Intro to EON.js:

Realtime Data Visualizations & Mapping Made Easy

ForwardJS 2017

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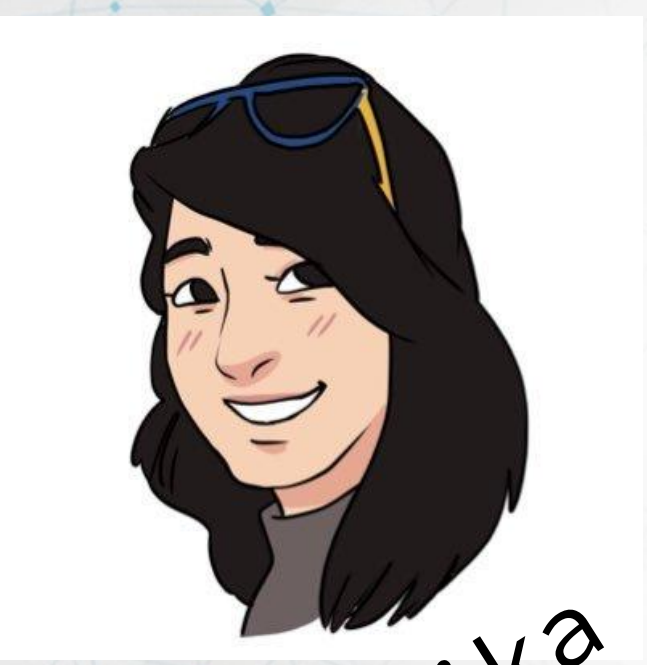
About Me



@lizziepika

```
{
    'speaker': {
        title:
'Developer Advocado'
        company:
'PubNub',
        location: 'Bryn
Mawr PA',
    }
}
```

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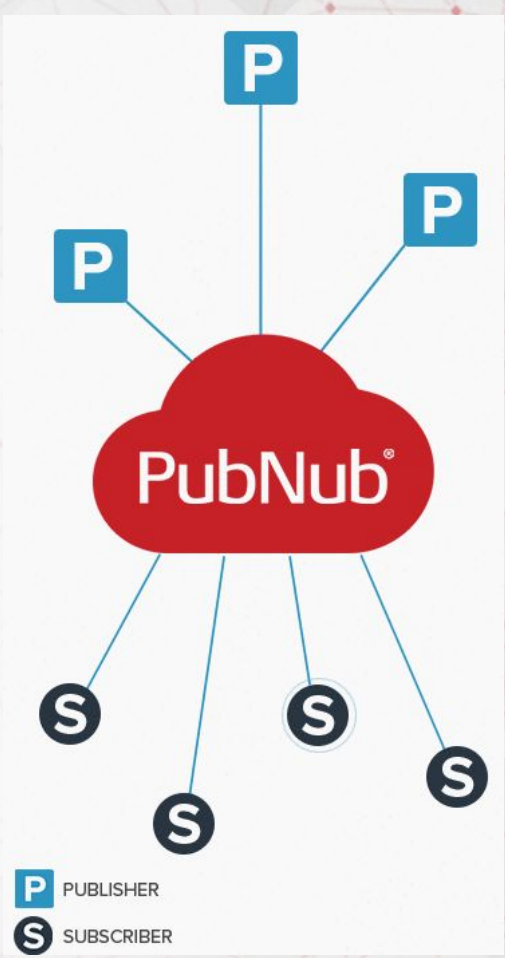
Agenda

- PubNub DSN Overview
- Project EON
  - Charts, Graphs
  - Maps
- Resources

What is PubNub?

- Globally distributed realtime Data Stream Network (DSN)
- 70+ SDKs



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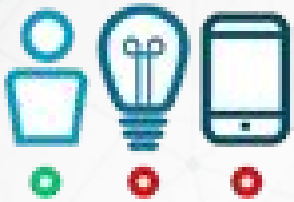
PubNub Features

Pub/Sub



Presence

Storage & Playback

Stream Controller

Push Notifs.

Analytics

Access Management

BLOCKS

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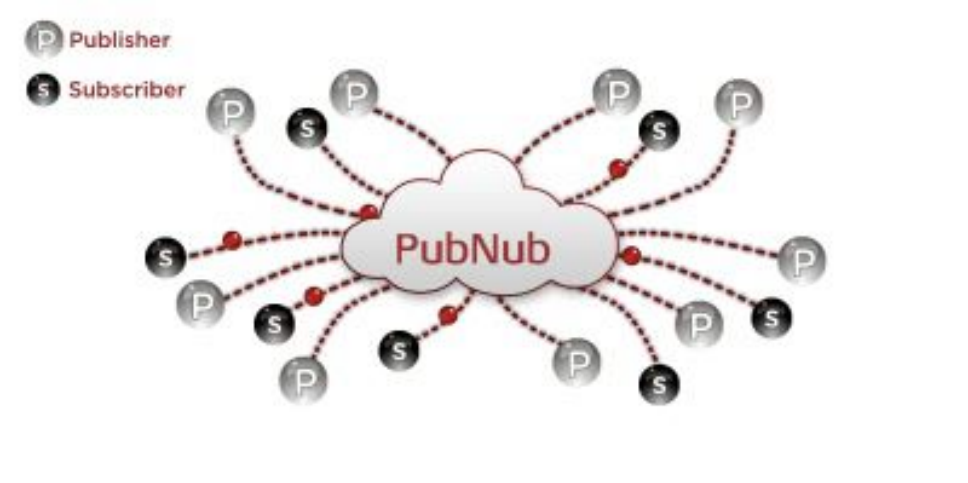
Realtime Interactivity of Today

- Unicast
- Multicast
- Broadcast



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PubNub Use-Cases

- Chat (Twitter Periscope)
- Multi-player games (PocketGem, :DeNA)
- Vehicle location tracking (, GetTaxi)
- Financial data (, Ameritrade, SAP)
- Collab. dev tools (Balsamiq,)
- IoT, Home automation (Insteon,

)

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JavaScript SDK Basics

```
<script src =
"//cdn.pubnub.com/pubnub-
[version#].min.js"></script>
```

Node.JS

```
$ npm install pubnub
```

Initialization

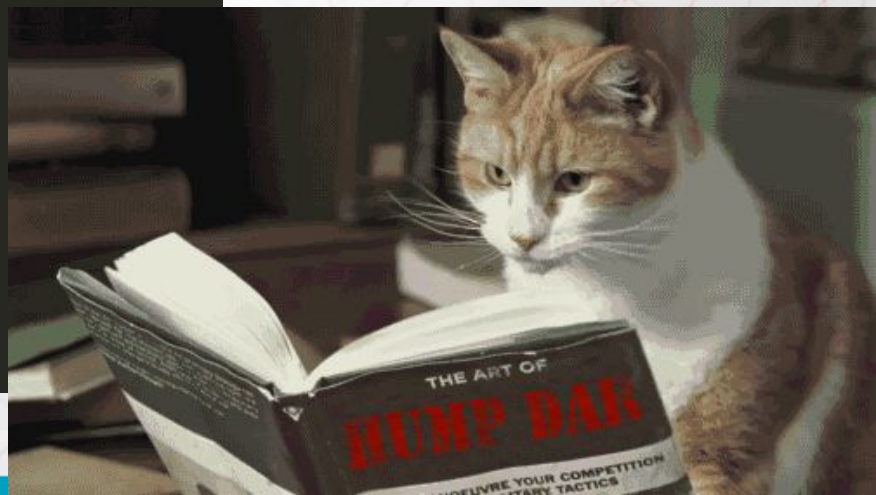
new makes PubNub object instance to invoke PubNub operations

```
var pubnub = new PubNub({
    subscribeKey: 'sub-c-f762fb78-...',
    publishKey: 'pub-c-156a6d5f-...',
    ...
});
```

, Inc.

Publish() sends messages to all channel subscribers

```
pubnub.publish({
    channel: 'bicycle-1',
    message: {
        lat: 37.78364,
        lon: -122.9924
    }
});
```



Subscribe

subscribe() = client makes open TCP socket, begins listening for messages on channel

```
pubnub.subscribe({
    channels: ['bicycle-1'],
    ...
});
```

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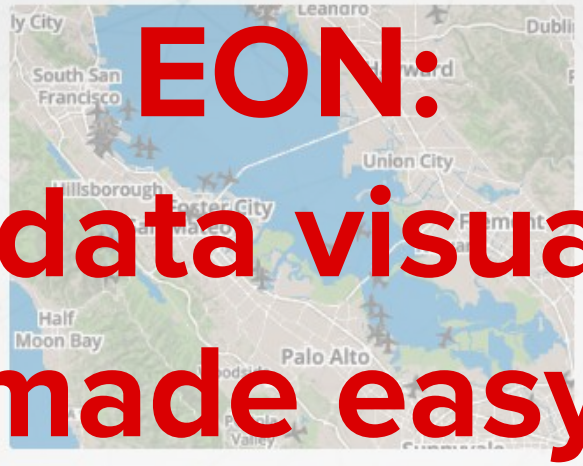
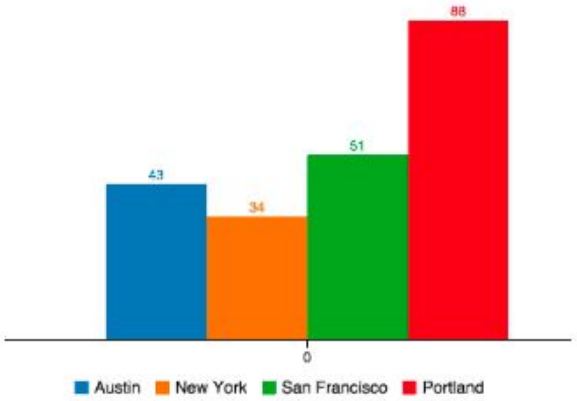
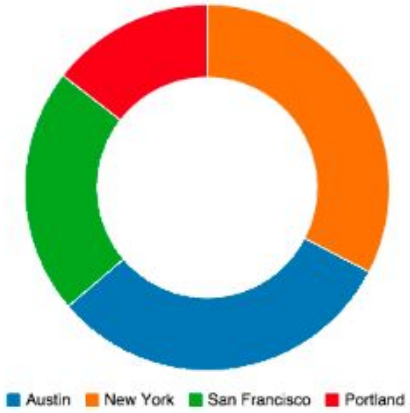


EON: realtime data visualizations made easy

- OS JS Framework to chart, map
- Charts: Built on D3.js
- Maps: Using MapBox





Why Visualization w/ D3.js Matters

- Most popular OS library

- Modern in-browser rendering *(and mobile)*
- Runs on all modern browsers
- Hardware-accelerated

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Plot a Basic Chart

1. Publish data to PubNub channel
2. Receive data + display chart
    a. Basic chart
    b. Basic chart + history
    c. Multiple graphs from multiple data
    d. Customize chart!

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Initialize PubNub object

```
var PubNub = require('pubnub')();
var pubnub = new PubNub({
    subscribeKey: 'sub-c-f762fb78-...',
    publishKey: 'pub-c-156a6d5f-...',
});
```

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Publish Data

```
// Publish some data
pubnub.publish({
    channel : 'my-data',
    message: { eon: {'humidity': 90} }
});
```

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Publish Fake Data

```
var num = 100;

function publish() {
    num += (Math.random() - 0.5);
    var message = { eon: {'value': num} };

    pubnub.publish({
        channel: 'rand_channel',
        message: message,
    });
}
setInterval(publish, 2000);
```

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Plot a Line Graph: HTML

```
<html>
  <head>
    <script type="text/javascript" src="//pubnub.github.io/eon/v/eon/1.0.0/eon.js"></script>
    <link type="text/css" rel="stylesheet" href="//pubnub.github.io/eon/v/eon/1.0.0/eon.css" /
  </head>
  <body>
    <div id="chart"></div>
  </body>
</html>
```

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eon.chart()

```
var pubnub = new PubNub({
    subscribeKey: 'sub-c-d784e128-da7d-...',
});

eon.chart({
    channels: ['rand_channel'],
    generate: {
        bindto: '#chart',
    },
    pubnub: pubnub
});
```

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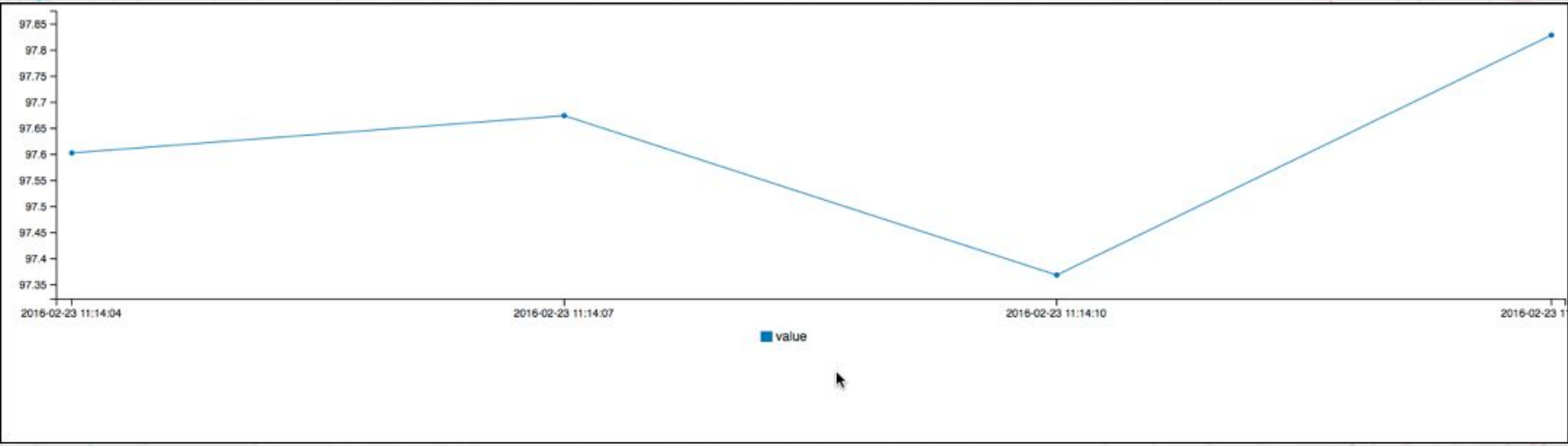
Browser Result



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PubNub History API

```
eon.chart({
   channels: ['random1'],
   generate: {
      bindto: '#chart',
   },
   history: true,
   pubnub: pubnub
});
```

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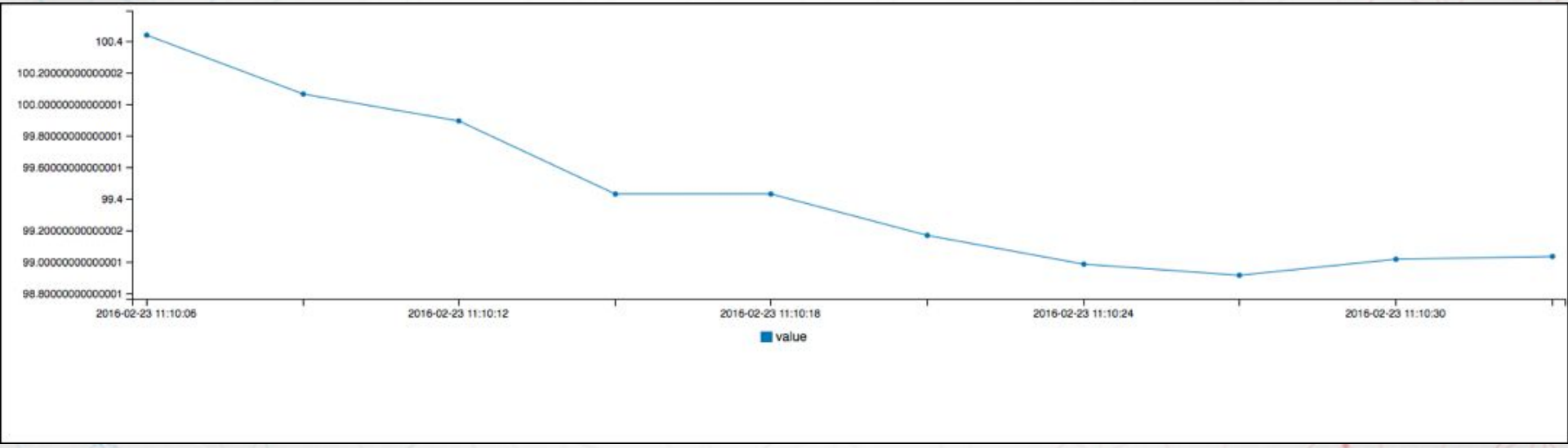
Result on Browser



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Twitter Visualization

```
var tweetObj = PUBNUB.init({
  subscribe_key: 'sub-c-78806dd4-42a6-11e4-aed8-02ee2ddab7fe' //constant
});

tweetObj.subscribe({
  channel: 'pubnub-twitter',
  callback: processData
})
```

Get Specific Tweets

```
var politicsWords = [
  'trump', 'donaldtrump', 'democrats', 'republicans', 'devos'
]
```

```
function processData(data) {
  if (!data) return;
  if (politicsWords.some(function(v) { return data.text.toLowerCase().indexOf(v) !== -1; })) {
    numPoliticsWords += 1;
    totalNumTweets += 1;
    publish2(); //publish data
    console.log(data);
  }
}
```

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Publish Twitter Data

```
function publish2() {
  twitterPubNubObj.publish({
    channel: 'your-channel-name',
    message: {
      eon: {
        "politics": numPoliticsWords / totalNumTweets //fills chart
      } //eon
    } //ms
  });
}
```

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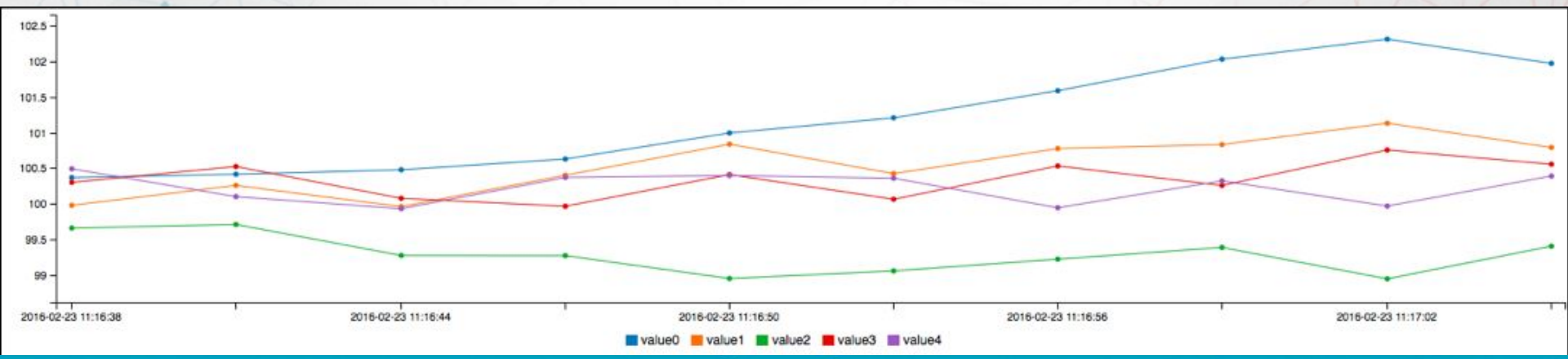
Publish Multiple Data

```
var data = {
  eon: {
    'value0': Math.floor(Math.random() * 99),
    'value1': Math.floor(Math.random() * 99),
    'value2': Math.floor(Math.random() * 99),
    'value3': Math.floor(Math.random() * 99),
    'value4': Math.floor(Math.random() * 99)
  }
}
pubnub.publish({
  channels: ['random5'],
  message: data,
});
```



Customize, Style the Data

```
generate: {
  bindto: '#chart',
    axis: {
      x: {
        type: 'timeseries',
        tick: {
          format: '%H:%m:%S'
        }
      },
      y: {
        label: {
          text: 'Temperature',
          position: 'outer-middle'
        }
      },
    } …
}
```

```
data: {
  type:'spline',
    colors: {
      value0:'#ffaaaa',
      value1:'#cc8888',
      value2:'#aa4444',
    },
    names: {
      value0: "SFO",
      value1: "DFW",
      value2: "ATL",
    }
},
```

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Customize, Style with CSS

```
.c3 svg {
  font: bold 20px sans-serif;
}
.c3-chart-line path {
  stroke-width: 10px;
  stroke-linecap: round;
}
```

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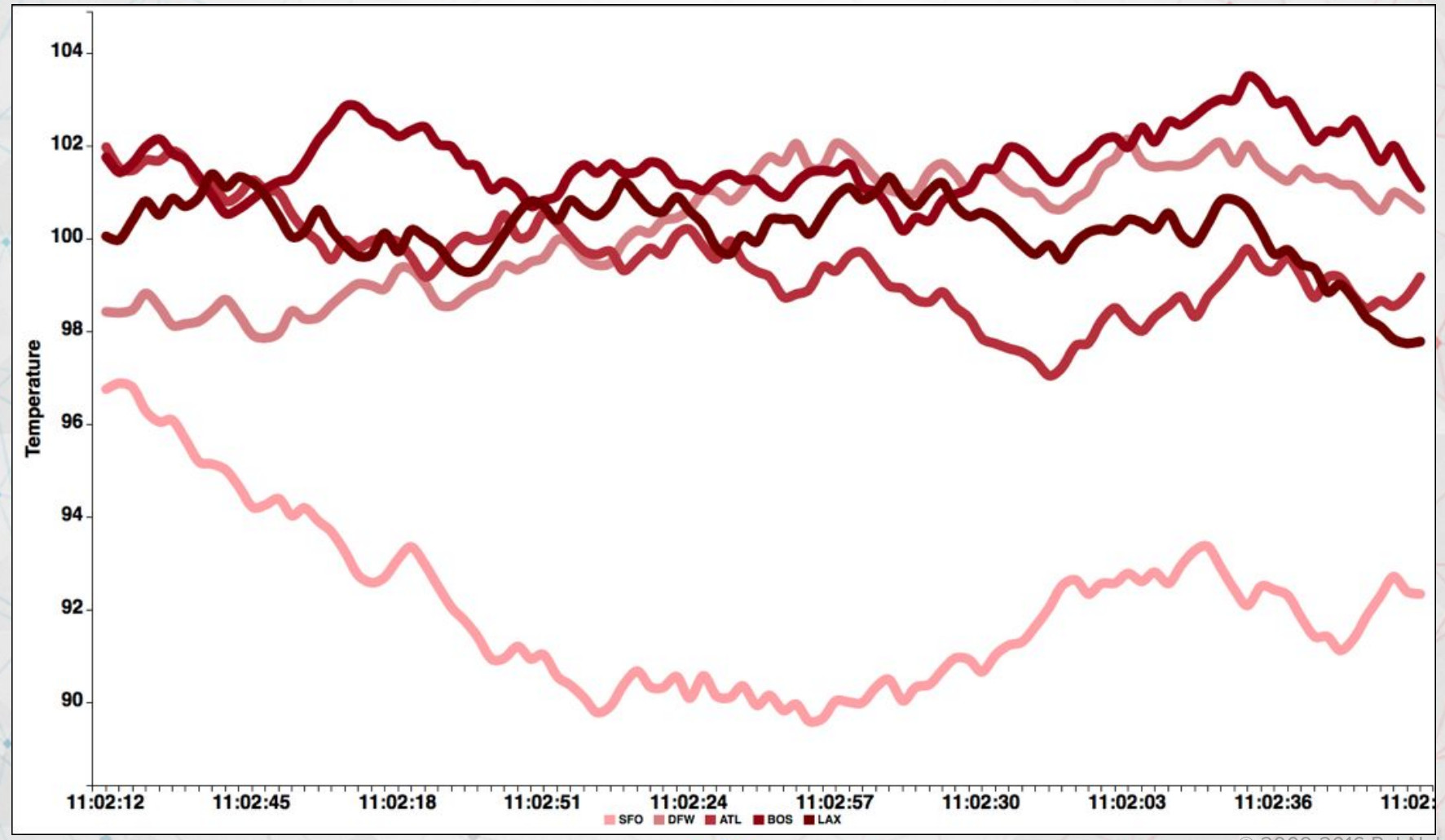
Results



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EON Chart Builder

https://www.pubnub.com/developers/eon/chart/builder/

1. Enter channel name, sub key
2. Set labels/colors of each data
3. Choose graph/chart type
4. Add labels + customize axes, tooltips, etc.
5. Copy & Paste the generated code

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EON Chart Builder

Chart

Configure your realtime chart.

Attribute	Value	Description
Chart Type	Spline	Time series, bar, donut, your call.
X Axis Label	*Empty*	
Y Axis Label	*Empty*	
Speed (ms)	1000	How fast your chart will update. If data is published faster than the update rate, it will be overwritten.
Limit	5	How many data points to display.
X Grid	OFF	Show gridlines along x axis.
Y Grid	OFF	Show gridlines along y axis.
Show Points	On	Show a point in line.
Show Tooltips	On	Show tooltips on hover.

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Maps

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Live Maps

1. Create simple map
2. Follow markers
3. Apply Real Data Stream
4. Make it pretty

Publish the Data

```
var points = [{"latlng":[31,-99]}, {"latlng",[41,-98]}];


points.forEach(function(d){
 pubnub.publish({
   channel: 'eon-map',
   message: d
 });
});
```

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Plotting Points on a Map w/ eon.map( )

```
var pubnub = new PubNub({
  subscribeKey: "sub-c-d784e128-da7d-...", ssl: true
});

var map = eon.map({
  id: 'map',
  mbToken: 'YOUR_MAPBOX_TOKEN',
  mbId: 'YOUR_MAPBOX_ID',
  channels: ['eon-map'],
  pubnub: pubnub
});
```

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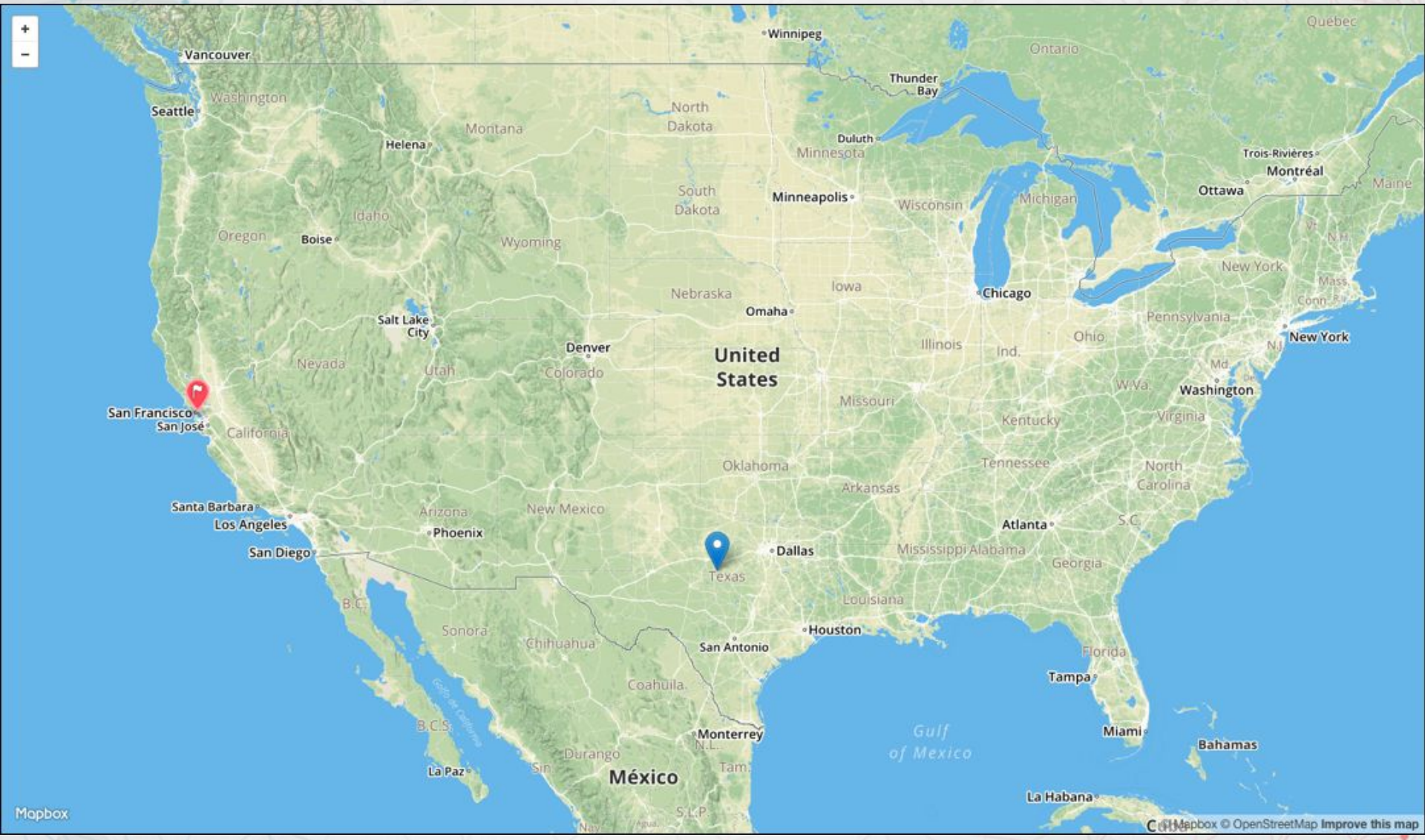

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Follow a Marker

```
var map = eon.map({
    ...
    channels: ['eon-map'],
    pubnub: pubnub,
    message: function (data) {
        map.setView(data[0].latlng, 8);
    },
});
```

Map zoom level

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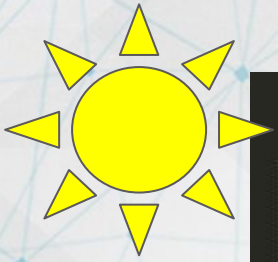
SFO Realtime Flight Data



```
var pubnub = new PubNub({
    subscribeKey:'sub-c-...',
    ssl: true,
});

var map = eon.map({
    id: 'map',
    ...
    channels: ['sfo-flight-data'],
    ...
});
```

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Customize Marker

```
eon.map({
  ...
  rotate: true,
  marker: function (latlng, data) {
        var marker = new L.RotatedMarker(latlng, {
       icon: L.icon({
         iconUrl:'img/airplane.png',
         iconSize: [24, 24]
       })
    });
    return marker;
  }
...
})
```

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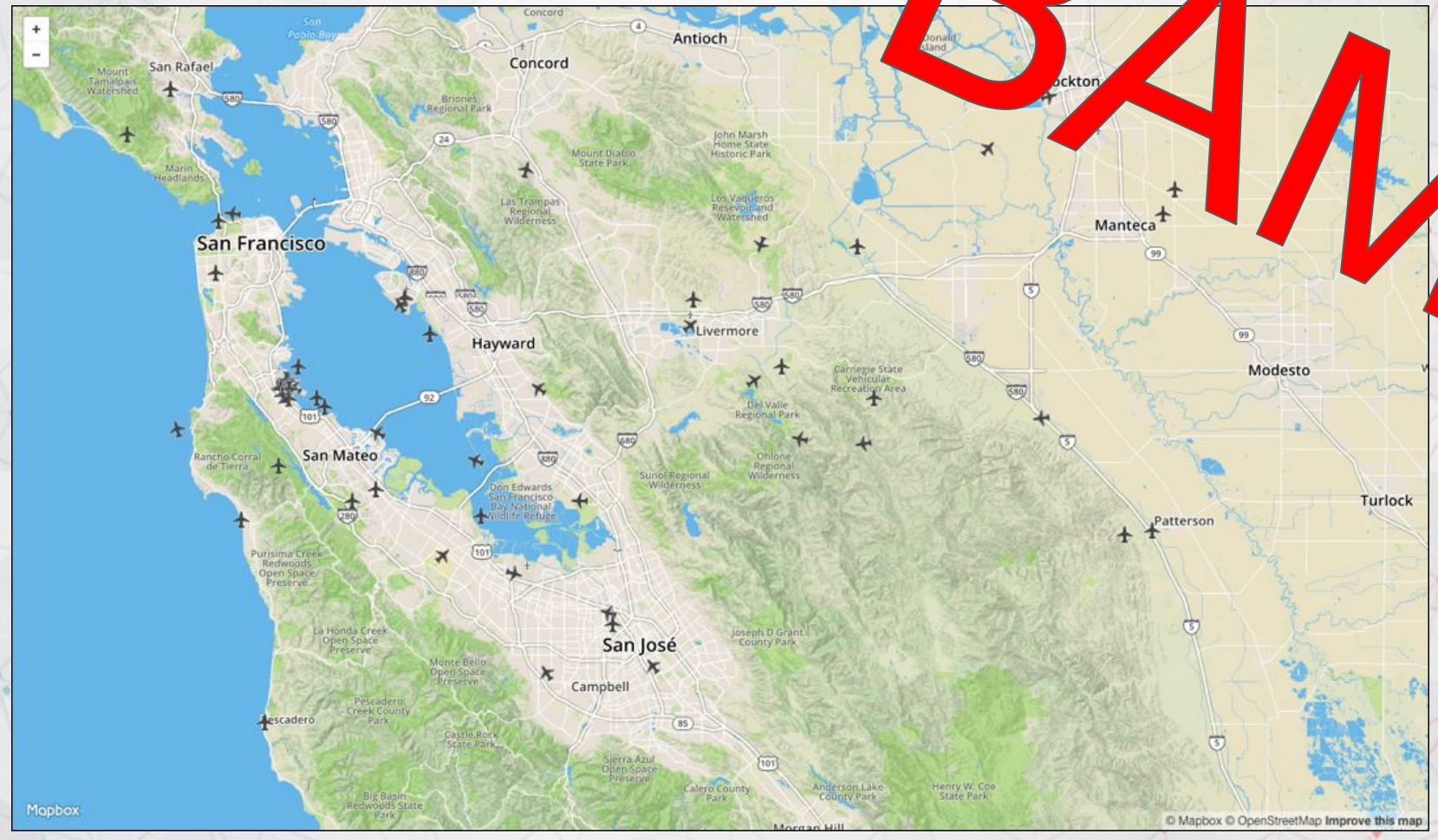
Channel: sfo-flight-data

BAM



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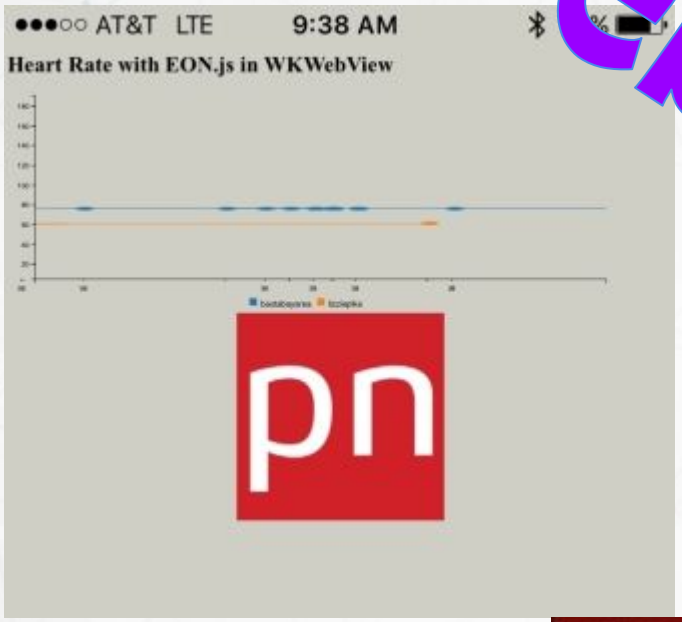
EON on mobile

WebViews!



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Resources

- EON home

  -https://www.pubnub.com/developers/eon/
- Support Form/Email-support.pubnub.com,

  support@pubnub.com
- Code -https://github.com/pubnub/eon-workshop

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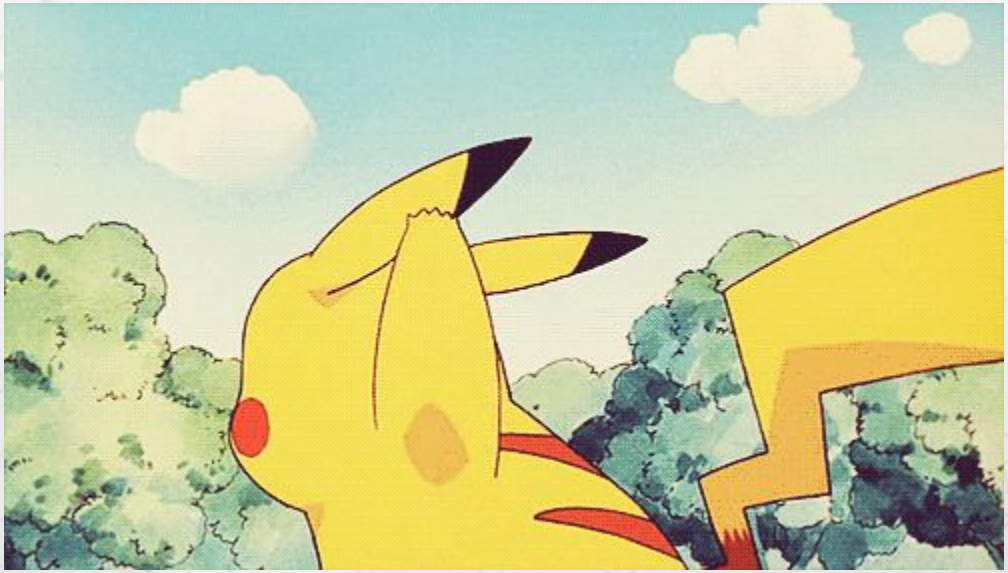
Thank you!

@lizziepika



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https://media.giphy.com/media/LkjlH3rVETgsg/giphy.gif
https://media.giphy.com/media/xT8qBi3Ww5swpG7PJ6/giphy.gif
https://media.giphy.com/media/cf7QC9A09Nq4o/giphy.gif
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