Introduction to Object Identifiers (OIDs) and Registration Authorities

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Context

Document TP-2015-0722 "*LS answer to ITU-T SG17 on the use of OID for IoT*"

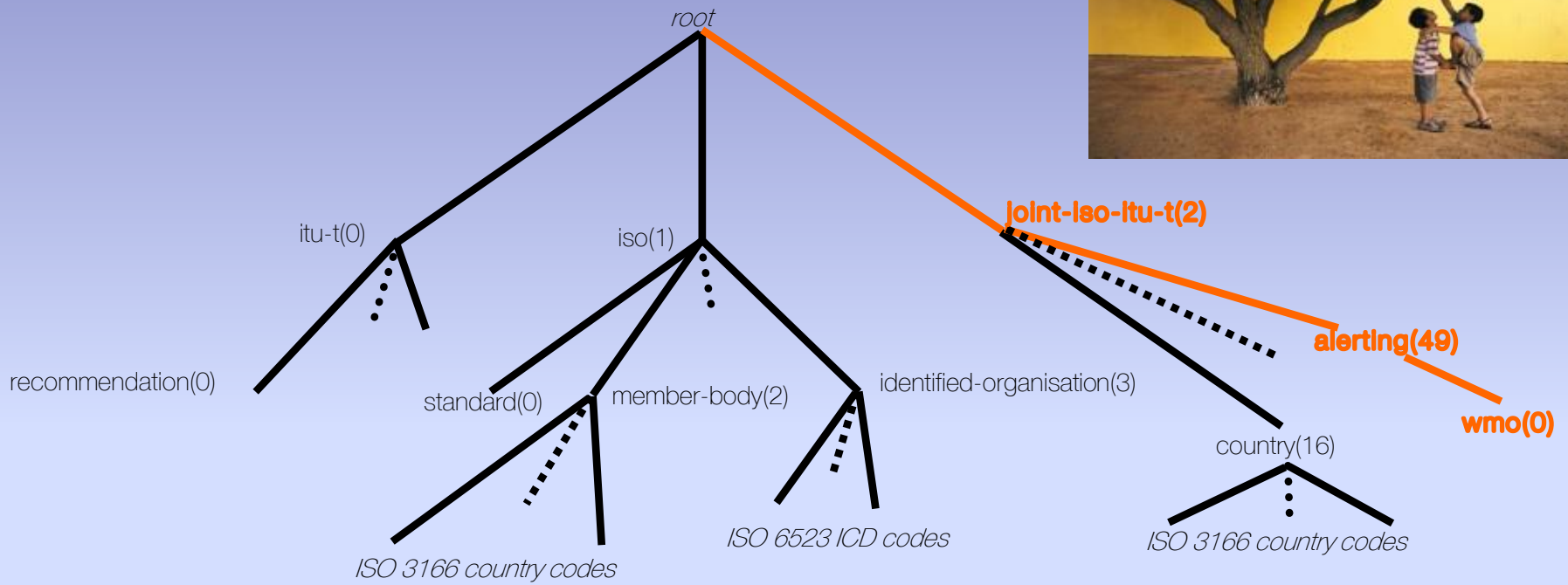
- encouraged further discussions on the subject of OIDs between the two groups
- invited a representative of ITU-T SG17 to one of the two upcoming oneM2M face-to-face Technical Plenary meetings

Basic concepts of Object Identifiers (OIDs)

- One of many identification schemes
- Basically very simple: A tree
- Arcs are numbered and may have an associated identifier
- 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

Top of the OID tree

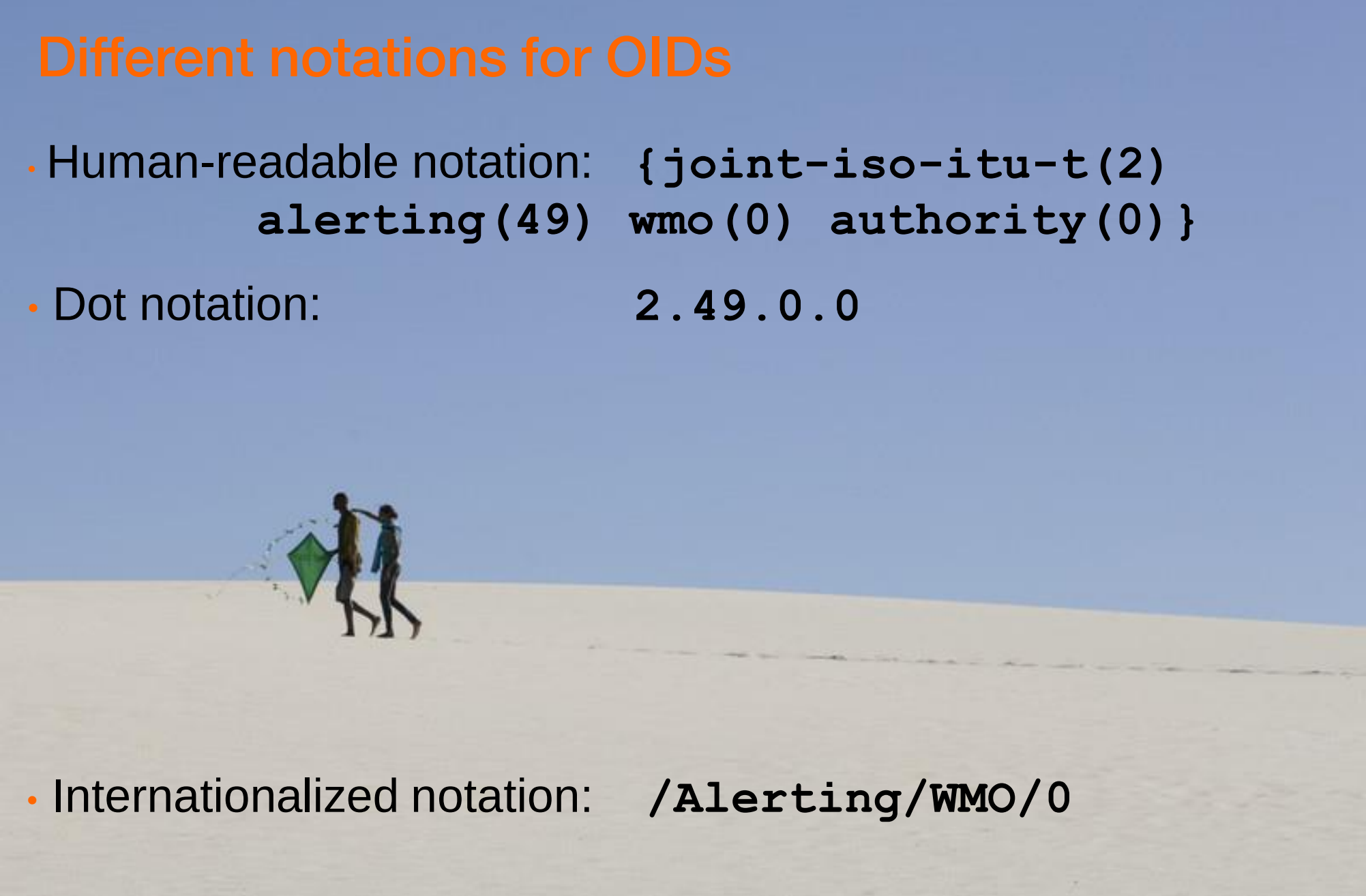


Example: `{joint-iso-itu-t(2) alerting(49) wmo(0)}`

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

Different notations for OIDs

- Human-readable notation: **`{joint-iso-itu-t(2) alerting(49) wmo(0) authority(0)}`**
- Dot notation: **`2.49.0.0`**



- Internationalized notation: **`/Alerting/WMO/0`**

Some advantages to using OIDs

- Used in many international standards, but not only!
- Very good take up: 955,000+ OIDs described in this OID repository; many more exist
- Can also be used in XML documents
- Internationally standardized by ITU-T, ISO and IEC
- Originated in 1985, still in use!

What can be identified by an OID?

OIDs can uniquely and universally identify:

- international standards
- countries, companies, projects
- encryption algorithms
- LDAP attributes
- X.509 certification policies
- SNMP MIBs
- other identification schemes
- patient medical information
- weather alerts and alerting agencies
- etc.

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

- Excerpt from the OID repository at http://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 (RA) ➔ 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 Orange: http://oid-info.com

OID Repository
http://www.oid-info.com

Home | Tree display | Search OID | FAQ
Display OID: Go

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

OID:	{joint-iso-itu-t(2) alerting(49) wmo(0)}	(ASN.1 notation)
	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. 1556 "Administrative procedure for registering WMO alerting identifiers."

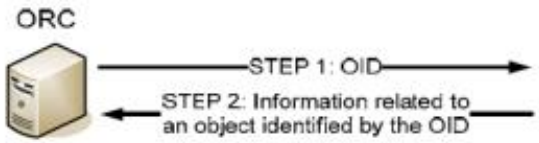
WMO maintains a publicly accessible Register of Alerting Authorities. In collaboration with the WMO Public Weather Services Programme, entries in the WMO Register of Alerting Authorities shall be maintained by the editors designated by the Permanent Representatives (PRs) to the WMO of national WMO Members.

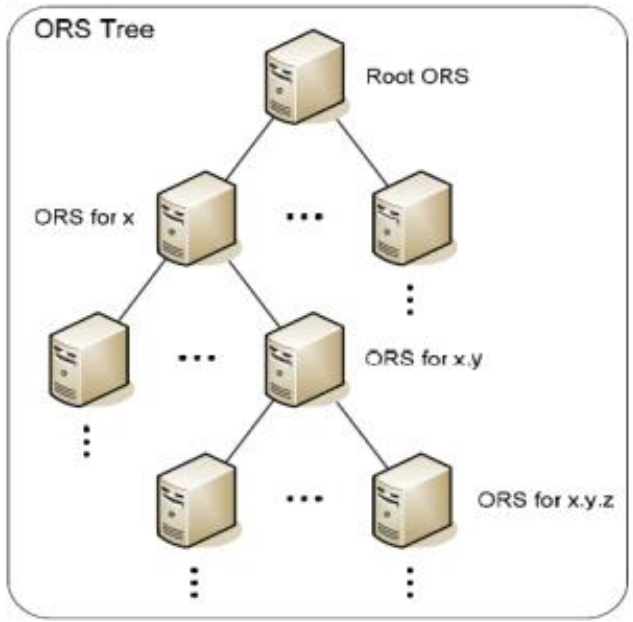
Current Registration Authority

Name: Ms. Haleh Kootval This person requested privacy protection.

OID resolution system (ORS)

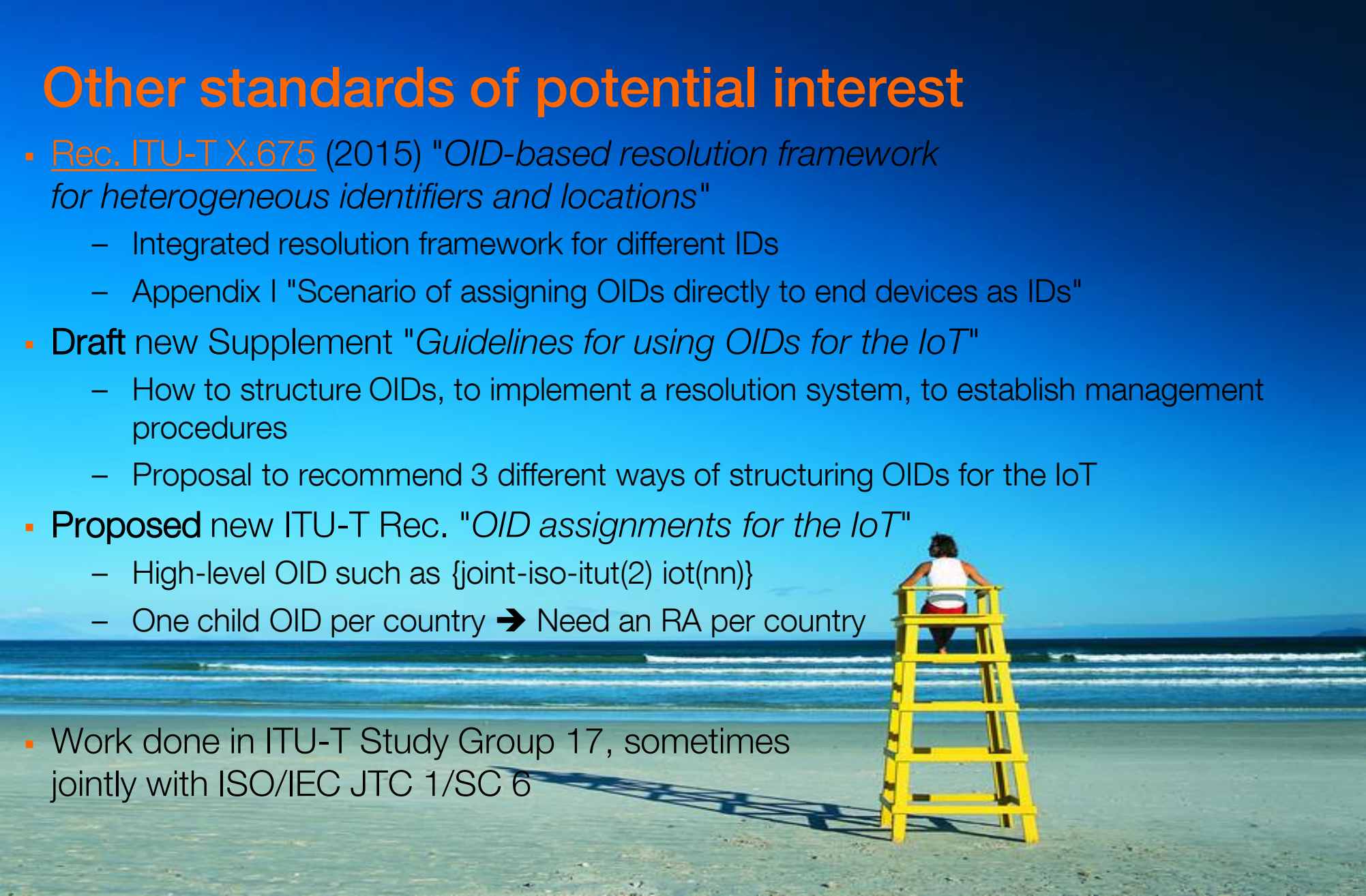
- A DNS-based protocol to provide information associated with any OID:
  - description, registration authority, creation date, etc.
  - child OIDs
  - OID-IRI canonical form
- Rec. ITU-T X.672 | ISO/IEC 29168-1 (2011)





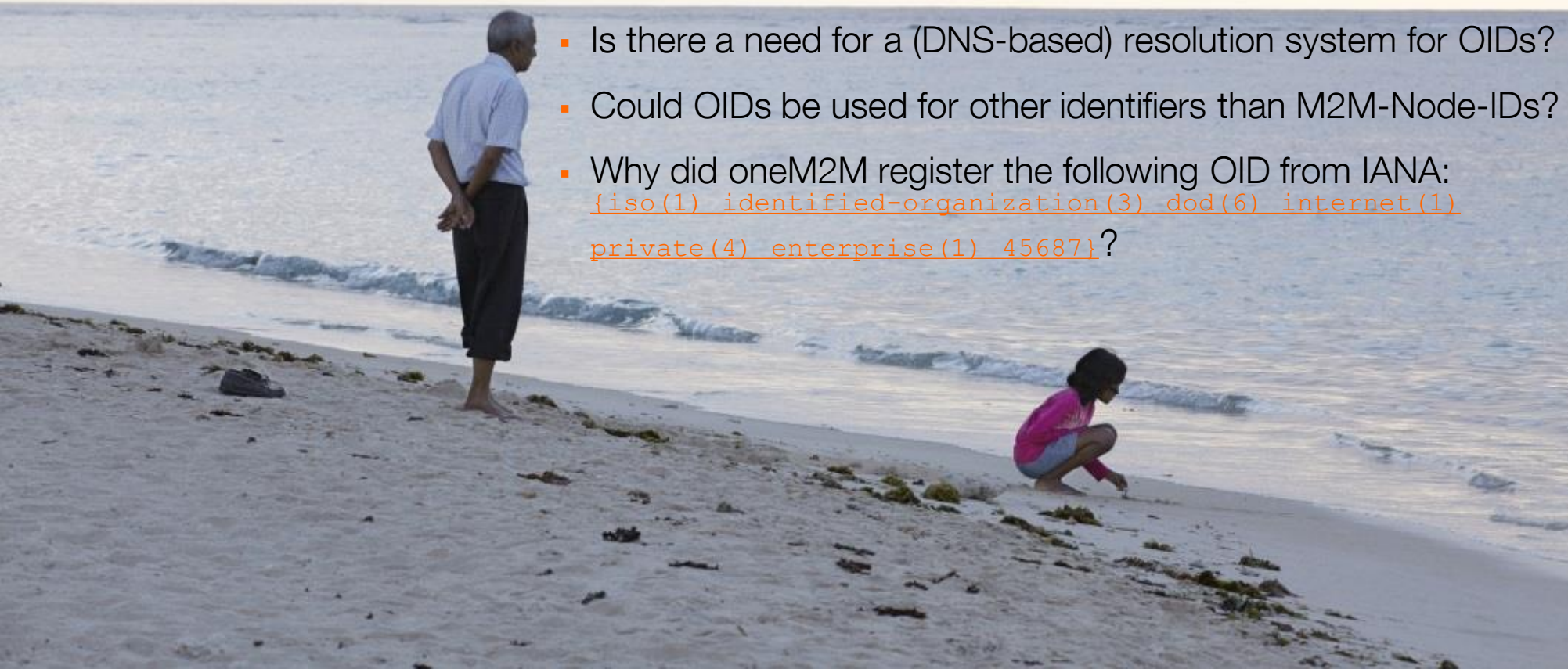
Other standards of potential interest

- Rec. ITU-T X.675 (2015) "*OID-based resolution framework for heterogeneous identifiers and locations*"
  - Integrated resolution framework for different IDs
  - Appendix I "Scenario of assigning OIDs directly to end devices as IDs"
- **Draft** new Supplement "*Guidelines for using OIDs for the IoT*"
  - How to structure OIDs, to implement a resolution system, to establish management procedures
  - Proposal to recommend 3 different ways of structuring OIDs for the IoT
- **Proposed** new ITU-T Rec. "*OID assignments for the IoT*"
  - High-level OID such as {joint-iso-itut(2) iot(nn)}
  - One child OID per country ➔ Need an RA per country
- Work done in ITU-T Study Group 17, sometimes jointly with ISO/IEC JTC 1/SC 6



Food for thought

- Is there a requirement on the size of M2M-Node-IDs?
- Is there a need for a (high-level) OID arc dedicated to the IoT (with one child OID per country)?
- Otherwise, do the 3 proposed OID structures in ITU-T SG17 draft Supplement "*Guidelines for using OIDs for the IoT*" make sense to oneM2M?
- Is there a need for a (DNS-based) resolution system for OIDs?
- Could OIDs be used for other identifiers than M2M-Node-IDs?
- Why did oneM2M register the following OID from IANA: `{iso(1) identified-organization(3) dod(6) internet(1) private(4) enterprise(1) 45687}`?



More information on OIDs

- Rec. ITU-T X.660 | ISO/IEC 9834-1: Main text which defines general procedures for the operation of a Registration Authority ("the Constitution")
- Rec. ITU-T X.662 | ISO/IEC 9834-3: Rules for allocation of arc under top-level arc `joint-iso-itu-t(2)`
- Free standards (Rec. ITU-T X.660 & X.670 series): http://www.itu.int/rec/T-REC-X/en

- OID repository:
  http://oid-info.com
- Other presentations:
  http://oid-info.com/faq.htm#3
  ITU-T OID handbook
- Frequently Asked Questions:
  http://oid-info.com/faq.htm


thank you