



THE INTERNET OF THINGS COVENANT

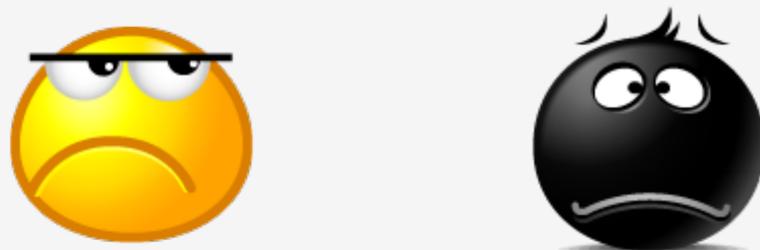
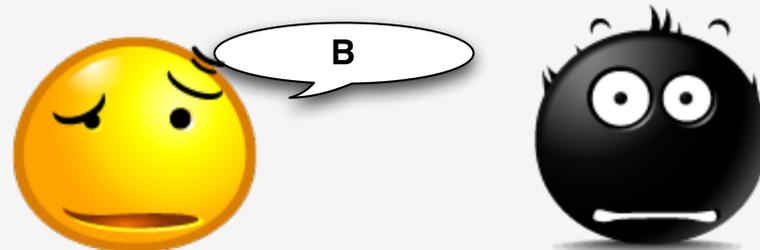
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Problem

How to achieve the coordination of largely heterogeneous services, i.e., how to make them agree on some result or behavior?



Motivation

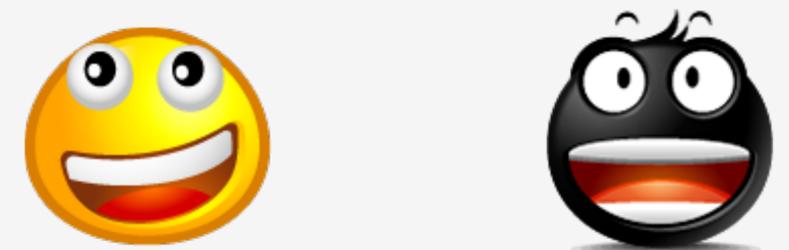
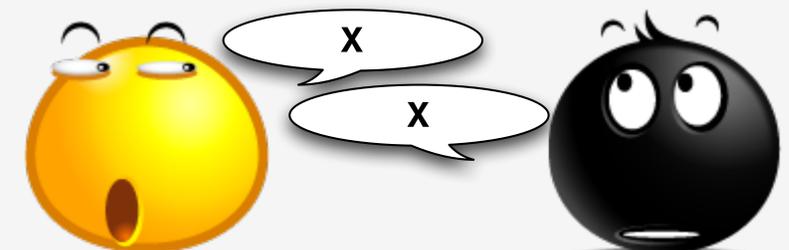
- Systems built using Service Oriented Architectures, ranging from large and complex inter-enterprise information systems to resource-constrained devices that host some service, complying with the Devices Profile for Web Services (DPWS) OASIS Standard.
- Consensus protocols solve the basic problem of fault tolerance in distributed systems, as they provide knowledge on the state of processes, i.e., if they are up and running correctly or have failed.
- Gossip protocols can provide reliable multicast communication and by being frugal in terms of resources' consumption, they are specially fitted for environments where devices with limited processing and communication ability are present.

Approach

- A generic consensus service would be extremely useful in achieving a simple methodology to build distributed systems with some complexity using simple and generic blocks that provide some basic service. Its applicability and usage in a Web Services environment would vary accordingly with the intended use for a consensus mechanism.
- Paxos is a family of consensus protocols, composed of several variants which cover a wide range of trade-offs between the number of participants, number of message delays before learning the agreed value, the activity level of individual participants, number of messages sent and types of failures. The common property to all of them is their safety from inconsistency.
- A gossip service can be used by a consensus service as a means of communication among all the nodes involved in the decision.

Goals

- Consensus
 - Service providing a facility for disparate services to reach an agreement when necessary
 - Switch the used variant of Paxos in accordance with the deployment environment
- Gossip
 - Leveraged as a Service Oriented Computing communication paradigm
 - Providing scalable and reliable communication to the Consensus Service



Acknowledgements

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