

Manageable, Scaled Deployments with VOLTTRON™



Andrew Rodgers
Intellimation

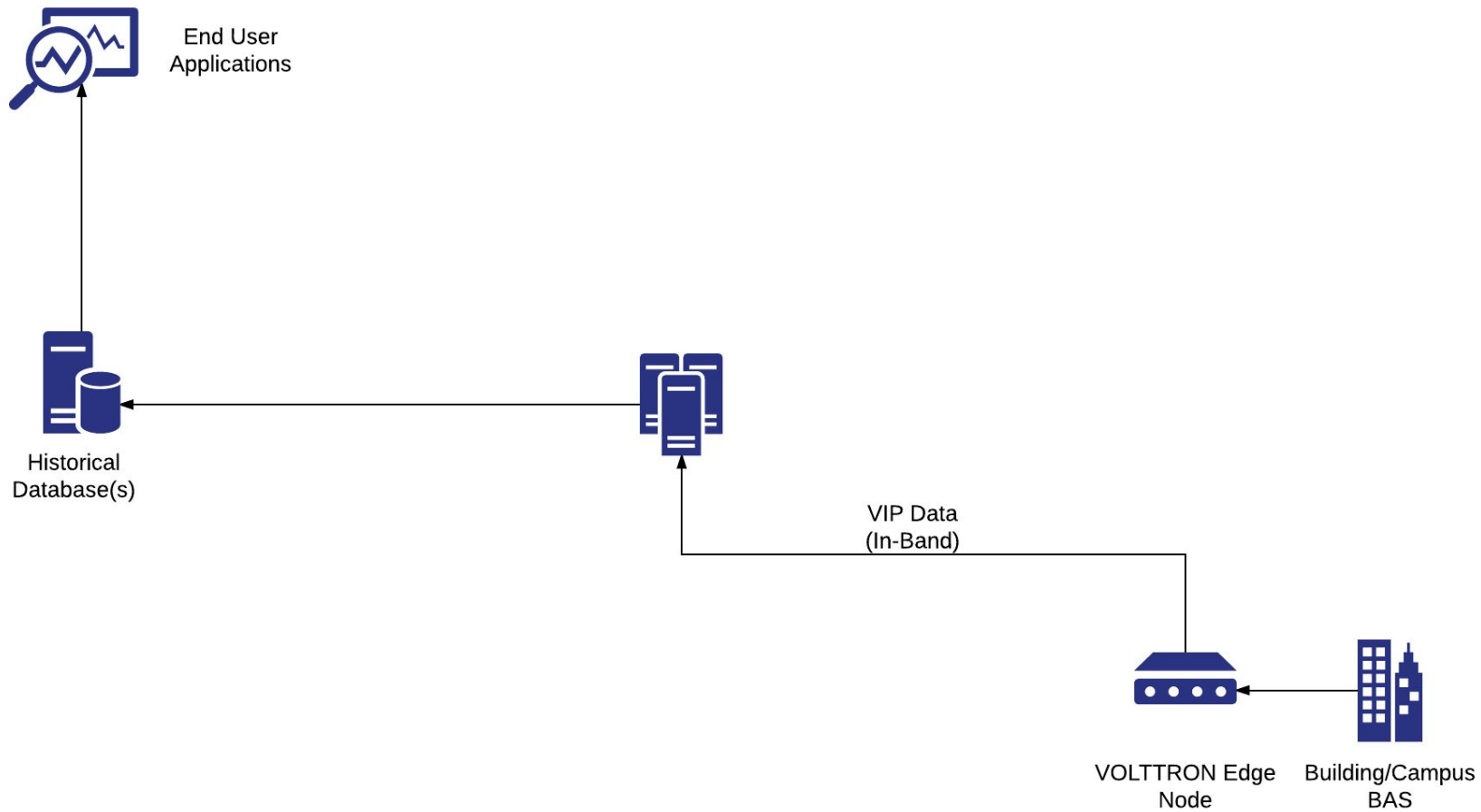
VOLTRON is great.

Until it isn't

What breaks VOLTTRON?

Then what?

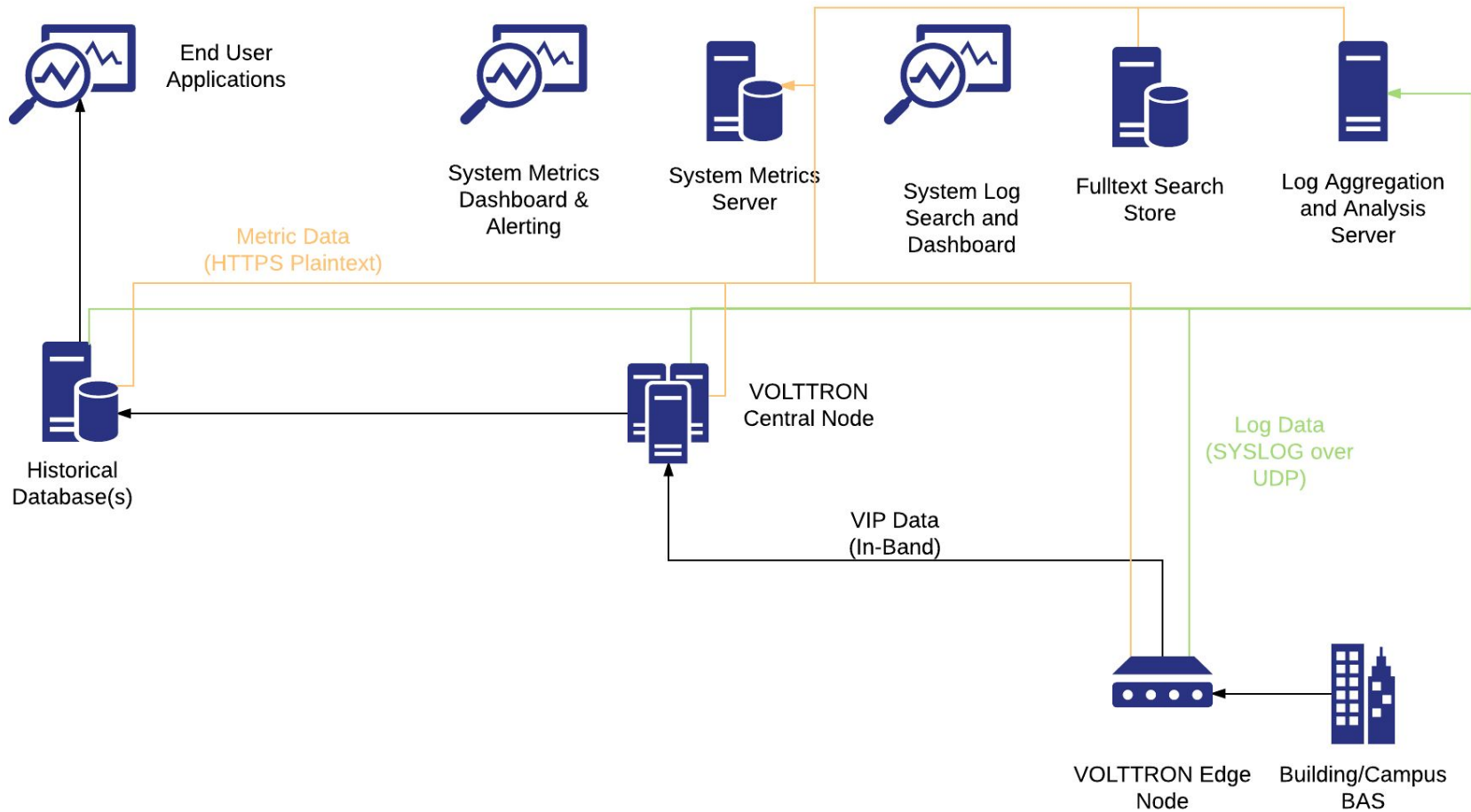
How we started:



Standard VOLTTRON deployment

Core infrastructure in Cloud

Where we are now:



Why?

Visibility

Metrology

Data

Insight

How?

Grafana & Prometheus:



Volttron Node Health



Zoom Out

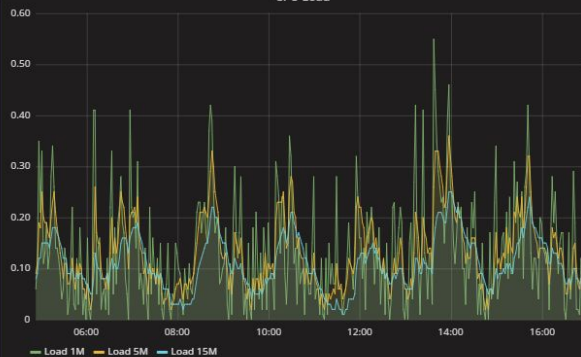
Last 12 hours



Collector Node

luke_c_moore

CPU Load



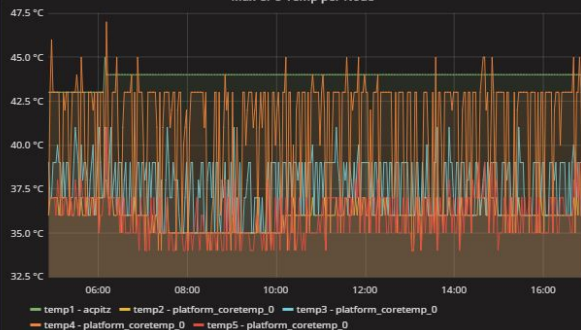
Memory Usage



Disk Usage



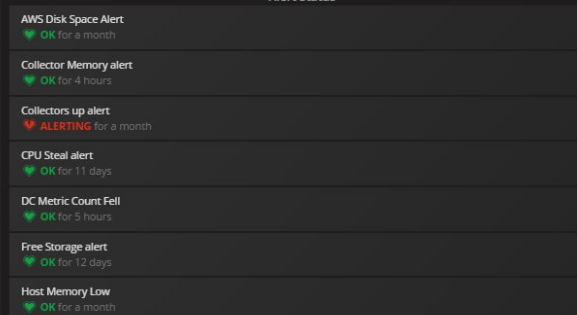
Max CPU Temp per Node



Panel Title



Alert Status

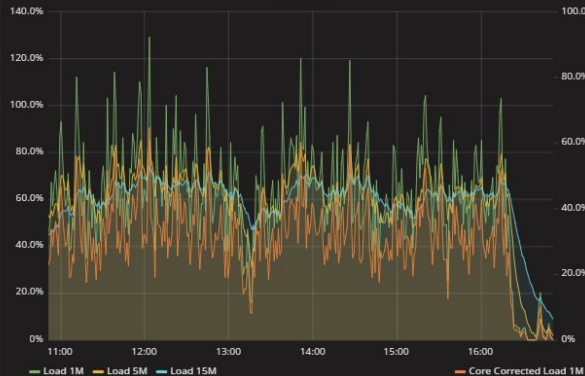


+ ADD ROW



AWS Instance 172.31.52.1:9100

CPU Load



Disk Usage



CPU Times



Sockets



Network Traffic



Memory Usage





Trend Status ▾



◀ Zoom Out ▶ ⌚ Last 6 hours



DC Metric Count

4066

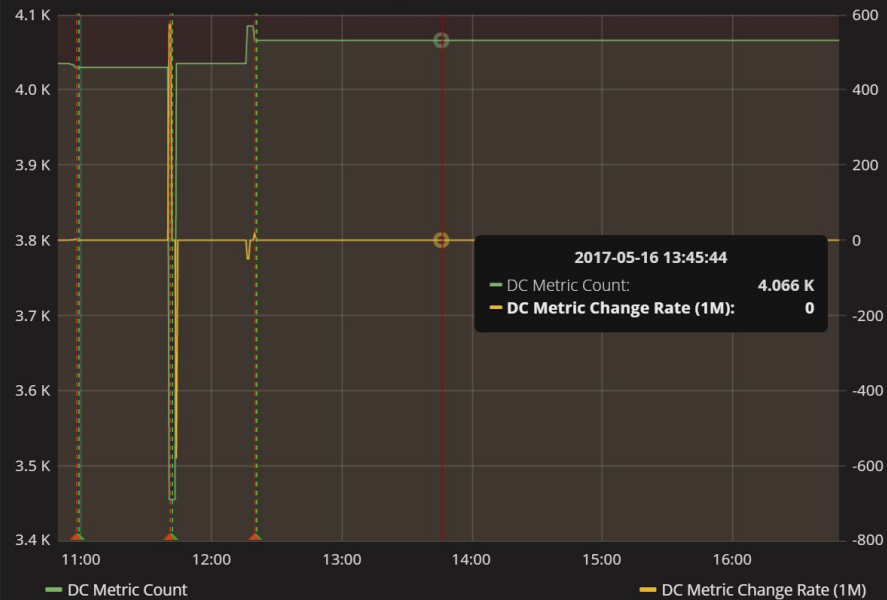
DC Crate Metric Count

5884

Metrics Delta 24h

-403

♥ DC Metrics



Logstash and Kibana (ELK Stack)

logstash-*

Selected Fields

? _source

Available Fields



Popular

t host

t message

severity

@timestamp

t @version

t _id

t _index

_score

t _type

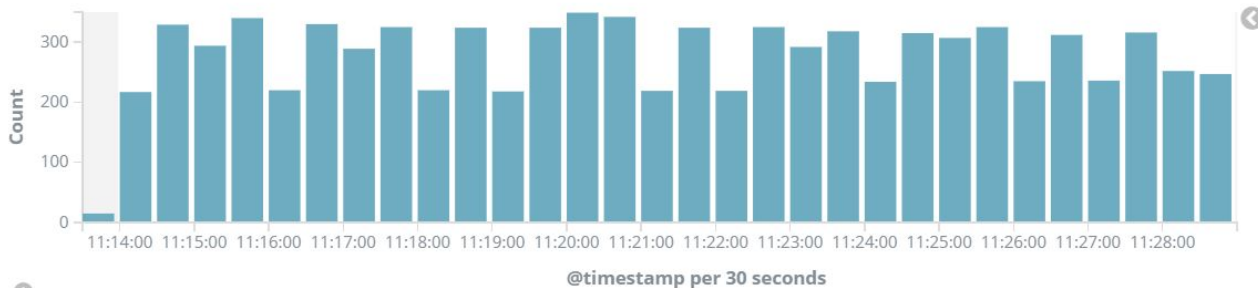
facility

t facility_label

t logsource

t pid

priority


May 17th 2017, 11:13:58.400 - May 17th 2017, 11:28:58.400 — [by 30 seconds](#)


Time

_source

- May 17th 2017, 11:28:51.000 **severity:** 6 **message:** 2017-05-17 15:28:50,988 (vcplatformagent-4.0 11718) vcp latplatform.agent INFO: Attempting to reconnect with volttron central. **type:** syslog **priority:** 14 **logsource:** intel **tags:** volttron **@timestamp:** May 17th 2017, 11:28:51.000 **@version:** 1 **host:** 10.57.78.26 **facility:** 1 **severity_label:** Informational **timestamp:** May 17 15:28:51 **facility_label:** user-level **_id:** AVwXB
- May 17th 2017, 11:28:51.000 **severity:** 3 **message:** 2017-05-17 15:28:51,023 (vcplatformagent-4.0 11718) <stderr> ERROR: Exception AttributeError: "'NoneType' object has no attribute 'set'" in <bound method Socket.__del__ of <volttron.platform.vip.green.Socket object at 0x7fafa4a5bf58>> ignored **type:** syslog **priority:** 11 **logsource:** intel **tags:** volttron **@timestamp:** May 17th 2017, 11:28:51.000 **@version:** 1 **host:** 1

289 hits

New Save Open Share May 16th 2017, 14:23:58.374 to May 16th 2017, 14:27:57.977

error AND host:10.57.78.26

error AND host:10.57.78.26

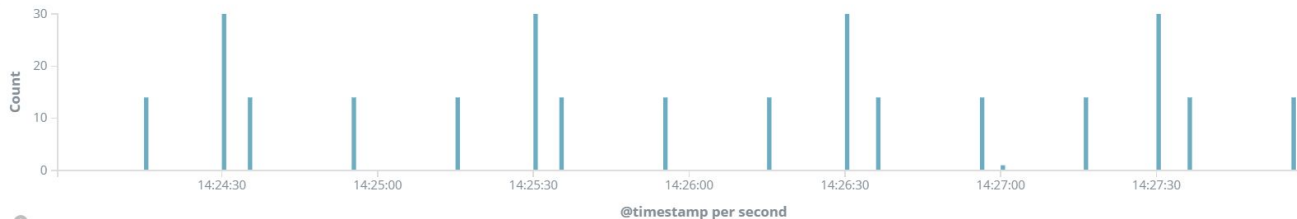
Selected Fields

? _source

Available Fields

Popular

- t host
- t message
- # severity
- @timestamp
- t @version
- t _id
- t _index
- # _score
- t _type
- # facility
- t facility_label
- t logsource
- # priority
- t severity_label
- t tags
- t timestamp
- t type



Time	_source
May 16th 2017, 14:27:56.000	<pre>host: 10.57.78.26 message: 2017-05-16 18:27:56,099 (vcplatformagent-4.0 11718) <stderr> ERROR: Traceback (most recent ca ll last): severity_label: Error severity: 3 @timestamp: May 16th 2017, 14:27:56.000 @version: 1 type: syslog priority: 11 logsource: intel facility: 1 timestamp: May 16 18:27:56 facility_label: user-level _id: AVwShEA81z60jX6f QyQ8 _type: syslog _index: logstash-2017.05.16 _score: -</pre>
May 16th 2017, 14:27:56.000	<pre>message: 2017-05-16 18:27:56,101 (vcplatformagent-4.0 11718) <stderr> ERROR: File "/var/lib/volttron/volttron/platform/vi p/agent/core.py", line 283, in run host: 10.57.78.26 severity_label: Error severity: 3 type: syslog priority: 11 logsource: intel tags: volttron @timestamp: May 16th 2017, 14:27:56.000 @version: 1 facility: 1 timestamp: May 16 18: 27:56 facility_label: user-level _id: AVwShEA81z60jX6fQyQ_ _type: syslog _index: logstash-2017.05.16 _score: -</pre>
May 16th 2017, 14:27:56.000	<pre>host: 10.57.78.26 message: 2017-05-16 18:27:56,103 (vcplatformagent-4.0 11718) <stderr> ERROR: self.socket = vip.Socket (self.context) severity_label: Error severity: 3 @timestamp: May 16th 2017, 14:27:56.000 @version: 1 type: syslog priority: 11 logsource: intel facility: 1 timestamp: May 16 18:27:56 facility_label: user-level _id: AVwShEA81z60jX6f QyRC _type: syslog _index: logstash-2017.05.16 _score: -</pre>
May 16th 2017, 14:27:56.000	<pre>host: 10.57.78.26 message: 2017-05-16 18:27:56,104 (vcplatformagent-4.0 11718) <stderr> ERROR: return base.__new__(cls, context, socket_type) severity_label: Error severity: 3 @timestamp: May 16th 2017, 14:27:56.000 @version: 1 type: sysl og priority: 11 logsource: intel facility: 1 timestamp: May 16 18:27:56 facility_label: user-level _id: AVwShEch1z60j</pre>

FlameGraphs

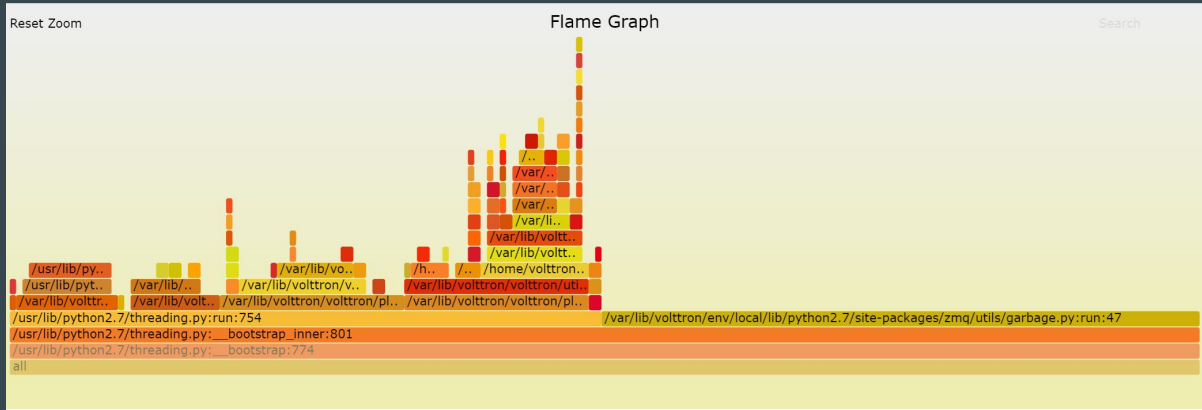
Production Crate Historian Flamegraph

More info on FlameGraphs:

<https://github.com/brendangregg/FlameGraph>

How I did it on a running Python process:

<https://github.com/uber/pyflame>



Now what?

What's next:

- Distributed tracing
- At will FlameGraph retrieval from across the infrastructure
- Better alert management (flapjack.io?)
- Centralized, simple system for initial platform install
- Regularly scheduled site network security audits and reporting
- More transfer of industry (IT Industry) best practices to VOLTTRON ecosystem

Thank you!

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Questions?