# A Framework for Survivability Evaluation

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Abstract

Survivability is defined as the ability of a system to continue or to deliver its services to the users in presence of attacks, failures or accidents. After occurrence of failure, the system may work in the degraded and still acceptable level of performance states. So we have to extend the classical framework of reliability and fault tolerant mechanisms to systems which have to survive to failures or attacks ("failure tolerance"). The concept of graceful degradation is embedded in the notion of survivability though the system may stop working in presence of failure, and even enter the "halt state". In this paper, we present a paradigm that integrates the concept of survivability with the well-defined aspects of dependability by extending the fault-error-failure chain of dependable systems. We present our proposed framework using a sample packet switched network.

Index Terms

Dependability, Survivability, Fault, Error, Failure, Halt



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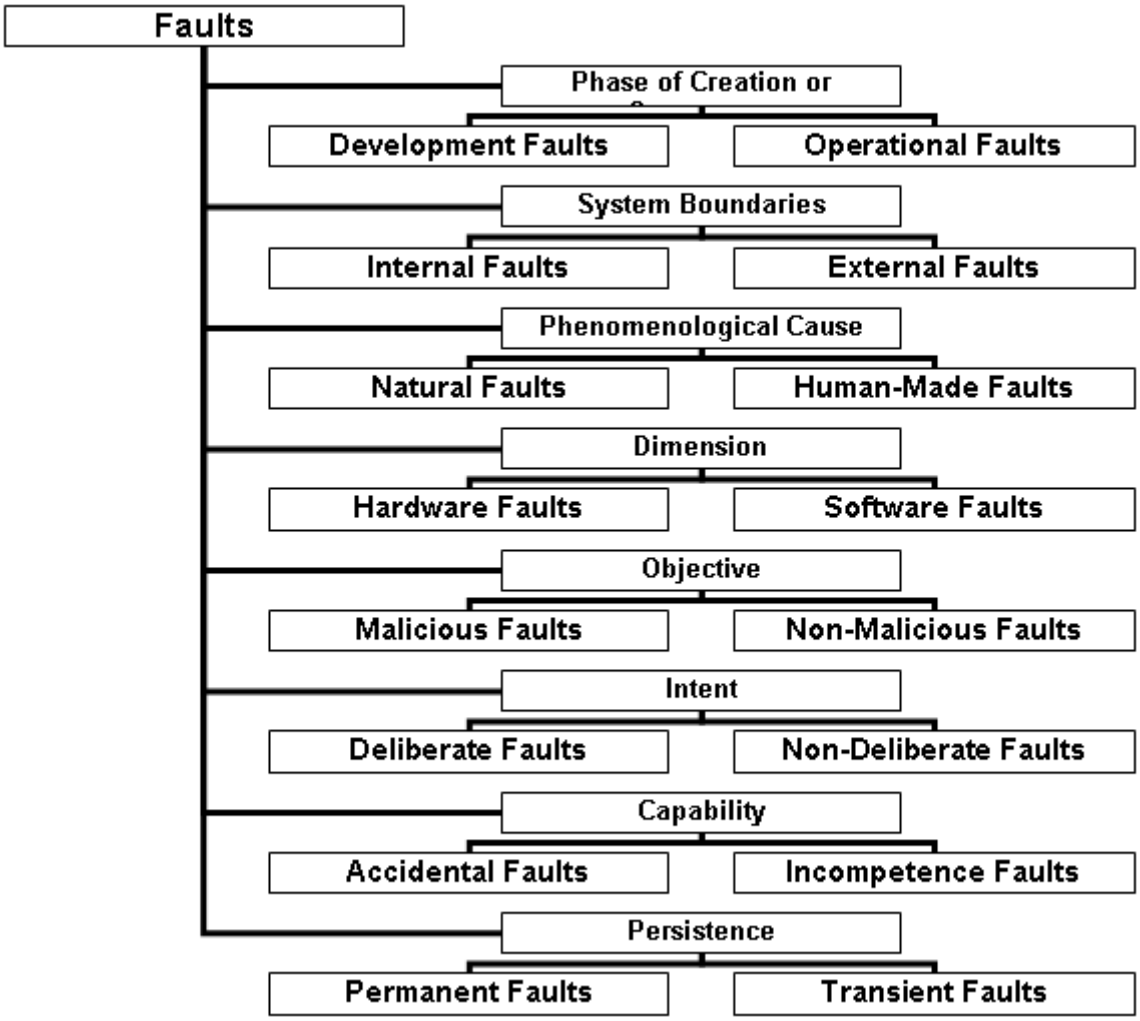


Fig. 1. Elementary fault classes (redrawn from [1])

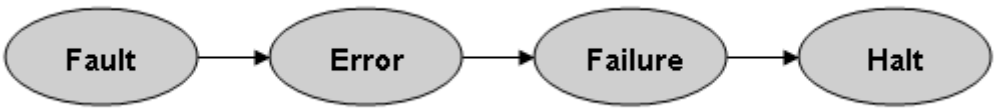


Fig. 2. Cause-and-effect chain of dependability

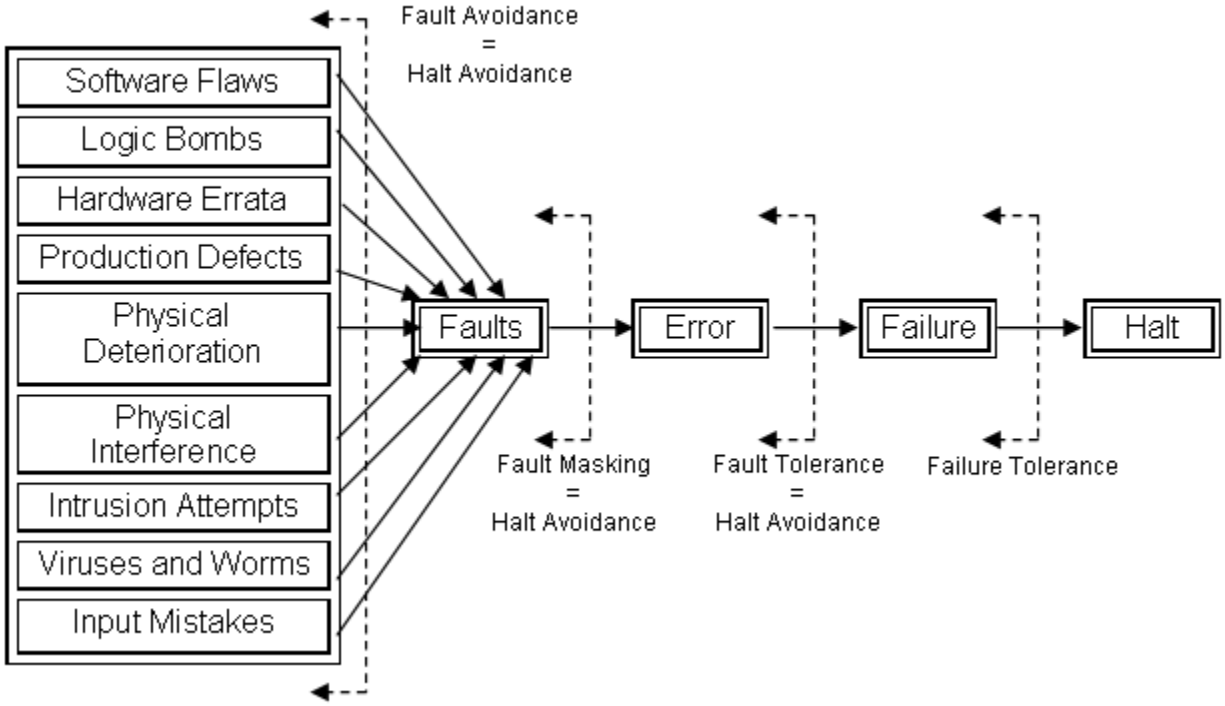


Fig. 3. Relationship between fault-tolerance and survivability

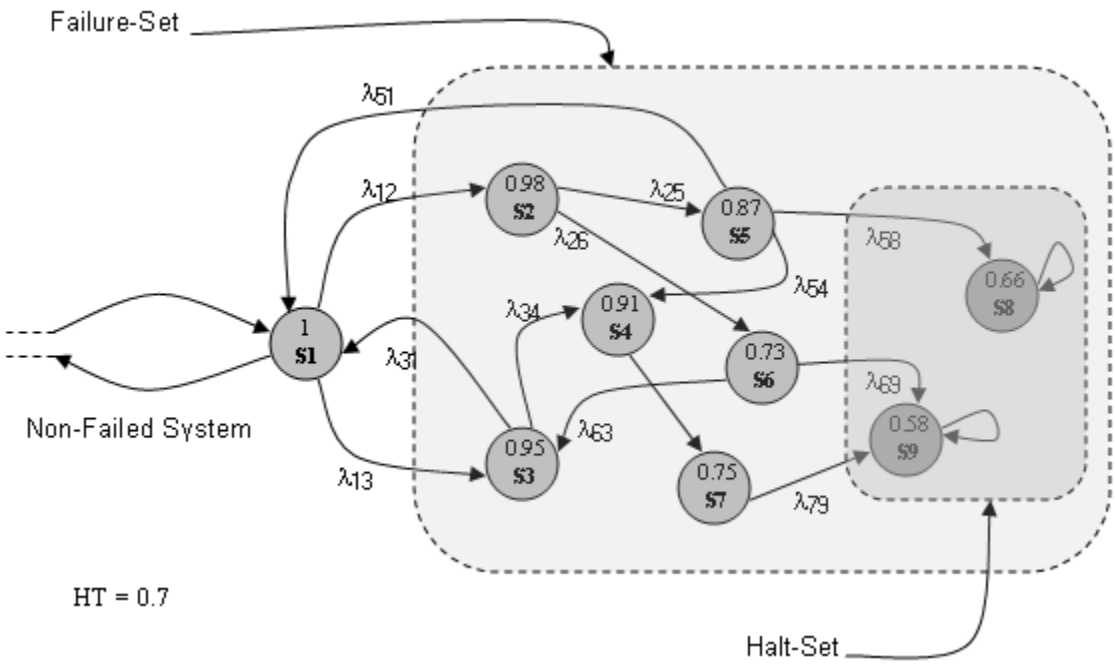


Fig. 4. Different states after failure