

24D - A New Approach to System-Availability Analysis: An Integrated Hardware, Software, and Procedures Model

Presenter

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Session Summary

Converged communication systems are increasingly feature-rich. Interactions are growing in complexity, and involve application, control, and hardware layers. Customers demand very high availability, driven by reliability requirements, modeling, and analyses. They expect a comprehensive view of downtime contributions from all supplier-attributable root causes of failure, hardware, software, and procedures. Previous approaches to predicting system availability have shortcomings such as: (a) models were hardware focused, (b) hardware and software failures were modeled independently, or (c) hardware and software failures were partially combined, e.g., software coverage factors were incorporated into a hardware model. Another shortcoming is that frequently, procedures failures were not modeled.

Purpose:

- Reduce optical-transmission-system operational cost:
 - By improving system availability
 - Through detailed modeling
- Develop model that accounts for all major supplier-attributable root causes and their interactions:
 - Hardware
 - Software
 - Procedures
- Account for unplanned downtime due to both routine system operation and planned maintenance activities
- Facilitate identification of primary downtime contributors
- Leverage this information to improve availability
- Validate model by comparison to field data

Outline:

- Acknowledgment
- Background
- Overview
- System and Model
- Comparison to Field Data
- Analysis
- Modeling Details
- Sensitivity Analysis
- Applications and Comments
- Summary and Future Work

About the Presenter – Phillip L. Scarff

Philip L. Scarff is a Senior Reliability Engineer with Alcatel-Lucent. Phillip received an MS degree in electrical engineering from the University of California, Berkeley in 1979, and a BS degree in electrical engineering from Lehigh University in 1978. He is a Senior Reliability Engineer at Alcatel-Lucent, Westford, MA. His responsibilities include component, board, system, and network-level reliability assessments, requirements, availability modeling, and field-data analysis. Prior to his current position,

Philip was a Member of the Technical Staff at Bell Laboratories, AT&T, and Lucent Technologies, where his responsibilities included Hybrid IC and piezoelectric device reliability modeling, accelerated testing, field analysis, as well as system test. Publications include papers on reliability of optical communications systems, SAW filters, ICs, hybrid ICs.