Session XII: Workshop Wrap-Up

Chair: Ralf Guido Herrtwich, IBM European Networking Center

While Session XI already reviewed many of the areas covered during the workshop, the final session further summarized what was accomplished during the two days in Heidelberg. Doug Shepherd of Lancaster University presented an excellent (and humorous) workshop conclusion from a very personal perspective.

Doug started by coming back to the last topic of the open session. He said that one of the most surprising results of the workshop for him was that the community more or less agreed on the need for new workstation technology to better support multimedia. While no talk really dealt with this issue, the discussion repeatedly came back to the topic of bus-based vs. switch-based systems, where some even want to integrate an ATM switch in the workstation to avoid message transformation from local to remote communication. The notion of "desktop networking" was used to describe this scenario.

More than one year after the Berkeley Workshop, Doug now sees agreement that operating systems need to be modified to handle multimedia. Doug was pleased not to see anyone voting for UNIX to support multimedia, but he sees that many people will modify UNIX for multimedia processing and that then the marketing people will step in and tell everybody "that they always said that UNIX would be suitable for multimedia." Real-time mechanisms need to find their way into a general-purpose operating system − they can no longer just be used in a dedicated environment. Abstractions that were developed in connection with modern, distributed operating systems such as Mach, Chorus, and Amoeba seem to be particularly useful for multimedia. Threads are one example: They allow to program applications that do not work with the traditional event-feedback loop common to handling discrete media. While a lot of abstractions were presented during the workshop for high-level programming with multimedia, it is yet a research issue how to map these abstractions to the operating system primitives.

During the workshop, many different proposals for multimedia communication protocols were made. Doug stressed the importance of standardization which was obviously not an attractive topic for most of the workshop participants. Yet, standards for multimedia communication will evolve anyway so it is the researchers' task to influence this process. Doug urged the participants to work together towards a common protocol for audio and video transport − though he was not sure whether a single protocol would suffice or whether different protocols for different purposes would be needed. In any case, he wants to have one protocol per problem, not "many protocols all doing the same, which is the current situation." Many schemes (e.g., for jitter control) are variations of methods already presented in the literature − yet, reference to them was not always made during the workshop. At the end, Doug asked for more recognition of work by others and more cooperation among people in the community.