Critical Syslog Tricks
(That No One Seems to Know About)

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Do You Have A Syslog Collection Problem?
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
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/
Configuring syslog-ng (options)

```ruby
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);
};
```

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"));
};
This Is The Most Important Line!

```plaintext
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.
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.
Do not use logrotate on a syslog server

- It will restart syslog-ng and you’ll lose a couple of seconds of logs

Use these cron jobs instead (adjust the times as needed):

```bash
# 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 {} \;
```
Architecting Syslog Infrastructure For Splunk
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
Configuring The Forwarder
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
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
```
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 UF variants 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](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
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/
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`
Thank You!

- george@rationalcyber.com
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- All of our open source projects, including all of our syslog resources: https://gitlab.com/rationalcyber/
Thank You

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