Naming, Identities and Locators in Ambient Networks

Lars Eggert, NEC and Bengt Ahlgren, SICS

HIP RG Meeting at IETF-62
Minneapolis, MN, USA
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
Naming Efforts

- Naming is a key work item for the AN architecture.
- Related architecture discussion in the Internet community:
  - Fragmentation of 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
there are many proposals on the table
- FARA, HIP, “A Layered Naming Architecture”, SNF, TurfNet, IP²

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
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