

Building projects portfolio with the GÉANT Software Catalogue - experience paper

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Abstract — GÉANT Software Catalogue is a repository of software projects and teams, established in order to facilitate and support the software engineering community within GÉANT project.

Keywords — *software team, software project, software portfolio, software community*

I. INTRODUCTION

There are many tools supporting software development during the whole lifecycle i.e. design, development, testing and deployment. Some of these tools, like source code repositories and issue tracking systems are essential for a typical software development project. The decision about selecting particular supporting tools can be made either according to the given set of governance and policy or individually, by every team, based on the project characteristics, individual habits, past experience, etc. The first approach is usually present in a commercial organization or industry-driven projects, where the software quality practices are firmly formalized. In case of research-driven organizations or scientific projects with existing diverse and informal processes, a looser approach is usually observed.

Although some of the supporting systems, e.g. GitHub [1], have the predominant position, the software development teams can have a variety of choices in selecting the desired solutions - SourceForge, Bitbucket, GitLab and individual hosting platforms. In consequence, software artifacts i.e. source codes, issues and documentation, can be stored in multiple types of repositories and recorded in many formats. They may also contain different scopes of information (an issue recorded in Jira has a different set of information compared with an issue recorded in GitHub). Moreover, software engineers use multiple authorization systems while accessing the public cloud based tools. Thereby they need to maintain separated identities while contributing to various software projects instead of using one common profile.

Our aim is to present the Software Repository, which has been deployed within the GÉANT project as a place containing essential information about development efforts such as general purpose, contacts, roles, community, communication channels, resources and many others. Such information repositories are present in large software communities (e.g. Apache Projects Directory), and evolves together with growing portfolio of software projects. A central and complete software data repository is a must-have feature for federated community of software developers, to gain maximum benefits for collaborative work and alleviate some negative effects of team

distribution, partial involvement in the project and similar others.

II. SOFTWARE DEVELOPMENT COMMUNITY IN GÉANT

The GÉANT projects bring together the world of National Research and Education Networks (NRENs) into one multi-domain community. The NREN community is involved in collaborative software development activities, focused on a specific product with different size, maturity and target domain [2]. More than 30 software projects are being developed in the GÉANT project by around 20 software development teams [3]. The teams are currently using either GÉANT tools (BitBucket, JIRA) or public services such as GitHub for software development.

The NREN software developers may have varying work methodologies in terms of style, experience, expectations and approach [4]. They can have different background i.e. software engineering, network engineering but most often, they combine the software knowledge with in-depth expertise in particular elements of network domain.

Software developers in NRENs constitute a demanding community, with a great need to constantly improve their technical skills and capabilities. What has been observed is that these individuals look for best ways to share knowledge among their peers, and for testimonials and successful cases inside the community they belong to. For example, software developers are willing to find a peer who has already tried a technology or tool, to make sure that the best-of-breed solution will be chosen for their products. Software team leaders would benefit to learn the way of avoiding typical pitfalls while working with geographically dispersed team

III. GEANT SOFTWARE CATALOGUE

The GÉANT Software Catalogue (GSC) provides a global view of the whole software development in GÉANT [5]. It is a unified repository of software teams and projects, automatically aggregating and presenting information from different data sources like source code repositories or issue tracker systems. The recent release of the Software Catalogue supports most commonly used types of repositories which are Atlassian JIRA, Git and GitHub (API). Additionally, a GÉANT LDAP interface is harnessed to enrich user identities, especially in terms of relation to the internal structure of the organization.

The new tool has not introduced another information repository by duplicating existing records: it rather retrieves the data from existing sources consolidating the information in a unified and customized way. It is highly focused on solving the organization's specific problems like finding the person with specific technology skills. In contrast to other

products on the market, GSC is not a public service and needs to be deployed on-premise. This favours the organization's data privacy.

Based on the identified needs of the GÉANT software community, the Software Catalogue is able to reconstruct a community of people and identify roles, including a main contact person. An analysis of source code allows to identify programming languages, technologies and frameworks. Project activity is visualized on a timeline. In particular, changes in share of programming languages can be tracked on chart. The catalogue is highly explorable so that it is easy to find projects and people by multiple criteria, including the programming language or technology framework.

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