Workshop on Dependability Benchmarking

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Classical features such as raw performance and functionality have long driven the computer industry to improve their products. But now, dependability and maintainability are seen as equally important. While there are relatively straightforward ways to evaluate and compare performance and functionality of different systems or components, the evaluation of dependability and maintainability features is much more difficult. Among the challenges that must be addressed are: incorporating the effects of software failures, characterizing the dependability of opaque off-the-shelf hardware and software components, including the effects of typical maintenance, operational, and configuration management procedures, and accommodating the fact that different application areas have different requirements for the various factors influencing dependability.

The goal of the Dependability Benchmarking Workshop is to provide a forum for the computer industry and academia to discuss problems associated with the evaluation and characterization of dependability and maintainability of components and computer systems. The identification of dependability benchmarking measures and the essential technologies for dependability benchmarking, including both experimental measuring and modeling technologies, are central aspects of this large discussion meant to garner ideas on practical and cost-effective ways to evaluate dependability and maintainability features.

This workshop is the outcome of the first two years of work of the IFIP 10.4 WG SIG on Dependability Benchmarking (SIGDeB) [SIGDeB02]. That SIG was formed in November 1999 under the IFIP 10.4 WG to promote the research, practice, and adoption of benchmarks for computer-related system dependability. Koopman & Madeira were the founding co-chairs.

The SIGDeB charter focusses on four areas in particular:

- Exchanging ideas about dependability benchmarking, including researchers and practitioners from universities, industry, and government agencies.
- Documenting the state of the art for dependability measurement and benchmarking.
- Creating lists of issues that must be resolved to advance dependability benchmarking to a mature science.
- Eventually, proposing a mechanism and agenda for a group to propose dependability benchmarks.

Of course those are long term objectives that will require far more than two years of work to accomplish. But several of the papers presented are the results of SIGDeB collaborations that have made progress. Beyond that, this workshop represents the first focussed exchange of ideas about dependability benchmarking in a public forum.

While the SIGDeB has been working, two other research programs have been created to address related areas: DBench and HDCP. Both DBench and HDCP have membership overlaps with SIGDeB, but are different in purpose.

DBench is a 3-year European research program to "define a conceptual framework and an experimental environment for benchmarking the dependability of COTS and COTS-based systems" [DBench02]. It emphasizes the areas of dependability measurement, identification of malfunctions/weaknesses, tuning components to improve dependability, and dependability comparisons. Most measurements use fault injection, and the majority of participants come from the fault tolerant computing community.

The HDCP (High Dependability Computing Program) is a long-term collaboration of US universities and NASA, with expected industry participation, to "ensure that the software we create meets the ever more challenging requirements of continuous operation, safety critical reliability, high integrity and high security" [HDCP02]. HDCP is formed largely of researchers from the software engineering community.

We are pleased that the papers being presented represent the SIGDeB, DBench, HDCP, and other researchers not formally affiliated with any of those groups.

References:

[DBench02] Dependability Benchmarking Project, *http://www.laas.fr/DBench/* accessed April 4, 2002.

[HDCP02] High Dependability Computing Program, *http://west.cmu.edu/research/hdcp.html* accessed June 11, 2002.

[SIGDeb02] SIG on Dependability Benchmarking *http://www.dependability.org/wg10.4/SIGDeB/* accessed April 4, 2002.