

# Platforms for Joint Development and Hosting of Software and the Example of their Implementation in the FAP SB RAS

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# The Classification of the Platforms

- The hosting of software projects (*Github, Bitbucket, etc.*).
- The support for software developers' communities (*Stack Overflow, OSZone, etc.*).

Or ***depending on the focus on supporting various technological solutions:***

- The specialization in a specific technology stack (*Microsoft Developer Network, Russian Software Development Network, Intel Software Network, Launchpad, etc.*).
- The support for free and open source software (*GNU Savannah, BerliOS, etc.*).
- The general-purpose storage (*Github*).

# The Catalogs of Software

- Softpedia, SourceForge.net, etc. in the past.
- The individual software stores for almost each platform are available nowadays (*Microsoft Store, App Store, Google Play, etc.*)
- There is good relevance of search engines, allowing users to easily and quickly find the right software on request.

# **The Key Services to the Operation of a Technological Platform for Joint Development and hosting of Software**

- The bug tracking subsystem.
- The version control subsystem.
- The project management subsystem.

# The Bug Tracking Subsystem

The application software designed to ***help software developers take into account and control bugs*** found in programs, ***feature requests*** for functionality additions, as well as monitor the process of eliminating these bugs and implementing requests.

The most common systems of this kind are *Bugzilla*, *Trac*, *Redmine*, *Jira*.

# The Version Control Subsystem

It allows to ***store several versions of the same source code*** (or document), return to earlier versions, and determine who made this or that revision and when.

In the process of software development, such systems are used to store source codes of developed programs.

Examples of such services are *Subversion, Bazaar, Mercurial* and *Git*.

# The Project Management Subsystem

The multipurpose software that includes services for ***task planning, resource management, collaboration, communication*** and documentation writing.

Such services provide project managers with a list of tasks for employees and information on the timing of tasks, as well as early warnings of possible risks associated with the project, information on the progress of the project, individual indicators and their forecasting.

The most famous representatives of such systems are *Trac, Redmine*.

# The Software Development Support at the SB RAS

The main reason for organizing the platform is the fact that the *life cycle of software developed at the research institutes* of the SB RAS *most often ends at the level of prototypes* used only by the developers of the software.

It was decided to organize the full cycle software development process at the SB RAS, *from the emergence of the scientific idea to its implementation in the form of the complete knowledge-based software product.*

This will *significantly expand the number of potential software' users*, as well as *attract third-party developers* interested in the initial development and subsequent software modernization process.



# The Goals of the Technological Platform for Software Development Creating at the SB RAS

- The association and attraction of the SB RAS specialists for joint software development.
- The ***transformation*** of the SB RAS software projects from the state of experimental (mock) versions ***into completed software products***.
- The direct interaction of developers of a knowledge-based software with its users.

# The Technological Platform will Provide the Following Opportunities to Software Developers

- The **access** to the **versioned repository** of project documentation and **source codes**.
- The **backup** and archiving of all software projects with the possibility of **recovery** in case of loss.
- The software **testing, registration of bugs** detected during testing, monitoring the process of their correction.
- The support for **software development by teams** of authors.
- The **distribution of software** among users at the end of the project build (based on the demonstration platform of the FAP SB RAS).

# Redmine (freeware, modular structure)

- The support for simultaneous work on several projects (with separate wiki, documentation and forum spaces for each).
- The time tracking for individual projects.
- The construction of Gantt charts.
- The integration with version control systems.
- The flexible, role-based, access control system.
- The support for authentication via LDAP.

As the version control subsystem, Redmine supports *Subversion*, *Mercurial*, *CVS*, *Bazaar*, *Git*. All of them are available to users of the platform.

# The Demonstration Platform for Knowledge-based Software at the SB RAS

Targeted information support for software users, and providing users with the *opportunity to test* the software *without the need to install it* on their own computers.

The platform is the systematic set of:

- The catalog of the demonstration pages on the Foundation's website.
- The demonstration server integrated with the platform with the pre-installed corporate operating system based on the Ubuntu OS and the software selected for demonstration.

# The Demonstration Pages (the Software Catalog for Linux)

- The software description (purpose, scope, capabilities, etc.).
- The advantages and disadvantages affecting the functionality of the software; the software analogues for various operating systems and its comparison with analogues.
- The operating systems in which the software runs.
- The type of license for the software.
- The link to the software page or software manufacturer.
- The software package (links to the packages for various OS and hardware platforms or to the source codes).
- The link to the demonstration server of the SB RAS where users can try the software in action.
- The user manual, training materials, useful links from other sites.

# The Demonstration Server

The server with the preinstalled corporate operating system based on the Ubuntu OS and the set of free software allocated in the information cluster of the FAP SB RAS.

A users can ***evaluate it in real-time mode without need for its preliminary installation*** on their own computers. Access to the server is via the protocols *RDP* (Remote Desktop Protocol), *VNC* (Virtual Network Computing), *NX*.

In the future, it is planned to create Web interfaces to the demonstrated software or use other presentation technologies.

# The Integration of the SB RAS Software Packages into Global Software Repositories

- The ***set of methodological documentation*** for software authors on the process of its preparation for integration in the package format and software repository of the Ubuntu operating system.
- The proposed ***solutions were tested*** on the example of several software products developed by specialists of the SB RAS for the possibility of their full integration in the repository at the source code level.
- The following programs / software packages are ***included in the Ubuntu repository***:
  - ***UGENE*** – the software package for molecular biologists (developed by Unipro and ICG SB RAS),
  - ***GALA-2.0*** – the package for solving linear algebra problems with the guaranteed accuracy estimate (IM SB RAS).

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