X-Sieve: CMU Sieve 2.2
Cc: "Frances Zelazny" <Frances.Zelazny@Identix.com>
To: DraftFips201@nist.gov
Subject: Comments on Public Draft FIPS 201
Date: Wed, 22 Dec 2004 19:33:34 -0500
From: "Paul Griffin" <Paul.Griffin@Identix.com>
Organization: Identix
User-Agent: Opera M2/7.54 (Win32, build 3869)
X-OriginalArrivalTime: 23 Dec 2004 00:33:34.0712 (UTC) FILETIME=[09476780:01C4E887]
X-MailScanner:
X-MailScanner-From: paul.griffin@identix.com

Are attached. Go NIST!

--Paul
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Paul A. Griffin, Ph.D.
Chief Technology Officer
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 IDNX_Comments.xls

Submitted by: _____

Date: _____

Cmt #	Organization	Point of Contact	Comment Type (G-General, E-Editorial, T-Technical)	Section,Annex,etc and Page Nbr	Comment(Include rationale for comment)	Proposed change			
0	Identix, Inc	Paul Griffin	G		Contact Information: Paul Griffin, Chief Technology Officer, Paul.Griffin@Identix.com, Identix, 5600 Rowland Road, Minnetonka, MN 55343				
1	Identix, Inc	Paul Griffin	T	4.4.4 p. 34	CBEFF Patron Type for finger image is not specified. The ANSI 381 Finger Image Format does not specify the CBEFF patron format. In CBEFF NISTIR 6529, three options are discussed - A, B(BioAPI), and C (X9.84). To maximize interoperability, FIPS 201 should specify a particular format.	Add - The patron format B specifed in NISTIR 6529 shall be used.			
2	Identix, Inc	Paul Griffin	T	4.4.4 p.34	The CBEFF SBH Security field is not specified. As the intent of the stored biometric data is to be stored and unsigned, (the signature is specified specific to FIPS 201 this field should be specified	The SBH security field in the CBEFF header shall be specified as 0x00			
3	Identix, Inc	Paul Griffin	T	4.4.4 p. 34	Labeling of finger and denotion of primary and secondary finger. Timing (see IBIA information specified in A1 below) indicates that the processing time for a two-finger match may be as much as 8 seconds on a 200 Mhz PAC device. As two-finger identification is not specified, and single finger ID is generally used for AC, there is no need to download and process both finger images. Rather, one should be denoted as primary, and the other as secondary. This will reduce the biometric processing time down to 4 seconds.	A finger shall be labeled as primary or secondary for the purposed of single finger authentiation. Unless there are specific user issues, the right hand shall have the primary finger and the left shall have the left. In all cases, the first finger image stored (lowest order memory on the card) shall be denoted as primary. [We urge the editors of FIPS 201 to construct the appropriate solution to this specification problem.]			
4	Identix, Inc	Paul Griffin	T	4.4.4 p. 34	No quality level for the finger image is specified. As interoperability is paramount for use of this data, both image quality and data quality standards should be specified, much as the slap capture data quality used for PIV-I background checks. Note that a careful reading of PIV-2 does not imply that the captured PIV-I slap data shall be used on the PIV-2 card – if this is the intent, then this should be explicitly stated in 4.4. Otherwise, separate quality for the card fingerprint data must be specified.	The single finger sensor used for enrollment shall conform to ANSI 381 Quality Settings Level 31 (500 dpi, EFTS/Appendix F certification). The quality discussed in section 7.2.5 of ANSI 381 shall denote the NIST finger image quality method (NFIQ) discussed in NISTIR 7151. The NFIQ module shall be applied to every finger image before storage on the PIV card is accomplished. A NIST quality of 5 (extrememly poor) fingerprint shall not be allowed on the PIV-II card.			
5	Identix, Inc	Paul Griffin	T	4.4.4 p. 34	No compression level for the fingerprint is specified	The maximum average WSQ compression level shall be no kore than 15:1. WSQ compression algorithms shall be NIST certified for use with PIV-II card creation.			

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6	Identix, Inc	Paul Griffin	T	4.4.4 p. 34	No minimum or maximum image size for the finger image is specified. A minimum size is required to assure that enough data is present for good matching with most algorithms. A maximum size is required to allow storage of all data on the PIV card. See A2 (below) for estimates of file sizes.	The minimum size for each single finger image shall be 1.524 cm x 1.524 cm (0.6 x 0.6 inches). The maximum size of each single finger image shall be 2.16 cm x 2.16 cm (0.85 x 0.85 inches). If a larger image must be cropped, then the cropping shall be with respect ot the center of mass (greyscale center) of the image. The maximum size of a ANSI 385 finger image shall be 12 kb. The minimum size shall be 6 kb. It is recommended to use larger size images to reduce biometric rejection rates.			
7	Identix, Inc	Paul Griffin	T	4.4.5 p. 35	CBEFF Patron Type for face image is not specified	Add - The patron format B specifed in NISTIR 6529 shall be used.			
8	Identix, Inc	Paul Griffin	T	4.4.5.3 p. 35	Face Image color space and face image size do not correspond. ANSI 385 allows for YUV 422, which allows for the encoding of a pixel with two bytes (verses three for RGB888, or 1.5 with YUV 411). Therefore, the total uncompressed data size is 640x480x2=614400 bytes. A 30:1 compression level allows for a size of 20,480 bytes = 20 kb.	Change table 4-7 value Uncompressed data size to 614400 bytes. Add to 4.4.5.5 "The maximum size of a Face Image Format record shall be 21 kb. The minimum size of a non-ROI face image record shall be 19 kb.			
9	Identix, Inc	Paul Griffin	T	4.4.5.5 p. 35	Region of interest compression is denoted in the image but is not specified in the text. ROI compression will allow for a reduced face image file size with equal quality for human and computer automated verification.	Region of interest (ROI) compression allows for a reduce format size. Section 4.4.5.5.1 would define ROI compression using the region defined in figure 4-4. The inner region of (width,height)=(384,480) shall be compressed no greater than 24:1 for a size of 15 kb, and the outer region compressed not greater than 120:1. [Note that JPEG *does* allow for ROI compression. Identix is releasing public domain source code based upon JPEG for unrestricted use.] The minimum size of a ROI compressed face image is 16.5 kb.			
10	Identix, Inc	Paul Griffin	T	4.4.3 p. 32	Minimum Slap platen size is not specified	Please verifiy with the DoJ that the FBI system does require a minimum slap 4-finger platen slize for scanners and include in the the PIV specification.			
11	Identix, Inc	Paul Griffin	T	4.4.3 p. 32	Thumb slap image size is unusual	Please verifiy the 2 inch wide thumb record specification. We believe this to be 3 inches, but the DoJ is the final authority on this.			

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12	Identix, Inc	Paul Griffin	G	page vi, section 10, and 4.4 p. 30	Comments on use of minutia-based template in PIV - As the ILO testing and the NIST minutia testing is accomplished and vendors are scientifically qualified producing interchangable data, it will make some sense to allow for the ANSI 378 type minutia on the PIV card. We would suggest that when such compatibility has been determined by NIST, that an optional format of a single (primary) finger image and two (primary and secondary fingers) minutia templates be allowed. NIST would determine the precise sub-format of 378 to specify.	page vi. Section 10. In addition, the maintenance agency shall review this standard within two years to determine the feasability of using an alternate storage mechanism for fingerprint match information. Section 4.2 After the conclusion of the MINEX04 evaluation, NIST will attempt to specify conformance requirements for the alternate use of a single finger image and two minutiae-based templates in replacement of the two fingerprint image specification provided in this document. If successful, NIST will publish, within two years of issuance of FIPS 201, a revised biometric storage specification allowing for this alternate format.
13	Identix, Inc	Paul Griffin	G	section 4.4	There is confusion on the amount of storage required for the biometric information	Please add a table similar to that below (A4) and discussion - The maximum storage size required for the biometrics is 41 kb and the minimum is 33 kb. The variation is due to allowed sensor sizes and the effectiveness image compression algorithms on different data. Note that a face typically requires twice the storage space of a fingerprint due to the encoding of color.

Notes

A1 **Timing Estimates (Provided by the IBIA)**

Process	Seconds
Transfer (2 images @ 10Kbytes ea.)	
9600 baud	
115Kbaud	2.9
Signed data decoding[1]	
200MHz	1.5
Decompression[2]	
200MHz	2
Encoding ("lite")	
200MHz	1.5
Encoding ("detailed")[3]	
200MHz	3.5
Matching (1:1)	
200MHz	0.3
Total, "Lite"	8.2
Total"Detailed"	11.7

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			[1] A conservative estimate, give or take .5 seconds					
			[2] Assumes a non-linear decrease in computing time over clock time					
			[3] Worst case scenario assumes that both fingers require detailed encoding. If only one finger requires detailed encoding, the worst case would be around 45 seconds.					
A2					**Two Finger Image Format Sizes**			
	Width	Height	dpi	compression	size (1kb = 1024 bytes)			
		0.6 in	500	15/1	5.86 kb			
Min	0.7 in	0.7 in	500	15/1	7.97 kb			
Max	0.85	0.85 in	500	15/1	11.76 kb			
A3					**Face Image Format Sizes**			
	Width	Height	bytes	compression	size (1kb = 1024 bytes)			
No ROI	480	640	614400	30/1	20 kb			
ROI inner region	384	480	368640	24/1	15 kb			
ROI outer region	256	480	245760	120/1	2 kb	Width of 256 =640-284		
ROI Total	480	640	614400	35.3/1	17 kb			
A4					**Biometric Storage Requirements**			
			Fingerprint	Face	Total			
		Maximum	2*12kb=24kb	21kb	41kb			
		Typical	2*8 kb= 16 kb	18 kb	34 kb			
		Minimum	2*5.9kb=11.7k	17kb	28.7kb			

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