Hackathon Wrap-Up

TJ Trask, facebook
Anna, Chris, Sean NANOG
NANOG 71 Hackathon

- Saturday evening tutorial “Let’s Build a BGP Traffic Engineering Controller” by Brandon Bennett
- 80 registered attendees for Sunday Hackathon
- 12+ groups resulting in 10 projects which gave 3-5 minute presentations in prototype forum
- Winner presentation follows wrap-up and first 2 runner-up projects will present Monday afternoon
Join Us

- NANOG is no longer just a conference for “conf t”
- Past NANOG tutorials for Network Engineers on python, automation, Netconf, and Yang
- NANOG 71 presentations on Openconfig, Flowspec API and model driven APIs for network layer
- NANOG 71 Hackathon [idea pad](#)
- #netengcode facebook group
- Local automation meetups and future hackathons
- PC welcomes submissions for tutorials, NANOG on the Road content, and hackathon tutorials
Hackathon Challenge

- Challenge: Hack on a project to support dynamic control of edge traffic egress from your network environment
  - Telemetry and data collection code to support traffic controller
  - Decision logic for shifting network traffic possibly incorporating performance targets or business rules
  - Interacting or injecting routing information into network to modify traffic forwarding
Hackathon Groups

Vote for the group you found most int...

- Covfefe Kafka
- Hack Overflow
- The Scope Creeps
- The Injectors
- Streamers
- Go Jet Yourself
- Downtimers - Main...

- Everyday I'm Pollin
- Flow Symmetry
- Go Fail. Hard
Winning hacks

- Winner: Downtimers
- 1st Runner Up: Covfefe Kafka
- 2nd Runner Up: Hack Overflow
Thanks!
Maintenance Traffic Controller

Colin McIntosh (Netflix)
Aaron Atac (DePaul University)
Background

- We get too many maintenance notifications
- It’s too hard to track them all
- With lots of external connections or circuits it can be a pain to manage downtime
Previous Work (Last NANOG Hackathon)

- Read partner maintenance notification emails
  - In a IMAP folder
- Identify maintenance notifications
  - Use the existing maint-notification BCOP standards
  - Fallback to naive regex parsing
- Add maintenance events to calendar
  - Use Google Calendar API
Goals

- Read partner maintenance notification emails
  - Already done!
  - Work was done at the last NANOG Hackathon
- Shift traffic off network links during planned maintenance
  - Use identified circuit IDs to match with device & peer/session
  - Create a schedule of peer sessions that need to be turned up/down
  - Create a daemon that watches the schedule and shifts traffic before and after maintenance
How it works

Email from Partner with planned maintenance

Circuits Database

Schedule of maintenance events

Manage Maintenance (Previous project)

Maintenance Traffic Controller

NAPALM

Network Devices
Controller

- Matches information from email to Circuit IDs in database
- Watch schedule and “engage maintenance mode” 5 minutes before maintenance start time
- “Disengage maintenance mode” after maintenance end time is reached
Traffic Shifting

- Many options for moving traffic
- Using Jinja2 templates to create command scripts
- Example using DENY ALL or AS PREPEND to shift traffic:

```plaintext
{% if DENYALL %}
replace protocols bgp group {{peer_group_name}} import DENY-ALL
replace protocols bgp group {{peer_group_name}} export DENY-ALL
set policy-options policy-statement DENY-ALL then reject
{% endif %}

set policy-options policy-statement {{IN_PEER}} term LOCAL_PREF_ADJ then local-preference 5
set policy-options policy-statement {{IN_PEER}} term LOCAL_PREF_ADJ then accept
set policy-options policy-statement {{OUT_PEER}} term AS_PATH_PREPEND_3 then as-path-prepend "{asn} {{asn}} {{asn}}"
set policy-options policy-statement {{OUT_PEER}} term AS_PATH_PREPEND_3 then accept

{% endif %}

{% if TRFENG_disengage %}
delete policy-options policy-statement {{IN_PEER}} term LOCAL_PREF_ADJ
delete policy-options policy-statement {{OUT_PEER}} term AS_PATH_PREPEND_3
{% endif %}
```
INFO:maint_controller.scheduler:Starting scheduler loop
INFO:maint_controller.scheduler:Tick started.
INFO:maint_controller.scheduler:Checking for events that are starting soon...
INFO:maint_controller.scheduler:Found 1 events that are starting soon.
INFO:maint_controller.scheduler:Engaging maintenance mode for switch01.lab.local.Ethernet
INFO:maint_controller.controller:Maintenance Mode ENGAGED for switch01.lab.local.Ethernet
INFO:maint_controller.scheduler:Checking for events that recently ended...
INFO:maint_controller.scheduler:Found 0 events that recently ended.
INFO:maint_controller.scheduler:Tick ended
^CInterrupt. Exiting.
Possible Future Work

- Check link & BGP status before restoring traffic to link
- Support more routing protocols than BGP
- Enable “maintenance mode” in anAlerting system (e.g. Nagios) to suppress alerts
- Ask vendors to use X-MAINTNOTE-* headers or .ics!!!!
- Additional work on the Maint-Note BCOP
This code: https://github.com/colinmcintosh/maintenance-traffic-controller

References:

Previous work on Manage-Maintenance: https://github.com/colinmcintosh/manage-maintenance

Maint Note BCOP: https://cloud.box.com/v/DRAFT-MaintNote-BCOP

Maint Note Library: https://github.com/maint-notification/maint-notification

Contact:

Colin Mcintosh: colin@colinmcintosh.com

Aaron Atac: aatac@mail.depaul.edu
AUTOMATING MAINTENANCE NOTIFICATIONS

ERIK KLAVON, BOX
TODD PARKER, TWITCH
RYAN GUNTER, TWITCH
GOALS

Establish conventions for formatting maintenance notifications to save time and reduce human error

- Machine parsable content supports tooling and automation
- Preserve existing human facing content
- General enough to be useful for any service

AUTOMATING MAINTENANCE NOTIFICATIONS
PHASES

AUTOMATING MAINTENANCE NOTIFICATIONS

DRAFT THE STANDARD

DEVELOP IMPLEMENTATIONS & AID EARLY ADOPTERS

PUBLISH STANDARD & ADVOCATE FOR BROAD ADOPTION
EARLY ADOPTERS

COMMITTED
- LEVEL 3
- TELIA
- ZAYO

DEVELOPMENT

PRODUCTION

AUTOMATING MAINTENANCE NOTIFICATIONS
SEEKING

- Carriers
- ISPs
- IX Operators
- Coders
INQUIRIES WELCOME

- Erik Klavon: erik.klavon@gmail.com
- Todd Parker: tparker@twitch.tv
- Ryan Gunter: rgunter@twitch.tv
MORE INFORMATION

- https://facebook.com/groups/maintnote/
- https://cloud.box.com/v/DRAFT-MaintNote-BCOP
- https://github.com/maint-notification/
- https://github.com/jda/xmaintnote-go/
- https://youtu.be/euSsG0aZx1U