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Critical Syslog Tricks

(That No One Seems to Know About)

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Do You Have A Syslog Collection Problem?

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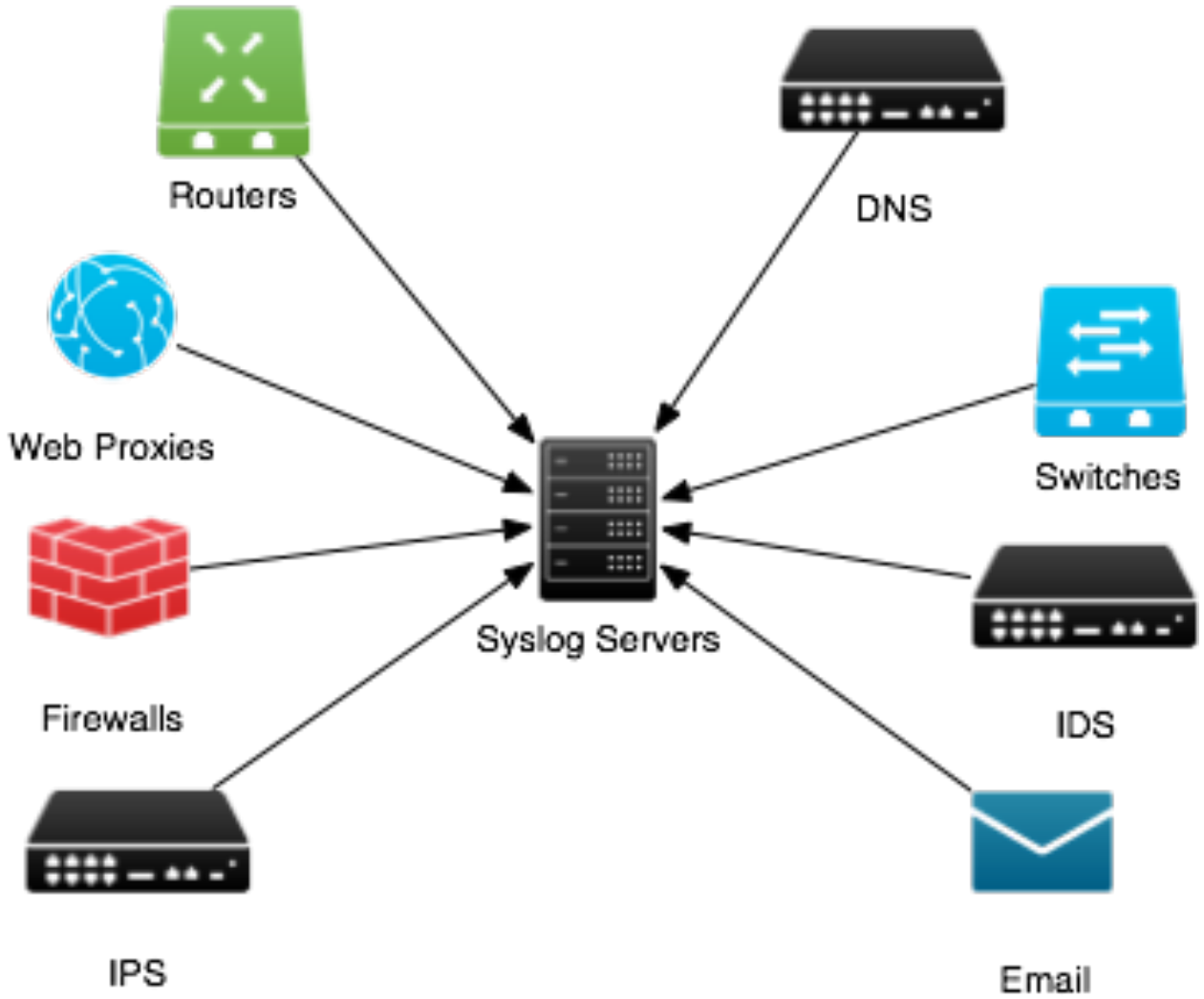
You Might Have A Syslog Collection Problem If…

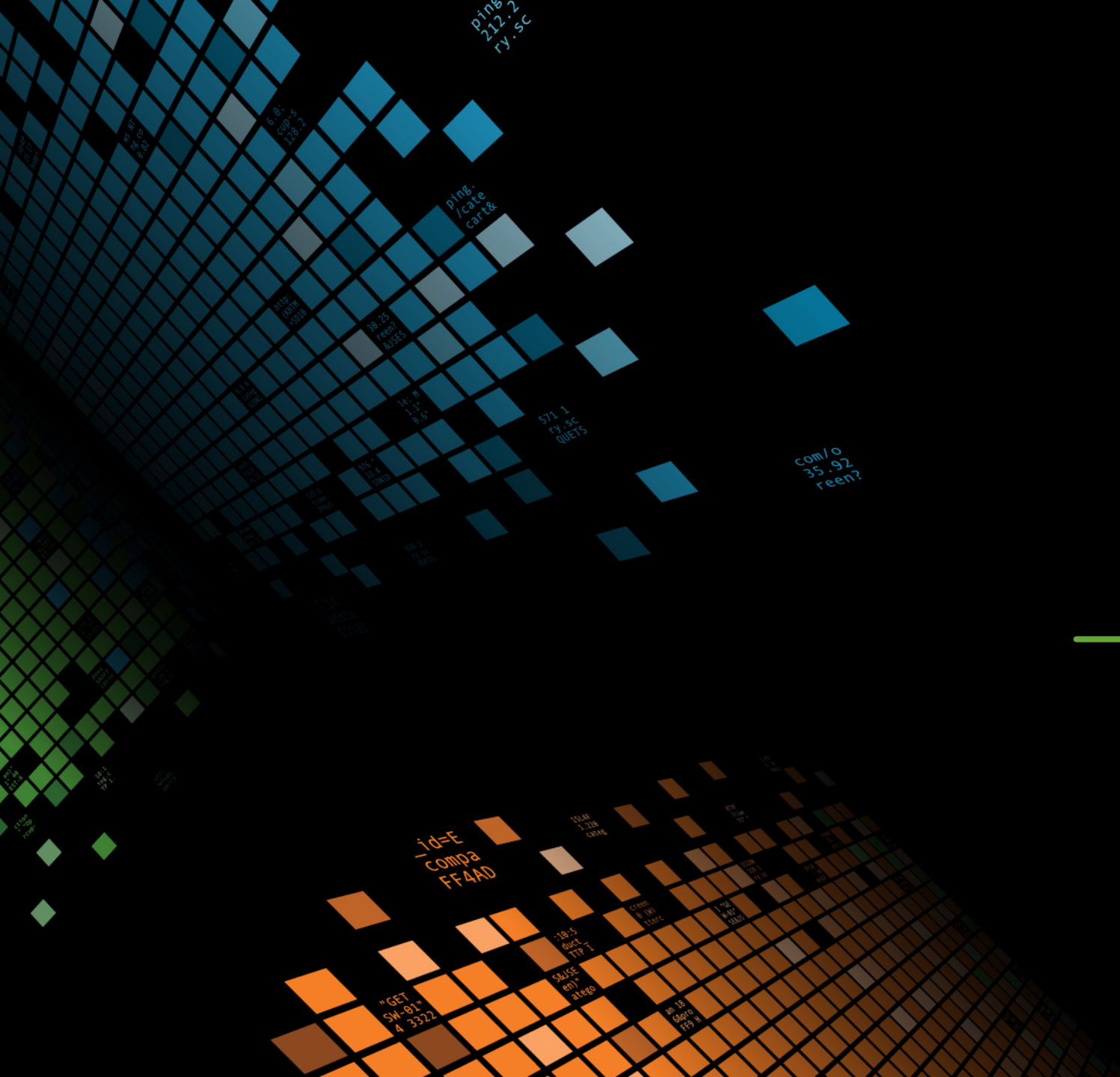
- Your syslog data arrives in Splunk more than a few seconds after the event time
- Syslog data that comes in while Splunk is restarting gets dropped
- You notice gaps or missing events in your syslog data feeds
- You need a new listening port every time you get a new syslog data source
- Your indexers or heavy forwarders have to look in raw events to figure out what index, sourcetype, or host to assign to those events
- Multiple hosts' syslog data are being aggregated under the same host because they came through the same syslog server
- Your IT people use grep instead of Splunk to troubleshoot live issues

Syslog Brings In Your Most Important Logs



What You'll Learn From This Presentation

- How to configure syslog-ng to collect all your syslog data for Splunk
- How to architect your syslog collection infrastructure
- How to configure Splunk to collect all the data from syslog-ng and index it in about 3 seconds
- How to find and troubleshoot syslog collection problems quickly



syslog-ng

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A Few Things To Note About Syslog-ng

- It's free. There's a paid version, but this presentation assumes you didn't buy it.
- We recommend version 3.5 or higher, as that supports multithreading and some other useful features
- You can do everything we're recommending using rsyslog instead, but we don't recommend it
  - syslog-ng handles poorly formatted syslog events more gracefully

https://syslog-ng.org/

https://www.balabit.com/documents/syslog-ng-ose-latest-guides/en/syslog-ng-ose-guide-admin/html/index.html

Configuring syslog-ng (options)

```
options {
    flush_lines (100);
    time_reopen (10);
    log_fifo_size (1000);
    chain_hostnames (off);
    use_dns (no);
    use_fqdn (no);
    create_dirs (yes);
    keep_hostname (yes);
    threaded (yes);
};
```

https://gitlab.com/rationalcyber/syslog-ng-configuration/blob/master/syslog-ng.conf

Configuring syslog-ng (Listening And Writing)

```
source s_aggregation {
    udp(ip(0.0.0.0) port(514));
    tcp(ip(0.0.0.0) port(514));
};

destination d_splunkf {
     file(“/mnt/$LOGHOST/log/$R_YEAR-$R_MONTH-
$R_DAY/$HOST_FROM/$HOST/$FACILITY.log" dir-owner("splunk") dir-
group("splunk") owner("splunk") group("splunk"));
};
```

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This Is The Most Important Line!

file("/mnt**/$LOGHOST/log/$R_YEAR-R_MONTH-R_DAY/$HOST_FROM/**$HOST/$FACILITY.log" dir-owner("splunk") dir-group("splunk") owner("splunk") group("splunk"));

- **/$LOGHOST**
  - Essentially, "the hostname of this syslog-ng server." You're going to be collecting syslog on more than one server, so this will help with troubleshooting.
- **/log/R_YEAR-R_MONTH-$R_DAY**
  - This is important for log rotation. We'll explain that on its own slide.
- **/$HOST_FROM**
  - "The host I received this feed from." It may be the same as the originating host, or it may be an intermediate syslog server. In the latter case, helps with troubleshooting.

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The Rest Of That Line

file(“/mnt/$LOGHOST/log/$R_YEAR-R_MONTH-R_DAY/$HOST_FROM**/$HOST/$FACILITY.log” dir-owner("splunk") dir-group("splunk") owner("splunk") group(“splunk"))**;

- **/$HOST**
  - “The hostname from the syslog header.” This may be an actual hostname, FQDN, or IP address, but it’s always the most reliable source of the logs’ originating host.
- **/$FACILITY.log**
  - “The syslog facility setting.” This generally isn’t useful by itself, but it can almost always be used in combination with $HOST to separate different sourcetypes from the same host.
- **dir-owner("splunk") dir-group("splunk") owner("splunk") group(“splunk”))**
  - Splunk should never be running as root! Make sure the splunk user can read and rotate all the log files.

Rotating Logs

- **Do not use logrotate on a syslog server**
  - It will restart syslog-ng and you'll lose a couple of seconds of logs
  - https://www.balabit.com/documents/syslog-ng-ose-latest-guides/en/syslog-ng-ose-guide-admin/html/example-logrotate.html
- Use these cron jobs instead (adjust the times as needed):

```
#cron job 1: at 5am, find yesterday's logs, and move them to old_logs
0 5 * * * /usr/bin/find /mnt/*/log/????-??-?? -maxdepth 0 -type d ! -mmin -
300 -exec bash -c 'dir={}; old=${dir/\/log\//\/old_logs\/}; mv ${dir}
${old}' \;

#cron job 2: find any files older than 5 days, 23 hours, and delete them
0 4 * * * /usr/bin/find /mnt/*/old_logs/????-??-?? -maxdepth 0 -type d ! -
mmin -8580 -exec rm -rf {} \;
```

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Architecting Syslog Infrastructure For Splunk

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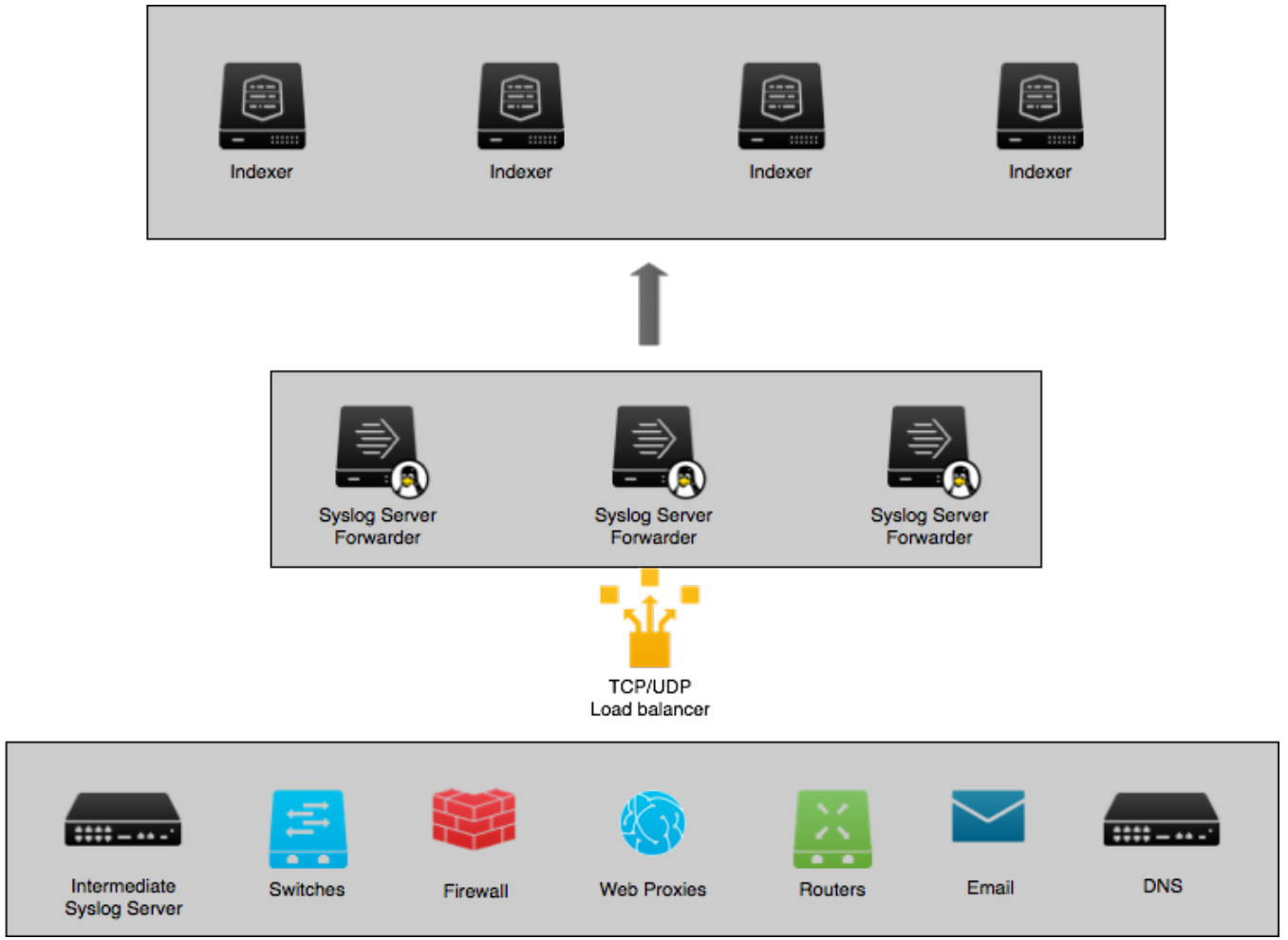
Network Architecture



What Kind of Forwarder?

Heavy vs Universal

Heavy Forwarder Advantages

- Can handle timezone conversions
  - Keep your props and inputs together
- Takes load off your indexers
- PII masking

Universal Forwarder Advantages

- Need a lot less bandwidth to the indexing tier
  - Less metadata
- Less processor/memory load on the syslog servers

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Configuring The Forwarder

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inputs.conf

```
[monitor:///mnt/log/*/*/fireeye*/local2.log]
host_segment = 5
index = idps
sourcetype = fe_cef_syslog

[monitor:///mnt/log/*/*/mail*/*]
host_segment = 5
index = mail
sourcetype = sendmail_syslog
```

props.conf

```
[source::/mnt/log/*/*/fireeye*/local2.log]
SHOULD_LINEMERGE = false
TZ = UTC

[source::/mnt/log/*/*/mail*/*]
SHOULD_LINEMERGE = false
TZ = US/Eastern
```

outputs.conf

- Most of Splunk's pipeline queues default to a maximum size of 512KB. That's fine for a normal universal forwarder, but not for a syslog server
- Is your output queue too small?
  - `index=_internal host=<syslog_server> source=*metrics.log group=queue name=tcpout* | eval output_queue_pct=current_size/max_size*100 | timechart perc95(output_queue_pct) by host | eval Bad=80`
- A 64MB output queue works well for many enterprise syslog servers, but you may need more (if your 64MB queue is filling up) or less (if your RAM is filling up)
- Outputs.conf contents:

```
[tcpout]
maxQueueSize = 64MB
```

server.conf

- Like the outputs queue, most Splunk queues default to a maximum size of 512KB, which is often insufficient for a syslog server
- Contents of server.conf:

```
[queue]
maxSize = 64MB
```

Better Balance Across Indexers

- For better load balancing, have the forwarders change indexers often and mid-stream:
  - outputs.conf:

```
[tcpout]
autoLBFrequency = 5
forceTimebasedAutoLB = true
```

  - On UFs running 6.5+, do not use forceTimebasedAutoLB. Add this to props.conf for each data source (or in `[default]`) instead:

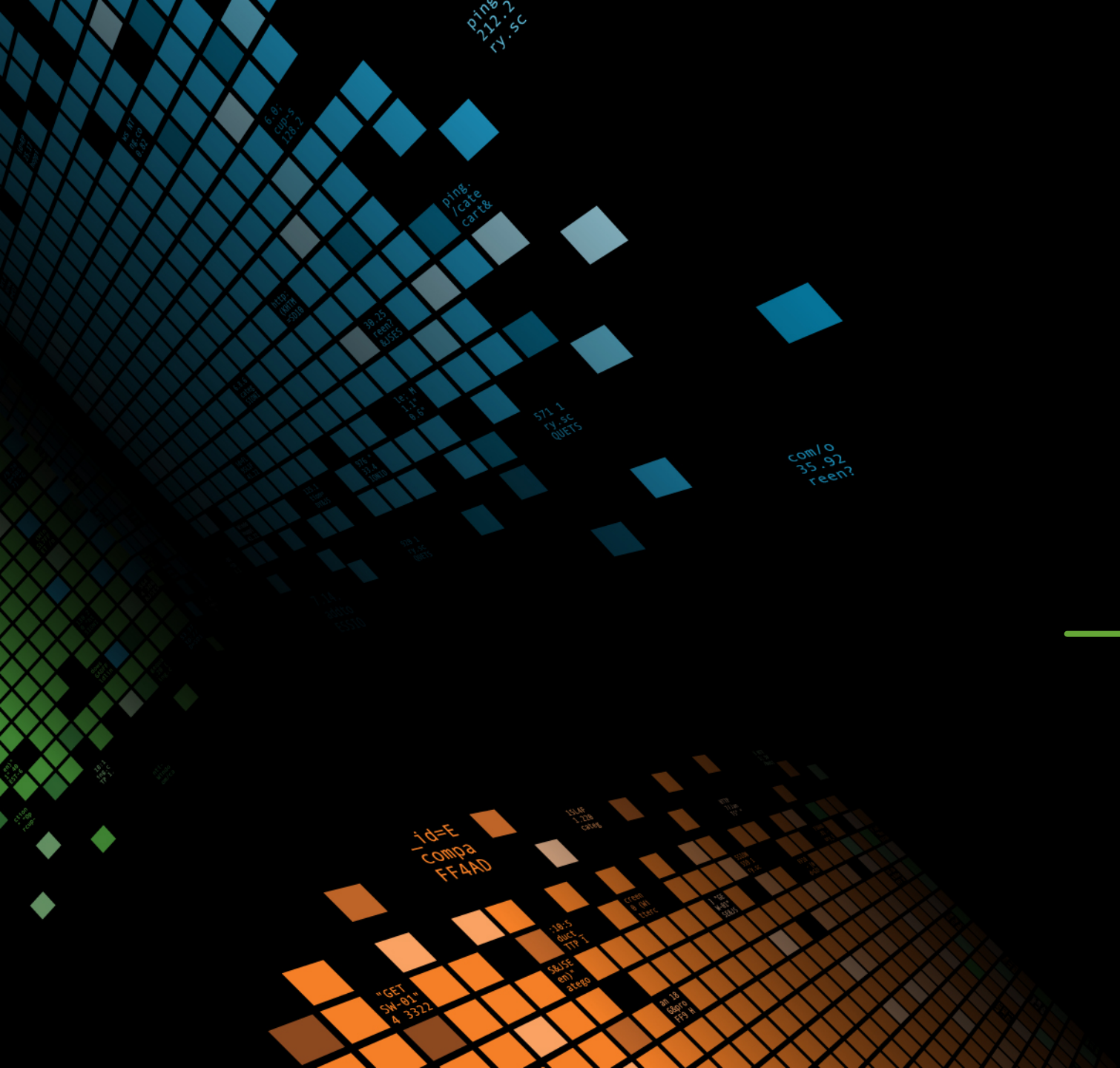
```
EVENT_BREAKER_ENABLE = true
```

https://www.splunk.com/blog/2014/03/18/time-based-load-balancing.html

Parallel Ingestion Pipelines

- Parallel ingestion pipelines allow Splunk to use more resources so it can ingest multiple streams of data at once
- Since these syslog servers are dedicated to Splunk data collection, they're excellent candidates for this feature
- The number of pipelines you set will depend on your hardware capacity and data rates. See notes on side effects of this setting at https://docs.splunk.com/Documentation/Splunk/latest/Admin/Serverconf
- Enabling parallel ingestion pipelines in server.conf:

```
[general]
parallelIngestionPipelines = 2
```



Automation

Syslog at Scale

- In a large enterprise, do not build syslog inputs and props manually!
  - With thousands of syslog feeds, they become impossible to manage
  - Small typos can cause massive failures
- We manage all of our syslog inputs in a CSV file and edit in Excel
- Find our script to auto-generate inputs.conf and props.conf for syslog servers at:
  - https://gitlab.com/rationalcyber/

Using A Catchall Index

- Sometimes upstream syslog sources start sending data you weren't expecting
- You want this data in Splunk, but you don't know what index or sourcetype to give it
- inputs.conf:

```
[monitor:///mnt/log/*]
blacklist = /mnt/log/*/*/((fireeye*/local2.log)|(mail*/*))
index = catchall
```

- This blacklist regex becomes unmanageable quickly; the script on the previous slide auto-generates it for you

Monitoring And Alerting

- Problems with one of the Splunk syslog servers (run every few minutes):
  - `| tstats count where source=/mnt/log/* by source | rex field=source "/mnt/log/(?<splunk_syslog_server>[^/]+)/" | stats sum(count), count by splunk_syslog_server`
- Problems with an upstream syslog server (run every few minutes):
  - `| tstats count where source=/mnt/log/* by source | rex field=source "/mnt/log/[^/]+/(?<upstream_syslog_server>[^/]+)/" | stats sum(count), count by splunk_syslog_server`
- Queues filling up and causing delays (observe daily—look for sustained issues):
  - `index=_internal host=<syslog_server> source=*metrics.log group=queue | eval queue_pct=if(isnull(current_size_kb), (current_size/max_size), (current_size_kb/max_size_kb)) | timechart limit=50 perc99(queue_pct) by name | eval Bad=80`
- Unknown syslog feeds (check weekly):
  - `| tstats count where index=catchall by source`

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Thank You!

- george@rationalcyber.com
- jonathan@rationalcyber.com
- All of our open source projects, including all of our syslog resources:

https://gitlab.com/rationalcyber/

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Thank You

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