

Master project

Distributed solutions for cluster interconnection management in personal networks¹

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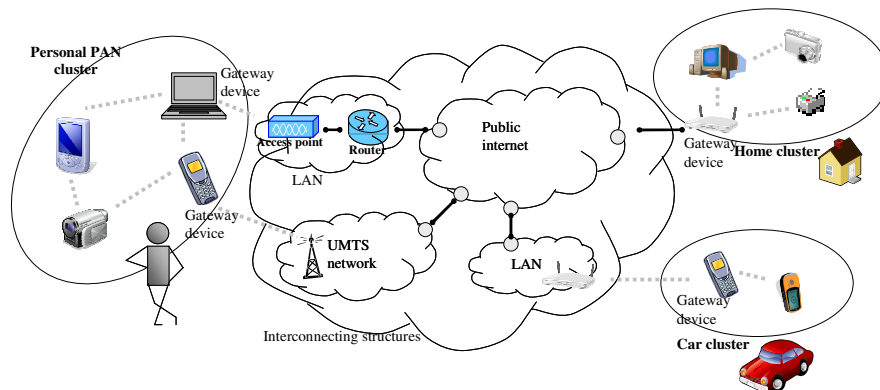
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A personal network consists of a set of personal devices organised in geographical distributed clusters. Examples of personal devices are laptops, mobile phones and cameras that belong to a single user. Clusters are formed by sets of personal devices that are close to each other. All the devices near the PN owner will form the 'personal private area network' (P-PAN) cluster. Other examples of clusters might be centric to the home or car.

The clusters of the PN are in general geographically dispersed and need to be interconnected via the infrastructure. Inter-cluster communication in a PN requires two functionalities. First, in order to establish tunnels between them, the clusters need a way to locate each other. Second, inter-cluster connectivity needs to be maintained regardless of mobility.



The entity that manages the functions that support inter-cluster connectivity is called the "PN agent". The PN agent can be either centralized, under the control of a single provider, or distributed over multiple providers or operators, or even under the control of the PN user.

The goal of this assignment is to propose solutions for management of inter-cluster connectivity in PNs based on the distributed approach. Since there may be some similarities with peer-to-peer concepts, part of this work consists on the investigation of the suitability of existing peer-to-peer technologies to support the required inter-cluster management functionality

The assignment consists of the following tasks:

- Study of the concept of personal network
- Definition of the requirements for distributed inter-cluster connectivity management. This point needs to take into account problems that crossing firewalls and NAT may cause.
- Review of the basic principles of peer-to-peer systems and study of available technologies
- Investigation of the suitability of the available peer-to-peer technologies for distributed inter-cluster connectivity management.
- Design of a concrete solution for distributed inter-cluster connectivity management. The solution could be either new or based on extensions to existing peer-to-peer technologies.
- Implementation, testing and evaluation of the proposed solution in the WMC test bed.

¹ Reference: Title: A Network Layer Architecture for Personal Networks

Authors: Martin Jacobsson, Jeroen Hoebeke, Sonia Heemstra de Groot, Anthony Lo, Ingrid Moerman, Ignas Niemegeers.