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INTERNATIONAL STANDARD ISO/IEC XXXX

ITU-T RECOMMENDATION X.XXX

Information technology – Open Systems Interconnection – Object Identifier Resolution System

Summary

This Recommendation | International Standard specifies an OID (Object Identifier) Resolution System which provides information associated with any object identified by an Object Identifier. This associated information can be access information, child node information, or the canonical form of the OID-IRI. The OID Resolution System consists of two processes: a general OID resolution process and an application-specific OID resolution process. The general OID resolution process utilizes the DNS (Domain Name System) protocol.

EDITOR's NOTE: See also Issue 2.

Keywords

OID, resolution, Object Identifier

메모 [OD1]: We recommend to spell this out as this acronym is probably not clear to everybody in the summary.

메모 [OD2]: What about the application-specific OID resolution process?

메모 [OD3]: This should be in the Scope, not in the summary. Moreover, the difference between both processes is not clear in the summary.

Information technology –
Open Systems Interconnection –
Object Identifier Resolution System

Introduction

This Recommendation | International Standard specifies an Object Identifier (OID) Resolution System which provides information associated with any object identified by an Object Identifier.

TBD

1 Scope

This Recommendation | International Standard specifies an OID Resolution System including the overall architecture and a DNS-based protocol. The OID Resolution System provides access to the information associated with a given OID using DNS servers.

This Recommendation | International Standard applies to the implementation, administration and maintenance of the OID Resolution System.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendation X.660 (2008) series | ISO/IEC 9834:2008, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: General procedures.*
- ITU-T Recommendation X.680 (2008) series | ISO/IEC 8824:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*
- ITU-T Recommendation X.690 (2008) series | ISO/IEC 8825:2008, *Information technology – Abstract Syntax Notation One (ASN.1): Encoding Rules.*

2.2 Additional references

- IETF RFC 1035:1987, *Domain names – Implementation and specification.*
- IETF RFC 3403:2002, *Dynamic Delegation Discovery System (DDDS) Part Three: The Domain Name System (DNS) Database.*
- IETF RFC 4033:2005, *DNS Security Introduction and Requirements.*

3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply.

3.1 Imported definitions

3.1.1 This Recommendation | International Standard uses the following term defined in ITU-T Rec. X.660 | ISO/IEC 9834-1:

a) object identifier.

3.2 Additional definitions

3.2.1 **canonical form (of an OID internationalized resource identifier):** A form which uses only integer valued Unicode labels.

3.2.2 **OID resolution**: a process which translates OID into associated information with the OID

3.2.3 **OID Resolution System**: a system which provides OID resolution functions

3.2.4 **OID resolution client**: the client-side of OID Resolution System which is responsible for initiating OID resolution process

3.2.5 **OID resolution server**: the server-side of OID Resolution System which maintains distributed database of associated information with OIDs

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

COI	Canonical for of OID-IRI
DNS	Domain Name System
FQDN	Fully Qualified Domain Name
NAPTR	Naming Authority Pointer
O2I	OID to Information
OID	Object Identifier
OID-IRI	OID internationalized resource identifier
ORC	OID Resolution Client
ORS	OID Resolution Server

메모 [OD4]: The acronyms COI and O2I should be avoided. They complicate the reading without any added value. Their definition is not too long and can be used everywhere.

메모 [OD5]: Are these acronyms really needed? They are not usual and complicate the reading.

5 OID Resolution System Architecture

5.1 Overview

The overall architecture and operation of the OID Resolution System is illustrated in Figure 1. The OID Resolution System consists of two processes: a general OID resolution process and an application-specific OID resolution process. The general OID resolution process uses the DNS protocol between the ORC (OID Resolution Client) and the ORS (OID Resolution Server). The ORC submits an OID for resolution and this OID is resolved via a series of linked ORSs. An ORS sends information related to an object identified by the OID back to the ORC.

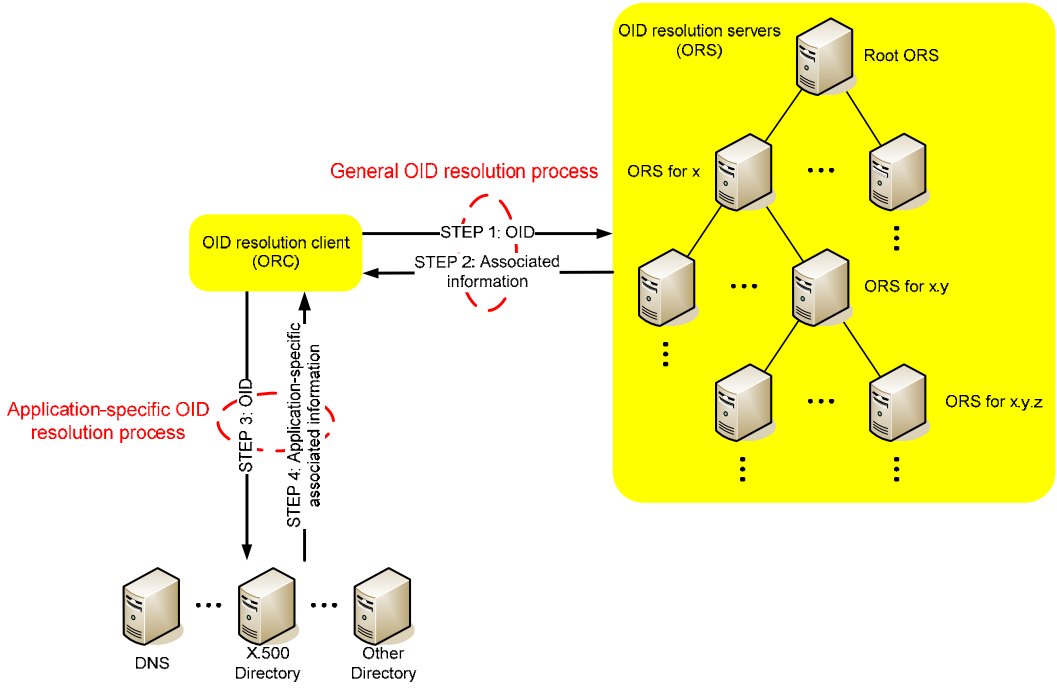

Figure 1. Architecture of the OID Resolution System

The associated information related to an object identified by the OID in STEP 2 in Figure 1 could be access information (see 6.2.1), child nodes information or the canonical form of the IRI.

If the result of the general OID resolution process is child node information or the canonical form of the OID-IRI, then the OID resolution process is finished. If the result of the general OID resolution process is access information then the application-specific OID resolution process is initiated.

NOTE – This Recommendation | International Standard specifies only the overall architecture of thegeneral OID resolution process. The application-specific OID resolution process is out of scope of this Recommendation | International Standard.

삭제됨: OID Resolution System and

5.2 General OID resolution process

The general OID resolution process utilizes DNS protocol and ORC always initiates this general OID resolution process. The result of the general OID resolution process could be access information, child nodes information or the canonical form of the IRI.

5.3 Application-specific OID resolution process

The application specific OID resolution process is only initiated when the result of the general OID resolution process is access information. In this process any kind of protocol can be used. The access information from the ORS should include access methods and locations for obtaining additional information.

삭제됨: which adequate for their purpose

6 The DNS protocol for the general OID resolution process

The general OID resolution process utilizes the DNS protocol and NAPTR Resource Record.

메모 [OD6]: This could be better said. It is not clear what "to utilize a NAPTR Resource Record" means.

6.1 Query to an OID resolution server

An input to ORS tree is a canonical form of OID-IRI (for example, /2/27/9999) or OID-IRI (for example, /joint-iso-itu-t/tag-based/myCode). In the DNS query message, these object identifiers should be converted into an FQDN form (for example, 9999.27.2.oid.foo and mCode.tag-based.joint-iso-itu-t.oid.foo). Figure 2 illustrates the DNS message format for a query.

메모 [OD7]: What is it?

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메모 [OD8]: A generic example (called "exampleCode" or "myCode") shall be used.

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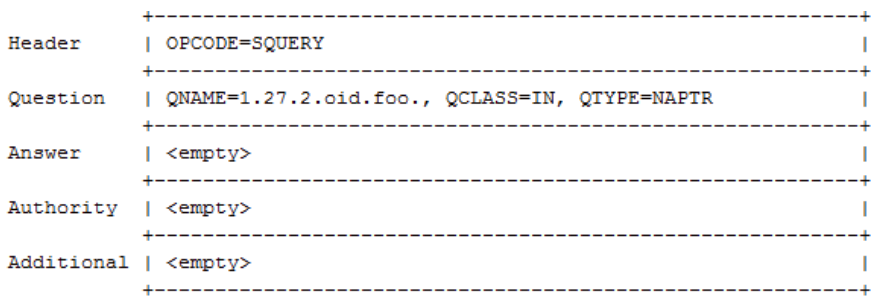

Figure 2. DNS message format for query

6.1.1 Converting canonical form of OID into FQDN form

A canonical form of OID can be converted into FQDN form using following procedure:

1) See that the canonical form of OID is written in its full form. For example, /2/27/9999

2) Remove first "/". For example, 2/27/9999

3) Put dots (".") instead of "/". For example, 2.27.9999

4) Reverse the order. For example, 9999.27.2

5) Append the string ".oid.foo." For example, 9999.27.2.oid.foo.

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6.1.2 Converting OID-IRI into FQDN form

An OID-IRI can be converted into FQDN form using following procedure:

1) See that the OID-IRI is written in its full form. For example, /joint-iso-itu-t/tag-based/myCode

2) Remove first "/". For example, joint-iso-itu-t/tag-based/myCode

3) Put dots (".") instead of "/". For example, joint-iso-itu-t.tag-based.myCode

4) Reverse the order. For example, myCode.tag-based.joint-iso-itu-t

5) Append the string ".oid.foo." For example, myCode.tag-based.joint-iso-itu-t.oid.foo.

6.2 Response from the OID resolution server

The result of a query to the ORS can be access information, child node information, or the canonical form of the OID-IRI (which has the same information content as the value of an OID). The result from the ORS is delivered to ORC using NAPTR Resource Record in DNS message format for response. Figure 3 illustrates DNS response message format.

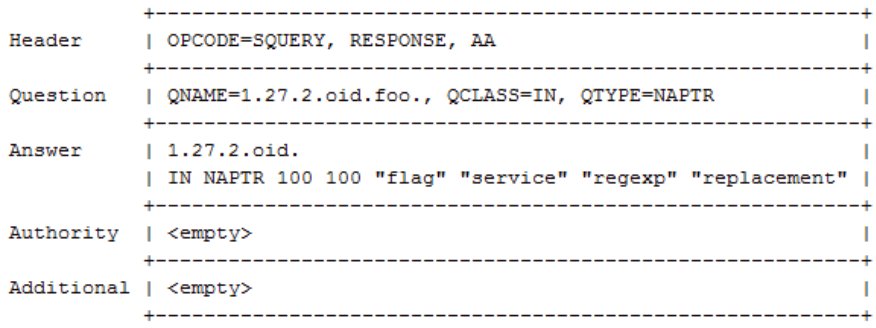

Figure 3. DNS message format for response

This Recommendation | International Standard specifies new Service Parameters for the general OID resolution process. Service Parameters take the following form and found in the service field of the NAPTR Resource Record.

Service-field = "O2I" servicespec

servicespec = “+” orpservice

orpservice = “DNS” | “X.500” | “LDAP” | “HTTP” | “HTTPS” | “COI” | “CINFO”

TBD

6.2.1 Access information

The access information contains access protocol and access location for the application-specific OID resolution process. An access protocol is specified in service filed of NAPTR Resource Record. This Recommendation | International Standard specifies 5 access methods: DNS, X.500, LDAP, HTTP and HTTPS. An access location is specified as URI in RegExp field of NAPTR Resource Record.

An example of NAPTR Resource Record for access information is:

9999.27.2.oid.foo. IN NAPTR 0 100 “u” “O2I+DNS” “!^.*$!oid.kr!” .

This describes the access information for OID {joint-iso-itu-t(2) tag-based(27) myCode(9999)}. In the application-specific OID resolution process, the client can access associate information with OID using DNS protocol at “oid-resolution-example.com”.

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6.2.2 Child node information

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EDITOR's NOTE – See also Issue 2

6.2.3 Canonical form of an OID-IRI

A canonical form of OID is specified in the service field of a NAPTR Resource Record.

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An example of NAPTR Resource Record for canonical form of OID is:

mCode.tag-based.joint-iso-itu-t.oid.foo. IN NAPTR 0 100 “u” “O2I+COI” “!^.*$!/2/27/9999!” .

메모 [OD9]: A generic example (called "exampleCode" or "myCode") shall be used.

The Service Parameter “O2I+COI” indicates that this NAPTR Resource Record includes a canonical form of OID-IRI.

삭제됨: 1

7 Operation of the OID Resolution System

TBD

Figure 4 describes hierarchical structure and delegation structure of OID resolution servers.

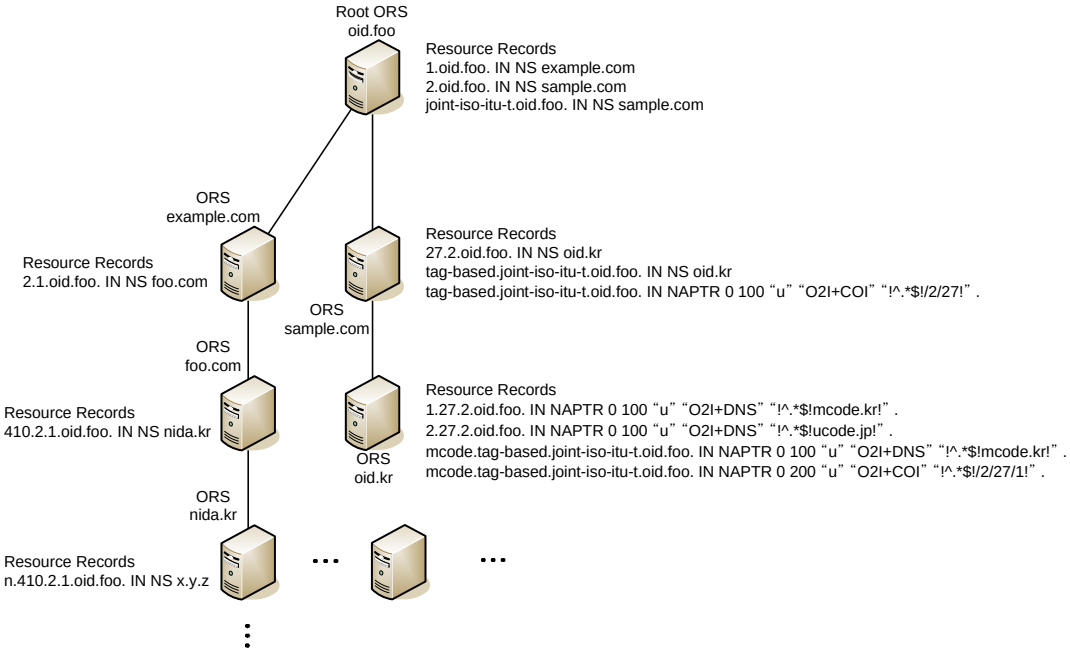

Figure 4. An example of structure of OID resolution servers

메모 [OD10]: Example to be updated to remove any reference to a particular (existing) solution.

Figure 5 shows the operation example of general OID resolution process with the configuration as Figure 4.

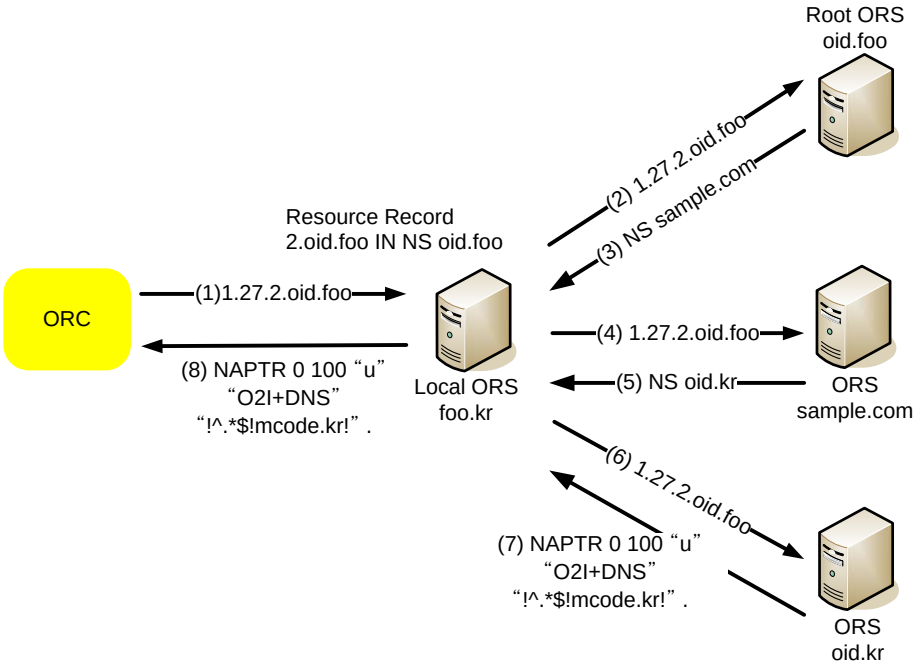

Figure 5. Example operation of general OID resolution process

8 Name space for OID Resolution System

TBD

EDITOR's NOTE – TLD for OID Resolution System will be specified.

9 Default setting of zone file for OID Resolution System

TBD

EDITOR's NOTE – The contents of NATPR Resource Record of DNS server for specific OID (for example, DNS server for 2.oid.) will be specified.

10 Security and Trust Aspects of the OID Resolution System

As general OID resolution process in OID Resolution System uses DNS protocol, there is no mechanism for ensuring that the data one gets back is authentic. DNSsec can be used in the general OID resolution process for information requiring a high degree of trust.

TBD

EDITOR's NOTE 1 – It is suggested that text in SAML “3.1.2 Security” may be useful

Bibliography

[1] TBD