Jochen Liedtke, In Memoriam

Jochen studied mathematics at the University of Bielefeld, completing his diploma in 1977. The focus of his thesis was the novel programming language ELAN. Jochen's first operating system was a by-product; a run-time environment for ELAN was needed on small Z80 micro computers.

The result of Jochen's effort, EUMEL, was based on two simple principles: persistent processes and data spaces. All data in the entire system including process control blocks and data space descriptors were contained in these data spaces. They could be copied efficiently and atomically using copy-on-write and garbage collection techniques. By copying the "data space of data spaces" every few minutes, a complete copy of the entire system state was taken and lazily written out to disk. Thus, process persistence was automatic, with no programmer effort. Sending around data spaces in synchronous messages was the only means of process interaction which made it easy to build a simple distributed EUMEL system. The paging device was a floppy disk (what else on a cheap computer at that time).

In 1984 Jochen moved to GMD, the German National Research Center, to build a "native code" version of EUMEL, called L3. This was the time when microkernel-based systems were en vogue. Soon, however, many researchers gave up their attempts to build the really fast message passing systems that were needed to run device drivers and other performance critical components at user level. Declaring "The Increasing Irrelevance of IPC Performance for Microkernel-Based Operating Systems," IPC was avoided by co-locating drivers and other components back into the kernel. Jochen, however, accelerated IPC by a factor of 20 over comparable systems at the time. The methods, mostly based on a thorough understanding of the interaction of modern microprocessor architectures with operating systems, were published in his SOSP 1993 publication ("Improving IPC by Kernel Design"). Still, L3 was not widely used (except in about 3000 installations in German law practices) because of its very specialized user and programming interface. Consequently, Jochen started close cooperation with Dresden University's operating systems group to build a Unix-like interface on top of L3. During this time, he invented hierarchical external pagers, another important feature that allowed physical memory management to be done in user-level pagers (SOSP 1995, "On Micro-Kernel Construction").

Jochen completed his PhD "On the Realization of Huge Sparsely-Occupied and Fine-Grained Address Spaces" in 1996 at TU Berlin. He demonstrated that not only was he a successful operating systems builder, but he also excelled with contributions to computer architecture.
Jochen began working at IBM's TJ Watson Research Center, NY, in 1996. The result was L4, a 12KB, extremely fast "second generation" microkernel. During many visits to Dresden's operating systems group, he helped to build L4Linux, a user-level implementation of the Linux kernel that demonstrated the effectiveness of Jochen's approach (SOSP '97, "The Performance of Microkernel-Based Systems"). His work gave research on microkernel systems fresh impetus and gained him international acknowledgement.

In 1999 he took the System Architecture chair at the University of Karlsruhe. He was an inspirational professor, adept at keeping students engrossed in his courses. This was reflected by the high popularity of his lectures among students.

Jochen also continued working on SawMill Linux, a multi-server version of Linux, and other related micro-kernel subjects. Several operating system research groups in Europe, Australia, and the US either base their work on Jochen's or draw from his results. He was highly acknowledged for his scientific achievements, which were reflected in numerous appointments to program committees.

Those who knew him remember the energy, stamina, and astute analysis with which he not only tackled his own scientific issues but also supported staff and colleagues. Not only technical expertise, but also friendship and mutual understanding played an important role between him and those he worked with. This cooperation developed numerous friendships over many years and large distances. Many colleagues, staff, and students enjoyed his generous hospitality, exceptional culinary skills, and tasted for good wine.

Jochen's most recent achievement was as general chair of HotOS. He spent many hours to ensure the workshop was a memorable one. He selected the fantastic venue, hand-picked the wines, chose the banquet discerningly, and proposed the wireless LAN and recording of the talks (both a first for the workshop). The workshop was a testament to his ability; it set a new standard for others to aspire to. He will be fondly remembered for his tireless pursuit of excellence, his characteristic encouraging and insightful input during the workshop, and of course, his presentation of another paper about improving IPC by another order of magnitude.

Jochen is survived by his wife Adelheid, with whom he lived happily. Her constant support was instrumental to his many achievements.

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