

Professor Vladimir O. Safonov's position statement

My intention as a candidate to the JCP Executive committee is to bring my professional knowledge and experience to the benefits of further development Java technology which plays very important role in my professional life and work as a professor of computer science, researcher, and software practitioner. I have a lot of ideas how to improve and extend the Java technology and am going to do my best to make this happen. Hope my JCP EC position will help me to accomplish that.

I have already made a contribution to Java technology as a manager and scientific advisor of a team of 75 people working for Sun Microsystems at St. Petersburg University in 1992 – 2002. I am proud I've worked with members of Dr. Gosling's team. I'd like to emphasize the role of Carla Schroer who was the head of Sun Russian Projects for a few years. Due to her, I started working with Java since 1996 from the early days of Java, and grateful to my Sun colleagues who discovered Java to me and my team. We've had a great opportunity to learn Java "from the origin", from Java Beans (JDK 1.1) till Java modules (Java 8). I am also proud the key people of my Sun contractors' team in 2005 formed a backbone of St. Petersburg Sun's software development center, and later on, in 2009 - a backbone of Oracle's Hi-Tech software development center in St. Petersburg whose primary goals are development of Java technology and Oracle Studio compilers.

In 2006 – 2008, together with my scientific school members, I contributed to NetBeans C / C++ Development Pack by implementing the *Make2NetBeans* tool for conversion make-style C / C++ projects to NetBeans projects. Also, we contributed to UML support for C / C++ in NetBeans but that project was not completed, since Sun stopped funding. Hopefully in my JCP EC status I will have more opportunities to continue these activities.

Generally speaking, I foresee new features in Java technology and will contribute to its further progress in the following respects I consider state-of-the-art:

- More enhanced support of cloud computing – new features in JEE and JSE for developing cloud services, and new features in JME for developing cloud-connected mobile apps;
- More adequate and enhanced support of principles of trustworthy computing, including formal methods (specification and verification); static analysis of source code and bytecode; security development life cycle (SDL, speaking in Microsoft terms); improving trustworthiness of the existing Java language and platform. As a simple example, currently Java does not have unsigned arithmetic, which makes Java code error-prone when the developer has to model that lacking feature using logical multiplication to bitmasks. Java technology does not have a thread deadlock analyzer on board (although third-party research projects do exist to implement such functionality). Java does not have support of formal specifications and verification in design-by-contract style (as compared to Microsoft's Spec#), and so on;
- More flexible approach to generics and overcome of its existing drawbacks. Currently Java suffers from "type erasure" when using instantiations of generic classes without an opportunity to distinguish between them at runtime (which is not trustworthy). To compare to .NET, in C# runtime type-checking of generics instantiations is quite possible. As opposed to CLU, in Java it is not possible to use *array <t>* where *t* is a type parameter. The Java generics mechanism is limited to type parameters only, although in the mid-1970s, in CLU language, constant parameters were also implemented (e.g., a parameter for max depth of a stack). As a proof-of-concept, we have developed an experimental implementation of constant parameters as openJDK project.

So I think Java technology should be made more contemporary in many respects and I am going to contribute to its progress.