splunk> .conf2017

Measuring HEC Performance For Fun and Profit

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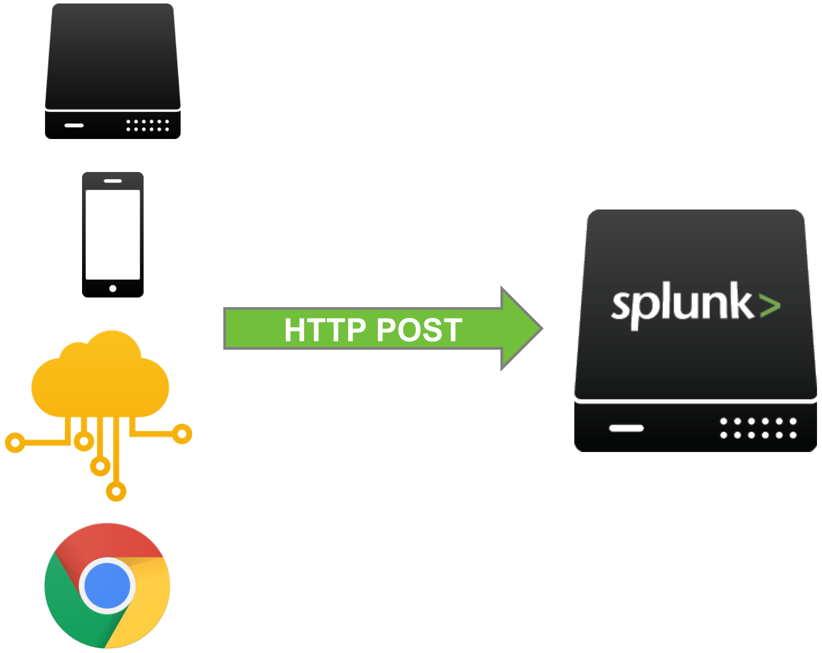
What the HEC Is the HTTP Event Collector?

- A simple HTTP endpoint for pushing data into Splunk
- Send events **directly** from anywhere (servers, mobile apps, IoT)
- Easy to configure and secure
- Highly scalable and performant
- Advanced features like specifying sourcetype, index, requesting ACK, etc.

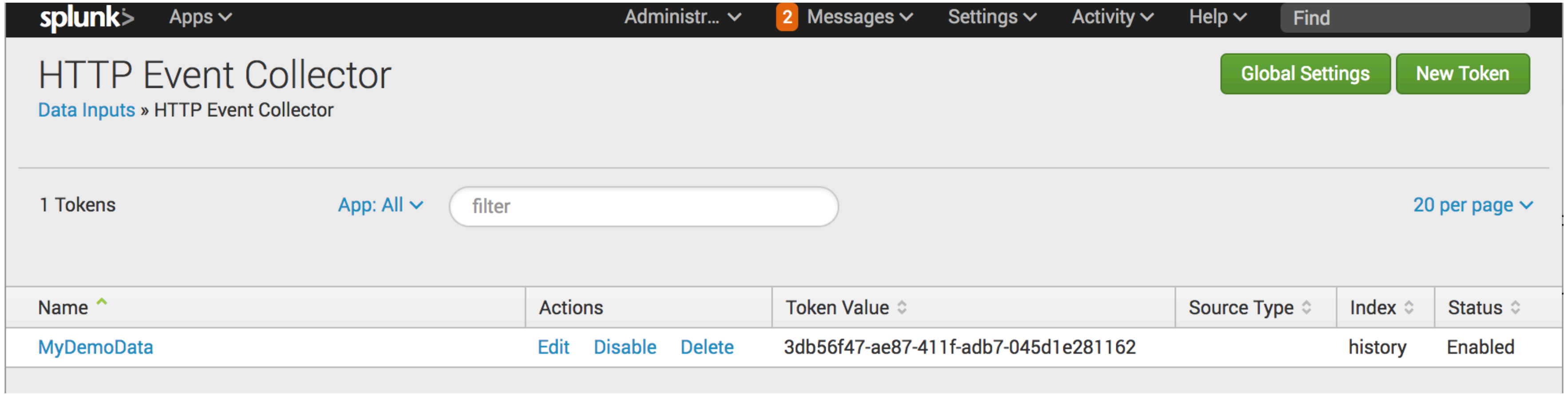


HEC in the Real World

- Customers have seen as much as 5x improvements in performance when switching from syslog to HEC
- Flexibility of HEC allows customers to ingest data from Kafka or AWS Lambda easily
- Management overhead can be greatly reduced by replacing many forwarders with just a few HEC endpoints

Enabling HEC

- Enable the HTTP Event Collector endpoint through Data Inputs (it's disabled by default)
- Generate an authorization token



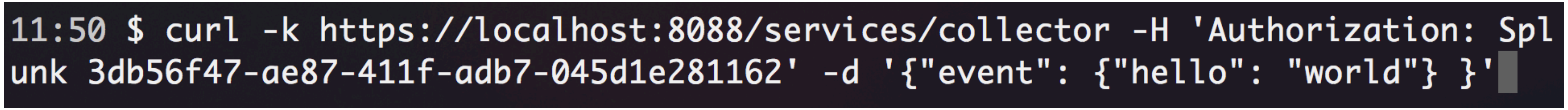
HTTP Event Collector

Data Inputs » HTTP Event Collector

1 Tokens   App: All   filter   20 per page

Name	Actions	Token Value	Source Type	Index	Status
MyDemoData	Edit Disable Delete	3db56f47-ae87-411f-adb7-045d1e281162		history	Enabled

- Use Splunk logging libraries to send data, or simply craft your own HTTP POST



```
11:50 $ curl -k https://localhost:8088/services/collector -H 'Authorization: Spl
unk 3db56f47-ae87-411f-adb7-045d1e281162' -d '{"event": {"hello": "world"} }'
```

Event Collector Performance Metrics

- The only metric that really matters is **Events Per Second** (eps)
- Secondary metrics are tracked to drive investigations and help us understand the performance of the system
  - Client network throughput (kbps)
  - Splunk CPU usage
  - Splunk Memory usage
  - Splunk Queue usage

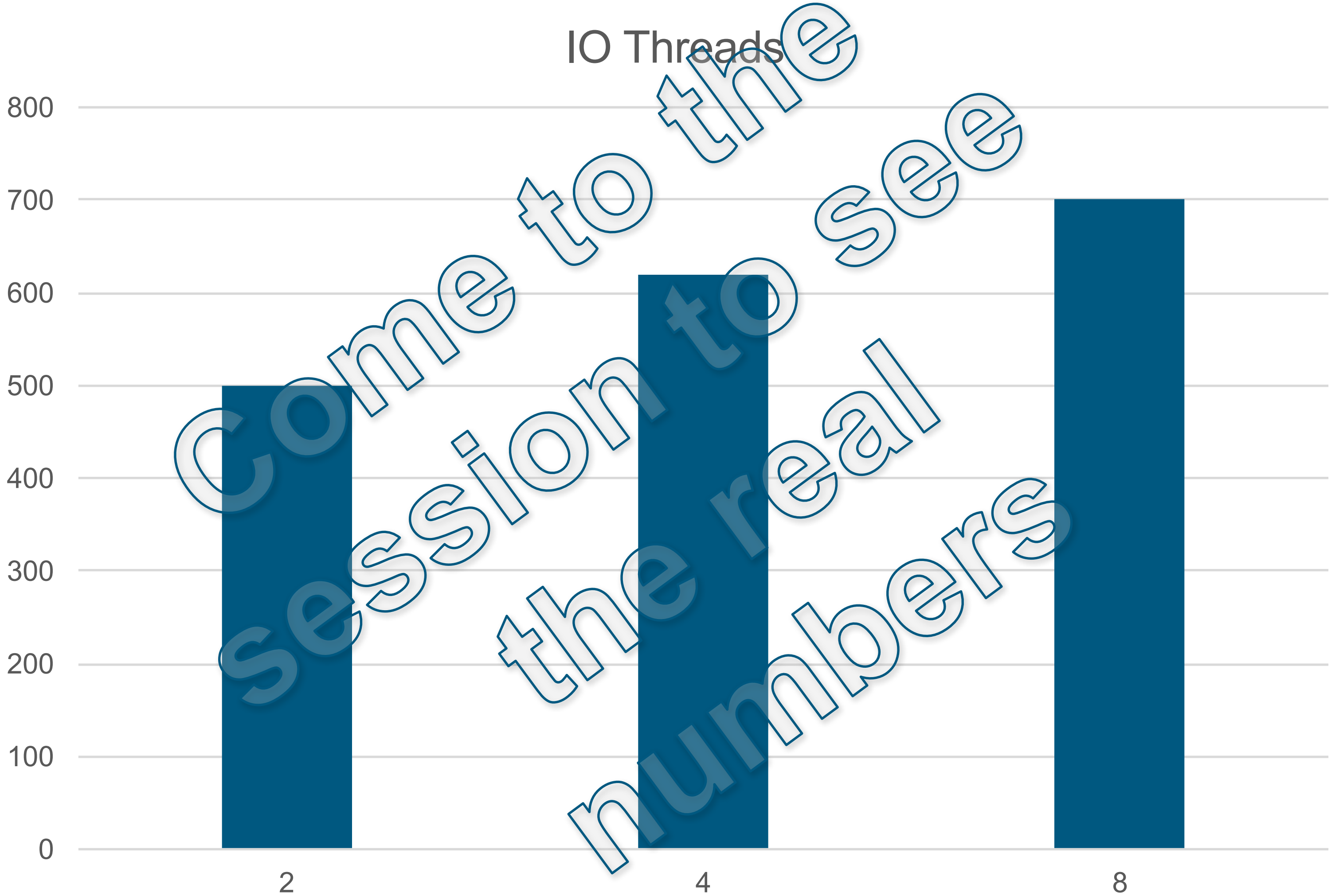
Tuning the Event Collector

- Splunk side tuning
  - Number of dedicated IO threads
  - Number of parallel ingestion pipelines
- Client-side tuning
  - Batching of events
  - HTTP Keep-Alive

Tuning HEC

Splunk Dedicated IO Threads

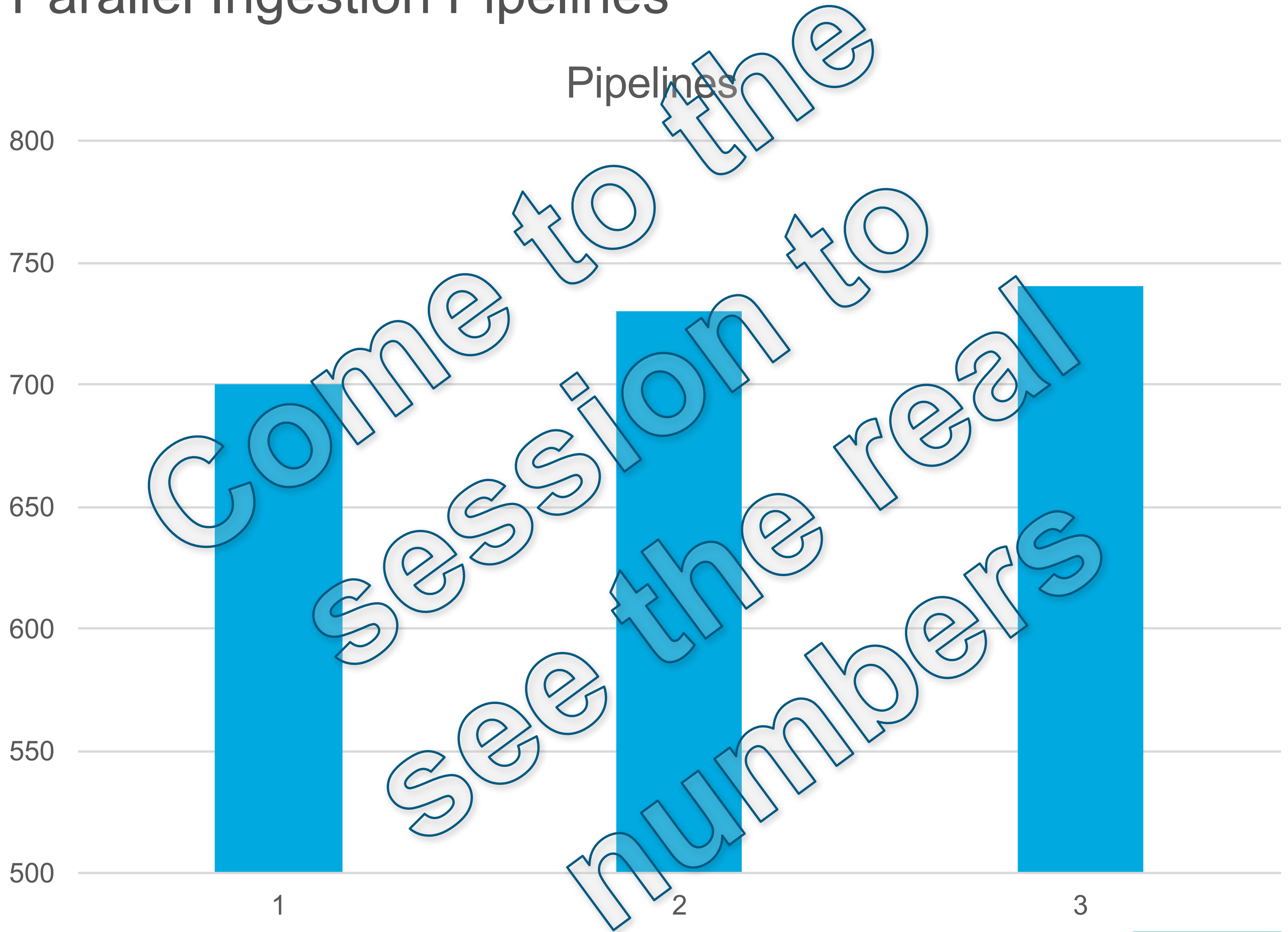
- By default, HEC uses one thread to handle all incoming HEC requests
- You can edit inputs.conf to raise the number of threads used by HEC to improve performance
- Recommendation: set to roughly the number of CPU cores on the machine



Tuning HEC

Splunk Parallel Ingestion Pipelines

- By default Splunk has a single data pipeline that runs from receiving data all the way to writing to disk
- The number of pipelines can be increased in server.conf
- Especially useful if you're processing large events
- Recommendation: Depends on event type, but typically 2 pipelines

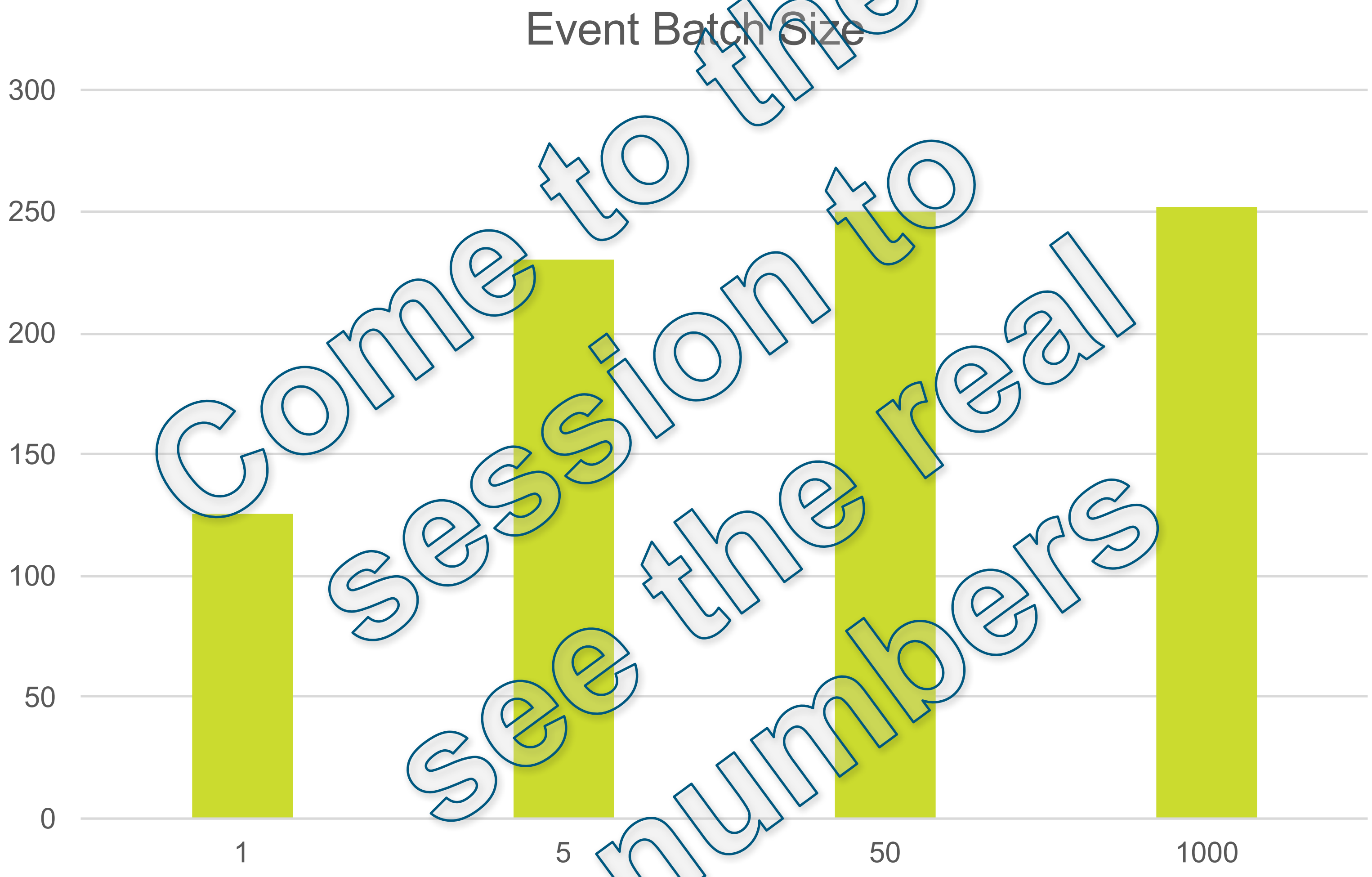


Come to the session to see the real numbers

Tuning HEC

Client Event Batching

- Batching has a significant impact on HEC performance
- The more events in a single request, the less wasted overhead
- Recommendation: Batch size between 5 and 50

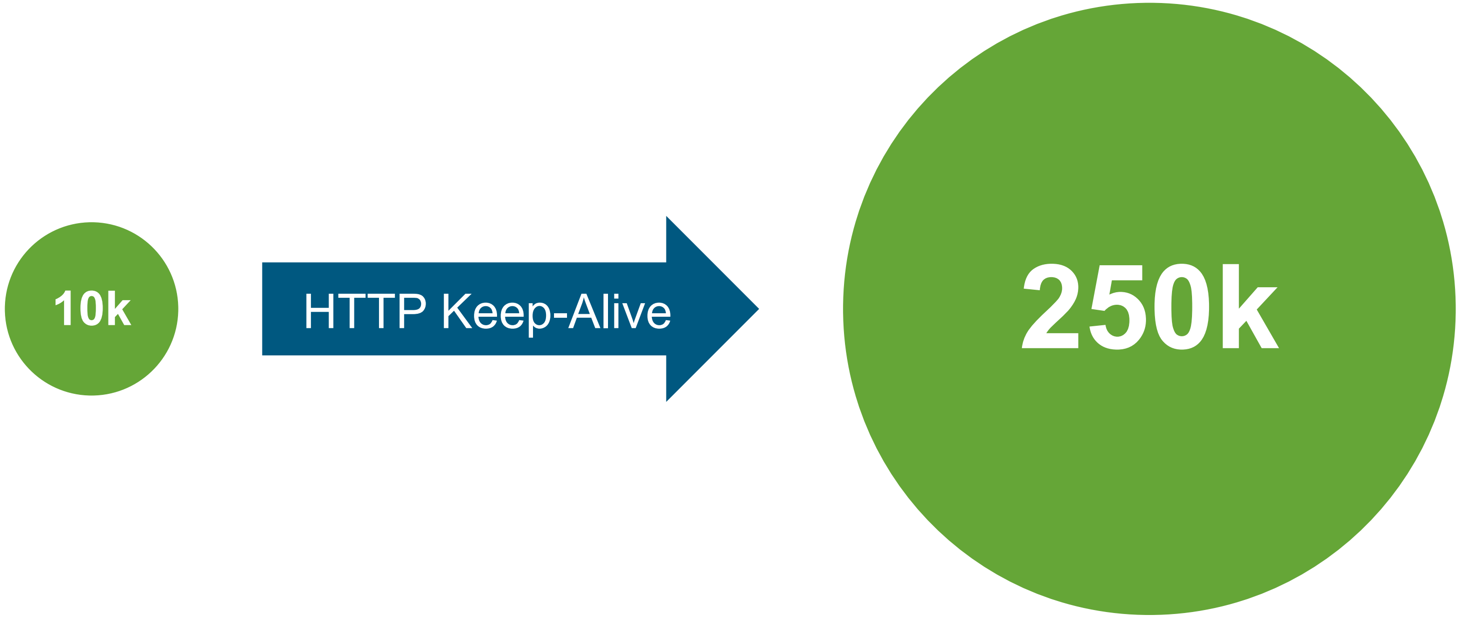


Tuning HEC

Client HTTP Keep-Alive

- The setup and teardown of HTTP connections is expensive
- Enabling Keep-Alive allows us to reuse the same connection for multiple batches
- Recommendation: Enable HTTP Keep-Alive on clients

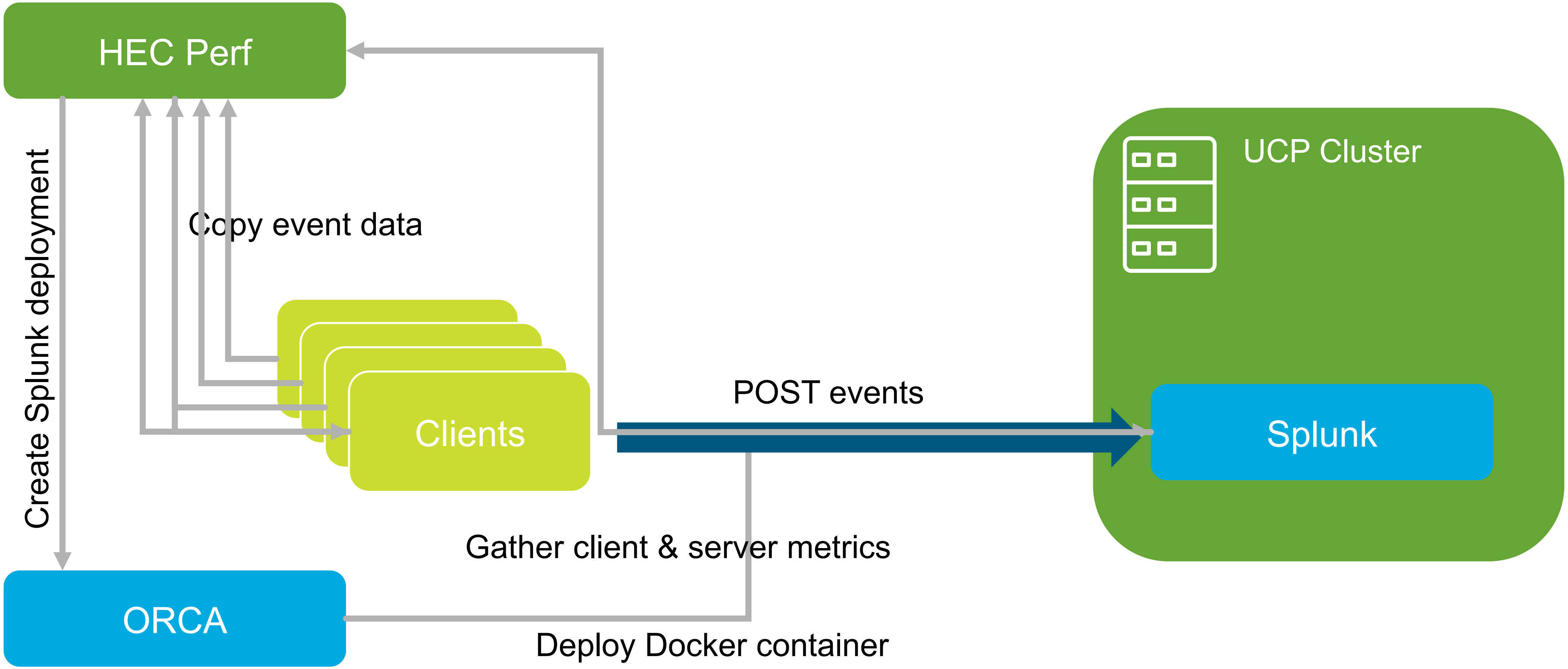
Events Per Second



HEC Performance Testing

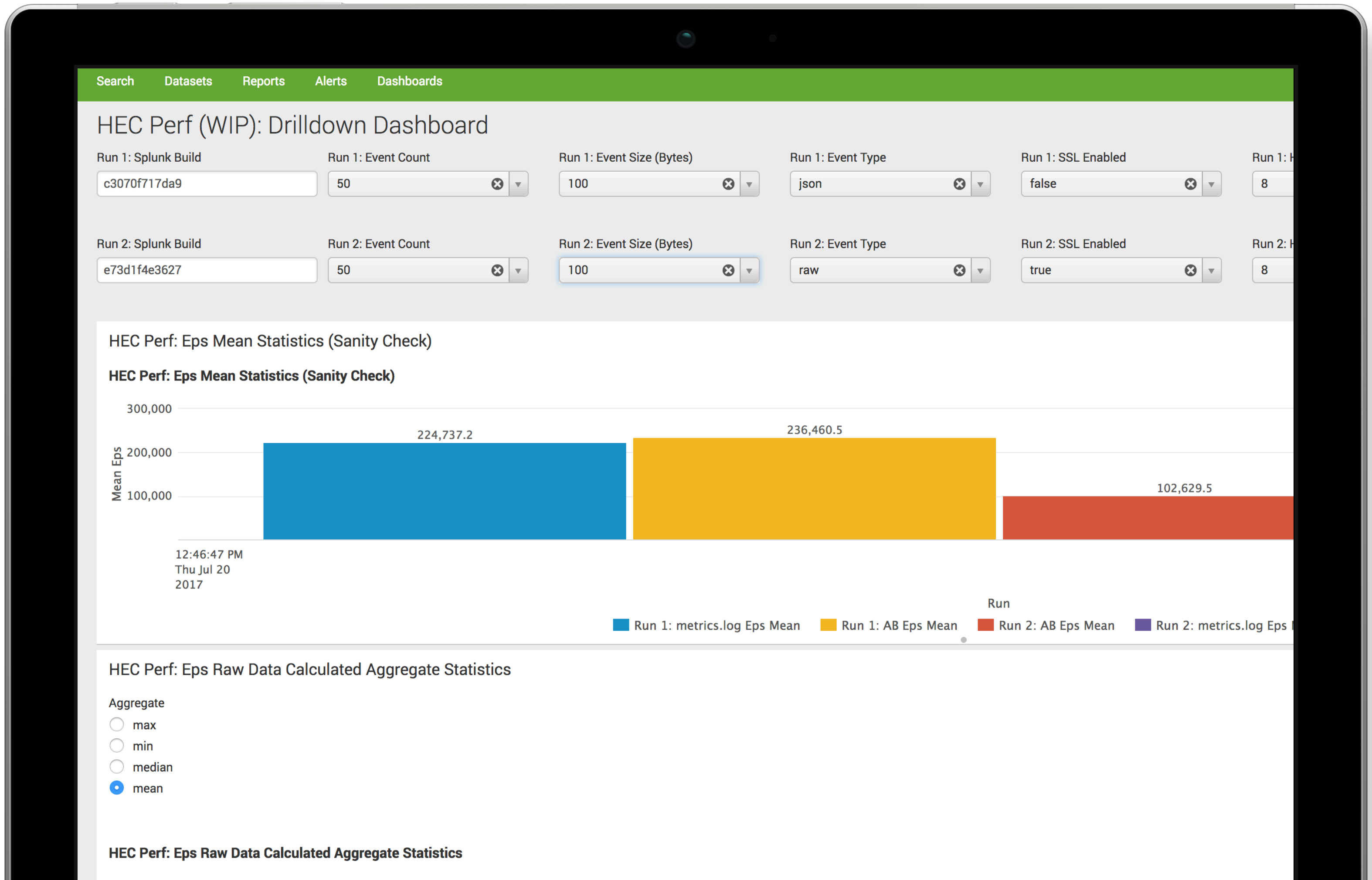
- Nightly Splunk builds are packaged as Docker images
- Every build has a suite of performance scenarios run against it, leveraging virtualization and a cluster of high-performance test machines
- Metrics from both the client and Splunk side are gathered and stored in Splunk for analysis

HEC Performance Testing



HEC Performance Dashboards

Demo



HEC Perf (WIP): Drilldown Dashboard

Run 1: Splunk Build: c3070f717da9

Run 1: Event Count: 50

Run 1: Event Size (Bytes): 100

Run 1: Event Type: json

Run 1: SSL Enabled: false

Run 1: H 8

Run 2: Splunk Build: e73d1f4e3627

Run 2: Event Count: 50

Run 2: Event Size (Bytes): 100

Run 2: Event Type: raw

Run 2: SSL Enabled: true

Run 2: H 8

HEC Perf: Eps Mean Statistics (Sanity Check)

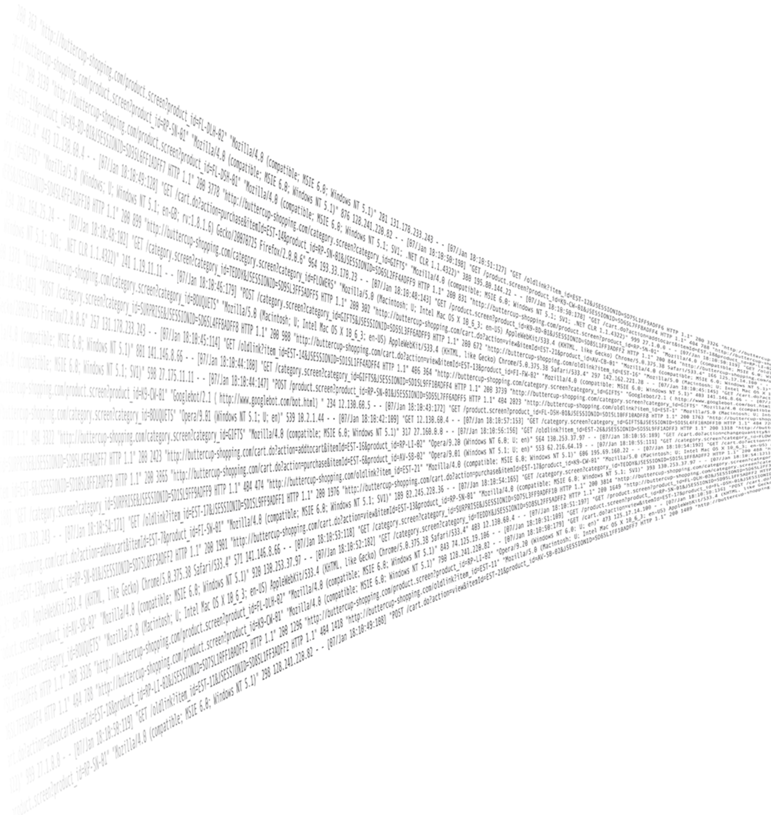
HEC Perf: Eps Mean Statistics (Sanity Check)

HEC Perf: Eps Raw Data Calculated Aggregate Statistics

Aggregate

○ max
○ min
○ median
● mean

HEC Perf: Eps Raw Data Calculated Aggregate Statistics



HEC Performance Recommendations

Client Batching
100 events/req

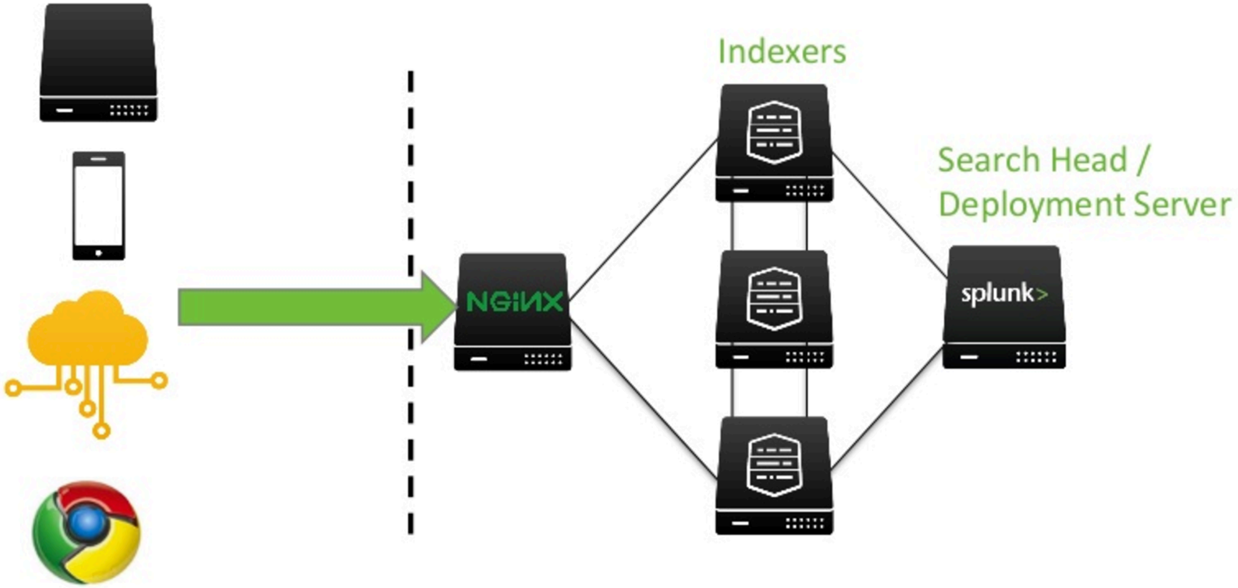
Client Keep-Alive
On

Splunk IO Threads
8

Splunk Pipelines
2

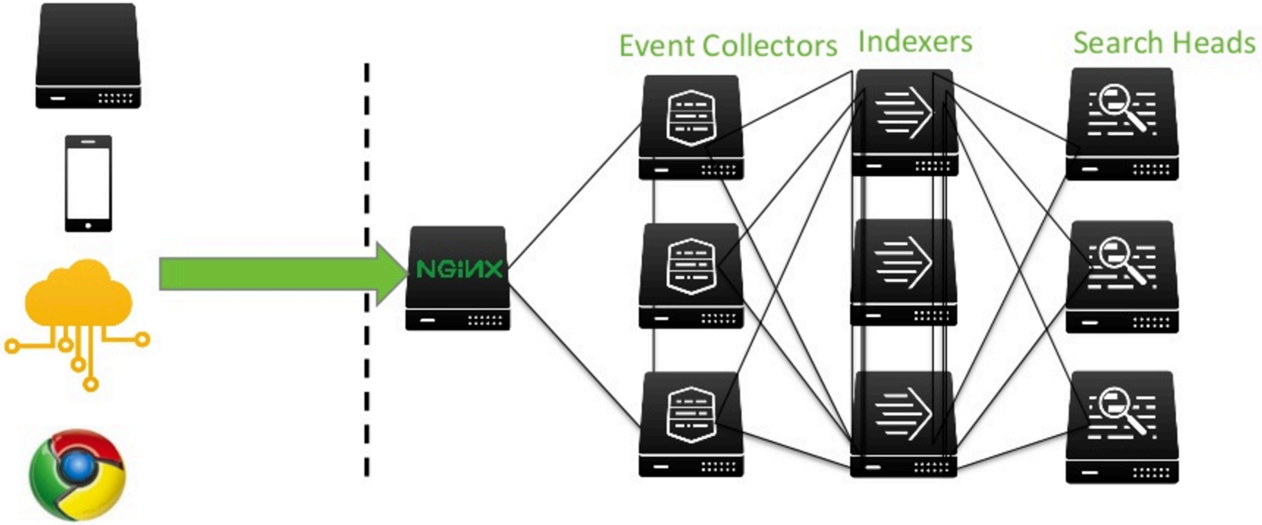
Scaling the Event Collector

- HEC can be enabled directly on your Splunk indexers
- When you have an indexer cluster, a load balancer can distribute incoming events evenly
- However, this requires you to scale indexing to increase HEC capacity



Scaling the Event Collector

- Enabling HEC on a cluster of forwarders dedicated to data ingestion allows independent scaling
- This topology avoids any conflict between optimizations for event collection vs. data indexing and searching



Next Steps

Learning how you can leverage HEC and tune it for your needs!

- HEC Developer Docs: http://dev.splunk.com/view/event-collector/SP-CAAAE6M
- Configuring a pool of HEC forwarders: http://dev.splunk.com/view/event-collector/SP-CAAAE73

Q&A

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Thank You

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