Naming, Identities and Locators in Ambient Networks
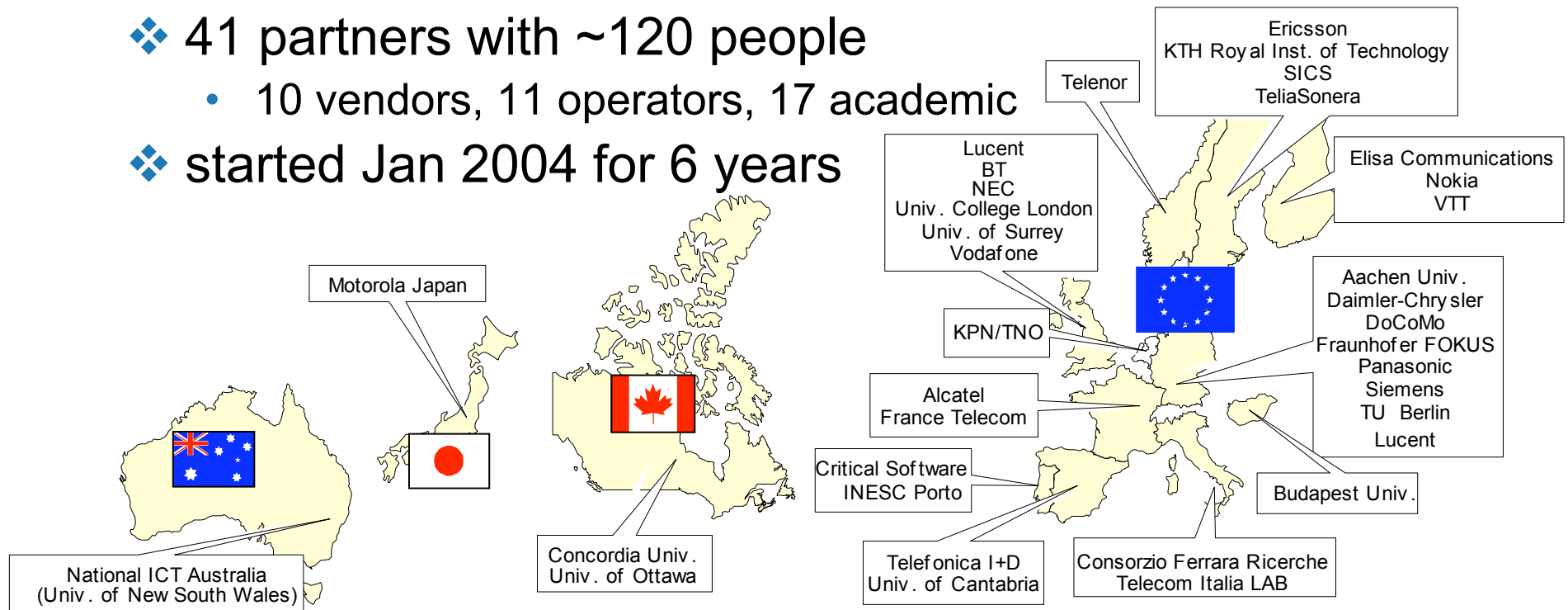
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HIP RG Meeting at IETF-62
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March 11, 2005

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

Ericsson
KTH Royal Inst. of Technology
SICS
TeliaSonera

Telenor

Elisa Communications
Nokia
VTT

Lucent
BT
NEC
Univ. College London
Univ. of Surrey
Vodafone

Motorola Japan

Aachen Univ.
Daimler-Chrysler
DoCoMo
Fraunhofer FOKUS
Panasonic
Siemens
TU Berlin
Lucent

KPN/TNO

Alcatel
France Telecom

Critical Software
INESC Porto

Budapest Univ.

Concordia Univ.
Univ. of Ottawa

Telefonica I+D
Univ. of Cantabria

Consorzio Ferrara Ricerche
Telecom Italia LAB

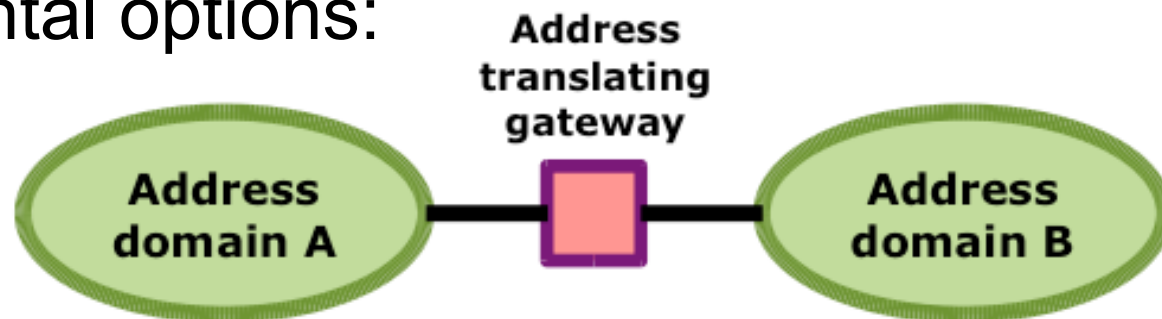National ICT Australia
(Univ. of New South Wales)

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
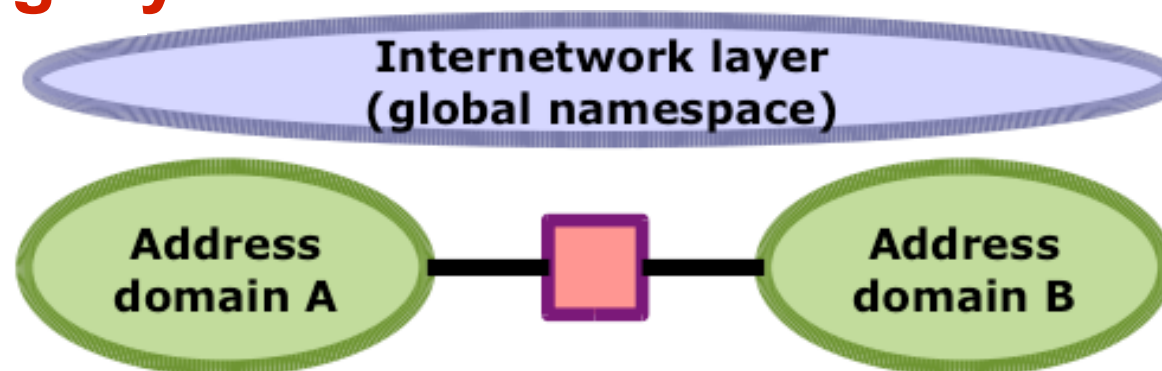
Relevant Goal Is Global Reachability

❖ communicate over different address domains

❖ two fundamental options:

❖ **translation**

Address translating gateway

Address domain A — Address domain B

❖ **global naming layer**

Internetwork layer (global namespace)

Address domain A — Address domain B

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