Dpt : RSR

The "Networks and Distributed Systems" department targets on designing solutions to understand, shape and manage present and future networks, systems and applications. It gathers six teams: MoVe (Modeling and Verification), REGAL (Répartition et Gestion des Applications à Large Echelle – Resource Management in Large Scale Distributed Systems), NPA (Networks and Performances Analysis), Phare, ComplexNetworks and APR (Algorithms, Programs and Resolution).

MoVe Team

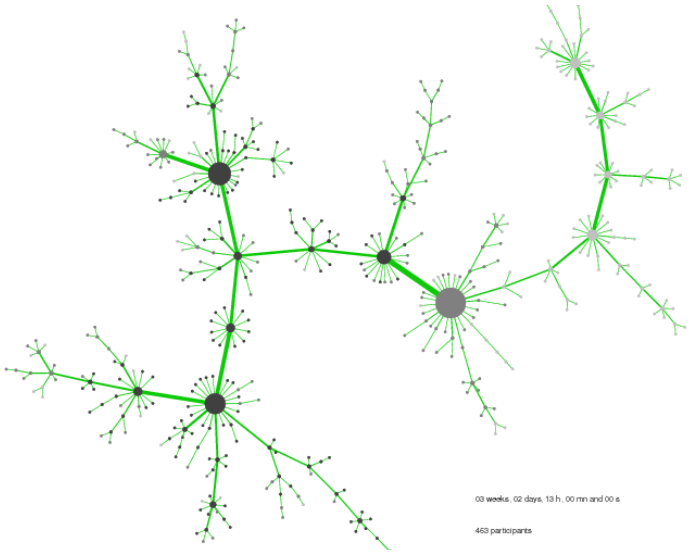
MoVe centers its research on the modeling and analysis of complex and dynamic distributed systems. In particular, the team focuses on: optimized techniques of formal verification through model-checking; development methodologies based on model-driven engineering; integration of formal analysis in development processes; design and implementation of new programming languages and models to increase the verifiability of distributed programs.

NPA Team

NPA team aims at developing a vision for the future Internet as well as designing solutions to shape and manage it. The target of the team is the control of ubiquitous, mobile and versatile networks that expand everywhere in our private and professional environments. The core of its work concerns problems related to multimedia and mobile networks, resource management, scalability, ambient networks, and content networking. Moreover, significant work is developed in the area of Internet measurement, modeling and traffic engineering.

ComplexNetworks Team

Complex networks, modeled as large graphs, appear in many contexts: computer science (internet topology, file exchanges, etc), social sciences (friendship or collaboration networks, trading networks, etc), life sciences (protein interactions, nervous systems, etc), and many others. All these graphs have nontrivial properties in common and raise similar questions, which makes it relevant to study them as a whole. The ComplexNetworks team conducts high-level research in this area using both practical, theoretical and experimental approaches. Our strategy consists in studying practical cases of interest and work on transversal questions, such as their measurement, modeling and description.



REGAL Team

Regal is a joint research team between LIP6 and INRIA Paris-Rocquencourt. The main focus of REGAL is research on large-scale distributed computing systems. It addresses the challenges of automated administration of highly dynamic networks, fault tolerance, consistency in large-scale distributed systems, information sharing in collaborative groups, dynamic content distribution, and operating system adaptation. It focuses on two kinds of large scale environments: computational grids and peer-to-peer (P2P) systems. It also studies the impact of new technologies, such as manycore architectures or clouds, on distributed protocols.

Phare Team

The Phare team aims at developing the future generation of telecommunications networks. The reasons for this new generation are: the massive arrival of clouds, the generalization of virtualization, universal mobility, too high energy consumption, too slow management and control schemes, and finally insufficient security. The Phare team goal is to design and test a set of protocols associated with these different elements to give birth to this new generation. This is why the Phare team develops an environment where all resources are virtualized up to virtualized cloud (the sky), using green algorithms, managing and controlling mobile resources, working intelligently, and using a hyper secure environment.

APR Team

The APR team revolves around two research projects: project Random Generation (RG), and project Web, Languages and Coherence (WLC). In the RG project, supported by the ANR project MAGNUM (Algorithmic Methods for Non Uniform Random Sampling, Models and Applications), the team develops methods of analytic combinatorics for random sampling with Boltzmann method. This model allows for sampling combinatorial objects from their specification, using efficient and generic algorithms, with many applications, especially in software testing and complex networks. The WLC project is supported by an ANR project nicknamed PWD for «Programming Diffuse Web». In the WLC project, the team develops new programming languages for the Web to enhance various aspects around HOP and OCsigen: formal semantics of Hop to ensure the security of the interactions between clients and servers. Around OCsigen, the PWD project studies how to handle the DOM in a strong typing context during all the lifecycle of the application.

Mots clés

Model engineering, modeling and checking of distributed systems, interoperability, adaptability, middleware, peer-to-Peer, GRID, internet, quality of service, mobility, metrology, wireless networks, the future internet, sensors networks and localization, graphs, algorithmics, complex networks, dynamic graphs.