Getting Data Into Splunk
The What and The How

Ian Whitney
ASR Data Engineering
he/his

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Splunk

What Is It

software for searching, monitoring, and analyzing machine-generated data

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Splunk

What Do We Use It For

- Ensuring our applications are healthy
- Alerts
- Dashboards
- Research when things go awry

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Splunk

Today's Topics

- Generation of data
- Ingestion of data

Another Time

- Working with data in Splunk

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Generation

Options

- Application logs
- Instrumentation
- API responses
- Database queries
- Server metrics

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Generation

General Advice

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More structured = better
More identifiers = better

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Generation

Application Logs

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Generation

Application Logs

- A sensible place to start
- You probably already have these
- Write them in JSON if you can

Generation

Application Logs

```
Mar 05 08:23:01 asr-kafka-qat-04.oit.umn.edu docker-compose[130842]: distributed-connect    | \
[2024-03-05 14:23:01,561] INFO 192.168.96.1 - - [05/Mar/2024:14:23:01 +0000] \
"GET /connectors/non_credit_registration.sub_offerings/status HTTP/1.1" 200 229 "-" "Ruby" 0 \
(org.apache.kafka.connect.runtime.rest.RestServer)
```

Generation

Instrumentation

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Generation

Instrumentation

- Offered by many application frameworks
- Write code to to observe code

Generation

Instrumentation

```
ActiveSupport::Notifications.instrument "your_application.magic" do |instrumentation|
  # magic happens
end
```

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Generation

Instrumentation


```
{
    "severity": "INFO",
    "timestamp": 1707750727997393,
    "program": "your_application",
    "environment": "production",
    "version": "0.0.40",
    "entry": {
        "string": null,
        "instrumentation": {
            "name": "your_application.magic",
            "started": 1707750727992772,
            "finished": 1707750727997335,
            "elapsed": 4563
        }
    }
}
```


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Generation

API Responses

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Generation

API Responses

- Health checks, status, etc
- These usually return JSON

Generation

API Responses

```
curl -H "Content-Type: application/json" \
-X GET \
"http://127.0.0.1:8088/healthcheck"
```

Generation

API Responses


```
{
    "isHealthy": true,
    "details": {
        "metastore": {
            "isHealthy": true
        },
        "kafka": {
            "isHealthy": true
        },
        "commandRunner": {
            "isHealthy": true
        }
    },
    "serverState": "READY"
}
```


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Generation

Database Queries

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Generation

Database Queries

- Databases contain data and metadata that you can track
- SQL queries can return JSON

Generation

Database Queries

```
SELECT /*json*/
    max(updated_at) as most_recent_update
FROM
    important_application_table
;
```

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Generation

Database Queries


```
{
    "most_recent_update": 1707750727992772
}
```

Generation

Server Metrics

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Generation

Server Metrics

- Ask the server how it's doing
- A lot of data from hosts is already in Splunk
  - `top`
  - `cpu`
  - `vmstat`
  - `syslog`

Ingestion

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Ingestion

Options

- Have the Splunk team do it
- Use methods that already exist, `syslog`
- Send it yourself, `HEC`
- Other (secretly also `HEC`)
- Other Other (OpenTelemetry, JMX, etc.)

Ingestion

Have the Splunk team do it

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Ingestion

Have the Splunk team do it

- Work with the Splunk team
- Format your files a consistent way
- Store your files in a consistent location

Ingestion

Have the Splunk team do it

- Requires fewer changes on your side
- Slower. Splunk team is super busy!
- Can require you to remember to add new hosts to Splunk ingestion

3/5/24
9:16:52.000 AM

```
24.245.40.58 - kowhe001@umn.edu [05/Mar/2024:09:16:52 -0600] "GET /students/5762507?include=degree
200 431 "https://www.myu.umn.edu/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (
Gecko) Chrome/121.0.0.0 Safari/537.36"
```

Event Actions

Type	Field	Value	Actions
Selected	host	asr-sdpapi-prd-app-02.oit.umn.edu	
	source	/swadm/var/log/httpd/2024/03/ssl_sdp.umn.edu_access_log	
	sourcetype	access_combined	
Event	uri	/students/5762507?include=degrees	
Time	_time	2024-03-05T09:16:52.000-06:00	
Default	index	asr_web	
	linecount	1	
	splunk_server	ulm-s1-idx03.uis.umn.edu	

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Ingestion

Use methods that already exist, `syslog`

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Ingestion

Use methods that already exist, `syslog`

- Splunk already ingests host log data
- Easy to set up if you run your process in
  - `systemd`
  - Docker
- Be sure to add unique and helpful tags

Ingestion

Use methods that already exist, `syslog`

- Ingestion is out of your control
- Written alongside a *ton* of other messages, can be noisy

3/4/24
11:19:02.000 AM

Mar 4 11:19:02 asr-kafka-prd-04 distributed-connect_health_check_production: I, [2024-03-04T17:19:02.317551 #1] INFO -- : {"name":"connect.splunk.sdp.student_queued","connector":{"state":"RUNNING","worker_id":"asr-kafka-prd-04.oit.umn.edu:8083"},"tasks":[{"id":0,"state":"RUNNING","worker_id":"asr-kafka-prd-04.oit.umn.edu:8083"}],"type":"sink"}#015

Event Actions

Type	Field	Value	Actions
Selected	host	asr-kafka-prd-04.oit.umn.edu	
	source	/var/log/messages	
	sourcetype	syslog	
Event	connector_state	RUNNING	
	dest	asr-kafka-prd-04.oit.umn.edu	
	eventtype	nix-all-logs	
	name	connect.splunk.sdp.student_queued	
	payload	{"name":"connect.splunk.sdp.student_queued","connector":{"state":"RUNNING","worker_id":"asr-kafka-prd-04.oit.umn.edu:8083"},"tasks":[{"id":0,"state":"RUNNING","worker_id":"asr-kafka-prd-04.oit.umn.edu:8083"}],"type":"sink"}	
	process	distributed-connect_health_check_production	
	src	asr-kafka-prd-04.oit.umn.edu	
	task_state	RUNNING	
Time	_time	2024-03-04T11:19:02.000-06:00	
Default	index	hosting_asr_os	
	linecount	1	

Ingestion

Send it yourself, HEC

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Ingestion

Send it yourself, HEC

- Get a token from the Splunk team
- Send your data over http

Ingestion

Send it yourself, HEC

- Code for you to manage
- Sometimes HTTP fails

> 2/19/24
9:42:18.000 AM

{ [-]
  data: [{"TOTAL_CREDITS":11.0}]
  environment: PRD
  logMessage: Running stored procedure
  message: Successful
  p_emplid: !
  p_strm: 1239
  processName: Graduate student registration exceptions
  runLength: 12 ms
  storedProcedure: wfg_rex_grad_active_creds
  success: True
}

Show as raw text

Ingestion

Other (secretly also HEC)

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Ingestion

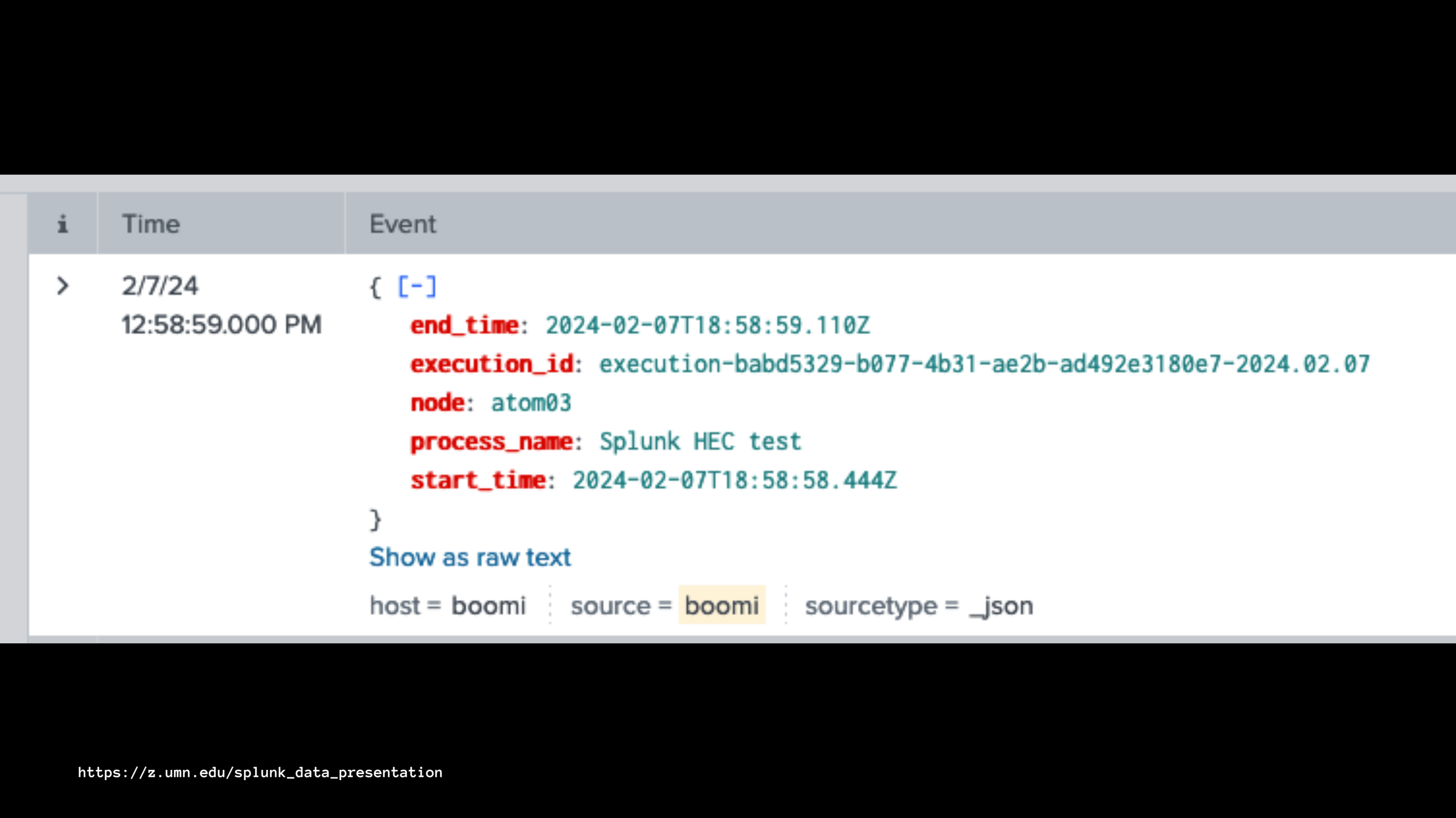
Other (secretly also HEC)

- Boomi
- Kafka
- Etc

Ingestion

Other (secretly also HEC)

- Allows you to integrate services in to Splunk
- Without managing all the integration code



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Ingestion

Other Other (OpenTelemetry, JMX, etc)

- Splunk offers connectors that ingests these things
- Ask the Splunk team!

Mix And Match

Generation

- Application logs
- Instrumentation
- API responses
- Database queries
- Server metrics

Ingestion

- Have the Splunk team do it
- Use methods that already exist, `syslog`
- Send it yourself, `HEC`
- Other (secretly also `HEC`)

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Questions

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