NIST/ITL Conformance Test Architecture

Beta Implementation V2.0

Conformance Test Suite for the PIV Profile of ISO/IEC 19794-6 rev for Images Stored on PIV Cards

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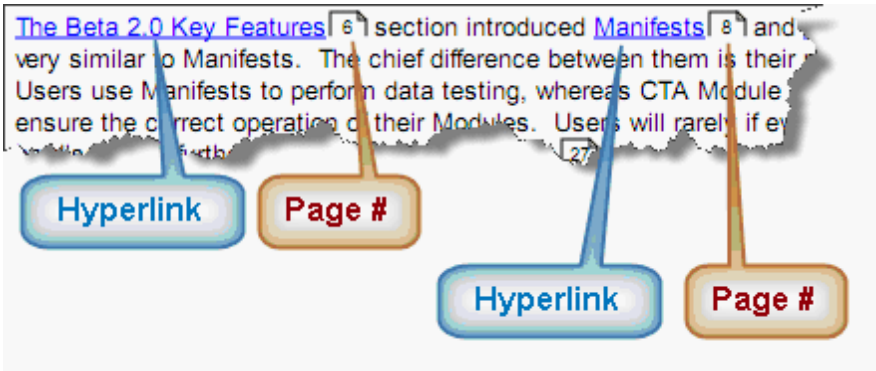
Note about Document References

When one part of this document refers to another part, the document's format helps you find the related information quickly and easily, whether you are reading an electronic or printed copy.



The image above illustrates the formatting. The top line has two references to other parts of the document. As shown, each reference has a *Hyperlink* and a *Page Number*.

- If you are reading an electronic copy simply click the Hyperlink to navigate to the reference.
- If you are reading a printed copy, turn to the indicated page to located the referenced material.

1 System Requirements

The Conformance Test Suite for the PIV Profile of ISO/IEC 19794-6 rev for Images Stored on PIV Cards requires the following:

- NIST/ITL CSD Conformance Test Architecture Beta 2.0
  - http://www.nist.gov/itl/csd/biometrics/biocta_download.cfm
- Microsoft® Windows® (XP, Vista, 7)
- .NET Framework 4.0

2 Disclaimer

DISCLAIMER FOR

NIST/ITL CONFORMANCE TEST ARCHITECTURE (CTA)

BETA IMPLEMENTATION V2.0

October 2010

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3 Relevant Standards and Documents

Standards:

The CTS is currently designed to test implementations of the profile of ISO/IEC 19794-6 rev for images stored in the PIV card [1]. Level 1 and 2 tests for the mandatory and optional requirements are implemented[1].

As specified in the PIV Profile of ISO/IEC 19794-6 rev for Images stored on PIV Cards, section 7.4, "Where required values and practice are not stated, the underlying requirements of the base standard shall apply." the CTS is also aligned with portions of the base standard [2].

The CTS is also aligned with the associated conformance testing methodology (CTM) which is being developed as an Amendment to ISO/IEC 19794-6 revision. The pertinent CTM document is ISO/IEC 2nd Working Draft 19794-6 revision Amendment 1 [3].

1) DRAFT NIST Special Publication 800-76-2, PIV Profile of ISO/IEC 19794-6 rev for Images Stored on PIV Cards

a) Section 7.4 - Iris Image specification for PIV Cards

b) Section 9 - Common header for PIV biometric data

2) ISO/IEC JTC 1/SC 37 N 4321, text of ISO/IEC FDIS 19794-6 revision, Biometric data interchange formats – Part 6: Iris image data

3) ISO/IEC JTC 1/SC 37 N 4247, text of ISO/IEC 19794-6 revision/PDAM 1 (Proposed Draft Amendment), biometric data interchange formatsAmendment 1: Conformance testing methodology

Documents (available at http://www.nist.gov/itl/csd/biometrics/biocta_download.cfm):

- Conformance Test Architecture for Biometric Data Interchange Formats - Version Beta 2.0, NISTIR 7771, February 2011, *Fernando Podio, Dylan Yaga, Mark Jerde*
- Conformance Test Architecture User Guide, May 2010, *Dylan Yaga, Mark Jerde, Fernando Podio*

[1] In Level 1 testing, an implementation is checked field-by-field, for conformance with the specification of the standard, both in terms of ranges, character types, encoding and cardinality. In Level 2 testing, an implementation is checked to determine if it is internally consistent. This is achieved by relating values from one or more fields or information items within an implementation to other values within the same implementation. Level 2 tests require more complex testing than Level 1, usually after the entire implementation has been parsed.

3.1 Differences from Standards

Level One Testing

- N/A

Level Two Testing

- The Field, "20_PixelDepth" from the Representation Header, is not currently checked against the meta data of the image.

4 Supported Test Types

When developing Test Cases the NIST/ITL CSD CTA Beta 2.0 supports four testing types. These types allow for a more granular testing environment that can cover more situations with fewer tests.

Test Type Name	Description	Supported	Additional Types Included
Data Only	Only the field values are tested. Structure and field relations are not considered in this test.	Yes	
Structure Only	The order and structure of the fields is tested.	Yes	
Partial	This testing type has limited support for VGA Dimension checking.	No	
Complete	Complete testing performs all tests and is the same testing that is used w ith binary files.	Yes	Data Only Structure Only

5 CBEFF Biometric Organization Identifiers

Below are the contents of the file `ValidBdbFormatOwners.txt` (located in the CTA Directory) showing the valid and invalid CBEFF Biometric Organization Identifiers at the time this Module was published.

```
# Last Update: 2-15-2011 by Dylan Yaga
#  URL:  http://www.ibia.org/cbeff/_biometric_org.php
#
# Previous Update:  5-11-2010 by Mark Jerde
#  URL:  http://www.ibia.org/cbeff/_biometric_org.php
#
# NOTE:  The codes "0000" and "0001" are missing from the ibia.org
#        page.  Fred Herr of ID Technology Partners and Chairman of
#        M1.2, the Task Group on Biometric Technical Interfaces and
#        Profiles, confirmed on 3-26-2010 that these codes should
#        be included.  He wrote regarding an earlier version of
#        this file,
#            "Your text file is historically correct and while
#             additions can be made to it, no existing content
#             should ever be changed or deleted."
#
# File Format:
#    Valid Codes:    The hexidecimal CBEFF Biometric Organization
#                    Identifier must be the first four characters
#                    on the line.  All other characters on the
#                    line are ignored.
#
#    Invalid Codes:  A minus sign ("-") must be the first character
#                    on the line.  The next four characters are the
#                    hexidecimal invalid code.  All other characters
#                    on the line are ignored.
#
# Invalid Codes
-0000 Not for Use
-FFFF Not for Use

# Valid Codes
0001 SAFLINK Corporation
0002 Bioscrypt, Inc.
0003 Identix Corporation
0004 Infineon Technologies, AG
0005 Iridian Technologies, Inc.
0006 Veridicom, Inc.
0007 Cyber SIGN, Inc.
0008 eCryp, Inc.
0009 Fingerprint Cards AB
000A SecuGen Corporation
000B Precise Biometrics, AB
000C Identix, Inc.
000D DERMALOG Identification Systems, GmbH
000E LOGICO Smartcard Solutions, AG
000F National Institute of Standards and Technology (NIST)
0010 A 4 Vision, S.A.
0011 NEC Solutions America, Inc.
0012 UPEK, Inc.
0013 Ultra-Scan Corporation
0014 Aurora Wireless Technologies, Inc.
0015 Thales Identification
```

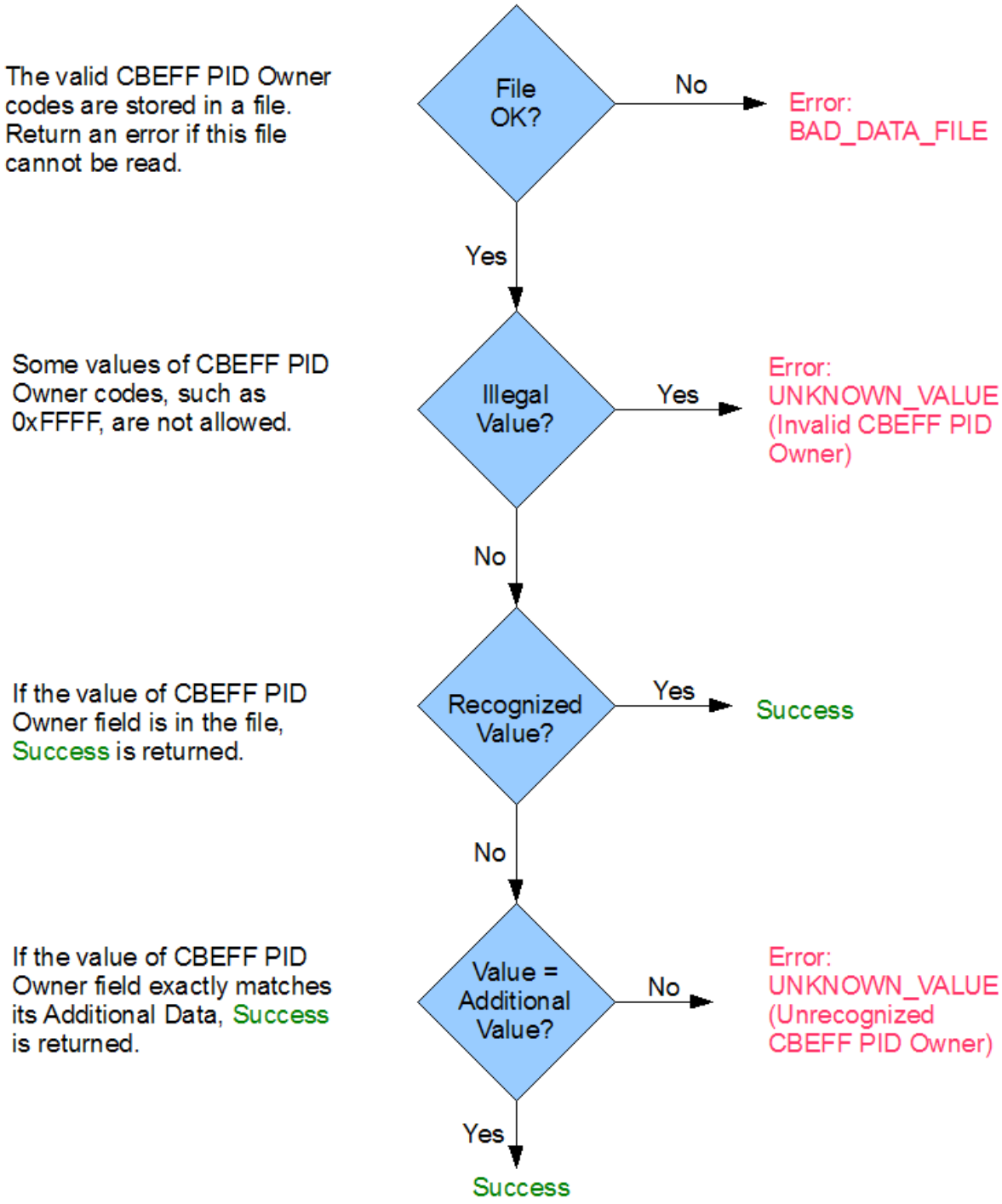
```
0016 International Biometric Group
0017 Cogent Systems, Inc.
0018 Cross Match Technologies, Inc.
0019 Recognition Systems, Inc.
001A German Institute for Standardization (Deutsches Institut fur Normung E.V.-DIN)
001B INCITS Technical Committee M1 - Biometrics
001C NITGEN
001D Sagem Morpho
001F BioLink Technologies International, Inc.
0020 ActivCard, Inc.
0021 HumanScan GmbH
0022 AcSys Biometrics Corp.
0023 Silex Technology, Inc.
0024 SITA (formerly Bio Wise, NV)
0025 Lumidigm
0026 Guardware Systems, Ltd.
0027 InvestorsHelpers, Inc.
0028 Validity, Inc.
0029 Viisage
002A LG Electronics USA, Inc.
002B StarTek Engineering, Inc.
002C JANUS Associates, Inc.
002D OmniPerception Limited
002E Motorola
002F CryptoMetrics
0030 BIO-key International
0031 Neurotechnologija
0032 Antheus Technology
0033 DigitalPersona, Inc.
0034 XTec, Incorporated
0035 Innovatrics
0036 East Shore Technologies
0037 Hitachi, LTD
0038 123ID, Inc.
0039 Bio-Key International
003A Griaule Tecnologia LTDA
003B Aware, Inc.
003C Sonda Technologies
003D Secure Design
003E Veridt
003F id3 Semiconductors
0040 Green Bit Americas Inc.
0041 Atmel
0042 Authen Tec
0043 Image Ware Systems, Inc.
0044 Suprema, Inc.
0045 Biovision
0046 Fujitsu Ltd
0047 AOptix
0048 Digent Co., Ltd
0049 Warwick Warp Ltd
004A Eastern Golden Finger Technology Beijing Co., Ltd
004B Federal Office for Information Security (BSI)
004C BioLogica Sistemas Ltda
004D Futronic Technology Co. Ltd.
004E IriTech, Inc.
004F PJSC "KP VTI"
0050 jFinger Co., Ltd.

0101 ISO/IEC JTC 1 SC 37-Biometrics
0102 ISO/IEC JTC 1 SC 27 IT Security techniques
```

FEFE Private use, not uniquely assigned by IBIA
FFF0 Reserved for Testing
FFFE Reserved for Testing

6 CBEFF PID Owner Additional Data

The **Additional Data** for the ***CBEFF PID Owner*** field is processed as shown in this flowchart.



7 Error Messages

This table lists the error messages returned by this Module. Supporting information is returned with the Error message so the meaning is unambiguous.

Name	Description
BAD_BDB_LENGTH	Either the content of the BDB is missing or zero (0) length when it should be present, or it is present when it should not be.
BAD_DATA_FILE	A system error. The module was unable to read the corresponding data file. For example if this error occurs when processing the Format Owner field, the module could not process the file of valid Format Owners.
BAD_LENGTH	The field content is not an allowable length.
UNDEFINED_FIELD	Undefined field in the Manifest or Test Case. This error usually occurs when the Manifest or Test Case is opened with a different module selected than the one used to create it. The error can also happen if the Manifest or Test Case becomes corrupted, such as by being incorrectly edited outside of the CTA program.
UNKNOWN_VALUE	An unknown or incorrect value was found in the field under test.
ENDIAN_ISSUE	The mutli-byte quantities have been encoded are not of the correct endian-ness.
REPRESENTATION_LENGTH	The actual length of the representation does not match the stated length.
IMAGE_DATA_LENGTH_ASSERTION	The asserted length of the image data does not match the actual length of the data.
INVALID_RECORD_LENGTH	The stated length of the image data does not match the actual length of the data.
EXPECTED (Field)	Missing a field that is expected at this location. (Primarily in Test Cases)
EXPECTED_END_OF_RECORD	The field is past the expected end of the record.
UNEXPECTED_END_OF_RECORD	One or more fields are missing at the end of the record.
UNEXPECTED_FIELD	The field placement is unexpected in its location.
STRUCTURE	Unable to parse the structure completely, possible errors.
REPRESENTATION_MISMATCH	The number of representations stated does not match the number of representations counted.
NUMBER_OF_EYES_MISMATCH	The Number of Eyes Represented field does not match the value of the Number of Eyes read.
IRIS_CENTER_BOUNDS	There is a problem with the iris center.
COMPRESSION_MISMATCH	The first few bytes of the image do not match the compression algorithms known bytes.

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