

Would Self-Organized or Self-Managed Networks Lead to Improved QoS?

Panel Convener: David Hutchison (Lancaster University, UK)

Background

Quality of Service (QoS) is an often misunderstood term. The International Standardisation (ISO) efforts of the early 1990s on a QoS Framework showed that there are several QoS aspects, the most significant being performance, availability and security. Ultimately, the most important consideration is that the service provided (by whatever system is providing it) is for the benefit of the user. Most of the research effort in subsequent decade has been on the performance aspect (including, rightly, perceptual QoS), but unfortunately the other aspects have largely been ignored or overlooked. Both availability and security have a central role to play in ensuring the overall QoS of a networked system. Should either of these be compromised, there will be a fairly direct and negative impact on the system performance: this is a particularly topical issue.

In recent years several events have shown how current networked systems are vulnerable to a wide variety of threats and failures. Malicious and terrorist attacks (hits to telecommunication and IT infrastructures, worms and Denial of Service attacks) as well as failures related to external events (natural disasters, major outages of electrical power) can lead to critical situations for the life of the current and the future Information Society. The interdependencies existing across all the components (hardware, software, support infrastructure) of complex networked systems demand a new approach to the definition of proper design and evaluation methodologies of fault and attack **resilience** capabilities. Even router mis-configurations may be a major source of disruption in the network, emphasising the urgent need for appropriate resilience mechanisms.

Resilience – the ability of a system to recover to acceptable levels of operation following failures or attacks – is therefore a key QoS characteristic that has a direct impact on the system's performance.

The Proposition

This panel debates the following proposition: *self-organization or self-management can help implement networked systems resilience and therefore provide improved QoS for end-users.*

Related issues likely to be covered include:

- what is our *definition of QoS* and *which layer(s)* are significant?
- what is the difference between *self-organization* and *self-management* in this context?

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