

Groupe de Recherche : MRS

Pôles :

<i>MINAS</i> (Micro et Nanosystèmes)	<input type="checkbox"/>
<i>MOCOSY</i> (Modélisation, Optimisation et Conduite des Systèmes)	<input checked="" type="checkbox"/>
<i>SINC</i> (Systèmes Informatiques Critiques)	<input type="checkbox"/>
<i>RIA</i> (Robotique et Intelligence Artificielle)	<input type="checkbox"/>

Mot(s)-clé(s) : IP/MPLS networks; QoS ; online optimization ; traffic matrix estimation

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Titre : Dynamic reconfiguration of IP/MPLS networks

Nowadays, the management of an IP/MPLS network requires the use of multiple specialized tools. The teams that are in charge of operating the network use different tools for the management of equipment configurations, traffic monitoring and network supervision. These tools provide a certain « view » of the state of the network at a point in time, but require the expertise of network specialists to decide potential network adaptations.

The project NEC (*Network Engineering & Control*) aims at designing and developing a complete environment for the operational management of IP/MPLS networks. Beyond the simple supervision, what is targeted is the « intelligent » control of computer networks. It amounts to conceiving and developing a Supervision/Control center that gives a global and accurate view of the network state, with consistent and high-level data, and that is a true engineering and decision-support tool based on end-to-end stochastic simulation models and on optimization algorithms allowing to take the optimal decisions. In addition to gathering all the information at a centralized point, this tool will enable the proactive analysis of all possible scenarios and the anticipation of the optimal decisions in case of adverse events (QoS degradations, attacks, failures, etc.).

The research of the PhD student will concern on one hand the estimation of the network traffic matrix from SNMP link loads, and on the other hand robust optimization algorithms for its dynamic reconfiguration. In particular this research will involve the dynamic optimization of OSPF weights and the rerouting of Label Switched Paths (LSP).