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# SDL 2003: System Design

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# Preface

This volume contains the papers presented at the 11th SDL Forum, Stuttgart.

As well as the papers, the 11th SDL Forum also hosted a system design competition sponsored by Solinet with a cash prize for the “best” design. This follows a similar competition at the SAM 2002 workshop (papers published in LNCS 2599). The winning entry from SAM 2002 is described in the last paper in this volume.

The SDL Forum was first held in 1982, and then every two years from 1985. Initially the Forum was concerned only with the Specification and Description Language first standardized in the 1976 Orange Book of the International Telecommunication Union (ITU).

From the start this graphical CEFSM (communicating extended finite state machines) notation was used both to describe the implementation of systems and to specify systems (especially protocol systems in standards). In the early days both types of description were quite informal, though specifications were certainly more formal than the main alternative: natural language with some ad hoc figures. Implementations were usually written in assembly language, which is at too low a level to reason well about the interaction between communicating agents within a system. In this case the notation provided an intermediate description that gave an overview of how the implementation worked, and often the actual logical development was done at the graphical level with hand coding of that description.

In the 20 years since the first SDL Forum there have been many advances in technology, but the CEFSM paradigm has stood the test of time. Moreover, whereas in 1982 only a few systems actually needed to be described in this way, nearly all systems are now considered to consist of communicating objects that can benefit from being defined in the CEFSM way. The approach is used to develop complete end-to-end systems in telecommunications, and is also used for other component systems such as vehicle engine management.

Fortunately one of the advances has been software development systems that allow engineers to use graphical notations directly for definition, with the implementation being derived directly from the graphical description. One might imagine that such developments have made the engineers’ work easier, but what has happened is that it has enabled engineers to develop more complex systems, so the work has remained just as challenging. An engineer or engineering team is likely to be concerned with much more than just the logic of the state machines. They will be expected to describe various scenarios and sequences of operation, the formal testing of the system, dimensioning and deployment, encoding on interfaces, fault tolerance and possibly the ergonomics of the user interface. While the logical operation of components is still vital, it is only part of the overall system design.

For system design the ITU recommends a set of notations (ASN.1, URN, MSC, eODL and TTCN) to be used with the CEFSSM notation. As the set of languages used by engineers has increased, so has the scope of the SDL Forum. The ITU SDL+ methodology published of 1996 included most of the previously mentioned notations, plus the object model notation familiar from UML: indeed many seem to think that UML is just the object model notation. UML (in the guise of OMT) was included to some extent in the 1997 SDL Forum, and four years later the 2001 SDL Forum was entitled “Meeting UML” (LNCS 2078). The trend is expected to continue beyond 2003, because there are plans to provide UML profiles for ITU languages. As a side effect UML will then be a framework that provides “glue” between the ITU languages. This is quite natural, because much of UML2.0 is based on the Message Sequence Chart and Specification and Description Language standards of ITU, and the UML Testing Profile is related to TTCN-3.

The 11th SDL Forum was therefore about System Design Languages, as reflected in the title of this volume and suggested as a new meaning for the acronym SDL. In some cases SDL is already used in this sense as engineers rarely use just one notation. For example, the third paper in this volume has SDL in the title but also includes collaboration diagrams, and message sequence charts. You can read the papers in this volume and come to your own conclusion, but do not be surprised to find others using SDL to mean System Design Languages rather than the CEFSSM notation defined by the ITU-T Recommendations in the Z.100 to Z.109 series for the Specification and Description Language.

April 2003

Rick Reed  
Chairman  
SDL Forum Society  
[www.sdl-forum.org](http://www.sdl-forum.org)

## SDL Forum Society

The SDL Forum Society is a not-for-profit organization that, in addition to running the SDL Forum:

- runs the SAM (SDL and MSC) workshop every 2 years between SDL Forum years;
- is a body recognized by ITU-T as co-developing the Z.100 to Z.109 and Z.120 to Z.129 standards; and
- promotes the ITU-T system design languages.

For more information on the SDL Forum Society, see <http://www.sdl-forum.org>.

# Organization

Each SDL Forum is organized by the SDL Forum Society with the help of local organizers. The Organizing Committee consists of the Board of the SDL Forum Society plus the local organizers, and others as needed depending on the actual event. For SDL 2003 the local organizers from Solinet need to be thanked for their effort to ensure that everything was in place for the papers in this book.

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## Thanks

A volume such as this could not, of course, exist without the contributions of the authors who are thanked for their work.



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