Keynote Address

Second Life:
The World's Biggest Programming Environment

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Abstract

Second Life is a large, on-line virtual world where avatars dance, fly, buy virtual clothing, play games, have meetings…and program. About 256k residents of Second Life write code that runs 24/7 in over 2M simulated objects in a continuous 3D landscape twice the size of Montréal.

This giant, collaborative development environment is run on a large grid of over 12k CPUs in a grid of "simulators" that run the land of Second Life. The simulators have an integral virtual machine for the scripting language people use. Despite the inherit difficulties, the system demonstrably does enough right to enable development of a huge amount of content in Second Life.

As the virtual world grows, we have been evolving its infrastructure for programming in several ways. Integration of the Mono virtual machine presented a huge set of challenges but offers major advantages as Second Life grows. We have also had to architect and extend in light of the fact that Second Life is a continuously running system on which over a million people rely.

Finally, apart from the language and run-time environment, Second Life also presents a social environment in which to program collaboratively. Within Linden Lab, we have pioneered the use of Second Life as an integral part of our development methodology even when working on the underlying code of Second Life itself. These experiences point toward a re-imagining of programming as a globally immersive collaborative experience.

Categories & Subject Descriptors: D.1 Programming Techniques

General Terms: Virtual worlds, scripting, collaboration

Bio

Dr Jim Purbrick has both academic and industry experience in designing and building virtual worlds. At Nottingham University he worked on the MASSIVE-3 virtual environment system and Prix-Ars-Electronica-winning mixed-reality games with IGDA award winners, Blast Theory. In industry, Jim designed online games at Codemasters, developed networking and load balancing technology for Warhammer Online, and is currently working on scripting and networking technology for Second Life while setting up Linden Lab, Brighton.

Mark Lentczner directs a software engineering studio at Linden Lab. His studio is primarily focused on the architectural extension of Second Life and the software infrastructure to support its expansion to Internet scale. He appears in Second Life as "Zero Linden".

Mr. Lentczner has worked in Silicon Valley for over 20 years, leading engineering teams on projects including virtual machines, software tools, cell phone browsers, and audio processing. He held leadership positions at Apple Computer, OpCode Systems, and Go Corporation before running his own consulting firm for a decade. He is a graduate of Harvard with a degree in Applied Math and Music.