

Splunk and the Weather

Powered by the Dark Sky API

Somen De | Function1

September 27, 2017 | Washington, DC

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About Function1

www.function1.com

- ▶ Founded in 2007; offices in Washington D.C., New York City, Toronto, and Chicago
- ▶ One of Splunk's premier professional services partners
- ▶ More than 1,000 successful Splunk engagements spanning all industry verticals: Security, Finance, Energy, E-Commerce, Government, Defense, Healthcare, Entertainment, Retail, and Education
- ▶ Services: Installation & Upgrades, Data Onboarding, Training, Dashboard & App Development, Products, Health Checks, Consulting
- ▶ Our team of Splunk experts is credited with designing the base architecture for some of the largest Splunk deployments to-date and have aided in developing the standard for enterprise class governance and data onboarding

CIOReview



splunk>

.conf2017

“Climate Is What We Expect, Weather Is What We **Get.**”

- Mark Twain

Quick Overview

- ▶ The Dark Sky API allows you to look up the weather anywhere on the globe, returning (where available):
 - Current weather conditions
 - Minute-by-Minute forecasts out to one hour
 - Hour-by-hour and day-by-day forecasts out to seven days
 - Hour-by-hour and day-by-day observations going back decades
- ▶ They provide two types of API requests:
 - A Forecast Request returns the current weather forecast for the next week in JSON format.
 - A Time Machine Request returns the observed or forecast weather conditions for a date in the past or future in the same JSON format.

Dark Sky API

Why it's Perfect for Splunk

- ▶ Data can be historical or from the future!
 - Anytime in the past or future
 - Just pass in an epoch time variable
- ▶ Data can be searched and charted in intervals
 - Currently
 - Daily
 - Hourly
 - Minutely
- ▶ Data is returned in neat and clean JSON
 - `props.conf`

Visualize Weather Trends

Max Temperature vs Min Temperature, per day, over 1 year

Lower Manhattan

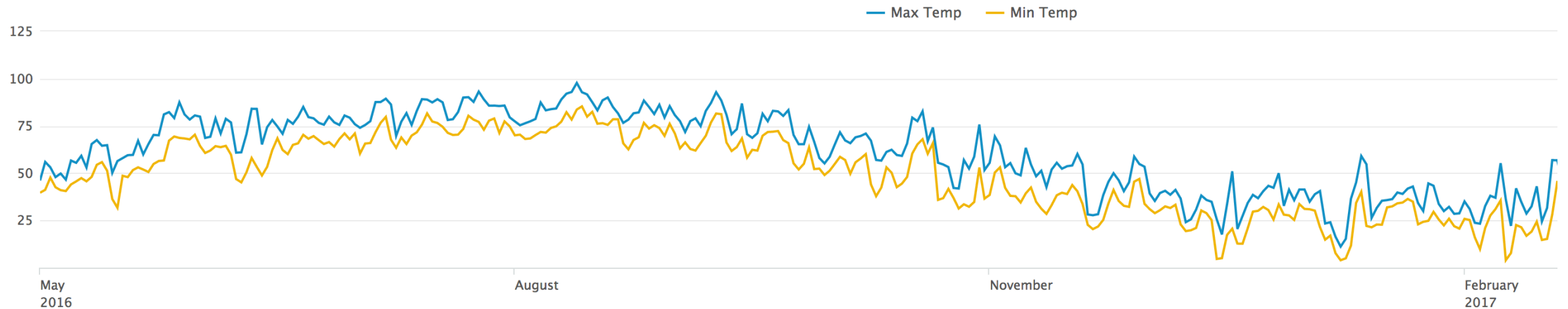
Max and Min Temps

```
index="weather_json" | timechart span=1d avg("daily.data{}.apparentTemperatureMax") as "Max Temp" avg("daily.data{}.apparentTemperatureMin") as "Min Temp"
```

✓ 732 events (5/1/16 12:00:00.000 AM to 5/2/17 12:00:00.000 AM) [No Event Sampling](#) ▾

Events Patterns Statistics (366) Visualization

Line Chart Format Trellis



Visualize Weather Trends

Precipitation Intensity, Summer 2016

Lower Manhattan

☐ Average Precipitation Intensity over Time

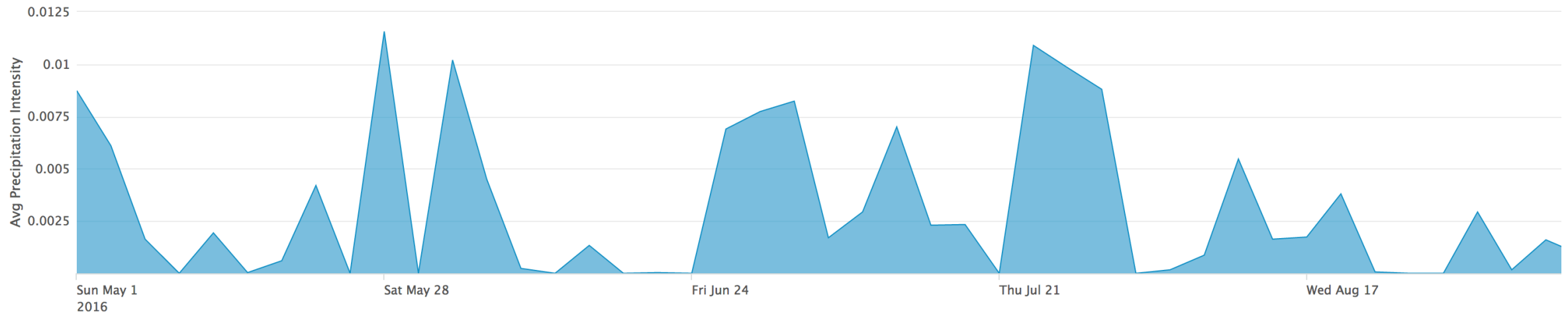
index="weather_json" | timechart span=3d avg("daily.data{}.precipIntensity")

✓ 308 events (5/1/16 12:00:00.000 AM to 10/2/16 12:00:00.000 AM) No Event Sampling ▾

Job ▾ ||

Events Patterns Statistics (52) Visualization

Area Chart Format Trellis



Average Wind Speed, per day, October 2016

Average Daily Wind Speed

[Save](#)
[Save As](#)
[View](#)
[Close](#)

index="weather_json" | timechart span=1d avg("daily.data{}.windSpeed")

during Oct 2016

62 events (10/1/16 12:00:00.000 AM to 11/1/16 12:00:00.000 AM)
[No Event Sampling](#)

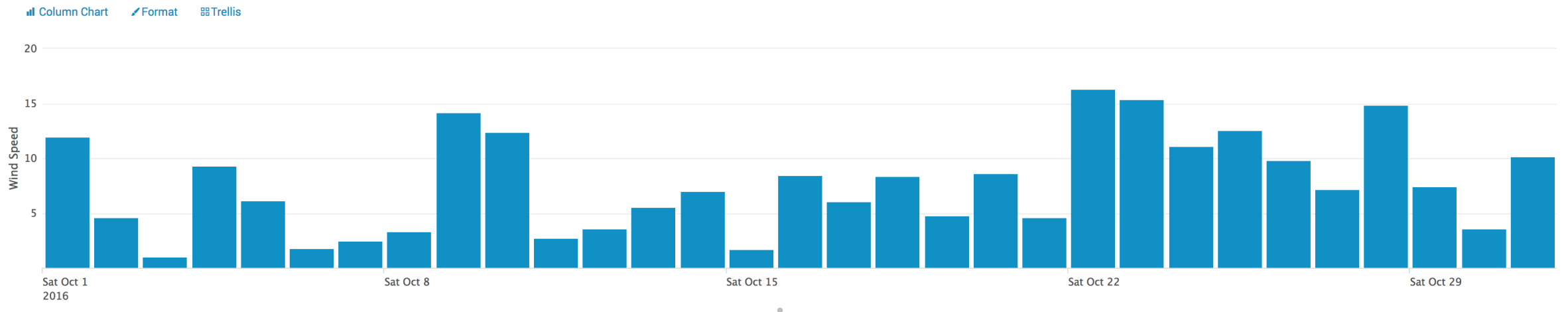
[Job](#)
[Pause](#)
[Reset](#)
[Print](#)
[Download](#)
[Smart Mode](#)

Events

Patterns

Statistics (31)

Visualization



Predict the Weather!

How Can We Predict if it will Rain?

- ▶ The Dark Sky API offers fields that Splunk can utilize to forecast Rain
 - Dewpoint
 - Humidity
 - Pressure
 - Cloud Cover
- ▶ We also set up a simple "eval" to create a field that we run the prediction on
 - `eval rain=if(LIKE(summary,"%Rain%"),"rain","norain")`

```
130.60.4 - - [07/Jun 18:10:57:153] "GET /category.screen?category_id=GIFTS&JSESSIONID=SD1SL4FF10ADFF10 HTTP 1.1" 404 720 "http://buttercup-shopping.com/cart.do?action=view&itemId=EST-6&product_id=FL-SW-01" "Opera/9.80.2013.10 (Windows NT 6.0; WOW64; rv:31.0) like"
128.241.220.82 - - [07/Jun 18:10:57:123] "GET /product.screen?product_id=FL-DSH-01&JSESSIONID=SD5SL7FF6ADFF9 HTTP 1.1" 404 3322 "http://buttercup-shopping.com/cart.do?action=purchase&itemId=EST-26&product_id=FL-SW-01" "Mozilla/5.0 (Windows NT 6.0; WOW64; rv:31.0) like"
317.27.160.0 - - [07/Jun 18:10:56:156] "GET /oldlink?item_id=EST-26&JSESSIONID=SD5SL9FF1ADFF3 HTTP 1.1" 200 1316 "http://buttercup-shopping.com/cart.do?action=changequantity&itemId=EST-18&product_id=AV-CB-01&JSESSIONID=SD10SL0FF2ADFF9 HTTP 1.1" 200 2423 "http://buttercup-shopping.com/cart.do?action=remove&itemId=EST-1"
130.60.4 - - [07/Jun 18:10:57:153] "GET /category.screen?category_id=GIFTS&JSESSIONID=SD1SL4FF10ADFF10 HTTP 1.1" 404 720 "http://buttercup-shopping.com/cart.do?action=view&itemId=EST-6&product_id=FL-SW-01" "Opera/9.80.2013.10 (Windows NT 6.0; WOW64; rv:31.0) like"
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```

Predict the Weather!

Use the Splunk Machine Learning Toolkit

Predict Categorical Fields

Predict the value of a categorical field using the values of other fields in that event.

Create New Model

Load Existing Settings

Enter a search

```
index=conf
| eval rain=if(LIKE(summary,"%Rain%"),"rain","norain")
```

✓ 10,267 events (3/1/16 12:00:00.000 AM to 9/10/17 6:40:48.000 PM)

Preprocessing Steps

No steps added.

[+ Add a step](#)

Algorithm

GaussianNB

Field to predict

rain

Fields to use for predicting

× dewPoint

× humidity

× pressure

× cloudCover

Split for training / test: 60 / 40

Save the model as

default_model_name

Fit Model



Open in Search

Show SPL

Predict the Weather!

Use the Splunk Machine Learning Toolkit

Precision [↗](#)**0.94**Recall [↗](#)**0.93**Accuracy [↗](#)**0.93**F1 [↗](#)**0.93**

```
130.60.4 - - [07/Jun 18:10:57:153] "GET /category.screen?category_id=GIFTS&JSESSIONID=SD1SLAFF10ADFF10 HTTP/1.1" 404 720 "http://buttercup-shopping.com/cart.do?action=view&itemId=EST-6&product_id=FL-SW-01" "Opera/9.80.20
128.241.220.02 - - [07/Jun 18:10:57:123] "GET /product.screen?product_id=FL-DSH-01&JSESSIONID=SD5SL7FF6ADFF9 HTTP/1.1" 200 1316 "http://buttercup-shopping.com/category.screen?category_id=GIFTS&JSESSIONID=SD1SLAFF10ADFF10 HTTP/1.1" 404 3322 "http://buttercup-shopping.com/cart.do?action=purchase&itemId=EST-26&product_id=FL-SW-01" "Mozilla/4.0
317.27.160.0.0 - - [07/Jun 18:10:56:156] "GET /oldlink?item_id=EST-26&JSESSIONID=SD5SL9FF1ADFF3 HTTP/1.1" 200 1316 "http://buttercup-shopping.com/cart.do?action=changequantity&itemId=EST-18&product_id=AV-CB-01&JSESSIONID=SD10SL9FF2ADFF9 HTTP/1.1" 200 2423 "http://buttercup-shopping.com/category.screen?category_id=FLOWERS&JSESSIONID=SD5SL7FF6ADFF9 HTTP/1.1" 200 1316 "http://buttercup-shopping.com/cart.do?action=remove&itemId=EST-11&product_id=FL-SW-01" "Opera/9.80.20
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```

Thank You

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