# Face It

## How Azure Face Service can help you recognize and identify faces

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# What is the Azure Face service?

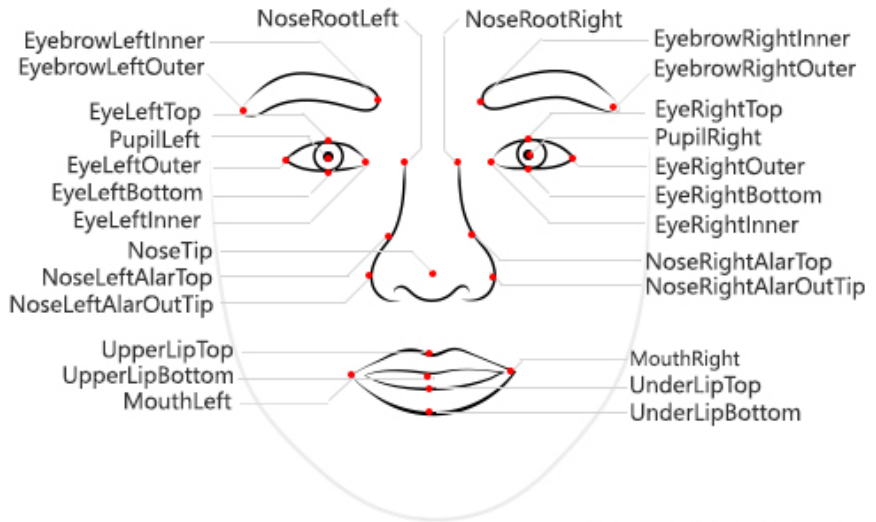
- The **Azure Face Service** provides **AI algorithms** that **detect**, **recognize**, and **analyze** human faces in images.
- You can use the Face Service through a client library **SDK** or by calling the **REST API** directly.

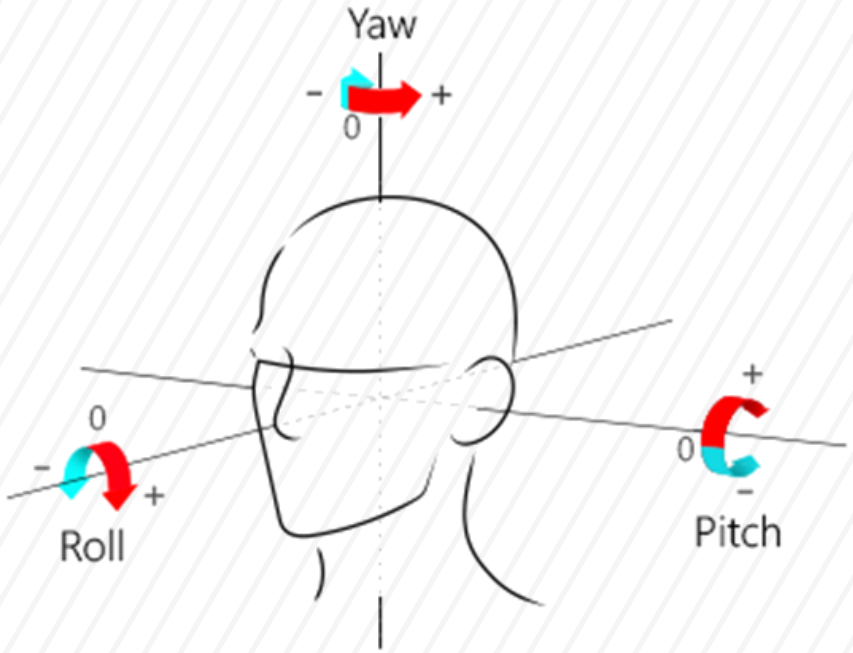
# Face Detection and Analysis

- 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.
- It can extract a set of **face-related attributes**, such as head pose, age, emotion, facial hair, and glasses.

# 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.




- **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.

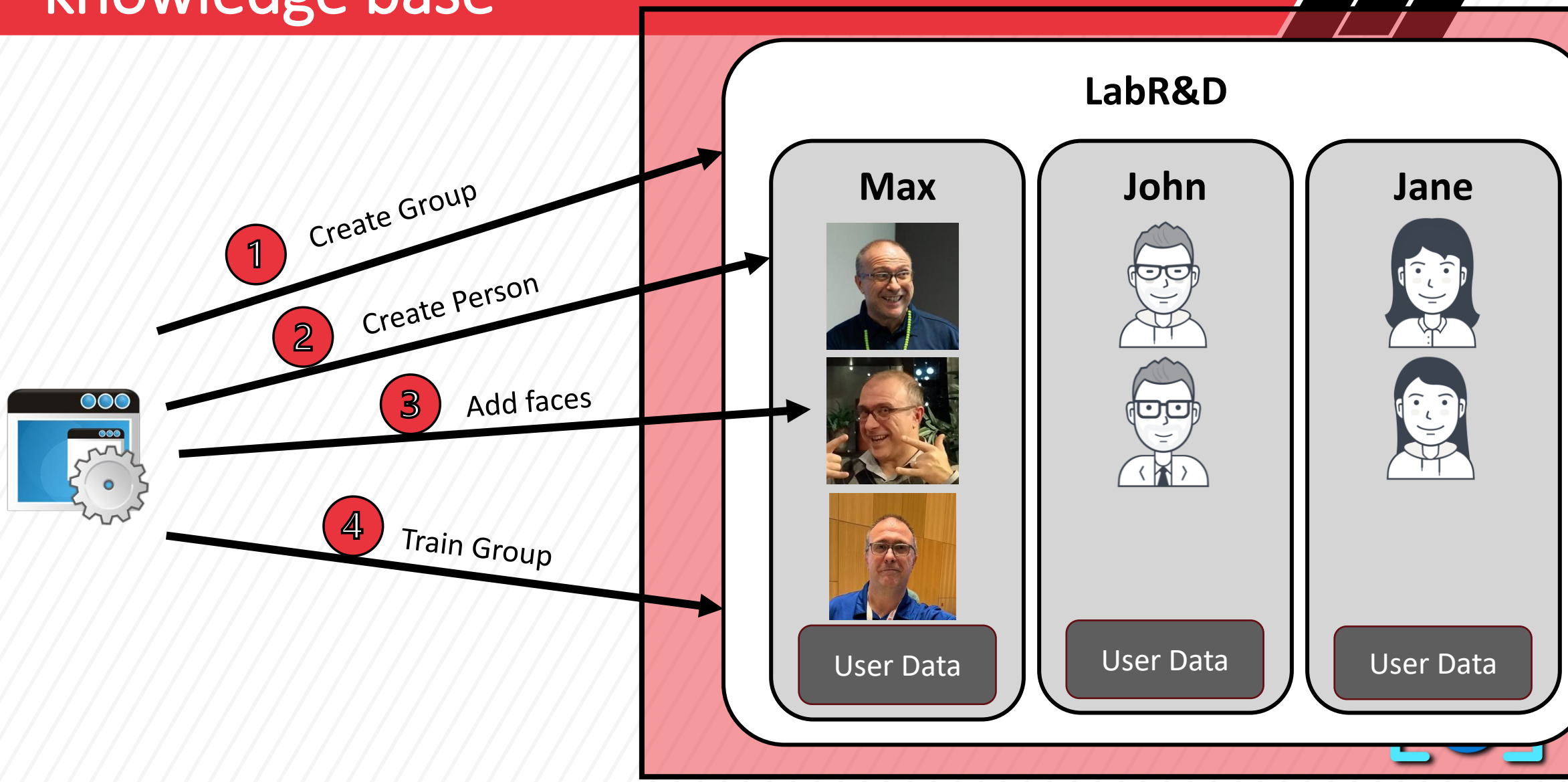
## Identification

- 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

1 Faces detection

f1363585-……-993d10763e88

2 Face Identification

f1363585-……-993d10763e88

Candidate IDs

3 Get Person

LabR&D

Max

John

Jane

User Data

User Data

User Data

# 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. |

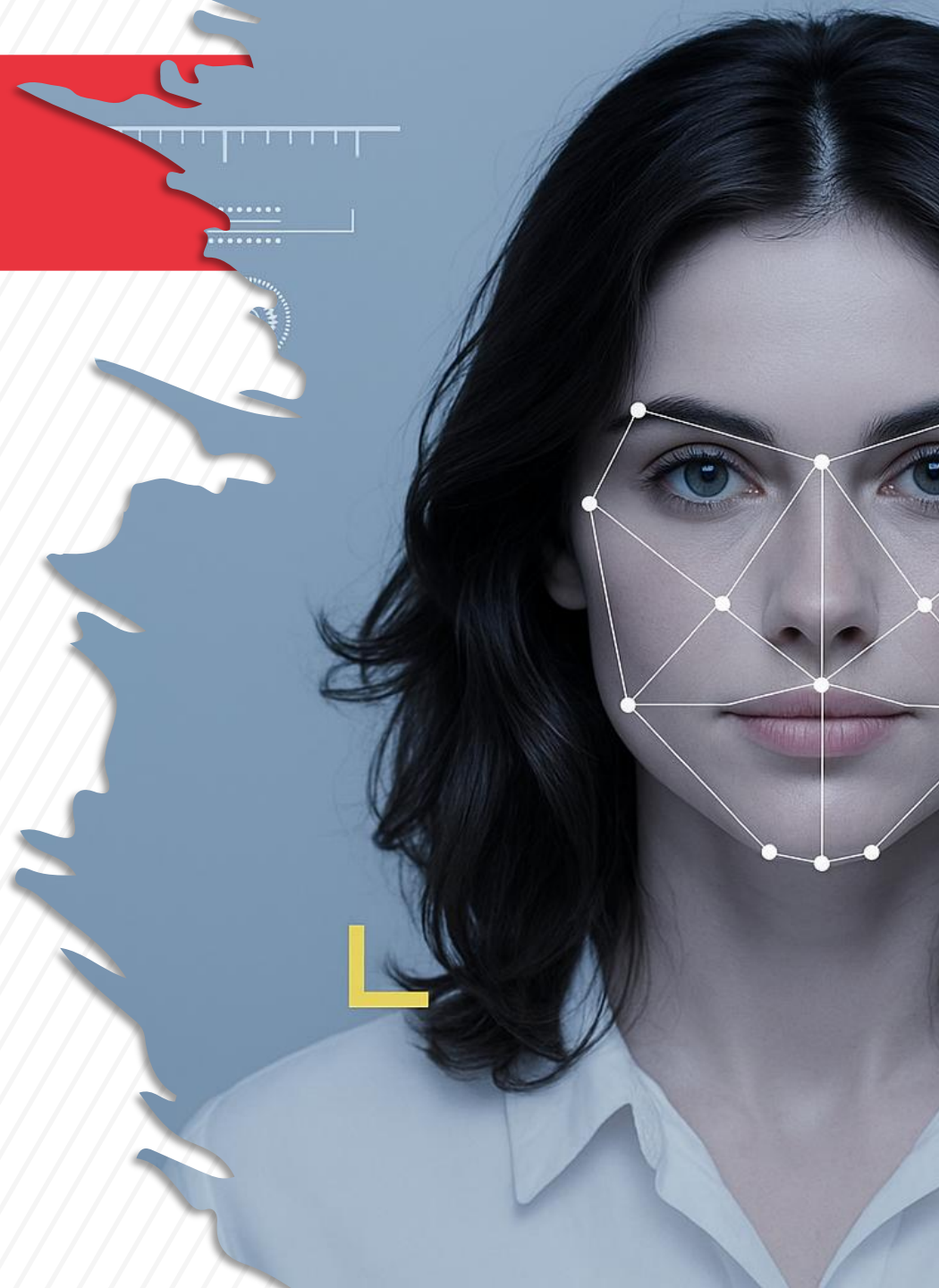
## Recognition Models

- Compares faces
- 4 models available: recognition_01 (2017), recognition_02 (2019), recognition_03 (2020), recognition_04 (2021)
- Use the latest one

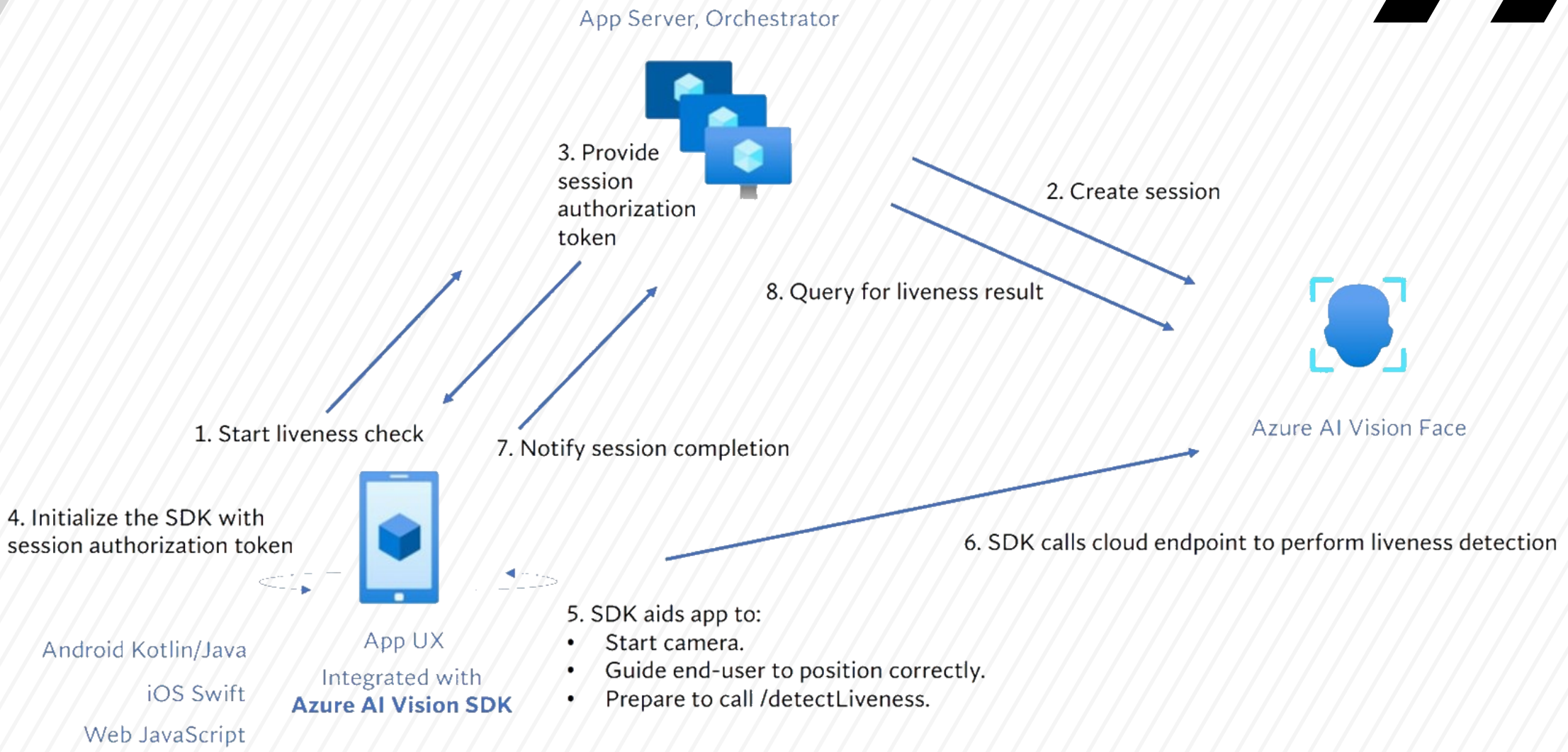
# DEMO

# Liveness detection

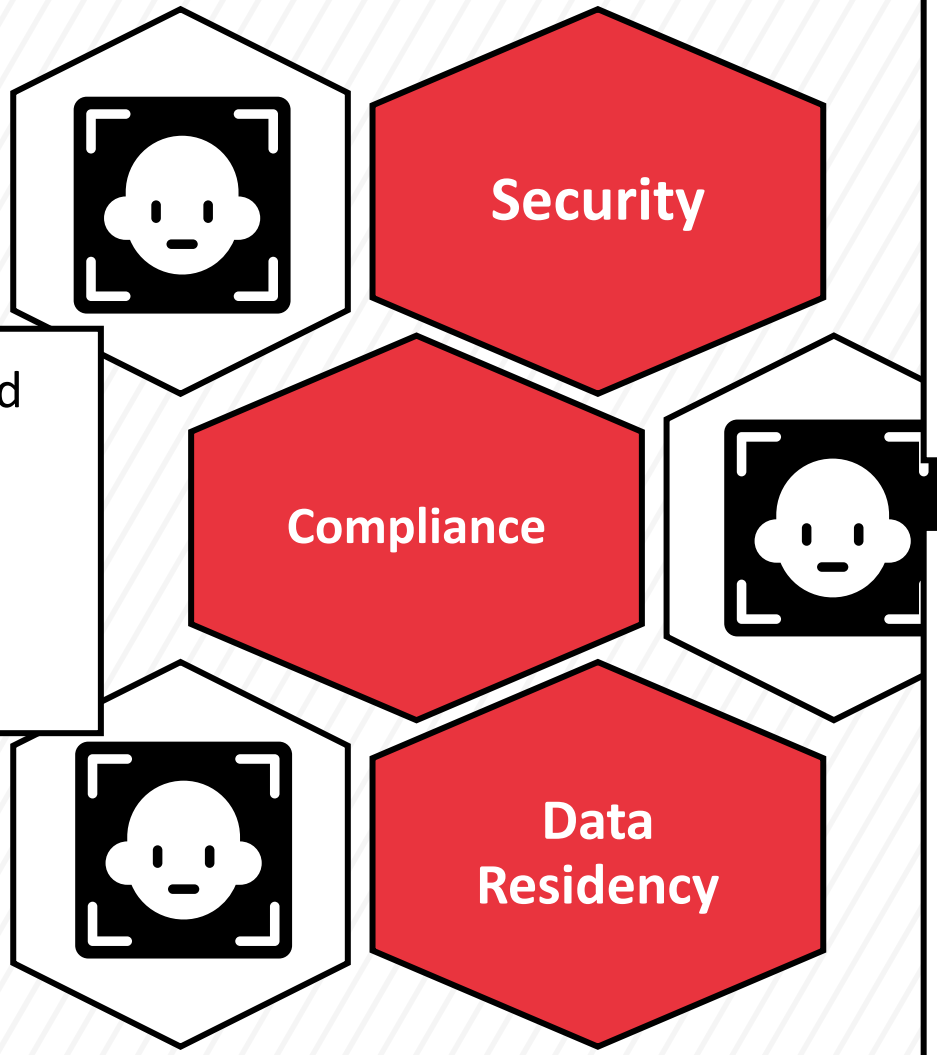
- Face Liveness detection can be used to determine if a face in an input video stream is real (live) or fake (spoof).
- The goal of liveness detection is to ensure that the system is interacting with a physically present live person at the time of authentication.
- Liveness detection solution meets **iBeta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



# Perform liveness detection



# Security, compliance and Data Residency




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

- Customer managed encryption keys are available.
- Face Service supports VNET integration.
- Face Service supports RBAC or Keys to provide access.

- No images sent to the Face Service are stored after analysis.
- Only info to detect image are stored.
- Data are stored in the same service region.

# Pricing

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



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# Any Questions?

# 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
- Understanding Azure Face Service - iEngage 2.0
- massimobonanni/FACEIT: FACEIT (Facial Access Control & Environmental Identity Technology)


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