



Introduction to Object Identifiers (OIDs) and their use by WMO

France Telecom Orange

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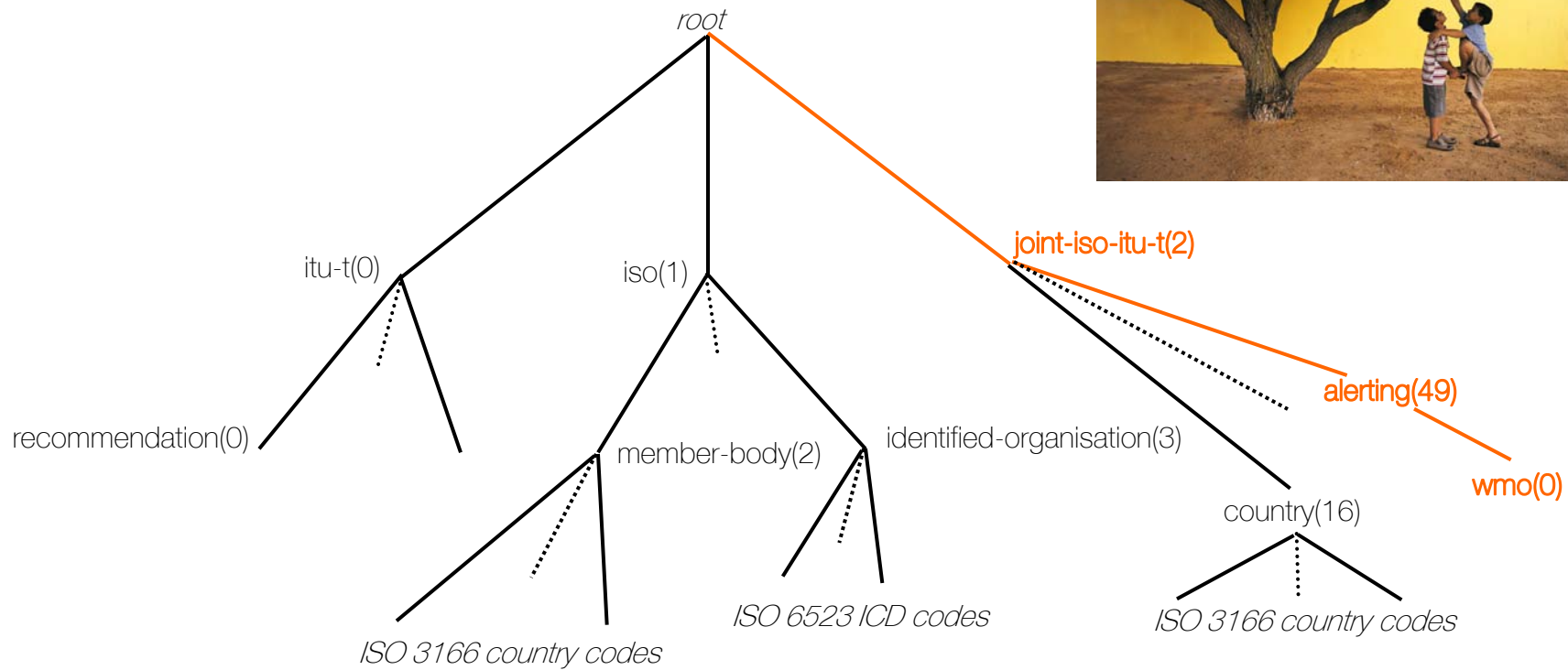


Basic concepts of Object Identifiers (OIDs)



- One of many identification schemes
- Basically very simple: A tree
- Arcs are numbered and may have an associated alphanumeric identifier (beginning with a lowercase)
- Infinitely many arcs from each node (except at the root)
- Objects are identified by the path (OID) from the root to a node
- A Registration Authority (RA) allocates arcs beneath its node to subordinate RAs, and so on, to an infinite depth
- The OID tree is a hierarchical structure of RAs
- Standardized in the [Rec. ITU-T X.660 | ISO/IEC 9834 series](#) (ITU-T SG 17 and ISO/IEC JTC 1/SC 6)
- Originated in 1985, still in use!

Top of the OLD tree



Example: {joint-iso-itu-t(2) alerting(49) wmo(0)}

Note: The name of the 3 top-level arcs does not imply a hierarchical dependency to ISO or ITU-T.

What is an "object"?

- *"Anything in some world, generally the world of telecommunications and information processing or some part thereof, which is identifiable and may be registered"* [Rec. ITU-T X.660 | ISO/IEC 9834-1]
- OIDs can uniquely and universally identify:
 - standards (ITU-T Recommendations, ISO International Standards, etc.)
 - countries, companies, projects
 - encryption algorithms
 - ASN.1 modules, ASN.1 types
 - Rec. ITU-T X.500/LDAP attributes
 - Rec. ITU-T X.509 certificates (OIDs are widely deployed in e-commerce)
 - certification policies
 - SNMP MIBs
 - identification schemes (incl. RFID, 2D bar codes, etc.)
 - HL7 patient medical information
 - alerts and alerting agencies
 - etc.
- More information at <http://www.oid-info.com/faq.htm>

Some advantages

- Human-readable notation:

```
{joint-iso-itu-t(2) alerting(49) wmo(0) authority(0)}
```

- Dot notation:

```
2.49.0.0
```

- URN notation:

```
urn:oid:2.49.0.0
```

- Internationalized notation (OID-IRI):

```
/Alerting/WMO/0
```

- Unicode labels (ISO/IEC 10646) can be associated to each OID arc

- Used in a lot of ISO standards, ITU-T Recommendations and IETF RFCs, but not only!
- Very good take up: 102,000+ OIDs described at <http://www.oid-info.com>; many more exist
- Compact binary encoding (normally used in all computer communications)
- Allows transmission over constrained networks
- Can also be used in XML documents

Procedures for the operation of a Registration Authority

- [Rec. ITU-T X.660 | ISO/IEC 9834-1](#): Main text which defines general procedures for the operation of an RA and applies to any RA ("the Constitution")
- [Rec. ITU-T X.662 | ISO/IEC 9834-3](#): rules for allocation of arc underneath top-level arc `joint-iso-itu-t(2)`
- WMO/TD NO.1556 "*Administration procedure for registering WMO alerting identifiers*"



Arcs at the 1st and 2nd levels of the OID tree

- Excerpt from the OID repository at <http://www.oid-info.com>



Web-based OID repository

- Provide details about an OID (description, rules to allocate child OIDs, contact information about the Registration Authority...)
- Not an official Registration Authority → each OID has to be officially allocated by the parent RA before being described in the OID repository
- Descriptions are entered "à la wiki" by any user but are validated by the OID repository administrator
- Automatic notification by email to the RA (if known) when child OIDs are added
- Many other services: search, update of OID descriptions, tree display, registrant accounts
- Web site sponsored by France Telecom Orange:
<http://www.oid-info.com>



• [joint-iso-itu-t\(2\)](#) • [alerting\(49\)](#)

wmo (0)

child OIDs: • [authority\(0\)](#) • [country-msg\(1\)](#) • [org\(2\)](#) • [org-msg\(3\)](#) •



• [Format of this page](#)

• [Modify this OID](#)

• [Create a child](#)

[OID](#)

• [Create a brother](#)

[OID](#)

OID description

	{joint-iso-itu-t(2) alerting(49) wmo(0)}	(ASN.1 notation)
OID:	2.49.0	(dot notation)
	/Alerting/WMO	(OID-IRI notation)

Description: [World Meteorological Organization \(WMO\)](#)

Information: In applications and services which support alerting, it is necessary to identify various information objects. Subsequent OIDs identify content included in alert messages or otherwise associated with the activity of alerting.

The procedures (and criteria for acceptance) for allocating subsequent arcs are described in WMO/TD No. 1558 "Administrative procedure for registering WMO alerting identifiers."

WMO maintains a publicly accessible [Register of Alerting Authorities](#). In collaboration with the [WMO Public Weather Services Programme](#), entries in the WMO Register of Alerting Authorities shall be maintained by the editors designated by the Permanent Representatives (PRs) to the WMO of national WMO Members.

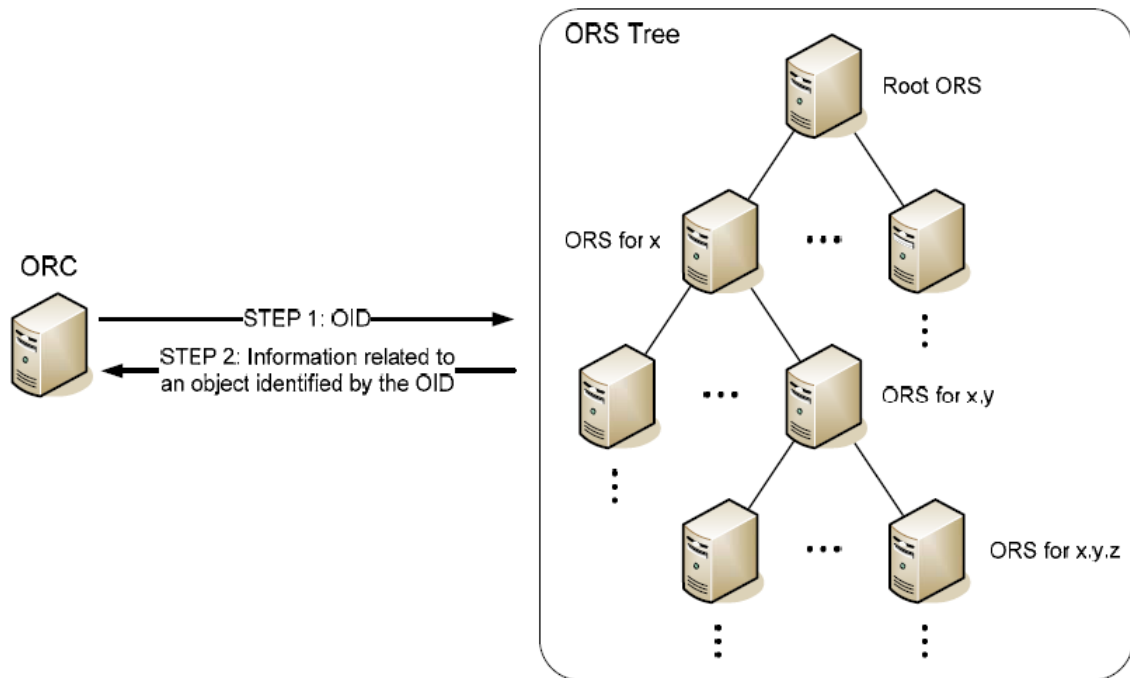
Current Registration Authority

Name: [Ms. Haleh Kootval](#)

This person requested privacy protection.

OID resolution system (ORS)

- A DNS-based protocol to provide information associated with any OID:
 - description, registration authority, creation date, etc.
 - child OIDs
 - OID-IRI canonical form
- Rec. ITU-T X.672 | ISO/IEC 29168-1 (2011)
- Not yet implemented



Use of OIDs for alerts

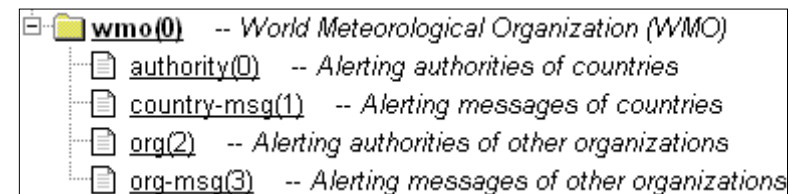
- Use of OIDs to identify alerting agencies and alert messages for early warning of populations
- Standardized in [Rec. ITU-T X.674](#) (2011)
- Potentially all kind of alerts: weather, cybersecurity, food...
- Sub-arc [{joint-iso-itu-t\(2\) alerting\(49\) wmo\(0\)}](#) allocated to the World Meteorological Organization (WMO) for weather alerts and weather alerting agencies
 - Used with the Common Alerting Protocol (OASIS CAP, Rec. ITU-T X.1303)






WMO alerting identifiers

- **alerting authorities of countries** are registered under arc
{joint-iso-itu-t(2) alerting(49) wmo(0) **authority**(0) *country*(n)}
- **alerting messages of countries** are registered under arc
{joint-iso-itu-t(2) alerting(49) wmo(0) **country-msg**(1) *country*(n)}
 - one sub-arc per country
 - *n* is the [numeric country code](#) allocated by the United Nations Statistics Division
 - *country* is the [ISO 3166-1 alpha-2 code](#)
 - automatic assignment of the country OID upon designation of an initial editor in the [WMO Register of Alerting Authorities](#) to the [WMO Public Weather Services Programme](#)
 - child OIDs allocated by that editor (under the country arc)
- **alerting authorities of organizations** (other than countries) are registered under arc
{joint-iso-itu-t(2) alerting(49) wmo(0) **org**(2) *abbrev*(n)}
- **alerting messages of organizations** are registered under arc
{joint-iso-itu-t(2) alerting(49) wmo(0) **org-msg**(3) *abbrev*(n)}
 - *n* is a numeric value assigned to the organization
 - subject to designation of an initial editor of the WMO Register of Alerting Authorities for the organization
 - approval according to the procedures specified in clause 7 of WMO/TD No. 1556
- More information in WMO/TD No. 1556 "*Administrative procedure for registering WMO alerting identifiers*"
- Contact: [Ms. Haleh Kootval](#)



More information on OIDs

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- A photograph of a white lighthouse with a glowing lantern room, situated on a dark, rocky cliff overlooking the ocean. The sky is a deep blue with scattered white clouds. The lighthouse is the central focus of the image.
- Free standards:
<http://www.itu.int/rec/T-REC-X/en>
(Rec. ITU-T X.660 & X.670 series)
 - OID repository:
<http://www.oid-info.com>
 - Other presentations:
 - <http://www.oid-info.com/faq.htm#3>
 - ITU-T OID handbook (soon available)
 - Frequently Asked Questions:
<http://www.oid-info.com/faq.htm>

thank you



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