FIPS 201 Evaluation Program -
CHUID Authentication Reader (Contact) Approval Procedure

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Document History

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Approved	1.0.0	07/18/07	Document creation.	Public
Approved	2.0.0	10/31/07	Updated to split approval processes from document. Processes can now be found in Suppliers Handbook.	Public

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1 Introduction

1.1 Overview

The FIPS 201 Evaluation Program (EP) is a U.S. Government entity administered by the Office of Government-wide Policy (OGP), within the General Services Administration (GSA) agency. The goal of the FIPS 201 Evaluation Program (EP) is to evaluate products and services against the requirements outlined in FIPS 201 and its supporting documents. In addition to derived test requirements developed to test conformance to the National Institute of Standards and Technology (NIST) Standard, GSA has also established interoperability and performance metrics to further determine product suitability. A set of approval and test procedures have been developed which outline the evaluation criteria, approval mechanisms and test process employed by the Laboratory during their evaluation of a Supplier's product or service against the requirements for that category.

A Supplier desiring to submit a CHUID Authentication Reader (Contact) (hereafter referred to as the Product) for evaluation must follow the Suppliers Policies and Procedures Handbook. In addition to this handbook, Supplier also need to refer to this Approval Procedure which provides the necessary category-specific details in order to have a Supplier's Product evaluated by the EP and placed on the Approved Products List (APL).

1.2 Category Description

The *CHUID Authentication Reader (Contact)* is a smart card reader with the capability to access and determine authenticity of the CHUID (as defined by SP 800-73, Section 1.8.3) stored on PIV Card. Authenticity will be determined by verifying the CHUID signature, followed by building a trusted path between the CHUID signer's certificate and the root Certification Authority (CA) which issued the CHUID signer's certificate, including intermediate certificates. After an authentic CHUID has been determined, reader will provide a user access control decision based person identifier values of the FASC-N and optionally other person identifier data elements of the CHUID. This reader uses the contact interface.

1.3 Purpose

The purpose of this document is to provide the following information:

(i) Provide a list of the artifacts and/or documentation that needs to be submitted to the Evaluation Lab as part of the application package submission.
(ii) Document the list of the requirements that apply to this category
(iii) Specify the evaluation criteria along with their approval mechanisms that will be used by Evaluation Labs to verify compliance of the Product against the requirements that apply to this category.

2 Application Package Contents

The Application Package Contents include the artifacts, documentation and in some cases the product itself that needs to be submitted to the Evaluation Lab so that evaluation can be performed. The Application Package Contents for this category include the following:

- The Product itself. This should be delivered to the lab (address can be found at http://fips201ep.cio.gov/labs.php) using a reliable method of delivery (e.g., FedEx, UPS, hand delivery);
- Completed Application Form, provided on the Evaluation Program website. (This form will be available through the web interface once users have been assigned a login credential.);
- Completed and signed Lab Service Agreement (found in the application submission package ZIP file). The Lab Service Agreement should be completed and scanned into a document to be uploaded to Evaluation Program website;
- Completed and signed Attestation Form (found in the application submission package ZIP file). The Attestation Form should be completed and scanned into a document to be uploaded to Evaluation Program website;
- Completed Supplier VDR-VTDR justification worksheet (found in the application submission package ZIP file);
- A Vendor Test Data Report, which provides test results showing that the Product complies with the requirements for this category. In this regard, the Supplier is expected to develop and document the test procedures used to determine how the Product was tested to arrive at the conclusion that it met all necessary requirements. The VTDR must at a typically contain information as stated in Section 3.2. Wherever possible, information to be supplied as part of this Vendor Test Data Report has been described in Section 4.3; and
- All necessary Supplier documentation providing proof that the Product complies with the subset of requirements (as outlined in Section 4.1) for this category which has Vendor documentation review as its approval mechanism. Examples of specific documentation would include: user guides, technical specifications, white papers, line cards, etc.

3 Evaluation Procedure for CHUID Authentication Reader (Contact)

3.1 *Requirements*

In order to approve the Product as conformant to the requirements of PIV, it at a minimum, must comply with all the requirements listed below. The approval mechanism column describes the technique utilized by the Lab to evaluate compliance to that particular requirement.

Identifier #	Requirement Description	Source	Reqt. #	Approval Mechanism
R-CHU-CA.1	Contact card readers shall conform to the ISO 7816 standard for the card-to-reader interface.	FIPS 201, Section 4.5.1	1.1-147	Vendor Documentation Review
R-CHU-CA.2	Logical contact card readers shall conform to the Personal Computer/Smart Card (PC/SC) Specification for the reader-to-host system interface in general desktop computing environment.	FIPS 201-1, Section 4.5.2	1.1-148	Vendor Documentation Review
R-CHU-CA.3	PIV readers shall support the Class A operating class as defined in ISO/IEC 7816-3:1997 and ISO/IEC 7816-3:1997/Amd 1:2002.	Card /Card Reader Interoperability Requirements, Section 2.2.2.2	3-9	Lab Test Data Report Vendor Test Data Report
R-CHU-CA.4	The contact interface of the reader shall support both the T=0 and T=1 transmission protocols as defined in ISO/IEC 7816-3:1997.	Card /Card Reader Interoperability Requirements, Section 2.2.2.3	3-10	Lab Test Data Report Vendor Test Data Report
R-CHU-CA.5	PIV readers shall support the Protocol and Parameters Selection (PPS) protocol as defined in ISO/IEC 7816-3:1997	Card /Card Reader Interoperability Requirements, Section 2.2.2.4	3-11	Vendor Test Data Report
R-CHU-CA.6	PIV Readers shall not generate a Programming Voltage.	Card /Card Reader Interoperability Requirements, Section 2.2.2.1	3-8	Vendor Test Data Report
R-CHU-CA.7	PIV Readers shall support implicit protocol and parameter selections as defined in ISO/IEC 7816-3:1997.	Card /Card Reader Interoperability Requirements,	3-11	Vendor Test Data Report

Identifier #	Requirement Description	Source	Reqt. #	Approval Mechanism
		Section 2.2.2.4		
R-CHU-CA.8	The reader buffer size shall be no less than 256 bytes.	Card /Card Reader Interoperability Requirements, Section 3.2.1.1	N/A	Vendor Documentation Review
R-CHU-CA.9	The reader shall be able to read the CHUID buffer on the PIV Card.	FIPS 201-1, Section 6.2.2	1.1-212	Vendor Test Data Report
R-CHU-CA.10	The authentication attempt shall compare the CHUID expiration date to the current date and determine card expiry.	FIPS 201-1, Section 6.2.2	1.1-212	Lab Test Data Report Vendor Test Data Report
R-CHU-CA.11	The digital signature on the CHUID is checked to ensure the CHUID was signed by a trusted source and is unaltered.	FIPS 201-1, Section 6.2.2	1.1-212	Lab Test Data Report Vendor Test Data Report
R-CHU-CA.12	One or more of the CHUID data elements are used as input to the authorization check	FIPS 201-1, Section 6.2.2	1.1-212	Vendor Test Data Report Lab Test Data Report
R-CHU-CA.13	For performing cryptographic operations (during verification of CHUID signature), the cryptographic module shall be FIPS 140-2 validated with an overall Security Level 2 (or higher).	Derived	N/A	Certification

Table 1 - Applicable Requirements

3.2 Approval Mechanism Matrix

The table below provides an indication of the total number of requirements applicable for the Product and provides a breakup of how the evaluation will be conducted based on the different approval mechanisms available to the Lab.

Total Requirements	Approval Mechanisms					
	SV	VTDR	LTDR	VDR	C	A
13	N/A	9	5	3	1	1
Legend: SV – Site Visit; VTDR – Vendor Test Data Report; LTDR – Lab Test Data Report; VDR – Vendor Doc. Review; C – Certification; A – Attestation						

Table 2 - Approval Mechanism Matrix

3.3 Evaluation Criteria

This section provides details on the process employed by the Lab for evaluating the Product against the requirements enumerated above.

3.3.1 Vendor Test Data Report

The Lab will update the status in the Web-Enabled Tool to "VTDR Begun" as instructed in the Web-enabled Tool Laboratory User Guide.

3.3.1.1 **R-CHU-CA.3**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • PIV readers shall support the Class A operating class as defined in ISO/IEC 7816-3:1997 and ISO/IEC 7816-3:1997/Amd 1:2002. At a minimum, the following test scenario must be performed to confirm compliance: a. Populate the CHUID container with valid data on a reference smart card[1] that only supports Class A operating conditions b. Present the Class A only reference smart card to Reader and perform a GET_DATA request for the CHUID container c. Output the expected CHUID data container d. Output the CHUID data container read from the Reader e. Verify that the data read from the Reader matches the expected data.

[1] Reference smart cards used for Supplier testing and reporting must be validated under NPIVP (http://csrc.nist.gov/npivp/)

Expected Results:	The CHUID data read off the reference smart cards matches the expected data values.

3.3.1.2 **R-CHU-CA.4**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • The contact interface of the reader shall support both the T=0 and T=1 transmission protocols as defined in ISO/IEC 7816-3:1997. At a minimum, the following test scenario must be performed to confirm compliance: a. Populate the CHUID container with valid data on a reference smart card[2] that only supports the T=0 protocol b. Present T=0 reference smart card to Reader and perform a GET_DATA request for the CHUID container c. Output the expected CHUID data container d. Output the CHUID data container read from the Reader e. Verify that the data read from the Reader matches the expected data f. Repeat steps a-e using a reference smart card that only supports the T=1 protocol.
Expected Results:	The CHUID data read off the reference smart cards matches the expected data values.

3.3.1.3 **R-CHU-CA.5**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • PIV readers shall support the Protocol and Parameters Selection (PPS) protocol as defined in ISO/IEC 7816-3:1997 At a minimum, the following test scenario must be performed to confirm compliance: a. A reference smart card[3] supporting both T=0 and T=1 protocols must be used for this test. Reset the card using the reader and record the ATR value b. Initiate the PPS by issuing a warm reset. Record the resulting ATR

[2] Reference smart cards used for Supplier testing and reporting must be validated under NPIVP (http://csrc.nist.gov/npivp/)
[3] Reference smart cards used for Supplier testing and reporting must be validated under NPIVP (http://csrc.nist.gov/npivp/)

	value c. Change the protocol from T=0 to T=1 and the values of F and D (if possible) by issuing a correctly formatted PPS command d. Record the PPS response from the card & the ATR output from the card after a successful PPS exchange e. Issue any APDU to the card and output the status words Record the APDU command resulting card response.
Expected Results:	1. The Product can successfully change the transmission protocol from T=0 to T=1. 2. The Product can successfully change serial transmission characters F & D.

3.3.1.4 **R-CHU-CA.6**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • PIV Readers shall not generate a Programming Voltage. At a minimum, the following test scenario must be performed to confirm compliance: a. Populate the CHUID container with valid data on a reference smart card b. Create a test harness that will allow monitoring of the Vpp pin of the reader/smart card c. Begin monitoring of the Vpp pin voltage level d. Present the reference smart card to the Reader and perform a GET_DATA on each of the containers e. End monitoring of Vpp pin.
Expected Results:	Results of the Vpp log shall show that no voltage is applied during operation of the GET_DATA command.

3.3.1.5 **R-CHU-CA.7**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • PIV Readers shall support implicit protocol and parameter selections as defined in ISO/IEC 7816-3:1997. At a minimum, the following test scenario must be performed to confirm compliance: a. A reference smart card with an implicit value for protocol and parameters (Bit 5 of interface byte TA(2) returned by ATR is 1) must be used for this test

	b. Reset the card using the reader and obtain an ATR value. Record the ATR value. c. Send an APDU to the card and output the status words. Record the APDU command resulting card response.
Expected Results:	The Product is able to support implicit protocol and parameters selection and communicate with a card that does not offer explicit selection.

3.3.1.6 **R-CHU-CA.9**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • The reader shall be able to read the CHUID buffer on the PIV Card. At a minimum, the following test scenario must be performed to confirm compliance: a. Perform same test scenario for R-CHU-CA.4
Expected Results:	See expected test results for R-CHU-CA.4

3.3.1.7 **R-CHU-CA.10**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • The authentication process compares the expiration date from the CHUID, located on the card, to the current date to ensure the card has not expired. At a minimum, the following test scenario must be performed to confirm compliance: a. Create a CHUID container that contains valid data for all fields except the expiration date. The expiration date should be set to a date in the past. b. Populate the CHUID container on a T=0 or T=1 reference smart card c. Present reference smart card to Reader and perform a GET_DATA request for the CHUID container
Expected Results:	The Product shall not grant access to the cardholder based on the invalid expiration date. The Product returns an error indicator or simply denies access.

3.3.1.8 **R-CHU-CA.11**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • The digital signature on the CHUID is checked to ensure the CHUID was signed by a trusted source and is unaltered. At a minimum, the following test scenario must be performed to confirm compliance: a. Populate the CHUID container with an invalid CHUID (invalid signature) on a T=0 or T=1 reference smart card b. Present reference smart card to Reader and perform a GET_DATA request for the CHUID container c. The Product performs a digital signature verification on the CHUID d. Signature validation should fail in this case and the authentication attempt should conclude e. Present another T=0 or T=1 reference smart card wherein the CHUID is signed by a certificate that is not trusted by the Product. f. Path Validation should fail in this case and the authentication attempt should conclude.
Expected Results:	The Product successfully verifies the digital signature on the CHUID and is capable of performing a path validation on the CHUID signer's certificate to determine authenticity of the CHUID.

3.3.1.9 **R-CHU-CA.12**

Evaluation Procedure:	The Lab will review the documentation submitted by the Supplier to ascertain the following: • One or more of the CHUID data elements are used as input to the authorization check At a minimum, the following test scenario must be performed to confirm compliance: a. Create a CHUID container that contains valid data for all fields except any one field which the Reader supports verification of. For example, if the Reader supports FASC-N verification, the FASC-N shall be set to a value that the reader will reject. b. Provide CHUID container value created in VTDR c. Populate the CHUID container on a T=0 or T=1 reference smart card d. Present reference smart card to Reader and perform a GET_DATA request for the CHUID container

	e. Repeat steps a-c for each additional CHUID data element that the Reader verifies (as documented by the Supplier)
Expected Results:	For test scenario executed, the Product shall not grant access to the cardholder based on the invalid CHUID data element. The Product returns an error indicator or simply denies access.

The Lab will update the status in the Web-Enabled Tool to "VTDR Complete" as instructed in the Web-enabled Tool Laboratory User Guide.

3.3.2 Vendor Documentation Review

Reference(s):	R-CHU-CA.1, R-CHU-CA.2, R-CHU-CA.8
Evaluation Procedure:	1. The Lab will update the status in the Web-Enabled Tool to "VDR Begun" as instructed in the Web-enabled Tool Laboratory User Guide. 2. The Lab will review the documentation submitted by the Supplier to ascertain the following: ▪ *ISO7816 Conformance (R-CHU-CA.1)* • The card-to-reader interface is compliant with the specifications of ISO7816. The tester shall verify that the documentation provided by the Supplier clearly shows that the reader conforms to all parts of ISO7816. ▪ *PC/SC Specifications (R-CHU-CA.2)* • For logical readers, the tester shall verify that the documentation provided clearly shows that the contactless card reader conforms to the Personal Computer/Smart Card (PC/SC) Specification [PCSC] for the reader-to-host system interface. ▪ *Buffer Size (R-CHU-CA.8)* • The reader buffer size shall be no less than 256 bytes. 3. The Lab will update the status to "VDR Complete" as instructed in the Web-enabled Tool Laboratory User Guide.
Expected Result:	1. The Product conforms to the specifications of ISO7816. 2. The Product conforms to the Personal Computer/Smart Card (PC/SC) Specification [PCSC] for the reader-to-host system interface. 3. The reader buffer size is at least 256 bytes

3.3.3 Lab Test Data Report

Reference(s):	R-CHU-CA.3, R-CHU-CA.4, R-CHU-CA.10, R-CHU-CA.11, R-CHU-CA.12
Test Procedure:	1. The Lab will update the status in the Web-Enabled Tool to "LTDR Begun" as instructed in the Web-enabled Tool Laboratory User Guide. 2. The Lab will execute test procedures for this category in accordance with the "*CHUID Authentication Reader (Contact) Test Procedure*". 3. The Lab will update the status to "LTDR Complete" as instructed in the Web-enabled Tool Laboratory User Guide.

Expected Results:	The Product successfully passes all the test cases documented within the test procedure.

3.3.4 Certification

Reference(s):	R-CHU-CA.13
Evaluation Procedure:	1. The Lab will update the status in the Web-Enabled Tool to "C Begun" as instructed in the Web-enabled Tool Laboratory User Guide. 2. The Lab will perform the following activities for the Cryptographic Module in order to determine certification status of the Product with FIPS 140-2 Level 2 requirements: ▪ Review the FIPS 140-2 Cryptographic Modules Validation List to determine inclusion of the Product and the level at which it has been certified. The list is available on the website located at: http://csrc.nist.gov/cryptval/140-1/1401val.htm. ▪ Optionally, if provided, examine the certification statement for authenticity (i.e. see if it provided by the NIST/CSE) and that it is still current i.e. valid 3. The Lab will update the status to "C Complete" as instructed in the Web-enabled Tool Laboratory User Guide.
Expected Results:	1. The Cryptographic Module is certified by NIST/CSE at FIPS 140-2 Level 2 or higher.

3.3.5 Attestation

Reference(s):	N/A
Evaluation Procedure:	1. The Lab will update the status in the Web-Enabled Tool to "A Begun" as instructed in the Web-enabled Tool Laboratory User Guide. 2. Review the Attestation Form provided by the Supplier, confirming that the Product to the best of their knowledge, conforms to all the necessary requirements of the category under which the Product applies. Verify that person signing this Attestation Form has the authority to do so (a minimum "C" level [e.g. CSO, CEO, CIO, CFO, Vice-President, President, Business Partner or Owner]). 3. The Lab will update the status in the Web-Enabled Tool to "A Complete" as instructed in the Web-enabled Tool Laboratory User Guide.
Expected Results:	1. The Attestation Form has been signed by an authorized individual (e.g. CSO, CEO, CIO, CFO, Vice-President, President, Business Partner or Owner).

Attachment A: Card/Reader Interoperability, Electronic Authentication and Security Requirements

Card/Reader Interoperability, Electronic Authentication and Security Requirements, v4.0, May 15, 2006.