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## A URN Namespace for ucode

### Abstract

This document describes a Uniform Resource Name (URN) namespace for ucode, an identifier system for objects and places. ucode technology is used in many applications, and this document provides a URN namespace for ucode to enable its use in Internet-related devices and software.

### Status of This Memo

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## 1. Introduction

ucode [UCODE] is an identifier to be stored in many types of tags (not limited to Radio Frequency Identification (RFID) tags). Its allocation and management is handled by the Ubiquitous ID Center [UIDC]. The embedding of ucode in many types of tags (RFID tags, optical code, infrared markers, and even sound source) is also specified by the Ubiquitous ID Center.

The basic length of ucode is 128 bits, but it is extensible in units of 128 bits if necessary.

ucode has been devised to identify objects and places where existing standards do not fit the application needs or the scope of the applications or where the allocation policy of existing standards is too limited for Small and Medium Enterprises (SMEs), small-scale research laboratories at academic institutions, or individual users.

Applications that use ucode take advantage of the Internet extensively. Use of ucode is open to anybody. Those who wish to have ucode allocated can do so either by having ucode subspace allocated to them directly from the Ubiquitous ID Center [UIDC] or by obtaining tags that have pre-stored ucode from so called "providers" [UCDMIP]. Such tags are certified as ucode tags [UIDTAG], and the reader specifications are published so that there will be many readers available for such tags.

By having a URN for ucode, we can facilitate the use of ucode in many Internet-related devices and software for the benefit of existing and future users of ucode and people who will access such tags attached to objects and places. Since an application based on ucode can run across organizational boundaries and spread across regions and countries, a formal URN Namespace Identifier (NID) assignment for 'ucode' is requested.

## 2. 'ucode' Registration Template

Namespace ID:

'ucode' requested

Registration Information:

Registration Version Number: 1

Registration Date: 2011-12-21

Declared registrant of the namespace:

T-Engine Forum  
2-20-1, Nishi-Gotanda  
Shinagawa, Tokyo, 141-0031  
Japan  
office@t-engine.org  
Tel: +81-3-5437-0572

Declaration of syntactic structure:

The structure of the namespace for 'ucode' using the hexadecimal representation of the identifier is as follows using ABNF [RFC5234].

```
UCODE-URN = "urn:ucode:" ucode-name
ucode-name = "_" ucode-number
ucode-number = 1*ucode-value
ucode-value = 32HEXDIG
HEXDIG      = DIGIT / "A" / "B" / "C" / "D" / "E" / "F"
DIGIT       = %x30-39
              ; 0-9
```

NOTE 1: "1\*" at the start of the ucode-number definition is not a typo. Although the currently used ucode [UCODE] is 128 bits (16 octets), thus requiring 32 hexadecimal characters to represent serially, ucode is designed to be extensible in increments of 128 bits. So, in the distant future, we may need to repeat the chunks of 128 bits. This is why "1\*" precedes ucode-value.

NOTE 2: ucode-name starts with a "\_" because it is also intended to be used as an identifier for XML [W3CXML]. Because an XML tag can't start with a digit, an "\_" (underscore) is inserted at the beginning to make sure ucode-name starts with a non-digit. For example, the 128-bit ucode value 0123456789ABCDEF0123456789ABCDEF, expressed in a series of hexadecimal digits, is as follows:

```
urn:ucode:_0123456789ABCDEF0123456789ABCDEF
```

Relevant ancillary documentation:

ucode, the identifier expressed by ucode-number, is managed by the Ubiquitous ID Center [UIDC], which is a sub-organization of the T-Engine Forum [TEF]. The document "Ubiquitous Code: ucode" [UCODE] defines this identifier system.

#### Identifier uniqueness considerations:

The 'ucode' namespace is managed by the Ubiquitous ID Center. The Ubiquitous ID Center assigns the identifier, ucode, in such a way that the uniqueness of the 'ucode' namespace will be maintained.

#### Identifier persistence considerations:

The assignment process guarantees that names are not reassigned and that the binding between the name and its resource is permanent, regardless of any standards or organizational changes or the assignment period.

#### Process of identifier assignment:

Names are assigned by the Ubiquitous ID Center and by any entities that are sub-delegated by the Ubiquitous ID Center. This assignment process is based on "ucode Management Implementing Procedures" [UCDMIP] established by the Ubiquitous ID Center.

#### Process of identifier resolution:

The process of identifier resolution is currently based on the "ucode Resolution Protocol" [UCSURP]. It will be enhanced by using newer recommendations from ITU-T and/or standards from ISO.

#### Rules for lexical equivalence:

The entire UCODE-URN is case-sensitive.

NOTE: This is an additional restriction imposed on the ucode namespace by the requirements of some major applications of ucode in existence. Only capital "A", "B", "C", ..., "F" are allowed as part of hexadecimal characters.

#### Conformance with URN syntax:

There are no special reserved characters. The URN of this namespace conforms to RFC 2141 [RFC2141] and RFC 3986 [RFC3986].

#### Validation mechanism:

No special considerations.

#### Scope:

Global.

### 3. IANA Considerations

One URN Namespace registration for 'ucode' (46) has been entered into the IANA "Formal URN Namespaces" sub-registry for URN NIDs.

### 4. Namespace Considerations

ucode, the identifier expressed by ucode-number, is a unique identification number to identify a tangible object or a place. Additionally, ucode can be assigned to "content" or "information" that does not exist in the real world or a "concept" that is yet more abstract.

ucode has been devised to identify objects and places where existing standards do not fit the application needs or the scope of the applications or where the allocation policy of existing standards is too limited for SMEs, small-scale research laboratories at academic institutions, or individual users.

ucode is only an identification number, and its value (or its sub-bitfields) does not contain any pre-assigned meaning. Any relevant information about the object or place to which a ucode is assigned is stored in a data server that can be reached after a "resolution process" [UCSURP]. This resolution process usually occurs over the Internet.

ucode can be assigned to an object to be identified regardless of the type of application. ucode is expected to be stored in any kind of tags (2D optical code, RFID, etc.), and it provides a framework where anyone can obtain unique numbers for identification purposes.

ucode has been designed to provide the services outlined in ITU-T Recommendation F.771 [ITU-T-F771] and to operate in the framework of ITU-T Recommendation H.621 [ITU-T-H621].

ucode architecture is general enough to cover many applications for the users.

### 5. Community Considerations

This namespace enables ucode to be stored in tags that are designed to store URN. Also, ucode-related information can be described as metadata using the URN namespace. Thus, the namespace facilitates the exchange of descriptions regarding objects and places among multiple organizations.

It is expected that many small-scale providers will offer ucode tags to small users and that large scale providers will hand out millions of tags to users.

The resolution servers and applications will be available to general users with appropriate access control over the Internet. The published specification for resolver and access services for 'ucode' allows the creation of client software for many types of computers including small mobile terminals and ever-popular smartphones.

## 6. Security Considerations

There are no additional security considerations other than those normally associated with the use and resolution of URNs in general.

## 7. References

### 7.1. Normative References

- [UCODE] T-Engine Forum, Ubiquitous ID Center, "ucode: Ubiquitous Code", UID-00010,  
<<http://www.uidcenter.org/spec#UID-00010>>.
- [UCDMIP] T-Engine Forum, Ubiquitous ID Center, "ucode Management Implementing Procedures", UID-00034,  
<<http://www.uidcenter.org/spec#UID-00034>>.
- [UCSURP] T-Engine Forum, Ubiquitous ID Center, "Simplified ucode Resolution Protocol", UID-00005,  
<<http://www.uidcenter.org/spec#UID-00005>>.
- [UIDTAG] T-Engine Forum, Ubiquitous ID Center, "ucode Tag Architecture", UID-00017,  
<<http://www.uidcenter.org/spec#UID-00017>>.
- [RFC2141] Moats, R., "URN Syntax", RFC 2141, May 1997.
- [RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005.
- [RFC5234] Crocker, D., Ed., and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008.

[ITU-T-F771] ITU-T, "Service description and requirements for multimedia information access triggered by tag-based identification", ITU-T Recommendation F.771, <<http://www.itu.int/rec/T-REC-F.771-200808-I>>.

[ITU-T-H621] ITU-T, "Architecture of a system for multimedia information access triggered by tag-based identification", ITU-T Recommendation H.621, <<http://www.itu.int/rec/T-REC-H.621-200808-I>>.

## 7.2 Informative References

[W3CXML] W3C, "Extensible Markup Language (XML) 1.1", <<http://www.w3.org/TR/xml11/>>.

[UIDC] Ubiquitous ID Center, <<http://www.uidcenter.org/>>.

[TEF] T-Engine Forum, <<http://www.t-engine.org/>>.

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## 9. Contributors

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