

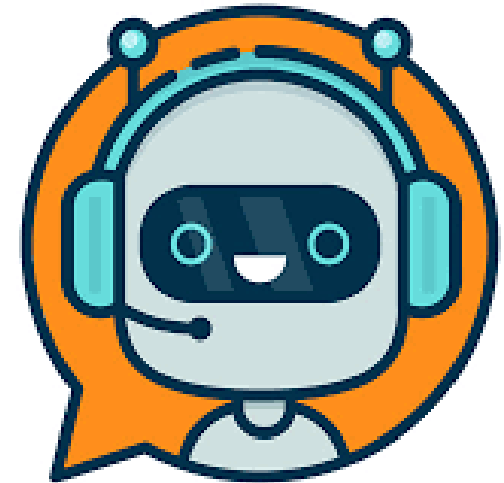
PROJET 10

DÉVELOPPEZ UN CHATBOT POUR RÉSERVER DES VACANCES ET PILOTER SA PERFORMANCE

#MICROSOFT BOT FRAMEWORK #AZURE LUIS #AZURE APPLICATION INSIGHT
#VSCODE #GITHUB #TEST UNITAIRE #KQL KUSTO QUERY LANGUAGE
#DASHBOARD
#AZURE APP SERVICES

Ingénieur IA

Développez et intégrez des algorithmes de Deep Learning au sein d'un produit IA



Ouddane Nabil

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Projet 10

Développez un chatbot pour réserver des vacances

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 - g. monitoring de log bespoke
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C. Model UPDATE



INTRODUCTION

1. Contexte



- **ENJEU Compétences DU P9:**
 - Chatbot avec **Microsoft Bot framework SDK v4**
 - **Analyse sémantique avec LUIS** d'azure pour identifier les variables nécessaires
 - Evaluation de la performance du modèle LUIS avec **Azure application insight**

- **ENJEU global:**
 - Développer un chatbot pour aider les utilisateurs à choisir une offre de voyage
 - MVP: support interne à la réservation d'un billet d'avion



2. Objectifs

- SCRIPT du pipeline complet stocké sur github
 - Application web chatbot développé grâce au **microsoft Bot Builder SDK et au service cognitif LUIS**
 - Démontrer les fonctionnalités de l'application à des futurs utilisateurs
 - Outils de suivi et d'analyse de l'activité du chatbot en prod avec Azure application insight
 - Pour rassurer les managers
- Méthodologie
 - pilotage de la performance du modèle en production
 - Critère d'évaluation du modèle LUIS
 - Schéma du mécanisme d'évaluation du modèle en prod
 - Modalités de mise à jour du modèle



3. données

- **Données utilisateur :**

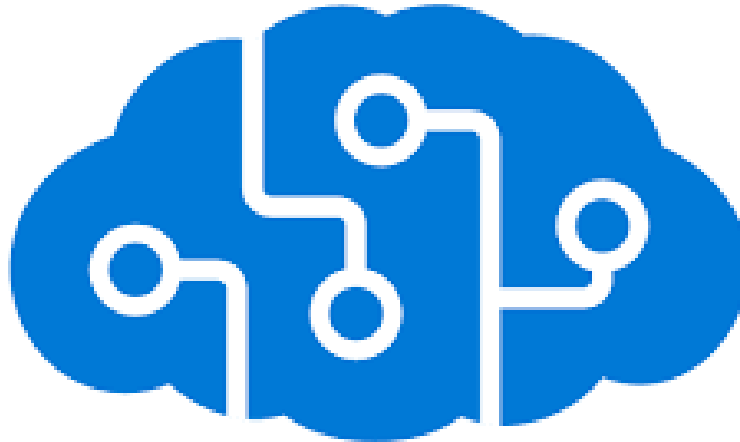
- <https://s3-eu-west-1.amazonaws.com/static.oc-static.com/prod/courses/files/AI+Engineer/Project+10%C2%A0-+D%C3%A9veloppez+un+chatbot+pour+r%C3%A9server+des+vacances/frames.zip>
 - Historiques d'échanges entre chatbot et utilisateur
 - JSON format. 5 champs principaux
 - user_id
 - wizard_id
 - Id
 - userSurveyRating
 - turns
-

B





1- CREATION DU MODELE LUIS








1-a: Creation d'une ressource Language Understanding LUIS sur AZURE

pricing authoring: F0: 5 calls/sec 1M calls /mois - pricing prediction: F0: 5 calls/sec 10K calls /mois

Microsoft Azure


Search resources, services, and docs (G+)



[Home](#) > [Create a resource](#) >

Language Understanding

Microsoft



Language Understanding

Microsoft

★ 3.6 (10 Azure ratings)

Plan

Language Understanding

▼

Create

Overview

Plans


Usage Information + Support

Reviews

Language Understanding (LUIS) is a natural language processing service that enables you to understand human language in your own application, website, chatbot, IoT device, and more. After you configure and publish your LUIS model, your application can easily receive user input in natural language and take action. You don't need to understand machine learning to solve the problem of extracting meaning from input. Instead you get to focus on your own application logic and let LUIS do the heavy lifting on your behalf. After your LUIS model is built and deployed, it exports a simple HTTP endpoint that is called by your application.

More products from Microsoft

[See All](#)




Active Directory Health Check

Microsoft

Azure Service

Assess the risk and health of Active Directory environments.




AD Replication Status

Microsoft

Azure Service

Identify Active Directory replication issues in your environment.




Device Update for IoT Hub

Microsoft

Azure Service

Securely and Reliably update your devices with Device Update for IoT Hub.



Front Door and CDN profiles

Microsoft

Azure Service

Azure Front Door and CDN profiles is security led, modern cloud CDN that provides static and dynamic content acceleration, global load balancing and enhanced security

1-a: Creation d'une ressource Language Understanding LUIS sur AZURE (LUIS va être remplacé par CLU)

The screenshot displays the Microsoft Azure portal interface. At the top, the header bar includes the Microsoft Azure logo, a search bar, and user information for 'nabil.ouddane@outlook...'. The main content area is titled 'P10luisinst-Authoring' with the subtitle 'Language understanding'. A left-hand navigation pane lists various services and monitoring tools. The central pane shows the 'Essentials' tab for the resource, displaying details such as the resource group 'P10_luis_rg', status 'Active', location 'West Europe', and subscription ID. It also lists the API type as 'Language Understanding Authoring (LUIS)', pricing tier as 'Free', and the endpoint URL. Below this, there are tabs for 'Discover', 'Develop', 'Deploy', and 'Monitoring'. The 'Discover' tab is active, showing a 'Before you get started' section with introductory text and a link to 'Read more about resources'. A 'Get Started with Language Understanding' section follows, explaining the LUIS service and providing a 'Learn More' link. On the right side of the 'Discover' tab, there is a 'Custom Portal' section with a brief description of the custom portal's purpose.

Microsoft Azure

Search resources, services, and docs (G+/)

Home > P10_luis_rg >

P10luisinst-Authoring ✨ ☆ ...
Language understanding

Search

Delete

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource Management

Keys and Endpoint

Pricing tier

Networking

Identity

Cost analysis

Properties

Locks

Monitoring

Alerts

Metrics

Diagnostic settings

Logs

Essentials [JSON View](#)

Resource group (move) : [P10_luis_rg](#)

Status : Active

Location : West Europe

Subscription (move) : [Paieement à l'utilisation](#)

Subscription ID : 83d8ecaa-cbe4-4ae1-a829-d3a63be1315e

Tags (edit) : [Click here to add tags](#)

API type : Language Understanding Authoring (LUIS)

Pricing tier : Free

Endpoint : <https://p10luisinst-authoring.cognitiveservices.azure.com/>

Manage keys : [Click here to manage keys](#)

Discover Develop Deploy Monitoring

Before you get started

Before you get started with Language Understanding, you need to understand what is an authoring resource and what is a prediction resource and when to use the one versus the other when using the service. Expand the menus below to learn more what each resource entails. Since you now have an authoring resource, you can go to the portal and build apps. Make sure to create a prediction resource to query endpoint after publishing your application.

[Read more about resources](#)

Authoring Resource

Prediction Resource

Get Started with Language Understanding

Language Understanding Service (LUIS) is a cloud-based conversational AI service that allows customizations of Natural Language Understanding (NLU) models and applies its machine-learned intelligence to predict overall meaning, and extract relevant detailed information to a user's conversational text. Use our custom portal to start building, training and customizing your models in an interactive manner.

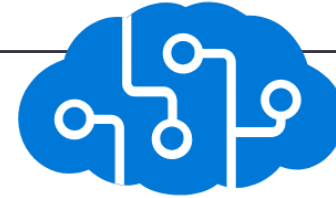
[Learn More](#)

Custom Portal

Go to our custom portal to build, train, test and publish your domain specific custom LUIS applications.

1-b: Modelisation LUIS (cf fichier jupyter p10_luis_0.2.ipynb)

3 POSSIBILITES : LIB PYTHON / API / PORTAIL



IMPORT et COMPREHENSION
des fichiers d'exemples de dialogues
frames.json

FORMATAGE pour FEEDING de LUIS
des fichiers d'exemples de dialogues
frames.json

CREATION de l'APPLICATION LUIS et du
CLIENT AUTHORIZING

ENTRAINEMENT:
À partir d'une 30taine d'exemples
formatés issus de frames.json

PUBLICATION

Analyse et extraction à partir des turns de l'intention et
des entités avec leurs positions:

- intentions
- dst_city
- or_city
- budget
- str_date
- End_date

- Modele d'intention
- Prebuilt entity (money, geography v2, datetime v2)
- Entities:
- Budget avec feature « money »
- Or_city avec feature « geography v2 »
- Dst_city avec feature « geography v2 »
- Str_date avec feature « datetime v2 »
- end_date avec feature « datetime v2 »



1-b: Modelisation LUIS Dashboard

My LUIS / P10 mvp book v0.1 ▾

DASHBOARD

BUILD

MANAGE

 Train

 Test

 Publish

Published app ⓘ

Publishing status

Last published:

Jul 5, 2022 2:36:56 PM

Version: 0.1

Slot: Production

[External services](#)

No Services

[Regions](#)

All regions

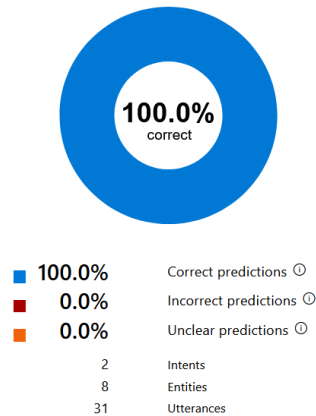
Endpoint hits per day



Training evaluation ⓘ

Active version: 0.1 – trained Jul 5, 2022 2:30:14 PM

Overall predictions ⓘ

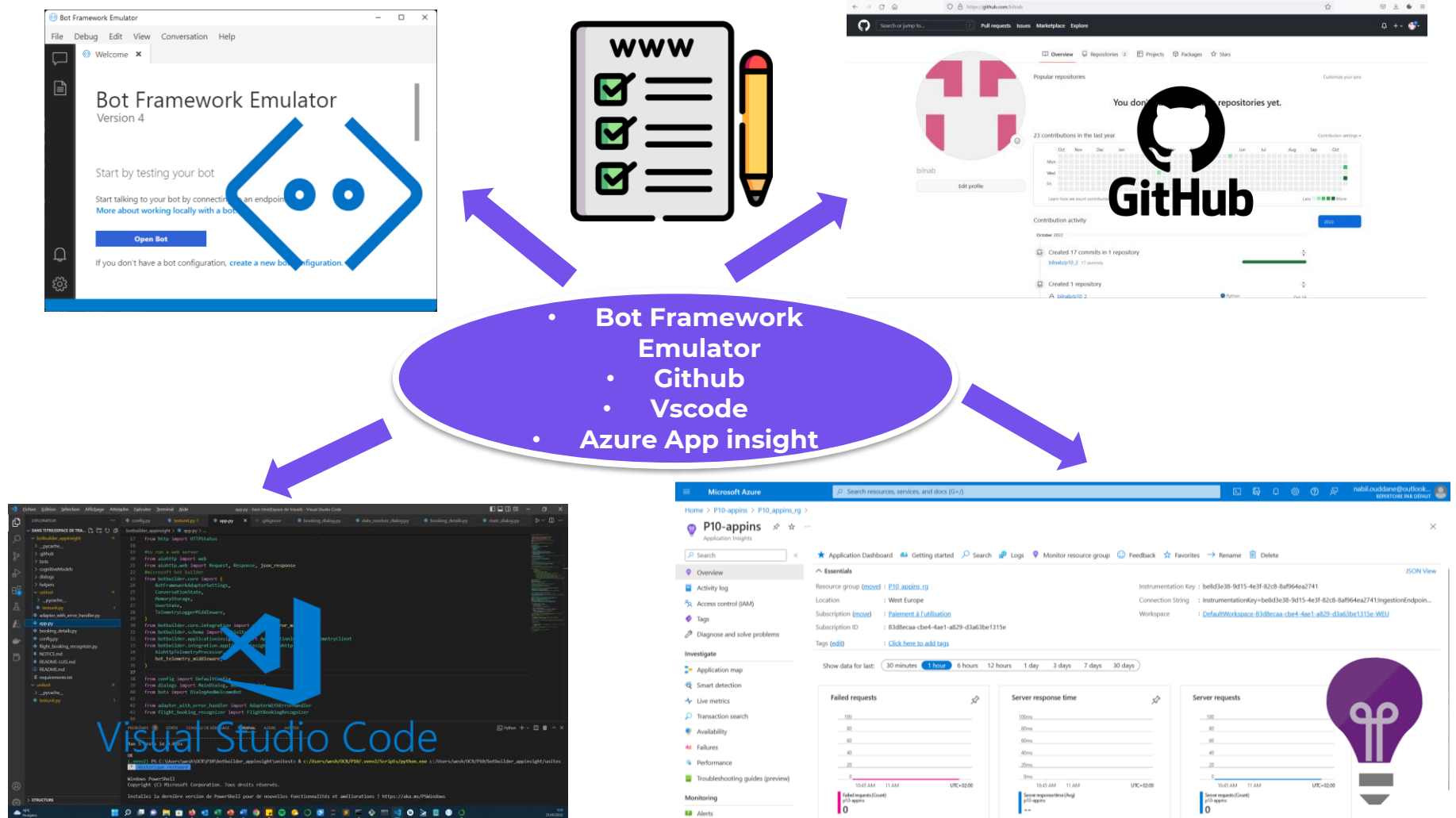


B

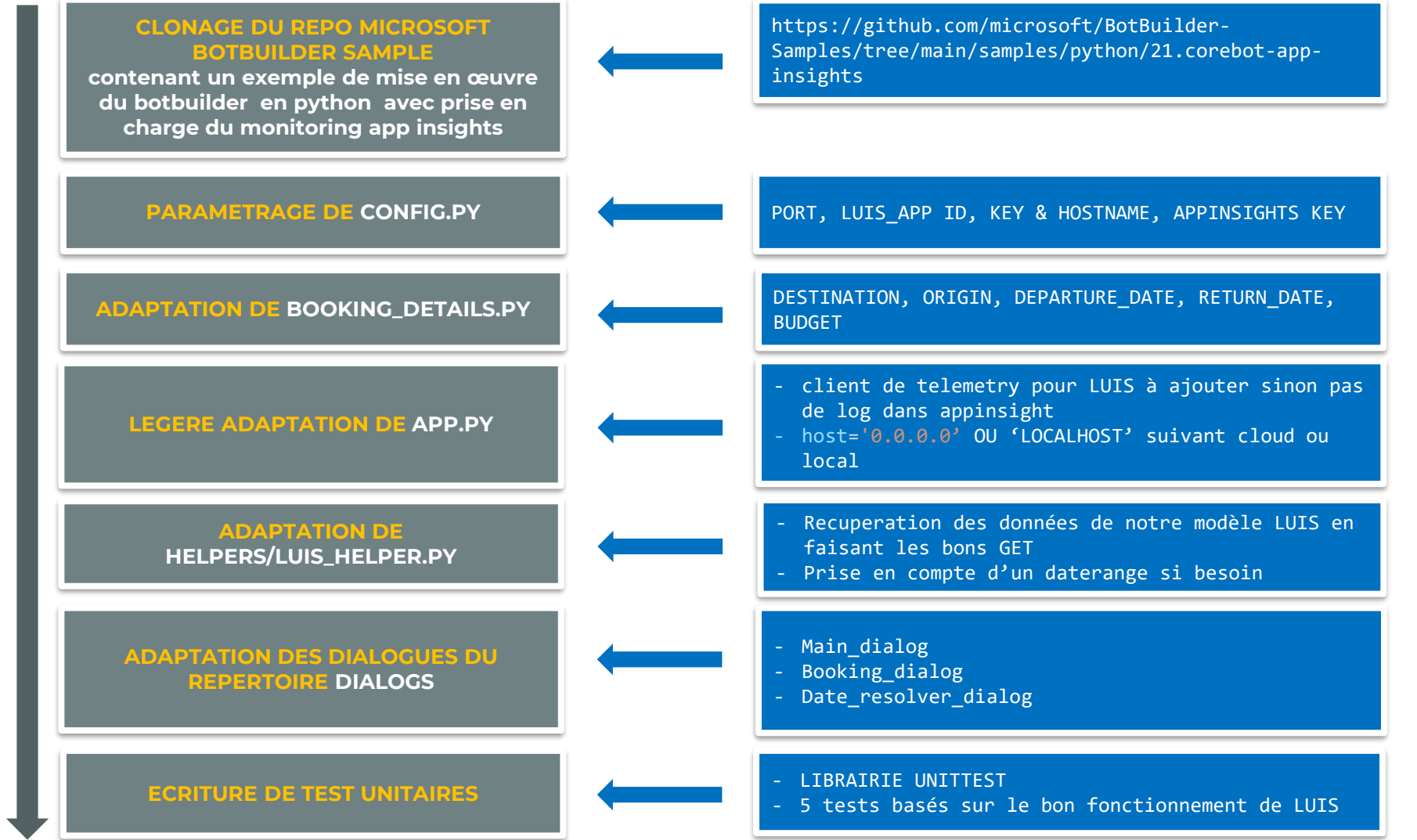
2- DEVELOPPEMENT DU BOT POUR REPONDRE A NOTRE BESOIN



2-a: prérequis au BOT




2-b : Developpement du BOT en python



2-c : Test du bot sur l'émulateur

Welcome Live Chat ✕
Restart Conversation - New User ID | Save transcript



Welcome to Bot FlyMe BOT
Our role is to help you to book your next trip

Get an overview

Ask a question

Learn how to deploy

3 minutes ago

hello

2 minutes ago

hello, I am flybot, how can I help you?

2 minutes ago

i want to go from London to Paris today and come back tomorrow for a budget of 2000\$

Type your message

Debug Edit View Conversation Help
Welcome Live Chat ✕
Restart Conversation - New User ID | Save transcript

when do you want to leave?

2 minutes ago


when do you want to come back?

2 minutes ago

Please confirm, you want to book a flight from: London to Paris from October 21 2022 to October 22 2022. for a budget of 2000 \$.

2 minutes ago

I have booked a fly from London to Paris on October 21 2022 and return on October 22 2022. with a budget of 2000 \$ \$.



today

2 minutes ago

tomorrow

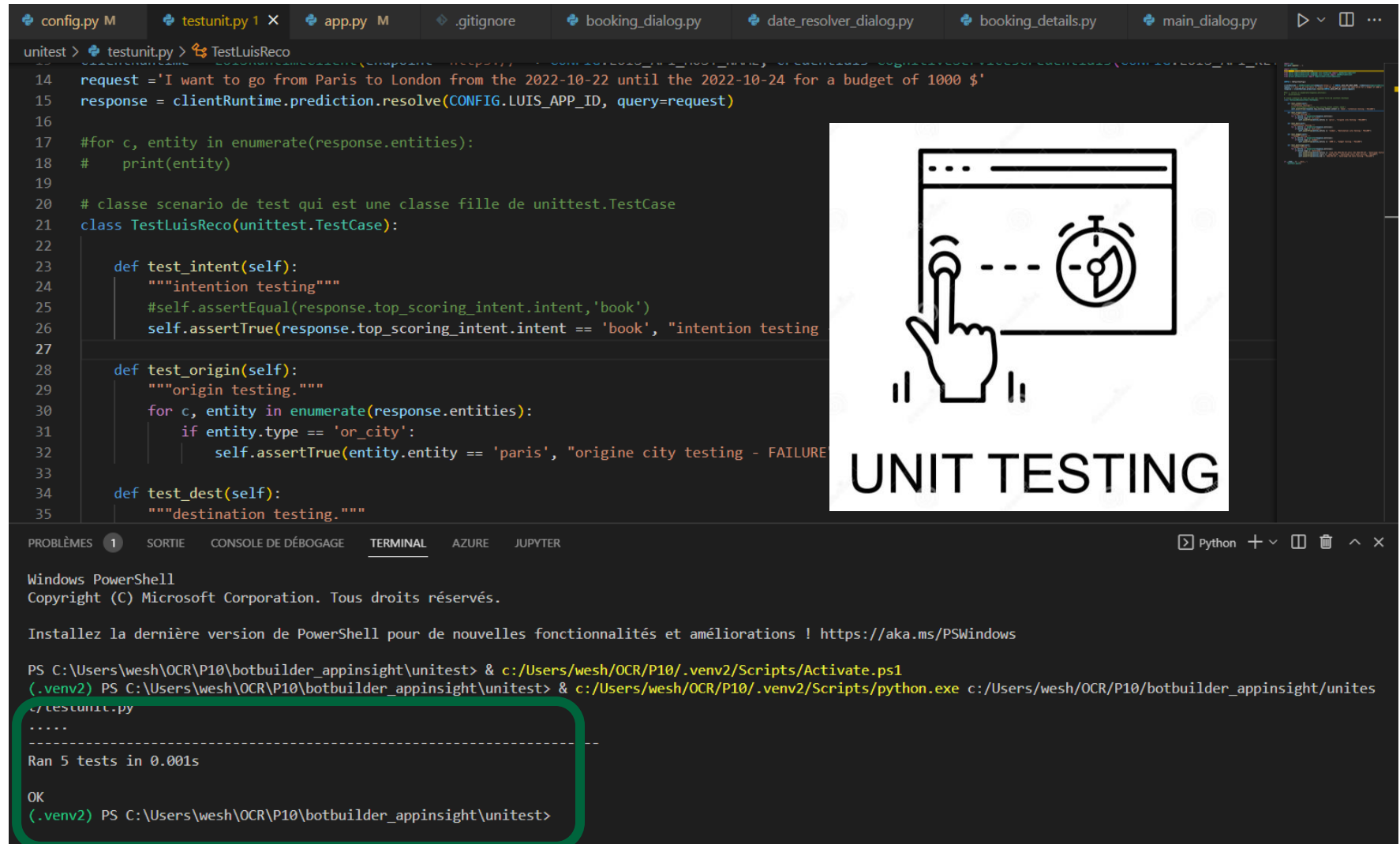
2 minutes ago

Yes

2 minutes ago


Type your message

2-d : Mise en place de 5 tests unitaires



The screenshot displays a VS Code editor with several open files: `config.py`, `testunit.py`, `app.py`, `.gitignore`, `booking_dialog.py`, `date_resolver_dialog.py`, `booking_details.py`, and `main_dialog.py`. The `testunit.py` file is the active editor, showing a Python script for unit testing. The script includes a `unittest.TestCase` class with three methods: `test_intent`, `test_origin`, and `test_dest`. The `test_intent` method tests the top scoring intent, `test_origin` tests the origin city, and `test_dest` tests the destination. The terminal window at the bottom shows the execution of the tests, indicating that 5 tests were run successfully in 0.001s.

```
unittest > testunit.py > TestLuisReco
14 request = 'I want to go from Paris to London from the 2022-10-22 until the 2022-10-24 for a budget of 1000 $'
15 response = clientRuntime.prediction.resolve(CONFIG.LUIS_APP_ID, query=request)
16
17 #for c, entity in enumerate(response.entities):
18 #    print(entity)
19
20 # classe scenario de test qui est une classe fille de unittest.TestCase
21 class TestLuisReco(unittest.TestCase):
22
23     def test_intent(self):
24         """intention testing"""
25         #self.assertEqual(response.top_scoring_intent.intent, 'book')
26         self.assertTrue(response.top_scoring_intent.intent == 'book', "intention testing")
27
28     def test_origin(self):
29         """origin testing."""
30         for c, entity in enumerate(response.entities):
31             if entity.type == 'or_city':
32                 self.assertTrue(entity.entity == 'paris', "origine city testing - FAILURE")
33
34     def test_dest(self):
35         """destination testing."""
```



UNIT TESTING

PROBLÈMES 1 SORTIE CONSOLE DE DÉBOGAGE TERMINAL AZURE JUPYTER

Windows PowerShell
Copyright (C) Microsoft Corporation. Tous droits réservés.

Installez la dernière version de PowerShell pour de nouvelles fonctionnalités et améliorations ! <https://aka.ms/PSWindows>

PS C:\Users\wesh\OCR\P10\botbuilder_appinsight\unitest> & c:/Users/wesh/OCR/P10/.venv2/Scripts/Activate.ps1
(.venv2) PS C:\Users\wesh\OCR\P10\botbuilder_appinsight\unitest> c:/Users/wesh/OCR/P10/.venv2/Scripts/python.exe c:/Users/wesh/OCR/P10\botbuilder_appinsight\unitest/testunit.py
.....
Ran 5 tests in 0.001s
OK
(.venv2) PS C:\Users\wesh\OCR\P10\botbuilder_appinsight\unitest>

2-e: Mise en place des alertes app insights

- Création d'**alertes** déclenchant **l'envoi de mails** à partir de requêtes sur les logs de la table **CustomEvents** de application insights:
 - Score moyen LUIS de l'intention < 0,5 sur n jours glissants*
 - Nombre d'intention « book » / Nombre d'intention « none » < 1 sur 4 jours glissants*
 - Nombre de waterfall bookdialogs debutés / nombre de waterfall bookdialogs terminés < 0,5 sur n jours glissants => indication d'interruption en cours de dialogue*
 - Nombre de waterfall Maialogs debutés / nombre de waterfall Maialogs terminés < 0,5 sur n jours glissants => indication de booking finalisés*
 - Nombre anormal (trop grand) d'activités d'un meme utilisateur*

[Home](#) > [P10-appins](#) | Alerts >

Alert rules

[+](#) Create [≡](#) Columns [↺](#) Refresh [↓](#) Export to CSV [🔗](#) Open query | [🗑](#) Delete [▶](#) Enable ☐ Disable

[Target resource type : all](#) [Target scope : P10-appins](#) [Subscription : all](#) [Signal type : all](#) [Severity : all](#) [Status : Enabled](#)

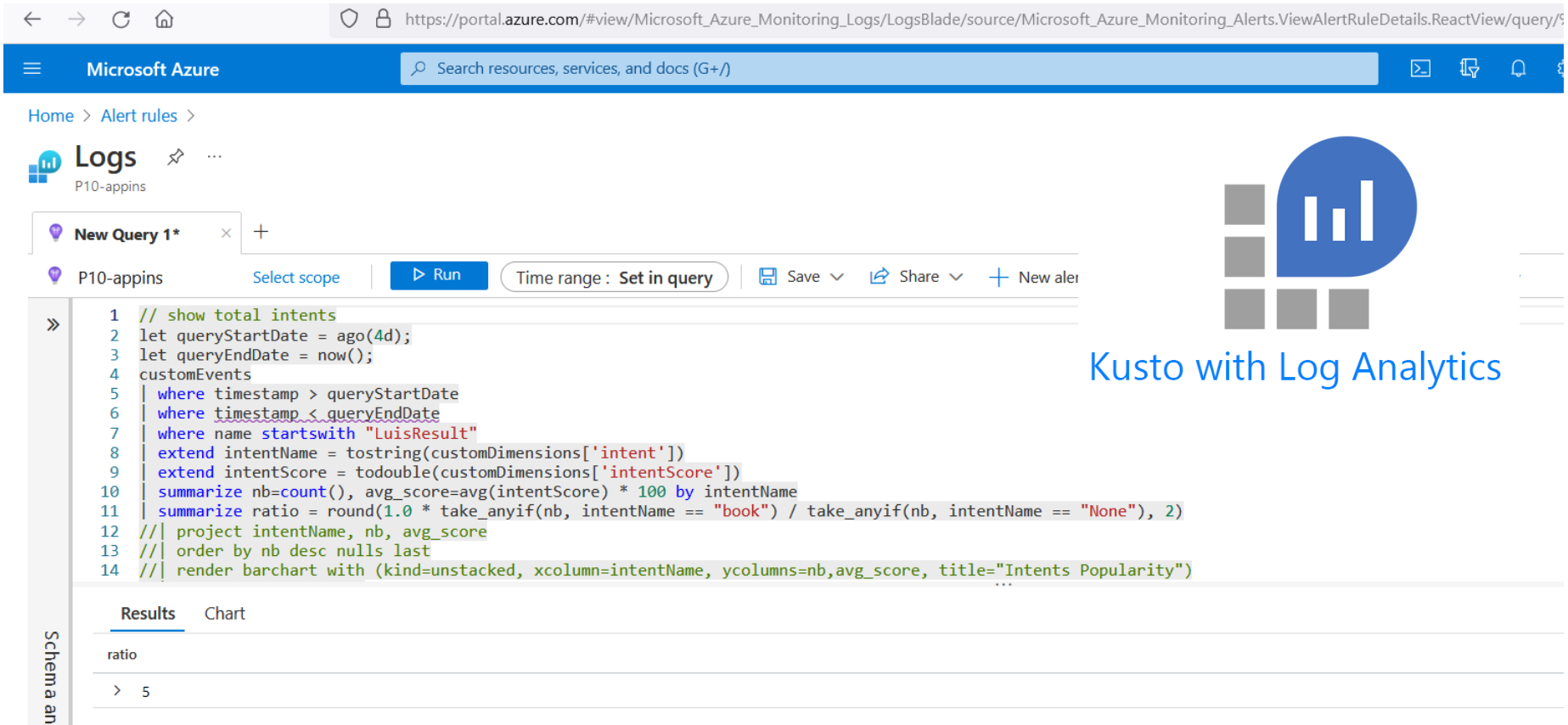
Showing 1 to 6 of 6 Alert rules.

Name ↑↓	Condition	Severity ↑↓	Target scope	Target resource type	Signal type ↑↓	Status ↑↓
<input type="checkbox"/> Failure Anomalies - P10-appins	Failure Anomalies detected	3 - Informational	p10-appins	Application Insights	Smart detector	✓ Enabled ...
<input type="checkbox"/> P10_Book_intent_score_tresh_Warning	avg_score <= 0.5 In selected dim...	2 - Warning	P10-appins	Application Insights	Log search	✓ Enabled ...
<input type="checkbox"/> P10_Book_none_intent_ratio_tresh_Warning	ratio <= 1	2 - Warning	P10-appins	Application Insights	Log search	✓ Enabled ...
<input type="checkbox"/> P10_BookDialog_tresh_Warning	Percentage <= 0.5 In selected di...	2 - Warning	P10-appins	Application Insights	Log search	✓ Enabled ...
<input type="checkbox"/> P10_MainDialog_tresh_Warning	Percentage <= 0.5 In selected di...	2 - Warning	P10-appins	Application Insights	Log search	✓ Enabled ...
<input type="checkbox"/> P10_user_abnormal_activity_attack_Warning	Count > 10	2 - Warning	P10-appins	Application Insights	Log search	✓ Enabled ...



2-e: Mise en place des alertes app insights

- Des ajustements sont évidemment nécessaires en fonction de la volumétrie
- Les requêtes sont écrites en **KQL** kusto query language



The screenshot displays the Microsoft Azure portal interface. The top navigation bar shows the Microsoft Azure logo and a search bar. The breadcrumb trail indicates the path: Home > Alert rules > Logs. The main content area shows the 'Logs' section for the 'P10-appins' resource. A 'New Query 1*' button is visible. The query editor contains the following KQL script:

```
1 // show total intents
2 let queryStartDate = ago(4d);
3 let queryEndDate = now();
4 customEvents
5 | where timestamp > queryStartDate
6 | where timestamp < queryEndDate
7 | where name startswith "LuisResult"
8 | extend intentName = tostring(customDimensions['intent'])
9 | extend intentScore = todouble(customDimensions['intentScore'])
10 | summarize nb=count(), avg_score=avg(intentScore) * 100 by intentName
11 | summarize ratio = round(1.0 * take_anyif(nb, intentName == "book") / take_anyif(nb, intentName == "None"), 2)
12 /// project intentName, nb, avg_score
13 /// order by nb desc nulls last
14 /// render barchart with (kind=unstacked, xcolumn=intentName, ycolumns=nb,avg_score, title="Intents Popularity")
```

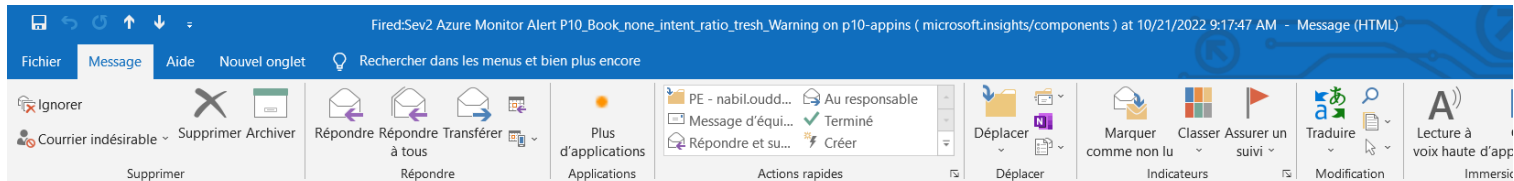
The query results are displayed in a table with the following data:

ratio
> 5

On the right side of the screenshot, there is a logo for 'Kusto with Log Analytics' featuring a blue circle with a white bar chart icon and the text 'Kusto with Log Analytics' below it.

2-e: Mise en place des alertes app insights

- Réception de mails



Fired:Sev2 Azure Monitor Alert P10_Book_none_intent_ratio_tresh_Warning on p10-appins (microsoft.insights/components) at 10/21/2022 9:17:47 AM



Microsoft Azure <azure-noreply@microsoft.com>
À nabil.ouddane@outlook.fr

En cas de problème lié à l'affichage de ce message, cliquez ici pour l'afficher dans un navigateur web.

**Fired:Sev2 Azure Monitor Alert
P10_Book_none_intent_ratio_tresh_Warning on
p10-appins (microsoft.insights/components)
at 10/21/2022 9:17:47 AM**

[View the alert in Azure Monitor >](#)

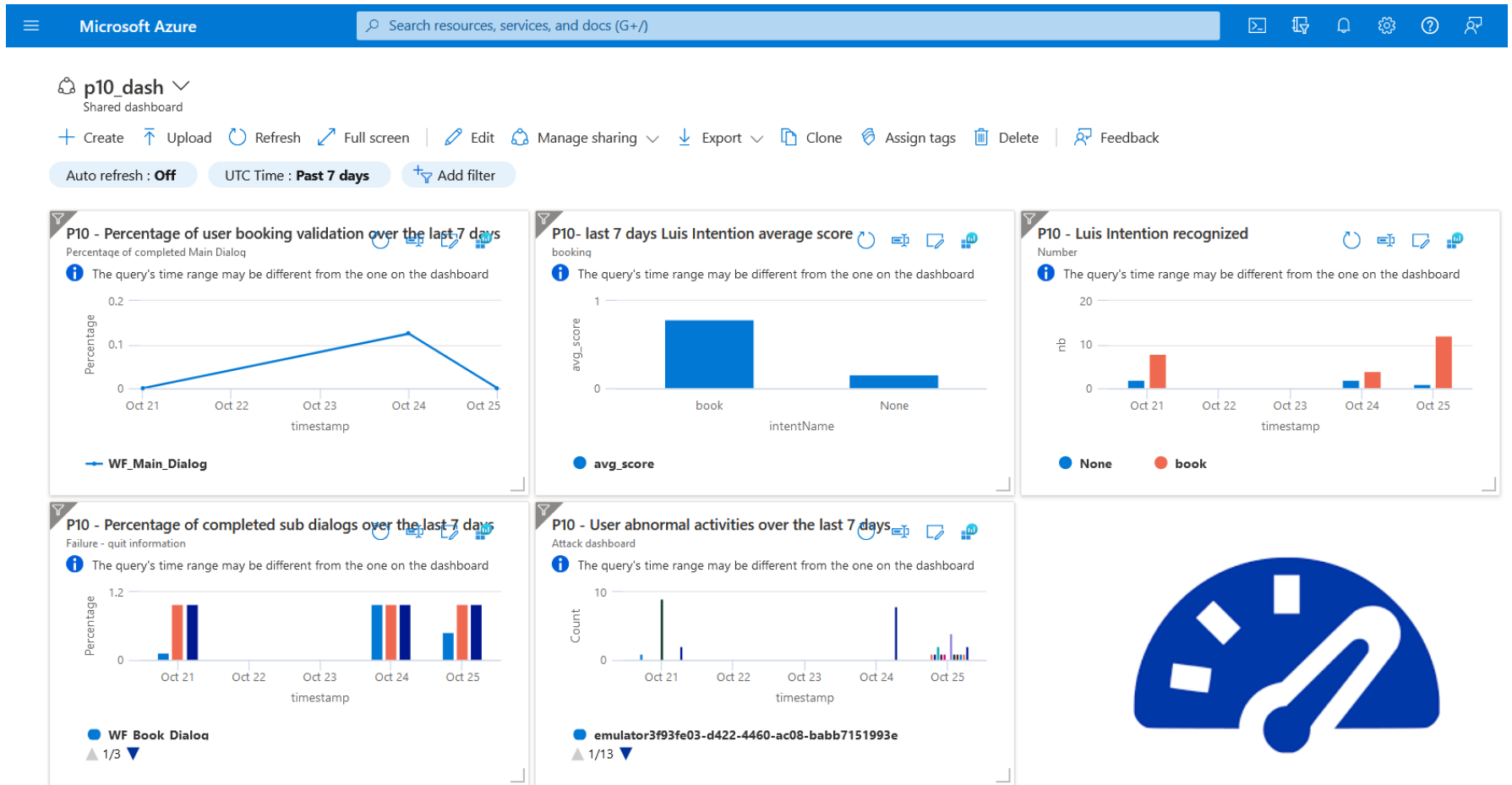
Summary

Alert name	P10_Book_none_intent_ratio_tresh_Warning
Severity	Sev2
Monitor condition	Fired
Affected resource	p10-appins
Resource type	microsoft.insights/components
Resource group	p10_appins_rg
Subscription	Paieement à l'utilisation



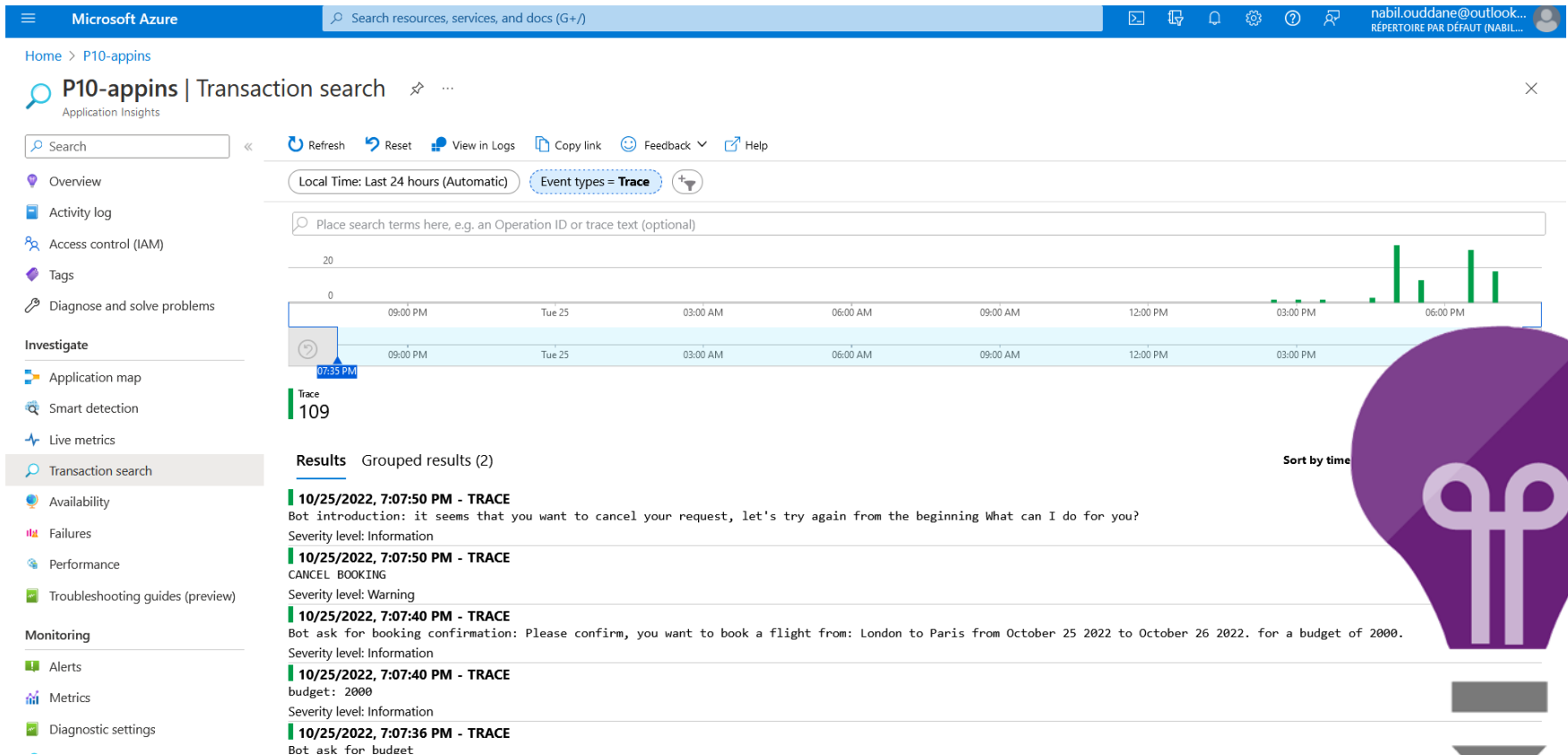
2-f: Creation d'un dashboard

- Suivi de plusieurs métriques importantes pour le modèle grâce aux requêtes KQL
- Possibilité de rajouter d'autres métriques si besoin



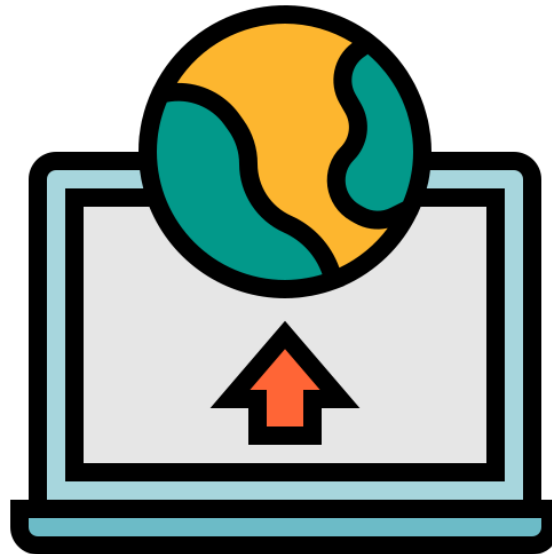
2-g: monitoring de log bespoke

- Export des logs vers app insights
- Plusieurs types de messages stockés dans la table TRACE: info / warning / error
 - Permettant une investigation plus fine sur les problèmes rencontrés

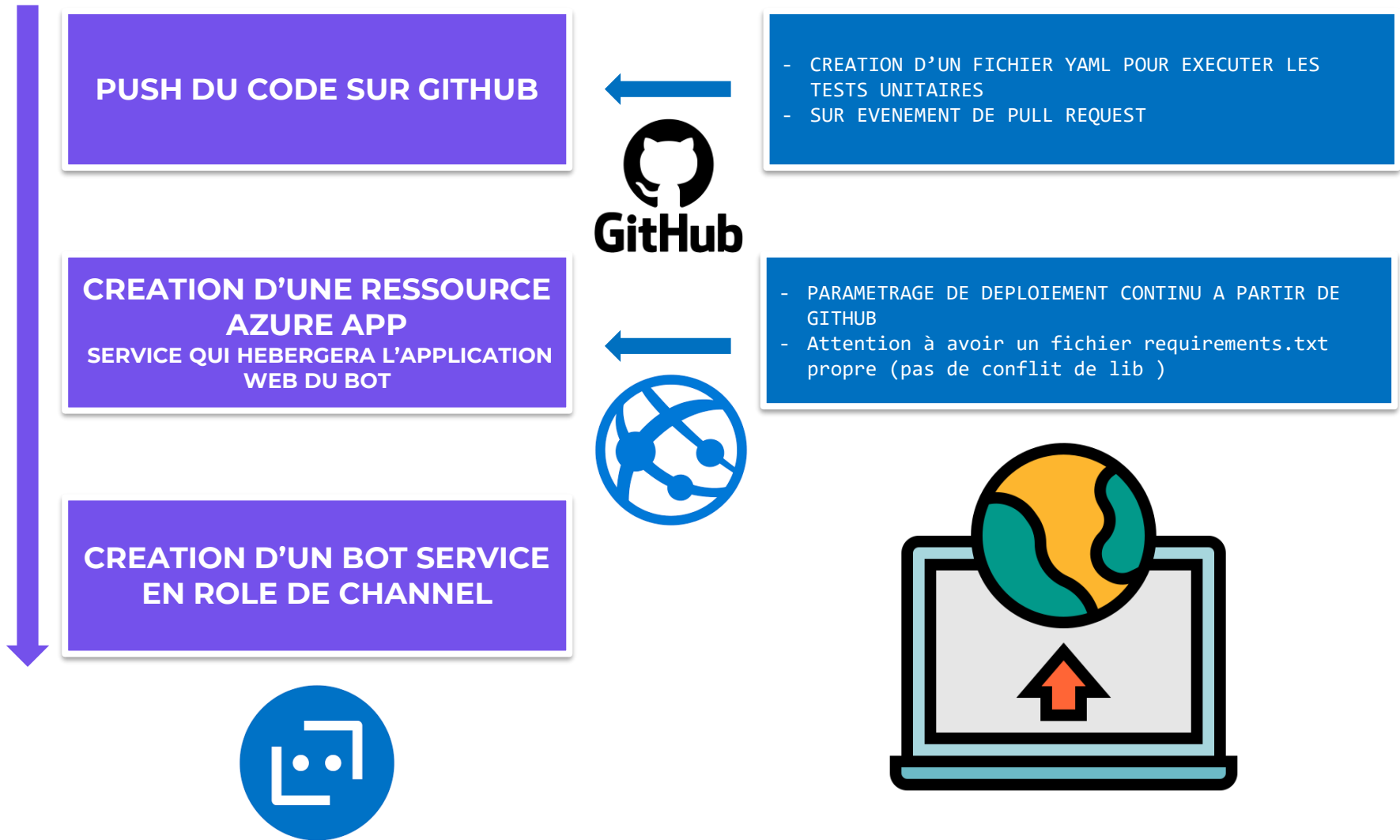


B

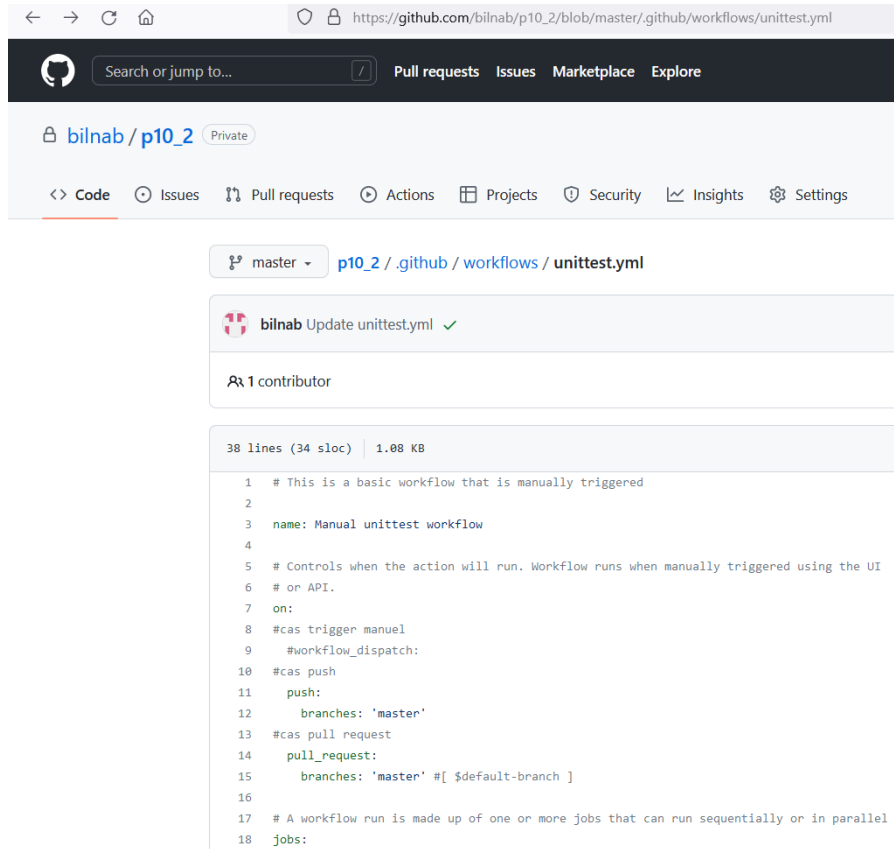
3- DÉPLOIEMENT DU BOT SUR AZURE



3 : Deploiement

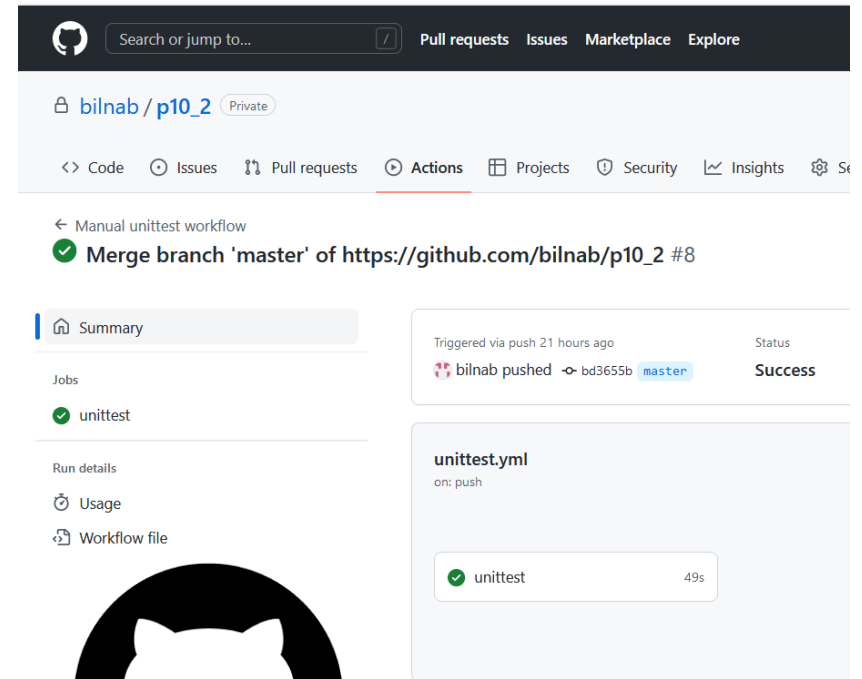


3-a: workflow github tests unitaires



The screenshot shows the GitHub repository page for `bilnab/p10_2`. The file `unittest.yml` is selected, showing its content. The workflow is named "Manual unittest workflow" and is triggered on a push to the `master` branch. The workflow file content is as follows:

```
1 # This is a basic workflow that is manually triggered
2
3 name: Manual unittest workflow
4
5 # Controls when the action will run. Workflow runs when manually triggered using the UI
6 # or API.
7 on:
8   #cas trigger manuel
9   #workflow_dispatch:
10  #cas push
11  push:
12    branches: 'master'
13  #cas pull request
14  pull_request:
15    branches: 'master' #[ $default-branch ]
16
17 # A workflow run is made up of one or more jobs that can run sequentially or in parallel
18 jobs:
```



The screenshot shows the GitHub Actions page for the `unittest` workflow. The workflow is triggered via a push to the `master` branch. The run details show a successful status with a duration of 49s.

Manual unittest workflow

✓ Merge branch 'master' of https://github.com/bilnab/p10_2 #8

Summary

Jobs

- ✓ unittest

Run details

- Usage
- Workflow file

Triggered via push 21 hours ago

bilnab pushed bd3655b master

Status: Success

unittest.yml

on: push

unittest 49s



3-a: workflow github tests unitaires: fichier YAML



```
# This is a basic workflow that is manually triggered

name: Manual unittest workflow

# Controls when the action will run. Workflow runs when manually triggered using the UI
# or API.
on:
  #cas trigger manuel
  #workflow_dispatch:
  #cas push
  push:
    branches: 'master'
  #cas pull request
  pull_request:
    branches: 'master' #[ $default-branch ]

# A workflow run is made up of one or more jobs that can run sequentially or in parallel
jobs:
  # This workflow contains a single job called "unittest"
  unittest:
    # The type of runner that the job will run on
    runs-on: ubuntu-latest

    # Steps represent a sequence of tasks that will be executed as part of the job
    steps:
      # Runs a single command using the runners shell
      - uses: actions/checkout@v3
      - name: Set up Python
        uses: actions/setup-python@v4
        with:
          python-version: '3.8'
      - name: Install dependencies
        run: |
          python -m pip install --upgrade pip
          pip install -r requirements.txt
      - name: Test with unittest
        run: |
          python -m unittest -v unittest/testunit.py
```

3-b: déploiement de azure web app service paramétrage github

Microsoft Azure

Home >

p10-wapp
App Service

Search

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Microsoft Defender for Cloud

Events (preview)

Essentials

Resource group (move) : [p10-wapp-rg](#)

Status : Running

Location : Central US

Subscription (move) : [Paielement à l'utilisation](#)

Subscription ID : 83d8ecaa-cbe4-4ae1-a829-d3a63be1315e

Tags (edit) : [Click here to add tags](#)

Microsoft Azure

Home > p10-wapp

p10-wapp | Deployment Center
App Service

Search

Save Discard Browse Manage publish profile Sync

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Microsoft Defender for Cloud

Events (preview)

Deployment

Quickstart

Deployment slots

Deployment Center

Settings

Configuration

Authentication

Application Insights

Identity

Backups

Custom domains

Settings

Logs

FTP credentials

Deploy and build code from your preferred source and build provider. [Learn more](#)

Source

GitHub

[Disconnect](#)

GitHub

Signed in as bilnab

Organization bilnab

Repository p10_2

Branch master

Build

Build provider GitHub Actions

Runtime stack Python

Version Python 3.8

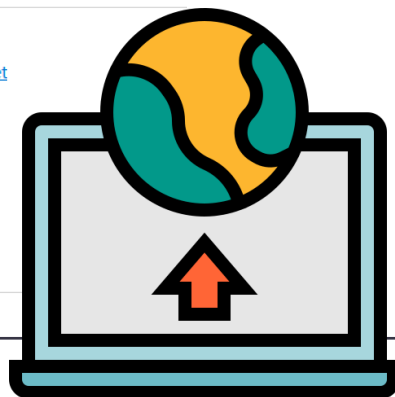
Reset publish profile Share to mobile Send us your feedback

URL : <https://p10-wapp.azurewebsites.net>

Health Check : [Not Configured](#)

App Service Plan : [ASP-p10wapprg-b304 \(B1: 1\)](#)

GitHub Project : https://github.com/bilnab/p10_2



3-b: deploiement de azure web app service

paramétrage de la startup commande

Microsoft Azure Search resources, services, and docs (G+/)

Home > p10-wapp

p10-wapp | Configuration ☆ ...

App Service

Search Refresh Save Discard Leave Feedback

Overview
Activity log
Access control (IAM)
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Diagnose and solve problems
Microsoft Defender for Cloud
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Settings
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Application settings General settings Path mappings

Stack settings

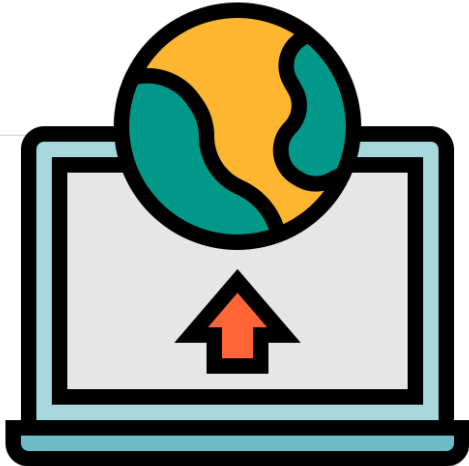
Stack Python
Major version Python 3
Minor version Python 3.8
Startup Command python3.8 -m aiohttp.web -H 0.0.0.0 - ...
Provide an optional startup command that will be run as part of container startup. [Learn more](#)

Platform settings

FTP state FTPS only
FTP based deployment can be disabled or configured to accept FTP (plain text) or FTPS (secure) connections. [Learn more](#)

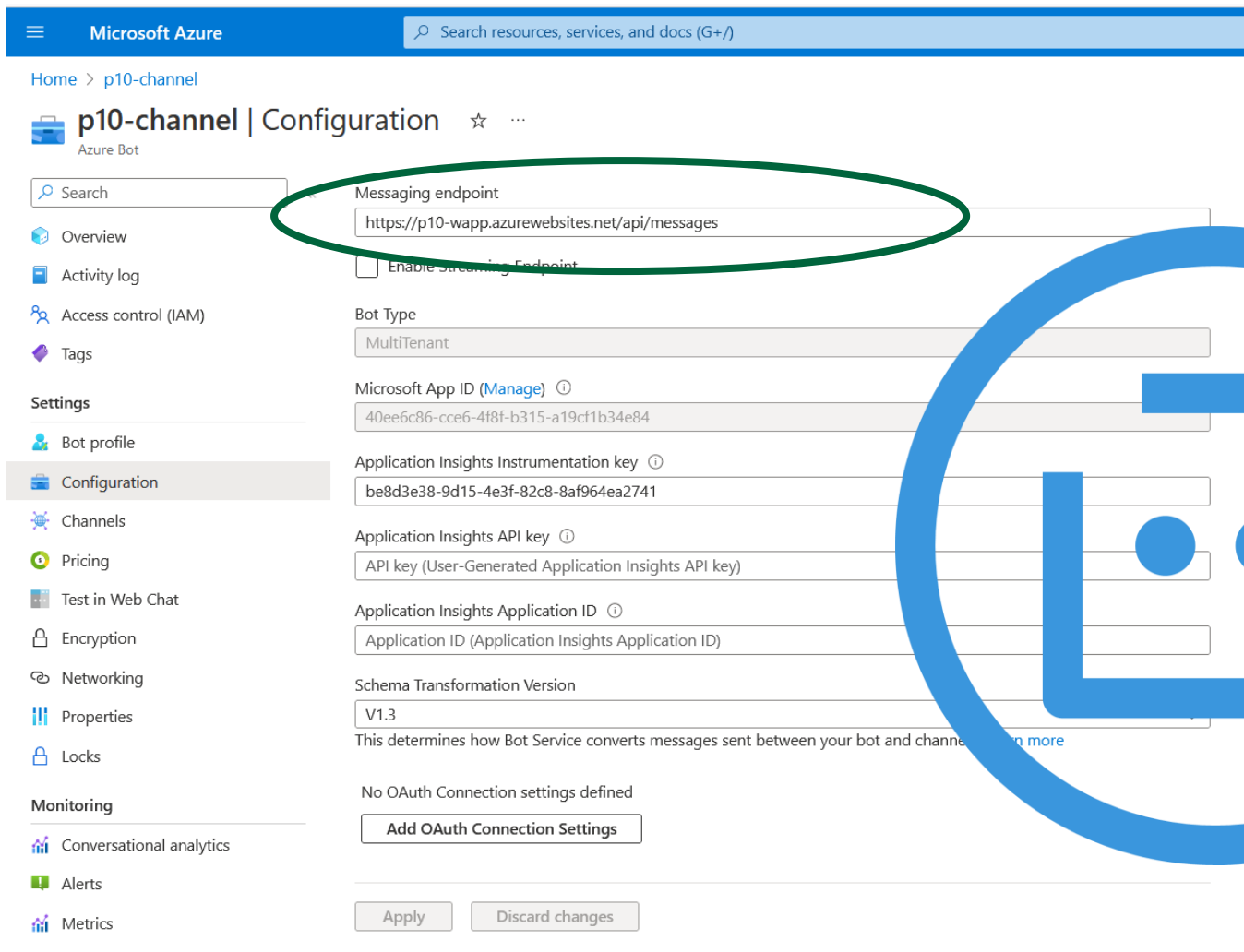
HTTP version 1.1

HTTP 2.0 Proxy On Off
When this setting is enabled, front end will forward HTTP 2.0 traffic to the worker enabling scenarios like gRPC.



3-c: azure bot service

parametrage du endpoint et des id/keys



Microsoft Azure

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Monitoring

Conversational analytics

Alerts

Metrics

Messaging endpoint

https://p10-wapp.azurewebsites.net/api/messages

☐ Enable Streaming Endpoint

Bot Type

MultiTenant

Microsoft App ID (Manage) ⓘ

40ee6c86-cce6-4f8f-b315-a19cf1b34e84

Application Insights Instrumentation key ⓘ

be8d3e38-9d15-4e3f-82c8-8af964ea2741

Application Insights API key ⓘ

API key (User-Generated Application Insights API key)

Application Insights Application ID ⓘ

Application ID (Application Insights Application ID)

Schema Transformation Version

V1.3

This determines how Bot Service converts messages sent between your bot and channel. [Learn more](#)

No OAuth Connection settings defined

[Add OAuth Connection Settings](#)

[Apply](#) [Discard changes](#)

3-c: azure bot service


web bot channel fonctionnel

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Test

🔄 Start over



Welcome to Bot FlyMe BOT

Our role is to help you to book your next trip

[Get an overview](#)

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[Learn how to deploy](#)

À l'instant

hello

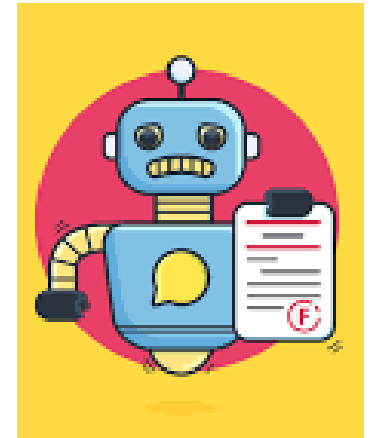
À l'instant

hello, I am flybot, how can I help you?

À l'instant

📎 Tapez votre message

➤





MODEL UPDATE

Savoir où on se trouve dans le cycle de vie



MODELE EN DEBUT DE VIE

- MVP : peu de fonctionnalités
 - Dialogues peu évolués
 - Peu mature
 - Peu de volumétrie
- De nombreux ajustements à faire

MODELE EN MILIEU DE VIE

- Mature
- Nécessite le développement de nouvelles fonctionnalités
- Nécessite des dialogues plus évolués
 - Volumétrie conséquente
- Peu d'ajustements à faire si on garde le même niveau de service

Modèle UPDATE: Cas du modèle en début de vie

