

Network Working Group  
Internet-Draft  
Intended status: Informational  
Expires: December 3, 2016

R. Atarius  
Ofinno Technologies, LLC  
June 2016

A Uniform Resource Name Namespace for the Device Identity and the Mobile  
Equipment Identity (MEID)  
[draft-atarius-dispatch-meid-urn-11](#)

## Abstract

This document defines a Uniform Resource Name (URN) namespace for the Third Generation Partnership Project (3GPP2) and a Namespace Specific String (NSS) for the Mobile Equipment Identity (MEID). The structure of an MEID is 15 hexadecimal encoded digits long and is defined in the Third Generation Partnership Project 2 (3GPP2) (see [[S.R0048-A](#)]) to uniquely identify each individual mobile equipment (e.g., a handset or mobile phone). The 3GPP2 has a requirement to be able to use an MEID as a URN. This document fulfills that requirement.

## Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on December 3, 2016.

## Copyright Notice

Copyright (c) 2016 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect

to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

## Table of Contents

<a href="#">1.</a>	<a href="#">Introduction</a>	<a href="#">2</a>
<a href="#">2.</a>	<a href="#">Terminology</a>	<a href="#">3</a>
<a href="#">3.</a>	<a href="#">Namespace Registration Template</a>	<a href="#">3</a>
<a href="#">4.</a>	<a href="#">Specification</a>	<a href="#">6</a>
<a href="#">4.1.</a>	<a href="#">MEID Parameters</a>	<a href="#">6</a>
<a href="#">4.2.</a>	<a href="#">MEID Format</a>	<a href="#">6</a>
<a href="#">4.2.1.</a>	<a href="#">Manufacturer Code</a>	<a href="#">6</a>
<a href="#">4.2.2.</a>	<a href="#">Serial Number</a>	<a href="#">7</a>
<a href="#">4.2.3.</a>	<a href="#">Check Digit</a>	<a href="#">7</a>
<a href="#">4.2.4.</a>	<a href="#">Hexadecimal Encoding</a>	<a href="#">7</a>
<a href="#">5.</a>	<a href="#">Community considerations</a>	<a href="#">7</a>
<a href="#">6.</a>	<a href="#">Namespace considerations</a>	<a href="#">8</a>
<a href="#">7.</a>	<a href="#">IANA considerations</a>	<a href="#">8</a>
<a href="#">8.</a>	<a href="#">Security considerations</a>	<a href="#">8</a>
<a href="#">9.</a>	<a href="#">Acknowledgements</a>	<a href="#">9</a>
<a href="#">10.</a>	<a href="#">References</a>	<a href="#">9</a>
<a href="#">10.1.</a>	<a href="#">Normative References</a>	<a href="#">9</a>
<a href="#">10.2.</a>	<a href="#">Informative References</a>	<a href="#">11</a>
	<a href="#">Author's Address</a>	<a href="#">11</a>

## [1.](#) Introduction

A single mode 3GPP mobile equipment which uses only 3GPP technology to transmit and receive voice or data, or a dual mode 3GPP/3GPP2 mobile equipment which uses either 3GPP or 3GPP2 technology to transmit and receive voice or data has an International Mobile station Equipment Identity (IMEI) to identify the mobile equipment. Document [\[RFC7254\]](#) defines a URN Namespace and an NSS for the IMEI. For cases where the mobile equipment uses decimal values (i.e., IMEI) as an identity for dual mode 3GPP/3GPP2 access the IMEI urn as defined in [\[RFC7254\]](#) can be used to identify the mobile equipment.

However, single mode 3GPP2 mobile equipment which supports only 3GPP2 access technology to transmit and receive voice or data has a hexadecimal MEID. Since there are fundamental differences between MEID and IMEI, i.e. in encoding, format and the ownership, [\[RFC7254\]](#) cannot be employed to represent the hexadecimal MEID.

This document specifies a URN namespace for 3GPP2 and an NSS for the hexadecimal MEID as per the namespace registration requirement in [\[RFC3406\]](#). The Namespace Identifier (NID) '3gpp2' is for identities



used in 3GPP2 networks. The MEID is managed by the 3GPP2, so this NID is managed by the 3GPP2. Whilst this specification currently specifies only the MEID NSS under the '3gpp2' NID, additional NSS under the '3gpp2' NID may be specified in the future by the 3GPP2.

The hexadecimal MEID is 15 hexadecimal digits long and includes a manufacturer code of 8 hexadecimal digits and the serial number of 6 hexadecimal digits plus a hexadecimal digit as a check digit.

The manufacturer code identifies the mobile equipment manufacturer. A manufacturer can be assigned more than one manufacturer code. The serial number uniquely identifies each mobile equipment within the manufacturer code. The check digit is used as assurance of integrity in error-prone operations, e.g. when used with certain types of readers during inventory management operations. The check digit is not transmitted.

The information here is meant to be a concise guide for those wishing to use the hexadecimal MEID as a URN. Nothing in this document should be construed to override [[S.R0048-A](#)] that defines the MEID.

## **2. Terminology**

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

## **3. Namespace Registration Template**

Namespace ID: '3gpp2' requested

Registration Information:

Registration version number: 1

Registration date: 2016-06-01

Declared registrant of the namespace:

Registration organization:

Name: 3GPP2

Address: MEID Global Hexadecimal Administrator

c/o Telecommunications Industry Association  
 1320 N. Courthouse Rd. Suite 200,  
 Arlington, Virginia 22201 USA

#### Declaration of syntactic structure:

The identifier is expressed in American Standard Code for Information Interchange (ASCII) characters and has a hierarchical expression using the Augmented Backus-Naur Form (ABNF) defined in [[RFC5234](#)], as follows:

```

pp2-urn           = "urn:" pp2-NID ":" pp2-NSS
pp2-NID           = "3gpp2"
pp2-NSS           = meid-specifier / future-pp2-specifier
meid-specifier    = "meid:" meidval
future-pp2-specifier = future-specifier *( ";" future-param )
future-specifier  = pp2-defined-nonempty ;3GPP2 defined
future-param      = par-name [ EQUAL par-value ]
par-name          = pp2-defined-nonempty
par-value         = pp2-defined-nonempty
EQUAL             = "="
pp2-defined-nonempty = 1*pp2-urn-char
pp2-urn-char      = ALPHA / DIGIT / "-" / "." / "_" / "%" / ":"
ALPHA             = %x41-5A / %x61-7A; A-Z / a-z
DIGIT             = %x30-39; 0-9

```

An NSS for the MEID is defined under the '3gpp2' NID.

An MEID is an identifier under the '3gpp2' NID that uniquely identifies mobile equipment used in 3GPP2 defined networks.

The representation of the MEID is a specific number of hexadecimal digits, as described in [[S.R0048-A](#)].

The formal definition of a URN with 'meid' NSS contains one meidval with the formal definition according to the following ABNF [[RFC5234](#)]:

```

meidval           = Manufacturer-Code "-" Serial-Number
Manufacturer-Code = 8HEX
Serial-Number     = 6HEX
HEX               = DIGIT / "A" / "B" / "C" / "D" / "E" / "F"

```

<future-pp2-specifier> and <pp2-defined-nonempty> can comprise any ASCII characters compliant with URN syntax in [[RFC5234](#)].

The 3GPP2 will take responsibility for the '3gpp2' namespace, including the 'meid' NSS.



#### Relevant ancillary documentation:

See 3G Mobile Equipment Identifier [[S.R0048-A](#)] and GHA (Global Hexadecimal Administrator) Assignment Guidelines and Procedures for Mobile Equipment Identifier (MEID) and Short Form Expanded UIM Identifier (SF\_EUIMID) [[SC.R4002-0](#)].

#### Identifier uniqueness considerations:

Identifiers in the '3gpp2' NID are defined and assigned by the 3GPP2 or an agency appointed by 3GPP2 after ensuring that the URNs to be assigned are unique. Uniqueness is achieved by checking against the IANA registry of previously assigned names.

Procedures are in place to ensure that each MEID is uniquely assigned by the mobile equipment manufacturer so that it is guaranteed to uniquely identify that particular mobile equipment.

#### Identifier persistence considerations:

The 3GPP2 is committed to maintaining uniqueness and persistence of all resources identified by assigned URNs.

As the NID sought is '3gpp2', and 3GPP2 is the long standing acronym for the standards organization which includes the mobile phone operators, the URN should also persist indefinitely (at least as long as there is a need for its use). The assignment process guarantees that names are not reassigned. The binding between the name and its resource is permanent.

The Manufacturer Code and Serial Number portions of the MEID are permanently stored in the mobile equipment so they remain persistent as long as the mobile equipment exists. The process for Manufacturer Code and Serial Number assignment is documented in [[SC.R4002-0](#)] and the Manufacturer Code and Serial Number values once assigned are not re-assigned to other mobile equipments.

#### Process of identifier assignment:

The 3GPP2 or its approved agency will manage the <NSS> (including '3gpp2') and <future-pp2-specifier> identifier resources to maintain uniqueness. The process for MEID assignment is documented in [[SC.R4002-0](#)].

#### Process for identifier resolution:

Since the '3gpp2' NSS is not currently globally resolvable, this is not applicable.





#### Rules for Lexical Equivalence:

Two 3GPP2 MEID URNs are equivalent if they have the same 'meidval' and the same parameter values in the same sequential order. All of these comparisons are to be case-insensitive.

Any identifier in '3gpp2' NSS can be compared using the normal mechanisms for percent-encoded UTF-8 strings (see [[RFC3629](#)]).

#### Conformance with URN Syntax:

The string representation of the '3gpp2' NID and of the MEID NSS is fully compatible with the URN syntax (see [[RFC2141](#)]).

#### Validation Mechanism:

The MEID can be validated using the mechanism defined in [[S.R0048-A](#)].

#### Scope:

3GPP2 URN is global in scope.

## **[4. Specification](#)**

### **[4.1. MEID Parameters](#)**

Any future change to the format of the 'meid' NSS requires the use of the procedure for URN NSS changes (currently through the publication of a future Informational RFCs approved by IETF consensus).

[[draft-atarius-dispatch-meid-urn-as-instanceid](#)] specifies how the MEID URN can be used as an instance ID as specified in [[RFC5626](#)]. Any change to the instance ID, will require an update to [[draft-atarius-dispatch-meid-urn-as-instanceid](#)]. An example of 3GPP2 MEID URN is:

urn:3gpp2:meid:A04B0D56-02A7E3

### **[4.2. MEID Format](#)**

#### **[4.2.1. Manufacturer Code](#)**

The manufacturer code is an 8 hexadecimal digit value. The manufacturer code identifies the mobile equipment manufacturer. The manufacturer code is chosen from a range of values allocated to the mobile equipment manufacturer in order to uniquely identify the mobile equipment.





based devices and 3GPP2 mobile equipments. Thus the existence and syntax of these namespaces needs to be available to the general Internet community and the namespace needs to be reserved with IANA in order to guarantee uniqueness and prevent potential namespace conflicts both within the Internet and within 3GPP2 networks. Conversely, Internet implementations will not generally possess MEID identifiers. The identifiers generated by such implementations will typically be URNs within namespaces other than '3gpp2', and may, depending on context, even be non-URN URIs. Implementations are advised to be ready to process URIs other than '3gpp2' namespaced URNs, so as to aid in interoperability.

## **6. Namespace considerations**

A URN was considered the most appropriate URI to represent the MEID as this identifier may be used and transported similarly to the Universally Unique Identifier (UUID) which is defined as a URN in [\[RFC4122\]](#). Since specifications for protocols that are used to transport device identifiers often require the device identifier to be globally unique and in the URN format, it is necessary that the URN formats are defined to represent the MEID.

## **7. IANA considerations**

In accordance with [BCP 66](#) [\[RFC3406\]](#), IANA is asked to register the Formal URN namespace '3gpp2' in the "Uniform Resource Name (URN) Namespaces" registry, using the registration template presented in [Section 3](#) of this document.

## **8. Security considerations**

MEIDs (but with the check digit) are displayable on most 3GPP2 mobile equipments and in many cases are printed on the case within the battery compartment. Anyone with brief physical access to the mobile device can therefore easily obtain the MEID. Therefore MEIDs MUST NOT be used as security capabilities (identifiers whose mere possession grants access). Unfortunately there are currently examples of some applications which are using the MEID for authorization. Also some service provider's customer service departments have been known to use knowledge of the MEID as "proof" that the caller is the legitimate owner of the mobile device. Both of these are inappropriate uses of the MEID.

Since the MEID is permanently assigned to the mobile equipment and is not modified when the ownership of the mobile equipment changes, (even upon a complete software reload of the mobile equipment), the MEID URN MUST NOT be used as a user identifier or user address by an application. Using the MEID to identify a user or as a user address



could result in communications destined for a previous owner of a device being received by the new device owner or could allow the new device owner to access information or services owned by the previous device owner.

Additionally, since the MEID identifies the mobile equipment, it potentially could be used to identify and track users for the purposes of surveillance and call data mining if sent in the clear.

Since the MEID is personally identifiable information, uses of the MEID URN with IETF protocols require a specification and IETF expert review [RFC5226] in order to ensure that the privacy concerns are appropriately addressed. Protocols carrying the MEID URN SHOULD at a minimum use strongly hop-by-hop encrypted channels and that it is RECOMMENDED that end-to-end encryption is used.

## 9. Acknowledgements

This document draws heavily on the 3GPP2 work on Numbering, Addressing and Identification in [S.R0048-A] and also on the style and structure used in [RFC7254] and [RFC4122].

The author thanks for the detailed comments, provided by Ramachandran Subramanian, Alex Gogic, and Randall Gellens.

## 10. References

### 10.1. Normative References

- [[draft-atarius-dispatch-meid-urn-as-instanceid](#)]  
Atarius, R., "S.R0048-A: Using the Mobile Equipment Identity (MEID) Uniform Resource Name (URN) as an Instance ID", Internet Draft [draft-atarius-dispatch-meid-urn-as-instanceid](#), June 2014.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<http://www.rfc-editor.org/info/rfc2119>>.
- [RFC2141] Moats, R., "URN Syntax", [RFC 2141](#), DOI 10.17487/RFC2141, May 1997, <<http://www.rfc-editor.org/info/rfc2141>>.
- [RFC3406] Daigle, L., van Gulik, D., Iannella, R., and P. Faltstrom, "Uniform Resource Names (URN) Namespace Definition Mechanisms", [BCP 66](#), [RFC 3406](#), DOI 10.17487/RFC3406, October 2002, <<http://www.rfc-editor.org/info/rfc3406>>.



- [RFC3629] Yergeau, F., "UTF-8, a transformation format of ISO 10646", STD 63, [RFC 3629](#), DOI 10.17487/RFC3629, November 2003, <<http://www.rfc-editor.org/info/rfc3629>>.
- [RFC4122] Leach, P., Mealling, M., and R. Salz, "A Universally Unique IDentifier (UUID) URN Namespace", [RFC 4122](#), DOI 10.17487/RFC4122, July 2005, <<http://www.rfc-editor.org/info/rfc4122>>.
- [RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", [BCP 26](#), [RFC 5226](#), DOI 10.17487/RFC5226, May 2008, <<http://www.rfc-editor.org/info/rfc5226>>.
- [RFC5234] Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, [RFC 5234](#), DOI 10.17487/RFC5234, January 2008, <<http://www.rfc-editor.org/info/rfc5234>>.
- [RFC5626] Jennings, C., Ed., Mahy, R., Ed., and F. Audet, Ed., "Managing Client-Initiated Connections in the Session Initiation Protocol (SIP)", [RFC 5626](#), DOI 10.17487/RFC5626, October 2009, <<http://www.rfc-editor.org/info/rfc5626>>.
- [S.R0048-A]  
3GPP2, "S.R0048-A: 3G Mobile Equipment Identifier (MEID) - Stage 1, Version 4.0", 3GPP2 TS S.R0048-A 4.0, June 2005, <[http://www.3gpp2.org/Public\\_html/specs/S.R0048-A\\_v4.0\\_050630.pdf](http://www.3gpp2.org/Public_html/specs/S.R0048-A_v4.0_050630.pdf)>.
- [SC.R4002-0]  
3GPP2, "SC.R4002-0: GHA (Global Hexadecimal Administrator) Assignment Guidelines and Procedures for Mobile Equipment Identifier (MEID) and Short Form Expanded UIM Identifier (SF\_EUIMID), Version 10.0", 3GPP2 TS SC.R4002-0 10.0, December 2013, <[www.3gpp2.org/public\\_html/Specs/SC.R4002-0\\_v10.0\\_GHA\\_Guidelines\\_for\\_MEID\\_20131206.pdf](http://www.3gpp2.org/public_html/Specs/SC.R4002-0_v10.0_GHA_Guidelines_for_MEID_20131206.pdf)>.
- [X.S0008-0]  
3GPP2, "X.S0008-0: MAP Support for the Mobile Equipment Identity (MEID), Version 2.0", 3GPP2 TS X.S0008-0 2.0, October 2005, <[http://www.3gpp2.org/public\\_html/specs/X.S0008-0\\_v2.0\\_051018.pdf](http://www.3gpp2.org/public_html/specs/X.S0008-0_v2.0_051018.pdf)>.





## **10.2. Informative References**

[RFC7254] Montemurro, M., Allen, A., McDonald, D., Gosden, P.,, "A Uniform Resource Name Namespace for the Global System for Mobile Communications Association (GSMA) and the International Mobile station Equipment Identity (IMEI)", Internet Draft [RFC7254](#), May 2014.

### Author's Address

Roozbeh Atarius  
Ofinno Technologies, LLC  
13900 Lincoln Park Drive, Suite 330  
Herndon, VA 20171  
USA

Phone: +1 571 599 2262  
Email: [ratarius@ofinno.com](mailto:ratarius@ofinno.com)