

Qualified Product List Testing Requirements and Interface Specification

v1.1

International·Biometric·Group

R e s e a r c h C o n s u l t i n g I n t e g r a t i o n

1 Introduction

This document provides manufacturers participating in Transportation Security Administration (TSA) Qualified Product List (QPL) testing with general information and instructions on installation, enrollment and verification application design, and data retention.

The information in this document complements but does not supersede information provided in the QPL Guidance package.

Specifications are subject to change based on TSA guidance and/or revised requirements.

2 System Installation and Configuration

This section provides generic instructions for manufacturers regarding biometric sub-systems installation.

2.1 Physical Installation and Configuration

Manufacturers are responsible for physical installation of sub-systems.

IBG will provide adjustable shelving or tables for enrollment and verification sub-systems. Shelving will be adjustable at approximately 1" increments. The manufacturer specifies the height at which enrollment and verification sub-systems are installed in order to maximize usability for the largest cross-section of the test crew. Once the manufacturer has signed off on the installation of the capture device, the shelf will not be raised or lowered. If the manufacturer's enrollment and/or verification devices are to be tested in a wall-mount fashion, the manufacturer shall provide and fix a mounting apparatus or stand that can sit on the provided shelving (the test facility will not support wall-mounted installations).

IBG will provide a Type B (American 3-pin) NEMA 5-15 (North American 15 A/125 V grounded) outlet. Manufacturers are responsible for providing converters or other components necessary to power their sub-system, given this supply.

2.2 Integration into QPL Test Platform

IBG will provide a QPL Test Platform consisting of networked laptops and servers. The QPL Test Platform will (1) receive and store enrollment templates and (2) collect test data including enrollment results, verification results, and transaction times for each biometric sub-system.

IBG will provide a dedicated laptop for each enrollment and verification sub-system. The manufacturer will interface its biometric sub-system to this laptop through Ethernet, USB, or other standard interface. The laptop screen will not be viewed by the Test Subject during verification transactions. The manufacturer is responsible for loading application software, drivers, etc. required to configure or operate its sub-system(s). IBG will work with the manufacturer to configure IP addresses, subnet masks, and other parameters required to interface with the enrollment and verification devices.

Laptop specifications are as follows (IBG reserves the right to substitute equivalent components):

- Model: IBM ThinkPad R40
- CPU: Pentium M-1.4GHz
- RAM: 512MB
- HD: 30GB
- Optical Drive: 24x10x24x CD-RW 8x DVD
- Video: 32MB ATI Radeon 7500
- Ethernet: 10/100
- OS: Windows XP Professional

Server specifications are as follows (IBG reserves the right to substitute equivalent components):

- Model: IBM xSeries 336
- CPU: Intel Xeon 3.0GHz
- RAM: 1GB
- HD: 500GB
- Optical Drive: CD-RW, DVD-RW
- Ethernet: 10/100/1000
- OS: Windows Server 2003

3 Training Application

The manufacturer is asked to provide a training application, loaded onto enrollment and verification workstations, that allows test subjects to conduct practice trials prior to conducting recorded enrollment and verification transactions. These trials will be used to increase test subjects habituation to devices. The training application should clearly communicate to the user whether a given presentation or series of presentations is considered adequate for enrollment and/or verification.

4 Enrollment Application Functionality

Biometric sub-systems' application architectures may vary, necessitating modifications to the enrollment functions below. To the degree possible enrollment processes should be representative of native system operations. IBG will work with manufacturers to ensure that enrollment functions are implemented in an impartial and representative fashion. The manufacturer is expected to provide a QPL Enrollment Application that executes or enables the following enrollment-related functions, in addition to other functions implied by the TSA Guidance Package: Biometrics for Airport Access Control.

1. Allows operator to enter a 5-digit Test Subject Identifier (TSID) through a graphical user interface (GUI), using an IBG-provided barcode reader.
2. Triggers enrollment sequence(s) on TSID entry.
3. Provides an interface through which the operator can monitor enrollment progress and prompt additional presentations, attempts, and sequences.
4. Permits up to three attempts to enroll in each sequence, with each attempt comprised of one or more presentations.
5. Indicates to the Test Operator whether an enrollment attempt has succeeded or failed.
6. For successful enrollment attempts, creates enrollment template(s) from the sample(s) provided during enrollment and saves template(s) to a database or data structure on device, laptop, or server. *NOTE: Manufacturers are expected to implement native enrollment logic and template generation, as opposed to implementing enrollment logic specific to QPL testing. If the manufacturer's native policy is to enroll multiple instances, then the system should be configured accordingly, although the number of attempts and transactions permitted to enroll is the same regardless of the number of instances that comprise an enrollment. Similarly, sub-systems may create multiple templates for a given instance if this is the manner in which their native system operates.*
7. Allows no more than 30 seconds for each enrollment attempt and times out unsuccessful attempts after no more than 30 seconds.
8. Allows for a second enrollment sequence for Test Subjects unable to enroll successfully in the first enrollment sequence. *NOTE: The enrollment application should present the message "Unable to enroll in first sequence. Please press OK to proceed to second enrollment sequence". The operator clicks "OK" and the application proceeds with a second enrollment sequence for this same Test Subject. This second enrollment sequence is identical to the standard enrollment sequence.*
9. Indicates to the operator that an enrollment sequence is completed and whether enrollment failed or succeeded. *NOTE: A failure to enroll only occurs once the Test Subject has failed both the first and second enrollment sequences.*
10. Prior to commencing the next transaction, writes enrollment transaction results to a log file in CSV format. These results are parsed and imported to the QPL Database; alternatively manufacturers may write transaction outputs to a native database whose contents would be mapped to the QPL Database. **The results must include test subject ID, transaction result, and timestamp.**

5 Verification Application Functionality

Biometric sub-systems' application architectures may vary, necessitating modifications to the verification functions below. To the degree possible, verification processes should be representative of native system operations. IBG will work with manufacturers to ensure that verification functions are implemented in an impartial and representative fashion. The manufacturer provides a QPL Enrollment Application that executes or enables the following verification -related functions, in addition to other functions required or implied by the TSA Guidance Package: Biometrics for Airport Access Control.

1. Allows operator to enter a 5-digit TSID through a GUI, using an IBG-provided barcode reader. This TSID is used to retrieve the enrollment template against which verification transactions are executed. These verification transactions may be impostor or genuine transactions.
2. Allows operator to trigger a verification transaction after TSID entry. The operator ensures that the Test Subject is properly positioned as the verification transaction commences. This operator trigger is the point from which verification transaction duration is measured.
3. Prompts the Test Subject to conduct a first verification attempt.
4. Provides an interface through which the Test Operator can monitor verification attempt and transaction progress.
5. Compares sample feature(s) from a first verification attempt against the enrollment template associated with the TSID in (2).
6. Indicates to the Test Subject whether the first verification attempt matches through a visual indicator (e.g. GUI or green light).
7. Prompts for a second verification attempt if the first verification attempt is declared a non-match.
8. Prompts for a third verification attempt if the second verification attempt is declared a non-match.
9. Allows no more than 30 seconds for each verification attempt and times out unsuccessful attempts after no more than 30 seconds.
10. Declares an accept or reject decision for each transaction.
11. Prior to commencing the next transaction, writes verification transaction results to a log file in CSV format. These results are parsed and imported to the QPL Database; alternatively manufacturers may write transaction outputs to a native database whose contents would be mapped to the QPL Database. **The results must include test subject ID, transaction result, transaction duration, and timestamp.** Duration is defined as the time between the ID claim and the match decision.
12. Indicates to the operator that the Verification Transaction is completed.
13. Allows operator to enter the next TSID to trigger the subsequent verification transaction until all ten verification transactions have been executed for a given Test Subject.

6 QPL Transaction Database

QPL data collected and generated in the course of transactions is saved in a MySQL database. Tables relevant to the Manufacturer are Visit, Capture, Enrollment Transaction, and Verification Transaction. IBG will work with the manufacturer to ensure that outputs from its system can be stored in this database. Manufacturers may write transaction outputs to a log file in CSV format whose contents would be imported to the QPL Database; alternatively manufacturers may write transaction outputs to a native database whose contents can be mapped to the QPL Database.

Fields are subject to change based on final database schema (e.g. multi-instance systems may require a separate layout).


The **visit table** provides associations to enrollment and verification transactions via *visit_id*.

Field	Type	Null	Key	Default	Extra
visit_id	int(5) unsigned zerofill		PRI		auto_increment
subject_id	int(5)				0
calendar_id	int(10) unsigned zerofill			0000000000	
visit_number	int(1)				0
visit_date	date			0000-00-00	
enter_time	datetime			0000-00-00 00:00:00	
exit_time	datetime	YES		0000-00-00 00:00:00	
station_order	varchar(100)				0
station_order_id	int(11)				0
next_station_id	int(11)				0
operator_id	int(11)				0
status	varchar(100)				
note	text	YES			


The **capture table** links to enrollment templates via *file_name*.

Field	Type	Null	Key	Default	Extra
capture_id	int(11)		PRI		auto_increment
e_trans_id	int(11)				0
vendor_id	int(2)				0
vendor_capture_id	int(11)				0
vendor_trans_id	int(11)				0
instance_id	int(2)				0
file_type	int(2)				0
file_name	varchar(100)				
error_code	int(5)				0

The **enrollment transaction table** indicates whether a transaction was successfully completed via *trans_result*, and is used to calculate FTE.

Field	Type	Null	Key	Default	Extra
 e_trans_id	int(11)		PRI		auto_increment
visit_id	int(5) unsigned zerof			00000	
vendor_id	int(2)			0	
vendor_trans_id	int(11)			0	
trans_result	tinyint(2)			-1	
trans_duration	double(11,3)			0.000	
error_code	int(5)			0	
timestamp	timestamp	YES		CURRENT_TIMESTAMP	

The **verification transaction table** stores verification transaction results as *match_result*, and is used to calculate FAR, FRR, and transaction duration.

Field	Type	Null	Key	Default	Extra
 v_trans_id	int(11)		PRI		auto_increment
visit_id	int(5) unsigned zerof			00000	
vendor_id	int(2)			0	
v_trans_number	int(2)			0	
vendor_trans_id	int(11)			0	
target_e_visit_id	int(5) unsigned zerof			00000	
match_result	tinyint(2)			-1	
trans_duration	double(11,3)			0.000	
error_code	int(5)			0	
timestamp	timestamp	YES		CURRENT_TIMESTAMP	

7 Template Storage

Enrollment templates may be stored in manufacturer-specific directories on one or more QPL servers. The layout of these directories is dependent on methods by which systems need to retrieve enrollment templates for the purpose of verification transactions. If the template can be retrieved in real time from a server without negatively impacting verification transaction duration, then enrollment templates may be pulled from the server on a transactional basis. If sub-systems need to retrieve templates from a local data structure, IBG will work with the manufacturer to ensure that enrollment templates can be retained in multiple locations (for repository and transactional purposes).

For all sub-systems, all enrollment templates must be stored on QPL server(s) at all times to reduce the risk of data loss should a device become non-functional.