



# XMASDEV

<oh>oh</oh>

## PROTEGGERE IL LABORATORIO SEGRETO DI BABBO NATALE CON AZURE FACE SERVICE!

Massimo Bonanni

FAS - Frying Air Storyteller



## Platinum Sponsor



## Gold Sponsor



## Silver Sponsor



## Technical Sponsor



## Community

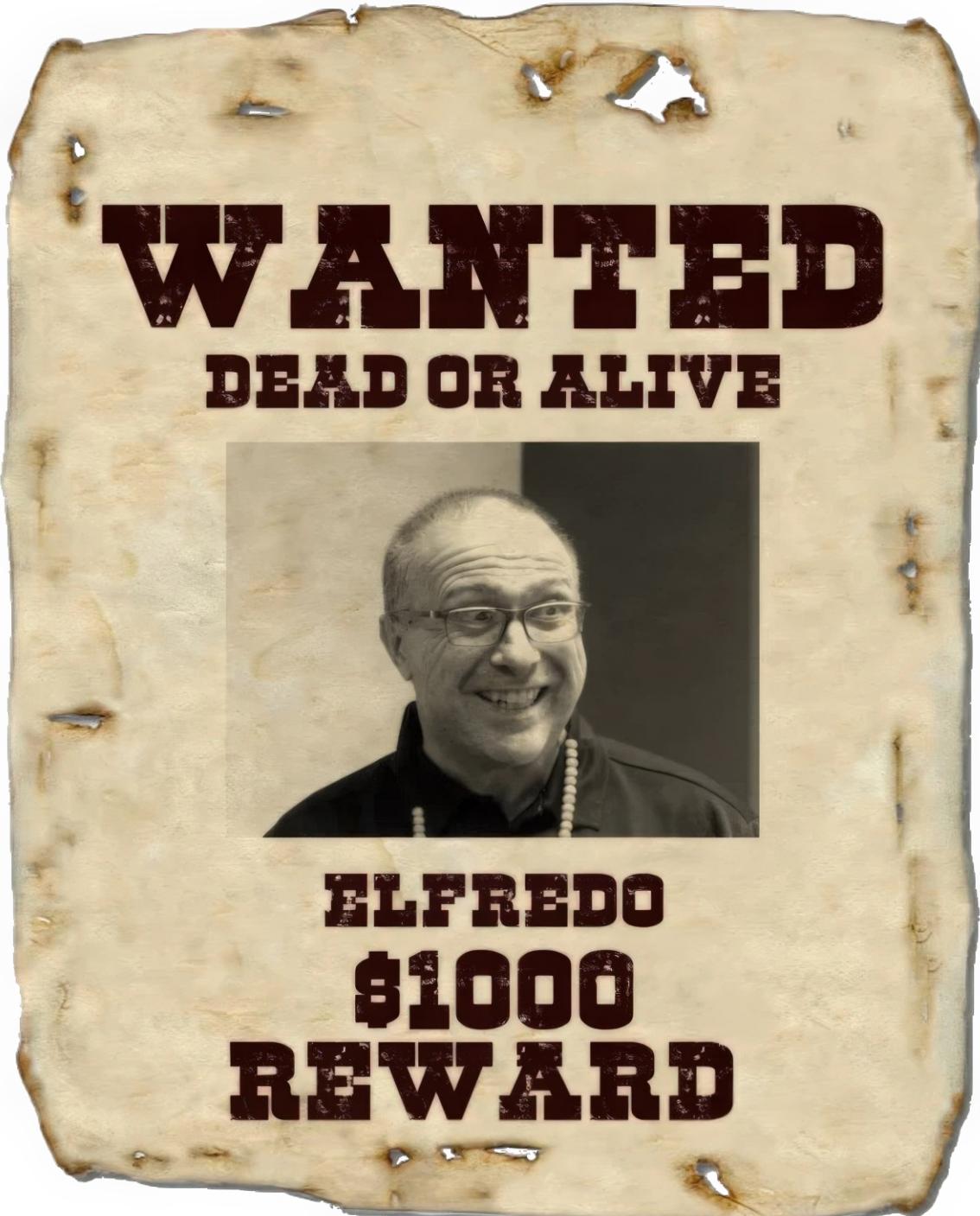






XMASDEV

<OH>OH</OH>





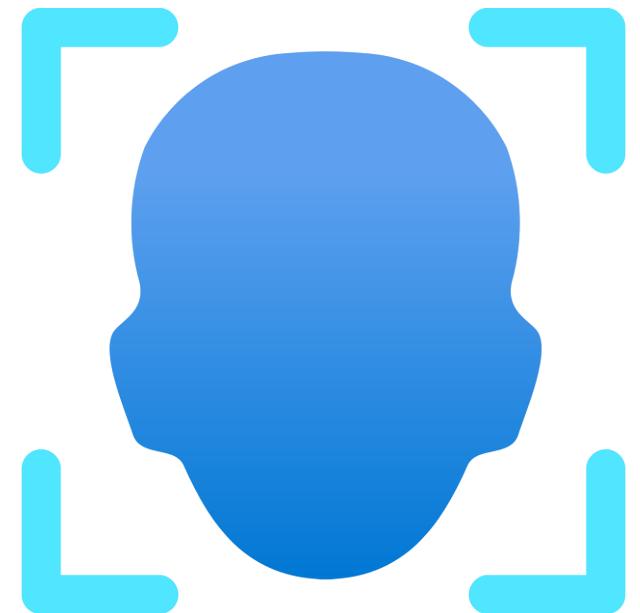
# WHAT IS SANTA CLAUS LOOKING FOR?

- **Face Recognition:** High accuracy, real-time verification, varied conditions.
- **Access Zones:** Define multiple zones/environments.
- **User Management:** Add/edit/remove users, secure storage.
- **Security and Compliance:** Data encryption, compliance, data residency.



## WHAT IS THE AZURE AI FACE SERVICE?

- The **Azure AI Face** service provides **AI algorithms** that **detect**, **recognize**, and **analyze** human faces in images.
- You can use the Face service through a client library **SDK** or by calling the **REST API** directly.





XMASDEV  
<OH>OH</OH>



# FACE DETECTION AND ANALYSIS

- The Detect API detects **human faces** in an image and returns the **rectangle coordinates** of their locations.
- It also returns a **Face ID** that represents the stored face data (called **temporary faces**).
- The Face ID will be invalidated (and the image removed) after a period of time.
- It can extract a set of **face-related attributes**, such as head pose, age, emotion, facial hair, and glasses.

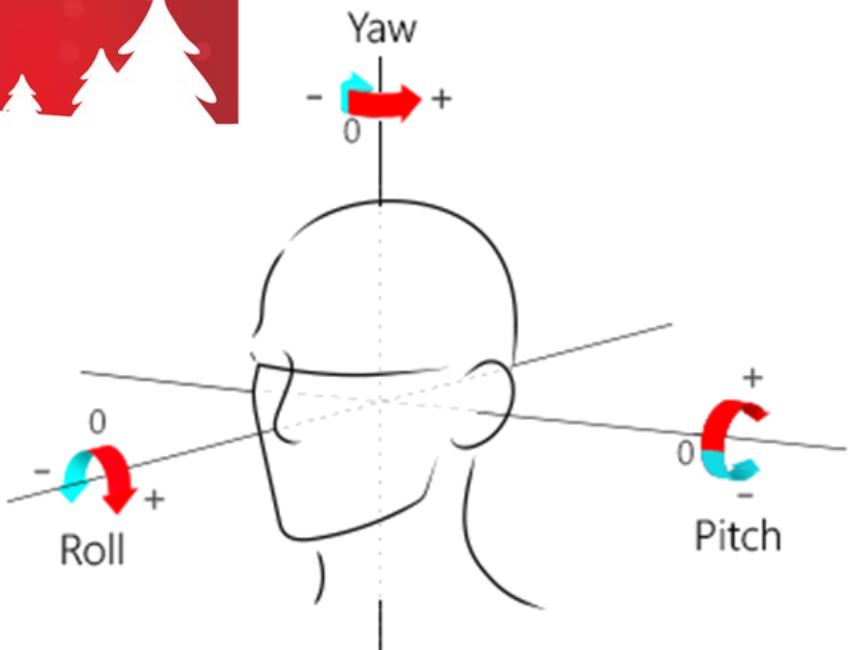
efe62efe-a852-4925-86d4-d329a009cb39



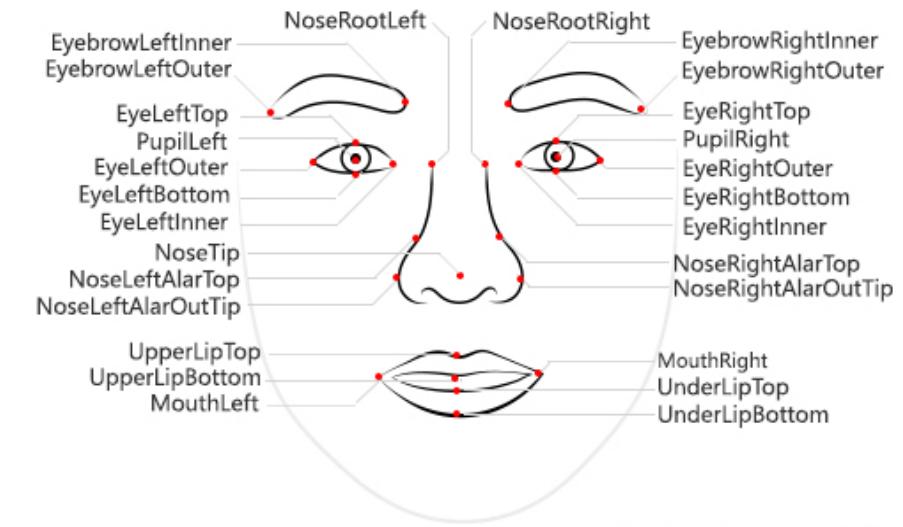


# FACE DETECTION, ATTRIBUTES, AND INPUT DATA

- **Face landmarks** are a set of easy-to-find points on a face, such as the pupils or the tip of the nose. By default, there are 27 predefined landmark points.



Copyright (c) Microsoft. All rights reserved



Copyright (c) Microsoft. All rights reserved

- **Attributes** are a set of features that can optionally be detected by the Detect API: Accessories, Blur, Exposure, Glasses, Head pose, Mask, Noise, Occlusion, QualityForRecognition
- The supported image formats are JPEG, PNG, GIF (the first frame), BMP, image file size should be no larger than 6 MB



# FACE RECOGNITION

**Face recognition** is the process of verifying or identifying individuals by their faces.

## Identification

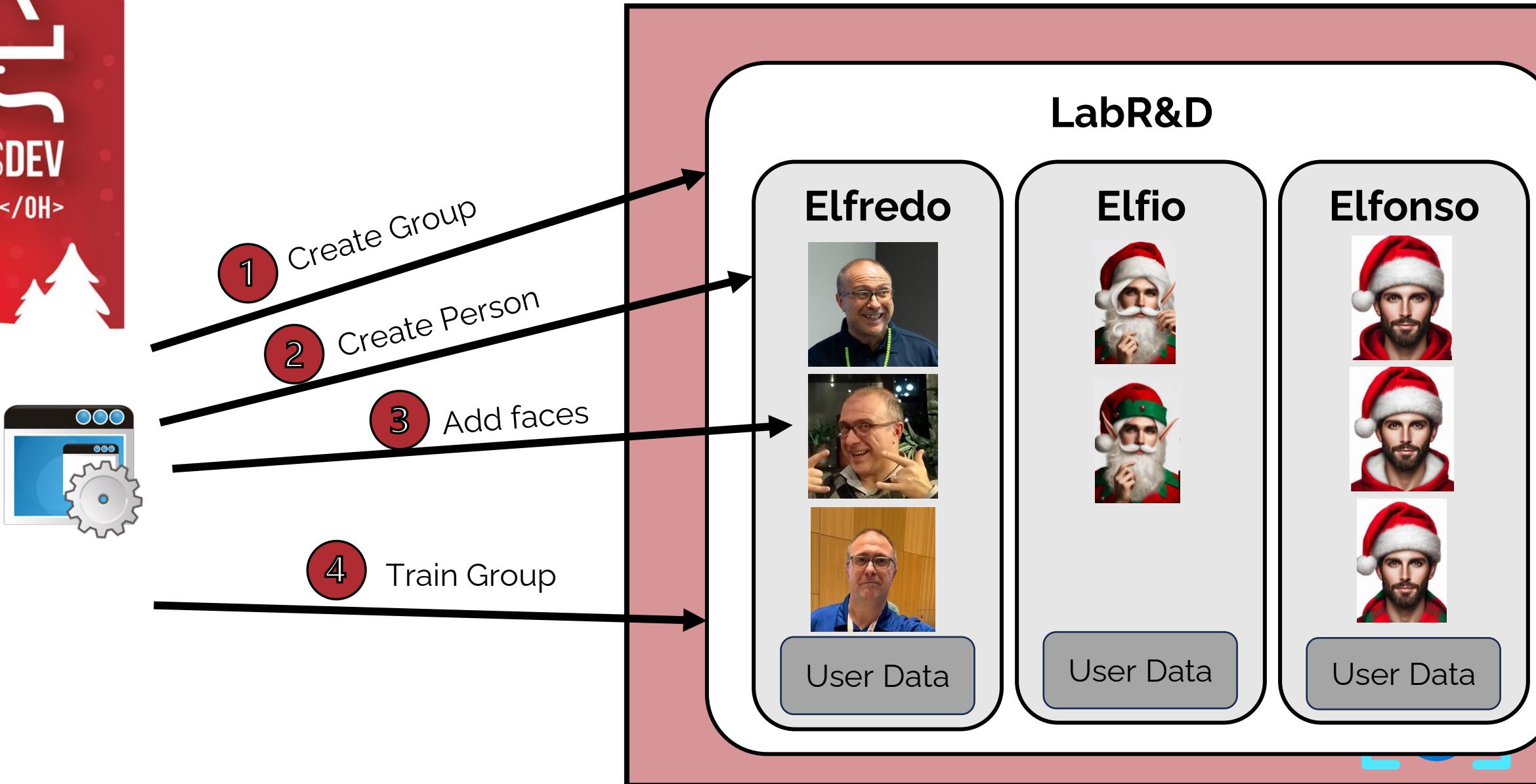
- The Identify operation takes one or several source face IDs and a PersonGroup or LargePersonGroup.
- It returns a list of the Person objects that each source face might belong to.
- Returned Person objects are wrapped as Candidate objects, which have a prediction confidence value.

## Verification

- The Verify operation takes a single face ID and a Person object.
- It determines whether the face belongs to that same person.
- Verification is one-to-one matching and can be used as a final check on the results from the Identify API call.

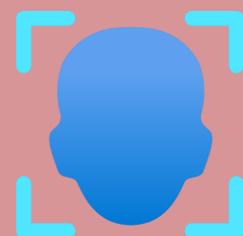
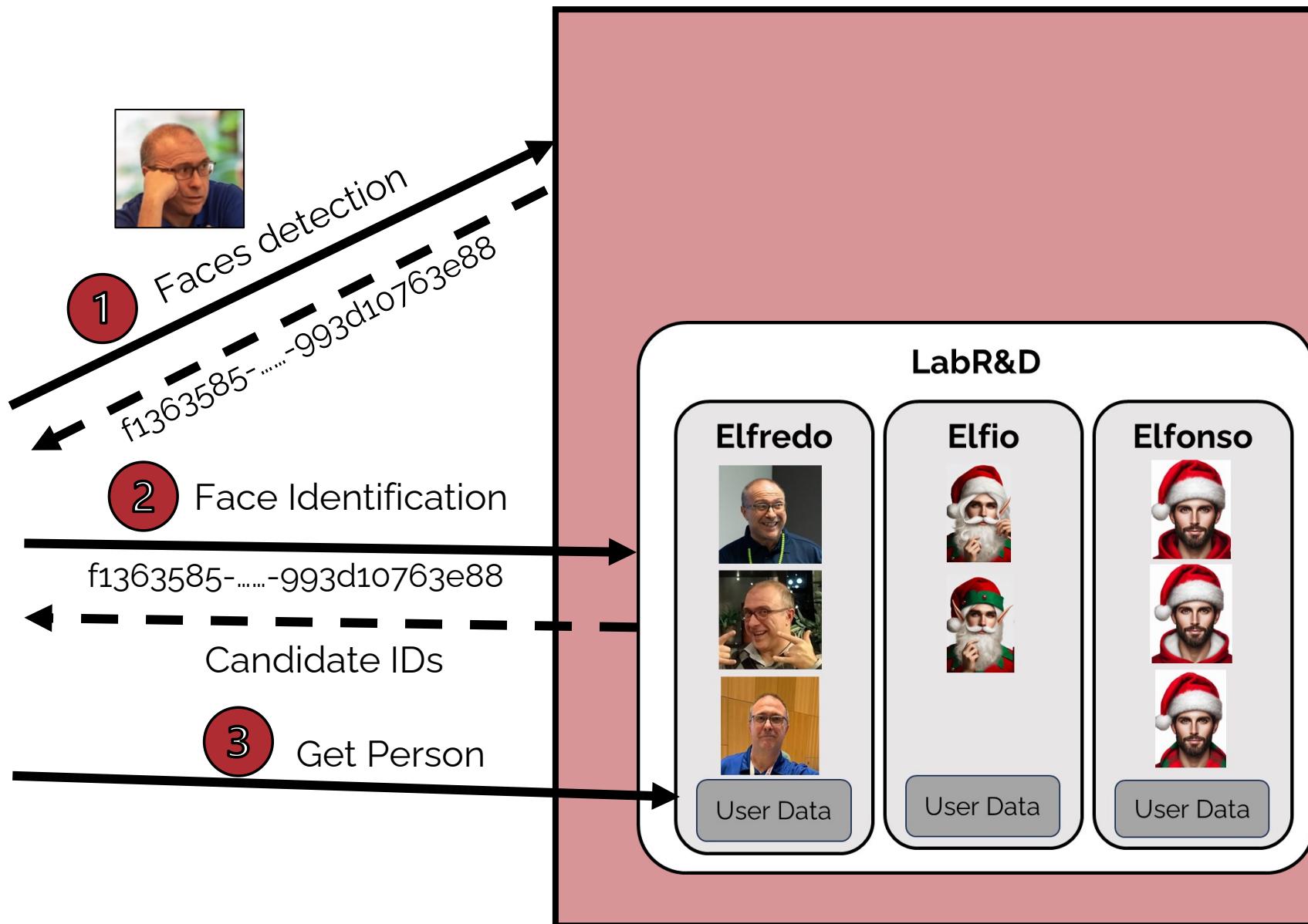


# RECOGNITION WORKFLOW – DEFINE FACES KNOWLEDGE BASE





# RECOGNITION WORKFLOW – IDENTIFY PERSONS





# FACE DETECTION AND RECOGNITION MODELS

The Face service uses two different sets of machine learning models to perform operations on human faces in images.

## Detection Models

- Detects faces in an image
- 3 models available

Model	Description	Performance notes	Landmarks
detection_01	Default choice for all face detection operations.	Not optimized for small, side-view, or blurry faces.	Returns face landmarks if they're specified in the detect call.
detection_02	Released in May 2019 and available optionally in all face detection operations.	Improved accuracy on small, side-view, and blurry faces.	Doesn't return face landmarks.
detection_03	Released in February 2021 and available optionally in all face detection operations.	Further improved accuracy, including on smaller faces (64x64 pixels) and rotated face orientations.	Returns face landmarks if they're specified in the detect call.

## Recognition Models

- Compares faces
- 4 models available:  
recognition\_01 (2017),  
recognition\_02 (2019),  
recognition\_03 (2020),  
recognition\_04 (2021)
- Use the latest one



XMASDEV

<oh>oh</oh>

**DEMO**  
**FACEIT**

**FACIAL ACCESS CONTROL & ENVIRONMENTAL IDENTITY TECHNOLOGY**



XMASDEV  
<OH>OH</OH>

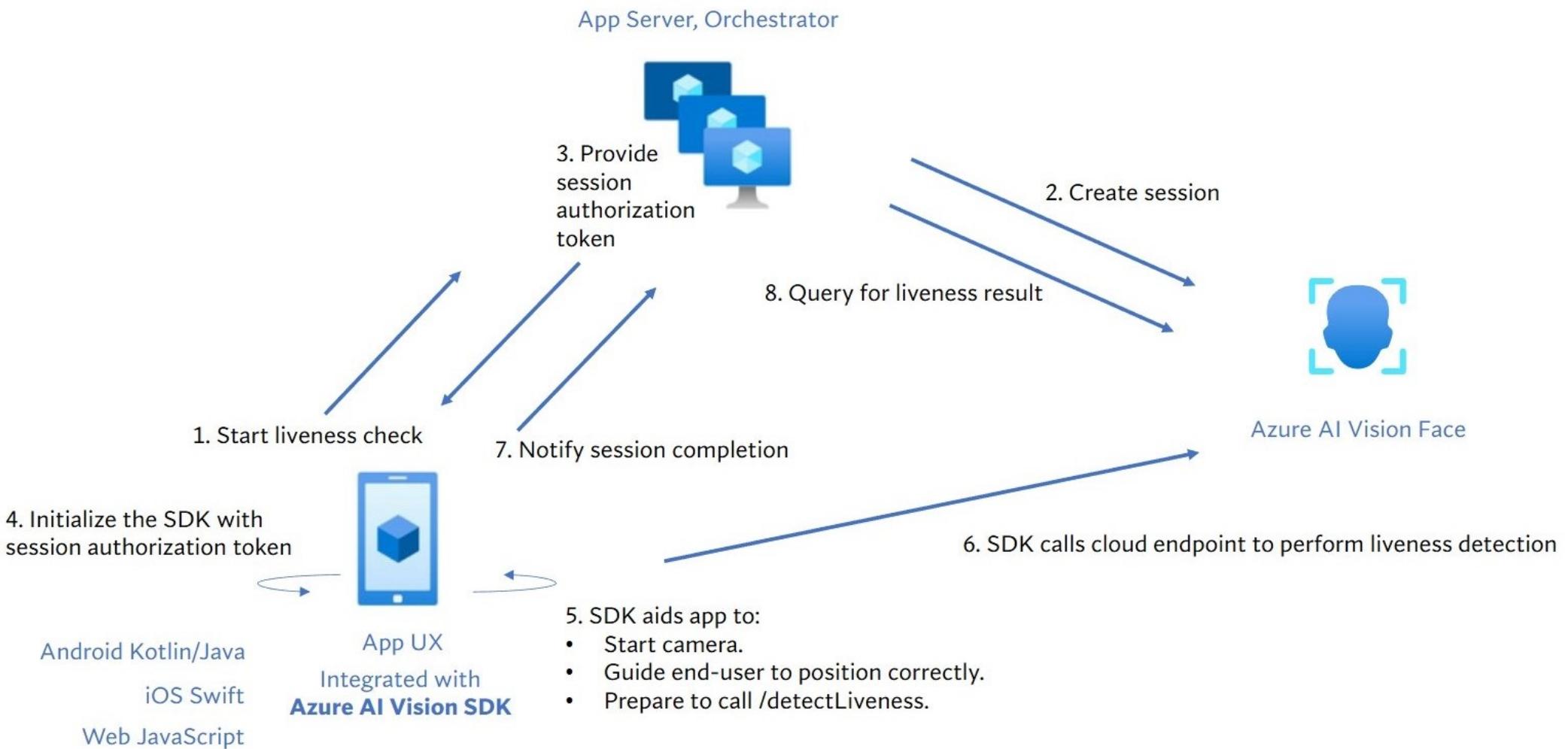
## LIVENESS DETECTION

- Face Liveness detection can be used to determine if a face in an input video stream is real (live) or fake (spoof).
- The goal of liveness detection is to ensure that the system is interacting with a physically present live person at the time of authentication.
- Liveness detection solution meets **iBeta Level 1 and 2 ISO/IEC 30107-3** compliance.





# PERFORM LIVENESS DETECTION





XMASDEV

- Face service can be managed using Policy.
- Certifications: ISO 27001, 27018, 27017, 27701, 9001, 22301 and other.

# SECURITY, COMPLIANCE AND DATA RESIDENCY



- Customer managed encryption keys are available.
- Face service supports VNET.
- Face service supports Azure Active Directory (Azure AD) authentication.
- No images sent to the Face service are stored after analysis.
- Only info to detect image are stored.
- Data are stored in the service region.



# PRICING

Instance	Transactions Per Second (TPS) *	Features	Price
Free - Web	20 transactions per minute	Face Detection Face Verification Face Identification Face Grouping Similar Face Search	30,000 transactions free per month
Standard - Web	10 TPS	Face Detection Face Verification Face Identification Face Grouping Similar Face Search	0-1M transactions - <b>€0.955</b> per 1,000 transactions 1-5M transactions - <b>€0.764</b> per 1,000 transactions 5-100M transactions - <b>€0.573</b> per 1,000 transactions 100M+ transactions - <b>€0.382</b> per 1,000 transactions
		Face Storage	<b>€0.010</b> per 1,000 faces per month
		Face Liveness	<b>€14.311</b> per 1,000 transactions per month
		Face Liveness + Verification	<b>€14.788</b> per 1,000 transactions per month



Now, finally, the  
children's gifts are  
safe

... maybe!!





# Thanks for your attention!!!!



## Massimo Bonanni

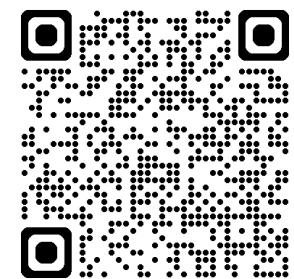
Microsoft Technical Trainer

[massimo.bonanni@microsoft.com](mailto:massimo.bonanni@microsoft.com)  
[@massimobonanni](https://twitter.com/massimobonanni)



## Azure Cookbook

Essential recipes for cloud automation and  
secure cloud solutions





## REFERENCES

- [What is the Azure AI Face service? - Azure AI services](#)
- [Are You Alive: Enhancing Azure AI Vision Face API with Liveness Detection](#)
- [Fundamentals of Facial Recognition - Training](#)
- [massimobonanni/FACEIT: FACEIT \(Facial Access Control & Environmental Identity Technology\)](#)

