

Motivation

Ad hoc networks are well suited to support ambient intelligence applications, that is, to provide an immediate access to resources (i.e., content or services) anywhere, anytime, at low cost. In this context, automatic discovery of resources within the network plays an essential role. However, conventional resource discovery solutions are not well suited for ad hoc networks, as they, in particular, use broadcasting to discover service providers. This results in the unavailability of the ad hoc network, which is induced by broadcast storms. **Research**

Our solution to resource discovery for MANET (Mobile Ad hoc NETworks) is designed so as to limit the induced traffic load, particularly when the number of users increases dramatically. Our solution is based on a subset of self-organized devices (called directories), which are periodically elected to store information about networked resources for the surrounding devices. Then, devices can access information from directories without flooding the network to discover resources. In addition, the system is designed to cope with moving resources, and, thus, related mobility-induced failures, by accounting for the existence of resource replicas within the network together with the quality of service offered by eligible resources.

Another critical issue in ad hoc networks is to enable users to easily access information from both the local and the wide area (e.g., the Internet). However, we have not yet reached the point where anywhere, anytime network access is actually offered. Infrastructure-based wireless networks use fixed network access points with which mobile terminals interact for communicating. Unfortunately, the unavailability of a base station results in network failure. Ad hoc networking may then be exploited for accessing resources available in the local area, which comes at no cost for users, and possibly accessing a WLAN base station to reach resources available in the wide area. The issue that we are addressing is on setting up an ad hoc network of mobile terminals that cooperate to access resources from the local network, and also to offer utilities intended to discover resources in the global network (i.e., the Internet), when needed. This requires interaction with the base station to gain access to the rich set of available Internet resources, when sought resources are not available in the local area. In this context, we have first concentrated on how to improve the Web latency using a WLAN, exploiting both the ad hoc and infrastructure-based capabilities of the network. Our main design objective was to minimize the energy cost of peer-to-peer communication among mobile terminals, so as to allow for inexpensive access when a fixed access point is not available in the communication range of the mobile terminal.

Contributors

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Supporting Grant

- [IST UBISEC](#) -- Ubiquitous Networks with Secure Provision of Services, Access and Content Delivery

Related Software

- [ARIADNE](#) Web service discovery protocol for MANET

Follow-up

- [Service-oriented middleware for ubiquitous networks](#)
- [Service discovery and access in heterogeneous networks](#)

Publications

- Titre [Localisation de ressources dans les réseaux ad hoc](#) Auteurs Sailhan Françoise
Détail Thèse, Université Pierre et Marie Curie - Paris VI (01/07/2005) Accès au texte intégral
- Titre [Scalable Service Discovery for MANET](#) Auteurs Sailhan Françoise; Issarny Valérie
Détail In *International Conference on Pervasive Computing and Communications : PerCom 2005*
(2005) 235-244 Accès au texte intégral
- Titre [Cooperative Caching in Ad Hoc Networks](#) Auteurs Sailhan Françoise; Issarny Valérie
Détail In *4th International Conference on Mobile Data Management : MDM 2003*
(2003) 13-28 Accès au texte intégral
- Titre [Energy-Aware Web Caching for Mobile Terminals](#) Auteurs Sailhan Françoise; Issarny Valérie
Détail In *International Conference on Distributed Computing Systems : ICDCS 2002*
(2002) 820-825 Accès au texte intégral