



ViGo[®] Architecture and Principles

Mobile Voice Biometrics as-a-Service

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Introduction to ViGo

The ViGo system provides voice biometric identity verification for mobile devices. It delivers this using a cloud based VoiceVault biometric engine, and standardized configurations optimized for use in mobile apps.

The guiding principles are simplicity and standardization. ViGo is Mobile voice biometrics as a service.

Vigo is a standardized approach to mobile voice biometrics that is based on the simple and overriding idea that mobile use cases are inherently the same: People are using the same devices, in the same environments to achieve the same goals. The ViGo approach means that building and deploying voice biometrics in a mobile app is as simple as possible and can be achieved in the shortest possible time and with a minimum of resources.

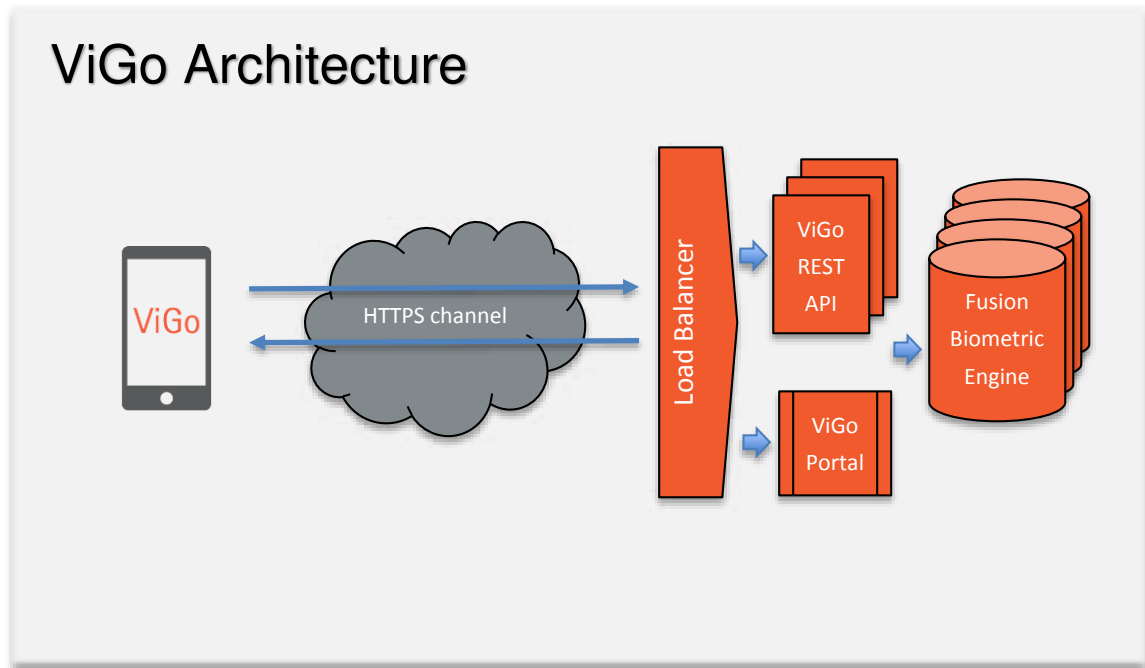
The ViGo system comprises the full ecosystem for implementing voice biometric identity verification in mobile apps. The ecosystem eliminates many of the hurdles traditionally associated with the deployment of voice biometrics and it provides ready-made components right out of the box that facilitate app development and deployment.

ViGo Architecture

ViGo consists of a server-side voice biometric system maintained and operated by VoiceVault, accessed through a secure Web Services interface. Client apps are developed against this cloud-based system using a range of ViGo components that includes the ViGo iOS and Android development platforms (available April 2014), iOS and Android sample application code, and the ViGo REST API.

ViGo does not include any components that require installation, configuration, optimization or management by you. Everything is provided and standardized to facilitate rapid application development and deployment with the minimum of effort and resources.

On the server-side, ViGo is effectively a black box voice biometric system hosted by VoiceVault using Amazon Web Services (AWS). This secure environment provides flexible capacity with all of the security and reliability benefits associated with AWS. The ViGo back-end is architected for scalability, both horizontally and vertically, with load balancing and fail-over designed in.



Security

The ViGo server-side components are hosted using AWS and are compliant with a wide range of security and data protection protocols and standards provided by the platform, such as PCI DSS certification. The ViGo platform leverages these and all communication is over a secure Web Services interface over SSL 3 / TLS 1.1 and above, providing ViGo customers with a robust and secure voice biometric service.

For more information, and for a full list of the compliance and data protection standards provided by AWS, follow this link <http://aws.amazon.com/compliance/>.

Reporting and metrics

Vigo provides self-service web-based access to system metrics and reporting. VoiceVault provides the standardized voice biometric configuration and maintains the server-side components and as such, there is nothing to integrate or install client-side to manage the system.

ViGo Voice Biometrics

ViGo is built on the best-in-class VoiceVault Fusion voice biometric engine. This in-house developed, proprietary voice biometric system is made available to ViGo customers as a black-box cloud-based voice biometrics service.

ViGo biometric accuracy

ViGo is based on a set of standard biometric configurations that deliver high-levels of security without compromising user convenience.

ViGo delivers a false accept rate of 0.01% at a false reject rate of ~5% when it is incorporated into an app using the ViGo-recommended UI and development best practices, as outlined below.

Each of the phrase and digits modes provided out-of-the-box is configured for this same high level of voice biometric accuracy, and the overall optimization of ViGo includes in-app data capture functionality and processing capabilities to maintain these levels of accuracy over time. For phrases, the minimum length is 7 words and the phrases supplied out-of-the-box with ViGo are 7+ words long.

The delivery of these accuracy levels is achieved through the incorporation of the ViGo voice biometrics into a multifactor authentication solution. In such a solution a third factor is used to supplement the first and second: ownership of the device (something you *have*), and the ViGo voice biometrics (something you *are*). This additional factor would typically come into play if voice biometric identity verification has not been successful, such as when the environment is particularly noisy for example.

This third factor can be any security measure or mechanism that is possible to implement in a mobile app such as a PIN or swipe pattern, both of which are implemented as examples in the ViGo demo app. The incorporation of a third factor is *mandatory* in a ViGo deployment, and is used by your app to trigger voice print adaptation mechanisms within the ViGo voice biometric system.

The replaying of recordings is a common attack vector in voice biometrics systems and ViGo incorporates replay attack detection mechanisms as standard.

Developing with ViGo

ViGo provides a range of app development options to suit your integration needs, based on a standard VoiceVault voice biometric REST API which provides all of the functionality that you need to implement voice biometric functionality in your app. The API is fully documented and supplemented by comprehensive iOS and Android sample code that covers the key voice biometric components for an app. To facilitate app development even further, ViGo includes a rapid application development framework for iOS and Android, that encapsulates the voice biometric functionality and user interface elements required in a mobile app. This framework (available April 2014)

False accepts and rejects

The false accept rate (FAR) is the probability that a bad guy, who has access to your device, will impost and break into the system as you. This is also known as a false positive.

The false reject rate (FRR) is the probability that a good guy, you, will be denied access. This is also known as a false negative.

facilitates the incorporation of voice biometric functionality into an existing app in the quickest way possible.

Recognizing that designing the speech capture user interface is fundamental to the success of the voice biometric part of an app, ViGo documents all of the UI elements required and the best practices for their use. The development framework encapsulates and provides examples of these UI controls that can be included into an application.

The ViGo demo app for iOS and Android, available from the App Store and Google Play (just search for ViGo), incorporates and demonstrates all of the development and UI best practices for a range of digit and phrase-based voice biometric verification modes. You are encouraged to try these apps to familiarize yourself with the data capture UI and user experience when applied to voice registration (enrollment) and login (verification). The ViGo development framework encapsulates these best practices to facilitate your application development.
