Detection of puffins on mutexes in multithreaded applications

V.S. Belous, V.A. Krischenko, N.Yu. Ryazanova

Bauman Moscow State Technical University, Moscow, 105005, Russia

The article is devoted to developing a method of detecting deadlocks when using mutexes in applications that are implemented by the POSIX standard. In the framework of the deadlock theory is analyzed and implemented a way to get information about blocked on mutexes processes. It is shown that the detection of closed circuit block processes corresponds to the detection loop in the general bipartite resource graph. Mechanism of inclusion in the core assets hook the kernel function, which manages the capture and release of flows on mutexes is describer. Algorithm of deadlock detection on the basis of received information is presented.

Keywords: deadlock, mutual exclusion, mutex, function-hook, detect deadlock.

Belous V.S. (b. 1993), a student of the Software and Information Technologies Department of Bauman Moscow State Technical University. e-mail: spectr0@mail.ru

Krishchenko V.A. (b. 1975) graduated masters from Bauman Moscow State Technical University in 1998. Ph.D., Assoc. Professor of the Software and Information Technologies Department of Bauman Moscow State Technical University. Author of more than 15 publications and is currently interested in software and network protocols verification and static and dynamic analysis of software. e-mail: kva@bmstu.ru

Ryazanova N.Yu. (b.1951), Ph.D., Assoc. Professor of the Software and Information Technologies Department of Bauman Moscow State Technical University. Author of more than 36 publications. Research interests: building system programming, algorithms of computer graphics. e-mail: ryaz_nu@mail.ru