# On the Dependability of Open Distributed Systems

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4/27/2017 at 02:00 pm
CoRE A (301)

**Abstract**

The general objective of this research is to enhance the dependability of an Open Distributed System (ODS) by establishing global/semi-global structures over it, and by providing a degree of trust between its diverse components. In response to the lack of complete central knowledge and control of the implementation of the components of an ODS, our approach is based on the governance of the interactions among system components, while being oblivious of their internals.

As a case in point, we take Service-Oriented Architecture (SOA), a typical and common instance of ODS, as the model of our research. We enable SOA systems with three capabilities that make such a system much more dependable: (a) establishing global/semi-global system properties in a dependable manner; (b) providing a practical degree of trust between system components; and (c) enforcing choreography schemes among system components. The enhanced architecture is named Governed Service-Oriented Architecture (GSOA). We also propose a technique for transparently transforming a legacy SOA system into a GSOA system with minimum effort.

Examination Committee: Prof. Naftaly Minsky (Chair), Prof. Badri Nath, Prof. Santosh Nagarakatte, Prof. Matthew Stone