

Cloud4all: Working toward a more accessible world

Imagine if devices could automatically adapt to users' needs and preferences. Cloud4all is a European Commission project to turn this vision into reality.

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As information and communications technology (ICT) becomes more important in daily life, new ICT systems need to facilitate access — not just to a single computer, but to all of the different devices that people use. This includes access to the ICT used in classrooms and laboratories, at home, at work, and in the community, when traveling and more. Improving accessibility may come from larger print, higher contrast or screen readers (to speak the text on screen), to name a few options.

Whereas the lack of accessibility, or even the maintenance of the status quo, would further increase social exclusion, its improvement can contribute to greater social inclusion. Benefits include better access to health and public services, improved employability and productivity, increased embeddedness for people in social relations and networks. This is the aim of Cloud4all.

Cloud4all is an international project funded by the Seventh Framework Programme (FP7) of the European Union working to make progress on the concepts behind the Global Public Inclusive Infrastructure (GPII) project. The Cloud4all project, involving 24 partners and three collaborators from nine European countries, plus Canada and the United States, will develop key parts of the GPII, building the knowledge base and algorithms needed and evaluating the ability of the concept to work across platforms, technologies and applications.

The objective

The Cloud4all/GPII project aims to achieve the following objectives:

- Simple, instant accessibility for all.
- Anywhere, any-device access.
- Supply and demand better connected.
- Affordable method to offer the diversity needed.

From the innovation perspective, Cloud4all and GPII aim to develop a complete new paradigm in accessibility, by augmenting the adaptation of second-generation, individual products and services with automatic personalization of any mainstream product or service a user encounters. This is done by using cloud technologies to activate and augment any natural (built-in) accessibility or installed access features the product or service has, or by recommending the appropriate third-party solutions, based on the user's needs and preferences.

Achieving the goal

To achieve its goal, the project concept is based on the creation of an explicit and implicit user preference sets (stored either locally or in the cloud; depending on user preference). This preference sets automatically matches mainstream products and services with necessary access features and configures them according to user preferences and context of use:

- Anywhere (any device the person encounter in any location).
- On any device (PC, mobile, smart phone, iTV).
- Seamlessly and holistically (configuring both content and user interface).
- Increasing the accessibility of the product when needed [through special web applications, cloud based assistive technology (AT), cloud-based desktops, run without AT installation or with download and AT installation].

To address these issues, an international coalition of organizations and individuals has come together and proposed the development of a Global Public Inclusive Infrastructure (GPII). The GPII consists of enhancements to platform and network technologies to create an infrastructure that simplifies the development, delivery and support of access technologies and provides users with a way to instantly apply the access techniques and technologies they need, automatically, on any computers or other ICT.

Digging deeper: The Global Public Inclusive Infrastructure (GPii)

GPii is a project carried out by the Raising the Floor Consortium, a consortium of academic, industry and non-governmental organizations and individuals.

The purpose of the GPii is to ensure that everyone who faces access barriers due to disability, literacy, digital literacy or aging, and regardless of economic resources, can access and use the Internet and all its information, communities, and services for education, employment, daily living, civic participation, health and safety.

The GPii is being developed via the funding of different European and North-American programs and initiatives, such as Cloud4all, PROSPERITY4all, US DeptofED and UIITA RERC. You can learn more about GPii by visiting its official website at <http://gpII.net/>.

Making the world more accessible

The Cloud4all architecture will provide the APIs, coding practices and frameworks that will enable an ecosystem for personalized accessibility to emerge, grow and be sustained for the long run. The Cloud4all architecture has been designed to provide the software development tools and techniques that will support:

- Deployment across multiple platforms and devices.
- Cloud-level scalability.
- Extensibility and long-term growth.

As part of the larger Global Public Inclusive Infrastructure effort, the code developed in Cloud4all is intended to be usable by real people, in the real world. As a result, the code — especially the core kernel that supports the configuration and extension of the system with new functionality over time — must be robust, stable, and forward-looking. To achieve these goals, Cloud4all's architectural approach emphasizes the importance of separation of concerns, data-oriented service APIs, Inversion of Control (IoC), unit testing and community code review. These approaches work together to ensure that the Cloud4all system can be easily extended and reconfigured to support new use cases, features and components in the future without requiring major code changes.

The Cloud4all architecture is based on the following technological paradigms:

- Web-oriented architecture.

- JSON, REST and Repartitioning.

Cloud4all is developing proof-of-concept, auto-configuration of accessibility features for the following devices, platforms and applications: Microsoft Windows 7 OS, Linux/Gnome OS, Chrome extension, Firefox add-on, Simple Java phones, Android phones, NVDA, WebAnywhere, SAToGo, EASIT4all, Sociable on MS Pixelsense, SuperNova AT, Maavis, Mobile Accessibility for Android, Read&Write Gold, Omnitor Total Conversation, BrowseAloud, online banking web applications, ticket vending machines, simulation of smart house controllers, Digital TV and Easy One Communicator.

By substantially improving accessibility over the next 10 years, Cloud4all will open up access to, and improve the use of, ICT products and services in general — whether eCommerce, eGovernment, eHealth, eCulture or Internet banking. Cloud4all will also work to facilitate online job applications, job-matching platforms, eLearning applications and other opportunities, especially for older people and people with disabilities.

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