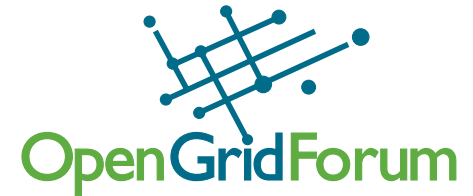


# Identifiers versus Addresses

General concepts about naming and routing



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# The Basics

- The *name* of a resource indicates **what** we seek,
- an *address* indicates **where** it is, and
- a *route* tells us **how to get there**.

John F. Shoch, “Inter-Network Naming, Addressing, and Routing”, IEN#19, Jan 1978.

# What do we need for NSI?

Endpoint STP	<i>Identifier or Name</i>
Topology	<i>Address</i>
NSA	<i>Identifier</i>
Intermediate STP/SDP	None?

# What *is* the difference?

## Identifiers

- Used for *naming*
- on the Control Plane
- Syntax typically two-tiered: domain:local-name
- E.g. DNS, ISBN, URN
- An entity should only have one identifier
- Should be persistent (thus not contain attributes)
- Should not be re-used

## Addresses

- Used for *routing*
- on the Data plane
- Syntax typically hierarchical, sometimes recursive
- E.g. IP, Telephony numbers, URL
- An entity can have multiple addresses
- May change over time
- May be re-used

# Why make a distinction?

- number portability <sup>1</sup> (telephony)
- user mobility <sup>1</sup> (IP)
- multi-homing <sup>2</sup> (MPTCP)

## For NSI:

- Move a STP from a testbed to a production network
- Split the network in two parts (e.g. NORDUnet Scandinavia and NORDUnet USA)

<sup>1</sup> portability, mobility: different addresses at a different point in time

<sup>2</sup> multi-homing: multiple addresses at the same time

# Did protocols make the distinction?

**No**

- IP: Oops. See next slide.
- DNS: use CNAME (aliases)
- Telephony: use call-forwarding (aliases)
- Handle: use locations (aliases)
- NML: Oops. NSI has a problem.

# Did they regret that?

**Yes**, the distinction is relevant.

- John F. Shoch, “Inter-Network Naming, Addressing, and Routing”, IEN#19, Jan 1978 (e.g. <http://ana-3.lcs.mit.edu/~jnc/tech/ien/ien19.txt>)
- J. H. Saltzer, “Naming and Binding of Objects”, LNCS 60, 1978, pp. 99-208. (e.g. <http://eris.prakinf.tu-ilmenau.de/res/papers/decdist/discovery/saltzer78Naming.pdf>)
- John Day, “Naming and Addressing”, chapter 5 in “Patterns in Network Design” (pages 141-184), 2008 (e.g. <https://www.informit.com/articles/article.aspx?p=1156299>)
- Dino Farinacci, et al., “The Locator/ID Separation Protocol (LISP)”, RFC 6830 (Experimental) (e.g. <https://tools.ietf.org/html/rfc6830>)