

# AI Sentiment Analysis of Audio Streams using Nexmo/ Vonage & IBM Watson

—

David Nugent

Developer Advocate, Cognitive, Data & Analytics

# Hi, I'm Dave

I'm a developer advocate for IBM in San Francisco. I also help organize:

- The SF JavaScript Meetup
- IBM Developer SF Meetup
- ForwardJS San Francisco && Ottawa

I participate in meetups, hackathons, webinars and write articles about technology for IBM and other organizations.



# Agenda

<b>Introduction to Nexmo &amp; Watson</b>	<b>05</b>	<b>Set Environment Variables</b>	<b>21</b>
Watson Services	07		
Nexmo & Watson Event Flow	11	<b>Run The Code!</b>	<b>23</b>
<b>Integration Code Overview</b>	<b>12</b>	<b>Upcoming Events</b>	<b>25</b>
<b>Spin Up Services</b>	<b>17</b>	<b>Q&amp;A</b>	<b>27</b>
Watson Services	19		
Nexmo	20		

# Step 0: Sign Up for IBM Cloud Account

[ibm.biz/nexmowebinar2020](http://ibm.biz/nexmowebinar2020)

## What is Nexmo?

“Nexmo, the Vonage API Platform is a business unit of Vonage that develops and markets communication APIs to enable developers and businesses to rapidly innovate the way they communicate with their customers. We tear down the barriers to entry so that any developer can reach a global audience from day 1 and enable businesses to create customer experiences so they can delight their customers.”



Developers be like:



## COMMUNICATION APIs

Cloud communications building blocks with global reach.



### Voice

Build modern, high-quality voice applications in the cloud.



### Video

Build live interactive video into your web and mobile apps.



### SMS

Programmatically send and receive SMS in practically every country.



### SIP Trunking

Make and receive calls from the cloud with your existing VoIP infrastructure.



### Messages NEW

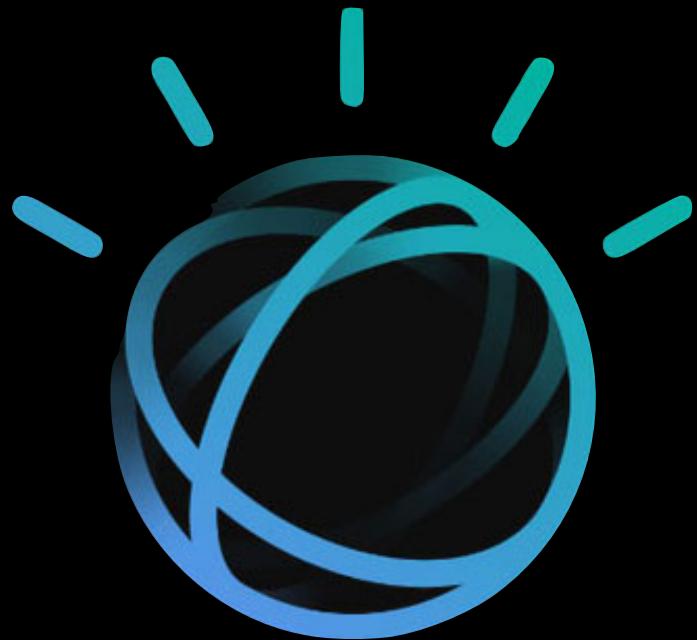
Communicate with **WhatsApp**,  
**Facebook Messenger**, **MMS**, and **Viber**.



### Number Insight

Get real-time intelligence on any phone number in the world.

# ↳ IBM Watson Services Overview



# 1. Tone Analyzer

[ibm.com/watson/services/tone-analyzer](https://ibm.com/watson/services/tone-analyzer)



## 2. Speech to Text

[ibm.com/watson/services/speech-to-text](https://ibm.com/watson/services/speech-to-text)

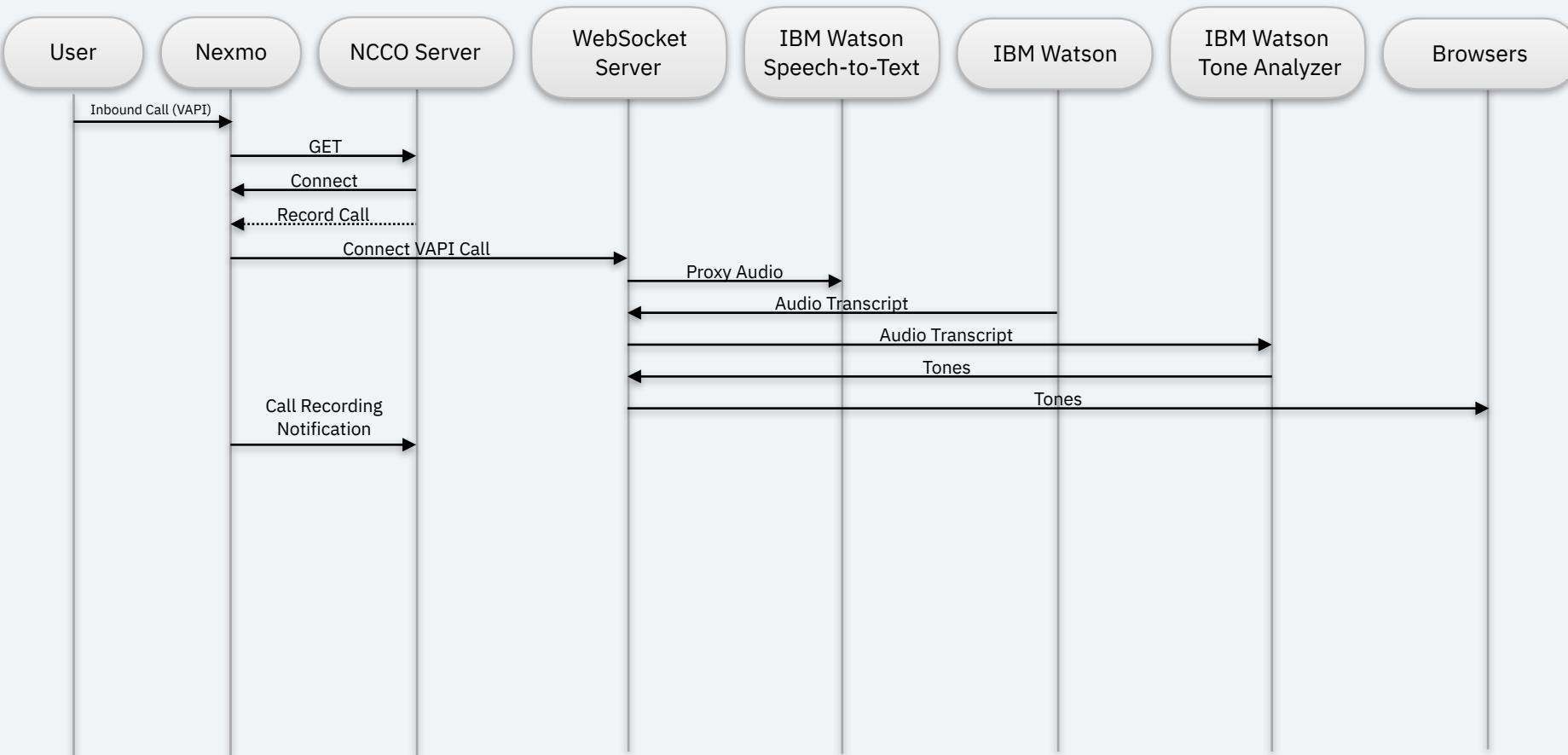
The question of what is artificial intelligence is a complex one non I would say if we define artificial intelligence is the ability of a machine on its own to understand large volumes of data to reason that data with a purpose state to predict the future and then tell you continue to learn and get better.

### 3. Natural Language Understanding

[ibm.com/watson/services/natural-language-understanding/](https://ibm.com/watson/services/natural-language-understanding/)

Aäå

# Data Flow Diagram



## ↳ Code Overview

↳ Clone the Code from GitHub

[github.com/drnugent/nexmo-watson-tone-workshop](https://github.com/drnugent/nexmo-watson-tone-workshop)



# Code overview

- NCCO ([developer.nexmo.com/voice/voice-api/ncco-reference](https://developer.nexmo.com/voice/voice-api/ncco-reference))
  - JSON Hijacking ([haacked.com/archive/2009/06/25/json-hijacking.aspx/](http://haacked.com/archive/2009/06/25/json-hijacking.aspx/))
  - Call Recording & Natural Language Understanding
  - ngrok ([dashboard.ngrok.com](https://dashboard.ngrok.com))

# ↳ About WebSockets



# About WebSockets

## Events

- onopen
- onmessage
- onerror

## Methods

- send()
- close()



↳ Create your ngrok Account  
[dashboard.ngrok.com](https://dashboard.ngrok.com)

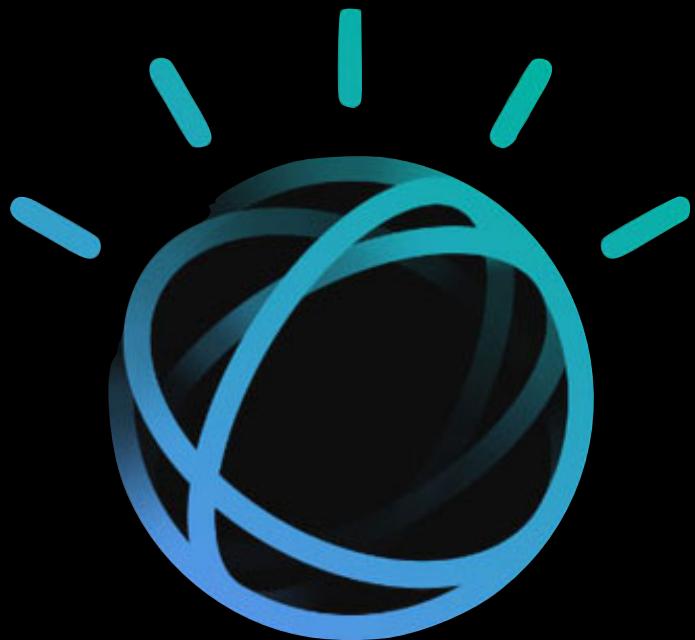
The image features a large, bold, orange sans-serif font spelling out the word "ngrok". The letters are slightly rounded and have a high contrast against a plain white background.

↳ Nexmo's ngrok Tutorial:

[nexmo.com/blog/2017/07/04/local-development-nexmo-ngrok-tunnel-dr](https://nexmo.com/blog/2017/07/04/local-development-nexmo-ngrok-tunnel-dr)

A large, bold, orange sans-serif font logo for "ngrok". The letters are slightly slanted to the right.

↳ Create Watson Services



# Step 0: Sign Up for IBM Cloud Account

[ibm.biz/nexmowebinar2020](https://ibm.biz/nexmowebinar2020)

↳ Create your Nexmo Application & Number



# ↳ Set Environment Variables

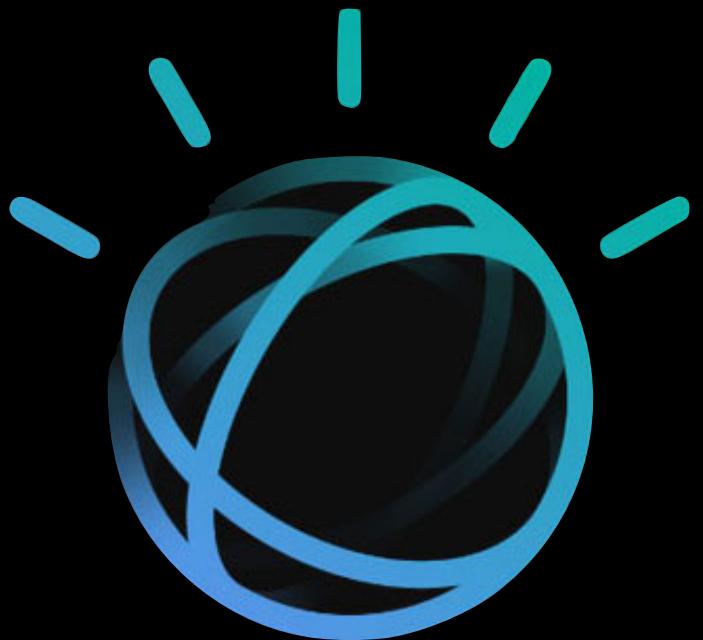


# Set Environment Variables

```
export SERVER_URL=https://nexmo-watson.ngrok.io
export WS_SERVER_URL=ws://nexmo-watson.ngrok.io
export NEXMO_VIRTUAL_NUMBER=
export WATSON_TRANSCRIPTION_USERNAME=
export WATSON_TRANSCRIPTION_PASSWORD=
export WATSON_UNDERSTANDING_USERNAME=
export WATSON_UNDERSTANDING_PASSWORD=
export WATSON_TONE_ANALYZER_USERNAME=
export WATSON_TONE_ANALYZER_PASSWORD=
```



↳ Run the Project



nexmo

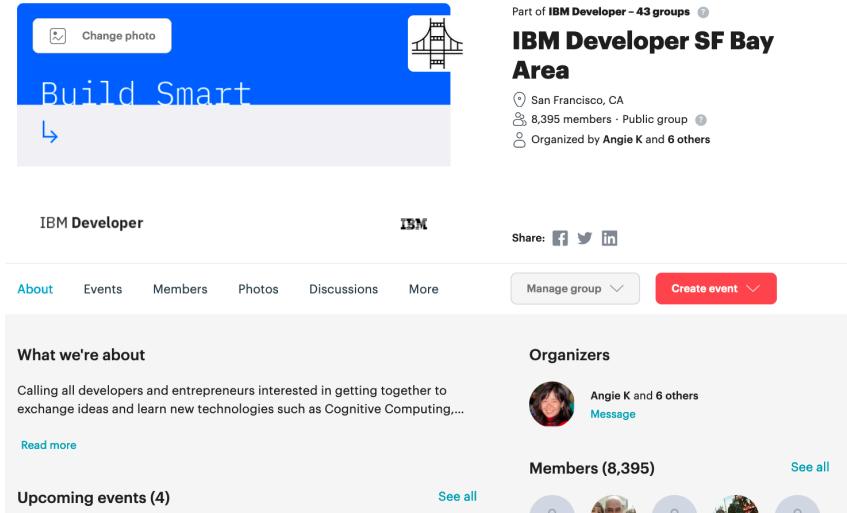
# Upcoming IBM Developer SF Meetups

Thursday, Jan 9 - San Jose, CA  
**Serverless Mobile Backend as a Service at Hacker Dojo**

Wednesday, Jan 15 - Online  
**Removing Unfair Bias in Machine Learning**

Thursday, Jan 23 - Online  
**Data Wrangling and Exploration with Pandas**

Register: [ibm.biz/ibm-dev-meetups](http://ibm.biz/ibm-dev-meetups)



The screenshot shows the LinkedIn group page for "IBM Developer SF Bay Area". At the top, there's a blue header with the group name and a bridge icon. Below it, a banner says "Build Smart". The main content area has tabs for "About", "Events", "Members", "Photos", "Discussions", and "More". A "Manage group" button and a "Create event" button are visible. The "About" section includes a "What we're about" summary: "Calling all developers and entrepreneurs interested in getting together to exchange ideas and learn new technologies such as Cognitive Computing,...". It also features a "Read more" link and a "Upcoming events (4)" section with a "See all" link. The "Organizers" section lists "Angie K and 6 others" with a "Message" button. The "Members (8,395)" section shows a grid of member profiles.

# IBM Partners

Enabling Independent Software Vendors (ISVs)  
and tech companies for growth

## Target audience

- ISVs and tech companies building and selling cloud solutions
- New to IBM Cloud
- Startups who aspire to build and sell their own solutions

## Offers to help you get started



**Build with up to \$12,000 of free IBM Cloud™ credits (\$1,000 per month for 12 months)**

Integrate your solutions with leading-edge IBM Cloud technologies to deliver more innovation and value to your clients. Access more than **130 unparalleled services** including Watson™, Analytics and Security.



**Build with 10TB of IBM Cloud Object Storage at no charge**

Build data capability into your offering. IBM Cloud Object Storage is designed for high durability, resiliency and security.



**Build with IBM Watson Assistant with a 1-year free trial**

Receive access to 100K API calls per month plus 10 workspaces. Build and deploy chatbots quickly and efficiently with IBM Watson Assistant's advanced capabilities and seamless interface.



**Build with IBM Cloud Kubernetes Service with a 1-year free trial**

Containerize your solution with 1TB of block storage. Ship all your applications in one agile, well-defined structure with IBM Cloud Kubernetes Service.



**Build with IBM Blockchain with a 6-month free trial**

Build a network with up to 3 organizations to prototype. Build a secure business transaction network for your clients using blockchain and smart contracts.



**Finished building and testing? Go-to-market with IBM**

Access Provider Workbench, attend an orientation session and join the premier network of over 400 partners who are already listing their solutions on the IBM Marketplace.



**Is your business a Startup? Build with up to \$120,000 in IBM Cloud credits**

If your business revenue in the last 12 months is less than \$1M and you've been in business for fewer than five years, then you may qualify for Startup with IBM.

## Get started

Experience IBM's countless partner benefits. Start building and selling with IBM today.

**Learn more and access offers at [ibm.com/partners/start](http://ibm.com/partners/start)**

# Questions?

And maybe, if we are lucky  
and the stars align:  
answers!

