

INTERNET-DRAFT  
Intended status: Standards Track  
Category: Experimental  
Expires: May 16, 2012

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November 2011

**Internet Market Identification Code (IMIC)  
draft-imic-00**

Abstract

An Internet MIC (IMIC) identifies an internet-based financial market in a manner that is superset-compatible with the ISO's existing Market Identification Code (MIC) standard [[ISO10383](#)].

Status of this Memo

This memo defines an Experimental Protocol for the Internet community. This memo does not specify an Internet standard of any kind. Discussion and suggestions for improvement are requested. Distribution of this memo is unlimited.

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## **1. Introduction**

An Internet MIC (IMIC) identifies an internet-based financial market. No assumptions are made about settlement paths or the currencies or commodities exchanged on the market. IMIC provides a building block with which the internet community can develop viable, interoperable alternatives to legacy financial systems.

Technically, IMIC is an unofficial superset of the ISO's existing Market Identification Code standard [[ISO10383](#)] that is widely used for global identification of conventional financial exchanges. Against the ISO's MIC registry [[MIC-REG](#)], IANA assumes name space management rights for codes beginning with the digits 0-9 in order to obtain an adequate name space with which to provide a financial market registrar service for the internet community.

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 [BCP 14](#), [RFC 2119](#) [[RFC2119](#)].



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## **2. Requirement**

In recent years the internet has seen the emergence of online markets trading in both conventional and novel [[BITCOIN](#)] financial instruments.

Given this trend, it makes sense to propose a standard mechanism for the consistent, global identification of internet-based markets. IMIC provides such a mechanism.

## **3. Solution**

### **3.1. ISO10383 (MIC)**

For inspiration we look toward present standards for the global identification of financial markets and exchanges in conventional financial networks. Today's most widely widely adopted international standard in this area is the International Standards Organizations's Market Identification Code (MIC) [[ISO10383](#)].

In practice, a MIC is simply a unique series of four alphanumeric characters that is associated with a given market by publishing it within the ISO's Market Identification Code registry [[MIC-REG](#)].

### **3.2. IMIC**

In order to issue financial endpoint identifiers within the MIC [[ISO10383](#)] scheme IANA assumes management of the portion of the name space beginning with the digits 0-9. IMIC thus becomes superset-compatible with MIC.

The IMIC format may be expressed in ABNF [[RFC5234](#)] as follows:

```
imic      = digit 3char      ; eg: 0I7E
mic       = letter 3char     ; eg: XTAF

char      = digit / letter
digit     = "0" / "1" / "2" / "3" / "4" / "5" / "6" / "7" / "8" /
           "9"
letter    = "A" / "B" / "C" / "D" / "E" / "F" / "G" / "H" / "I" /
           "J" / "K" / "L" / "M" / "N" / "O" / "P" / "Q" / "R" /
```



"S" / "T" / "U" / "V" / "W" / "X" / "Y" / "Z"

Of the assumed name space, only codes with the zero (0) prefix are initially considered assignable by IANA, with the remainder reserved for private or future use as summarized below.

| Prefix | Auth. | Std. | Description                | Codepoints |
|--------|-------|------|----------------------------|------------|
| 0000   | IANA  | IMIC | Local (or default) market  | 1          |
| 0      | IANA  | IMIC | IANA assignable name space | 46,655     |
| 10     | IANA  | IMIC | Private use                | 1,296      |
| 11-1Z  | IANA  | IMIC | (Reserved for future use)  | 45,360     |
| 2-9    | IANA  | IMIC | (Reserved for future use)  | 373,248    |
| A-Z    | ISO   | MIC  | ISO managed name space     | 1,213,056  |

## 4. General Considerations

### 4.1. Namespace Prefix

ISO's Market Information Code (MIC) registry document [[MIC-REG](#)] contains assignments spanning approximately eight years, yet contains no evidence that a MIC has ever been issued with leading digits. IANA may thus safely and conveniently subsume management of the portion of the name space beginning with the digits 0-9.

Within this name space, a strong candidate for an initial prefix from which IANA may issue IMIC assignments is zero ('0'). Zero is considered particularly attractive for the following reasons:

- \* It is unlikely that a market will emerge that is best identified with leading '0'.
- \* '0' will appear above legacy market identifiers in alphabetically sorted destination lists.
- \* '0' provides reduced complexity for international recognition.
- \* The digit '0' tends to have digital connotations.

IMIC therefore reserves the name space defined by any leading digit for assignment by IANA, but employs '0' as the initial prefix for assignments.



## **4.2. Identifier Issuing Paradigms**

### **4.2.1. Distributed Hash Table (DHT)**

Using distributed hash tables (DHT) or a similar mechanism it may be possible to provide dynamic identifier name space management within a financial network itself, such that individual markets can self-issue IMICs and have them corroborated by network consensus.

Drawbacks to this approach include:

- \* The 'always on, always connected' requirement of most of these architectures.
- \* The 'endpoint exposure' problem.  
IP addresses for critical financial systems or their proxies are generally made available to a DHT network, which MAY not be desirable in a financial services setting.
- \* Namespace exhaustion.  
Without some underlying capability for reliable network participant identification, a single party COULD request vast quantities of identifiers in a bid to disrupt the network through name space exhaustion or processing overhead, causing Denial of Service (DoS).

The primary benefit of a DHT-based approach is that it is completely decentralized, thus avoiding issues associated with centralization.

In future, part of the reserved name space might be considered for assignment to a DHT-style self-managing peer to peer network.

### **4.2.2. Private Issue**

Just as the Internet Protocol provides a mechanism for Address Allocation for Private Internets [[RFC1918](#)], so too IMIC provides a mechanism for address allocation for private financial networks. Private financial networks MAY include those operated associated with Massive Multiplayer Online Roleplaying Games (MMORPGs) or financial simulations.

For this reason, the prefix '10' (in deference to IPv4's well known 10.x.x.x range [[RFC1918](#)]) is allocated for private use, with a total of 1,296 codepoints.



#### [4.2.3.](#) Combined Issue

Various approaches have been discussed with reference to their individual benefits and drawbacks. A combined process allows these to be balanced against other requirements, such as IANA's need to perform name space management. Under the IMIC scheme, provision for privately issued addresses is included, top-level institution registration is managed by IANA, and future assignments COULD provide DHT or similar mechanisms for the management of a delegated name space to users desirous of such services.

#### [4.3.](#) Why Markets?

With the advent of truly decentralized virtual currencies such as [[BITCOIN](#)] the conventional idea of a financial market (such as a stock exchange) MAY be seen by some as superfluous. However, the notion remains useful:

- \* Consolidated instruments such as corporate stock require a degree of centralization in order to maintain rapid settlement of trades
- \* Multi-currency or multi-instrument markets will require support for conventional currencies whose immediate settlement is difficult or impossible in many situations.
- \* Systems such as [[BITCOIN](#)] have quirks that require slightly delayed settlement due to the nature of their decentralized, consensus-based approach to fiscal transfer.

#### [4.4.](#) Number of Markets

The present ISO Market Identification Code (MIC) database contains 794 'live' codes. We therefore assume a requirement to support at least a few thousand market codes. We claim 466,560 codepoints from ISO's existing name space (prefixes 0-9), and activate 46,656 (10%) under the prefix zero ('0') for immediate assignment.



## **5. Security Considerations**

IMIC only provides a financial market identification scheme and DOES NOT approach problems of communications security, which are purposefully left to other protocols. Other than IANA processes regarding registration, maintenance, expiry of registrant codepoints and the potential for name space exhaustion, no security security considerations are felt to apply.

## **6. IANA Considerations**

### **6.1. Market Identifiers**

#### **6.1.1. Reserved IMIC**

The following IMIC are reserved and MUST NOT be issued to registrants.

|         |                                        |
|---------|----------------------------------------|
| +-----+ | -----+                                 |
| IMIC    | Purpose                                |
| +-----+ | -----+                                 |
| 0000    | Denotes the local (or default) market. |
| +-----+ | -----+                                 |

Implementers should note that the precise meaning of '0000' is system-specific and as such it MUST NOT be used in inter-system communications except by explicit prior arrangement. (See also [Appendix A](#): Special Purpose MIC Values).

#### **6.1.2. Registration**

Internet MICs (IMICs) MUST be assigned by IANA on a first come first served basis [[RFC5226](#)]. IMICs SHOULD NOT be provided to entities with existing MICs, as this would represent duplicate allocation under the MIC standard. Such entities MUST be defined as those appearing within SWIFT's official MIC registry [[MIC-REG](#)]. Registrants MUST provide the domain name with which their service is primarily associated and the name of the registrant (either a person or an organizational entity). Registrants MAY provide a physical address, and MAY provide one additional identifier such as a business registration or license number.

IMICs MUST be assigned randomly from the pool of available assignments and MUST NOT be granted on a specific request basis. Thus, the first issued institution code MUST NOT be '001'.



Institutions unhappy with their random assignment for legitimate reasons (such as unfortunate numerological connotations) MAY request one (1) replacement assignment. No further replacement is allowed. Registrants requesting replacement assignments automatically cause their initial allocation to expire (see Expiry, below).

#### **6.1.3. Modification / Cancellation**

Registrants MUST contact IANA to cancel or change the details associated with their registration. Authentication procedures will be stipulated at IANA's discretion.

#### **6.1.4. Expiry**

In case of imminent name space exhaustion and no viable alternative avenues for expansion, IANA MAY consider the expiry of a registrant's stated primary domain for a reasonable period (as determined by IANA) as adequate grounds for the deallocation of an IMIC. Deallocated IMIC MUST be immediately returned to the pool of available allocations, and MUST be re-issued to new parties on a first come, first served [[RFC5226](#)] basis.

### **6.2. Publications**

#### **6.2.1. IMIC Market Identifier Registry**

IANA SHALL publish revisions to the global registry of IMIC institution identifiers as changes are made. The registry SHALL include date of registration and date of last modification of each record, in addition to registrant information and the assigned institution code.

### **6.3. Future Considerations**

In future, part of the reserved name space might be considered for assignment to a DHT-style self-managing peer to peer network.

#### **6.4. ISO Liason**

In the future, at IANA's discretion, it may be worthwhile for the sake of preventing double assignment to contact the ISO's ISO10383 managing authority (SWIFT) via <http://www.iso15022.org/> and advise



them of leading-digit MIC name space utilization.

#### **[6.5.](#) Security**

IANA MUST provide adequate authentication of registrant institution communications in order to prevent the subversion of established institutions' registration information via IANA's registrar functions. As IANA is likely to have superior experience in this domain, specific procedures are left to IANA's judgement.

## **7. References**

### **7.1. Normative References**

- [ISO10383] ISO TC 68/SC 4 (Securities and related financial instruments), "ISO 10383:2003: Securities and related financial instruments - Codes for exchanges and market identification (MIC)", ISO10383:2003.  
[http://www.iso.org/iso/catalogue\\_detail?csnumber=33444](http://www.iso.org/iso/catalogue_detail?csnumber=33444)
- [MIC-REG] SWIFT, "ISO10383, Codes for exchanges and market identification", October 3rd, 2011.  
<http://www.iso15022.org/MIC/homepageMIC.htm>
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC5226] Narten, T., and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", [BCP 26](#), [RFC 5226](#), May 2008.
- [RFC5234] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, [RFC 5234](#), January 2008.

### **7.2. Informative References**

- [BITCOIN] Nakamoto, S., "Bitcoin: A Peer-to-Peer Electronic Cash System", 2009-05-24.  
<http://www.bitcoin.org/bitcoin.pdf>
- [RFC1918] Rekhter, Y. et al, "Address Allocation for Private Internets", [BCP 5](#), [RFC 1918](#), February 1996.



## **8. Acknowledgments**

\* Payward Inc. funded the research and development of this document.

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## [10.](#) Appendices

### [10.1.](#) [Appendix A](#): Special Purpose MIC Values

The Market Identification Code (MIC) registry [[MIC-REG](#)] specifies the following special values of which implementers should be aware.

```
+-----+-----+
| MIC   | Purpose                               |
+-----+-----+
| XXXX  | No market (eg: unlisted securities)    |
+-----+-----+
```