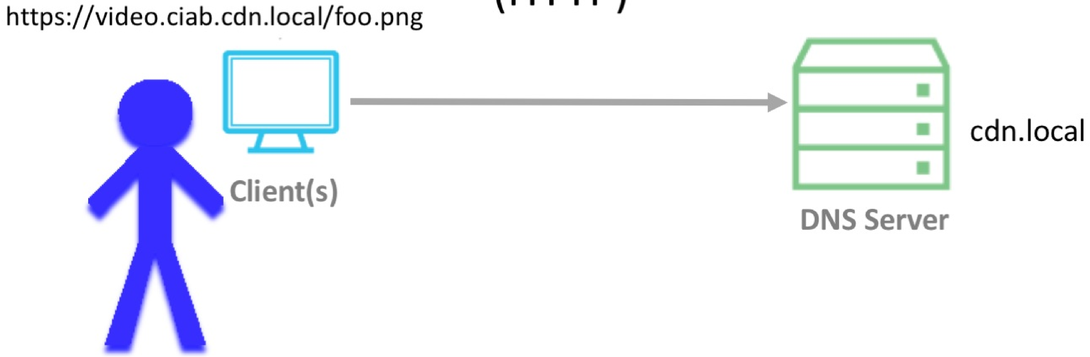
Traffic Control Overview



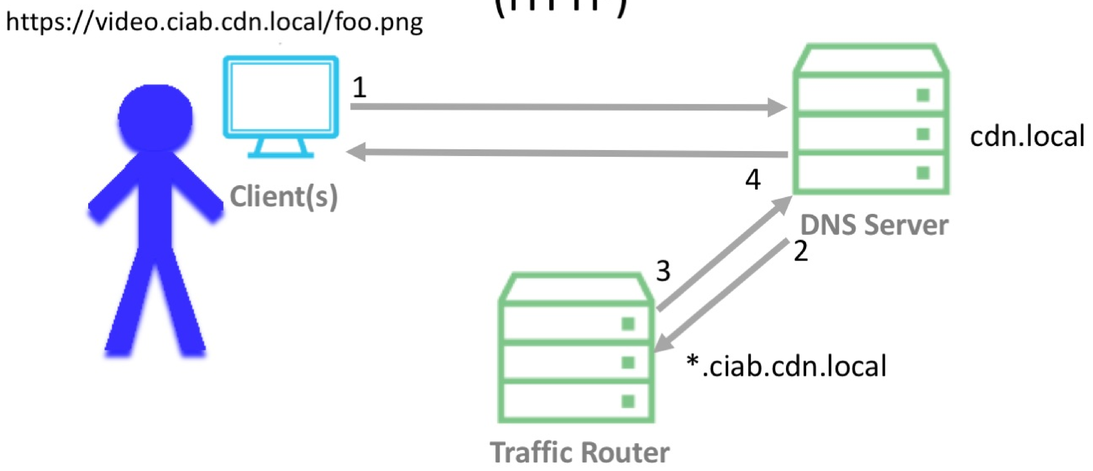
Traffic Portal
User Interaction



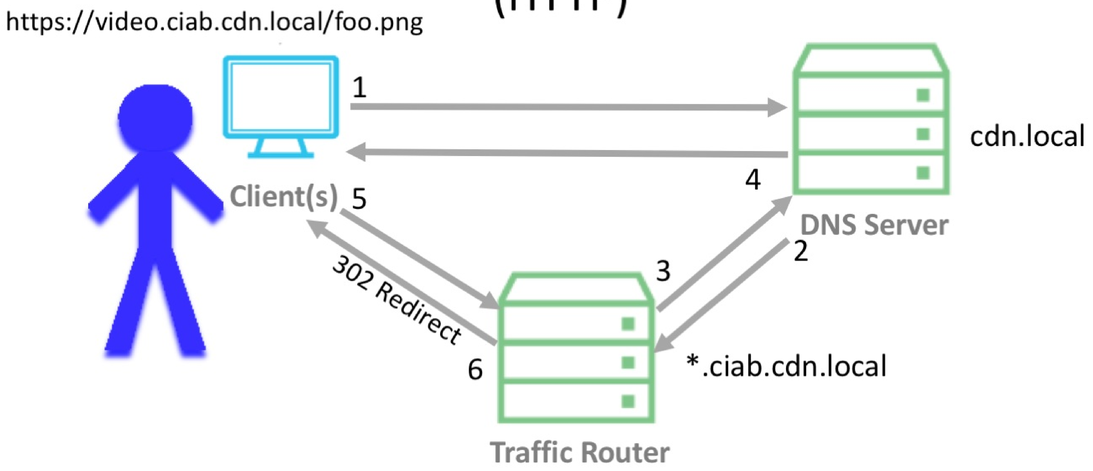
Traffic Router Interaction (HTTP)

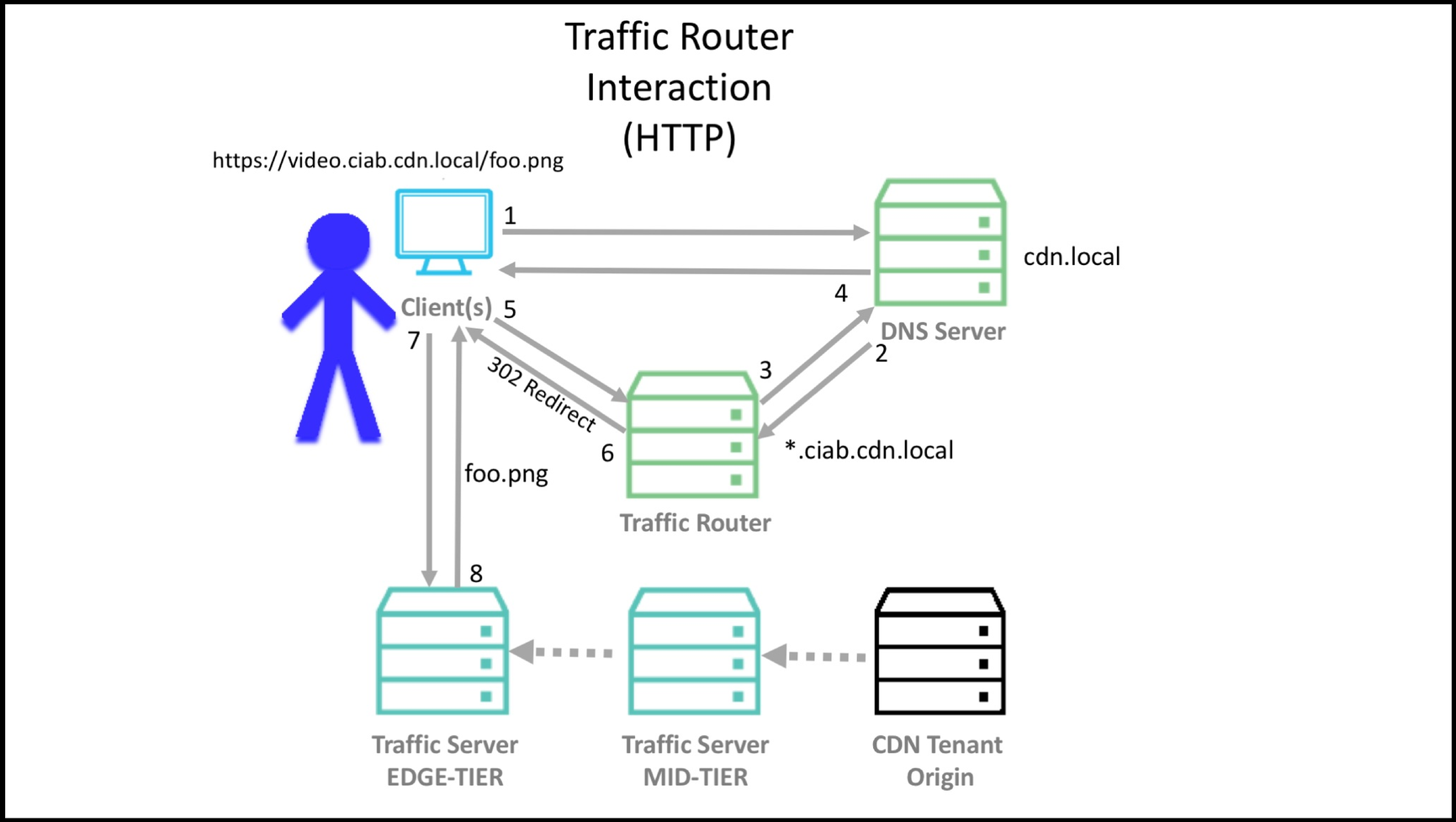


Traffic Router Interaction (HTTP)

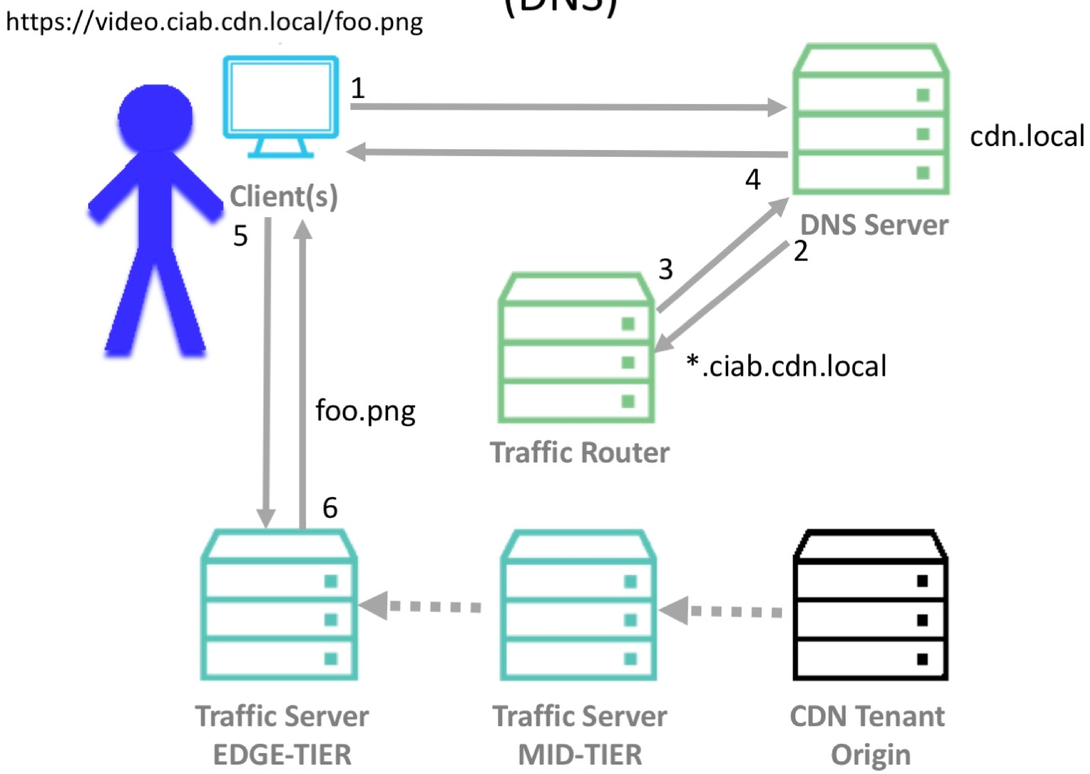


Traffic Router Interaction (HTTP)

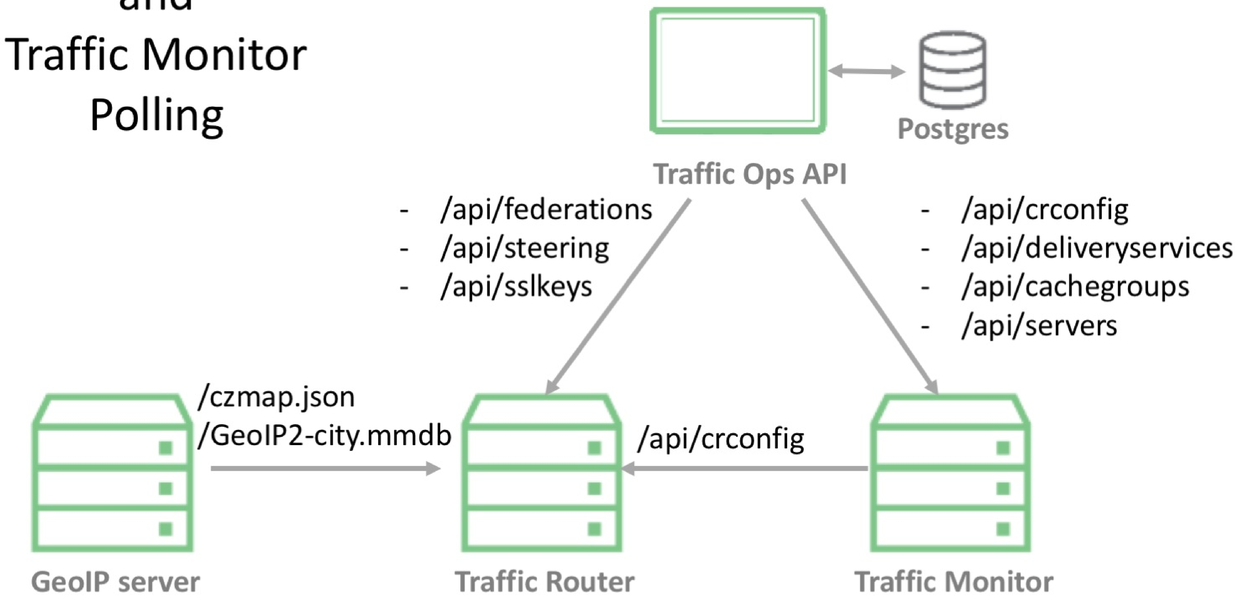



Traffic Router Interaction (HTTP)
https://video.ciab.cdn.local/foo.png
Client(s)
1
2
3
4
5
6
7
8
cdn.local
DNS Server
302 Redirect
*.ciab.cdn.local
Traffic Router
foo.png
Traffic Server EDGE-TIER
Traffic Server MID-TIER
CDN Tenant Origin

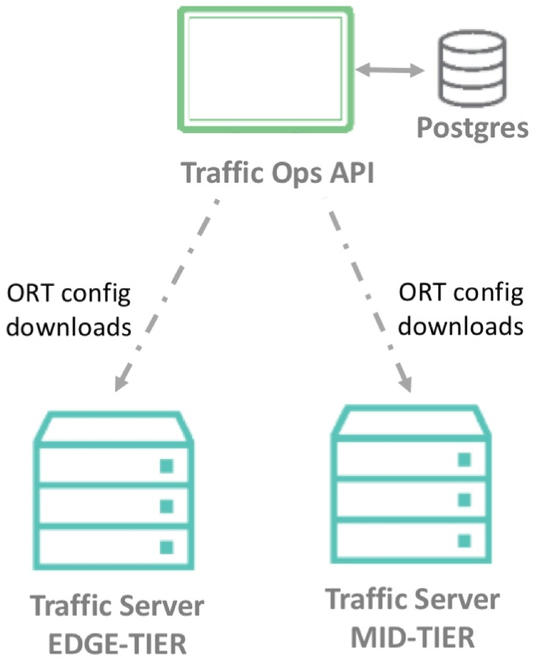
Traffic Router Interaction (DNS)

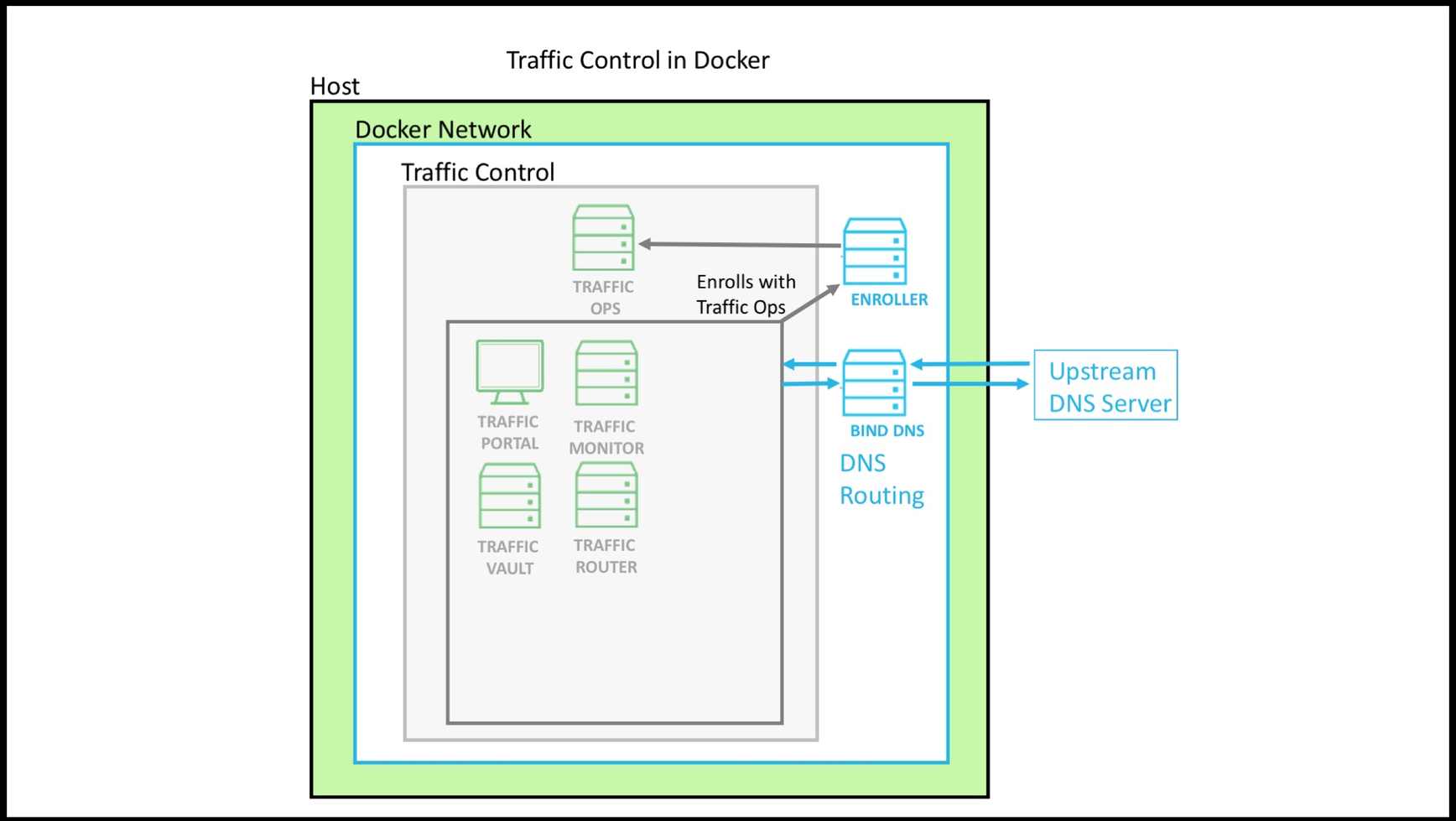


Traffic Router and Traffic Monitor Polling



ORT Config Polling

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Demo
Docker Container for Traffic Router

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Traffic Stats

Analytics

Acquires and stores statistics about the CDNs managed by Traffic Control

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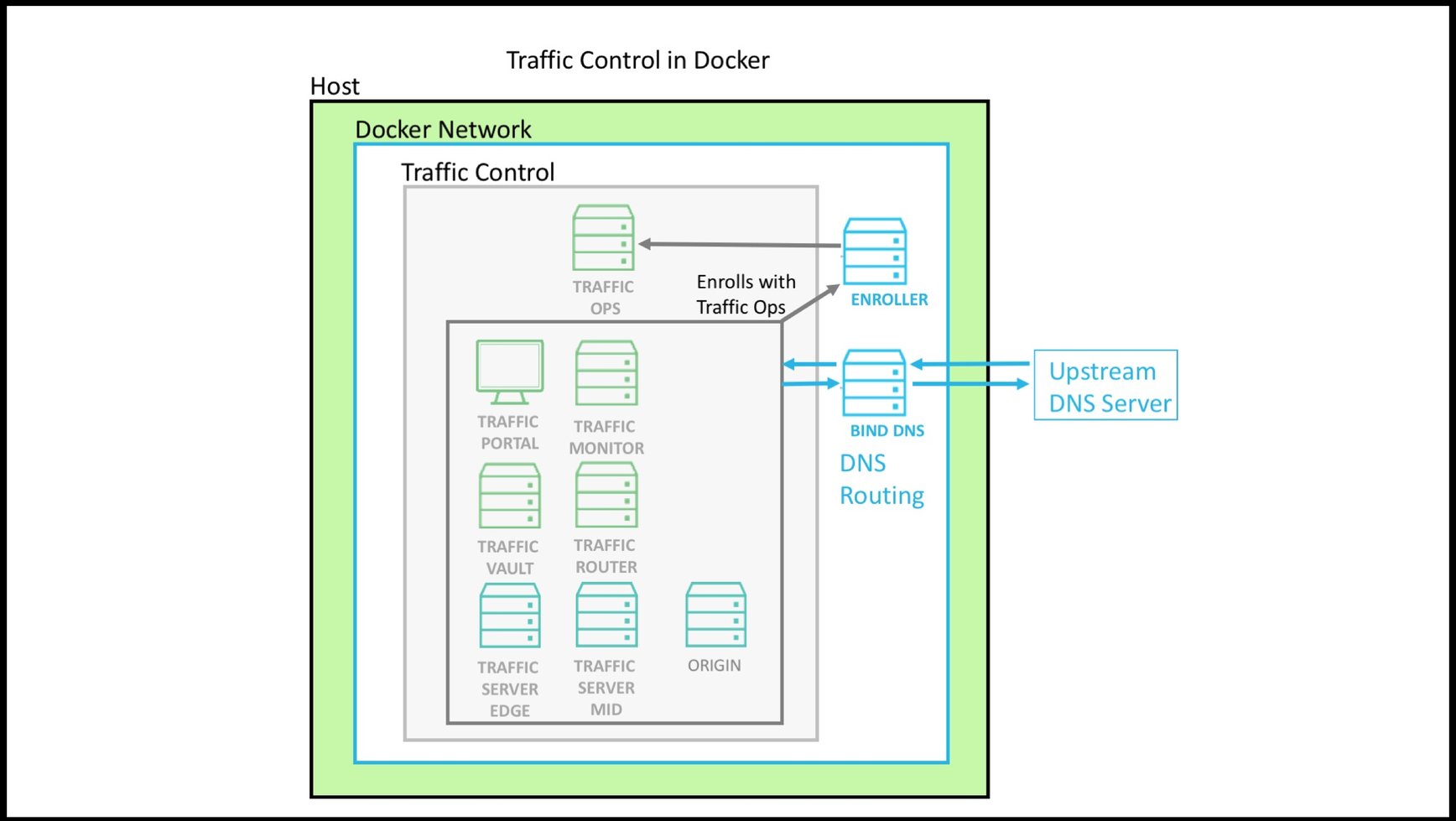
Traffic Vault

SSL Keys

Storage of SSL keys for Traffic Router's DNSSEC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TRAFFIC SERVER EDGE
TRAFFIC SERVER MID
ORIGIN
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Future Development

- Self Service for tenants
- Logging analytics
- Pattern Based Consistent Hashing
- URI Signing (RFC draft)
- Additional caching software support (Nginx and others)
- HTTP/2 - push content vs pull

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Thank you

- Jeff Bevill
- Brennen Fieck
- Rob Butts

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Slack Questions?

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Traffic Control Resources

These slides
http://bit.ly/atc-up-and-running

These slides in pdf
http://bit.ly/atc-up-and-running-pdf

Traffic Control Website
https://trafficcontrol.apache.org

Traffic Control Releases
https://trafficcontrol.apache.org/releases

Apache Traffic Server
http://trafficserver.apache.org

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THE END