PID: A Generic Naming Schema for Information-centric Network

Xinwen Zhang, Ravi Ravindran
Haiyong Xie, Guoqiang Wang

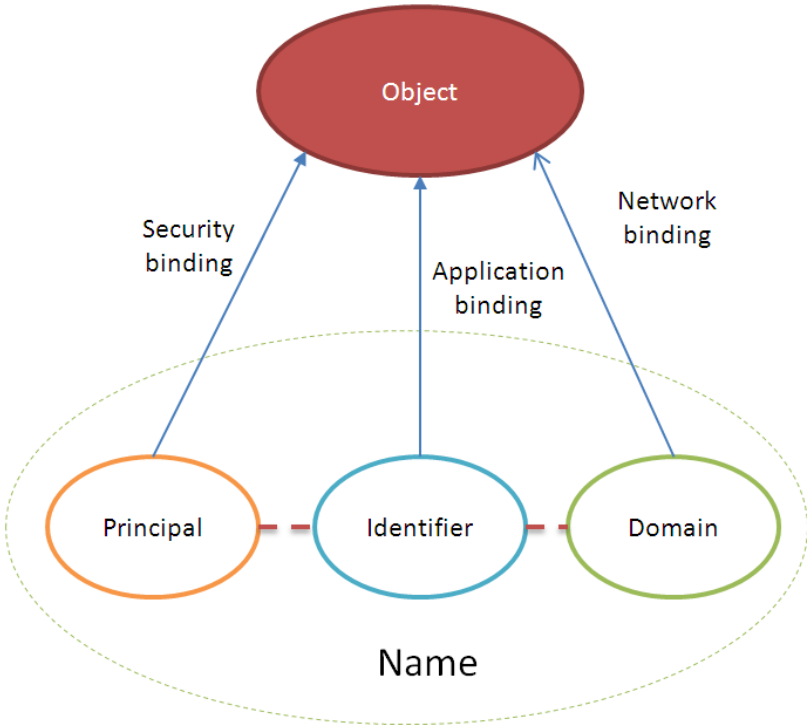
Huawei Technologies

Background

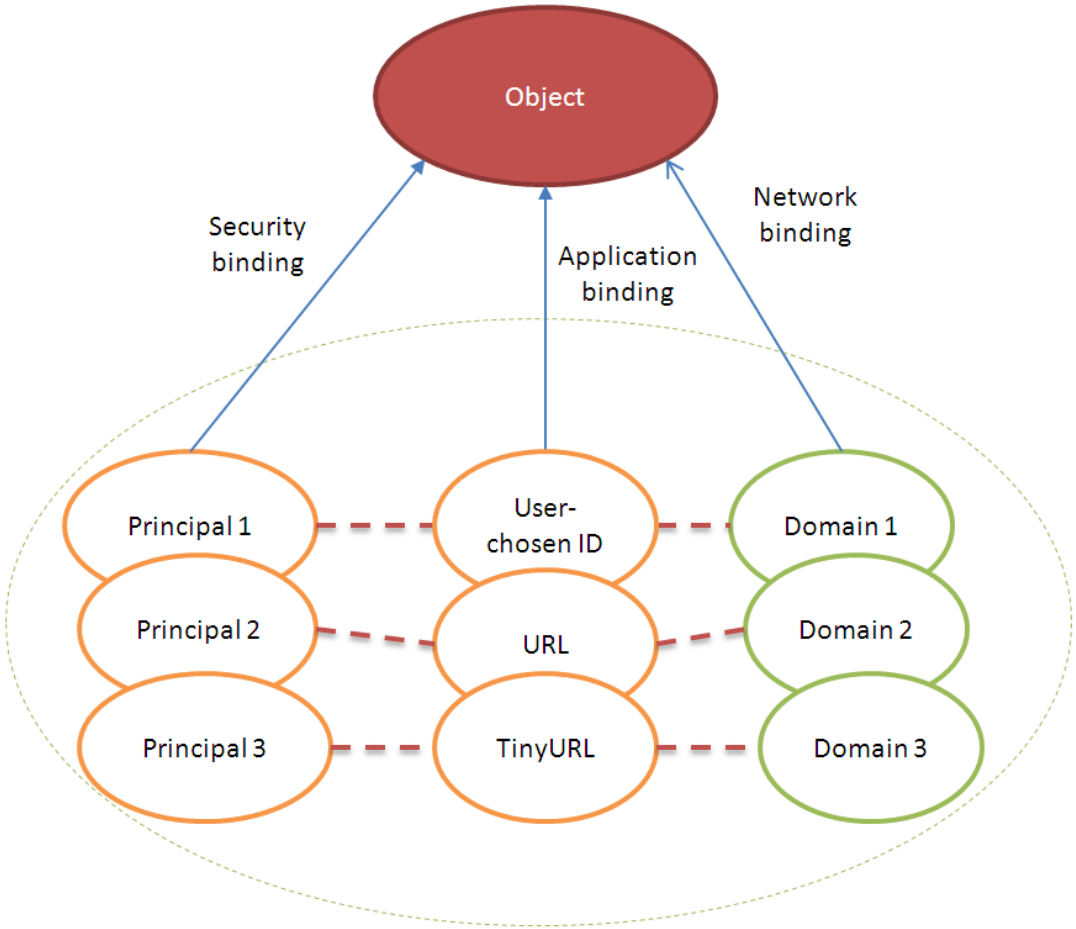
- **Naming a content object is fundamental for ICN**
  - Affect all other design options
- **There are multiple roles for a name, for example:**
  - R1 (relatively unique) -- identifying
  - R2 (always locatable) - routing
  - R3 (readable/semantic) – meaning (to app)
  - R4 (bindable) – security verifier
  - R5 (trustable) – trust verifier
- **Previously, community try to achieve many roles with single-entity name**
  - Flat name
  - Hierarchical readable name
  - Hierarchical flat name
- **We propose a different way**
  - A name consists of multiple entities
  - Each for different purposes

P:I:D naming schema

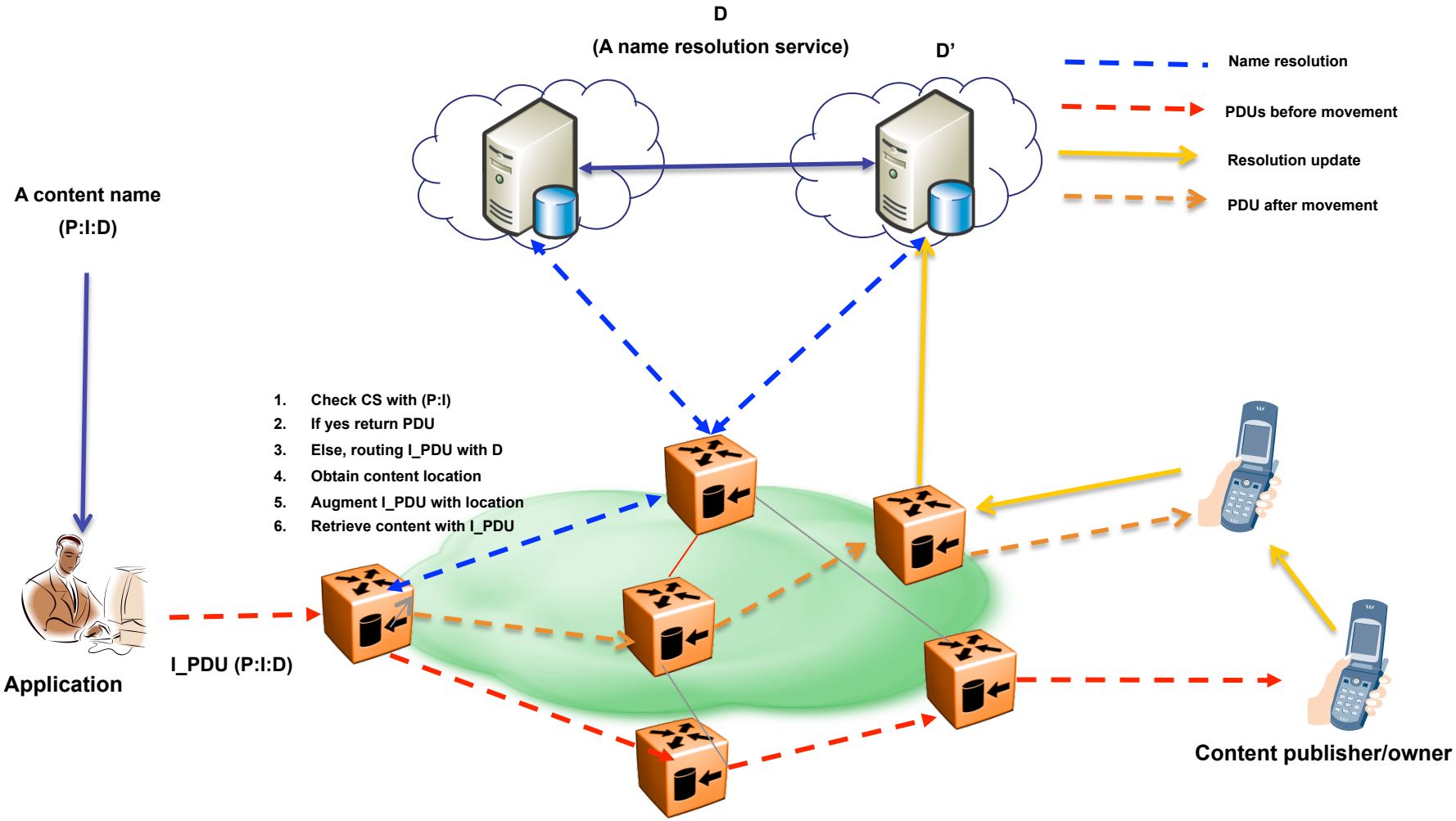
- I is the identifier of the object
  - •can be something chosen by publisher
  - • can be hierarchical or flat, user-readable or non-readable, and location-independent.
- D is the domain that provides resolution from identifier to the real location of the object by routers.
  - •The locator of the target object if the locator is persistent;
  - •The resolution service name which maps the content identifier to its real location, if the resolution service name is persistent;
  - • A resolution service name that maps the content identifier to another resolution service name or location, that is, a meta-domain;
  - •Any combination of above.
- P is the principal to bind the object with complete name for security purpose
  - • for different relationships, e.g., ownership, administration, and social relations.
  - • usually constructed by hashing the public key of the principal, or the hashing the content object itself if it is static.



Generalized naming scheme



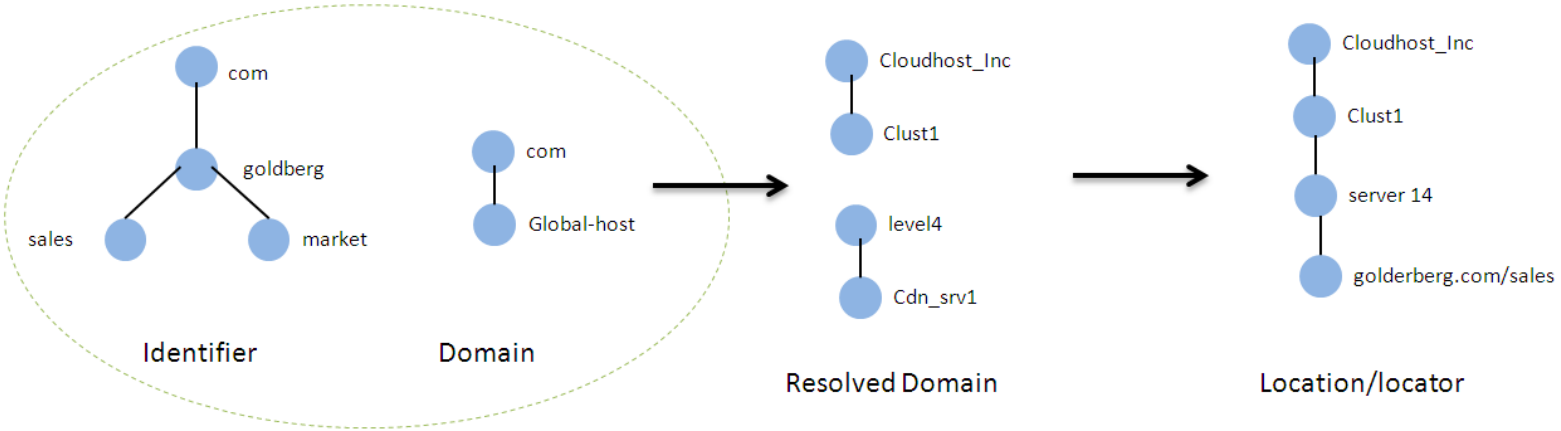
P:I:D naming resolution protocol



Features

- **Multi-home of content**
  - with multiple domains in one name
  - Which supports multiple NRS at the same time
- **Mobility support**
  - Late-binding of address to PDU
- **Flexibility**
  - Support names in legacy and ICN proposals
- **Strong binding**
  - Enable efficient check if a content is correctly named in network
- **Enable trust verification at end side**
  - With help of external trust management mechanisms (e.g., PKI)

Example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sales
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Global-host
Domain
Cloudhost_Inc
Clust1
level4
Cdn_srv1
Resolved Domain
Cloudhost_Inc
Clust1
server 14
golderberg.com/sales
Location/locator

Thank You

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