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We has reviewed the document ISO/IEC JTC1/SGFS N1331, Recommended from JTC1 for Action Plans and Information from Scs and SGFS on Implementation of JTC1 Policy on Conformity Assessment and JTC1Policy on Interoperability (JTC1 N3826). Based on this review, we provide the following comments about N1331 Clause 2.7.

1. The role of FDT (Formal Description Techniques) tools

The application of FDTs to the development of large and complex protocols depend on the availability of appropriate computer tools. The complexities of the theories behind FDTs and the time required to process them make difficult to use the formal methods without the supporting tools. The FDT tools allow users to use the application of the formal methods without having to fully understand the theories of FDTs, reduce the development costs and improve the quality avoiding long development time and human errors. In order to offer the above properties in the perspective of protocol development cycle, FDTs tools should have the following functions.

a) Ease of use : It should include facilities to support:
   - user interface : support multiple graphics and text windows
   - customization : suit the user needs including I/O formats and permit user to define new commands
   - helpfulness : perform the interactive tools and tutor system
   - error handling : check for and correct user errors

b) Power : It can be analyzed at two levels : internal and external
   - internal level : capability of performing and speed of processing
   - external level : relate to the interface with other tools and the environment

c) Robustness : It should include facilities to support:

- consistency : allow concurrent access and maintain data integrity
- evolution : accommodate changes in the environment and requirements
- version control/management : accommodate modifications and new improvements and maintain compatibility between versions
- fault tolerance : recover from environmental failures
- self-instrumented : locate the source of an error

2. Classification of FDT tools

Several classifications of FDT toolshave been proposed. W e review their classification. Based on thisreview and considered the development cycle, FDTs tools are classified into thefollowing categories.

a) tool for specification development
   - Bookkeeping tools : checking of syntactic properties of the protocol
   - Front-end tools : syntax and static checking of the specification

b) tool for validation & verification
   - validation : checking of syntactic properties of the protocol
   - verification : checking of semantic properties of the protocol

c) tool for implementation(back-end tools)
   - translative tools : compilers and translators
   - symbolic tools : interpreters and simulators

d) tool for testing
   - active : test case generation
     test case management(including editing, storage and retrieval functions)
     test driver(FDT-independent)
   - passive : result analysis(monitoring and analyzing errors)