



IEC 63652-2

Edition 1.0 2026-02

INTERNATIONAL STANDARD

**NFC Forum Specifications -
Part 2: NFC Data Exchange Format**

Sample Document

get full document from standards.iteh.ai



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2026 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search -

webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Warning! Make sure that you obtained this publication from an authorized distributor.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

NFC Forum Specifications - Part 2: NFC Data Exchange Format

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 63652-2 has been prepared by technical area 15: Wireless Power Transfer, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

It is based on NFC Data Exchange Format Version 1.0 and was submitted as a Fast-Track document.

The text of this International Standard is based on the following documents:

Draft	Report on voting
100/4400/FDIS	100/4435/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

The structure and editorial rules used in this publication reflect the practice of the organization which submitted it.

This document was developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE In accordance with ISO/IEC Directives, Part 1, IEC PASs are automatically withdrawn after 4 years.

Sample Document

get full document from standards.iteh.ai



NFC Data Exchange Format

Technical Specification

Version 1.0

2021-08-23

[NDEF]

NFC Forum™

Sample Document

get full document from standards.iteh.ai

Copyright © 2010-2021 NFC Forum

Contents

1	Overview	1
1.1	Objectives.....	1
1.1.1	Design Goals	1
1.1.2	Anti-Goals	2
1.2	Applicable Documents or References	2
1.3	Administration	3
1.4	Trademark and Logo Usage	3
1.5	Intellectual Property.....	3
1.6	Special Word Usage.....	3
1.7	Abbreviations	3
1.8	Glossary.....	4
2	NDEF Mechanisms	6
2.1	Introduction	6
2.2	Intended Usage	6
2.3	NDEF Encapsulation Constructs	7
2.3.1	NDEF Message.....	7
2.3.2	NDEF Record	8
2.3.3	NDEF Record Chunks	8
2.4	NDEF Payload Description	11
2.4.1	NDEF Payload Length.....	11
2.4.2	NDEF Payload Type.....	11
2.4.3	Payload Identification	13
2.5	Data Transmission Order.....	13
2.6	NDEF Record Layout	14
2.6.2	MB (Message Begin).....	14
2.6.3	ME (Message End)	14
2.6.4	CF (Chunk Flag).....	15
2.6.5	SR (Short Record).....	15
2.6.6	IL (ID_LENGTH Field is Present)	15
2.6.7	TNF (Type Name Format)	16
2.6.8	TYPE_LENGTH	18
2.6.9	ID_LENGTH.....	18
2.6.10	PAYLOAD_LENGTH.....	18
2.6.11	TYPE	18
2.6.12	ID.....	19
2.6.13	PAYLOAD.....	19
3	Special considerations	20
3.1	Internationalization	20
3.2	Security	20
3.3	Maximum Field Sizes	20
3.4	Use of URIs in NDEF	20
A.	Exhibit A	22
B.	Revision History	23

Figures

Figure 1. Example of an NDEF Message with a Set of NDEF Records	7
Figure 2. NDEF Octet Ordering.....	13
Figure 3. NDEF Record Layout.....	14
Figure 4. NDEF Short Record Layout (SR=1)	15

Tables

Table 1: Abbreviations	4
Table 2. TNF Field Values	16
Table 3: Revision History.....	23

Requirements

Requirements 1: Intended Usage	7
Requirements 2: NDEF Encapsulation - Message	8
Requirements 3: NDEF Encapsulation – NDEF Record Chunks	10
Requirements 4: NDEF Payload Length	11
Requirements 5: NDEF Payload Type	12
Requirements 6: Data Transmission Order.....	13
Requirements 7: Normal Record Layout.....	14
Requirements 8: SR (Short Record).....	15
Requirements 9: IL (ID_LENGTH Field is Present)	16
Requirements 10: TNF (Type Name Format).....	17
Requirements 11: ID_LENGTH	18
Requirements 12: PAYLOAD_LENGTH.....	18
Requirements 13: TYPE.....	19
Requirements 14: ID	19
Requirements 15: Maximum Field Sizes.....	20
Requirements 16: Use of URIs	21

1 Overview

The NFC Data Exchange Format (NDEF) specification defines a message encapsulation format to exchange information between two NFC Forum Devices.

NDEF is a lightweight, binary message format that can be used to encapsulate one or more application-defined payloads of arbitrary type and size into a single message construct. Each payload is described by a type, a length, and an optional identifier.

Type identifiers can be URIs, MIME media types, or NFC-specific types. This latter format permits compact identification of well known types commonly used in NFC Forum applications, or self-allocation of a name space for organizations that wish to use it for their own NFC-specific purposes.

The NDEF Payload Length is an unsigned integer that indicates the number of octets in the payload. A compact, NDEF short-record layout is provided for very small payloads.

The optional NDEF Payload Identifier enables association of multiple payloads and cross-referencing between them.

NDEF Payloads can include nested NDEF Messages or chains of linked chunks of length unknown at the time the data is generated.

NDEF is strictly a message format, which provides no concept of a connection or of a logical circuit, nor does it address head-of-line problems.

1.1 Objectives

The NFC Data Exchange Format (NDEF) specification is a common data format for NFC Forum Devices.

The NFC Data Exchange Format specification defines the NDEF data structure format as well as rules to construct a valid NDEF Message as an ordered and unbroken collection of NDEF Records. Furthermore, it defines the mechanism for specifying the types of application data encapsulated in NDEF Records.

The NDEF specification defines only the data structure format to exchange application or service specific data in an interoperable way, and it does not define any NDEF Record Types in detail — NDEF Record Types are defined in separate specifications.

This NDEF specification assumes a reliable underlying protocol and therefore this specification does not specify the data exchange between two NFC Forum Devices.

An NFC Forum Device can process the NDEF information independently of the way it has received the NDEF Message.

Because of the large number of existing message encapsulation formats, record marking protocols, and multiplexing protocols, it is best to be explicit about the design goals of NDEF and, in particular, about what is outside the scope of NDEF.

1.1.1 Design Goals

The design goal of NDEF is to provide an efficient and simple message format that can accommodate the following:

1. Encapsulating arbitrary documents and entities, including encrypted data, XML documents, XML fragments, image data like GIF and JPEG files, etc.

2. Encapsulating documents and entities initially of unknown size. This capability can be used to encapsulate dynamically generated content or very large entities as a series of chunks.
3. Aggregating multiple documents and entities that are logically associated in some manner into a single message. For example, NDEF can be used to encapsulate an NFC-specific message and a set of attachments of standardized types referenced from that NFC-specific message.
4. Compact encapsulation of small payloads should be accommodated without introducing unnecessary complexity to parsers.

To achieve efficiency and simplicity, the mechanisms provided by this specification have been deliberately limited to serve these purposes. NDEF has not been designed as a general message description or document format such as MIME or XML. Instead, NFC applications can take advantage of such formats by encapsulating them in NDEF Messages.

1.1.2 Anti-Goals

The following list identifies items outside the scope of NDEF:

1. NDEF does not make any assumptions about the types of payloads that are carried within NDEF Messages or about the message exchange patterns implied by such messages.
2. NDEF does not in any way introduce the notion of a connection or a logical circuit (virtual or otherwise).
3. NDEF does not attempt to deal with head-of-line blocking problems that might occur when stream-oriented protocols like TCP are used.

1.2 Applicable Documents or References

[NFC RTD]	NFC Record Type Definition (RTD) Specification, NFC Forum
[RFC 1700]	Reynolds, J. and J. Postel, "Assigned Numbers", STD 2, RFC 1700, October 1994.
[RFC 1900]	B. Carpenter, Y. Rekhter, "Renumbering Needs Work", RFC 1900, IAB, February 1996.
[RFC 2046]	N. Freed, N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types" RFC 2046, Innosoft, First Virtual, November 1996.
[RFC 2047]	K. Moore, "MIME (Multipurpose Internet Mail Extensions) Part Three: Message Header Extensions for Non-ASCII Text", RFC 2047, University of Tennessee, November 1996.
[RFC 2048]	N. Freed, J. Klensin, J. Postel, "Multipurpose Internet Mail Extensions (MIME) Part Four: Registration Procedures", RFC 2048, Innosoft, MCI, ISI, November 1996.
[RFC 2119]	S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119, Harvard University, March 1997.
[RFC 2616]	R. Fielding, J. Gettys, J. C. Mogul, H. F. Nielsen, T. Berners-Lee, "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, U.C. Irvine, DEC W3C/MIT, DEC, W3C/MIT, W3C/MIT, January 1997.