



Agenzia per la Cybersecurity Nazionale



Organismo di Certificazione della Sicurezza Informatica

Schema nazionale per la valutazione e certificazione della sicurezza di sistemi e prodotti ICT
(DPCM del 30 ottobre 2003 - G.U. n. 93 del 27 aprile 2004)

Certificato n. 8/23

(Certificate No.)

Prodotto: **HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware**
(Product)

Sviluppato da: **HP, Inc**
(Developed by)

Il prodotto indicato in questo certificato è risultato conforme ai requisiti dello standard ISO/IEC 15408 (Common Criteria) v. 3.1 per il livello di garanzia:

The product identified in this certificate complies with the requirements of the standard ISO/IEC 15408 (Common Criteria) v. 3.1 for the assurance level:

Conforme a: **Protection Profile for Hardcopy Devices v1.0 [HCDPP] with Errata#1**
(Conformant to)

p. il Direttore Generale
dell'ACN

Il Capo Servizio
Certificazione e Vigilanza
(Andrea Billet)

Roma, 25 settembre 2023

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Agenzia per la Cybersicurezza Nazionale

Servizio Certificazione e Vigilanza



Organismo di Certificazione della Sicurezza Informatica

Certification Report

HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware

OCSI/CERT/ATS/18/2022/RC

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Courtesy translation

Disclaimer: This English language translation is provided for informational purposes only. It is not intended to substitute the official document and has no legal value. The original Italian language version of the document is the only approved and official version.

1 Document revisions

Version	Author	Information	Date
1.0	OCSI	First issue	25/09/2023

2 Table of contents

1	Document revisions	5
2	Table of contents	6
3	Acronyms.....	8
3.1	National scheme	8
3.2	CC and CEM.....	8
3.3	Other acronyms	8
4	References	12
4.1	Normative references and national Scheme documents	12
4.2	Technical documents.....	13
5	Recognition of the certificate	14
5.1	European recognition of CC certificates (SOGIS-MRA)	14
5.2	International recognition of CC certificates (CCRA).....	14
6	Statement of Certification.....	15
7	Summary of the evaluation.....	16
7.1	Introduction.....	16
7.2	Executive summary	16
7.3	Evaluated product	17
7.3.1	TOE architecture	18
7.3.2	TOE security features	20
7.4	Documentation	24
7.5	Protection Profile conformance claims	24
7.6	Functional and assurance requirements.....	24
7.7	Evaluation conduct.....	25
7.8	General considerations about the certification validity	25
8	Evaluation outcome	26
8.1	Evaluation results.....	26
8.2	Additional assurance activities	27
8.3	Recommendations.....	28
9	Annex A – Guidelines for the secure usage of the product.....	29
9.1	TOE delivery.....	29

9.2	Identification of the TOE by the User.....	29
9.3	Installation, initialization, and secure usage of the TOE	30
10	Annex B – Evaluated configuration	31
10.1	TOE operational environment	33
11	Annex C – Test activity	34
11.1	Test configuration	34
11.2	Functional and independent tests performed by the Evaluators.....	34
11.3	Vulnerability analysis and penetration tests.....	35

3 Acronyms

3.1 National scheme

DPCM	Decreto del Presidente del Consiglio dei Ministri
LGP	Linea Guida Provvisoria
LVS	Laboratorio per la Valutazione della Sicurezza
NIS	Nota Informativa dello Schema
OCSI	Organismo di Certificazione della Sicurezza Informatica

3.2 CC and CEM

CC	Common Criteria
CCRA	Common Criteria Recognition Arrangement
CEM	Common Evaluation Methodology
cPP	collaborative Protection Profile
EAL	Evaluation Assurance Level
ETR	Evaluation Technical Report
PP	Protection Profile
SAR	Security Assurance Requirement
SFR	Security Functional Requirement
SOGIS-MRA	Senior Officials Group Information Systems Security – Mutual Recognition Agreement
ST	Security Target
TOE	Target of Evaluation
TSF	TOE Security Functionality
TSFI	TSF Interface

3.3 Other acronyms

AES	Advanced Encryption Standard
AH	Authentication Headers

BEV	Border Encryption Value
BLE	Bluetooth Low Energy
CA	Certification Authority
CBC	Cipher Block Chaining
DB	Data Base
DH	Diffie-Hellman
DSA	Digital Signature Algorithm
ECB	Electronic CodeBook
ECDH	Elliptic-curve Diffie-Hellman
ECDSA	Elliptic Curve Digital Signature Algorithm
EEPROM	Electrically Erasable Programmable Read-Only Memory
eMMC	embedded Multi Media Card
ESP	Encapsulating Security Payload
EWS	Exchange Web Services
FIPS	Federal Information Processing Standards
FTP	File Transfer Protocol
HCD	Hardcopy Device
HMAC	Hash-based Message Authentication Code (or Keyed-Hash Message Authentication)
HSM	Hardware Security Module
HTTP	HyperText Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
HW	Hardware
IKE	Internet Key Exchange
IPsec	Internet Protocol Security
ISAKMP	Internet Security Association and Key Management Protocol
IT	Information Technology

LAN	Local Area Network
LCD	Liquid Crystal Display
LDAP	Lightweight Directory Access Protocol
MFP	Multi-Function Printer
NFC	Near Field Communication
NTLM	New Technology LAN Manager
NTP	Network Time Protocol
NTS	Network Time Service
OE	Operational Environment
OS	Operating System
OXPd	Open Extensibility Platform device
PIN	Personal Identification Number
PJL	Printer Job Language
PKCS	Public-Key Cryptography Standards
PKI	Public Key Infrastructure
PS	Permission Set
PSTN	Public Switched Telephone Network
PSK	Pre-shared Key
RBAC	Role Based Access Control
RDP	Remote Desktop Protocol
REST	Representational State Transfer
RSA	Rivest, Shamir, Adleman
SED	Self-encrypting Drive
SFP	Single-function Printer
SHA	Secure Hash Algorithm
SMB	Server Message Block

SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SPI	Serial Peripheral Interface
SW	Software
TCP	Transmission Control Protocol
TLS	Transport Layer Security
TSA	Time Stamping Authority
UDP	User Datagram Protocol
UI	User Interface
USB	Universal Serial Bus
VTL	Virtual Test Laboratory
WINS	Windows Internet Naming Service
WLAN	Wireless Local Area Network
WS	Web Services
XML	eXtensible Markup Language

4 References

4.1 Normative references and national Scheme documents

- [CC1] CCMB-2017-04-001, “Common Criteria for Information Technology Security Evaluation, Part 1 – Introduction and general model”, Version 3.1, Revision 5, April 2017
- [CC2] CCMB-2017-04-002, “Common Criteria for Information Technology Security Evaluation, Part 2 – Security functional components”, Version 3.1, Revision 5, April 2017
- [CC3] CCMB-2017-04-003, “Common Criteria for Information Technology Security Evaluation, Part 3 – Security assurance components”, Version 3.1, Revision 5, April 2017
- [CCRA] “Arrangement on the Recognition of Common Criteria Certificates In the field of Information Technology Security”, July 2014
- [CEM] CCMB-2017-04-004, “Common Methodology for Information Technology Security Evaluation – Evaluation methodology”, Version 3.1, Revision 5, April 2017
- [LGP1] Schema nazionale per la valutazione e certificazione della sicurezza di sistemi e prodotti nel settore della tecnologia dell’informazione - Descrizione Generale dello Schema Nazionale - Linee Guida Provvisorie - parte 1 – LGP1 versione 1.0, Dicembre 2004
- [LGP2] Schema nazionale per la valutazione e certificazione della sicurezza di sistemi e prodotti nel settore della tecnologia dell’informazione - Accredитamento degli LVS e abilitazione degli Assistenti - Linee Guida Provvisorie - parte 2 – LGP2 versione 1.0, Dicembre 2004
- [LGP3] Schema nazionale per la valutazione e certificazione della sicurezza di sistemi e prodotti nel settore della tecnologia dell’informazione - Procedure di valutazione - Linee Guida Provvisorie - parte 3 – LGP3, versione 1.0, Dicembre 2004
- [NIS1] Organismo di certificazione della sicurezza informatica, Nota Informativa dello Schema N. 1/23 – Modifiche alla LGP1, versione 1.1, 21 agosto 2023
- [NIS2] Organismo di certificazione della sicurezza informatica, Nota Informativa dello Schema N. 2/23 – Modifiche alla LGP2, versione 1.1, 21 agosto 2023
- [NIS3] Organismo di certificazione della sicurezza informatica, Nota Informativa dello Schema N. 3/23 – Modifiche alla LGP3, versione 1.1, 21 agosto 2023
- [NIS5] Organismo di certificazione della sicurezza informatica, Nota Informativa dello Schema N. 5/23 – Condizioni per l’effettuazione di test da remoto in valutazioni Common Criteria, versione 1.1, 21 agosto 2023

[SOGIS] “Mutual Recognition Agreement of Information Technology Security Evaluation Certificates”, Version 3, January 2010

4.2 Technical documents

[CCECG] “Common Criteria Evaluated Configuration Guide for HP Multifunction Printers HP Color LaserJet Enterprise MFP M480 HP Color LaserJet Managed MFP E47528 HP LaserJet Enterprise MFP M430/M431 HP LaserJet Managed MFP E42540”, HP Inc., Edition 1, 5/2023

[ETR] “Final Evaluation Technical Report Evaluation HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware”, Version 1, atsec information security srl, 07 July 2023

[HCDPP] Protection Profile for Hardcopy Devices, IPA, NIAP, and the MFP Technical community, Version 1.0, 10 September 2015

[HCDPP-ERR] Protection Profile for Hardcopy Devices – v1.0 Errata #1, June 2017

[ST] HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, HP Color LaserJet Managed MFP E47528 Security Target, Version 1.0, 21 July 2023

5 Recognition of the certificate

5.1 European recognition of CC certificates (SOGIS-MRA)

The European SOGIS-Mutual Recognition Agreement (SOGIS-MRA, version 3 [SOGIS]) became effective in April 2010 and provides mutual recognition of certificates based on the Common Criteria (CC) Evaluation Assurance Level up to and including EAL4 for all IT-Products. A higher recognition level for evaluations beyond EAL4 is provided for IT-Products related to specific Technical Domains only.

The current list of signatory nations and of technical domains for which the higher recognition applies and other details can be found on <https://www.sogis.eu/>.

The SOGIS-MRA logo printed on the certificate indicates that it is recognised under the terms of this agreement by signatory nations.

This certificate is recognised under SOGIS-MRA for all declared assurance components.

5.2 International recognition of CC certificates (CCRA)

The current version of the international arrangement on the mutual recognition of certificates based on the CC (Common Criteria Recognition Arrangement, [CCRA] was ratified on 08 September 2014. It covers CC certificates compliant with collaborative Protection Profiles (cPP), up to and including EAL4, or certificates based on assurance components up to and including EAL2, with the possible augmentation of Flaw Remediation family (ALC_FLR).

The current list of signatory nations and of collaborative Protection Profiles (cPP) and other details can be found on <https://www.commoncriteriaportal.org/>.

The CCRA logo printed on the certificate indicates that it is recognised under the terms of this agreement by signatory nations.

This certificate is recognised under CCRA for all declared assurance components.

6 Statement of Certification

The Target of Evaluation (TOE) is the product “HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware”, developed by HP, Inc.

The TOE is a hardcopy device (HCD) including internal firmware, but exclusive of non-security relevant options such as finishers. The TOE also includes the English-language guidance.

The evaluation has been conducted in accordance with the requirements established by the Italian Scheme for the evaluation and certification of security systems and products in the field of information technology and expressed in the Provisional Guidelines [LGP1, LGP2, LGP3] and Scheme Information Notes [NIS1, NIS2, NIS3]. The Scheme is operated by the Italian Certification Body “Organismo di Certificazione della Sicurezza Informatica (OCSI)”, established by the Prime Minister Decree (DPCM) of 30 October 2003 (O.J. n.98 of 27 April 2004).

The objective of the evaluation is to provide assurance that the product complies with the security requirements specified in the associated Security Target [ST]; the potential consumers of the product should review also the Security Target, in addition to the present Certification Report, in order to gain a complete understanding of the security problem addressed. The evaluation activities have been carried out in accordance with the Common Criteria Part 3 [CC3] and the Common Evaluation Methodology [CEM].

The TOE resulted compliant with the requirements of Part 3 of the CC version 3.1 for the assurance components included in the PP [HCDPP], according to the information provided in the Security Target [ST] and in the configuration shown in “Annex B – Evaluated configuration” of this Certification Report

The publication of the Certification Report is the confirmation that the evaluation process has been conducted in accordance with the requirements of the evaluation criteria Common Criteria - ISO/IEC 15408 ([CC1], [CC2], [CC3]) and the procedures indicated by the Common Criteria Recognition Arrangement [CCRA] and that no exploitable vulnerability was found. However, the Certification Body with such a document does not express any kind of support or promotion of the TOE.

7 Summary of the evaluation

7.1 Introduction

This Certification Report states the outcome of the Common Criteria evaluation of the product “HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware” to provide assurance to the potential consumers that TOE security features comply with its security requirements.

In addition to the present Certification Report, the potential consumers of the product should also review the Security Target [ST], specifying the functional and assurance requirements and the intended operational environment.

7.2 Executive summary

TOE name	HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware
Security Target	HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, HP Color LaserJet Managed MFP E47528 Security Target, Version 1.0, 21 July 2023 [ST]
Evaluation Assurance Level	Conformant to PP including the following assurance components: ASE_CCL.1, ASE_ECD.1, ASE_INT.1, ASE_OBJ.1, ASE_REQ.1, ASE_SPD.1, ASE_TSS.1, ADV_FSP.1, AGD_OPE.1, AGD_PRE.1, ALC_CMC.1, ALC_CMS.1, ATE_IND.1, AVA_VAN.1
Developer	HP, Inc.
Sponsor	HP, Inc.
LVS	atsec information security S.r.l.
CC version	3.1 Rev. 5
PP conformance claim	Protection Profile for Hardcopy Devices v1.0 [HCDPP] with Errata#1 [HCDPP-ERR]
Evaluation starting date	19 December 2022
Evaluation ending date	07 July 2023

The certification results apply only to the version of the product shown in this Certification Report and only if the operational environment assumptions described in the Security Target [ST] are fulfilled.

7.3 Evaluated product

This section summarizes the main functional and security requirements of the TOE. For a detailed description, please refer to the Security Target [ST].

The Target of Evaluation (TOE) is HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware with the following elements:

- HP LaserJet Enterprise MFP M430f
- HP LaserJet Enterprise MFP M431f
- HP LaserJet Managed MFP E42540f
- HP Color LaserJet Enterprise MFP M480f
- HP Color LaserJet Managed MFP E47528f

The TOE is an HCD including internal firmware, but exclusive of non-security relevant options such as finishers. The TOE also includes the English-language guidance documentation.

The following firmware modules are included in the TOE:

- System firmware
- Jetdirect Inside firmware

All TOE models use the same Jetdirect Inside firmware version:

- JOL25030046.

The TOE includes the following System firmware versions:

- 2503252_000044 (HP FutureSmart 5.3.2 Firmware)
- 2503252_000047 (HP FutureSmart 5.3.2 Firmware)

The following Table 1 shows the HCD models included in the evaluation.

Model name	Product number	System firmware version
HP Color LaserJet Enterprise MFP M480f	3QA55A	2503252_000044
HP Color LaserJet Managed MFP E47528f	3QA75A	2503252_000044
HP LaserJet Enterprise MFP M430f	3PZ55A	2503252_000047
HP LaserJet Enterprise MFP M431f	3PZ56A	2503252_000047
HP LaserJet Managed MFP E42540f	3PZ75A	2503252_000047

Table 1 - TOE hardware and firmware reference

For a detailed description of the TOE, consult sections 1.4 and 1.5 of the Security Target [ST]. The most significant aspects are summarized below.

7.3.1 TOE architecture

The TOE is designed to be shared by many client computers and human users. It performs the functions of printing, copying, scanning, faxing, and storing/retrieving of documents. It can be connected to a local network through the embedded Jetdirect Inside's built-in Ethernet, to an analog telephone line using its internal analog fax modem, or to a USB device using its USB port (but the use of which must be disabled in the evaluated configuration except when the administrator performs trusted update via the USB).

[HCDPP] defines the TOE's physical boundary as the entire HCD product with the possible exclusion of physical options and add-ons that are not security relevant. These exclusions include paper/media trays and feeders, document feeders, output bins, and printer stands.

The TOE's operating system is Linux 4.9.180 running on an ARM Cortex-A72 processor.

The TOE supports Local Area Network (LAN) capabilities. The LAN is used to communicate with client computers, the administrative computer, and several trusted IT entities. Some TOE models include support for Wireless LAN (WLAN), but the WLAN must be disabled in the evaluated configuration.

The TOE protects all network communications with IPsec, which is part of the Jetdirect Inside firmware. It implements Internet Key Exchange version 1 (IKEv1) and supports both pre-shared key (PSK) authentication and X.509v3 certificate-based authentication. The TOE supports both Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6).

The Administrative Computer connects to the TOE using IPsec. This computer can administer the TOE using the following interfaces over the IPsec connection.

- Embedded Web Server (EWS)
- Representational state transfer (REST) Web Services

The HTTP-based EWS administrative interface allows administrators to remotely manage the features of the TOE using a web browser. This interface is protected using IPsec.

The Web Services (WS) interfaces allow administrators to externally manage the TOE. The evaluated configuration only supports the REST Web Services interface. The REST Web Services interface is protected using IPsec.

For design reasons, only one computer can be used as the Administrative Computer for the TOE in the evaluated configuration. This computer is used for administration of the TOE. All other client computers connecting to the TOE to perform non-administrative tasks are known as Network Client Computers in this ST.

Network Client Computers connect to the TOE to submit print jobs to the TOE using the Printer Job Language (PJL) interface. They can also receive job status from the TOE using PJL. The PJL interface connection is protected using IPsec. The [CCECG] section IPsec describes how to properly configure the TOE to allow a single Administrative Computer and one or more Network Client Computers.

Some models of the TOE contain a built-in PSTN connection for sending and receiving faxes. For models of the TOE that do not have built-in analog fax functionality, an optional analog fax accessory can be installed to add analog fax functionality. The Control Panel uses identification and authentication to control access for sending faxes over PSTN.

The PJL interface is used by unauthenticated users via Network Client Computers to submit print jobs and receive job status (e.g., view the print queue). The unauthenticated users use PJL over an IPsec connection. It is also used in a non-administrative capacity by the Administrative Computer. The Administrative Computer uses PJL over IPsec to send print jobs to the TOE as well as to receive job status. In general, PJL supports password-protected administrative commands, but in the evaluated configuration, these commands are disabled. For the purposes of this document, we define the PJL interface as PJL data sent to port 9100.

The TOE supports Microsoft SharePoint and remote file systems for the storing of scanned documents. The TOE uses IPsec to protect the communication to SharePoint and to the remote file systems. For remote file system connectivity, the TOE supports the FTP and SMB protocols. (SharePoint is HTTP-based, but IPsec is used to protect the HTTP-based communications.)

The TOE can be used to email scanned documents, email received faxes, or email sent faxes. In addition, the TOE can send email alert messages to administrator-specified email addresses, mobile devices, or to a website.

The TOE supports protected communications between itself and Simple Mail Transfer Protocol (SMTP) gateways. It uses IPsec to protect the communication with the SMTP gateway. The TOE can only protect unencrypted email up to the SMTP gateway. It is the responsibility of the Operational Environment to protect emails from the SMTP gateway to the email's destination. Also, the TOE can only send emails; it does not accept inbound emails.

The TOE supports the auditing of security-relevant functions by generating and forwarding audit records to an external syslog server. It supports both internal and external storage of audit records. The TOE uses IPsec to protect the communications between itself and the syslog server.

The TOE requires a DNS server, an NTS server, and a WINS server in the Operational Environment. The TOE connects to them over an IPsec connection.

Each HCD contains a user interface (UI) called the Control Panel. The Control Panel consists of a touchscreen LCD and a physical home screen button as part of the Control Panel. The Control Panel is the physical interface that a user uses to communicate with the TOE when physically using the HCD. The LCD screen displays information such as menus and status to the user. It also provides virtual buttons to the user such as an alphanumeric keypad for entering usernames and passwords. Both administrative and non-administrative users can access the Control Panel.

The TOE supports the following Internal Authentication mechanisms in the evaluated configuration.

- Local Device Sign In

The TOE supports the following External Authentication mechanisms in the evaluated configuration.

- LDAP Sign In
- Windows Sign In (i.e., Kerberos)

All TOE models contain one field-replaceable nonvolatile storage device. This storage device is an eMMC.

The disk drive contains a section called Job Storage which is a user-visible file system where user document data, such as stored print, stored copy, and stored received faxes, are located.

The Jetdirect Inside firmware and System firmware components comprise the firmware on the system. Both firmware components work together to provide the security functionality defined in this document for the TOE. They are shown as two separate components but they both share the same operating system. The operating system is part of the System firmware.

The Jetdirect Inside firmware provides the network connectivity and network device drivers used by the System firmware. The Jetdirect Inside firmware includes IPsec and the management functions for managing these network-related features. It also provides the network stack and drivers controlling the TOE's embedded Ethernet interface.

The System firmware controls the overall functions of the TOE from the Control Panel to the storage drive to the print jobs.

7.3.2 TOE security features

The Security Problem of the TOE, including security objectives, assumptions, threats and organizational security policies, is defined in section 3 of the Security Target [ST].

For a detailed description of the TOE Security Functions, consult sections 1.5.3 and 7.1 of the Security Target [ST]. The most significant aspects are summarized in the following sections.

7.3.2.1 Auditing

The TOE supports both internal and external storage of audit records. The evaluated configuration requires the use of an external syslog server for external audit record storage. The connection between the TOE and the syslog server is protected using IPsec. No unauthorized access to the audit records is allowed by the TOE.

7.3.2.2 Data Encryption (a.k.a. cryptography)

IPsec

The TOE's IPsec supports both pre-shared keys (PSKs) and X.509v3 certificates for authentication, the Encapsulating Security Payload (ESP), Internet Security Association and Key Management Protocol (ISAKMP), Internet Key Exchange version 1 (IKEv1) protocol, and the following cryptographic algorithms: Diffie-Hellman (DH), Digital Signature Algorithm (DSA), Rivest-Shamir-Adleman (RSA), Advanced Encryption Standard-Cipher Block Chaining (AES-CBC), Advanced Encryption Standard-Electronic Code Book (AES-ECB), Secure Hash Algorithm-based (SHA-based) Hashed Message Authentication Codes (HMACs), Public-Key Cryptography Standards (PKCS) #1 v1.5 signature generation and verification, and counter mode deterministic random bit generator using AES (CTR_DRBG(AES)).

It supports multiple DH groups, transport mode, and uses Main Mode for Phase 1 exchanges in IKEv1. The IKEv1 uses the DH ephemeral (dhEphem) scheme to implement the key agreement scheme finite field cryptography (KAS FFC) algorithm when establishing a protected communication channel. DSA key generation is a prerequisite for KAS FFC when using DH ephemeral. The IKEv1 uses imported RSA-based X.509v3 certificates to authenticate the connections. The RSA authentication is accomplished using the IKEv1 digital signature authentication method.

Storage Encryption

The TOE contains one field-replaceable, nonvolatile storage device. This storage device is an eMMC. The TOE performs encryption of User Document Data and confidential TSF data on the eMMC without any user intervention.

The TSF implements a feature called Customer Data Encryption that is based on the device-mapper crypt (dm-crypt) target. dm-crypt provides transparent encryption of block devices using the HP FutureSmart Firmware Linux Kernel Crypto API. The Customer Data Encryption feature encrypts customer data (including User Document Data) stored on the partition (a.k.a., customer data partition) designated for storing customer data on the eMMC drive. In the evaluated configuration, the Customer Data Encryption feature is configured to use AES-CBC-256 to encrypt data.

Data stored on the customer data partition includes: Stored jobs (e.g., print, copy, fax), temporary job files, PJI and PostScript filesystem files including downloaded fonts, and extensibility customer data (if stored there by the extensibility solution).

The TSF encrypts identity certificates and their corresponding private keys stored on the eMMC drive.

- Certificates XML file: the TSF stores the network identity certificate and its corresponding private key in encrypted form in a certificates XML file stored on the eMMC drive. AES-

CBC-256 is used to encrypt the network identity certificate and its private key contained in the certificates XML file.

- Thumbprint files: the TSF stores identity certificates and their corresponding private keys in individual files (a.k.a., thumbprint files) stored in encrypted form on the eMMC drive. AES-CBC-256 is used to encrypt thumbprint files.

The TSF encrypts the JDI configuration file which contains the IPsec pre-shared keys and other networking configuration data. The JDI configuration file is stored on the eMMC drive and is encrypted using AES-CBC-256.

Digital Signatures for Trusted Update

The TOE uses digital signatures based on the RSA 2048-bit algorithm, SHA2-256 algorithm, and PKCS#1 v1.5 to verify the authenticity of the signed update images. The TOE's EWS interface allows an administrator to verify and install the signed update images.

The TOE uses digital signatures as part of its TSF testing functionality.

The TOE uses multiple cryptographic implementations to accomplish its cryptographic functions. Table 2 provides the complete list of cryptographic implementations used to satisfy the [HCDPP] cryptographic requirements and maps the cryptographic implementations to the firmware modules.

Cryptographic implementation	Usage
HP FutureSmart Firmware OpenSSL 1.1.1	Storage Encryption, TSF Testing, Trusted Update
HP FutureSmart Firmware QuickSec 7.3 Cryptographic Module	IKE
HP FutureSmart Firmware Linux Kernel Crypto API	IPsec, Storage Encryption

Table 2 - TOE cryptographic implementations

The product contains one eMMC drive (a.k.a., storage drive). The TOE encrypts specific areas of the storage drive containing customer data using AES-128-CBC. This can be configured to use AES-256-CBC encryption, if desired.

7.3.2.3 Identification, Authentication, and Authorization to Use HCD Functions

The following Table 3 shows the Internal and External Authentication mechanisms supported by the TOE in the evaluated configuration and maps the mechanisms to the interfaces that use them.

Authentication type	Mechanism name	Supported interfaces
Internal Authentication	Local Device Sign In	Control Panel, EWS, REST
External Authentication	LDAP Sign In	Control Panel, EWS
	Windows Sign In	Control Panel, EWS, REST

Table 3 - TOE authentication mechanisms and their supported interfaces

7.3.2.4 Access Control

The TOE enforces access control on TSF data and User Data. Each piece of User Data is assigned ownership and access to the data is limited by the access control mechanism. The PSs used to define roles also affect the access control of each user.

The TOE contains one field-replaceable, nonvolatile storage device. This storage device is an eMMC. The TSF ensures that confidential TSF Data and User Document Data stored on the drive is not stored as plaintext.

7.3.2.5 Trusted Communications

The TOE uses IPsec to protect the communications between the TOE and trusted IT entities as well as between the TOE and client computers. IPsec provides assured identification of the endpoints. It implements IKEv1 and transport mode. The TOE also supports both X.509v3 certificates and pre-shared keys (PSKs) for endpoint authentication.

7.3.2.6 Administrative Roles

The TOE supports administrative and non-administrative roles. Assignment to these roles is controlled by the TOE's administrator. In the case of a user authenticated using an External Authentication mechanism (Windows Sign In and LDAP Sign In), the roles are implemented as permission sets. In the case of a user authenticated using an Internal Authentication mechanism (Local Device Sign In), only an administrative account exists.

7.3.2.7 Trusted Operation

TOE updates can be downloaded from the HP Inc. website. These updates are digitally signed by HP Inc. using the RSA 2048-bit algorithm, SHA2-256 algorithm, and PKCS#1 v1.5 signature generation. The TOE's EWS interface allows an administrator to install the update images. When installing an update image, the TOE validates the digital signature of the update image before installing the update image.

The TOE contains TSF testing functionality referred to as Whitelisting to help ensure only authentic, known-good firmware files that have not been tampered with are loaded into memory. The TOE supports dm-verity to protect the integrity of the SquashFS file system firmware images. On each boot, the TOE verifies the digital signature of the dm-verity hash tree corresponding to a SquashFS file system firmware image. During operation, dm-verity verifies the integrity of a file system block before loading it into memory. The TOE uses digital signatures based on the RSA 2048-bit algorithm, SHA2-256 algorithm, and PKCS#1 v1.5 to verify the integrity of a dm-verity hash tree.

7.3.2.8 *PSTN Fax-network Separation*

The PSTN fax capability is either included with or can be added to the TOE. In either case, the TOE provides a distinct separation between the fax capabilities and the Ethernet network connection of the TOE prohibiting communication via the fax interface except when transmitting or receiving User Data using fax protocols.

7.4 Documentation

The guidance documentation specified in “Annex A – Guidelines for the secure usage of the product” is delivered to the customer together with the product.

The guidance documentation contains all the information for secure initialization, configuration, and secure usage the TOE in accordance with the requirements of the Security Target [ST].

Customers should also follow the recommendations for the secure usage of the TOE contained in section 8.3 of this report.

7.5 Protection Profile conformance claims

The Security Target [ST] claims exact conformance to the following Protection Profiles:

- Protection Profile for Hardcopy Devices, Version 1.0 [HCDPP].
- Protection Profile for Hardcopy Devices – v1.0 Errata #1 [HCDPP-ERR] Functional and assurance requirements.

7.6 Functional and assurance requirements

All Security Assurance Requirements (SAR) have been selected from CC Part 3 [CC3].

All the SFRs have been selected or derived by extension from CC Part 2 [CC2].

Considering that the Security Target claims exact conformance to the Protection Profile for Hardcopy Devices [HCDPP], all the SFRs from such PP are included.

Please refer to the Security Target [ST] for the complete description of all security objectives, the threats that these objectives should address, the Security Functional Requirements (SFR) and the security functions that realize the same objectives.

7.7 Evaluation conduct

The evaluation has been conducted in accordance with the requirements established by the Italian Scheme for the evaluation and certification of security systems and products in the field of information technology and expressed in the Provisional Guideline [LGP3] and the Scheme Information Note [NIS3] and in accordance with the requirements of the Common Criteria Recognition Arrangement [CCRA].

The purpose of the evaluation is to provide assurance on the effectiveness of the TOE to meet the requirements stated in the relevant Security Target [ST]. Initially the Security Target has been evaluated to ensure that constitutes a solid basis for an evaluation in accordance with the requirements expressed by the standard CC. Then, the TOE has been evaluated on the basis of the statements contained in such a Security Target. Both phases of the evaluation have been conducted in accordance with the CC Part 3 [CC3] and the Common Evaluation Methodology [CEM]. Furthermore, all specific assurance activities required by the Protection Profile for Hardcopy Devices [HCDPP] have been carried out.

The Certification Body OCSI has supervised the conduct of the evaluation performed by the evaluation facility (LVS) atsec information security S.r.l.

The evaluation was completed on July 7th, 2023 with the issuance by LVS of the Evaluation Technical Report [ETR], which was approved by the Certification Body on July 20th, 2023. Then, the Certification Body issued this Certification Report.

7.8 General considerations about the certification validity

The evaluation focused on the security features declared in the Security Target [ST], with reference to the operational environment specified therein. The evaluation has been performed on the TOE configured as described in “Annex B – Evaluated configuration”. Potential customers are advised to check that this corresponds to their own requirements and to pay attention to the recommendations contained in this Certification Report.

The certification is not a guarantee that no vulnerabilities exist; it remains a probability (the smaller, the higher the assurance level) that exploitable vulnerabilities can be discovered after the issuance of the certificate. This Certification Report reflects the conclusions of the certification at the time of issuance. Potential customers are invited to regularly check the arising of any new vulnerability after the issuance of this Certification Report, and if the vulnerability can be exploited in the operational environment of the TOE, check with the Developer if security updates have been developed and if those updates have been evaluated and certified.

8 Evaluation outcome

8.1 Evaluation results

Following the analysis of the Evaluation Technical Report [ETR] issued by the LVS atsec information security S.r.l. and documents required for the certification, and considering the evaluation activities carried out, the Certification Body OCSI concluded that TOE “HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware” meets the requirements of Part 3 of the Common Criteria [CC3] provided for the evaluation assurance level defined by the SARs included in the PP [HCDPP], with respect to the security features described in the Security Target [ST] and the evaluated configuration, shown in “Annex B – Evaluated configuration”.

Table 4 summarizes the final verdict of each activity carried out by the LVS in accordance with the assurance requirements established in [CC3] for the evaluation assurance level defined by the SARs included in the PP [HCDPP].

Assurance classes and components		Verdict
Security Target evaluation	Class ASE	Pass
Conformance claims	ASE_CCL.1	Pass
Extended components definition	ASE_ECD.1	Pass
ST introduction	ASE_INT.1	Pass
Security objectives for the operational environment	ASE_OBJ.1	Pass
Stated security requirements	ASE_REQ.1	Pass
Security problem definition	ASE_SPD.1	Pass
TOE summary specification	ASE_TSS.1	Pass
Development	Class ADV	Pass
Basic functional specification	ADV_FSP.1	Pass
Guidance documents	Class AGD	Pass
Operational user guidance	AGD_OPE.1	Pass
Preparative procedures	AGD_PRE.1	Pass
Life cycle support	Class ALC	Pass
Labelling of the TOE	ALC_CMC.1	Pass
TOE CM coverage	ALC_CMS.1	Pass
Test	Class ATE	Pass
Independent testing - conformance	ATE_IND.1	Pass
Vulnerability assessment	Class AVA	Pass
Vulnerability survey	AVA_VAN.1	Pass

Table 4 - Final verdicts for assurance requirements

8.2 Additional assurance activities

The Protection Profile for Hardcopy Devices [HCDPP] includes additional assurance activities that are specific to the TOE technology type, and are required for exact conformance to the PP.

The Evaluators used for the PP assurance activities a notation similar to assurance components of existing CC assurance classes. The objective of these sub-activities is to determine whether the requirements of the assurance activities included in the PP are met.

Table 5 summarizes the final verdict of the PP assurance activities carried out by the LVS.

PP assurance activities		Verdict
ASE: Security Target evaluation	ASE_HCDPP.1	Pass
AGD: Guidance documents	AGD_HCDPP.1	Pass

PP assurance activities		Verdict
ALC: Life cycle support	ALC_HCDPP.1	Pass
ATE: Tests	ATE_HCDPP.1	Pass
AVA: Vulnerability assessment	AVA_HCDPP.1	Pass
AEN: Entropy Description	AEN_HCDPP.1	Pass
AKM: Key Management Description	AKM_HCDPP.1	Pass

Table 5 - Final verdicts for PP assurance activities

8.3 Recommendations

The conclusions of the Certification Body (OCSI) are summarized in section 6 (Statement of Certification).

Potential customers of the product “HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware” are suggested to properly understand the specific purpose of the certification by reading this Certification Report together with the Security Target [ST].

The TOE must be used according to the “Security Objectives for the Operational Environment” specified in section 4.2 of the Security Target [ST]. It is assumed that, in the operational environment of the TOE, all the Organizational Security Policies and the Assumptions described, respectively, in section 3.3 and 3.2 of the Security Target [ST] are complied.

This Certification Report is valid for the TOE in its evaluated configuration; in particular, “Annex A – Guidelines for the secure usage of the product” includes a number of recommendations relating to delivery, initialization, configuration and secure usage of the product, according to the guidance documentation provided together with the TOE ([CCECG]).

A residual vulnerability has been identified that may cause a Denial of Service. It does not directly impact TOE SFRs and require an attack potential greater than Basic (therefore the classification as residual). The Developer has been informed with the recommendation to apply a patch to fix the issues in next releases of the product.

9 Annex A – Guidelines for the secure usage of the product

This annex provides considerations particularly relevant to the potential customers of the product.

9.1 TOE delivery

The firmware and guidance documentation are packaged in a single ZIP file and available for download from the HP Inc. website. The firmware is packaged in this ZIP file as a single firmware bundle which contains both the System firmware and the Jetdirect Inside firmware. The evaluated firmware versions are provided in Table 1.

In order to download the ZIP file, the customer needs to register with HP and sign into a secure website (HTTPS) to access the download page. The customer can receive sign-in credentials by sending an email to ccc-hp-enterprise-imaging-printing@hp.com. On the download site, a SHA-256 checksum is provided along with instructions on how to use it for verification of the integrity of the downloaded package.

The customer receives the hardware independently of the ZIP file. The evaluated hardware models, which are listed in Table 1, are either already on the customer's premise or must be obtained from HP. The user can use the following steps to verify that the TOE hardware has not been tampered with during the delivery:

- Inspect the cardboard box the TOE hardware was delivered in. Ensure the cardboard box contains the HP logo, has not been opened and resealed, the product information label is present, and no major physical damage exists.
- Inspect the contents of the cardboard box. Ensure all expected items have been delivered, the packaging the TOE hardware is contained in has not been tampered, and no missing or reapplied tape exists on the TOE hardware.

After that, the user can verify that the delivered TOE hardware is the correct model by taking the following steps:

- Verify the full product model name, serial number and product number in the order confirmation is consistent with the label on the cardboard box.
- Verify the invoice located in the cardboard box the TOE hardware was delivered in is consistent with the order confirmation.
- Verify the serial number and product number on the product label on the back of the TOE hardware is consistent with the order confirmation.

9.2 Identification of the TOE by the User

The TOE user can identify TOE components as described below:

- **Hardware:** the model name is marked on the front of the TOE hardware and the product number on the product label on the back.

- **Firmware:** the user can verify firmware version by checking the “Configuration Page” through the EWS administrative interface or using the Control Panel.
- **Guidance documentation:** the version number is printed in the documents.

9.3 Installation, initialization, and secure usage of the TOE

TOE installation, configuration and operation should be done following the instructions in the appropriate sections of the guidance documentation provided with the product to the customer.

In particular, the Common Criteria Evaluated Configuration Guide for HP Multifunction Printers [CCECG] contains detailed information for the secure initialization of the TOE, the preparation of its operational environment and the secure operation of the TOE in accordance with the security objectives specified in the Security Target [ST].

The developer also provides user guides for the specific evaluated printer models. These additional documents are listed in Table 1-2 (“User guides”) and Table 1-3 (“Hardware installation guides”) of [CCECG].

10 Annex B – Evaluated configuration

The Target of Evaluation (TOE) is the product “HP LaserJet Enterprise MFP M430/M431, HP Color LaserJet Enterprise MFP M480, HP LaserJet Managed MFP E42540, and HP Color LaserJet Managed MFP E47528 multifunction printers (MFPs) with HP FutureSmart 5.3.2 Firmware”, developed by HP, Inc.

The evaluated configuration of the TOE includes the hardware models and firmware versions listed in Table 1.

The physical boundary of the TOE is the physical boundary of the HCD product. Options and add-ons that are not security relevant, such as finishers, are not part of the evaluation but can be added to the TOE without any security implications.

The following items will need to be adhered to in the evaluated configuration.

- HP Digital Sending Software (DSS) must be disabled.
- Only one Administrative Computer is used to manage the TOE.
- Third-party solutions must not be installed on the TOE.
- PC Fax Send must be disabled.
- Fax polling receive must be disabled.
- Device USB must be disabled.
- Host USB plug and play must be disabled.
- Firmware upgrades through any means other than the EWS (e.g., PJJ) and USB must be disabled.
- All non-fax stored jobs must be assigned a Job PIN or Job Encryption Password.
- HP Jetdirect XML Services must be disabled.
- External file system access through PJJ and PS must be disabled.
- Only X.509v3 certificates and pre-shared key are supported methods for IPsec authentication (IPsec authentication using Kerberos is not supported).
- IPsec Authentication Headers (AH) must be disabled.
- Control Panel Mandatory Sign-in must be enabled (this disables the Guest role).
- SNMP must be disabled.
- The Service PIN, used by a customer support engineer to access functions available to support personnel, must be disabled.

- Wireless functionality must be disabled:
 - Near Field Communication (NFC) must be disabled.
 - Bluetooth Low Energy (BLE) must be disabled.
 - Wireless Direct Print must be disabled.
 - Wireless station must be disabled.
- PJI device access commands must be disabled.
- When using Windows Sign In, the Windows domain must reject Microsoft NT LAN Manager (NTLM) connections.
- Remote Control-Panel use is disallowed.
- Local Device Sign In accounts must not be created (i.e., only the built-in Device Administrator account is allowed as a Local Device Sign In account).
- Access must be blocked to the following Web Services (WS) using IPsec:
 - Open Extensibility Platform device (OXPD) Web Services
 - WS* Web Services
- Device Administrator Password must be set.
- Remote Configuration Password must not be set.
- OAUTH2 use is disallowed.
- SNMP over HTTP use is disallowed.
- Licenses must not be installed to enable features beyond what is supported in the evaluated configuration.
- All received faxes must be converted into stored faxes.
- Fax Archive must be disabled.
- Fax Forwarding must be disabled.
- Internet Fax and LAN Fax must be disabled.
- Firmware updates through REST Web Services is disallowed.
- Remote User Auto Capture must be disabled.
- PS privileged operators must be disabled.

- Cancel print jobs after unattended error must be enabled.
- Smart Cloud Print must be disabled.
- Partial Clean function must not be performed.

10.1 TOE operational environment

The following required components are part of the Operational Environment (refer also to section 1.4.1 of the Security Target [ST]).

- A Domain Name System (DNS) server.
- A Network Time Service (NTS) server.
- One administrative client computer network connected to the TOE in the role of an Administrative Computer. It must contain a web browser.
- One or both of the following:
 - A Lightweight Directory Access Protocol (LDAP) server.
 - A Windows domain controller/Kerberos server.
- A Syslog server.
- A Windows Internet Name Service (WINS) server.

The following optional components are part of the Operational Environment.

- Client computers network connected to the TOE in a non-administrative computer role.
- HP Print Drivers, including the HP Universal Print Driver, for client computers (for submitting print job requests from client computers).
- Microsoft SharePoint®.
- The following remote file systems:
 - File Transfer Protocol (FTP).
 - Server Message Block (SMB).
- A Simple Mail Transfer Protocol (SMTP) gateway.
- Telephone line connection.

11 Annex C – Test activity

This annex describes the task of both the Evaluators and the Developer in testing activities. For the assurance level defined by the SARs included in the PP [HCDPP], such activities do not require the execution of functional tests by the Developer, but only independent functional tests and penetration tests by the Evaluators.

11.1 Test configuration

All testing activities have been carried out remotely from the LVS premises on the Virtual Test Laboratory (VTL) located at the Developer site in Boise, Idaho, USA. The Developer setup the test environment with the actual TOE models.

The Evaluators verified the configuration of the test environment, including the TOE, and found it to be consistent with the Common Criteria Evaluated Configuration Guide [CCECG] and the Security Target [ST].

The Evaluators performed testing remotely by connecting to the test environment using Microsoft Remote Desktop (RDP) and the communication was protected using TLSv1.2.

All remote test activities have been carried out in accordance with the instructions provided by the Italian Certification Body in the Scheme Information Note 5/23 - Conditions for performing tests remotely in Common Criteria evaluations [NIS5].

11.2 Functional and independent tests performed by the Evaluators

The Security Target [ST] claims exact conformance to the PP [HCDPP], which defines test cases mapped to SFRs. The Evaluators performed both automated and manual test cases to fulfil the required tests, thereby also fulfilling the requirements for ATE_IND.1.

Before initiating the testing activity, the Evaluators verified that the TOE was configured correctly. They also verified that the test environment was properly set up by the Developer.

The Evaluators tested the physical TOE models listed in Table 6, thereby covering all system firmware versions.

TOE model name	System firmware version
HP LaserJet MFP M430	2503252_000047
HP Color LaserJet MFP M480	2503252_000044

Table 6 - TOE models tested

The Evaluators executed all required tests described in the PPs [HCDPP] and [HCDPP-ERR], and in the applicable NIAP Technical Decisions listed in section 2.1.1 of the Security Target [ST].

All the actual test results were consistent to the expected test results.

11.3 Vulnerability analysis and penetration tests

For the execution of these activities, the Evaluators worked on the same VTL and the same TOE models already used for the functional test activities, verifying that the TOE and the test environment were properly configured.

Since an attack requires an attack surface, the Evaluators decided to examine if the TOE exposes such interfaces, i.e., open ports.

Port scans were performed against the TOE interfaces that are accessible to a potential attacker. The Evaluators examined all potential interfaces (IPv4 and IPv6 TCP and UDP ports of the TOE).

The Evaluators determined that only UDP port 500 (ISAKMP) is available outside of IPsec. This is the expected result.

A residual vulnerability has been identified that may cause a Denial of Service. It does not directly impact TOE SFRs and require an attack potential greater than Basic (therefore the classification as residual). The Developer has been informed with the recommendation to apply a patch to fix the issues in next releases of the product.

The Evaluators could then conclude that the TOE is resistant to an attack potential of Basic in its intended operating environment.