Naming, Identities and Locators in Ambient Networks

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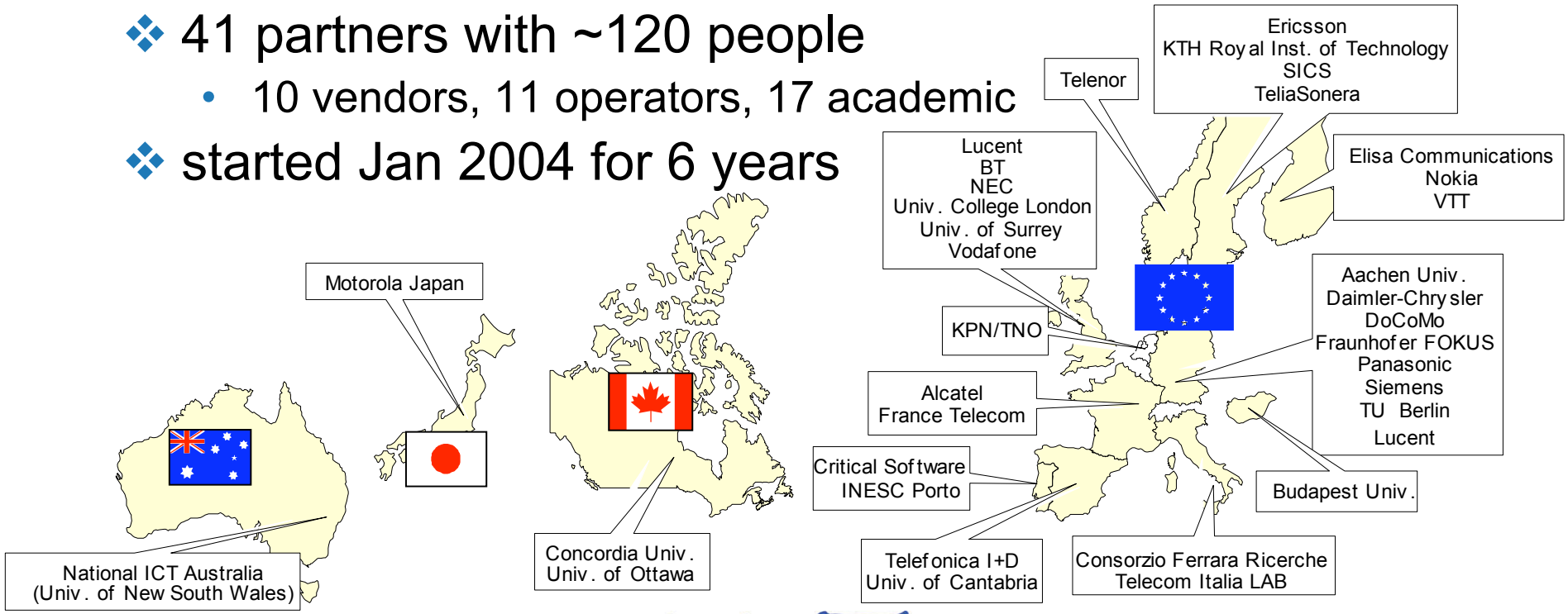
About Ambient Networks

- funded by EU IST under the 6th framework
- **internetworking as a mechanism to build interesting future mobile systems**
- 41 partners with ~120 people
  - 10 vendors, 11 operators, 17 academic
- started Jan 2004 for 6 years

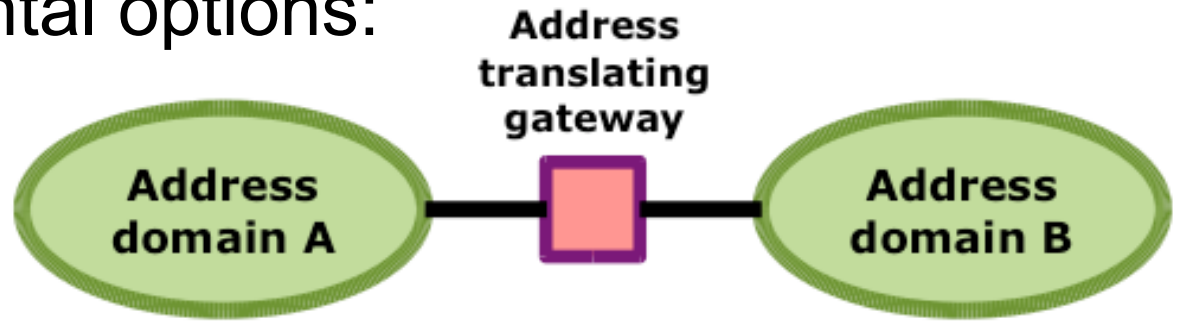


Naming Efforts

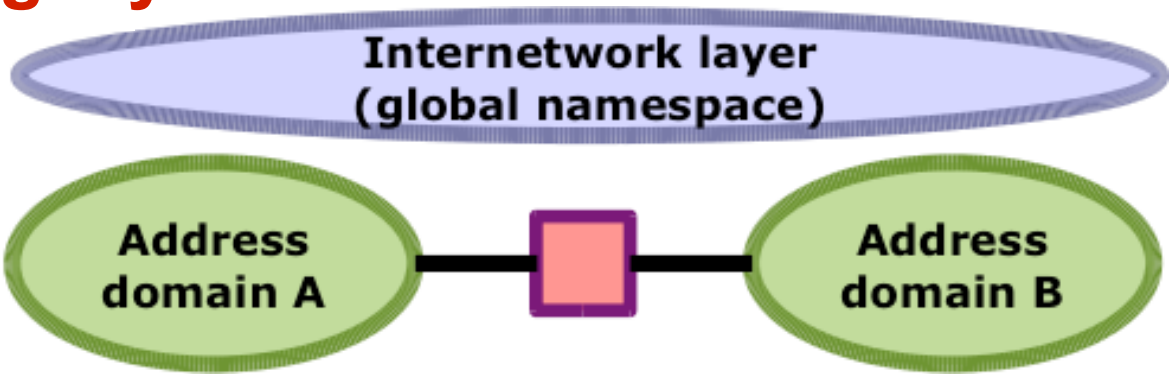
- **naming is a key work item for the AN architecture**
- related architecture discussion in the Internet community
  - fragmentation of the the Internet into independent realms
  - overlay networks
  - changes to addressing schemes, e.g., HIP, multi6, shim6, etc.
- related trends in the cellular world
  - IMS, all-IP networks
  - 3GPP standards aiming at integrating WLAN and other technologies into the cellular networks

Relevant Goal Is Global Reachability

- communicate over different address domains
- two fundamental options:
- **translation**



- **global naming layer**



Naming Requirements

- **legacy naming systems**
  - unrealistic to replace existing systems
  - (this is an industry-heavy project, ability to migrate is key)
- **global reachability across addressing domains**
  - enable interoperation between networks of different types
  - generalization of the multi-homing problem
- **native mobility and multi-homing of nodes**
  - separation of node identity and location needed
- **not defining a new replacement name system**
  - not defining replacements for DNS, E.164, IP addresses, etc.
  - not identifying all different kinds of objects that require names
- **rather:** define architecture in which existing (and future) **name systems can coexist** in one way or another

New Internetwork Layer?

- IP(v4) once solved the problem!
- but “developments” un-solved it for us:
  - address space depletion (*rathole alert*)
  - NATs, firewalls etc that limit transparency
  - IPv6 and other technologies
- fundamental issue:
  do we want/need a new internetworking layer?
  - new global namespace
  - above IPv4 & IPv6 & MPLS & ...
- or is translation an alternative?
- with a layered naming architecture, we might not need to make an exclusive choice at all levels

Approach

- there are many proposals on the table
  - FARA, HIP, “A Layered Naming Architecture”, SNF, TurfNet, IP^2
- AN is analyzing them according to a set of *criteria*
  - **namespace properties**
    - namespace syntax and structure; implications of flat/hierarchical namespaces
  - **name system design**
    - how is name resolution done, i.e., how are the dynamic bindings between the naming layers managed?
  - **network boundary traversal**
    - does it provide for bridging over multiple addressing domains?
  - **AN applicability assessment**
    - how does it address the overall AN requirements and scenarios? maturity and migration are also considered
- this analysis guides the development of AN naming

Summary

- AN is a real project which has challenging requirements for new naming technologies
- identity/locator split one component of AN naming
- we want to work with the HIP (and the general naming) research communities in finding good uses for new ideas