NGI INCREMENT 3 EBTS CHANGES

This paper identifies the existing, new, and modified EBTS messages used by NGI Increment 3. The new messages will be added to the native EBTS specification and may require changes to the XML EBTS specification. Modifications to existing EBTS messages may also require changes to both specifications.

New messages added to EBTS are to support additional NGI functionality for NGI users. The new functionality will not be mandatory for external users. The EBTS philosophy is that upgrades are backwards compatible so as not to impact existing capabilities. However, in order for the external user to take advantage of the new functionality NGI is offering, changes will have to be made to existing messages. The changes defined here-in are an effort to efficiently take advantage of what NGI will be offering to the user.

1.1 Increment 3 NGI EBTS Messages

The table below lists the EBTS messages applicable to Increment 3. The highlighted EBTS messages are new and defined to support Increment 3. Increment 3 removes LCN/LCX from most of the EBTS messages. The rationale is that no Authorized Contributor needs to be aware of Service Provider case identifiers. When the Service Provider needs to communicate that information, the LCN/LCX will be populated in the LSR message. For increment 3 the usage of the ERRI and ERRA TOTs are changed. In previous versions of the EBTS these were described as Image Error (ERRI) and Administration Error (ERRA) messages. Under NGI they're meaning is redefined to Information Error (ERRI) for errors associated with Information retrieval request (Images, Audit Trail, etc.) and Administration Error (ERRA) is taking on the new role of errors during a File Maintenance request.

EBTS Messages Processed by NGI in Increment 3

NGI Service	Communication method	Inbound EBTS TOT(s)	Outbound EBTS TOT(s)	EBTS Error TOT
Identification Services				
Tenprint Fingerprint Identification Search (NGI performs repository maintenance only)	SMTP (palm or supplemental from IAFIS), JMS (maintenance from IdFP)	CAR, CNA, CPDR, CPNU, DOCE, EMUF, FANC, FAUF, FNDR, NNDR, NFAP, NFUE, NFUF, MAP, DEK, DEU, MPR, AMN, CARC, CNAC, DEKC, FNCC, FUFC, MAPC, NFFC, NFDP	SRE (from IAFIS to NGI HMI)	ERRT (from IAFIS to NGI HMI)
Latent Fingerprint Identification	SMTP, Web service	LFS	LSR	ERRL
Rapid Fingerprint Identification Search	SMTP, Web service	RPIS	RPISR	ERRT
Verification Services				

NGI Service	Communication method	Inbound EBTS TOT(s)	Outbound EBTS TOT(s)	EBTS Error TOT
Fingerprint Verification Request (NGI performs repository maintenance only)	SMTP (palm or supplemental from IAFIS), JMS (maintenance from idFP)	FVR	N/A (IAFIS can return SRE)	N/A (IAFIS can return ERRT)
Information Services				
Fingerprint Image/Features Retrieval Request	SMTP, Web service	IRQ	IRR, ISR	ERRI
Palmprint Image/Features Retrieval Request	SMTP, Web service	IRQ	IRR, ISR	ERRI
Latent Print Image/Feature Retrieval Request	SMTP, Web service	IRQ	IRR, ISR	ERRI
Palmprint Audit Trail Retrieval Request	SMTP, Web service	BATQ	BATR	ERRI
Unsolved Latent Audit Trail Retrieval Request	SMTP, Web service	BATQ	BATR	ERRI
Investigation Services				
Latent Penetration Query Request	SMTP, Web service	LPNQ	LPNR	ERRL
Latent Repository Statistics Query	SMTP, Web service	LRSQ	LRSR	ERRL
Latent Print Image Investigation Search Request	SMTP, Web service	LFIS	SRL	ERRL
Latent Print Feature Investigation Search Request	SMTP, Web service	LFFS	SRL	ERRL
Notification Services (Not Inbound NGI Services)				
Unsolved Biometric Notification	SMTP, Web service (out)	n/a	ULM	n/a
Unsolicited Unsolved Latent Record Delete Notification	SMTP, Web service (out)	n/a	UULD	n/a
RISC Notification via Unsolicited Hit Notification	SMTP, Web service (out)	n/a	UHN	n/a
Data Management Services				
Fingerprint Deletion Request	SMTP, Web service	BDEL	BDELR	ERRA
Palmprint Deletion Request	SMTP, Web service	BDEL	BDELR	ERRA
Supplemental Deletion Request	SMTP, Web service	BDEL	BDELR	ERRA

NGI Service	Communication method	Inbound EBTS TOT(s)	Outbound EBTS TOT(s)	EBTS Error TOT
Unsolved Latent File Delete Request	SMTP, Web service	ULD	ULDR	ERRL
Latent Decision Request	SMTP, Web service	BDEC	BDECR	ERRA
Fingerprint Image Replacement Request	SMTP, Web service	FIS	FISR	ERRI
Direct Palmprint Enrollment Request	SMTP, Web service	FIS	FISR	ERRA
Direct Supplemental Fingerprint and Palmprint Enrollment Request	SMTP, Web service	FIS	FISR	ERRA

1.2 Changes to EBTS Unique Record Identifiers (Appendix C)

While the Universal Control Number (UCN) is used internally in NGI, EBTS continues to use existing fields to maintain backward compatibility with existing users. The existing 2.014 FBI field that holds the criminal FBI number in most IAFIS uses is converted to hold the UCN in all NGI TOTs. NGI UCN will hold Criminal, Civil, and Unsolved Latent Identity numbers. In this document the 2.014 FBI Number field name will change from "FBI Number" to "FBI Number (UCN)", and the identifier it contains will be referred to as the UCN. It is planned that the current EBTS UCN field (2.081) will be retired. The existing 2.086 SCNA field used in many Latent TOTs continues to be used, but it is converted from a numeric field to an alphanumeric field. These updates will be applied to Appendix C.

1.3 Changes to EBTS to Support Biometric Sets (Appendix P)

IAFIS stores a composite set of biometrics for an identity in all biometric matching repositories. NGI continues this practice for the tenprint IdFP matching subsystem, but will start to store biometrics for all events in the Friction Ridge Investigative File (FRIF). The FRIF is composed of the Criminal, Civil, and Special Population Cognizant (SPC) files. Search results against the FRIF return biometric sets for specific events as opposed to composite biometric sets for an identity. In addition, other services such as image retrieval and audit trail retrieval also support referencing biometric sets tied to specific events. NGI modifies EBTS messages to allow a unique reference to a biometric set. After the initial deployment of Increment 3, NGI will begin an effort to convert historical IAFIS Certification File into events that will be placed into the FRIF.

The following sections describe the biometric images in a Fingerprint set allowed by IAFIS today, as well as NGI. In addition, IAFIS does allow Tenprint Fingerprint Identification submissions to include palmprints submitted in accordance with the ANSI/NIST-ITL 1-2007 specification, but NGI is changing EBTS to define new rules for submitting a set of palmprints as described below Palmprint Image Sets. NGI also allows users to submit Supplemental Fingerprints and Palmprints (referred to as Supplemental Prints in this document) with Tenprint Fingerprint Identification submissions and changes EBTS to define rules for submitting a set of supplemental prints as described below under Supplement Print Image Sets. NGI also modifies other existing TOTs and creates new TOTs that use Palmprint sets and Supplemental sets.

NGI will be expanding the existing EBTS Type-2 Image Type (IMT) field to specify the biometric set(s) being referenced in a transaction. A new EBTS Type-2 field called Biometric Set Identifier (BSI) is created for use in both existing and new TOTs. The BSI field is a numeric value that uniquely identifies a Fingerprint set, a Palmprint set, or a Supplemental print set as defined in this document. This field will also be used to identify additional types of biometric sets in future NGI Increments. Type-2 records also need to specify individual images from a Supplemental Print image set. The Friction ridge Generalized Position (FGP 2.074) field is set to 19 for all Entire Joint Images (EJI) and Finger Tip images from a Supplemental Print image set. The Print Position Descriptors (PPD) field used in the ANSI/NIST Type-14 record is added to the Type-2 record to allow users to reference EJI or Tip images for specific fingers. A new Biometric Images Available (BIA) field is added to EBTS to indicate the existence of available biometric images (fingerprint, palmprint, supplemental print, facial photo, and SMT photo) for an Identity in the FRIF. The BIA field uses a numeric code to represent the biometric images available for an identity. NGI also modifies the NDR (2.098) field for Increment 3. The maximum number of occurrences is expanded from 4 to 10. Also, the maximum number of FBI or Other Federal Organization SPCs that NGI supports is increased from 35 to 99 where the NDR values would be in the range 101 through 199. These changes will be applied to Appendix C and Appendix P.

1.3.1 Fingerprint Image Sets

A full Tenprint Fingerprint image set consists of a combination of 14 Type-4 or Type-14 Fingerprint image records (from the FD-249 or FD-258 card or equivalent livescan):

- Ten Rolled Fingerprint images
- Two Four-Finger Slap Fingerprint images
- Two Flat Thumb Fingerprint images
- Two-Thumb Slap image

To be considered a full Tenprint set all images must be present or a designation that each missing finger is either amputated or unprintable is required. CJIS prefers that contributors submit 1000ppi images with the Type-14 record.

Some EBTS messages that include fingerprints do not require a full tenprint set, such as the Rapid Fingerprint Identification Search TOT that may have as few as two fingerprint images. TOTs that use fingerprints but do not require full tenprint sets have specific requirements specified in the appropriate subsections.

1.3.2 Palmprint Image Sets

A Palmprint image set consists of all of the image blocks from an FD-884 card or an equivalent livescan. Each FD-884 card has images for one hand, so a Palmprint image set with images for both hands contains:

1-8 Type-15 Palmprint image records

- One Writer's Palm image from each hand
- Either
  - One Full Palm image from each hand

  Or
  - One Upper Palm image and one Lower Palm image from each hand

Or

- One Palm Thenar Area image, one Palm Hypothenar Area image, and one Palm Interdigital Area image from each hand

0-12 Type-14 Fingerprint image records

- Five individual finger images from the back of the FD-884 card from each hand
- One individual index finger image from the front of the FD-884 card from each hand

At least one palm image must be given but as the fingerprint images are optional, no amputation or unprintable flags are needed for these records. NGI will accept the fingerprint images from the palm card, but will not be enrolling them into the database. That functionality will be picked up in future releases of NGI. Changes to the Type-14 and Type-15 records to allow each of these images to be uniquely identified are detailed below in EBTS Changes to ANSI/NIST Biometric Record Types.

1.3.3 Supplemental Print Image Sets

A Supplemental Print image set consists of all of the image blocks from and FD-884a card or an equivalent livescan. Each FD-884a card has images for one hand, so a Supplemental Print image set with images for both hands contains:

0-20 Type-14 Fingerprint image records

- 5 Entire Joint Image (EJI) Fingerprint images from each hand
- 5 Finger Tip Fingerprint images from each hand

0-2 Type-15 Palmprint image records

- 1 Thenar Region Palmprint image from each hand

While both finger and palm are listed as optional, at least one image must be given to be accepted. With optional fingerprint images, no amputation or unprintable flags are needed for these records. Similarly, each EJI image can contain four different impressions of each finger as defined in EBTS, but there is no requirement for an EJI images to contain all or any one of the fingerprint impressions. Changes to the Type-14 and Type-15 records to allow each of these images to be uniquely identified are detailed below.

1.4 EBTS Changes to ANSI/NIST Biometric Record Types

The ANSI/NIST specification includes a number of user-defined fields to allow organizations to enhance biometric record types to suit their own needs. FBI EBTS specific changes are made to the ANSI/NIST Type-14 and Type-15 records as described in this section. No changes are made to the Type-4 and Type-7 records used by IAFIS today. No changes are made to the Type-13 record that NGI uses for Latent images, where the 1000 ppi resolution is supported. NGI will store latent imagery in the same logical record as received (Type-4, Type-7, Type-13, Type-14 and Type-15). NGI will return imagery (i.e. image retrievals and candidate lists) to contributors in the same format as stored (e.g. as received).

The ANSI/NIST specification defines the Type-14 as a variable-resolution fingerprint image record. The Type-14 is used in IAFIS and in NGI Increment 2 for identification flat fingerprint images. NGI expands the use of this record to include the finger images from Palmprint image sets and Supplemental Print image sets as well as accepting individual rolled and flat fingerprint images. These updates will be applied to Appendix N.

In addition to using existing ANSI/NIST fields to specify details of these images, NGI adds a new Image Source (ISC) field to allow images from multiple biometric sets that use the same record type to be distinguishable. The ISC field uses a numeric code to represent the Image Source. Allowable values are shown in Table 2.

Table 2: ISC Code Values

Image Source	Value
Tenprint Fingerprint Set	1
Palmprint Set – Front of Card (including fingers on front)	2
Palmprint Set – Fingers on Back of Card	3
Supplemental Print Set	4

Two different values are required for the Palmprint card to distinguish between the index finger image on the front of the card and the index finger that is part of the set of five finger images on the back of the card. Livescan palm capture should use value 2 and is not expected to contain any finger images.

The following types of images use the Type-14 record:

1. Identification Flat Fingerprint Images
    - ISC (14.200) field set to 1 or default when omitted (thus existing submissions do not need to change)
    - FGP (14.013) field set to 13 (Plain Right Four Fingers), 14 (Plain Left Four Fingers), or 15 (Left and Right Thumbs) as FGP is defined in the ANSI/NIST-ITL Specification
    - SEG (14.021) containing finger numbers and position coordinates for the segments
2. Index Finger Image from the Front of a Palmprint Card
    - ISC (14.200) field set to 2
    - FGP (14.013) field set to 2 (Right Index Finger) or 7 (Left Index Finger)
3. Finger Images from the Back of a Palmprint Card
    - ISC (14.200) field set to 3
    - FGP (14.013) field set between 1 and 10 as defined in the ANSI/NIST-ITL Specification
4. Entire Joint Images (EJI) from a Supplemental Print Card
    - ISC (14.200) field set to 4
    - FGP (14.013) field set to 19 (EJI)
    - Print Position Descriptors (PPD – field 14.014) and Coordinates (PPC – field 14.015) fields specify the finger number and segment locations for each impression in the EJI as defined in the ANSI/NIST-ITL Specification.
5. Finger Tip Images from a Supplemental Print Card
    - ISC (14.200) field set to 4
    - FGP (14.013) field set to 19 (Tip)

- Print Position Descriptors (PPD – field 14.014) field specifies the finger number and that the image is a TIP as defined in the ANSI/NIST-ITL Specification.

The ANSI/NIST specification defines the Type-15 as a variable-resolution palmprint image record. The standard ANSI/NIST Type-15 is used in IAFIS for submissions of palmprints with tenprint transactions. NGI expands the use of this record to include all palm images from Palmprint image sets and palm thenar area images from Supplemental Print image sets. The Type-15 also adds the Image Source (ISC) field specified above with the field number of 15.200. These changes will be applied to Appendix P.

The following types of images use the Type-15 record:

- Palmprint Images from the Front of a Palmprint Card (or palmprint livescan)
    - ISC (15.200) field set to 2, or default when omitted (thus existing submissions do not need to change). As the front/back designation is not relevant to NGI processing, livescan submissions can use either value.
    - PLP (15.013) field set to appropriate Palm Code value from the ANSI/NIST-ITL Specification.
- Writer's Palm Image from the Front of a Palmprint Card
    - ISC (15.200) field set to 2
    - PLP (15.013) field set to 22 (Right Writer's Palm) or 24 (Left Writer's Palm) as defined in the ANSI/NIST-ITL Specification.
- Palm Thenar Area Image from a Supplemental Print Card
    - ISC (15.200) field set to 4
    - PLP (15.013) field set to 32 (Right Thenar) or 35 (Left Thenar) as defined in the ANSI/NIST-ITL Specification.

1.5 NGI Support ANSI/NIST Type-9 Biometric Record (Appendix J)

The following tables define the "public" templates that are also defined within the LFR ICD of the NGI Internal ICD. NGI uses the Extended Feature Set (EFS) section of the Type-9. Table 3 defines the fields utilized by NGI in an EBTS request and Table 4 describes the response returned by NGI.

Table 3: Type-9 EFS fields Utilized by NGI matcher in an EBTS Request

Field	Code	Name	Usage	Comment
ROI	9.300	Region of Interest	Mandatory	Defines where the area within or bounds of the latent image containing the feature data has been specified.
ORT	9.301	Orientation	Optional	If absent, this means print is assumed to be upright ±15°; orientation must be indicated otherwise.
FPP	9.302	Finger/Palm Position	Mandatory	Indicates the source of friction ridge skin (finger or palm); value may be "unknown"
PAT	9.307	Pattern Classification	Optional	This field is used to specify one or more general pattern classification codes to which the fingerprint may match. Any combinations up to all four possible values are allowed (specifying all four is equivalent to no value and implies "unknown").

Field	Code	Name	Usage	Comment
COR	9.320	Cores	Optional	All cores must be marked if present in fingerprint images. (Core-like structures in palms may optionally be marked)
DEL	9.321	Deltas	Optional	All deltas must be marked if present in fingerprint images (Delta-like structures in palms may optionally be marked)
MIN	9.331	Minutiae	Optional	All minutiae must be marked if present in the image
SIM	9.372	Skeletonized Image	Optional	Ridges in image may be marked (tracing) for improved accuracy

Table 4 defines the fields populated by NGI in an EBTS response.

Table 4: Type-9 EFS fields Populated by NGI Matcher in an EBTS Response

Field	Code	Name	Usage	Comment
ROI	9.300	Region of Interest	Mandatory	The ROI provided as part of original template submission, the area within or the bounds of the image from which the features were extracted.
ORT	9.301	Orientation	Optional	If absent, this means print is assumed to be upright ±15°; orientation must be indicated otherwise.
FPP	9.302	Finger/Palm Position	Mandatory	Indicates the source of friction ridge skin (finger or palm); value may be "unknown"
PAT	9.307	Pattern Classification	Optional	The classification specified as part of original template or that determined by the encoder; may be "UC" (unable to classify)
FQM	9.316	Friction Ridge Quality Metric	Optional	Quality specified on original template submission or the quality computed by the encoder
COR	9.320	Cores	Optional	Any identified cores will be marked; only for fingerprint images.
DEL	9.321	Deltas	Optional	Any identified deltas will be marked; only for fingerprint images.
MIN	9.331	Minutiae	Mandatory	All identified minutiae will be marked. Note this field contains ALL minutiae from the original template.
MFD	9.350	Method of Feature Detection	Optional	The NGI LFR encoder designation if template was created by that algorithm or not given otherwise (externally created)
COM	9.351	Comment	Optional	Additional information that describes the extractor if this template was automatically generated from image.
CPF	9.361	Corresponding Points or Features	Optional	Matching Features between probe and candidate when requested. The Type Of Correspondence (TOC) to be provided for NGI is 'F' (Feature). Note this field contains the labeled feature that definitely corresponds to the specific feature defined by the Field Number and the Field Occurrence information items.
RRC	9.363	EFS Relative Rotation of Corresponding Print	Optional	This field is used when returning search results with Type-9s to indicate the overall rotation of the probe (or target) print that resulted in the match score with the candidate.

1.6 EBTS TOTs Used in Increment 3

1.6.1 Tenprint TOTs (EBTS Section 3.1.1)

IAFIS receives and performs the Tenprint search and identification and returns EBTS SRE responses to the submitters for these messages in Increment 3. If IAFIS performs enrollment, it passes the images to NGI for enrollment of Tenprint fingerprints and any included palmprints and/or Supplementals. NGI then performs cascaded searches against the Unsolved Latent File (ULF) with the fingerprints, palmprints, and supplementals submitted with these transactions. NGI serves as a pass through for CAR transactions sent from the HMI to IAFIS and for SRE results messages returned from IAFIS to an HMI user, but NGI does not process the contents of those messages aside from formatting them for transmission. These updates will be applied to Section 3.1.1 along with Summary Transaction Tables in Appendix L.

There are no changes to the Type-2 records submitted for these TOTs in Increment 3. The major change to these TOTs in Increment 3 is the allowable record types to allow for full submission of palmprint and supplemental images. The types and quantities of logical records required in Tenprint Fingerprint Identification submissions are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record
- 1 Fingerprint Image Set
- 0-4 Type-10 Photo records
- 0-2 Type-7 Tenprint Fingerprint Card Image records (used only for CSS TOTs CARC and CNAC)
    - One scan of each side of a 2-sided Tenprint Fingerprint Card
- Palmprint Image Set
- Supplemental Image Set

The SRE message is returned by NGI in response to Tenprint Fingerprint Identification submissions. IAFIS produces all SRE messages and there are no changes to the record types or their contents in Increment 3. When an NGI Latent HMI user submits a CAR message, NGI passes this EBTS message to IAFIS for processing. NGI receives an SRE message in return and passes this back to the Latent HMI. NGI will produce the SRE in a future Increment and its contents may change at that time.

1.6.2 Latent Fingerprint Image(s) Submission (LFS TOT, EBTS Section 3.1.2)

The LFS message is an existing IAFIS TOT used to request an identification of a latent friction ridge image. This latent request may result in biometric searches initiated by Service Providers of the NGI Friction Ridge Identification File (FRIF) and/or the NGI Unsolved Latent File (ULF). An LFS can also request enrollment in the ULF. These changes will be applied to Section 3.1.2 along with the Summary of Record Layouts for Type-2 found in Appendix D. Updates will also be applied to the Summary of Transactions Tables in Appendix L. The user will be able to include the Print Position Descriptor (PPD) field to aid in defining the supplemental image submitted on the Type-14 with the transaction. The record types accepted by NGI for the LFS TOT are expanded to allow for the following:

- 1 Type-1 Header Record

- 1 Type-2 Descriptive Record
- Latent image records consisting of either:
    - 1-14 Type-4/Type-14 Fingerprint Image Records
    - Or 1-10 Type-7 User Defined Image Records
    - Or 1-10 Type-13 Latent Friction Ridge Image Records

Users are encouraged to use the Type-13 record to submit latent friction ridge images, but NGI supports the legacy Type-4 and Type-7 records. If multiple images are submitted, the finger number or palm position code needs to be set and must be unique for each image. NGI is also expanding the use of the LFS to allow a tenprint image card to be submitted as LFS, taking on the functionality of the discontinued CFS and ELR. Therefore, the Type-14 image records have been included in the above listing.

1.6.3 Latent Submission Results (LSR TOT, EBTS Section 3.1.2)

The LSR message is an existing TOT returned by NGI in response to LFS messages. The message contains search results findings and Identity History Summary along with image types available if there is an identified subject. These changes will be applied to Section 3.1.2 along with the Summary of Record Type-2 Layouts found in Appendix D. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

The existing Search Results Findings field is expanded to support an "inconclusive" decision. The SCNA field will be included to specify the UCN given to the image if it is enrolled into the ULF.

1.6.4 Rapid Fingerprint Identification Search Submission (RPIS TOT, EBTS Section 3.1.3)

This message is a one-to-many, rapid response, and "Lights Out" search request of either the RISC Repository or the full Criminal repository in IdFP. RPIS was a new TOT introduced in Increment 2. It supported searches against the RISC repository only. NGI expands RPIS for Increment 3 to support rapid fingerprint searches for Customs and Border Protection (CBP) Primary Inspections at a Port of Entry (POE) against the Criminal repository. The NDR field will be used to distinguish between the two rapid search types after the usual authorization of ORI and TOT. These changes will be applied to Section 3.1.3 along with the Summary of Transactions Tables in Appendix L.

Rapid Search against RISC Repository

For the rapid search of the RISC repository, there are no functional changes to the Increment 2 design for RPIS content for RISC rapid searches. Increment 3 increases the possible fingerprint images allowed on the submission:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record
- Fingerprint Image Records:
    - 2-10 Type-4 Rolled or Flat fingerprint image records (valid FGP values of 1-14)
    - Or 1-14 Type-14 Rolled or Flat records with a total of 2-20 finger images present (valid FGP values of 1-15).

Rapid Search against CMF Repository

RPIS also supports the rapid search request of Customs and Border Protection (CBP) Primary Inspections at a Port of Entry (POE) against the full Criminal repository in IdFP. An RPIS with a repository designation of Criminal (NDR=1) is for searches from Customs and Border Protection (CBP) Primary Inspections at a Port of Entry (POE). It contains limited descriptive data and requires ten rolled or flat fingerprint images and only searches against the criminal repository (CMF). The types and quantities of logical records required in this RPIS search are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record
- Either:
    - 2-10 Type-4 Rolled fingerprint image records (valid FGP values of 1-10)
    - Or 2-10 Type-14 Rolled or Flat fingerprint image records (valid FGP values of 1-10).

If any of the ten fingers are amputated or unprintable, a value in the 2.084 AMP field is required in lieu of the fingerprint image.

1.6.5 Rapid Fingerprint Identification Search Response (RPISR TOT, EBTS Section 3.1.3)

This message is the successful response returned to an RPIS message. The error response to an RPIS message is the existing ERRT TOT as defined in the EBTS specification. For Increment 2 the RPISR is the response to rapid RISC searches. NGI expands RPISR to support the Customs and Border Protection (CBP) Primary Inspections at a Port of Entry (POE) search responses against the Criminal repository.

For increment 3 RPISR also supports the rapid search response of Customs and Border Protection (CBP) Primary Inspections at a Port of Entry (POE) against the full Criminal repository in IdFP. These changes will be applied to Section 3.1.3 along with the Summary of Transactions Tables in Appendix L.

When the response from a criminal repository search is returned, the SRF field in the Type-2 record is populated with either an “R” for Red indicating that a potential criminal match has been found or a “G” for Green indicating that no disseminable match has been found. No biographic data or identity information (such as FNU) is included in this response, it is expected a Red indicator response will be followed by a separate Tenprint Fingerprint Identification request message to provide the identity of the subject. These changes will be applied to Appendix C.

1.6.6 Biometric Image/Feature Retrieval Submission (IRQ TOT, EBTS Section 3.3.1.1)

This message is an existing IAFIS TOT used today to retrieve composite Tenprint Fingerprint image sets for identities. These changes will be applied to Section 3.3.1.1 along with the Summary of Record Type-2 Layouts in Appendix E. Additional changes will be applied to the Summary of Transactions Tables in Appendix L. In Increment 3, NGI expands this capability to also allow for the retrieval of:

1. Tenprint Fingerprint identity composite (legacy behavior) or specific biometric image sets
2. Fingerprint image sets along with associated feature sets for identities and specific biometric image sets in the FRIF
3. Palmprint image sets along with associated feature sets for identities and specific biometric image sets

4. Supplemental Print image sets along with associated feature sets for identities and specific biometric image sets.
5. Latent Print image sets along with associated feature sets for latent records and specific biometric image sets in the ULF

The IRQ continues to accept requests for multiple sets of images in the same message. Each request may reference images for either identities or specific biometrics. Where the legacy IRQ supported retrieval of one or more fingerprint images for multiple identities, the biometric image positions had to be the same for each identity retrieved. Increment 3 expands the existing capability to allow retrieval of specific image types and/or position codes for each requested image in a single IRQ request. In order to support multiple biometric sets and multiple modalities (image types) for an identity a new EBTS field has been created. This field is the Biometric Image Description (BID) field. If the new BID field is populated then the UCN (2.014) field is ignored.

The BID field is a set type where its repeating subfields define each image requested. The UCN subfield indicates the identity or latent record requested. The IMT field indicates the type of image requested. The Biometric Set Identifier (BSI) denotes the specific biometric set being requested. The FNR field indicates the finger or palm position code of the image, and coupled with the PPD field (populated when FNR equals 19), it indicates the position code of the supplemental print. The subfield UCN must be populated in the BID field.

The other rule that needs to be adhered to is that PPD is only specified if FNR is supplemental (19). If the BSI field is not present, the representative biometric set(s) are retrieved for the identity or latent record specified in the UCN field. The representative set for fingerprints will be a composite set of images, while the representative set of palmprints or supplemental prints will be the latest set. Otherwise, the specified fields are validated for consistency. The IMT field has been expanded to support Latent Prints and Composite Fingerprints and the FNR field is expanded to allow palmprint position codes as specified in the ANSI/NIST specification. These new and updated fields will be applied to Appendix C definitions.

The new BID field supports a repeating set of the following subfields:

1. UCN of the identity or latent record
2. IMT image type of the image to be retrieved
3. BSI of the biometric set to be retrieved
4. FNR is the fingerprint or palmprint position code of the image to be retrieved
5. PPD of the supplemental image to be retrieved when FNR equals supplemental (19)

As a summary, the UCN alone (with continued support for the FBI Number and Civil Record Number used in IAFIS) retrieves composite criminal finger images from IAFIS (default legacy behavior), the UCN with BSI will retrieve the specified image set, while the UCN with IMT retrieves the latest set of the specified type; i.e. composite Fingerprint, latest enrolled Palmprint, and latest enrolled Supplemental from the FRIF, and Latent Print from the ULF.

New fields include the Request Features Record (RFR) to request features with images (only for fingerprint events, palmprints or supplementals from the FRIF and latent prints from the ULF).

1.6.7 Image Request Response (IRR TOT, EBTS Section 3.3.1.4)

This message is an existing IAFIS TOT that is part of the successful response returned to an IRQ message. One IRR message is returned for each successfully retrieved biometric image set per identity.

These changes will be applied to Section 3.3.1.4 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L. The types and quantities of logical records required in an IRR message are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Records
- 1 Biometric Image Set (or subset of images for that set):
    - 1 Fingerprint Image Set (Type-4/14)
    - Or 1 Palmprint Image Set (Type-14/15)
    - Or 1 Supplemental Print Image Set (Type-14/15)
    - Or 1 Unsolved Latent Image (Type-4, Type-7, or Type-13)
- 0-1 Biometric Feature Set (For Increment 3, only Fingerprint, Palmprint and Supplemental features available in the FRIF and Latent features in the ULF are supported)

The FBI field now returns the UCN that may contain either the criminal FBI number (FNU), the Civil Record Number (CRN), or Unsolved Latent (SCNA) of the returned record. When a composite set is returned, no Biometric Set Identifier (BSI) is returned in the message. The new Biometric Image Available (BIA) field is added to reflect the biometric image types available for the Identity.

1.6.8 Image Summary Response (ISR TOT, EBTS Section 3.3.1.5)

This message is an existing IAFIS TOT that is part of the successful response returned to an IRQ message. The ISR message returns a summary of all of the biometric sets that were successfully returned from one IRQ request. These changes will be applied to Section 3.3.1.5 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

New fields added to the message are the Image Type (IMT) to specify the type of biometric set returned and Biometric Set Identifier (BSI) to specify the exact biometric set returned if the set is not a composite set. The FNU, SID, IMT, and BSI fields are all ordered such that the Nth occurrence of each field is partnered with the Nth element of the other three fields. SCNA is not included, just UCN. No indication is given as to whether features were returned with an image set.

1.6.9 Biometric Audit Trail Retrieval Query Request (BATQ TOT, EBTS Section 3.3.2.1)

This message is a new TOT used to retrieve the Audit Trail for a specific biometric set(s). An Audit Trail is defined as the details of when a biometric image has been disseminated. NGI Increment 3 supports the retrieval of audit trails for Palmprint biometric sets and Supplemental biometric sets in the FRIF along with retrieval of audit information for Unsolved Latent records in the ULF. In Increment 3, composite tenprint fingerprint dissemination is not audited as this continues to be managed by IAFIS and thus will not be reported. Future increments will support audit trail retrievals for additional biometric sets. These changes will be applied to Section 3.3.2.1 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

The main inputs are the UCN to specify the Identity or latent record, BSI to specify a specific biometric set, and IMT to specify the image types. Only the owner (contributor) of the biometric set is allowed to

request an audit trail, a transaction error is returned if anyone other than the owner tries to request it. The BATQ TOT request supports multiple image types per request. When BSI is provided, IMT is ignored. When IMT is provided without BSI, audit details are returned for all of the biometric sets of type IMT that are owned by the requestor for that Identity or latent record (UCN). When BSI and IMT are not provided, the audit trail details returned will consist of all biometric sets owned by the requestor. For Increment 3, this would provide Palmprint and Supplemental image audit information for a FRIF UCN, and Latent image audit information for a ULF UCN.

1.6.10 Biometric Audit Trail Retrieval Response (BATR TOT, EBTS Section 3.3.2.2)

This message is a new TOT that is a successful response returned to a BATQ message. This message contains details of when and how the biometric sets specified in a BATQ have been disseminated. Possible audit trail contents include when images are returned in responses to Biometric Image/Feature Retrieval Submissions and Latent Fingerprint Image Submissions and Investigations. If images from the requested biometric set have not been disseminated, a successful BATR is returned, but it does not have any instances of audit trail data. In Increment 3, composite tenprint fingerprint dissemination is not audited as this continues to be managed by IAFIS and thus will not be reported. For increment 3 if the requestor does not own any of the images based on the BATQ request criteria, this will result in a transaction error condition (ERRI), including the reason for the error in the MSG field. Also, if the BSI or IMT is not associated with the UCN, an ERRI would be the response. These changes will be applied to Section 3.3.2.2 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

A new Audit Trail Record (ATR) field is added to EBTS to support a repeating set of the following subfields for each requested image:

1) ORI of the originator that received the image
2) Date the images were disseminated
3) TOT used to acquire the image set
4) BSI of the image
5) IMT of the image
6) FNR of the image (supports fingerprint and palmprint position codes)
7) PPD of the supplemental image when FNR equals supplemental (19)

The FNR and PPD subfields are present in ATR to identify the image within the biometric set that was disseminated. If the max occurrences for ATR are reached the MSG field will be populated informing user that this scenario occurred. In addition to the new ATR field, the UCN, IMT, and BSI fields from the BATQ request are included to echo the query parameters back to the requester.

1.6.11 Latent Penetration Query (LPNQ TOT, EBTS Section 3.4.2.4)

This message is an existing IAFIS TOT that allows the user to check for the percentage of designated search repositories that are accessed by a latent friction ridge search. These changes will be applied to Section 3.4.2.4 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

NGI changes the LPNQ to support the return of penetration values for the Criminal and/or Civil repositories of the FRIF. While the newly added NDR field supports all valid values for NDR,

meaningful penetration values are only returned for Criminal and/or Civil repositories. If SPC(s) and/or ULF are the only entries for NDR then a penetration value for the Criminal repository is returned.

Although all the legacy biographic filter capability can be entered in the LPNQ Type-2, NGI will only utilize the biometric filter criteria FGP (and PPD when FGP =19) and Pattern Classification, and for further reduction the following legacy filter criteria are supported for reducing search space: NDR – Name of Designated Repository, DOB – Date of Birth (Only year of birth is used for filtering), RAC – Race, SEX – Sex, POB – Place of Birth, and CRI – Controlling Agency Identifier (Place of Arrest).

1.6.12 Latent Penetration Query Response (LPNR TOT, EBTS Section 3.4.2.5)

This message is an existing IAFIS TOT that is a successful response returned to an LPNQ message. These changes will be applied to Section 3.4.2.5 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

The Penetration Query Response field (PEN – EBTS Field 2.078) contains a penetration percentage as specified in the LPNQ request. The penetration value returned in the PEN field (2.078) will be a combined percentage of all the repositories specified in the LPNQ request except SPC and ULF. The NDR field from the LPNQ request is echoed back in the response. Appendix C will be updated with these changes.

1.6.13 Latent Friction Ridge Image(s) Investigation Search (LFIS TOT, EBTS Section 3.4.2.1)

The LFIS message is an existing IAFIS TOT used to request a latent friction ridge investigation search of the NGI FRIF and/or the NGI Unsolved Latent File (ULF). The LFIS search results are returned to the submitter with no FBI human intervention to extract features or confirm potential matches. The TOT can also request that the latent images for the submission be enrolled in the ULF. These changes will be applied to Section 3.4.2.1 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L. The record types accepted by NGI for the LFIS TOT are:

- 1 Type-1 Header Record
- 1-2 Type-2 Descriptive Records
- Latent Friction Ridge image records for search consisting of either:
    - 0-10 Type-4 Fingerprint Image Records
    - Or 0-10 Type-7 User Defined Image Records
    - Or 0-10 Type-13 Latent Friction Ridge Image Records

As with the LFS TOT, users are encouraged to use the Type-13 record to submit latent friction ridge images, but NGI supports the legacy Type-4 and Type-7 records. If multiple images are submitted, the finger number or palm position code needs to be set (in their respective logical record) and must be unique for each image. If the record is to be enrolled in the ULF, two Type-2 records are allowed. The Type-2 record that has biographic data to limit the FRIF search penetration should contain the ULF enrollment flag set to ‘N’ and the other Type-2 record that contains the biographic data to be stored with

the ULF enrollment should contain the ULF enrollment flag set to 'Y' (or omit the field as enrollment is the default action).

The RFR field is used to request features as well as images returned in the resulting candidate list; matching minutiae are also returned with this request. Within the Extended Feature Set (EFS) of the Type-9, the publicly available template is returned. The matching minutiae are also returned with this request in the Corresponding Points or Features (CPF) field (9.361) of the same Type-9 which will be defined in Appendix J. The NDR field accepts values specified in EBTS for Criminal File (FRIF), Civil File (FRIF), Unsolved Latent File (ULF), and FBI Special Population Cognizant (SPC) Files (FRIF or ULF). For SPCs, the requesting ORI must be authorized to search the requested SPC file. If the NDR field is not populated, the default is the Criminal File of the FRIF. The NIR field is used to request a lesser number of candidate images than candidate identifiers requested with the existing NCR field. This also limits the number of feature records returned if RFR is specified. As searches from legacy users who do not choose to change their applications do not contain these fields, the default behavior is to search the criminal identity group in the FRIF and return the same number of images as candidates. NGI may limit candidates and images returned even if more are requested.

1.6.14 Latent Friction Ridge Features Search (LFFS TOT, EBTS Section 3.4.2.2)

The LFFS message is an existing IAFIS TOT used to request a latent friction ridge search of the NGI Friction Ridge Identification File (FRIF) and/or the NGI Unsolved Latent File (ULF) with submitted features. The LFFS TOT is identical to the LFIS TOT except that friction ridge features are submitted along with latent images. The format of the features can be in the existing CJIS representation for compatibility. NGI will support the new ANSI/NIST Extended Feature Set (EFS) definition. Images sent with an LFFS message will be used for searching and will be stored with the ULF record if enrollment is requested. Because the current NGI solution reports a greater accuracy in matching ability when the image is included with the search, CJIS is encouraging users to also send an image with the LFFS. These changes will be applied to Section 3.4.2.2 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L. The record types accepted by NGI for the LFFS TOT are the same as those in IAFIS:

- 1 Type-1 Header Record
- 1-2 Type-2 Descriptive Records
- 1-10 Type-9 Friction Ridge Feature Records for search
- 0-10 Latent Friction Ridge image records for search consisting of either:
    - 0-10 Type-4 Fingerprint Image Records
    - Or 0-10 Type-7 User Defined Image Records
    - Or 0-10 Type-13 Latent Friction Ridge Image Records for search

If multiple feature records are submitted, the finger number or palm position code needs to be set (in their respective logical record) and must be unique for each record. As with the LFIS TOT, if the record is to be enrolled in the ULF, two Type-2 records are allowed. The Type-2 record has biographic data to limit the FRIF search penetration should contain the ULF enrollment flag set to 'N' (or omit the field) and the other Type-2 record contains the biographic data to be stored with the ULF enrollment should contain the ULF enrollment flag set to 'Y'.

The RFR field is used to request features as well as images to be returned with the resulting candidate list. Within the Extended Feature Set (EFS) of the Type-9, the matching minutiae is also returned with this request in the Corresponding Points or Features (CPF) field (9.361) which will be defined in Appendix J. As with the LFIS TOT, the NDR field accepts values specified in EBTS for Criminal Master File, Civil File, Unsolved Latent File, and FBI SPC Files (if the requesting ORI is allowed to search the requested SPC file) for this TOT. The NIR field is used to request a lesser number of candidate images than candidate identifiers requested with the existing NCR field. This also limits the number of feature records returned if RFR is specified. As searches from legacy users who do not choose to change their applications do not contain these fields, the default behavior is to search the criminal participation group in the FRIF and return the same number of images as candidates.

1.6.15 Search Results - Latent (SRL TOT, EBTS Section 3.4.2.3)

The SRL message is an existing TOT returned by NGI in response to LFIS and LFFS messages. The message contains a candidate list of potential matches from the repositories that were searched up to the number of candidates requested in the LFIS/LFFS. The SRL also returns the image from the biometric with the highest matching score for each candidate. These changes will be applied to Section 3.4.2.3 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

The record types included by NGI in the SRL TOT for NGI are:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record
- For each probe and candidate image (first 20 candidates only, depending on NIR field in LFIS or LFFS). For example, when NIR is 20, there will be 20 Type-9 records for the corresponding 20 candidate images and there will be Type-9 records for each of the latent images that comprise the probe (max of 10):
    - 1 Minutiae Record (Type-9; only if return minutiae data is requested, 'RFR', in the LFIS or LFFS)
    - In addition, each candidate will receive one of the following:
        - 1 Fingerprint Image Record (Type-4 or Type-14)
        - Or 1 Palmprint Image Record (Type-14 or Type-15)
        - Or 1 Supplemental Print Image Record (Type-14 or Type-15)
        - Or 1 Unsolved Latent Image (Type-4, Type-7, or Type-13)
        - Or when no image is available for the latent friction ridge feature that matched, Information about the owning ORI is specified in the NOT subfield

EBTS defines the existing CAN field (2.064) as consisting of two subfields – a UCN and a Name. NGI does not modify the structure of this field, but the UCN field in IAFIS only returns criminal FNUs where NGI returns UCNs, FNUs, and CRNs. For latent records from the ULF, the UCN will be returned (even if the old SCNA value exists). The existing EBTS candidate list (CAN) will continue to be included in the SRL with results from the search of fingerprint images, along with the new Candidate Investigative List (CNL) field with results from searching all image types. For the new CNL field, the IMT subfield indicates the type of image being returned and the PPD field coupled with the existing FGP field (when FGP equals 19) indicates the finger or palm position code of the image. If the IMT

field indicates a latent image, then the UCN subfield of the CNL field is a latent UCN for that candidate. The BSI for each image is returned. The new Biometric Image Available (BIA) field is provided to indicate the available biometric image types for the identity. The BSI and the BIA allow the recipient to request more images for the subject. The new CNL field supports a repeating set of the following subfields:

1. UCN of the candidate (FRIF or ULF member)
2. NAM of the subject
3. BSI of the candidate image
4. IMT of the candidate image
5. FGP of finger or palm
6. PPD of the supplemental image when FGP equals supplemental (19)
7. MSC (match score) of the candidate.
8. BIA (available biometric image types) for the candidate
9. NDR of repository(ies) the candidate resides in based on request
10. IDC of the Image Designation Character for candidate image and features (if included)
11. NOT of the owning ORI information when no image is available for candidate

While up to 99 matched identifiers can be returned, the additional image and minutiae content is limited to the first 20 matched images. The SRL supports the CNL field for tracing to proper images and features. Each candidate identified in the CNL field, with a maximum of 20 occurrences, is aligned to the associated image and features through the IDC subfield in the CNL. If the feature data was requested (RFR field in the request), then both the minutiae and the matched minutiae data (that used to select the candidate as a potential match) are returned in the Extended Feature Set (EFS) section of the Type-9 for each of the requested image (NIR). The matched minutiae are represented using the ANSI/NIST Extended Feature Set (EFS) format in the Type-9 record (CPF field 9.361) which will be defined in Appendix J. The UCN field (2.014) is added to the Type-2 to hold the new NGI UCN value for the latent enrollment. The legacy SCNA field remains and is also populated with the enrolled UCN as well. Since Increment 3 redefines SCNA to be an alpha-numeric this is possible. The new and updated fields will be applied to Appendix C.

1.6.16 Latent Repository Statistics Query (LRSQ TOT, EBTS Section 3.4.3.1)

This message is an existing IAFIS TOT used by NGI to retrieve the statistical breakdown of fields used to filter searches of the Criminal and/or Civil repositories of the FRIF. The fields in the LRSQ Type-2 record do not change.

1.6.17 Latent Repository Statistics Response (LRSR TOT, EBTS Section 3.4.3.2)

This message is an existing IAFIS TOT that is a successful response returned to an LRSQ message. The fields in the LRSR Type-2 record do not change, but the contents of the Repository Statistics Response (RSR) field contain fields used to filter searches of the NGI FRIF, which differ from the fields returned by IAFIS to filter searches of the IAFIS Criminal Master File. NGI expands further on the RSR field/file to include statistics on not only the Criminal repository but also the Civil and the Criminal and Civil

repositories combined. To support the additional statistics the RSR field is expanded from 32,000 bytes to 96,000 bytes. The field/file will include five columns:

1. Category String
2. Code Values
3. Criminal, the fraction of the file having that value of the category
4. Civil, the fraction of the file having that value of the category
5. Combined, the fraction of the Criminal and Civil files having that value of the category

In the native encoding formatting, the fields are separated by "whitespace" (spaces and/or tabs) with DOS end-of-line convention (CR+LF). A period character is used as a decimal point in the fraction values. The value should be interpreted as the percentage of records matching that category and code. Some records may specify multiple codes within the same category but such instances are undeterminable from this data. Data rows containing all zeroes will not be returned. These changes will be applied to Section 3.4.3.2 along with the field definition in Appendix C.

1.6.18 Unsolved Latent Match (ULM TOT, EBTS Section 3.5.1)

This message is an existing IAFIS TOT that notifies a ULF record owner that its record has been potentially matched by a search transaction. These notifications can occur after cascaded ULF searches or after Biometric Decision submission from a user that is not the owner of the ULF image. If a Biometric Decision of an IDENT is submitted and the requestor does not own the latent record or the searching image is also a latent then a ULM notification is triggered to the owner of the latent record. The message returns case and biographic data about both the enrolled ULF record as well as the matching search subject. These changes will be applied to Section 3.5.1 along with the Summary of Record Type-2 Layouts in Appendix E. Updates will also be applied to the Summary of Transactions Tables in Appendix L. The types and quantities of logical records required in a ULM message are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record
- One Latent Print Image for the ULF Owner's Record
    - 1 Unsolved Latent Friction Ridge Image (Type-4, Type-7, or Type-13)
    - Or Contact information about a latent friction ridge feature enrolled in the ULF not accompanied by an image
- One Image Set for the Matching Record Image Set (Probe Images)
    - 1 Fingerprint Image Set
    - Or 1 Palmprint Image Set
    - Or 1 Supplemental Print Image Set
    - Or 1 Unsolved Latent Friction Ridge Image (Type-4, Type-7, or Type-13)

The existing biographic fields are modified from mandatory to optional to support cascaded searches of the ULF where limited or no biographic data is provided. The four new fields shown all pertain to the probe (or search) record. The BSI field uniquely identifies the matching biometric set, the IMT field

indicates what type of biometric set matched the ULF record, and the PPD field works with the existing FGP field to identify the matching images if the matching set is a Supplemental Print set. The new Biometric Image Available (BIA) field is added to reflect the available biometric image types available for the Identity. The existing SCNA field is populated with the legacy SCNA value if NGI has it, if not it is populated with the UCN value for the ULF latent that matched. These updates will be applied to Appendix C.

1.6.19 Unsolved Latent Delete (ULD TOT, EBTS Section 3.6.1)

This message is an existing IAFIS TOT that allows a ULF record owner to request a delete of their image from the ULF repository. The existing SCNA field is populated with either the legacy SCNA value (this may be the only identifier the submitter has) or user can populate with the UCN of the latent record to be deleted. Since Increment 3 redefines SCNA to be an alpha-numeric this is possible. These changes will be applied to the Summary of Record Type-2 Layouts in Appendix E.

1.6.20 Unsolicited Unsolved Latent Delete (UULD TOT, EBTS Section 3.5.2)

This message is an existing IAFIS TOT that notifies a ULF record owner that its record has been deleted from the ULF due to space limitations. Deletions for other reasons involve an action on the record owner's part and as such do not generate a UULD. The UCN field is added to specify the UCN deleted from ULF. These changes will be applied to the Summary of Record Type-2 Layouts in Appendix E.

1.6.21 Unsolicited Hit Notification (UHN TOT, EBTS Section 3.5.6)

This message is the notification to a RISC record owner that its record has been hit by a search transaction. This notification message is designed to be flexible enough to support other notification types in the future and as such it is expected that additional optional fields may be added in the future. The TOT for this message is UHN to represent a generic Unsolicited Hit Notification. There are no changes to the Increment 2 TOT design.

1.6.22 Biometric Delete Request (BDEL TOT, EBTS Section 3.6.3.2)

This message is a new TOT used to request the deletion of a specific biometric set. NGI Increment 3 supports Palmprint Deletion and Supplemental Print Deletion against the FRIF repository. BDEL also supports deletion of Fingerprints from SPCs and Unsolved Latent Deletion of Latent Prints from the ULF. This TOT will support additional deletions in the future. Only a record's owner can request its deletion. The UCN and BSI are used to specify the specific image set being deleted from the FRIF and both fields are required. The BDEL can be used against the ULF where 3 combinations are supported: UCN/BSI, CIN, and CIN/CIX. The NDR field is provided when the delete is performed against specific identity groups (i.e. SPCs or other Identity Groups) to ensure the correct records are referenced. The legacy ULD TOT continues to be supported to allow deletion of ULF entries using the case identifiers CIN and CIX, or SCNA. These changes will be applied to Section 3.6.3.2 along with the Summary of Record Type-2 Layouts in Appendix I. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

1.6.23 Biometric Delete Response (BDELR TOT, EBTS Section 3.6.3.2)

This message is a new TOT that is a successful response returned to a BDEL message and indicates whether the latent was deleted from the ULF. If any permission or processing errors are encountered an error TOT, ERRA, is returned, so receipt of the BDELR indicates the requested delete was successful.

These changes will be applied to Section 3.6.3.2 along with the Summary of Record Type-2 Layouts in Appendix I. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

1.6.24 Biometric Decision Request (BDEC TOT, EBTS Section 3.6.3.3)

This message is a new TOT used to submit a match decision after an SRL response to a Latent Investigation search or in response to a ULM notification. It will be used for the submission of other biometric decisions in the future. These changes will be applied to Section 3.6.3.3 along with the Summary of Record Type-2 Layouts in Appendix I. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

The message requires identifiers about the matched candidate, the searching record (or probe), and the IDENT, NON-IDENT, or PENDING biometric decision. The candidate record can be identified through various field values: UCN (preferred) or legacy value SCNA (potentially from ULM). In all cases the BSI can optionally be provided to explicitly designate the image set used for the decision. The probe is identified by the TCR (1.010) field in the Type-1 record of the BDEC, it will contain the NGI Control Number (NCN) that resides in the TCN (1.009) field of the ULM or SRL. An IDENT decision on a latent record in the ULF will result in the record being deleted. The user will have the option to set a "retain in ULF flag" on an IDENT decision. If the submitter does not own the latent record or the probe is also an unknown (latent) then the latent record in the ULF is not deleted and a ULM notification is triggered to the owner of the latent record.

1.6.25 Biometric Decision Response (BDECR TOT, EBTS Section 3.6.3.4)

This message is a new TOT that is a successful response returned to a BDEC message. If any permission or processing errors are encountered an error TOT is returned, so receipt of the BDECR indicates the decision submission was successful. If the decision is IDENT and the matched candidate is a latent the MSG field will indicate if the latent was deleted. These changes will be applied to Section 3.6.3.4 along with the Summary of Record Type-2 Layouts in Appendix I. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

1.6.26 Biometric Enrollment Request (FIS TOT, EBTS Section 3.6.2 & 3.6.3)

This is an existing IAFIS TOT used by III/NFF states to submit a Fingerprint image set to possibly update (based on quality) images on file in IAFIS. This capability is expanded in NGI to support palmprint image sets and/or supplemental Print image sets. The FIS allows users to submit image sets to be attached to an existing event or to add image sets to an identity. For Increment 4 the Palmprints and/or Supplemental prints can be associated to an event using the Event Identifier (EVI) field. For Increment 3 users may not have the EVI to link to the prior Fingerprint enrollment event, but users will be able to link to the Identity (i.e. UCN), creating a new event. The Increment 3 FIS will also support Direct Enrollment of Palmprints, Supplemental prints, and Fingerprints to Criminal and Civil Identity Groups of the FRIF. Increment 4 will allow Direct Enrollment to SPCs to be designated as well. These changes will be applied to Section 3.6.2 & 3.6.3 along with the Summary of Record Type-2 Layouts in Appendix I. Updates will also be applied to the Summary of Transactions Tables in Appendix L.

The types and quantities of logical records required in an FIS submission are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record

1 or more image sets from the following:

a. 0-1 Fingerprint Image Set

b. 0-1 Palmprint Image Set

c. 0-1 Supplemental Print Image Set

For III/NFF state submissions, and other authorized ORIs, this submission is expanded to support Palmprint image sets and/or Supplemental Print image sets along with the Fingerprint image set for composite update in IdFP. The enrolled image set will assume the Identity Group(s) associated with the UCN given in the request.

For MOU states, a Direct Enrollment FIS submission do not need to contain Fingerprints for validation of the UCN. For MOU Direct Enrollment, where a UCN is provided and includes Palmprint and/or Supplemental biometric image set(s), the biometric image set(s) will become a new event for the identity, each biometric set assigned a unique BSI, and the submitted biometric image sets inherit the Identity Groups of the UCN specified in the request.

For non-MOU states, a Direct Enrollment of Palmprints and/or Supplemental prints must include a Fingerprint image set for validation of the UCN. The biometric image sets are enrolled to the FRIF Criminal repository after 2 validations are performed against the specified UCN: 1) the mandatory Fingerprint image set and 2) the distal fingerprints from the full Palm image and/or distal Fingerprints from the Supplemental (EJI) image. Once validation is complete, the submitted fingerprints and palmprints and/or supplementals are enrolled. If the validation of the distal fingerprints fails the palmprint and/or supplemental are enrolled, but the failure is logged. These updates will be applied to Appendix C.

1.6.27 Biometric Enrollment Response (FISR TOT, EBTS Section 3.6.2 & 3.6.3)

This message is an existing IAFIS TOT that is a successful response returned to a FIS message. These changes will be applied to Section 3.6.2 & 3.6.3 along with the Summary of Record Type-2 Layouts in Appendix I. Updates will also be applied to the Summary of Transactions Tables in Appendix L. The types and quantities of logical records required in a FISR message are as follows:

- 1 Type-1 Header Record
- 1 Type-2 Descriptive Record

The main change is to include the Biometric Set Identifier (BSI) for the biometric sets enrolled in processing the FIS message. The response contains the IMT for each biometric set submitted and its assigned BSI. The FIU field continues to indicate which fingers are replaced for III/NFF FIS messages including fingerprints, but as composite biometric sets are not maintained for Palmprint and Supplemental Print sets no corresponding values are sent back from the biometric sets. Thus, FIU is modified to be optional. The MSG field will be used to report if any of the specified images were below acceptable NGI quality level, which will prevent the image from being used for search. This condition does not prevent enrollment and thus is not an error condition. The MSG is also used to report Palmprint and/or Supplemental enrollment failures associated with a successful Fingerprint enrollment to the FRIF Criminal (this is the III/NFF Fingerprint update scenario). If the Fingerprint enrollment fails and there are associated Palmprint and/or Supplemental enrollments an ERRI will be returned where an additional message in the MSG field states that their enrollment was not attempted. If the FIS submission does not have Fingerprints and all the enrollments fail then NGI will return an ERRI indicating the failure(s) in the MSG field. If the FIS submission does not contain Fingerprints and one image type enrollment is successful and the other is not, then NGI will return a FISR indicating the failure in the optional MSG

field. The IMT field is used to specify the image type for each BSI successfully enrolled. The UCN field is used to return the identifier that was affected for the FIS submission. The UCN is that provided in the FIS submission, or, for increment 4, the new UCN created for the enrollment into the SPC. The BSI is of the enrolled biometrics.

1.7 Summary of Changes

The following table summarizes the changes being made to existing TOTs. It lists the TOTs and the fields that are being changed for that TOT. Also included are whether the field is mandatory or optional and what kind of change is being made to the TOT, such as a new field added to the TOT or the field is modified for new functionality being added. The column of great interest is 'Backward Compatible', which means if the user does not make the necessary changes described here will they still be able to communicate with NGI.

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.1.2	Latent Identification Search	LSR	SRF	Mandatory	Modified	To include 'inconclusive'	No
3.1.2	Latent Identification Search	LSR	IMT	Optional	New	Image Type Matched	Yes
3.1.2	Latent Identification Search	LSR	BSI	Optional	New	Biometric Identifier Matched	Yes
3.1.2	Latent Identification Search	LSR	PPD	Optional	New	Describe Supplemental Matched	Yes
3.1.3	Rapid Identification Search	RPIS	AMP	Optional	New	Allow for marking FGP not able to print	Yes

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.3.1	Biometric Image / Feature Retrieval	IRQ	RFR	Optional	New	Request Features along with Image	Yes
3.3.1	Biometric Image / Feature Retrieval	IRQ	BID	Optional	New	More descriptive of image(s) requesting	Yes
3.3.1	Biometric Image / Feature Retrieval	IRR	IMT	Optional	New	Image Type Retrieved	Yes
3.3.1	Biometric Image / Feature Retrieval	IRR	AMP	Optional	Modified	Increase to identify flat slap images	No
3.3.1	Biometric Image / Feature Retrieval	IRR	BSI	Optional	New	NGI Identifier of Image set returned	Yes
3.3.1	Biometric Image / Feature Retrieval	IRR	BIA	Optional	New	Other Biometrics available for Identity	Yes

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.3.1	Biometric Image / Feature Retrieval	ISR	FBI	Optional	Modified	Increase to allow for multiple biometrics on the same UCN	Yes, if the retrieval is only composite from IAFIS. No, when retrieving using new fields in IRQ for NGI images.
3.3.1	Biometric Image / Feature Retrieval	ISR	SID	Optional	Modified	Increase to allow for multiple biometrics on the same UCN	Yes, if the retrieval is only composite from IAFIS. No, when retrieving using new fields in IRQ for NGI images.
3.3.1	Biometric Image / Feature Retrieval	ISR	IMT	Optional	New	Image Types Returned	Yes
3.3.1	Biometric Image / Feature Retrieval	ISR	BSI	Optional	New	Biometric Image Set Identifier	Yes
3.4.2.4	Latent Penetration Query	LPNQ	NDR	Optional	New	Allow for Criminal or Civil or both Repositories	Yes

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.4.2.4	Latent Penetration Query	LPNR	NDR	Optional	New	Identify which repository the results are from.	Yes
3.4.2	Latent Friction Ridge Investigation Search	LFIS	RFR	Optional	New	Features Returned	Yes
3.4.2	Latent Friction Ridge Investigation Search	LFIS	NDR	Optional	New	Allow up to 10 occurrences	Yes
3.4.2	Latent Friction Ridge Investigation Search	LFIS	NIR	Optional	New	How many matched images to return	Yes
3.4.2	Latent Friction Ridge Investigation Search	LFFS	RFR	Optional	New	Features Returned	Yes
3.4.2	Latent Friction Ridge Investigation Search	LFFS	NDR	Optional	New	Allow up to 10 occurrences	Yes
3.4.2	Latent Friction Ridge Investigation Search	LFFS	NIR	Optional	New	How many matched images to return	Yes

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.4.2	Latent Friction Ridge Investigation Search	SRL	CNL	Optional	New	Replacing the current CAN field listing the matched candidates	No
3.4.2	Latent Friction Ridge Investigation Search	SRL	NIR	Optional	New	How many matched images retrieved	Yes
3.4.2	Latent Friction Ridge Investigation Search	SRL	FBI	Optional	New	New UCN for ULF enrolled	Yes
3.4.2	Latent Friction Ridge Investigation Search	SRL	SCNA	Optional	Modified	Allow for Alpha characters	No
3.5.1	Unsolved Latent Match Notification	ULM	NAM	Optional	Modified	Changed from Mandatory to Optional	No
3.5.1	Unsolved Latent Match Notification	ULM	DOB	Optional	Modified	Changed from Mandatory to Optional	No
3.5.1	Unsolved Latent Match Notification	ULM	SEX	Optional	Modified	Changed from Mandatory to Optional	No

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.5.1	Unsolved Latent Match Notification	ULM	RAC	Optional	Modified	Changed from Mandatory to Optional	No
3.5.1	Unsolved Latent Match Notification	ULM	HGT	Optional	Modified	Changed from Mandatory to Optional	No
3.5.1	Unsolved Latent Match Notification	ULM	WGT	Optional	Modified	Changed from Mandatory to Optional	No
3.5.1	Unsolved Latent Match Notification	ULM	EYE	Optional	Modified	Changed from Mandatory to Optional	No
3.5.1	Unsolved Latent Match Notification	ULM	HAI	Optional	Modified	Changed from Mandatory to Optional	No
3.5.1	Unsolved Latent Match Notification	ULM	IMT	Optional	New	Image Type Included	Yes
3.5.1	Unsolved Latent Match Notification	ULM	BSI	Optional	New	Biometric Image Set Identifier of image included	Yes

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.5.1	Unsolved Latent Match Notification	ULM	PPD	Optional	New	Descriptive of supplemental image included	Yes
3.5.1	Unsolved Latent Match Notification	ULM	BIA	Optional	New	Biometrics available for Identity included	Yes
3.5.2	Unsolicited Unsolved Latent Delete	UULD	FBI	Optional	New	New NGI UCN for ULF being deleted	Yes
3.6.3.1	Biometric Enrollment Response	FISR	MSG	Optional	New	Contain messages to contributor as if there was a problem with the enrollment.	Yes
3.6.3.1	Biometric Enrollment Response	FISR	IMT	Optional	New	Image Type enrolled	Yes
3.6.3.1	Biometric Enrollment Response	FISR	FIU	Optional	Modified	To allow for flat slap images being updated	No

EBTS Section	Service/ Function	TOT	Field	Mandatory/ Optional	Type of Change	Notes	Backward Compatible
3.6.3.1	Biometric Enrollment Response	FISR	BSI	Optional	New	New Biometric Image Set Identifier of image set enrolled	Yes

1.8 New TOTs and Elements Added

Below is a table summarizing all the new TOTs along with the fields being included with these new TOTs. The column 'New/Existing' refers to whether field being used is already defined. If we are changing the definition of an existing field, it will be described in the Notes column.

EBTS Section	Service / Function	TOT	Field	New/Existing	Mandatory/ Optional	Notes
3.3.2	Biometric Audit Trail Retrieval	BATQ	ATN	Existing	Mandatory	
3.3.2	Biometric Audit Trail Retrieval	BATQ	SCO	Existing	Optional	
3.3.2	Biometric Audit Trail Retrieval	BATQ	FBI	Existing	Mandatory	FBI Number (UCN)
3.3.2	Biometric Audit Trail Retrieval	BATQ	IMT	Existing	Optional	Image Set to Retrieve
3.3.2	Biometric Audit Trail Retrieval	BATQ	CRI	Existing	Optional	
3.3.2	Biometric Audit Trail Retrieval	BATQ	BSI	New	Optional	Biometric Image Set Identifier
3.3.2	Biometric Audit Trail Response	BATR	LEN	Existing	Mandatory	
3.3.2	Biometric Audit Trail Response	BATR	IDC	Existing	Mandatory	

EBTS Section	Service / Function	TOT	Field	New/Existing	Mandatory/ Optional	Notes
3.3.2	Biometric Audit Trail Response	BATR	ATN	Existing	Mandatory	
3.3.2	Biometric Audit Trail Response	BATR	SCO	Existing	Optional	
3.3.2	Biometric Audit Trail Response	BATR	FBI	Existing	Mandatory	FBI Number (UCN)
3.3.2	Biometric Audit Trail Response	BATR	MSG	Existing	Optional	Contain messages to contributor as if there was a problem with the retrieval request or there were more audit records then could be placed in this message.
3.3.2	Biometric Audit Trail Response	BATR	CRI	Existing	Mandatory	
3.3.2	Biometric Audit Trail Response	BATR	ATR	New	Optional	Audit Trail Record containing all the necessary information for each audit record available for the UCN and/or specified Biometric Image Set.
3.6.3.2	Biometric Deletion Submission	BDEL	ATN	Existing	Mandatory	

EBTS Section	Service / Function	TOT	Field	New/Existing	Mandatory/ Optional	Notes
3.6.3.2	Biometric Deletion Submission	BDEL	CIN	Existing	Optional	Contributor Case number associated with ULF being deleted.
3.6.3.2	Biometric Deletion Submission	BDEL	CIX	Existing	Optional	Contributor Case Extension number associated with ULF being deleted.
3.6.3.2	Biometric Deletion Submission	BDEL	CRI	Existing	Mandatory	
3.6.3.2	Biometric Deletion Submission	BDEL	FBI	Existing	Optional	NGI UCN for Identity being deleted.
3.6.3.2	Biometric Deletion Submission	BDEL	NDR	Existing	Optional	Repository to delete from (ULF or SPC)
3.6.3.2	Biometric Deletion Submission	BDEL	BSI	New	Optional	Biometric Image Set Identifier
3.6.3.2	Biometric Deletion Response	BDELR	ATN	Existing	Mandatory	
3.6.3.2	Biometric Deletion Response	BDELR	CRI	Existing	Mandatory	
3.6.3.2	Biometric Deletion Response	BDELR	FBI	Existing	Mandatory	NGI UCN for Identity that was deleted.

EBTS Section	Service / Function	TOT	Field	New/Existing	Mandatory/ Optional	Notes
3.6.3.3	Biometric Decision Submission	BDEC	ATN	Existing	Mandatory	
3.6.3.3	Biometric Decision Submission	BDEC	CIN	Existing	Optional	Contributor Case number associated with ULF being deleted.
3.6.3.3	Biometric Decision Submission	BDEC	CIX	Existing	Optional	Contributor Case Extension number associated with ULF being deleted.
3.6.3.3	Biometric Decision Submission	BDEC	SRF	Existing	Mandatory	Decision being made
3.6.3.3	Biometric Decision Submission	BDEC	CRI	Existing	Mandatory	
3.6.3.3	Biometric Decision Submission	BDEC	FBI	Existing	Optional	NGI UCN of Identity in FRIF if positive decision
3.6.3.3	Biometric Decision Submission	BDEC	BSI	New	Optional	Biometric Image Set Identifier
3.6.3.3	Biometric Decision Submission	BDEC	Delete from ULF	New	Optional	Flag to retain in ULF (waiting for LM to give field name)
3.6.3.3	Biometric Decision Response	BDECR	ATN	Existing	Mandatory	

EBTS Section	Service / Function	TOT	Field	New/Existing	Mandatory/ Optional	Notes
3.6.3.3	Biometric Decision Response	BDECR	CRI	Existing	Mandatory	
3.6.3.3	Biometric Decision Response	BDECR	FBI	Existing	Mandatory	NGI UCN decision was applied to