ED STIC - Proposition de Sujets de Thèse

pour la campagne d'Allocation de thèses 2011

Titre du sujet : How the Internet will change with a content centric networking (CCN) architecture?

Mention de thèse : Informatique

HDR Directeur de thèse inscrit à l'ED STIC : Dabbous Walid

Co-encadrant de thèse éventuel :

Nom : Legout

Prénom : Arnaud

Email : arnaud.legout@inria.fr

Téléphone : 0492387815

Email de contact pour ce sujet : arnaud.legout@inria.fr

Laboratoire d'accueil : INRIA

Description du sujet :

The Internet has fundamentally changed since its beginning in the 70s. Whereas the Internet has been designed to access hardware ressources (server, printers, etc.), it is now used to access contents. However, the IP protocol (the protocol that defines the Internet) can only address hardware ressources, not contents. This is the reason why DNS and URLs have been designed. However, this is just a hack to the Internet that does not solve the fundamental question: how to access a content irrespectively of its location?

The Content Centric Networking (CCN) concept (invented by Van Jacobson the inventor of the congestion control in TCP) has been introduced to solve this question. However, CCN is new and has many fundamental implications on how the Interent is working and on how it is used. The goal of this Ph.D. thesis is to explore the impact of CCN on the Internet and its usage. Many possible paths of exploration exist. Two possibles (but not restrictive) paths are the following.

First, it is cumbersome to guarantee that users data are in sync among all user's potential terminals (laptop, desktop, smartphone, etc.), or just that your data are available when you need them. This issue is currently solved at the application layer using adhoc techniques (most often a dedicated infrastructure that is used to synchronize compatible terminals). This management of personal data must be part of the functionality offered by the network, as it is (in the current data centric era) the minimum functionality that is needed by every user. CCN defines fundamental concepts into that direction, thus a Personal Content Management layer might be built on top of CCN. A possible path of exploration is to evaluate the impact of CCN on personal content management.

Second, a fundamental issue with the Internet is its lack of built-in privacy functionality. However, as shown in the Bluebear (planete.inria.fr/bluebear) project privacy is an overlooked, but critical issue in the Internet. CCN provides some core functionalities to improve security, however, its impact on end-users privacy is not yet understood. One possible path of exploration is to evaluate the impact of CCN on privacy.

URL : http://www-sop.inria.fr/members/Arnaud.Legout/positions.html

English version: