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Press- Release

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A consortium consisting of 10 research institutions and industrial partners from 6 different countries is launching the MANCOOSI project, an EU-funded research project aiming at improving support for software upgrades in the field of Free and Open Source software.

MANCOOSI, standing for MANaging the COmplexity of the Open Source Infrastructure, has a total budget of 4.4 million euros, including a 3.3 million euros funding from the European Union.

Free and Open Source software is developed through the cooperation of volunteer programmers, public institutions, and software industry. This mode of development guarantees transparency of the inner working of the software, and encourages users to become contributors themselves. Free and Open Source software continues to gain its share among system installations, not only among home users but also among power users in industry, public institutions, and Internet services.

Free and Open Source software usually evolves in a rapid succession of new versions. Software developed and published in this way is bundled into packages by software distributions for easy deployment and installation, as for instance distributions of the GNU/Linux operating system and its huge collection of application software. These collections of available packages are constantly updated for the benefit of the user who needs the latest versions of software products, to fix security issues for instance. Consistent distributions of these software packages are published by editors, which may be released in updated versions several times a year, but over time each user's machine inevitably ends up with a unique mixture of software components coming from different versions of her preferred distribution, and also from external sources. Maintaining the set of components installed on a machine in a consistent state is a daunting task that is becoming recurrent.

> *The rapid evolution of the software base makes upgrades a recurrent task that needs to be both safe and easy, for home users that do not want to waste time on system administration, and as smooth as possible for power users that cannot afford system downtime due to failed upgrades.*

This is a difficult task: a free software distribution is made up of dozens of thousands of software packages, interconnected by complex dependency and conflict relationships which change with the evolution of the software packages. As a consequence, even when a user wants to upgrade a single package it may be necessary to remove or install many other packages on the system. Finding an upgrade path of a complex software installation is a complex task in terms of algorithms, and finding a path taking into account the

preferences or resource constraints of the user is even more difficult.

To address this challenging problem, the MANCOOSI project will:

- define **formal models of a software platform** and add **transactional suppor**t to existing tools to ensure that it is possible to unroll a failed upgrade attempt;
- develop **specialized algorithms** and **tools** for the **discovery and optimization** of upgrade paths
- **mobilize a large research community** to take part in an international competition for solving upgrade and other maintainability issues collected as a corpus of actual, real-world descriptions of upgrade failures

Did you know?

Some of the Mancoosi partners have collaborated in the framework of the **EDOS project** which was devoted to the specific problem of building Linux distributions. This has led – among the various other results of the EDOS project – to the development of ground-breaking tools that allow to efficiently check the consistency of a set of packages: these tools are today succesfully adopted and used daily in mainstream Linux distributions ranging from Caixa Magica, to Debian and Mandriva.

The main target of the project is the Free and Open Source infrastructure, as it provides a real-world example of what tomorrow's complex, quickly changing software systems will look like, but the applicability of these models and algorithms goes far beyond Free and Open Source software, and technologies developed in Mancoosi will pave the way to the maintainability of the software systems of the future, especially for systems of systems, even when they are not Free or Open Source.

To achieve Mancoosi's goals, the consortium brings together a mixture of actors, ranging from industry to academia to user communities. Mancoosi's Partners are:

Coordinator:

Université Paris Diderot
France

Partners (alphabetical order):

Caixa Mágica
Portugal

Edge-IT
France

INESC-ID
Portugal

ILOG
France

Pixart
Argentina

Tel Aviv University
Israel

Université catholique de Louvain
Belgium

Università degli Studi dell'Aquila
Italy

Université Nice Sophia Antipolis
France

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