The design and implementation of an intentional naming system

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This paper describes the design and implementation of a intentional naming system.

The intentional naming system (INS) is a resource discovery and service location system for dynamic and mobile networks. It supports three different kind of bindings. Early binding returns a list of IP addresses corresponding to a name, whereas intentional anycast and intentional multicast build the two forms of late binding. In intentional anycast a message is routed to one of potential multiple addresses. Intentional multicast is routed to any addressee. Beside the naming, the system supports a form of query, which is used to describe the attributes of the required resources. Devices might be queried by location or experienced load.

The core of the system is build of intentional naming routers, which build an overlay. The communication is done over a spanning tree on the overlay. Latency is used to optimize the spanning tree.

This paper introduces the concept of late binding in the field of resource and device localization. The system gives a great comfort to the users, since it decouples locality from the actual usage of resources. The printing systems locates the a printer based on proximity and load and therefore maximizes the user experience.

This form of routing is very costly, especially late binding introduces a high cost. It might be beneficial to use early binding within the network and only fall back to late binding if early binding fails. This can be done transparently to the client by using some form of proxy at the client side.

This paper moves the systems complexity into the core system, which must have enough computation power to handle the load. Ideally complexity is handled at the clients to overcome any potential bottleneck inside the system.