

Software Rejuvenation in embedded systems and other more recent applications

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Mobile communication devices have multitasking embedded software running in their operating systems (OS) as well as applications. Both the OS modules and the application components are assigned predetermined memory in those devices due to their near-realtime performance requirements. Memory (stack and heap) overflow problems occur in such software components because of programmer's inability to accurately estimate the size of the needed memory and also because of Mandelbugs due to their complexity. A new software rejuvenation variation called Opportunistic Micro Rejuvenation (OMR) is proposed where a task that "misbehaves" is identified and rejuvenated at an opportune instant, like when it is in a waiting state. Following the traditional model for software rejuvenation[†], a Stochastic Area Network model is used to simulate and study the availability of such embedded systems with OMR. It is shown that OMR alone will increase the availability only slightly but however when combined with other memory management techniques (such as shared supplementary memory), OMR will increase the availability significantly. I will also provide a brief survey of software rejuvenation in other more recent applications such as client-server systems, intrusion tolerance etc.

[†] Yennun Huang, Chandra Kintala, Nick Kolettis and N. Dudley Fulton; Software Rejuvenation: Analysis, Module and Applications. In Proc of the 25th Intl. Symposium on Fault-Tolerance Computing (FCTS-25), pp. 381-390, Pasadena, CA, June 1995