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Financial Instrument Global Identifier

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Table of Contents

1 Scope 9
1.1 Overview 9
2 Conformance 11
2.1 Introduction 11
2.2 Conformance as a Provider of Identifiers 12
2.2.1 Background & Approach 12
2.2.2 Conformance 13
2.3 Conformance as a Consuming Application 13
3 References 14
3.1 Normative References 14
3.2 Changes to Adopted OMG Specifications 14
4 Terms and Definitions 15
4.1 Specific Terminology 15
4.2 Financial Terms 15
4.3 Identifier 15
5 Symbols and Abbreviations 17
5.1 Symbols 17
5.2 Abbreviations 17
6 Architecture 18
6.1 Global Identifier structure 18
6.1.1 Introduction 18
6.1.2 Syntax 18
6.2 Global Identifier Associated Content 20
6.2.1 Introduction 20
6.2.2 Exchange Code 20
6.2.4 Financial Instrument Name 21
6.2.5 Pricing Source 21
6.2.6 Security Type 21
6.2.7 Ticker 21
6.3 Relationships Among Elements 21
6.3.1 Global Identifier 21
6.3.2 Composite Global Identifier 22
6.3.3 Share Class Global Identifier 22
6.3.4 Exchange Code 23
6.3.6 Financial Instrument Name 23
6.3.7 Pricing Source 23
6.3.8 Security Type 23
6.3.9 Ticker 23
7 Controlled Vocabularies 24
7.1 Introduction 24
7.2 Security Types 24
7.3 Pricing Sources 24
8 FIGI Ontology 25
8.1 Ontology Architecture and Namespaces 25
8.2 Global Instrument Identifiers Ontology 26
8.2.1 Ontology Metadata 26
8.2.2 Top-Level Class Hierarchy 28
8.2.3 Financial Instruments 30
8.2.4 Identifiers 33
8.2.6 Security Types 37

Appendix A: Shared Semantics Treatments 38
Appendix B: Creation of New Identifiers 39
B.1 General 39
B.2 Request Service 39
B.3 Certified Provider (CP) 40
B.3.1 Registration Authority (RA) role 40
B.3.2 Certified Provider (CP) role 41
B.4 New Security Types and new Pricing Sources 41
Appendix C: Allocation of Identifier Prefixes 42
Appendix D: Other Standards in the Financial Space 44
D1. ISO 6166 (ISIN) 44
D2. ISO 10962 (CFI) 44
D.3 ISO 20022 (UNIFI) 45
D.4 ISO 10383 (MIC) 45

Preface

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Helvetica/Arial – 9 or **10 pt. Bold:** OMG Interface Definition Language (OMG IDL) and syntax elements.

`Courier/Courier New – 9` or **`10 pt. Bold:`** Programming language elements.

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1 Scope

1.1 Overview

The development of a Financial Instrument Global Identifier originated out of the recognition that chaos theory has nothing on the complexity generated everyday by the millions-perhaps billions-of security transactions that cross trading floors, clearinghouses and exchanges all over the world. Almost every aspect of securities management is based on closed systems that use proprietary identifiers that are privately owned and licensed. Closing each deal is as much an exercise in translation as it is in transaction processing, as traders, investors and brokers wrestle with multiple proprietary formats to determine what a security is, who owns it, how much it is worth, and when the deal should be closed. It introduces a tremendous amount of friction into the trade lifecycle and creates opaqueness where clarity is sought. In addition, the use of proprietary identifiers adds significant cost and overhead when users wish to integrate data from disparate sources or migrate to a different market data system.

The evolution of advanced symbologies has helped the securities industry grow, but the limitations and costs imposed by the closed systems have become more apparent as companies and institutions continue to integrate operations on a global scale. Proprietary symbology now stands as one of the most significant barriers to increased efficiency and innovation in an industry that sorely needs it. Moreover, the lack of common identifiers is a key roadblock to achieving the holy grail of straight-through processing (STP).

Points of Note:

- Licensing fees require firms to pay for each symbol system they use. International firms bear an especially heavy burden, because they often have to license several symbologies in order to manage trading operations in several countries.
- Restrictions imposed by proprietary symbologies prevent companies from easily mapping one set of codes to another. This hinders integration of market data from diverse sources as well as efforts to automate trade and settlement activities.
- Market data consumers who adopt proprietary symbols for use in their own systems must not only pay licensing fees, but such symbols also lead to significant future costs associated with efforts to connect to emerging trading systems.
- Proprietary trading environments may have worked well for years; but they are a byproduct of a time when data systems operated largely as islands that did not have to interoperate with other systems.

Current trends dictate a different approach. Markets, customers and governments are demanding greater connectivity, transparency and efficiency. What's more, the openness of Internet-based systems has profoundly altered the way businesses-and individuals-collect, manage and share information. Thus, in addition to new regulations that demand clarity and accountability, the move to open symbology is being driven by growing investor and institutional demands.

Adopting an open system of shared symbology establishes the foundation for a tremendous leap forward in the efficient trade and settlement of securities as well as data management and reporting of financial instruments more generally. Such a system will allow firms and technology service providers to shift resources from laborious, inefficient processes to new investments in tools and products that will better serve clients.

An open system answers the call for greater transparency. Eliminating the need to remove proprietary IDs and re-map financial instruments will greatly simplify the steps needed to migrate between market data platforms and trading systems. Availability of a central symbology reference will facilitate mapping between users' internal systems and create opportunities for integration and automation of the global enterprise. This is to say that this standard represents a novel solution in the market that is not currently covered by other identifiers currently in circulation.

This specification lays out the details of the Financial Instrument Global Identifier across two dimensions:

1. The specification of the structure of the Global Identifier itself—what is/is not valid as a Global Identifier and how a Global Identifier is constructed and validated.

2. An ontological model specifying the relationship between the Global Identifier and other closely related information.

This specification has been created with the clear understanding that a published interface for creating identifiers and linking together relevant parties, e.g., Certified Providers or the Registration Authority, through the use of technology is a critical part of the operationalization of this standard. While high level descriptions of the various types of organizations that need to be involved as well as high level descriptions of the interactions between such organizations has been included in this document, they are included on the understanding that there will need to be a subsequent specification produced that details the necessary technical infrastructures and service level agreements for all participating organizations. To be clear, the technical specification of those services and service level agreements is out of scope for this document.

Global Identifier concepts are documented using two forms of definition:

1. A structured ontology specification of the concept, and its relationships to others, represented using the Web Ontology Language (OWL), in the form of (a) RDF/XML serialized OWL, (b) ODM (Ontology Definition Metamodel)-compliant ODM XMI, and (c) ODM-compliant UML XMI.
2. Natural language definitions which represent the concepts in natural language using the vocabulary of the finance industry.
3. Two controlled vocabularies in rdf format, one specifying the list of possible values for security types, one specifying the list of possible values for pricing sources. These lists are subject to growth over time as new security types are either invented or incorporated into FIGI and as new pricing sources are taken into account.

This specification covers both the content of the models, and the underlying architecture employed for producing and presenting the model.

This model is developed from a previously existing infrastructure that is currently active and had issued in excess of 150 million FIGI-compliant identifiers to date. The currently issued identifiers are freely available on a web site and through data files and are delivered upon request in bulk on a daily basis to interested parties. The purpose of this specification, however is to specify the structure of the Identifier itself and its relationship to key information elements rather than to specify the technology and related interfaces used to generate, access, and manage the identifiers.

2 Conformance

2.1 Introduction

An identifier is in conformance with this standard if, and only if, all of the following conditions are met:

Requirement	Description	Reference
Syntax of identifier.	The identifier shall be a twelve (12) character string as follows: Position 1: any upper case alphabetical character excluding vowels (but including “Y”). Position 2: any upper case alphabetical character excluding vowels (but including “Y”).. Position 3: the letter “G”. Positions 4-11: any alpha numeric character excluding vowels (but including “Y”).that, in combination with positions 1 and 2 does not constitute a duplicate of an existing string. Position 12: check digit (see section 7.1.2 for algorithm). Qualification: positions 1 and 2 cannot be the following sequences: BS, BM, GG, GB, VG.	Section 6.1.2
Uniqueness of identifier.	The identifier shall be a twelve character string, as specified above, that has never been assigned as a Financial Instrument Global Identifier.	Section 6.1.1
Composite Global Identifier	If a global identifier is to be designated as a Composite Global Identifier, it shall have at least one Global identifier associated with it.	Section 6.1.1
Share Class Global Identifier	If a global identifier is to be designated as a Share Class Global Identifier, it shall have at least one Composite Global identifier associated with it.	Section 6.1.1
Exchange Code	A global identifier will have either zero (0) or one (1) exchange code associated with it.	Section 6.2.2
Financial Instrument Name	Each global identifier will have at least one name, which need not be unique to the identifier.	Section 6.2.4
Pricing Source	A global identifier will have any finite number of pricing sources, including zero (0) associated with it.	Section 6.2.5
Security Type	A global identifier will be associated with at least one (1) Security Type.	Section 6.2.6
Ticker	A global identifier will have at least one ticker associated with it. That ticker need not be unique to the identifier.	Section 6.2.7

There are no degrees of conformance.

2.2 Conformance as a Provider of Identifiers

2.2.1 Background & Approach

In order to support the accurate assignment of identifiers it is vital that a single financial instrument, appropriately understood, be identified by exactly one identifier. Further, it must be the case that a particular identifier, unless it is a composite or share class Identifier (see section 6 below), identifies exactly one financial instrument. In order to support this, then, it is necessary that when an Identifier is created two conditions are met:

- Uniqueness of Identifier: the twelve character string (see section 6 for details) is unique and has never been used at any time for a FIGI.
- Uniqueness of the Financial Instrument: the financial instrument being identified does not already have a FIGI associated with it.

In order to ensure that these two conditions are met there are two basic approaches that might be considered:

- one comprehensive system of record (perhaps with non-official copies embedded in other organizations) that can serve as the single point of reference against which to check Financial Instruments and Identifiers
- a consistently applied mechanism by which both Identifiers and Financial Instruments are partitioned and distributed amongst multiple systems.

The second approach is essentially the approach taken in support of the LEI effort. This approach has had its challenges, but one might argue that it is now stable and operating properly and that since it is a working system that is fully specified, we would do well to adopt that model for FIGI. While it is certainly the case that the multiple provider approach to generating LEIs is better now than it was at the outset, the system is still far from perfect. Again, the key factor in assigning an identifier, be it for LEI or FIGI, is to ensure that the identifier is unique and that the thing being identified is unique. In the former case, the system in place for LEI is working fine; by distributing unique identifier characteristics across multiple providers, the only possibility of a duplicate identifier is in a case where one provider reuses a string. While this is a possibility, it is not a real problem. In the latter case, this amounts to ensuring that the entity identified does not already have an identifier associated with it. This, however, is where the distributed approach used to support LEI continues to break down, albeit not a badly as it did when it was initially introduced. Duplicate entities are being found on a weekly basis by one firm alone. The turn-around time to resolve these duplicates varies from hours to days. Again, while this is an improvement over the initial state of affairs, this is hardly an efficient model and clearly is sub-optimal in supporting near real-time markets.

The alternative model, leveraging a single system of record clearly solves this problem. By having a single system of record the possibility that two organizations can register the same entity is eliminated. Therefore, the single system of record approach is preferred. To that end, the following distinction needs to be made:

- Registration Authority (RA): the Registration authority serves as both an issuer of Identifiers and as a comprehensive system of record of the registered Identifiers.
    - The organization that will serve as the Registration Authority will be specified by the FDTF of the OMG.
- Certified Provider (CP): a Certified Provider (there can potentially be many) serves as an issuer of Identifiers and can elect to maintain a comprehensive inventory of Identifiers for their own purposes.
    - Each CP will elect an unused two consonant prefix to be used as the first two characters of the identifiers that they create.

The details of how two letter prefixes will be assigned is documented in Appendix C. The details of how new Identifiers are created, either by a CP or through a request service is documented in Appendix B.

2.2.2 Conformance

In order to conform to this specification, in addition to adhering to the technical requirements set out in Appendix B, a Certified Provider will be required to:

- Specify only identifiers that are compliant with the technical specifications of the identifier as specified in Section 6.
- Specify only identifiers that begin with the two letter prefix that is assigned to their organization as per the process outlined in Appendix C.
- Take reasonable steps to ensure that each identifier they issue is unique within their assigned domain of possible identifiers.
- Provide an appropriate description of the financial instrument, which may vary according to the type of financial instrument, so as to provide the Registration Authority the ability to confirm the uniqueness of the instrument.

2.3 Conformance as a Consuming Application

A consuming application is in conformance with this standard provided that it is configured to ingest and store a syntactically correct Financial Instrument Global Identifier, a Composite Global Identifier, and a Share Class Global Identifier. Optionally, a consuming application may, but is not required to, ingest and store any or all of the remaining data points associated with an Identifier, e.g., the associated definition.

3 References

3.1 Normative References

The following normative documents contain provisions which, through reference in this text, constitute provisions of this specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

Reference	Description
[OWL 2]	OWL 2 Web Ontology Language Quick Reference Guide (Second Edition), W3C Recommendation 11 December 2012. Available at http://www.w3.org/TR/2012/REC-owl2-quick-reference-20121211/.
[RDF 1.1]	RDF 1.1 Concepts and Abstract Syntax, W3C Recommendation, 25 February 2014. Available at http://www.w3.org/TR/2014/REC-rdf11-concepts-20140225/
[RDF 1.1 Schema]	RDF Schema 1.1. W3C Recommendation, 25 February 2014. Available at http://www.w3.org/TR/2014/REC-rdf-schema-20140225/.
[SKOS]	SKOS Simple Knowledge Organization System Reference, W3C Recommendation 18 August 2009. Available at http://www.w3.org/TR/2009/REC-skos-reference-20090818/.
[W3C Datatypes in RDF and OWL]	XML Schema Datatypes in RDF and OWL, W3C Working Group Note 14 March 2006, Available at http://www.w3.org/TR/2006/NOTE-swbp-xsch-datatypes-20060314/.
[XML Schema Datatypes]	W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes. W3C Recommendation, 5 April 2012. Available at http://www.w3.org/TR/xmlschema11-2/.
[Dublin Core]	DCMI Metadata Terms, Issued 2013-06-14 by the Dublin Core Metadata Initiative. Available at http://www.dublincore.org/documents/dcmi-terms/.
[MOF]	Meta Object Facility (MOF™) Core, v2.4.1. OMG Available Specification, formal/2011-08-07. Available at http://www.omg.org/spec/MOF/2.4.1/.
[MOF XMI]	MOF 2/XMI (XML Metadata Interchange) Mapping Specification, v2.4.1. OMG Available Specification, formal/2011-08-09. Available at http://www.omg.org/spec/XMI/2.4.1/.
[ODM 1.1]	Ontology Definition Metamodel (ODM), Version 1.1, Available at http://www.omg.org/spec/ODM/1.1/.
[OMG AB Specification Metadata]	OMG Architecture Board recommendations for specification of ontology metadata, Available at http://www.omg.org/techprocess/ab/SpecificationMetadata.rdf.
[UML2]	Unified Modeling Language™ (UML®), version 2.4.1. OMG Specification, formal/2011-08-06. Available at http://www.omg.org/spec/UML/2.4.1/.

3.2 Changes to Adopted OMG Specifications

None

4 Terms and Definitions

The human readable definitions have been constructed by and with the input of business subject matter experts. In cases where there are FIBO definitions available either the FIBO definitions were used or they were incorporated into the formal definitions.

For the purposes of this specification, the following terms and definitions apply.

4.1 Specific Terminology

Ontology

Definition: A formalization of a conceptualization. For the purposes of this specification the formalization is in OWL and the conceptualization is that of business subject matter specific to the identification of financial instruments.

Taxonomy

Definition: A set of terms which stand in some classification relation to one another.

Vocabulary

Definition: A set of words, each giving one or more formal definitions which apply to a meaningful concept that is referred to by that word.

4.2 Financial Terms

Financial Instrument

Definition: Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.

4.3 Identifier

In general terms, an Identifier can be understood as follows:

> An identifier is a name that identifies (that is, labels the identity of) either a unique object or a unique class of objects, where the "object" or class may be an idea, physical [countable] object (or class thereof), or physical [noncountable] substance (or class thereof). The abbreviation ID often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification). An identifier may be a word, number, letter, symbol, or any combination of those.
>
> The words, numbers, letters, or symbols may follow an encoding system (wherein letters, digits, words, or symbols stand for(represent) ideas or longer names) or they may simply be arbitrary. When an identifier follows an encoding system, it is often referred to as a code or ID code. Identifiers that do not follow any encoding scheme are often said to be arbitrary IDs; they are arbitrarily assigned and have no greater meaning. (Sometimes identifiers are called "codes" even when they are actually arbitrary, whether because the speaker believes that they have deeper meaning or simply because he is speaking casually and imprecisely.)

The above definition is general and applies to a range of items in this specification including Financial Instrument Names and Financial Instrument Identifiers. A more precise definition is, however, called for with respect to Financial Instrument Global Identifiers.

For the purposes of this specification an identifier when applied to the FIGI is understood as:

Definition: A unique string of characters which is semantically meaningless, but adheres to specific syntax restrictions.

Unpacking this:

Unique:

Definition: An item is unique if, and only if, within its domain, understood in this context to include all and only FIGIs, it does not duplicate any other item either currently or historically specified as an identifier within the domain where “duplicate” means consisting of exactly the same twelve characters in exactly the same order.

Uniqueness does not apply across domains. That is to say, that there is no guarantee that a given string may not be used as an Identifier outside of FIGI. That said, considerable effort was employed to reduce the chances that a given Identifier would not be a duplicate of another Identifier within the financial domain.

To say that the identifier is semantically meaningless is to say that, beyond syntax restrictions, the assignment of characters to given positions within the twelve character string is entirely without semantic content. The only exceptions to this clause are slight restrictions to which two letters can occupy the first two positions, the letter that shall occupy the third position, and the value of the last character, which is a calculated, though still meaningless, check digit.

5 Symbols and Abbreviations

5.1 Symbols

There are no symbols introduced by this specification.

5.2 Abbreviations

The following abbreviations are used throughout this specification:

- FIBO – Financial Industry Business Ontology
- FIGI – Financial Instrument Global Identifier
- ISIN – International Securities Identification Number
- LEI – Legal Entity Identifier
- ODM – Ontology Definition Metamodel
- OWL – Web Ontology Language
- RDF – Resource Definition Framework
- SME – Subject Matter Expert
- UML – Unified Modeling Language
- URL – Uniform Resource Locator
- XMI – XML Metadata Interchange
- XML – eXtensible Markup Language

Additional symbols and abbreviations that are used only in annexes to this specification are given in those annexes.

6 Architecture

6.1 Global Identifier structure

6.1.1 Introduction

A Financial Instrument Global Identifier is structured as a twelve (12) character string which is semantically meaningless. As the string is intended to remain attached to a given financial instrument throughout the life of that instrument in addition to serving as a historical reference for retired/obsolete financial instruments, it is vital that the string be structured in such a way as to be semantically neutral.

Owing to the granularity of the Financial Instrument Identifier, there is a need for multiple types of identifiers so as to provide groupings of Financial Instruments. The three types of Financial Instrument Global Identifiers are as follows:

- Global Identifier: this is the most basic type of identifier that applies to exactly and only one Financial Instrument at the most granular level. For example, AAPL common stock as traded on NASDAQ Global Select. The granularity of this identifier is found in that which it identifies. In particular, the most basic FIGI identifies a financial instrument, where applicable, at the trading venue level. That is, where applicable, the Global Identifier identifies a Financial Instrument within the context of an exchange venue.

- Composite Global Identifier: The Composite Global Identifier is itself a Global Identifier which is differentiated from a “normal” Global Identifier in that it serves as a parent in a hierarchy of individual Global Identifiers. For example, AAPL common stock, US Composite. The purpose of this “version” of the identifier is to group individual identifiers, as per above, into groupings at the country level. This is not, however, merely a grouping of financial instruments. Rather, a Composite Global Identifier identifies a unique financial instrument within the context of a country.

  The Composite Global Identifier only applies to a limited subset of Global Identifiers. In particular, it only applies to those Global Identifiers that can be differentiated based on either the exchange on which the asset is traded or on the pricing source of the asset. These conditions only obtain in the case of Equities. As such, the Composite Global Identifier is only used in grouping equities.

- Share Class Global Identifier: The Share Class Global Identifier is itself a Global Identifier which is differentiated from a “normal” Global Identifier and a Composite Global Identifier in that it serves as a parent in a hierarchy of individual Composite Global Identifiers. For example, AAPL common stock as traded across the planet presented as a list of Composite Global Identifiers. Similar to a Composite Global Identifier, the Share Class Global Identifier identifies a financial instrument within the context of the global perspective, e.g., aapl common stock.

  Like the Composite Global Identifier, the Share Class Global Identifier only applies to a limited subset of Global Identifiers. As a grouping mechanism for Composite Global Identifiers, the Share Class Global Identifier is only used in grouping equities.

All three types of Financial Instrument Identifiers have exactly the same structure and syntax restrictions as specified below.

6.1.2 Syntax

The permissible characters for use within a FIGI are a subset of ISO 8859-1 as follows:

- All upper case ISO 8859-1 consonants (including Y).
  - The exact list of permissible letters is B,C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z
- The single digit integers 0 – 9.

While the string itself is semantically meaningless, there is a specific structure that is used. The syntax rules for the twelve characters are as follows:

- Characters 1 and 2:
    - Any combination of upper case consonants with the following exceptions:

  BS, BM, GG, GB, GH, KY, VG The purpose of the restriction is to reduce the chances that the resulting identifier may be identical to an ISIN string. (Strictly speaking, a duplicate is not a problem as the strings designate different things, but care has been taken to reduce ambiguity.) The way that ISIN is constructed is that the first two characters correspond to the country of issuance. The third character, depending on the issuing organization is typically a numeral. However, in the case of the United Kingdom, the letter "G" is assigned. As we are using the letter "G" as our third character (see below), the only combinations that may come up within ISIN that only incorporates consonants are BSG (Bahamas), BMG (Bermuda), GGG (Guernsey), GBG (United Kingdom) and VGG (British Virgin Islands). The reason for this is that the United Kingdom issues ISIN numbers for entities within its broader jurisdiction.

  The allocation of the prefixes for different Certified Providers (CPs) is specified in Appendix C below.

- Character 3:
    - The upper case letter G (for "global")
- Characters 4 – 11:
    - Any combination of upper case consonants and the numerals 0 – 9
- Character 12:
    - A check digit (0 – 9) which is calculated as follows:
        - Letters are converted to integers as illustrated below. Using the first 11 characters and beginning at the last character in integer format and working right to left, every second integer is multiplied by two. The resulting string of integers (numbers greater than 10 become two separate digits) are added up. Subtract the total from the next higher integer ending in zero. If the total obtained when summing up the digits is a integer ending in zero, then the check digit is zero.

          Alphabetical characters are assigned a numeric value according to the following table:

B = 11	F = 15	J = 19	M = 22	Q = 26	T = 29	X = 33
C = 12	G = 16	K = 20	N = 23	R = 27	V = 31	Y = 34
D = 13	H = 17	L = 21	P = 25	S = 28	W = 32	Z = 35

For example, for the string BBG000BLNQ1 the calculation of the check digit would be as follows:

B	B	G	0	0	0	B	L	N	Q	1	
11	11	16	0	0	0	11	21	23	26	1	convert letters to numeric value here
1	2	1	2	1	2	1	2	1	2	1	multiply every other value by 2
11	22	16	0	0	0	11	42	23	52	1	the resulting values after multiplying in above step

Add up the resulting values above :

1+1+2+2+1+6+0+0+0+1+1+4+2+2+3+5+2+1 = 34

Check digit 6

40 the next highest integer ending in zero

The string with check digit would be BBG000BLNQ16

Similarly:

N	R	G	9	2	C	8	4	S	B	3	
23	27	16	9	2	12	8	4	28	11	3	convert letters to numeric value here
1	2	1	2	1	2	1	2	1	2	1	multiply every other value by 2
23	54	16	18	2	24	8	8	28	22	3	the resulting values after multiplying in above step

Add up the resulting values above :

2+3+5+4+1+6+1+8+2+2+4+8+8+2+8+2+2+3 = 71

Check digit 9

80 the next highest integer ending in zero

The string with check digit would be NRG92C84SB39.

The provenance of the check digit is the familiar Modulus 10 algorithm developed initially by Hans Peter Luhn and described in U.S. Patent No. 2,950,048 and part of the public domain. A familiar instantiation of this algorithm is specified in ISO 6166 and is used in generating the check digit for ISIN identifiers. In this instance, a few elements of the "standard" Modulus 10 algorithm have been adjusted so as to result in a different check digit than would be present in other similarly structured identifiers, e.g., ISIN. In particular, rather than multiplying the integer value corresponding to every second character starting with the second character in the identifier by two, as is the case with this specification, the ISIN specification begins with the first character. The result is that the check digit is different in over 90% of the logically possible strings.

6.2 Global Identifier Associated Content

6.2.1 Introduction

While the Global Identifier is at the heart of this specification, it does not exist in a vacuum. Rather, a set of complementary fields are associated with the Identifier, two of which are special instances of the identifier itself. The need for the additional data points is largely a function of the granularity of the Global Identifier. Since the Global Identifier serves to identify financial instruments at the most granular possible level, it is very helpful to clearly specify the differentiators that constitute the granularly. To that end, a number of key data elements are associated with each Global Identifier that serve to highlight the differentiating features as well as provide additional information about the financial instrument, e.g., its name.

The following sections outline the various data elements associated with the Global Identifier. The relationships between the various types are explicated in later sections.

6.2.2 Exchange Code

Financial instruments are, by their nature, things which can be bought or sold. The financial instruments to which this standard speaks are bought or sold on an individual exchange. Since the Global Identifier assigns unique identifiers to financial instruments at the most granular level possible, specifying the exchange on which the individual financial instrument is traded is valuable. It is grouped, along with Pricing Source, as an associated Code. Exchange codes are associated with Financial Instruments through the "has" object property. ("has" is used rather than a more descriptive object property such as "hasAssociatedCode" in order to leverage reasoning facilities and be "mappable" to FIBO relations.)

6.2.4 Financial Instrument Name

Financial Instrument Name is the name of the company, and sometimes including a brief description of the security. The name of an instrument may change in conjunction with corporate actions. As noted above, the Identifier associated with the instrument will not change in response to such an event. In many cases, e.g., common stock, the Financial Instrument Name also happens to be the name of the issuing body. This is not sufficient to individuate the financial instrument, however, as organizations issue financial instruments with exactly the same name but that trade on different exchanges. This is a distinction that is absent in other identifiers, but serves as an individuating characteristic for FIGI.

As it is the identifier that serves as the source of persistence through change, any changes in names are simply that, changes in names. The FIGI itself, which does not change, simply has the value of the Financial Instrument Name class change for a particular individual. Historical names are not part of the FIGI standard, though there is nothing precluding any organization from capturing and storing historical FIGI data for their own needs including, but not limited to, the Financial Instrument Name.

6.2.5 Pricing Source

The pricing source for a financial instrument is the organization or company that supplies the pricing data for the particular vehicle within the particular market, e.g., on a given exchange. It is grouped, along with Exchange Code, as an associated code. A set of individuals that are members of the class “PricingSource” are specified in an associated ontology included as part of this specification.

6.2.6 Security Type

A security type is a specific category of a financial instrument that further clarifies the nature of the instrument. For example, an Equity might be a American Depository Receipt as opposed to a Common Stock. The list of Security types is dynamic and should be expected to change over time. A set of individuals that are members of the class “SecurityType” are specified in an associated ontology included as part of this specification.

6.2.7 Ticker

A ticker is a specific identifier for a financial instrument that reflects common usage. Tickers are not, however, unique to specific exchanges or specific pricing sources. Rather, a given ticker might be associated with multiple Global Identifiers, e.g., an October 13 Put on AAPL US (Name) might have a ticker value of AAPL10/19/13 P210 yet be associated with multiple Global Identifiers owing to the diversity of exchanges on which the asset can be traded.

6.3 Relationships Among Elements

As outlined above, there are multiple information elements that are associated with a given Global Identifier. These serve to provide either context for the financial instrument or a user-friendly reference. In order to serve in these functions, however, the various classes need to stand in specific relationships with the Global Identifier. The exact natures of the relationships are specified in the associated OWL file; below is the description of those relationships. Detailed UML diagrams specifying these relationships are presented below in section 8. The current descriptions are intended for a business audience that may be more comfortable with explanations rather than technical diagrams.

6.3.1 Global Identifier

At the heart of this model are two things: a financial instrument and a global identifier. The Global Identifier itself is part of group of three different types of financial instrument identifiers. As such, the Global Identifier stands in relationships to both Financial Instruments and to the other identifiers.

- Relationship to Financial Instruments:
    - A Global Identifier identifies exactly one Financial Instrument.
    - A Financial Instrument is identified by exactly one Financial Instrument Identifier (the parent class of the Global Identifier).

- Relationship to other Financial Instrument Identifiers
    - A Global Identifier may have up to, but not exceeding, one Composite Global Identifier as a parent.

6.3.2 Composite Global Identifier

As noted above, a Composite Global Identifier is, essentially, a grouping of more granular Global Identifiers. The key differentiator is that a Composite Global Identifier has at least one "child" global identifier. As such the relationship between a Global Identifier and a Composite Global identifier is:

- Relationship to other Financial Instrument Identifiers
    - A Composite Global Identifier shall have at least one Global identifier as a child.
    - A Composite Global Identifier may have up to, but not exceeding, one Share Class Global Identifier as a parent.

6.3.3 Share Class Global Identifier

The relationship between a Composite Global Identifier and a Share Class Global Identifier is as follows:

- Relationship to other Financial Instrument Identifiers
    - A Share Class Global Identifier shall have at least one Composite Global Identifier as a child.

A visual summary of sections 6.3.1 – 6.3.3 is presented below in Figure 6.1

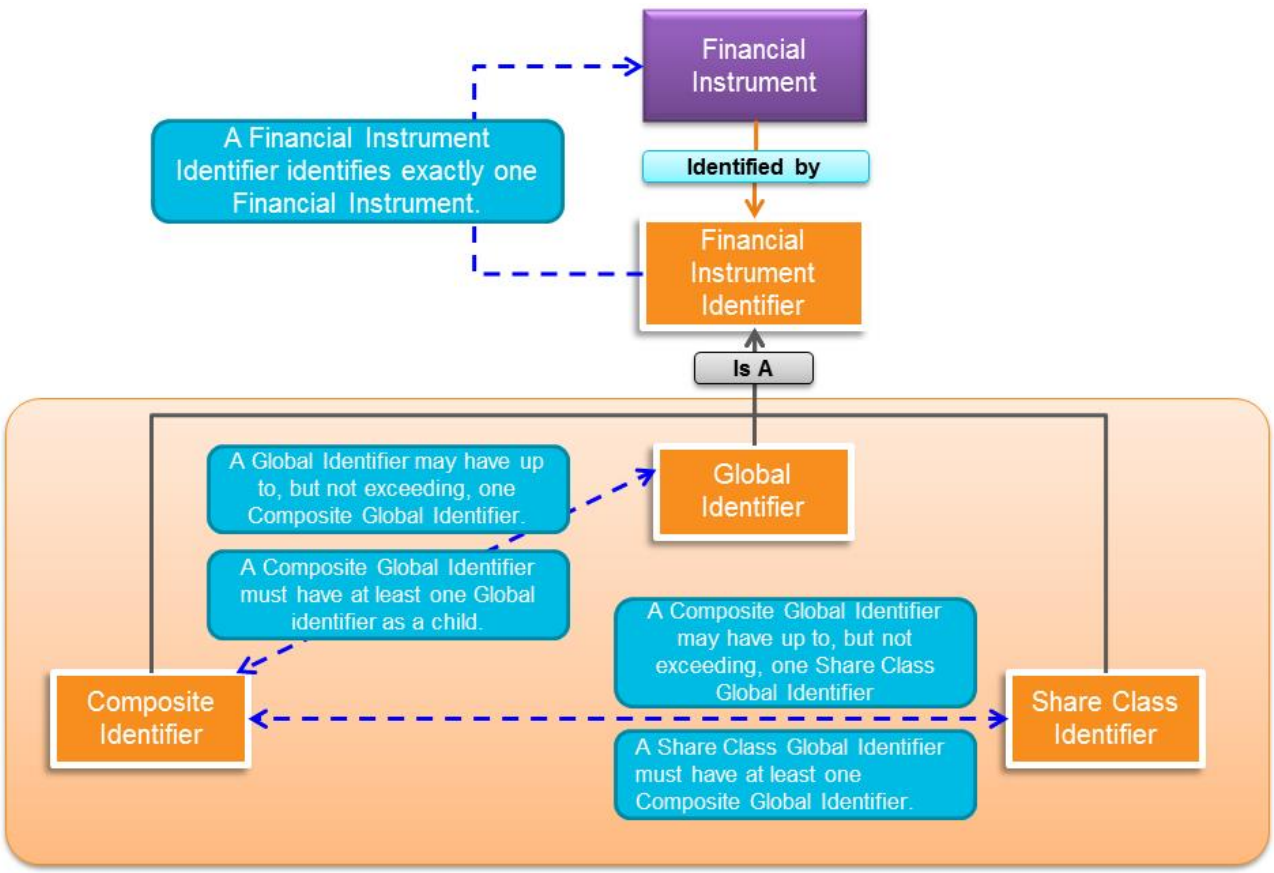

Figure 6.1 Identifier Types

6.3.4 Exchange Code

The relationship between a Financial Instrument and an Exchange Code is as follows:

- A Financial Instrument may have up to, but not exceeding, one Exchange Code.
    - Note: the vast majority of Financial Instruments have, as a matter of practice, one Exchange Code.

6.3.6 Financial Instrument Name

The relationship between a Financial Instrument and a Financial Instrument Name is as follows:

- A Financial Instrument is identified by at least one Financial Instrument Name.

Multiple Financial Instruments can be associated with a single name as there is no requirement that the name of a Financial Instrument specify all of the individuating characteristics of a Financial Instrument, e.g., the pricing source. There is, however, nothing precluding such specificity either.

6.3.7 Pricing Source

The relationship between a Financial Instrument and a Pricing Source is as follows:

- A Financial Instrument may have any number of Pricing Sources, including zero.

As a matter of practice, almost all Financial Instruments have an associated Pricing Source, but there are cases, e.g., some corporate bonds, where this is not the case.

6.3.8 Security Type

The relationship between a Financial Instrument and a Security Type is as follows:

- A Financial Instrument is classified by at least one Security Type.

6.3.9 Ticker

The relationship between a Financial Instrument and a Ticker is as follows:

- A Financial Instrument is identified by at least one Ticker.

7 Controlled Vocabularies

7.1 Introduction

In addition to the basic classes outlined above, there are two sets of named individuals that serve as controlled vocabularies for the classes. While the vocabularies described below and included as a part of the specification are current as of the writing of this document, they are subject to change, through growth, over time.

The process by which the controlled vocabularies changes is directly related to the activities of both the Registration Authority and the Certified Providers (see Appendix B).

7.2 Security Types

As specified above, each Global Identifier has at least one Security Type associated with it. The Security Types are specified in the associated SecurityTypes.rdf vocabulary.

Over time, the set of available security types is subject to change. Two events can trigger such a change:

- New security types are invented.

  The financial sector is dynamic and new financial instruments are constantly being created. Some are simply variations on existing instruments, *e.g*., a new mutual fund, but some are genuinely novel. Given the granularity of the security types currently inventoried in this controlled vocabulary (375 unique named individuals), it is likely that new financial instruments will emerge that require a new label.

- The coverage of FIGI expands.

  Currently FIGI covers over 190 million financial instruments. A large number to be sure, but given the granularity of FIGI, *e.g*, differentiating between AAPL being traded on one exchange as opposed to another, this list is certainly incomplete. Over time, additional financial instruments that simply are not covered at present will be incorporated into FIGI at which point the security type list will need to be expanded.

7.3 Pricing Sources

Like Security Types, there is a known set of individuals that can be used to specify the Pricing Source, as defined in PricingSources.rdf. The pricing sources, while not applicable to all financial instruments, specify the organization that has issued the pricing data for a particular Financial Instrument. Frequently, the organization is a financial services organization such as a Bank. As the pricing source is one of the elements that can serve to differentiate one Financial Instrument from another for the purposes of FIGI, it is vital that this information is specified. However, the potential list of pricing sources is subject to grow over time as new organizations enter the business space.

Note, because FIGI also applies to historical data and “retired” financial instruments, there will be no instances where pricing sources specified will drop off of the list.

8 FIGI Ontology

8.1 Ontology Architecture and Namespaces

The ontology architecture for FIGI is designed to facilitate ontology extension, evolution, mapping, and reuse to the degree possible. It depends on (1) basic terminology and ontology metadata, such as the OMG Architecture Board's Specification Metadata recommendation, and (2) may ultimately be mapped to other ontologies such as parts of the Financial Industry Business Ontology (FIBO). The FIGI specification includes two subordinate vocabularies:

- SecurityTypes.rdf, which contains all of the named individuals for security types as of the date of publication, and
- PricingSources.rdf, which contains all of the named individuals for pricing sources as of the date of publication

The namespaces and their well-known prefixes corresponding to external elements required for use of the FIGI Global Instrument Identifier ontology consist of of those listed in Table 8-1, below.

Table 8-1. Prefix and Namespaces for referenced/external vocabularies

Namespace Prefix	Namespace
rdf	http://www.w3.org/1999/02/22-rdf-syntax-ns#
rdfs	http://www.w3.org/2000/01/rdf-schema#
owl	http://www.w3.org/2002/07/owl#
xsd	http://www.w3.org/2001/XMLSchema#
dct	http://purl.org/dc/terms/
skos	http://www.w3.org/2004/02/skos/core#
sm	http://www.omg.org/techprocess/ab/SpecificationMetadata/

The namespace approach taken for FIGI is based on OMG guidelines and is constructed as follows:

- A standard OMG prefix, http://www.omg.org/spec/
- The abbreviation for the specification: FIGI
- The ontology or vocabulary name: GlobalInstrumentIdentifiers, SecurityTypes, and PricingSources

Note that the URI/IRI strategy for the ontology and two related vocabularies takes a "slash" rather than "hash" approach, in order to accommodate server-side applications. Though not technically necessary, this specification does mandate namespace prefixes to be used. These are constructed as follows with the components separate by "-":

- The specification abbreviation: figi
- The ontology or vocabulary abbreviation: gii, st, and ps, respectively.

The namespace itself for this specification is: http://www.omg.org/spec/FIGI/GlobalInstrumentIdentifiers/, and corresponding namespace prefix is figi-gii. The version IRI for the specification is http://www.omg.org/spec/FIGI/20140201/GlobalInstrumentIdentifiers/.

The namespaces for the subordinate vocabularies are:

- http://www.omg.org/spec/FIGI/SecurityTypes/
- http://www.omg.org/spec/FIGI/PricingSources/

and their corresponding version IRIs are:

- http://www.omg.org/spec/FIGI/20140201/SecurityTypes/
- http://www.omg.org/spec/FIGI/20140201/PricingSources/.

8.2 Global Instrument Identifiers Ontology

8.2.1 Ontology Metadata

The FIGI ontologies include metadata that conforms with the Specification Metadata recommendation from the OMG architecture board. The tables that follow provide the annotation property names and their values for metadata specified at the ontology level.

8.2.1.1 Specification-Level Metadata

The annotations provided in Table 8.1, below include metadata common to the GlobalInstrumentIdentifiers ontology, SecurityTypes and PricingSources vocabularies. In every instance, the metadata is specified in the informative about files rather than in each ontology file.

Table 8-1. Specification Level and Version Metadata

Metadata Term	Value
sm:specificationTitle	Financial Instrument Global Instrument Identifier (FIGI) Specification or Financial Instrument Global Identifier (FIGI) Specification Version 1.0
sm:specificationAbbreviation	FIGI
sm:specificationURL	http://www.omg.org/spec/FIGI/ or http://www.omg.org/spec/FIGI/1.0/
sm:specificationAbstract	A Financial Instrument Global Identifier (FIGI) is a unique, persistent twelve character string that serves to identify financial instruments. Along with the identifier, a number of related data points are identified and defined so as to provide clear context and differentiation of the financial instruments specified by the identifiers. The machine consumable OWL file associated with FIGI defines all of the classes that constitute an identifier as well as the relationships between those classes so as to provide a comprehensive semantic model for Financial Instrument Global Identifiers.
sm:dependsOn	http://www.omg.org/techprocess/ab/SpecificationMetadata/

Metadata Term	Value
sm:thisVersion	1.0
sm:publicationDate	2014-02-24T18:00:00
sm:specificationVersionURL	http://www.omg.org/spec/FIGI/ or http://www.omg.org/spec/FIGI/1.0
sm:specificationVersionStatus	Formal Specification
skos:historyNote	Revisions to the FIGI specification are managed per the process outlined in the Policies and Procedures for OMG standards, with the intent to maintain backwards compatibility in the ontologies to the degree possible. The RDF/XML serialized OWL for the Foundations ODM/OWL ontologies have been checked for syntactic errors and logical consistency with Protege 4 (http://protege.stanford.edu/) and HermiT 1.3.8 (http://www.hermit-reasoner.com/), Pellet 2.2 (http://clarkparsia.com/pellet/) and RacerPro reasoners for OWL 2 ontologies. Note that Pellet 2.2 cannot process the regex string pattern in the data restriction, however. Users who wish to use Pellet due to other advantages should comment out the restriction on the hasUniqueTextIdentifier property in the definition of FinancialInstrumentIdentifier.
sm:addressForComments	http://www.omg.org/issues/
sm:copyright	Copyright (c) 2013-2015, Bloomberg LP Copyright (c) 2015, Object Management Group, Inc.
sm:submitter	Bloomberg LP
sm:contributor	Adaptive, Inc., Thematix Partners LLC
dct:license	The MIT License: Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the “Software”), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The copyright notice and this permission notice shall be included in all copies or substantial portions of the Software. THE SOFTWARE IS PROVIDED “AS IS”, WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES

Metadata Term	Value
	OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNEC-TION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.
dct:license	http://opensource.org/licenses/mit-license.php
sm:responsibleTaskForce	http://fdtf.omg.org/

8.2.1.2 Ontology-Level Metadata

The annotations provided in Table 8.2, below include metadata specific to the GlobalInstrumentIdentifiers ontology.

Table 8-2 Ontology-level Annotations for FIGI

Metadata Term	Value
sm:filename	Global Instrument Identifiers Ontology
sm:fileAbbreviation	figi-gii
OntologyIRI	http://www.omg.org/spec/FIGI/GlobalInstrumentIdentifiers/
owl:versionIRI	http://www.omg.org/spec/FIGI/20150501/GlobalInstrumentIdentifiers/
sm:contentLanguage	http://www.omg.org/spec/ODM/ http://www.w3.org/standards/techs/owl#w3c_all

8.2.2 Top-Level Class Hierarchy

In addition to this specification, FIGI is provided as an ODM/OWL 2 compliant ontology with two supporting OWL 2 vocabularies. The ontology is defined using the ODM 1.1 stereotypes for RDF and OWL, and is explained via UML diagrams and corresponding tables describing the relevant model elements (the source for which is included as part of this specification in separate machine-readable files).

Each of the classes specified here are direct reflections of the concepts defined in 6.1 and 6.2 with the single exception of Financial Instrument which is defined as follows:

> Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.

A clarification of this (which is represented as a “note” in the associated model files) is as follows:

> Financial instruments can be categorized by form depending on whether they are cash instruments or derivative instruments:
>
> > Cash instruments are financial instruments whose value is determined directly by markets. They can be divided into securities, which are readily transferable, and other cash instruments such as loans and deposits, where both borrower and lender have to agree on a transfer.

Derivative instruments are financial instruments which derive their value from the value and characteristics of one or more underlying assets. They can be divided into exchange-traded derivatives and over-the-counter (OTC) derivatives.

Alternatively, financial instruments can be categorized by "asset class" depending on whether they are equity based (reflecting ownership of the issuing entity) or debt based (reflecting a loan the investor has made to the issuing entity). If it is debt, it can be further categorized into short term (less than one year) or long term.

Foreign Exchange instruments and transactions are neither debt nor equity based and belong in their own category.

The grouping of Financial Instrument Identifier along with Financial Instrument Name and Ticker into a broader class named Identifier is a reflection of the fact that all three classes contain as individuals things which serve to identify, perhaps not uniquely in some cases, other things, in this case, financial instruments. Figure 8.1 provides the top-level class hierarchy for the model.

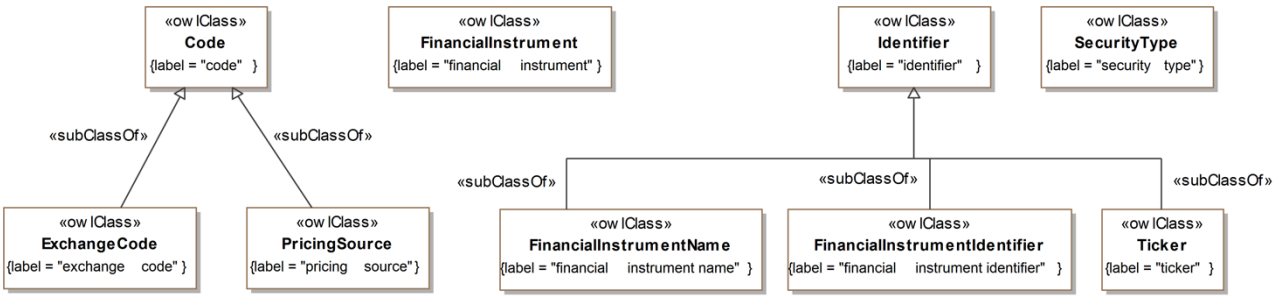

Figure 8.1 Top-Level Class Hierarchy

Property definitions for all properties in the FIGI ontology are given in Table 8-3, below.

Table 8-3 Property Definitions for the FIGI Ontology

Property Name	Type	Label	Definition	Definition Source	Domain	Range
classifies	object property	classifies	arranges in classes; assigns to a category	Merriam-Webster Dictionary	owl:Thing	owl:Thing
has	object property	has	indicates that someone (or something) possesses something, as a characteristic, attribute, feature, capability, and so forth		owl:Thing	owl:Thing
identifies	object property, functional	identifies	relates an identifier to the entity that it identifies		owl:Thing	owl:Thing

	property					
isClassifiedBy	object property, irreflexive property	is classified by	indicates the category or classifier used to classify an entity		owl:Thing	owl:Thing
isIdentifiedBy	object property	is identified by	relates an entity to an identifier or key that identifies it		owl:Thing	owl:Thing
hasUniqueTextIdentifier	data property	has unique text identifier	links an entity to a unique identifier for that entity; may be associated with anything. With reference to a given (possibly implicit) set of objects, a unique identifier (UID) is any identifier which is guaranteed to be unique among all identifiers used for those objects and for a specific purpose.	https://en.wikipedia.org/wiki/Unique_identifier	owl:Thing	xsd:string

8.2.3 Financial Instruments

As noted in section 6.3 above, Financial Instruments, which are at the heart of this specification, stand in a number of relationships to the other classes and subclasses defined in the model. Figure 8.2 depicts these relationships in detail.

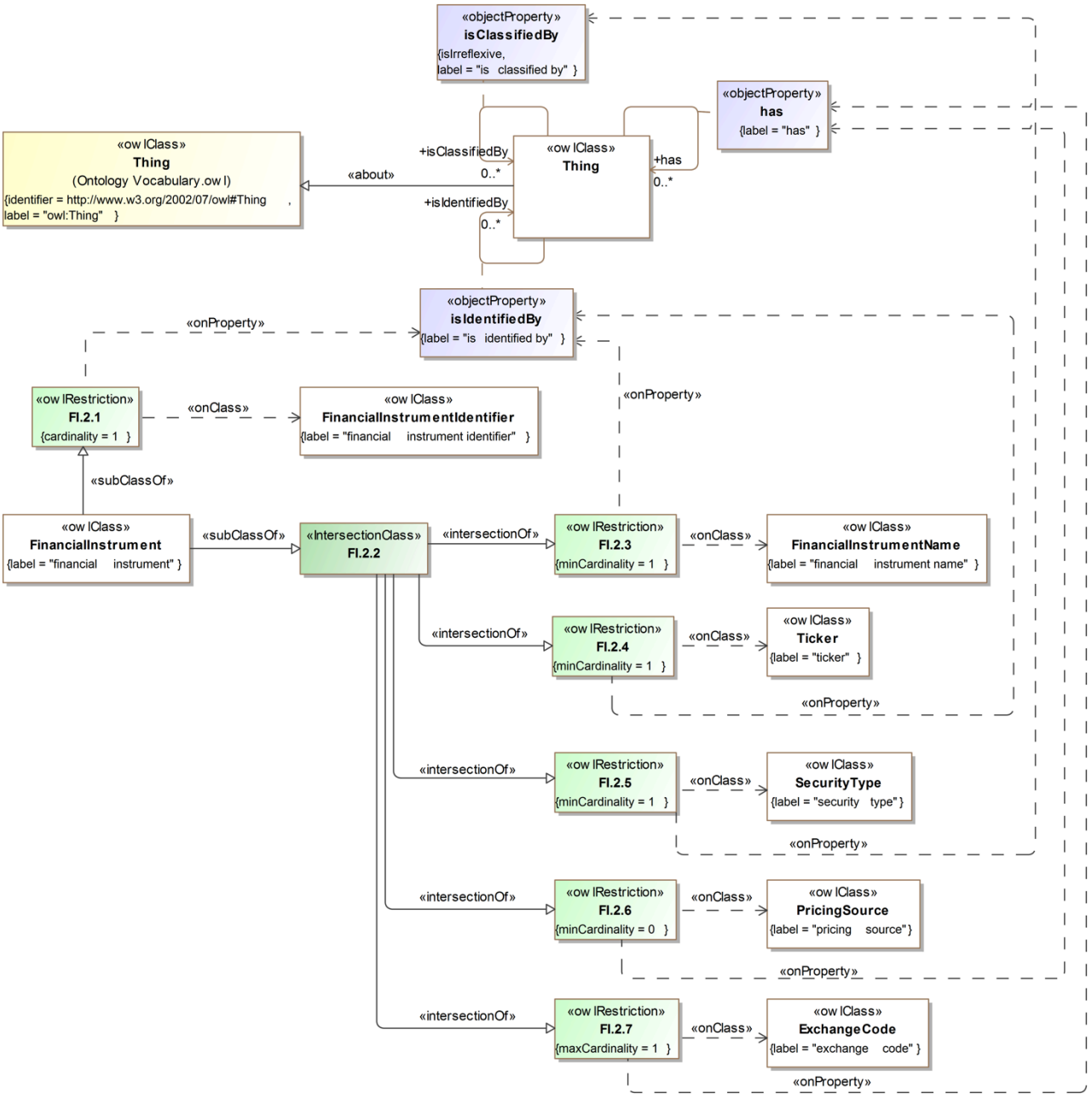

Figure 8.2 Financial Instruments

Of note in the above diagram, we can see that Financial Instruments participate in three types of relationships:

- ‘has’: indicates that someone (or something) possesses a property such as a characteristic, attribute, feature, capability, and so forth.
- ‘is classified by’: indicates the category is used to classify an entity, in this case, a financial instrument.
- ‘is identified by’: relates an entity, in this case a financial instrument, to an label of some sort that serves as a reference to it (perhaps not uniquely).

The diagram illustrates the following, again as outlined in 6.3.3:

- ‘has’ applies to:

- financial instrument → exchange code (FI.2.7)
- financial instrument → pricing source (FI.2.6)

- ‘is classified by’ applies to:
  - financial instrument → security type (FI.2.5)
- ‘is identified by’ applies to:
  - financial instrument → financial instrument name (FI.2.3)
  - financial instrument → ticker (FI.2.4)
  - financial instrument → financial instrument identifier (FI.2.1)

Class expression definitions for all expressions depicted in Figure 8.2, above, are given in Table 8-4, below.

Table 8-4 Class Expression Definitions for Financial Instruments

Class Expression	Type	Label	Definition	Parent
ExchangeCode	class	exchange code	a code for the exchange on which the security trades	Code
FinancialInstrument	class	financial instrument	Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.	F.2.1, F.2.2
FinancialInstrumentIdentifier	class	financial instrument identifier	A financial instrument identifier is an identifier that identifies (that is, labels the identity of) a financial instrument with a unique, persistent, semantically meaningless ID. The abbreviation 'ID' often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification). A financial instrument identifier consists of a 12 digit alpha-numeric, randomly generated ID covering active and inactive securities. In total there will be more than 852 billion potential combinations available. The first 3 characters begin with 'xxG'; where 'x' can be any upper-case consonant or 'Y' (with certain restrictions), positions 4-11 are alpha-numeric (excluding vowels) and the last digit is a check digit, which is calculated based on a variation of the Modulus 10 Double Add Double Formula.	Identifier, I.3.2, I.3.3 (equivalence)

FinancialInstrumentName	class	financial instrument name	the English language name of the company or the financial instrument, e.g., a particular fund name. It sometimes includes a brief description of the security or a differentiating feature, e.g., the issuance date. The name of an instrument may change in conjunction with corporate actions.	Identifier
<blank node>	restriction	FI.2.1	isIdentifiedBy exactly 1 FinancialInstrumentIdentifier	
<blank node>	intersection	FI.2.2	intersection of F.2.3, F.2.4, F.2.5, F.2.6, and F.2.7.	
<blank node>	restriction	FI.2.3	isIdentifiedBy min 1 FinancialInstrumentName	
<blank node>	restriction	FI.2.4	isIdentifiedBy min 1 Ticker	
<blank node>	restriction	FI.2.7	isClassifiedBy min 1 SecurityType	
<blank node>	restriction	FI.2.8	has min 0 PricingSource	
<blank node>	restriction	FI.2.9	has max 1 ExchangeCode	
PricingSource	class	pricing source	The pricing source for a security.	Code
SecurityType	class	security type	The type of security, for example, common stock.	ST.5.1, ST.5.2
Ticker	class	ticker	The assigned ticker. The rules for forming the ticker vary according to security class.	Identifier

8.2.4 Identifiers

Figure 8.3 specifies the ontological relationships between the three varieties of Financial Instrument Identifiers as well as their relationship to Financial Instruments. In every case, the relationships are as specified in 6.3.1 – 6.3.3.

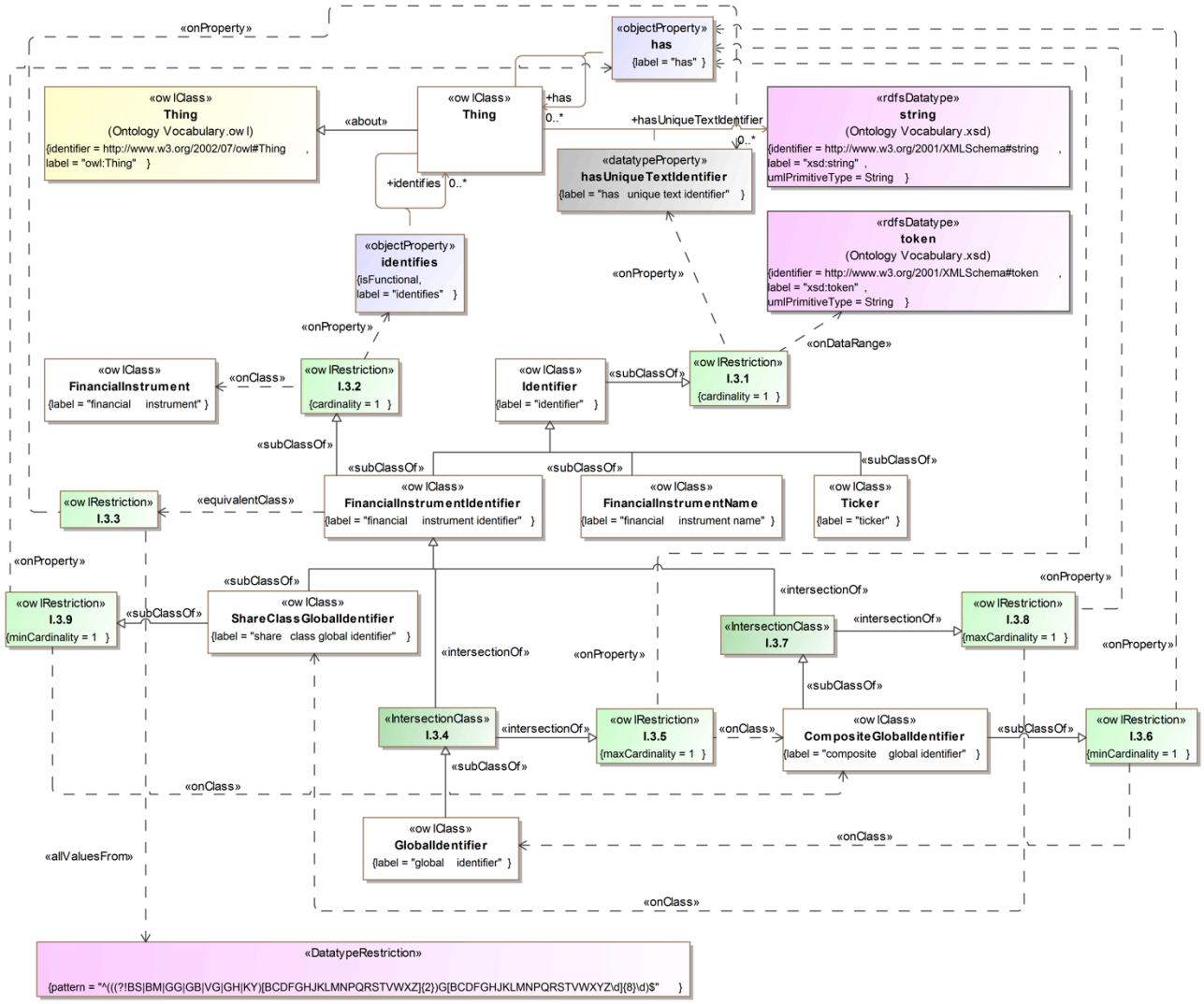

Figure 8.3 Identifiers

Of note in this diagram is the additional DataTypeRestriction (I.3.3) placed on the Financial Instrument Identifier, in particular:

"^(((?!BS|BM|GG|GB|VG|GH|KY)[BCDFGHJKLMNPQRSTVWXYZ]{2})G[BCDFGHJKLMNPQRSTVWXYZ\\d]{8}\\d)$"^^string]

This regex expression is in place to specify the syntactic restrictions on FIGI as specified in section 6.1. The breakdown is as follows:

- (?!BS|BM|GG|GB|VG|GH|KY): the first two characters cannot be any of the following strings:
  - ‘BS’
  - ‘BM’
  - ‘GG’
  - ‘GB’
  - ‘VG’
  - ‘GH’
  - ‘KY’
- [BCDFGHJKLMNPQRSTVWXYZ]{2}: the above condition not-with-standing, the first two characters can be any combination of upper case consonants (including “Y”).
- G: the third character shall be an upper case ‘G’.
- [BCDFGHJKLMNPQRSTVWXYZ\\d]{8}: the next eight characters (positions 4 – 11) can by any upper case

consonant or any single digit (trivially 0 – 9) numeral.

- \\d: the last character shall be a single digit (trivially 0 – 9) numeral.

What is absent from this DataTypeRestriction is the logic which dictates the calculation of the last character. This is specified in 6.2.2 but is not included in the OWL file as the calculation of the check digit would require an algorithm which is beyond the scope of regular expressions, e.g., javascript. At this point OWL 2.0 cannot support such code.

Class expression definitions for all expressions depicted in Figure 8.3, above, are given in Table 8-5, below.

Table 8-5 Class Expression Definitions for Identifiers

Class Expression	Type	Label	Definition	Parent
CompositeGlobalIdentifier	class	composite global identifier	This represents the identifier for the composite for equity securities.	I.3.6, I.3.7
FinancialInstrument	class	financial instrument	Financial instruments are cash, evidence of an ownership interest in an entity, or a contractual right to receive, or deliver, cash or another financial instrument.	F.2.1, F.2.2
FinancialInstrumentIdentifier	class	financial instrument identifier	A financial instrument identifier is an identifier that identifies (that is, labels the identity of) a financial instrument with a unique, persistent, semantically meaningless ID. The abbreviation ID often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification).	Identifier, I.3.2, I.3.3 (equivalence)
FinancialInstrumentName	class	financial instrument name	The English language name of the company or the financial instrument, e.g., a particular fund name, and sometimes include a brief description of the security or a differentiating feature, e.g., the issuance date. The name of an instrument may change in conjunction with corporate actions.	Identifier
GlobalIdentifier	class	global identifier	A 12 character alpha-numeric, randomly generated ID covering active and inactive securities. In total there will be more than 852 billion potential combinations available. The first 3 characters begin with ‘BBG’; positions 4-11 are alpha-numeric (less vowels) and the last digit is a check digit, which is calculated based on the Modulus 10 Double Add Double Formula.	I.3.4

Identifier	class	identifier	An identifier is a name that identifies (that is, labels the identity of) either a unique object or a unique class of objects, where the object or class may be an idea, physical (countable) object (or class thereof), or physical (noncountable) substance (or class thereof). The abbreviation ID often refers to identity, identification (the process of identifying), or an identifier (that is, an instance of identification). An identifier may be a word, number, letter, symbol, or any combination of those.	I.3.1
<blank node>	restriction	I.3.1	hasUniqueTextIdentifier exactly 1 xsd:string	
<blank node>	restriction	I.3.2	identifies exactly 1 FinancialInstrument	
<blank node>	restriction	I.3.3	hasUniqueTextIdentifier only xsd:string, pattern=">^(((?!BS|BM|GG|GB|VG)[BCDFGHJKLMNPQRSTVWXYZ]{2})G[BCDFGHJKLMNPQRSTVWXYZ\d]{8}\d)$	
<blank node>	intersection	I.3.4	intersection of (subclass of FinancialInstrumentIdentifier and I.3.5)	
<blank node>	restriction	I.3.5	has max 1 CompositeGlobalIdentifier	
<blank node>	restriction	I.3.6	has min 1 GlobalIdentifier	
<blank node>	intersection	I.3.7	intersection of (subclass of FinancialInstrumentIdentifier and I.3.8)	
<blank node>	restriction	I.3.8	has max 1 ShareClassGlobalIdentifier	
<blank node>	restriction	I.3.9	has min 1 CompositeGlobalIdentifier	
ShareClassGlobalIdentifier	class	share class global identifier	A Global Identifier assigned at the share class level so as to represent a hierarchy of Composite Global Identifiers. Since this identifier can be linked to more than one equity ticker, it will not load a single security. This class is only applicable to some securities, and excludes warrants.	Financial-Instrument-Identifier, I.3.9

Ticker	class	ticker	The assigned ticker. The rules for forming the ticker vary according to security class.	Identifier

8.2.6 Security Types

As discussed in 6.2.6, 6.3.8, and 7.2, Financial Instruments are further classified by specific Security. Security types and their relationships are specified below in Figure 8.5:

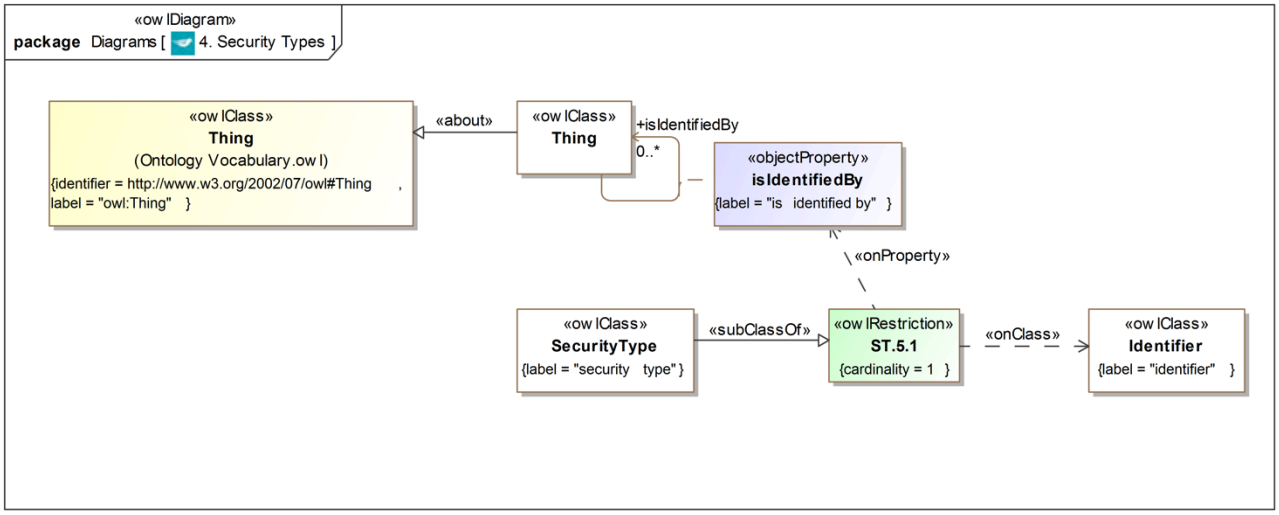

Figure 8.5 Security Types

Class expression definitions for all expressions depicted in Figure 8.5, above, are given in Table 8-7, below.

Table 8-7 Class Expression Definitions for Security Types

Class Expression	Type	Label	Definition	Parent
<blank node>	restriction	ST.5.1	hasUniqueTextIdentifier exactly 1 xsd:string	
SecurityType	class	security type	The type of security, for example, common stock.	ST.5.1, ST.5.2

Appendix A: Shared Semantics Treatments

(Informative)

The Financial Instrument Global Identifier is, in many ways, a complement to FIBO. The objective of FIBO includes providing a model of financial instruments as part of the model of the financial industry. The Financial Instrument Global Identifier is not, properly speaking, a part of that. The FIGI model does not specify a conceptual model of the financial instruments themselves, after all. Rather, it provides a concrete model for references, both descriptive and technical, for those instruments. FIGI is also designed to be mapped to the relevant aspects of FIBO as the modules describing financial instruments at the conceptual level become available.

Since the scope of the Financial Instrument Global Identifier is exclusively focused on Financial Instruments, the only part of FIBO that needs careful attention in the context of this standard is the treatment of Financial Instruments. Based on the latest ontology architecture information available for FIBO, definitions for financial instruments will span multiple specifications, each containing a number of modules and individual ontologies, none of which are available as OMG standards as of this writing.

Appendix B: Creation of New Identifiers

(Informative)

B.1 General

There will be two mechanisms by which an organization other than the designated Registration Authority (RA) can initiate the creation of new identifiers. It is recognized that a single RA individual can anticipate all possible market needs for identifiers. And while an RA can certainly provide a broad coverage of the market, there are inevitable market needs that will emerge over time. To this end, in addition to establishing additional RAs, two mechanisms for creation of new identifiers are proposed: 1. Request Service. 2. Certified Provider (CP) status. Each is explicated below.

B.2 Request Service

The simplest manner in which a new identifier or a set of new identifiers can be created is through the use of a request service whereby an organization interested in having an identifier or set of identifiers established simply issues a request to the RA which results in the RA creating a new identifier(s).

As has been noted throughout this document, the uniqueness of identifiers is vitally important. This applies not only to the actual twelve-character string used as an identifier, but also to the instrument(s) identified. Simply put, a single financial instrument, appropriately defined, can only have one identifier. So, in order to issue a new identifier, two things must be in place:

1. Uniqueness of the identifier: A mechanism by which it is ensured that the newly assigned twelve-character string(s) is unique.
2. Novelty of the financial instrument: A mechanism by which is it ensured that the financial instrument(s) being identified are not already identified by another twelve-character string.

Meeting condition 1 is trivial: since the RA serves as the system of record for all FIGIs, assigning a novel FIGI is merely a matter of creating a new identifier and checking against the existing inventory to ensure that the identifier is new. Exactly how the RA (or a CP, see below) might elect to do this is left open to the organization in question, provided that uniqueness obtains.

Meeting condition 2 is much more elaborate than was meeting condition 1. The conceptual model of a financial instrument that has been employed in this standard, however, is key to addressing this issue. As explicated in Section 6 of this standard, a financial instrument is identified by multiple things, is classified by multiple things, and is associated with multiple things. It is this collection of relationships that need to be understood so as to ensure that a given financial instrument has not already been assigned an identifier. So, the following data points need to be reviewed in order to confirm that the Financial Instrument in question has not yet been assigned an Identifier:

- Name
- Ticker (if applicable)
- Exchange Code
- Pricing Source (if applicable)
- Security Type

Owing to the diverse nature of financial instruments, it is expected that additional data points will be required, particularly as the coverage provided by FIGI expands, to provide decisive identification of financial instruments. (If such is viewed as necessary by either the Registration Authority or by a Certtified Provider (see B.3), a revision of this specification will be required so as to fully document the additional classes or vocabularies.) In any event, once the uniqueness of the financial instrument is established, then condition 1 can be met by issuing a new identifier.

In order to request a new identifier, therefore, it is necessary that the requester provide the data points corresponding to the the above six data points (where applicable) so as to identify the financial instrument as well as any additional data points that might be required moving forward. Further, it is incumbent upon the RA to provide a request mechanism that easily accommodates the multi-faceted requests, both in one-off format and in bulk (perhaps with restrictions on the number per request), in a simple and easy to use manner, e.g., a web site, web service or an ftp drop box.

B.3 Certified Provider (CP)

It is recognized that some organizations may have an interest in the creation of such a volume of identifiers that utilizing a request service as outlined in C.1. is simply insufficient for their needs. This, coupled with the fact that the FIGI standard is an open standard, requires that a set of mechanisms and processes be defined so as to accommodate alternative issuers of identifiers.

Certified Providers are self-identified and nominated (self-nomination included) as potential Certified Providers to both the OMG Finance Domain Task Force and the RA. A committee consisting of at least one representative from the RA and at least one OMG member organization that is not the RA (CP evaluation committee) will evaluate the nomination of the CP according to the following criteria:

1. Does the potential CP have the necessary infrastructure in place or in a funded, scheduled infrastructure project that is sufficient to:
    a. Scalably store and maintain the repository necessary to provide FIGIs?
    b. Scalably, and with sufficient redundancy, provide only access to the FIGIs it creates?
    c. Provide a sufficiently robust API interface to support the registration of new FIGIs and related items?
2. Is the potential CP committed to providing the above services in perpetuity with no restrictions on redistribution and absolutely no charge to any potential user or organization?

The CP evaluation committee will issue their response to the application within six (6) months/two OMG meetings of the completed application being presented to the Finance Domain Task Force at an OMG meeting. The response will provide appropriate documentation explaining why the decision was made as it was if the outcome is not positive. In the event of a negative outcome, the potential CP is free to reapply for CP status anytime in the future through the above process.

The two conditions outlined above, 1. Uniqueness of the identifier and 2. Novelty of the financial instrument are both highly relevant and, as it happens, a bit more complex in the case of a CP. The complexity stems from the fact that there will only be one comprehensive system of record that can serve to ensure that conditions 1 and 2 are met: the inventory maintained by the RA. To address this complexity, the mechanism and processes by which CPs can create identifiers needs to be considered from both the perspective of the potential CP as well as from the perspective of the RA. We begin with the RA.

B.3.1 Registration Authority (RA) role

The RA, as the keeper of the comprehensive inventory of identifiers needs to ensure that both conditions 1 and 2 are met prior to an identifier being issued. When the RA itself is issuing an identifier, this is relatively simple as outlined in C.1.. When an identifier is requested by a CP, however, the situation is different. Regarding condition 1: the uniqueness of the identifier, an allocation system for two letter prefixes as outlined below in Appendix C addresses that easily enough. Regarding condition 2: the uniqueness of the financial instrument requires a bit more effort.

Given the data points associated with a given financial instrument as discussed in C.1., determining if an instrument has already been assigned an identifier within the confines of the RA environment is not overly complex. In the case of a Certified Provider, however, there are two infrastructures at play: the RA infrastructure and the CP infrastructure. So, in order to ensure that condition 2 is met, the RA will need to provide an API that will permit each CP to check their proposed financial instrument against the existing inventory as part of the registration process. As it is possible that two CPs might elect to assign identifiers (trivially different twelve-character strings, see Appendix C) within a small window of time, it is necessary that this check occur at the time of registration, which will be after the time when the CP has assigned an identifier string, as opposed to a preliminary step prior to the assignment of the string. This way, at any

given time there will be either zero (0) or one (1) twelve-character string assigned to any given financial instrument with no need to “hold” a spot.

As part of the process whereby this lookup is supported a clearly communicated service level agreement must be established. Exactly what that will be will be determined and communicated prior to the service being set into place and will depend, in part, on the architecture of the service as well as the security infrastructure through which the communications will need to pass.

B.3.2 Certified Provider (CP) role

Like the RA, the CP will be responsible for ensuring that conditions 1 and 2 are met. In this case, however, the CP is not expected to check for conditions 1 and 2 against the entire inventory of financial instruments. Rather, they are only responsible for checking that conditions 1 and 2 are met against their own inventory. Once it is determined that a candidate financial instrument is not already present in the CPs inventory and that the identifier assigned to the instrument is unique within the CPs inventory (again, the uniqueness of identifiers across inventories is assured given the allocation rules specified in Appendix C), the CP issues a call to the API provided by the RA to register the financial instrument and the identifier assigned to it. There are three possible outcomes, all of which will be communicated back to the CP:

1. The registration is accepted and the financial instrument and identifier are inserted into the RAs comprehensive inventory thereby making it/them available for use.
2. The registration is rejected because:
    a. The instrument is already present in the comprehensive inventory, in which case the identifier will be communicated back.
    b. The data points provided to describe the instrument was incomplete or otherwise non-computable, in which case the offending data elements will be specified in the communication back.
3. Manual review of the request is required owing to some ambiguity or other issue; in which case an estimated time of resolution will be communicated back (within the constraints of an established SLA). This is expected to be a very rare occurrence and is included here for the sake of logical completeness.

In the event that a registration is rejected because the instrument is already present in the comprehensive inventory, it is up to the CP whether they put the identifier string back into their unused inventory or not. Given that each CP will have an initial allotment of roughly 852 Billion identifiers, inventory control is not a high priority.

B.4 New Security Types and new Pricing Sources

In addition to new identifiers, new Security Types and new Pricing Sources can, and will, be created from time to time. The mechanism by which these can be created are entirely parallel to the mechanisms by which new identifiers are created. In particular, as the two conditions necessary for a new identifier: 1. Uniqueness, and 2. Novelty, apply also the Security Types and Pricing Sources, the exact same process will be followed:

- The Registration Authority, as the holder of the definitive repository, is responsible for confirming the uniqueness and novelty of each new Security Type and Pricing Source it creates.
- The Certified Provider(s) are responsible for:
    - Confirming the uniqueness and novelty of each new Security Type and Pricing Source it creates against their own inventory.
    - Making a call to the RA’s API to confirm the global uniqueness and novelty of the new vocabulary item.
    - It is expected that this process can either stand alone as the registration of a vocabulary item or can be packaged as part of the request process for a new identifier which is such that a new vocabulary item is required to support it.

Appendix C: Allocation of Identifier Prefixes

(Informative)

The total possible inventory of identifiers is in excess of 600 Trillion. Each two letter prefix can be associated with over 852 Billion identifiers given the logic by which the identifiers are governed. While these numbers are sufficient to give us comfort from a statistical perspective that duplicate identifiers will not be generated, a mechanism by which specific two character prefixes are allocated and managed is necessary to ensure that duplication does not occur across different providers. To this end, the following logic will be employed:
Given that all grandfathered identifiers (those specified prior to the adoption of this standard and numbering over 150 Million) have been generated by a single organization and all begin with the "BB" as the first two letters:

- The organization currently issuing identifiers will continue to issue identifiers using the "BB" prefix until such time as the possible combinations are exhausted or are nearing exhaustion (threshold: 500 Million remaining identifiers) at which point they will select another two letter prefix following the same process as other organizations.
- Other organizations that wish to create identifiers will have the opportunity to select a two letter prefix from the unused inventory of two letter prefixes. In order to secure a particular two letter prefix, the following conditions must be met:
    - The organization shall demonstrate that they either currently have the capacity to deliver identifiers in accordance with the requirements specified concerning issuing authorities or have in place a funded project by which they will have the capacity to deliver identifiers in accordance with the requirements specified concerning issuing authorities within 18 months of approval.
    - The application for a new two letter prefix is presented in writing to both the relevant part of the OMG as well as the RA at least six (6) months prior to the anticipated approval date.
- If an issuing organization that has secured an identifier does not issue at least one identifier within six months of establishing the operational ability to create identifiers, the two letter prefix will be returned to the open inventory not withstanding any other written agreements between the issuing organization, OMG, and the RA to the contrary.

Once a two letter prefix is established and in use by a particular issuer, the issuer is restricted to issuing identifiers using only that prefix until such as time as all of the possible combinations are exhausted or are nearing exhaustion (threshold: 500 Million remaining identifiers) at which point they will be allocated another two letter prefix following the same process as outlined above.

The process flow by which CPs are established is as illustrated below:

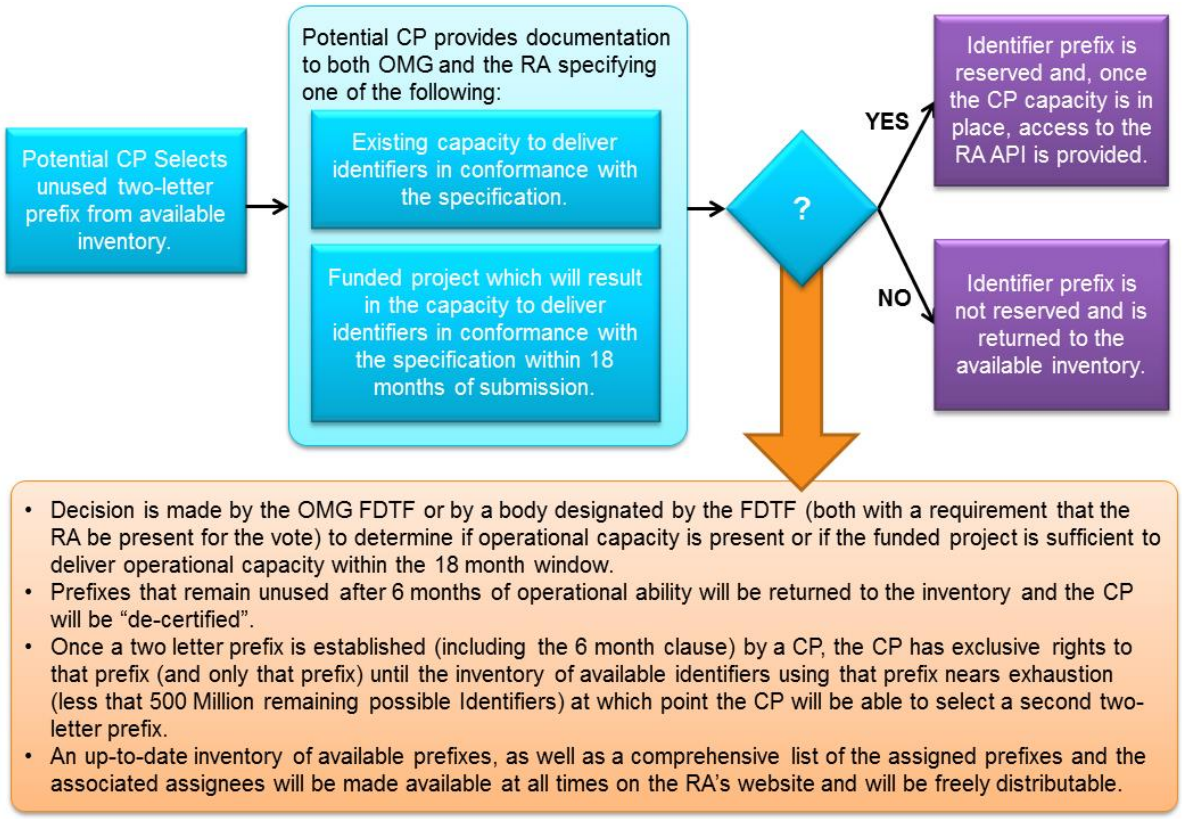

Figure C.1 Allocation of Certified Providers and Prefixes

Appendix D: Other Standards in the Financial Space

(Informative)

While the Financial Instrument Global Identifier specification is intended as a stand-alone specification which is focused on the integrity of unique, persistent identification of Financial Instruments, the fact remains that there are standards in place at any given time that speak to Financial Instruments and may, therefore, intersect with or overlap with the FIGI specification. The purpose of this appendix is to provide some acknowledgement of those facts and to proactively counter any confusion that might arise. To that end, this appendix will consist of a listing of the relevant standards and a brief treatment of the relationship between those standards and FIGI. Again, as there are constantly emerging and evolving standards, it is expected that this appendix will change over time as part of the revision process.

D1. ISO 6166 (ISIN)

The ISIN standard overlaps with the FIGI standard in that it, too, seeks to assign unique identifiers to Financial Instruments. It differs, however, from the FIGI in a number of critical ways which will be explicated below. Because of the overlap and the differentiation, FIGI and ISIN can be viewed as complimentary, rather than competing, standards.

The ISIN and the FIGI differ in three broad ways:

1. Scope: The FIGI provides, both in practice and in future implementation, a much broader scope than does ISIN. In particular, FIGI identifies not only securities, but, potentially, all financial instruments. The reason that the scope is so much broader is a function of purpose: the ISIN is focused on serving as a reference for a fungible instrument at the initial issuance level, which serves a proper and needed function in and of itself. FIGI, in contrast, while capable of serving in that capacity, is focused on providing a consistent and unique data point that serves to identify financial instruments and the different contexts they exist in throughout their lifecyle, so as to enable robust and comprehensive data management and, from that, compliance.

2. Granularity: The ISIN provides a single identifier at the single issued level for a fungible instrument. FIGI, in contrast, provides not only that in the form of the Share Class Global Identifier (hence the overalp), but also at the country level through the Composite Global Identifier, and, where applicable, at the trading venue level as well.

3. Persistence: Corporate actions, such as name changes, acquisitions, corporate relocations, and so on, can result in the need for an ISIN to change. This is not intended as part of the ISO 6166 specification, but is a function of the distributed delivery system for ISINs. Such is not the case with FIGIs in that the characters present in the FIGI string are, with the exception of the check digit, entirely meaningless. As such, there is no hidden reference to the currency, market or country location, or company name present in the identifier—a condition which is consistently present in ISINs.

Organizations that are licensed to use ISIN are free to map between FIGI and ISIN at the Global share class level. Indeed, this is a common practice. Owing, however, to licensing restrictions on ISIN (though not on FIGI), such mappings cannot be freely redistributed.

D2. ISO 10962 (CFI)

The Classification of Financial Instruments (CFI) code is a six character string that serves to classify financial instruments both at a high-level, e.g, debt instruments vs equities, and through their attributes, e.g., fully paid vs partly paid. In a sense, this can be viewed as related to the Security Type vocabulary that is part of the FIGI specification. The mechanism by which the distinctions are made, beyond the top levels, however are very different and so these should be viewed as complimentary classification systems.

The mechanism by which CFI distinguishes between Financial Instruments at the granular level is largely a function of the legal distinctions that govern the acquisition and disposition of such instruments. For example, Future Contracts will be differentiated by whether the terms are standardized or non-standardized. In contrast, the different security types that

inform FIGI reflect the manner(s) in which a financial institution would classify their positions for multiple operational and regulatory reporting purposes, and may be influenced by jurisdiction.

As with other standards, it is possible, indeed common, for organizations to map their holdings to both the FIGI listing of Security Types and to CFI. Distribution of the CFI mapping is not, however, part of the FIGI specification, nor it is required as part of FIGI compliance within the standard (though it is not precluded).

D.3 ISO 20022 (UNIFI)

ISO 20022 is a messaging standard what specifies the structure of a metadata repository containing descriptions of messages and business processes. The relationship between ISO 20022 and FIGI is potentially an intersecting, rather than overlapping, relationship. In particular, given that the identifiers associated with FIGI are, potentially, items that would be embedded in messages used within the financial sector, there is the potential that FIGI would be formally recognized as having a place within ISO 20022. Strictly speaking, however, ISO 20022 and FIGI are entirely independent of one another as they seek to do very different things.

D.4 ISO 10383 (MIC)

The Market Identifier Code (MIC) provides a universal method of identifying exchanges, trading platforms, and regulated or non-regulated markets as sources of prices and related information for Financial Instruments. This function overlaps with parts of FIGI, in particular, the Pricing Source. As with ISIN, there are key differences.

1. Scope: The MIC provides identification of places where securities can be, broadly speaking, bought and sold. As such, it only applies to tradable securities that are exchanged at a venue (broadly understood). The list of pricing sources present in FIGI goes far beyond this to support Financial Instruments that are not exchanged at a venue. In fact, FIGI can support Financial Instruments that are not tradable at all, e.g., an individual person's home mortgage contract (not currently supported, but under consideration).
2. Embeddedness: The MIC code is a stand-alone code that identifies a Market. As such, it serves a different purpose than does the Pricing Source attribute of FIGI. The Pricing Source attribute of FIGI serves as a differentiator of otherwise identical financial instruments and that differentiation is embedded into the Financial Instrument Global Identifier. In the case of the MIC, it can be used in concert with the ISIN to deliver this to some level, but it is not fully embedded into the identifier's meta data.

As is the case with other standards, there is nothing precluding any organization from mapping FIGIs to MIC codes. It is not, however, part of the formal requirements of the FIGI.