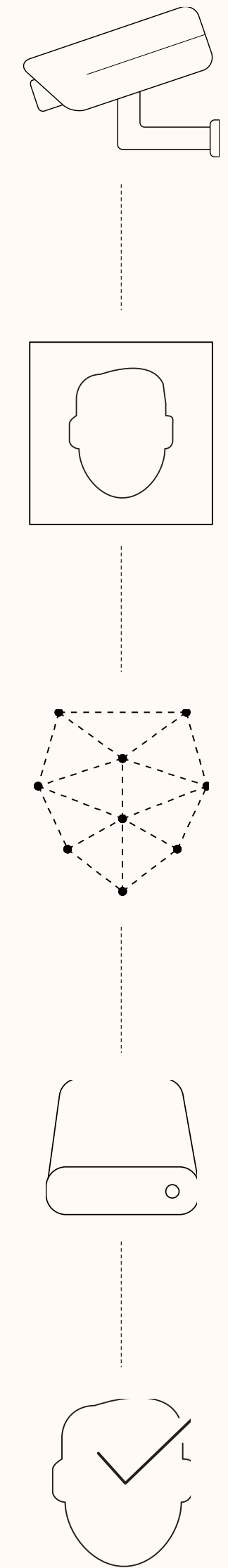
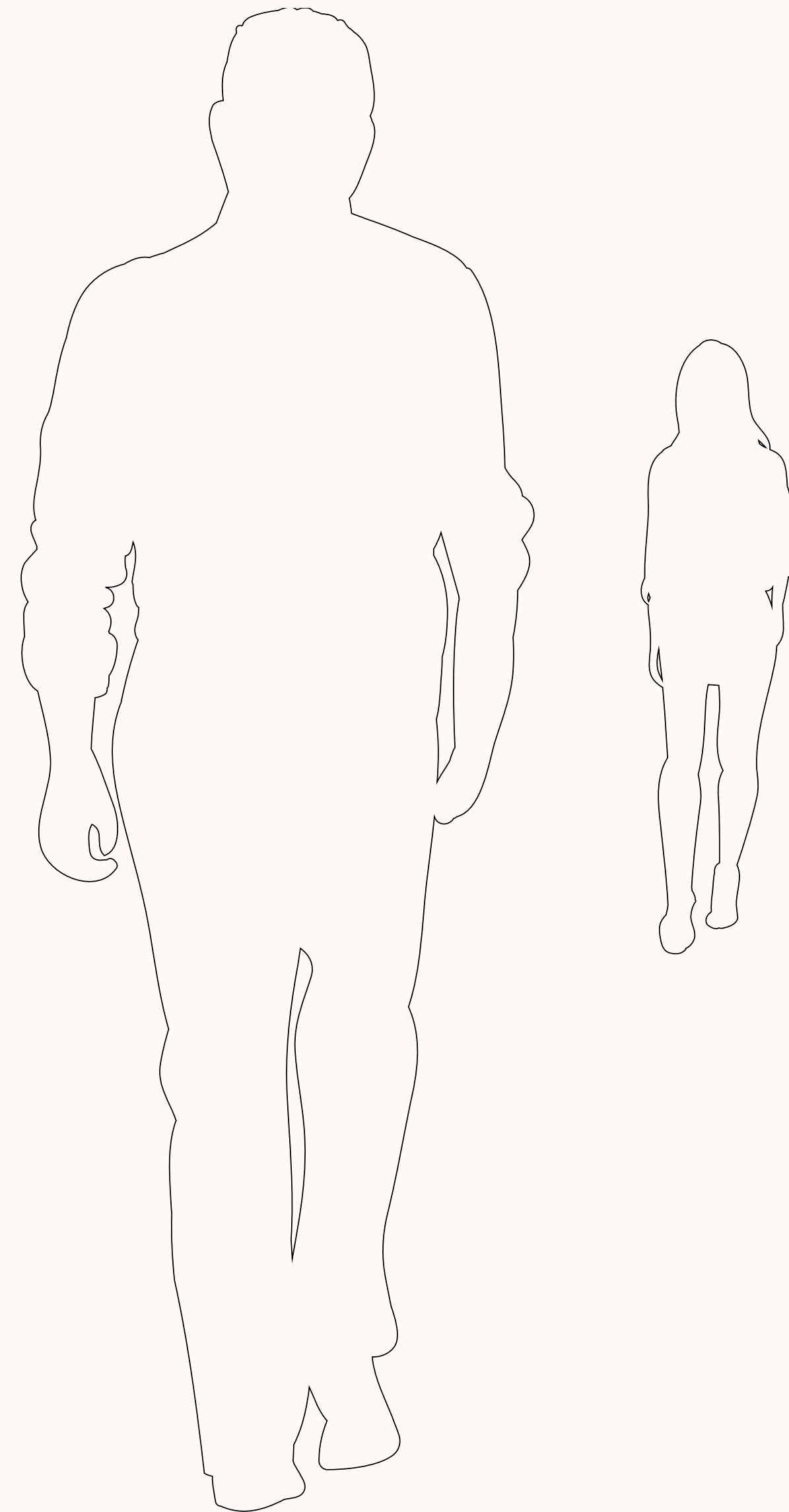


S **A** **F** **R**™
from *realnetworks*.

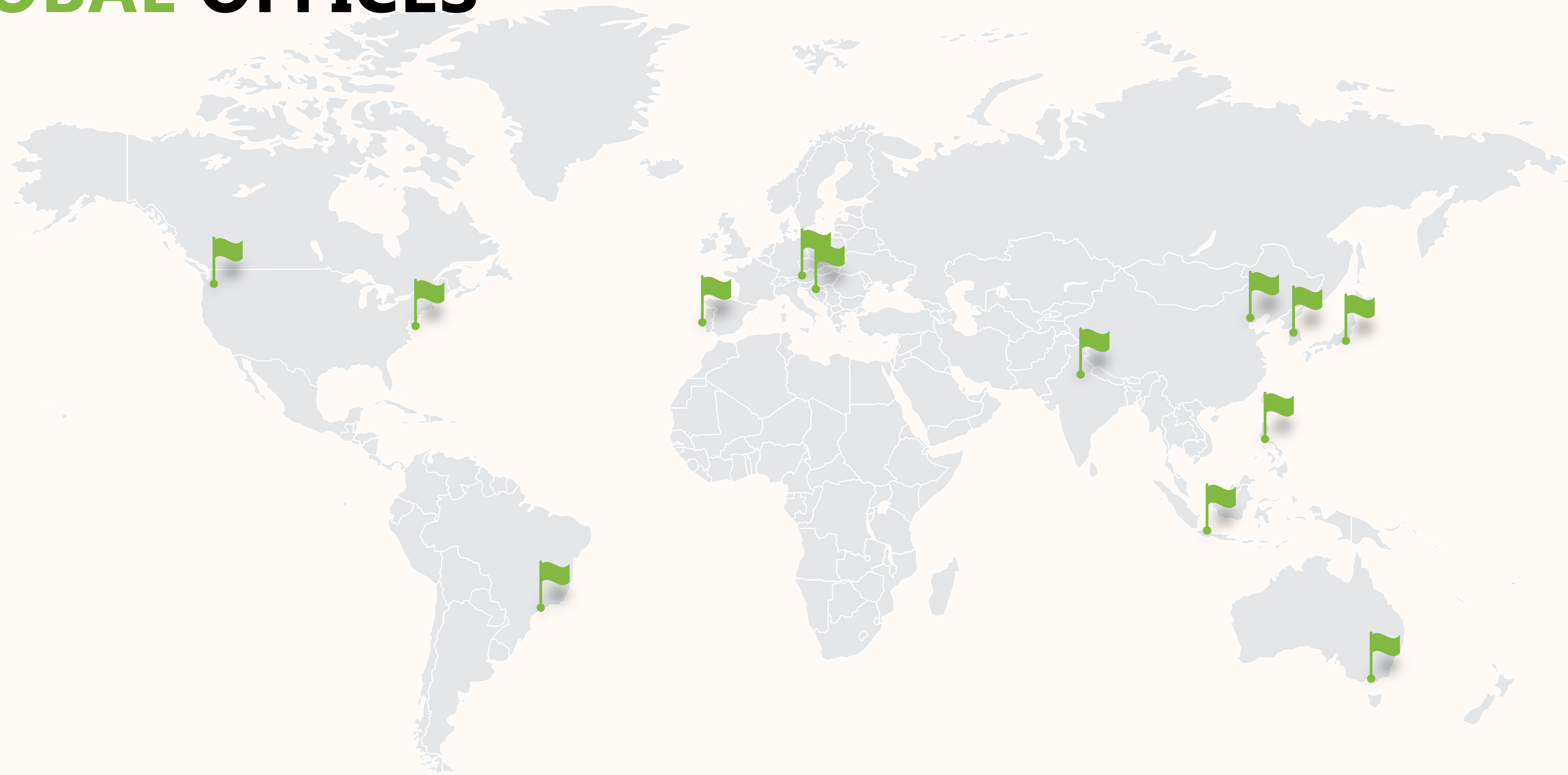
FACIAL RECOGNITION PLATFORM



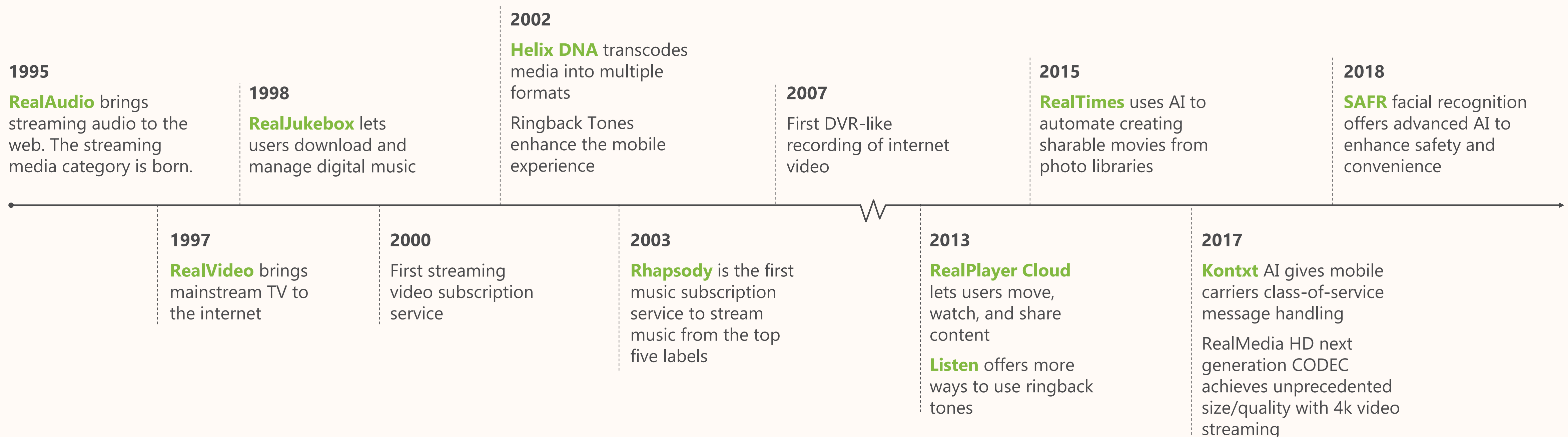
from *realnetworks*.

SAFR is from RealNetworks®, a global company with a near 25-year legacy of innovation in digital media, video compression, rich metadata, and solutions that intelligently scale on massive distributed networks across diverse topologies. This deep experience augmented by the latest AI research has enabled the framework for the SAFR facial recognition platform.

GLOBAL OFFICES



A LEGACY OF INNOVATION



THE SAFR PLATFORM

SECURE, ACCURATE FACIAL RECOGNITION

The SAFR Platform is a highly accurate, machine learning facial recognition platform distinguished from other solutions by its accuracy and performance while recognizing faces in motion, in live video, unconstrained, occluded, in low light, or otherwise camera unaware.

WHY SAFR?

Facial recognition for the real world.

ACCURACY

Dependable accuracy and performance are central to any viable recognition solution.

Latency, false positives, and questionable results render a system unusable.

PERFORMANCE

The SAFR Platform is architected to distribute the workload in a more cost-efficient way. The hard work of image processing is supported by edgware that processes video streams closer to the source, which greatly reduces overhead and bandwidth requirements.

FLEXIBILITY

SAFR can be installed on macOS, Windows, or Linux and can be deployed on premises, in the SAFR cloud, or in your cloud.

BEST IN CLASS ACCURACY FOR WILD FACES



99.8%

LFW Faces

University of MA 2017

NIST

0.048

Wild Faces FNMR*

National Institute of Standards and Technology 2018

*The NIST Wild Faces FNMR (False Non Match Rate) score of 0.048 found that the SAFR algorithm correctly recognized a camera unaware individual from an imperfect image in 95.2% of cases while perfectly differentiating a population of 10,000 people.

WILD FACES

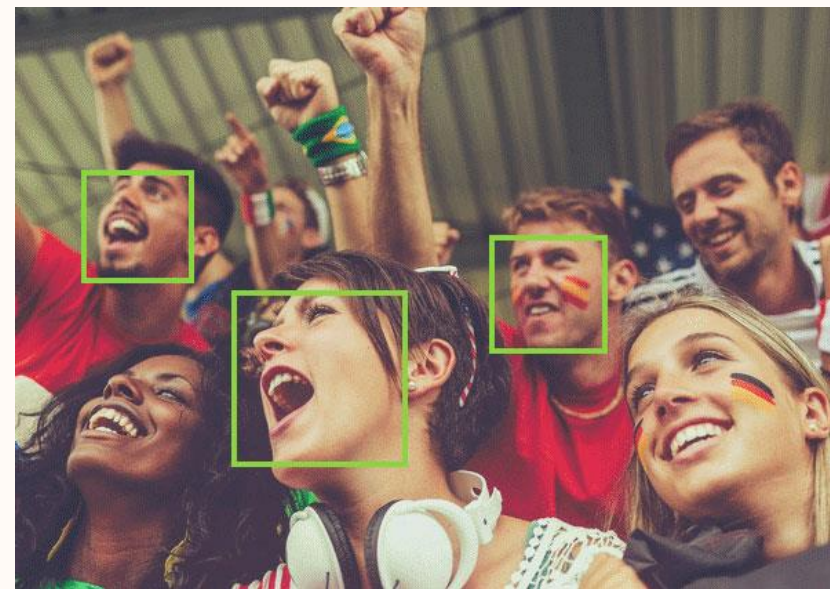
VISA FACES



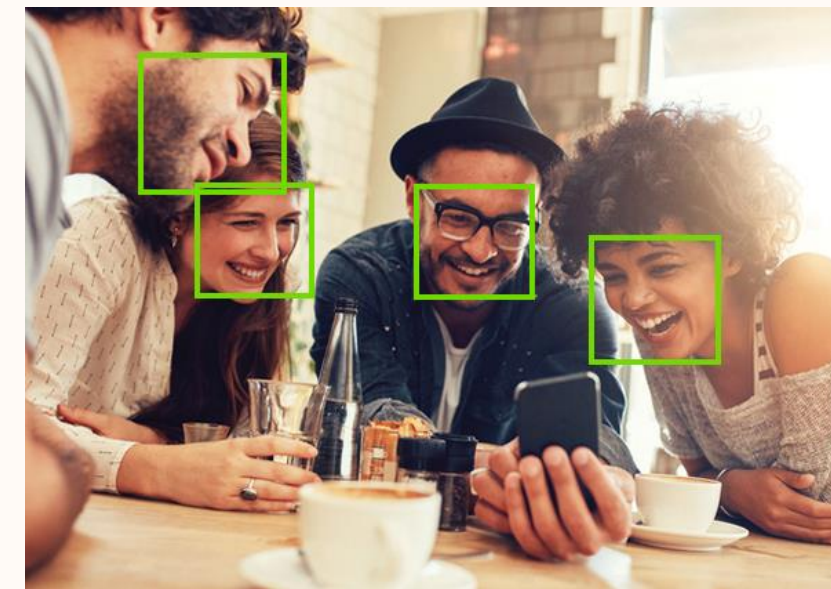
Camera unaware, in motion, occluded

Posed, still, well lit

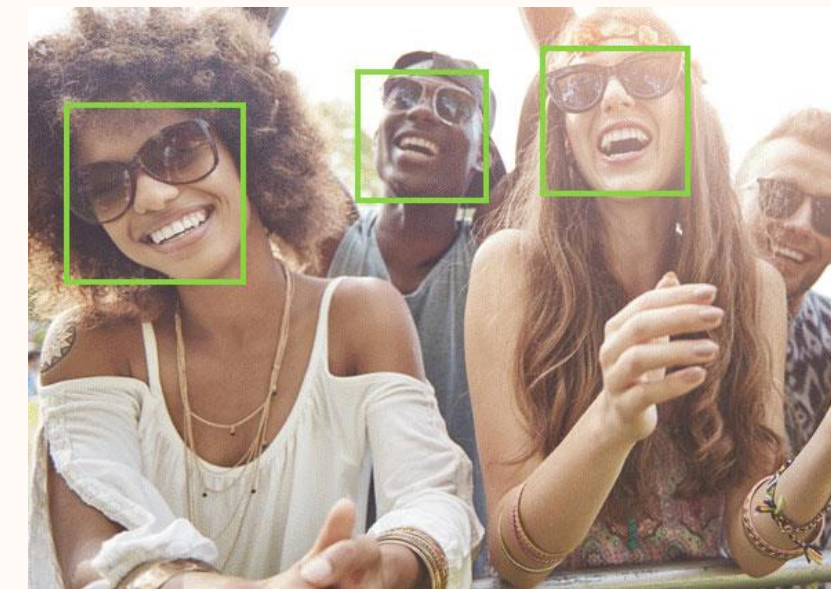
PERFORMANCE IN ADVERSE CONDITIONS



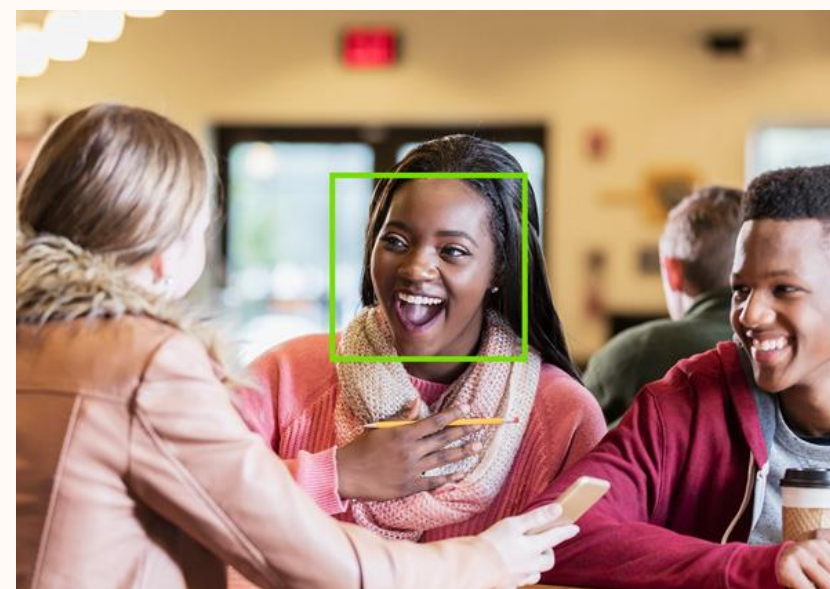
Scale



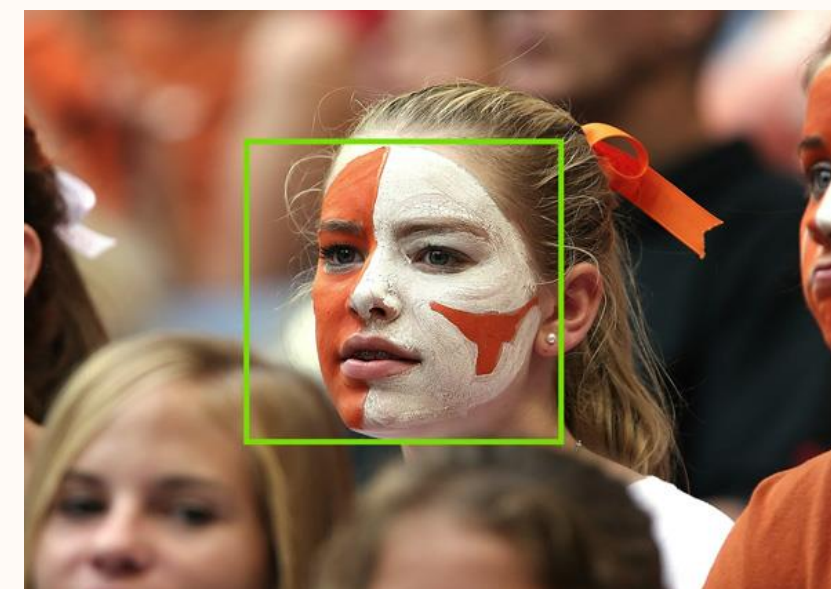
Pose



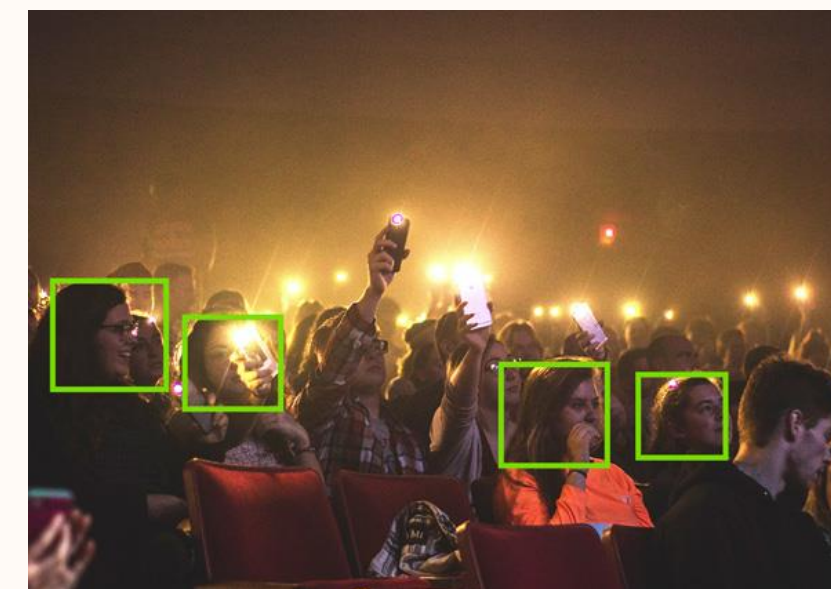
Occlusion



Expression



Makeup



Illumination

- Designed specifically to recognize faces of people in motion, in dim lighting, and at occluded angles
- Non-literal matching: handles multiple variations, including masks, makeup, spectacles, hair styles, and aging
- High tolerance to yaw, tilt, and rotation
- Allows error rate tuning to minimize false rejections and false acceptances, or to optimize between the two

DEPLOYMENT FLEXIBILITY AND SCALABILITY

✓ On Premises

✓ SAFR Cloud

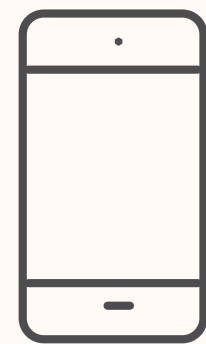
✓ Your Cloud

The SAFR platform is flexible. It supports multiple OS and hardware platforms, and can be adapted for different environments, applications, and use cases. SAFR can detect and match many faces in a single IP camera feed and scale to thousands of cameras and millions of faces.

WAYS TO **USE** THE PLATFORM

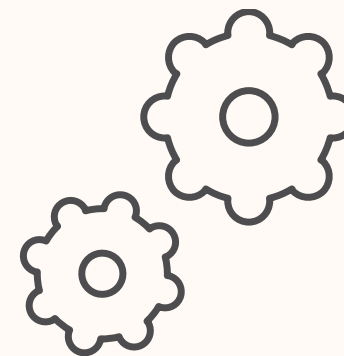
Adapt the platform to your needs or specific use cases

USE OUR MOBILE APPS



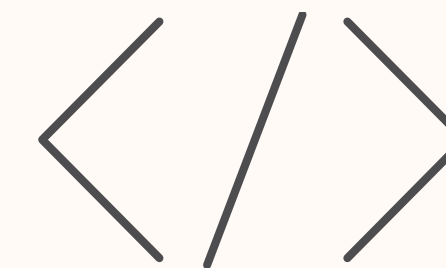
The SAFR mobile app running on MacOS or Android can be configured as a registration kiosk or as a secure access point which can recognize a registered individual and unlock a door.

CALL THE RESTful APIs



Developers and system integrators can build customer solutions with the SAFR RESTful API's which provide access to an array of functions, events, metadata, and configuration settings.

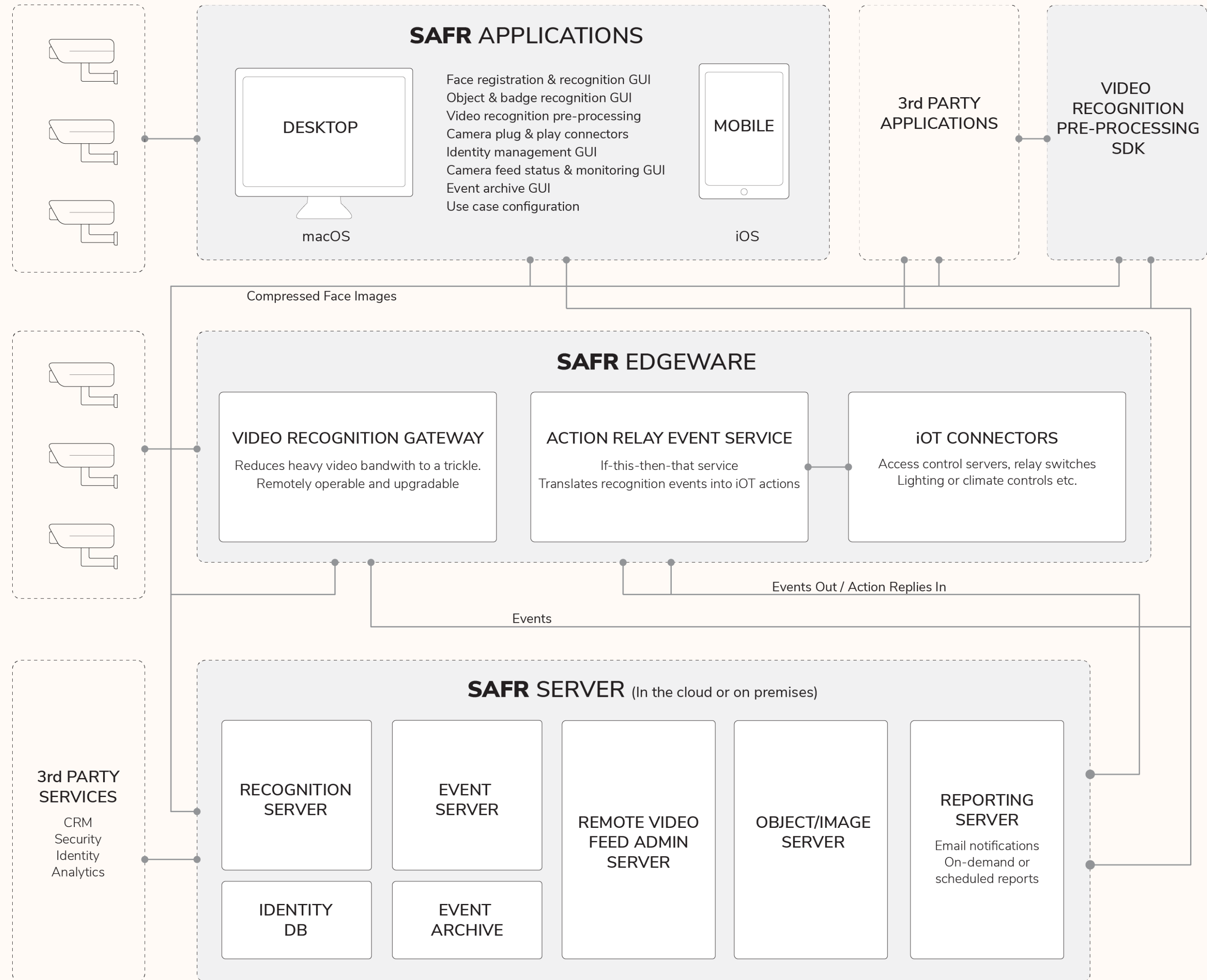
BUILD YOUR OWN APPS

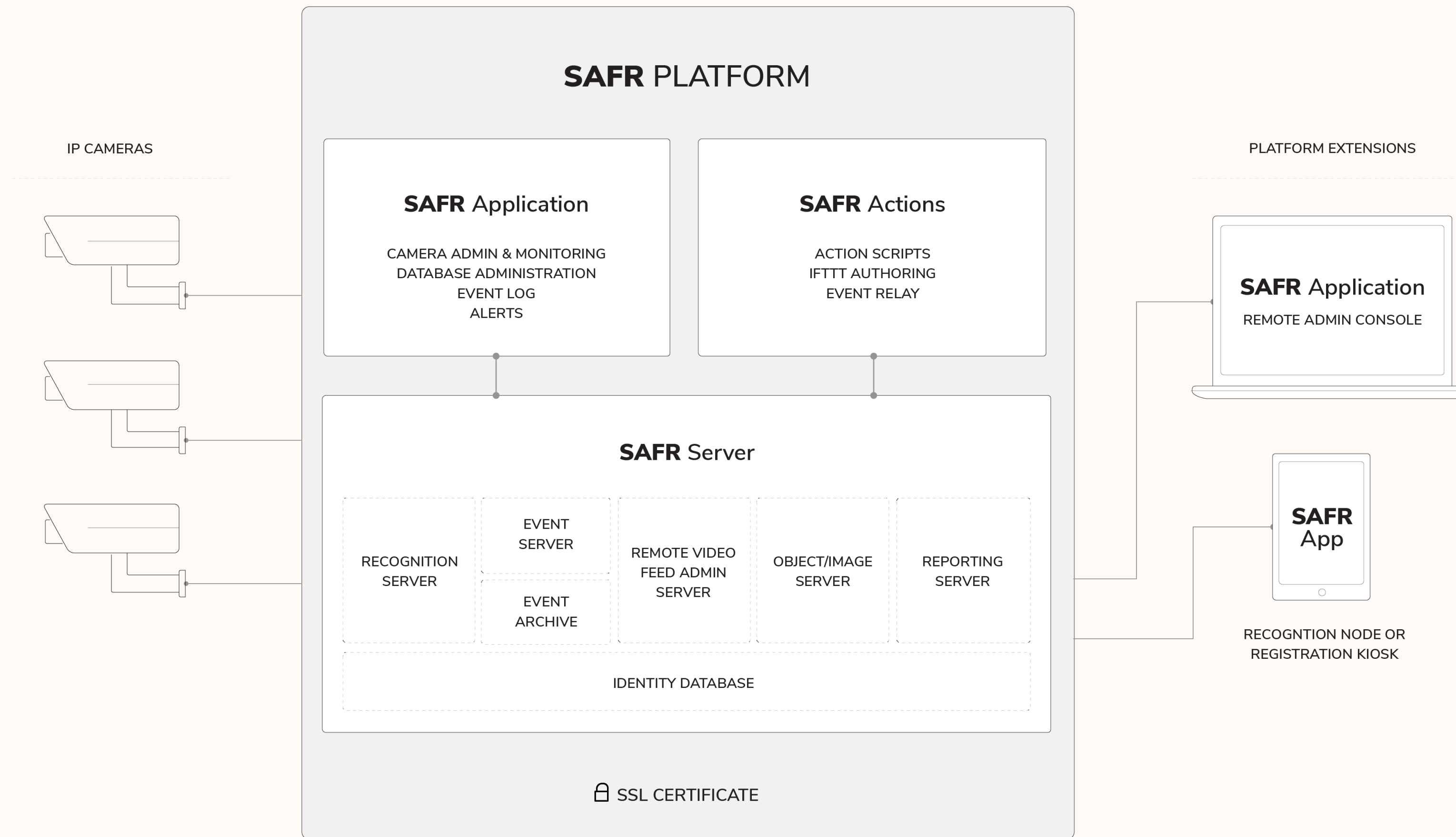


The SDK gives developers the tools to build custom mobile apps that leverage the SAFR Platform.

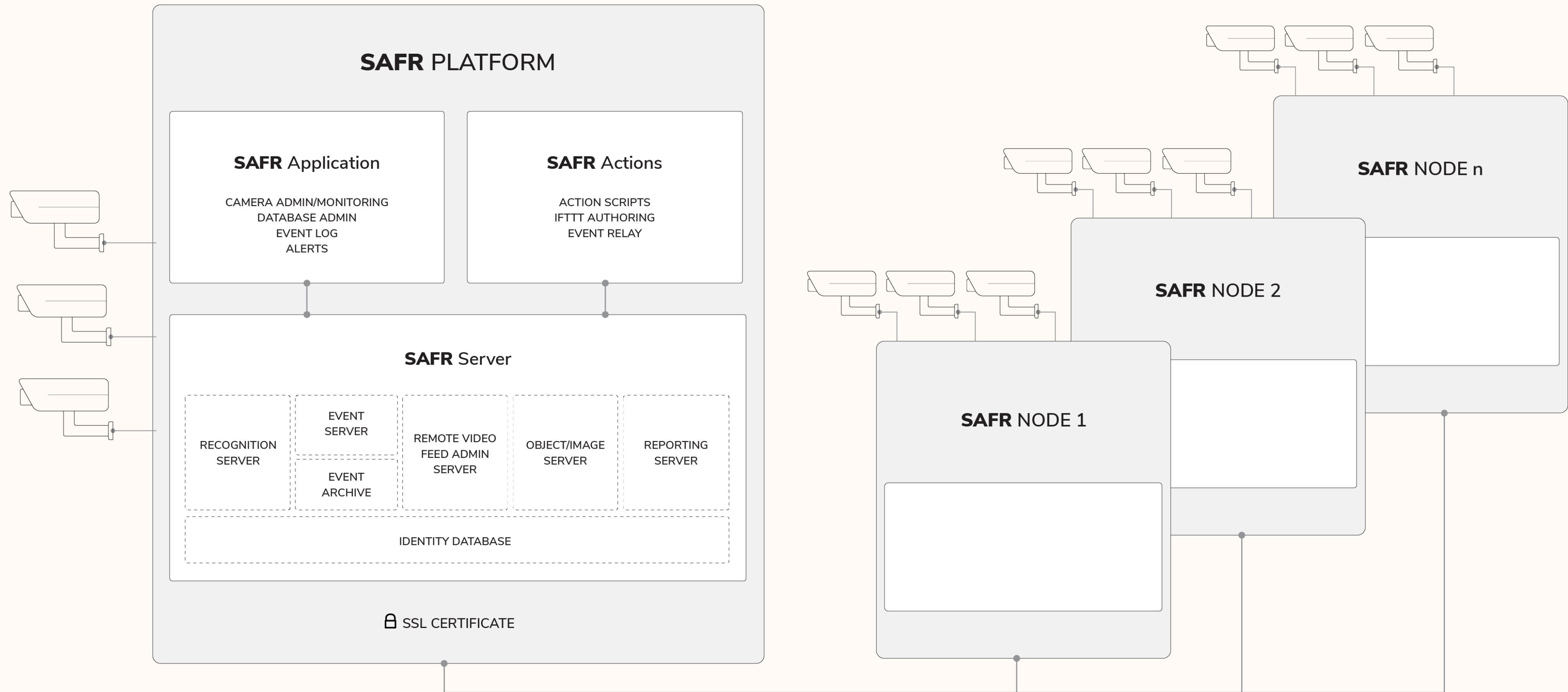
SYSTEM ARCHITECTURE

SAFR is architected to economically scale with high performance and rapid processing to detect and match millions of faces in real time.





PLATFORM INSTALLATION



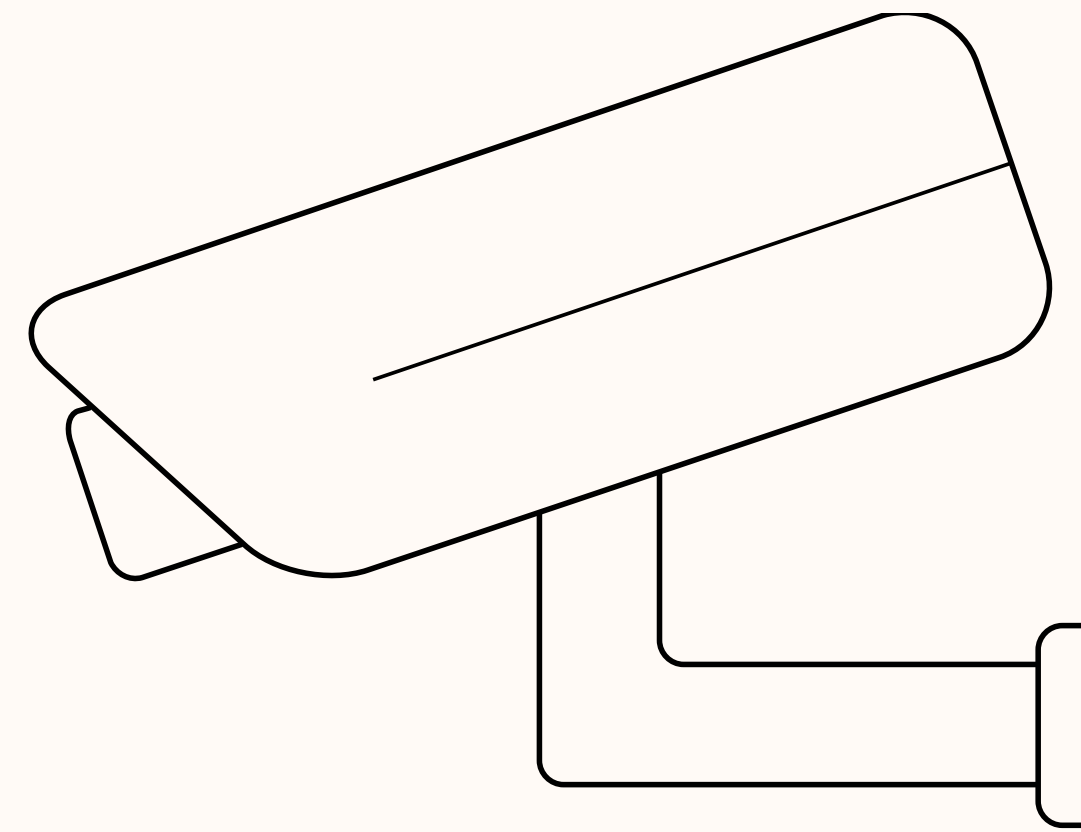
SAFR platform nodes support additional cameras. All nodes connect to host database.

SCALED INSTALLATION

HOW IT WORKS

Summary overview of what SAFR does

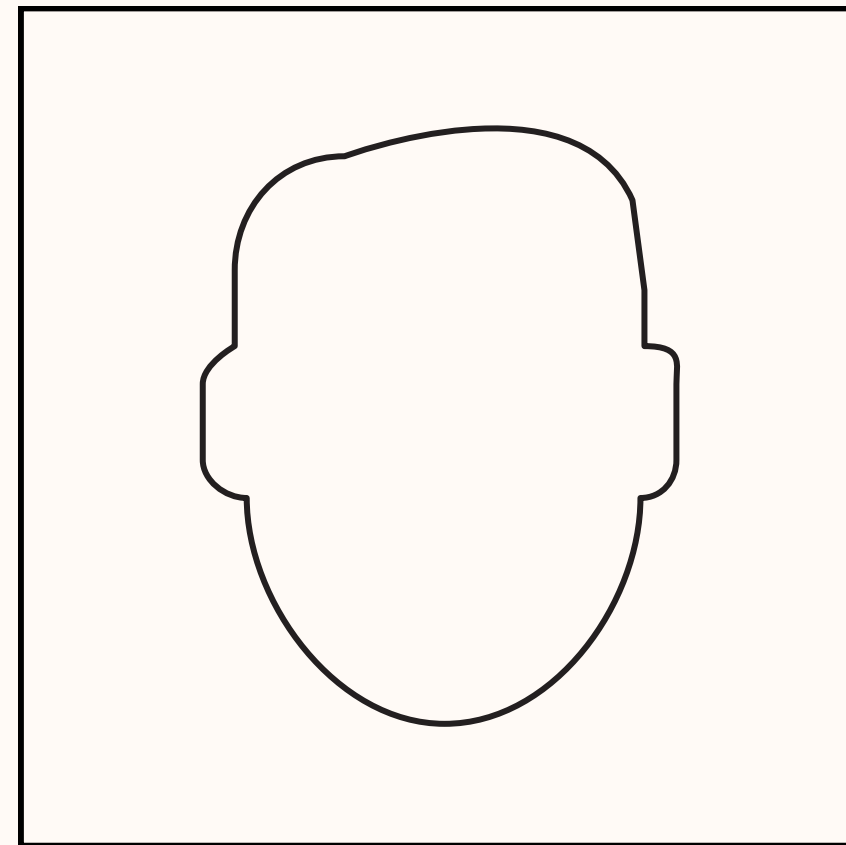
01



CONNECT IP CAMERAS

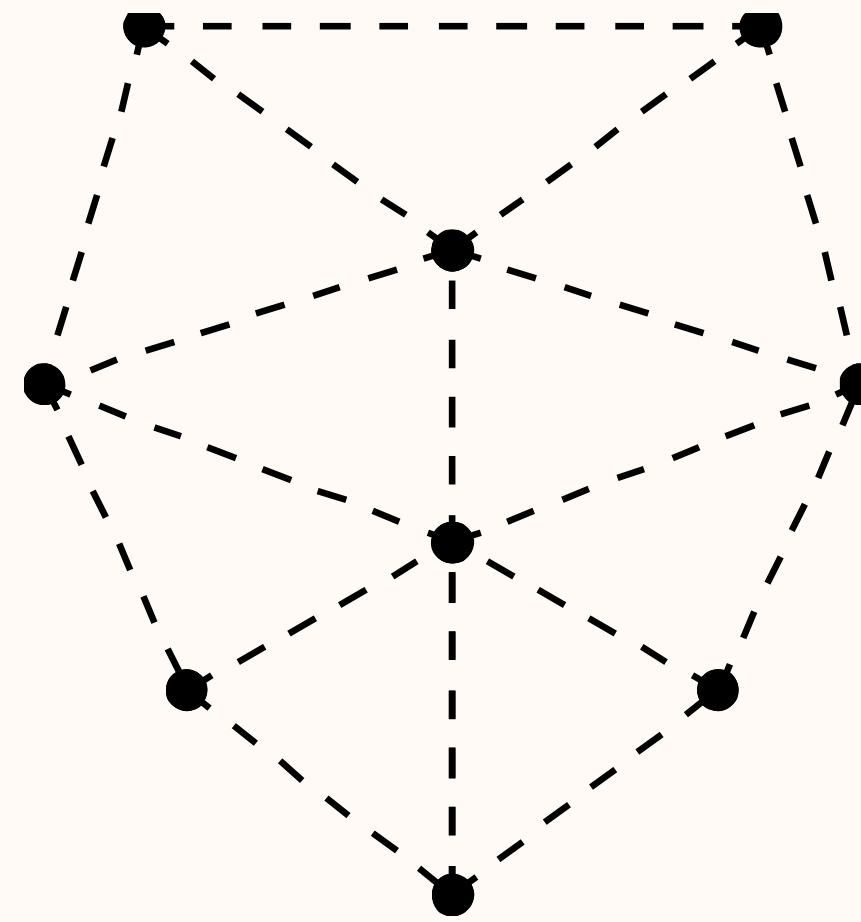
Once the platform is installed, connect any IP camera to SAFR. Configure cameras and monitor feeds with the SAFR administration application.

02

**DETECT FACES IN LIVE VIDEO STREAMS**

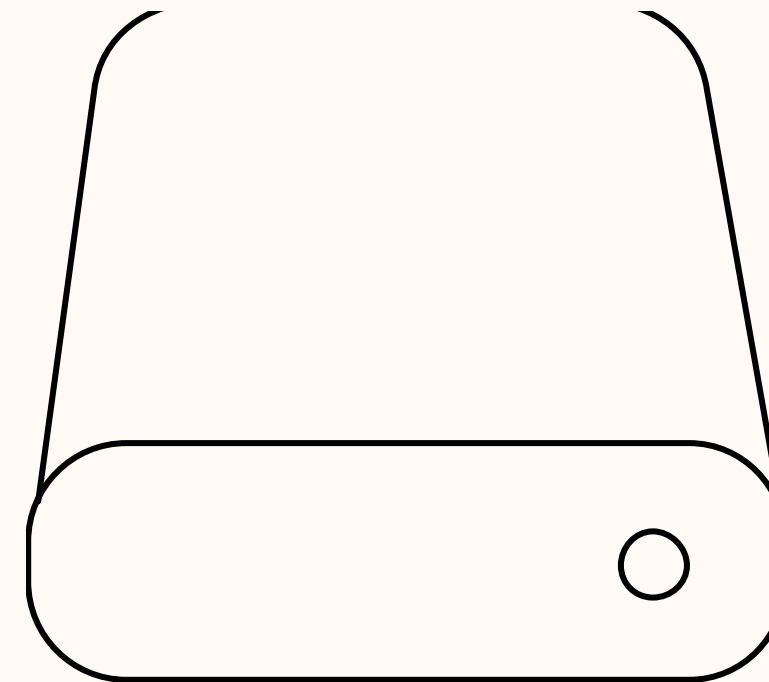
SAFR detects and tracks multiple faces in each live video stream. Each face image is clipped, optimized, and sent for processing.

03

**CREATE A UNIQUE FACE SIGNATURE**

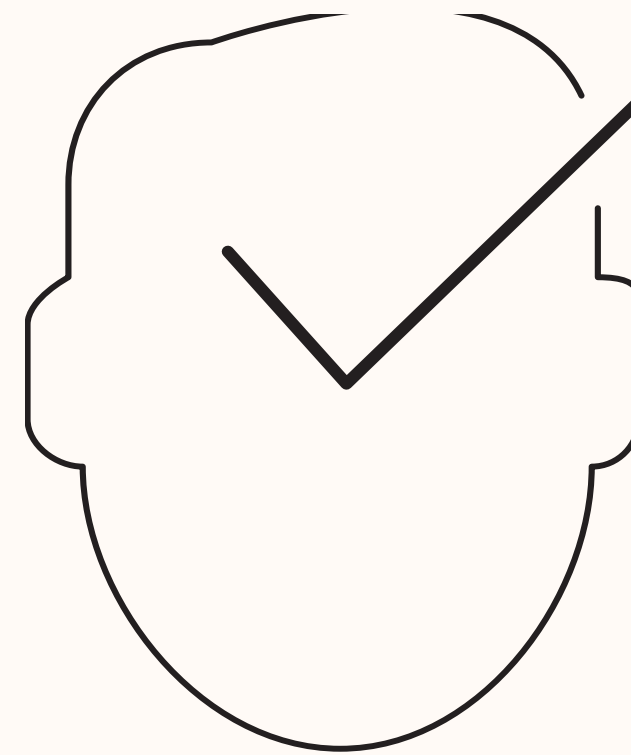
The face image is processed, filtered, and converted into a unique face signature comprised of mathematical vectors in Euclidean space derived from over a thousand facial features.

04

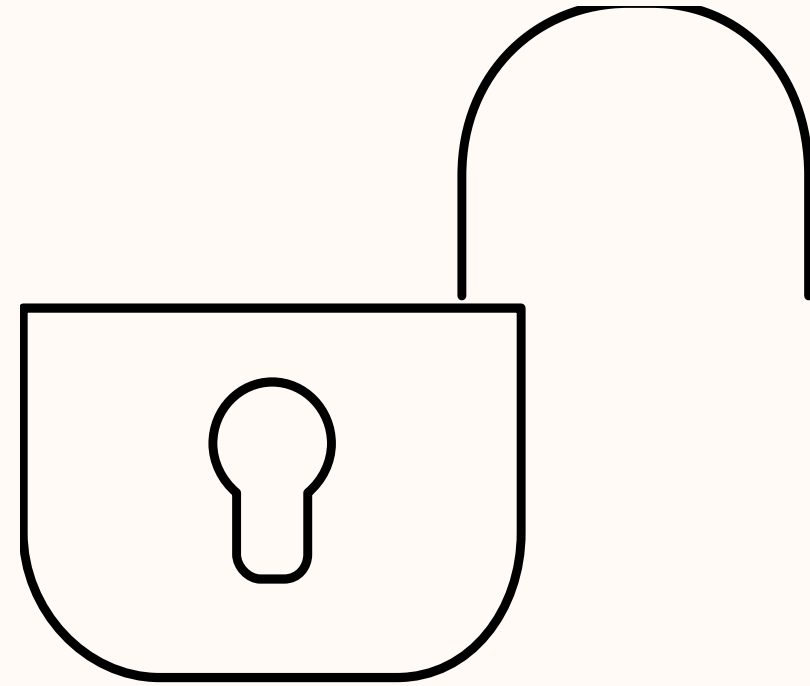
**LOOK FOR A MATCH IN THE DATABASE**

The resulting signature is matched against the SAFR database which can compare millions of signatures in near real time.

05

**ALERT ON MATCH**

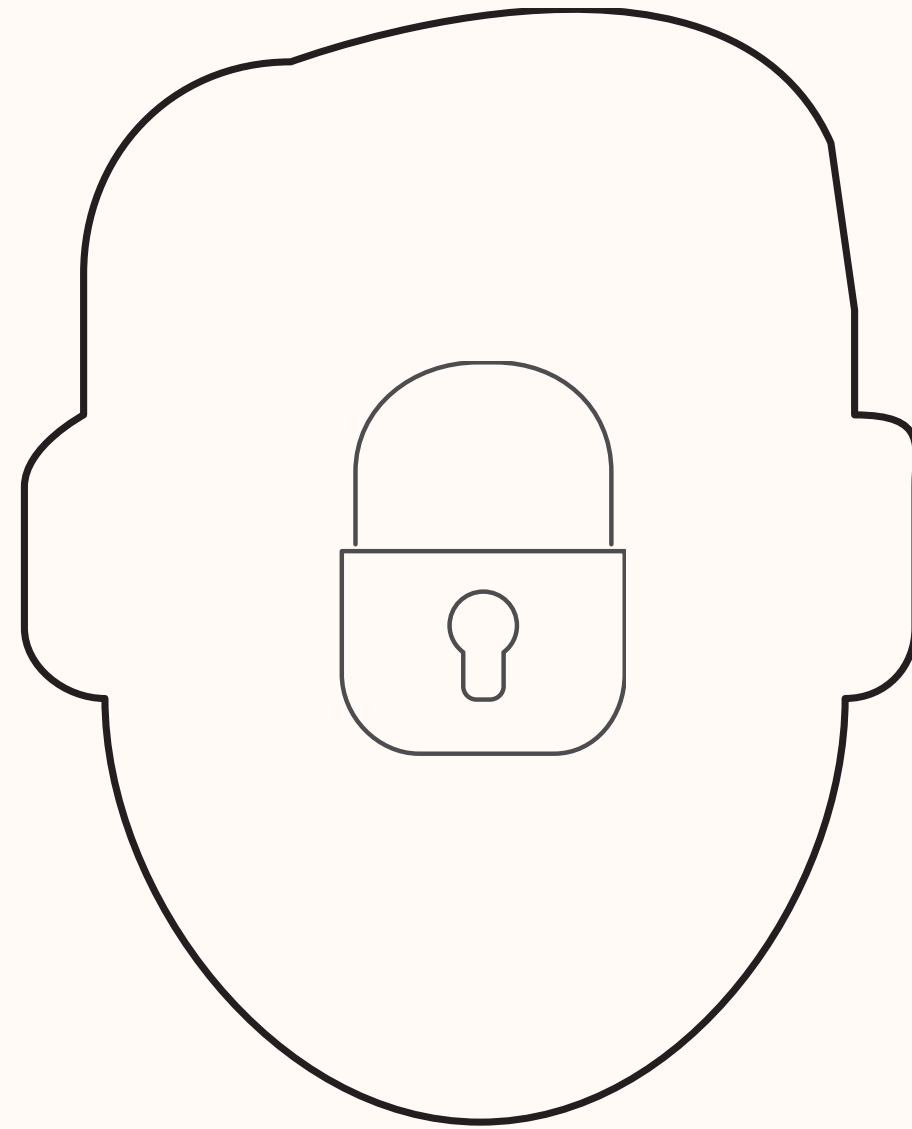
If a match is found, the individual is recognized. Depending on their database status a notification, event trigger, or metadata is transmitted based on pre-defined rules.



ACTION ON EVENTS

Recognition events can be customized using the SAFR Actions application included with the platform. Actions can be relayed to other hardware such as door locks or lights. Actions can also log data for insights and reporting.

SAFR employs a multi-tenant security regime. All face data and imagery is encrypted in transit and at rest.



Furthermore, the biometric face signature is kept separate from the face image used for its creation.

PRIVACY & DATA SECURITY

PLATFORM COMPONENTS

The building blocks of the SAFR solution



SAFR APPLICATION

The SAFR Application is used to add and configure cameras, monitor feeds, get alerts, and view activity. It is also used to update and manage the identity database. The SAFR Application can be installed on additional laptops or desktops to allow administration and monitoring anywhere, anytime.



SAFR SERVER

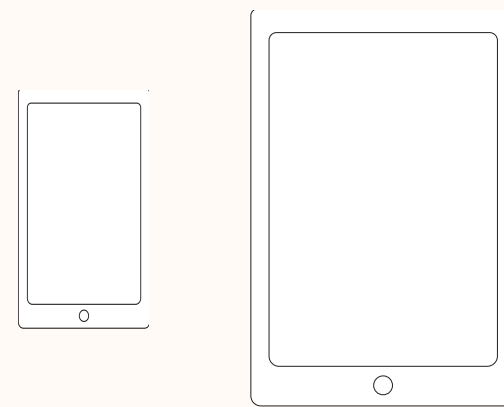
The SAFR Server is the heart of the platform. The Server is comprised of multiple components that includes the facial recognition server, identity database, recognition event server, event archive, remote video feed administration server, and object server. The SAFR server can be installed locally or in the cloud.



SAFR ACTIONS APPLICATION

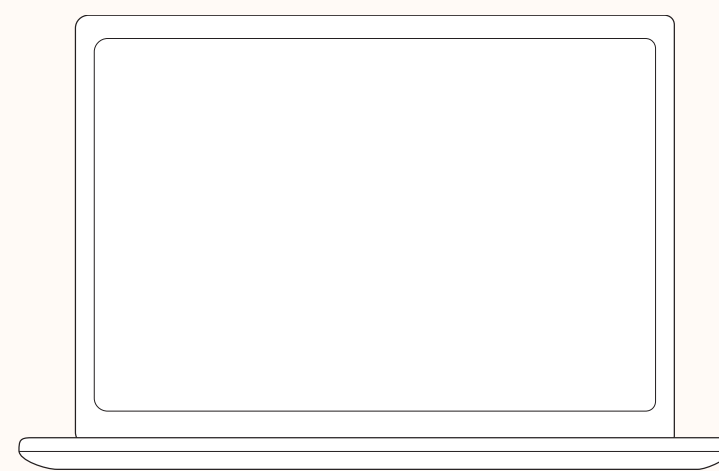
SAFR Actions is used to create and manage actions based on event triggers. Actions are written in Python and can be deployed for wide range of IFTTT scenarios. Actions can unlock a door, turn on a light, send an alert, record data for reporting, or any number of actions depending on the use case.

PLATFORM EXTENSIONS



SAFR MOBILE APP

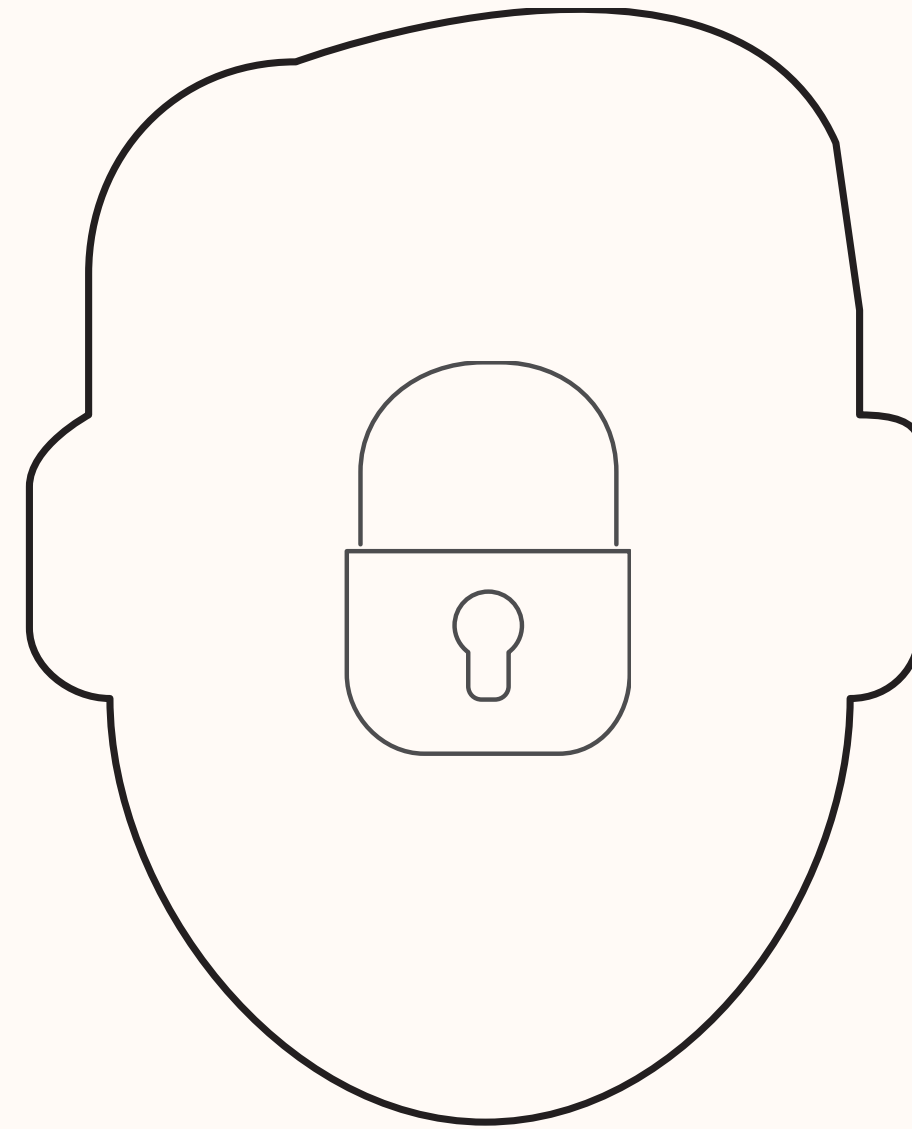
Configure a phone or tablet as a registration kiosk to add people to the database. Or install a mobile device as a recognition node at an entry door and allow faces to unlock the door.



SAFR REMOTE ADMINISTRATION

Install the SAFR Application on a laptop or desktop machine so you can monitor video feeds, manage the registration database and get notifications anytime, anywhere.

SAFR employs a multi-tenant security regime. All face data and imagery is encrypted in transit and at rest.



Furthermore, the biometric face signature is kept separate from the face image used for its creation.

PRIVACY & DATA SECURITY

SAFR USE CASES

ACCESS & ENTITLEMENT

Manage Access & Recognize Priority Customers

Lets reception staff make informed decisions

Easy integration into turnstile, door opening and Intercom Systems

User management interface (GUI and API)

Mobile & Tablet Apps for user registration

Two Factor Authentications

Local or Cloud Implementations

USE CASES

Public Building & Workspaces

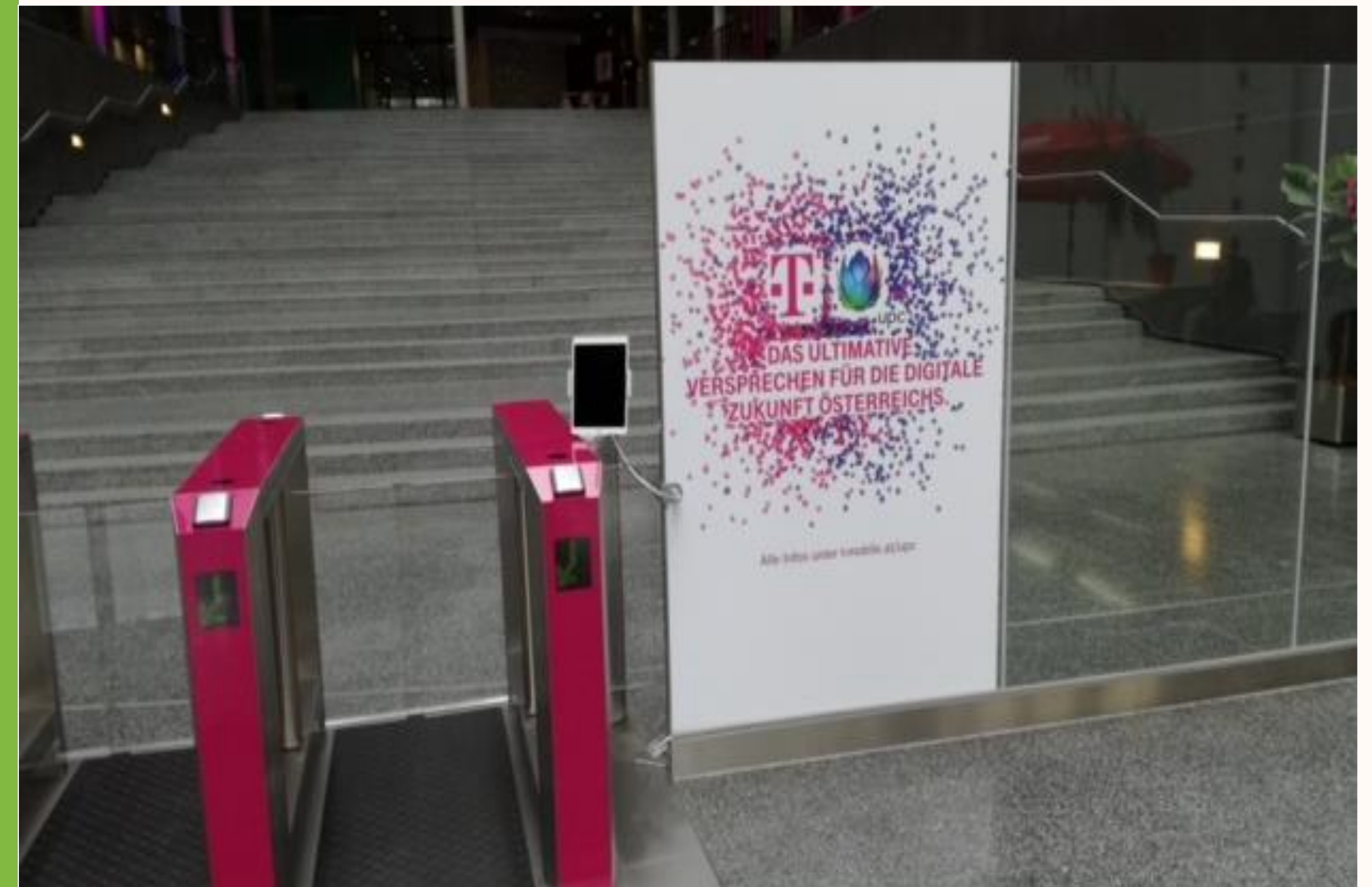
Loyalty and Recognition of High Value Customers

Stadium & Event Controls

Customer Segmentation

Digital Identification

Badge and Faces for Two Factor Authentication



SAFETY & MONITORING

Identify and create Notifications

Blacklist, White-List Management (Assign differing threat levels)

Identify and Add suspicious persons

Easy creation of alerts and call to actions

Integration into Video Management Systems

Scalable to multiple cameras and locations

Onsite or Cloud Implementation

USE CASES

Stadiums and major events

Airports and transportation

Education and governmental facilities

Company Campuses and perimeter fencing

Retail and shopping malls

Terrorism, theft, hooliganism and anti social behaviour



TRACKING & ANALYTICS

Understand your customers

People, Age, Gender and Sentiment

User Journeys, Behaviours & Dwell Times

Recognize customers for loyalty and promotions

Digital Signage and Advertisement Interfaces

Full Anonymity (no user data saved or stored)

Local or Cloud Based Install

USE CASES

Intelligence for retail

Single camera for advanced people counting

Multi Camera / Locations for detailed analytics

Customer Recommendations

Targetted Promotions

Healthcare



THANK YOU