INTERNATIONAL STANDARD

ISO/IEC 11411

First edition
1995-04-01

Information technology — Representation for human communication of state transition of software

Technologies de l'information — Représentation pour un utilisateur final des états de transition des logiciels

Reference number
ISO/IEC 11411:1995(E)

Contents

ISO/IEC Copyright Office • Case postale 56 • CH-1211 Genève20 • Switzerland
Printed in Switzerland

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 11411 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software engineering*.

Annexes A to D of this International Standard are for information only.

Introduction

Software in some fields can be represented by state transition diagrams and tables. The software changes its states through transitions. When a certain condition arises, the corresponding transition from state to state is performed. Conditions are brought about by input of data. The data may take various forms, e.g.:

- signals,
- commands,
- messages,
- tokens, flags,
- characters, words,
- records, etc.

This International Standard describes minimum set of concepts and symbols for human communication of state transition of software.

This International Standard

a) defines the nature of state transitions of software;
b) defines the notation of state transition elements;
c) specifies a set of state transition elements.

Information technology - Representation for human communication of state transition of software

1 Scope

The underlying concept of this International Standard is that diagrams and symbols defined herein can be helpful in representing software functions and transitions and in improving human communication. The areas covered by this International Standard are development, communication and review of software requirement analysis and design.

This International Standard is effective in the following fields of software.

Interactive software
----To describe the representation of functions and transitions on screens.

Data communication software
----To describe communication protocols and corresponding actions.

Language/command
----To describe the syntax.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 state : A state is the unique value that represents the stage of progress of software in its execution. The state shall have a unique name as its identifier which is called state name.

2.2 transition : A transition is a change from one state to another state or the same state. A transition takes place when a condition is satisfied. An action may take place along with the transition. Formally, a transition consists of three parts:

- direction part;
- condition part;
- action part.

The direction part in turn consists of two state identifiers:

- previous state identifier, pointing to the previous state;
- next state identifier, pointing to the next state.

The condition part expresses the condition that must be satisfied for the action to take place and the change from one state to another. If more transitions are defined to change from one state to another state or the same state, they shall be mutually exclusive.

The action part represents the action which is performed by the software according to the condition. The action may be any processing or may be nil.

3 Specification

3.1 Specification of state

States are

a) Initial state
One and only one state is initial. In the initial state, the software starts its activity. The initial state must be the previous state of at least one transition.

b) Final state
One or more states can be the final state. In final states the software terminates its activity. Each final state must be the next state of at least one transition.

c) Initial/final state
The initial state can be the final state. In this case, the software terminates its activity and the activity may or may not be immediately restarted. The initial/final state must be the previous state of at least one transition and the next state of at least one transition.

d) Intermediate state
A state that is not initial, not final, and not initial/final is called an intermediate state. It must be the next state of at least one transition from another state and the previous state of at least one transition to another state.