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**Invited Talk for BCI 2009
The New Technologies and the New Challenges for Informatics**

Abstract

GRIDs, CLOUDs and Web2.0 all offer exciting possibilities. These new technologies are discussed. However, none yet overcome some of the existing outstanding problems in informatics, and indeed they raise new problems. How do we maintain the concept of state, integrity and ACID (Atomicity, Consistency, Isolation, Durability) transactions in a world with millions of nodes, very fast streams of data from detectors and worldwide update, retrieval and processing of data? How do local policies of security, privacy and integrity affect massive systems of heterogeneous nodes? How do we maintain security and privacy across such dynamic systems? Can we build trust systems applicable to today's environment? It is noticeable that over the last 20 years storage systems have improved speeds, capacities and cost per unit of around 10^{18} ; processor power similarly by around 10^{15} but wide area telecommunications by only around 10^4 . This poses problems for system designers. Similarly the very high cost of software production and maintenance will only become greater unless we change the model. A way forward is proposed based on SOKU (Service-Oriented Knowledge Utilities).