Introduction to Nexmo Voice API

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Use the Voice API to make and receive calls, play audio, send and receive DTMF tones, and to record calls.

Workshop plan:

- Introduce concepts and vocabulary (mostly talking)
- Make and receive calls (hands-on)
- Interact with user input (hands-on)

NCCO: Nexmo Call Control Object

NCCOs describe the flow of the call. They are a series of stepsi described in JSON, such as this example showing text-to-speech:

```
[
  {
    "action": "talk",
    "text": "You are listening to a Call made with Voice API"
  }
]
```

You can find a full reference here: https://developer.nexmo.com/voice/voice-api/ncco-reference

NCCO: Nexmo Call Control Object

Elements in an NCCO may include:

- text-to-speech
- playing audio (optionally looping)
- recording a call
- accepting DTMF input
- transferring a call (to a conversation, or a new NCCO)
- ... and much more

Calls vs Conferences

There are two types of conversation that you might use:

- A "call" is a temporary conversation that only exists for as long as the call is taking place
- A "conference" is a conversation with a name, that additional callers can be added to. This type of conversation persists and can be reused.

```
{
  "action": "conversation",
  "name": "nexmo-conference-standard",
  "record": "true"
}
```

The Voice API

Make an API call to:

- make an outgoing call (we'll do this in a bit)
- hang up a call
- transfer a call
- interact with an in-progress call
- get information about current and past calls

The Voice API

The Voice API is an HTTP API so you can access it in many different ways:

- Explore the API with Postman or your favorite HTTP client
- Use `request(s)` or whichever library you prefer in your application
- Try one of our Server SDKS: https://developer.nexmo.com/tools (recommended)

You will find lots of code examples and the API reference on https://developer.nexmo.com

NCCO + API = Many Good Things

Combining the NCCOs to control program flow and the API calls to react to events allows us to create interesting and fully-featured applications.

Voice API Examples

- IVR
  - Incoming call, serve NCCO to answer it
  - Prompt user for DTMF input
  - DTMF input arrives as a webhook, return a new NCCO
- Proxy
  - Incoming call, serve NCCO to answer it
  - Put user into conference
  - API call to place outgoing call to other user, with NCCO to join same conference

Voice Webhooks

- Webhooks are events over HTTP
- Nexmo sends information about events and changes in call state as they happen
- These events are webhooks: incoming HTTP requests
- Your application needs to be able to receive requests and respond

The URL is set up in advance, as part of the application configuration

Voice Webhooks

Webhooks can be expected:

- When the call is answered, an HTTP request to your application's `answer_url`
- When events such as "ringing", "answered", "completed" occur, HTTP requests to your application's `event_url`
- When a user enters digits during an `input` action, an HTTP request to the URL specified in the NCCO
- When a recording is completed and available, an HTTP request to the specified `recording_url`
- When a `notify` action occurs

Webhooks on Dev Platforms

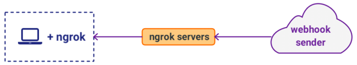
https://ngrok.com/ - secure tunnel to your dev platform

Use this tool to:

- webhook into code running locally
- inspect the request and response of the webhook
- replay requests and see the responses

Ngrok for Testing Webhooks

Start the tunnel on your laptop: receive a public URL



We have a blog post about this: https://www.nexmo.com/blog/2017/07/04/local-development-nexmo-ngrok-tunnel-dr

The Answer Webhook

When someone calls your Nexmo number, you get a webhook like this:

```
{
  "from": "442079460000",
  "to": "447700900000",
  "uuid": "aaaaaaaa-bbbb-cccc-dddd-0123456789ab",
  "conversation_uuid": "CON-aaaaaaaa-bbbb-cccc-dddd-0123456789ab"
}
```

Your code must return a valid NCCO

The Event Webhook

Many different events can produce webhooks to the `event_url`:

- Changes in call state e.g. "ringing"/"answered"
- `record` and `input` actions can specify a URL, which may be the same as the event URL
- Errors will also be sent to the `event_url`

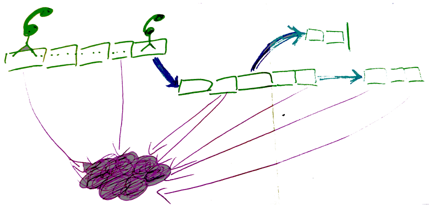
Detailed reference: https://developer.nexmo.com/voice/voice-api/webhook-reference#event-webhook

Voice Events Logger

A tool you can use to direct your `event_url` to, it just acknowledges the webhook and displays what arrived.

https://github.com/Nexmo/voice-event-logger - it can be run locally or deployed to Heroku

Pieces of the Voice API



Further Reading

- Use Cases for Voice API: https://developer.nexmo.com/voice/voice-api/use-cases/