

# Online Biometric Authentication

## Introduction

Requirement for fool proof authentication is a major driver for growth in fingerprint authentication in India. Biometric authentication has grown popularity in the areas of attendance monitoring, financial inclusion, e-Passport and ration card projects.

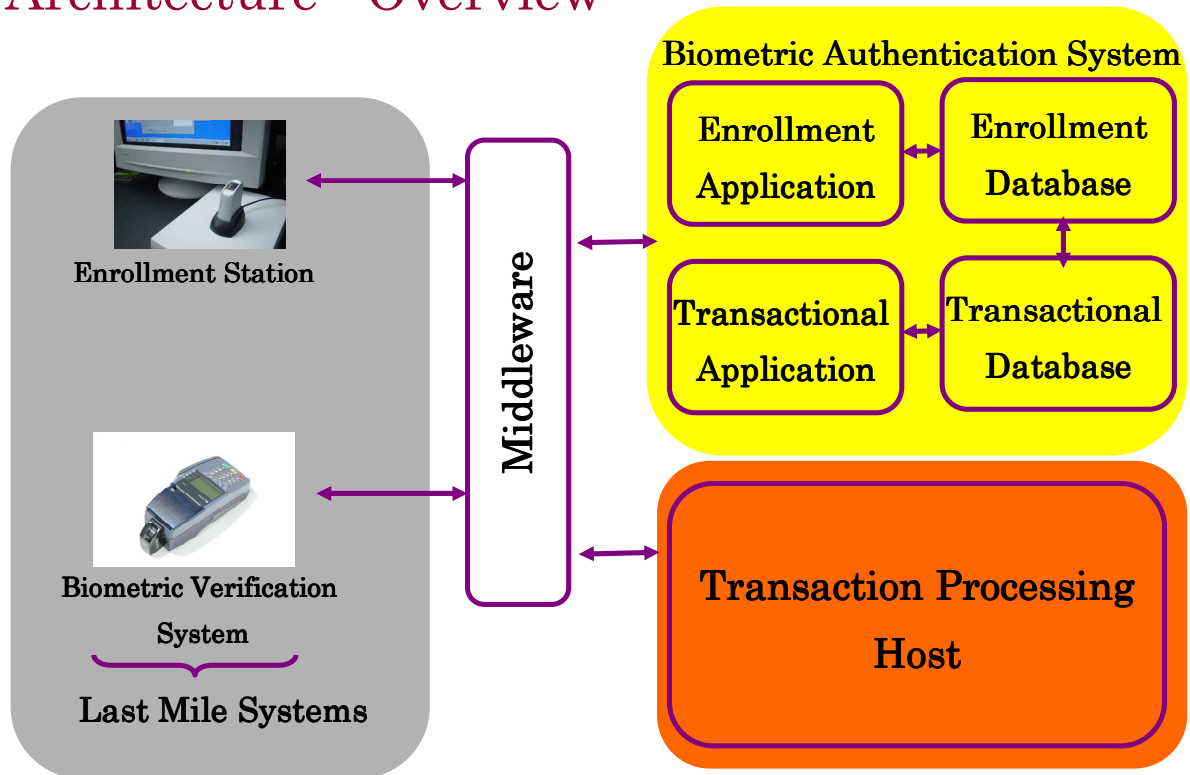
Addition of biometric authentication in any transaction process requires three key processes, namely enrollment, storage and verification to be added to the process. Enrollment is a one-time activity of storing a customer's fingerprints against their identity. Verification involves authenticating a live fingerprint against the stored identity. Storage of fingerprints is typically carried out locally on smart-cards provided to the customers during enrollment. During verification the live fingerprint is matched against the fingerprint retrieved from the smart-card. This paper presents trueServer, a low-cost, secure method for storage of biometric templates during enrollment and for verification, thereby providing savings on card distribution and management and providing a central management facility for the processor.

trueServer is a state-of-art biometric server that provides for online biometric authentication and transaction management capabilities for biometric payment, financial inclusion, presence monitoring services and other biometric enabled transaction processing. It is a real-time secure server that provides for online storage and retrieval of biometric data for transaction processing.

## trueServer – Online Biometric Authentication Server

trueServer utilizes 4 key elements to implement the online biometric authentication. These elements are depicted in the diagram below and described in the following subsections:

### Architecture - Overview



**Fig1: Architecture Overview**

### *Enrollment Station*

Enrollment Station comprises of a USB based biometric scanner connected to a computer to capture the biometric and demographic details of the end user.

### ***Biometric Verification System***

A biometric verification system is responsible for capturing customer id and biometric details for verification. This system can be used to capture other details required for the transaction. All captured details are transmitted over GPRS to middleware system in ISO8583 format.

### ***Middleware***

The middleware enables routing of transactions to various applications for processing. The middleware uses ISO 8583 standards for communicating with various parties.

### ***Biometric Authentication System***

Biometric authentication system stores the enrollment data that flows from enrollment stations and processes authentication systems from biometric verification system. All biometric details are stored in the server in ISO 19794-2 standard and thus enables interoperability between various biometric systems.

### ***Transaction Processing Host***

Transaction processing host processes and completes the transaction.

## **Process Flow**

The following process flow describes implementation of a typical biometric application using trueServer's technology:

## ***Enrollment***

- User approaches enrollment desk
- Operator enters the following information for the user
  - Demographic Details
  - Identification Number
  - Biometric Details
- Enrollment desk transfers the information over Internet or GPRS to the middleware which in turn passes the information to the Biometric Authentication System
- Biometric Authentication system stores this information in the enrollment database
- Users identification number and biometric details are transferred to the transaction database

## ***Verification***

- User approaches point of transaction
- With the assistance of the operator, user enters
  - Identification number
  - Transaction details
  - Puts finger on the biometric scanner
- These details are transmitted over GPRS to the middleware.
- The middleware in turn passes the information to Biometric Authentication System for verification
- Biometric Authentication System compares the customer identification number and the biometric detail against the data stored in the transactional database and approves / rejects the request. This approval / rejection message is sent to the middleware

- Approved transactions are sent to the Transaction Processing Host by the middle ware for further processing
- Rejected transactions are sent to the device at the point of transaction. The last mile system displays the appropriate message to the customer.

## Technical Specifications

The following table describes the technical specifications for trueServer:

Parameter	Online Biometric Authentication
Server operating system	Linux
Hardware requirements	20GB disk space, 1GB RAM, static IP
Application requirements	Java, Mysql
Gateway interfaces	POS terminals, Web interface
Biometric template format	ISO 19794-2
Database security	All templates encrypted using AES (128, 256 bit encryption)
Reporting	Full feature transaction reporting, reporting on successful, failure and repeated attempts
Terminals supported	Innoviti Vx610-trueID, Vx610-trueID-GPRS Other biometric devices can be integrated with the server on request
Verification time	<1s, template extraction time depends upon online connectivity

**Table1: Technical Specifications**

## Benefits

- Eliminates requirement for smart card and hence costly card distribution and management operations are not required.
- All intelligence is transferred from last mile systems to backend systems. Sophisticated business process engine for dynamic business rules setting and extensive reporting interface is made available at the backend.
- ISO 19794-2 based biometric template matching to allow for inter-operability between enrollments carried out using different biometric technologies
- Single gateway for managing all biometric authentication requirements.

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Gaurav looks after western region business of Innoviti, a leading provider of financial and transaction processing technologies. Innoviti is a leading provider of biometric and POS solutions for the rapidly growing financial inclusion space. Innoviti was the winner of the Best Consumer Electronics product award in 2004, Red Herring Top 100 Companies in Asia Award in 2006 and Wireless Innovation Contest Award in 2007.

Prior to joining Innoviti in 2007, Gaurav has worked as Product Manager for Micro Insurance Vertical at FINO and as CRM consultant with Deloitte Consulting.

Gaurav did his bachelors and masters in EE from IIT, Bombay in 2003.