

# Testing Bots

Mithun Prasad, PhD  
miprasad@Microsoft.com



# Testing Bots

- What Should We Test?
- How do you test a bot?
- Mocking

Unit/Functional/Load Testing

- Channel Testing

# Unit Tests



# Unit Tests

- Mock out the Bot Framework
- Perform Unit Testing by reusing the Bot Builder code
  - DialogTestBase.cs
  - FiberTestBase.cs
  - MockConnectorFactory.cs
- Runs locally

# What is Mocking?

*Simulate the behaviour of real objects*

- Used in unit testing
- Used when the unit being tested has external dependencies
- To isolate the behaviour of the object you want to test, the other objects will be replaced by mocks that simulate the behaviour of the real objects
- Useful if the real objects are impractical to incorporate into the unit test
- Moq for Bots - mocking framework for .NET

LAB:

BotsUnitTestingLab



# Testing a Hosted Bot



# Testing Channels

- Host the Bot service on a public URL endpoint
- When designing / building / testing your code, you don't always want to have to redeploy
- Redeploying means paying hosting costs

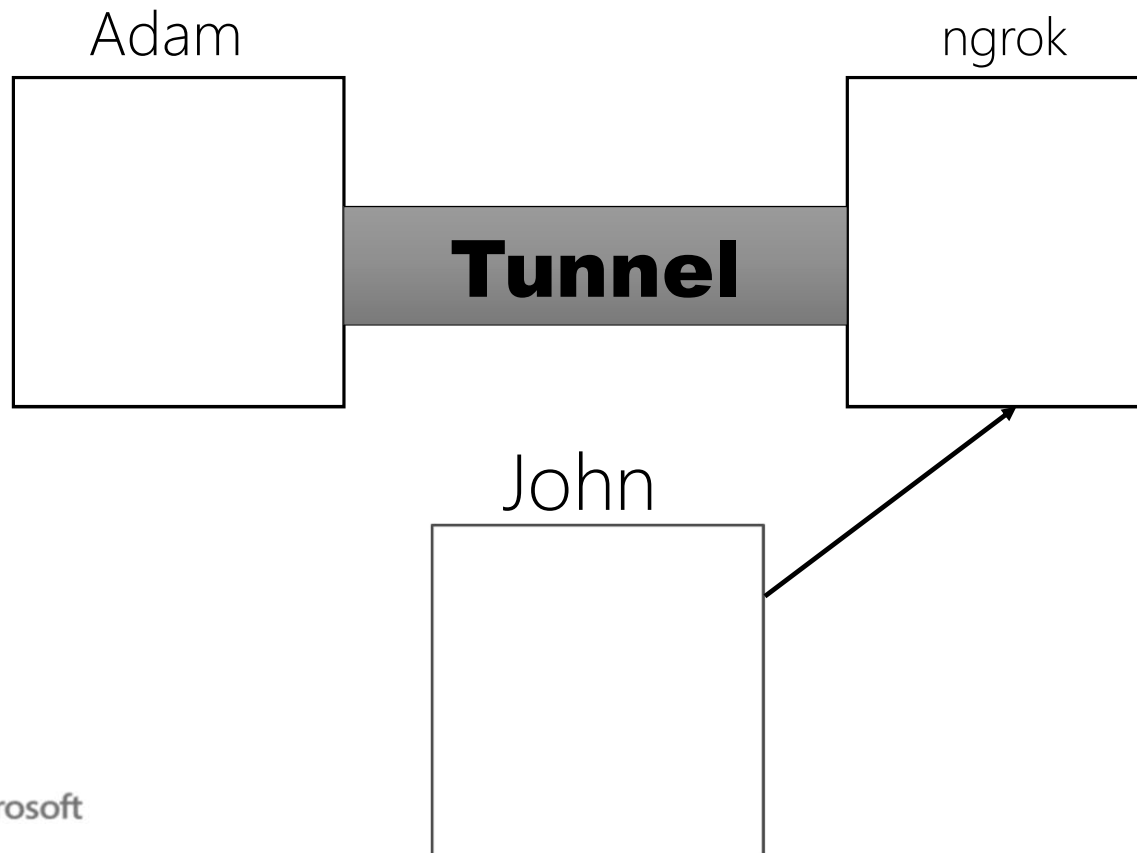


# Ngrok

## Secure tunnels to localhost

"I want to expose a local server behind a NAT or firewall to the internet."

# What is Ngrok?



# Forwarding

ngrok http 1111

```
ngrok                                     <Ctrl+C to quit>
Tunnel Status                           online
Version                                 1.6/1.5
Forwarding                               http://6125081c.ngrok.com -> 127.0.0.1:1111
Forwarding                               https://6125081c.ngrok.com -> 127.0.0.1:1111
Web Interface                           127.0.0.1:4040
# Conn                                  22
Avg Conn Time                            16.86ms
```

# Forwarding

- Given the bot is being hosted on localhost:3979, use ngrok to expose it to public internet
- `ngrok.exe http 3979 -host-header="localhost:3979"`
- The forwarding url is the public endpoint for the bot service

ngrok by @inconsreveable

```
Session Status      online
Version            2.2.4
Region             United States (us)
Web Interface       http://127.0.0.1:4040
Forwarding          http://542c7f9f.ngrok.io -> localhost:3979
Forwarding          https://542c7f9f.ngrok.io -> localhost:3979

Connections        ttl    opn    rt1    rt5    p50    p90
                   5      0      0.00   0.01   4.34   42.74

HTTP Requests
-----
POST /api/messages  200 OK
POST /api/messages  200 OK
POST /api/messages  500 Internal Server Error
POST /api/messages  200 OK
POST /api/messages  200 OK
```

# Testing Emulator on Public Endpoints

- The forwarding public urls from ngrok can be used in the emulator as shown below

Local Port	Emulator Url	Bot Url
9000	<a href="https://e4c7108d.ngrok.io/">https://e4c7108d.ngrok.io/</a>	<a href="http://542c7f9f.ngrok.io/api/messages">http://542c7f9f.ngrok.io/api/messages</a>

User:  Cor

LAB:

BotsNgrokLab



Direct Line



# Talk Directly

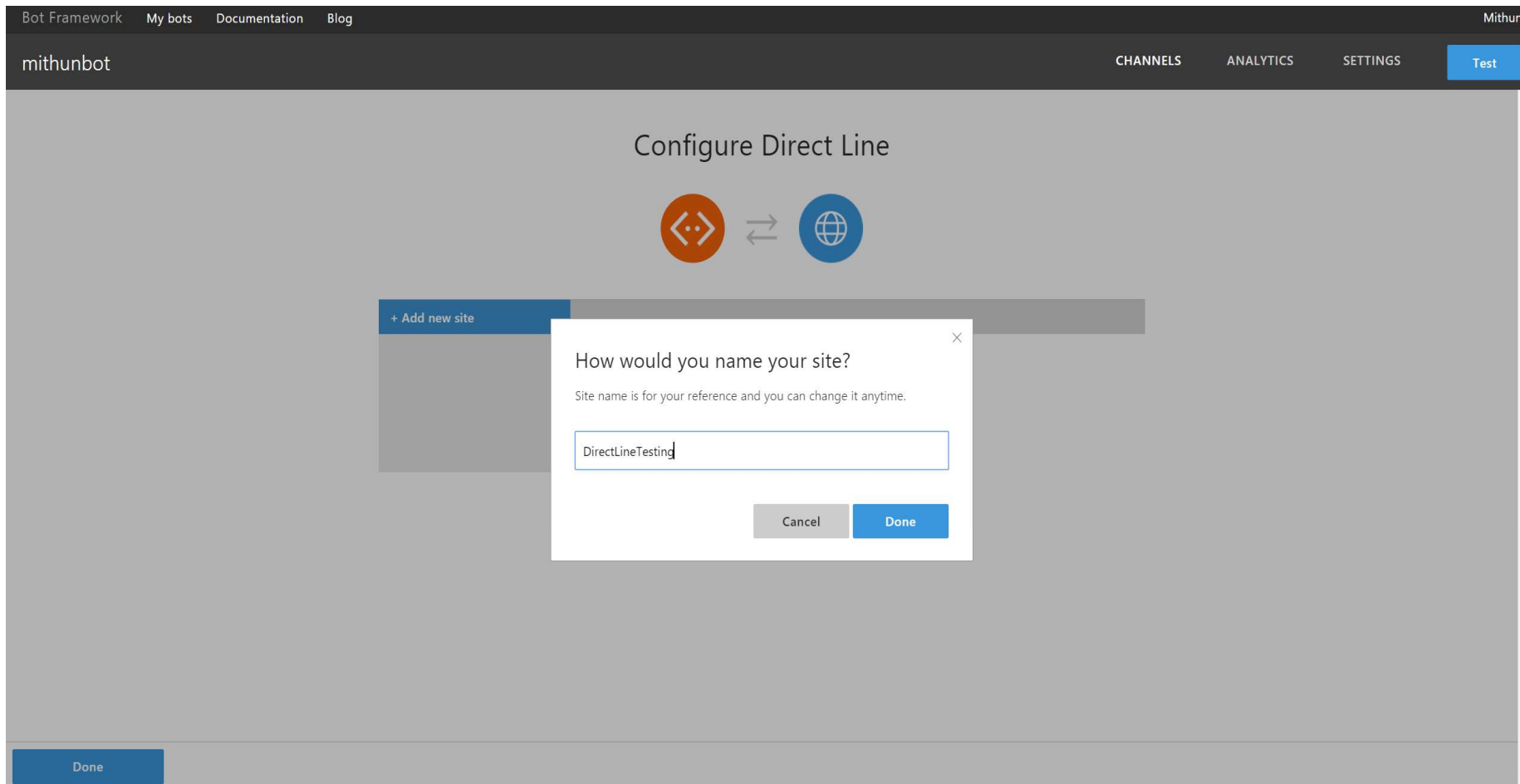
- A rich list of channels are supported. But what do you do when the channels provided aren't quite enough?
- *Direct Line!*
- Direct Line is a REST API for the bot framework that allows it's users to create their own integrations
- Example: If you have a mobile app that you directly want to integrate a chat bot into. You cannot make your app a channel!



# Authentication

- Call the Bot directly from a custom application to test authentication
- Allows you to authenticate a user in your application and securely communicate with the Bot as that user
- Direct Line API requests can be authenticated either by using a secret that you obtain from the Direct Line channel configuration page in the Bot Framework Portal

# Direct Line Configuration






# Direct Line Configuration

[Bot Framework](#) [My bots](#) [Documentation](#) [Blog](#) Mithun


mithunbot CHANNELS ANALYTICS SETTINGS Test


## Configure Direct Line



+ Add new site

DirectLineTesting

DirectLineTesting 

Disable 

Secret keys

dLIRPIK\_37l.cwA.xEg.cfBMU9cp1AL5Tt5eJsJvbC-KUANas9860\_zxPI2NU\_

[Hide](#) [Regenerate](#)

dLIRPIK\_37l.cwA.vXE.W2snA75Da1JYnBq81Bi87w1LBduhJq2\_uUTy1uEl

[Hide](#) [Regenerate](#)

Version


Select which versions of the Direct Line protocol are enabled on this site. More information about these versions can be found in the [Direct Line reference documentation](#).

☒ 1.1

☒ 3.0 [PREVIEW]

☐ High-speed storage [PREVIEW]

Done

 Microsoft

# Start a Conversation

The screenshot displays the ARC REST client interface. On the left is a sidebar with navigation options: HTTP request (selected), Socket, History, Saved, and Projects. The main panel is titled 'Request' and shows the URL `https://directline.botframework.com/api/conversations`. The HTTP method is set to POST. Under the 'Raw headers' tab, an 'Authorization: Bearer' header is visible. A warning message states 'Content-Type header is not defined'. The 'Raw payload' tab is active, showing an empty text area. Below the payload area, the response status is '200 OK' with a response time of '698.00 ms'. At the bottom, the 'JSON' tab displays the response body as a JSON object. The interface also includes a 'SEND' button and a 'DETAILS' dropdown.

ARC

Request

Use XHR

HTTP request

Socket

History

Saved

Projects

> `https://directline.botframework.com/api/conversations`

☐ GET ☒ POST ☐ PUT ☐ DELETE ☐ PATCH Other methods Custom content type

Raw headers Headers form Headers sets Variables

Authorization: Bearer `dLIRPiK_37I.cwA.xEg.cfBMU9cp1AL5Tt5ejsJvbC-KUANas9860_zxP12NU_s`

Content-Type header is not defined 86 bytes

Raw payload Data form Files

SEND

200 OK 698.00 ms DETAILS

Raw JSON

```
{
  "conversationId": "COR95mdLIUIGNaKidxXj2g",
  "token": "dLIRPiK_37I.dAA.QwAwAFIAOQA1AG0AZABMAEkAVQBJAEcAbgBhAEsAaQBkAHgAWABqADIAZwA.E3g1Cp_w0gE.vEcqo0bBVAA.TFJ5P0w6Ikj9Oztks8iSPeyCNZj6Ao5SZmT8ZpH1hk0",
  "expires_in": 1800
}
```

Selected environment: default

# Direct Line Concepts

- Starting a conversation
- Sending messages
- Receiving messages
- End conversation

LAB:

BotsDirectLineLab

