

SEMINAR TALK

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NTNU – Trondheim
Norwegian University of
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Managing reliability in the context of service level agreements (SLAs)

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BIOGRAPHY

Bjarne E. Helvik received his Siv.ing. degree (MSc in technology) from the Norwegian Institute of Technology (NTH), Trondheim, Norway in 1975. He was awarded the degree Dr. Techn. from NTH in 1982. In the period 1976-1996 he was with ELAB and SINTEF Telecom and Informatics, working on dependability, traffic engineering and QoS issues in national and European projects. In the period 1988-1996, he was appointed as Adjunct Professor at the Department of Computer Engineering and Telematics at NTH.

Helvik has since 1997 been Professor at the Norwegian University of Science and Technology (NTNU), the Department of Telematics. He was Principal Investigator at the Norwegian Centre of Excellence (CoE) for Quantifiable Quality of service in Communication systems (Q2S) in the period 2003-2012. In the period 2009-2017, he was Vice Dean with responsibility for research at the Faculty of Information Technology, Mathematics and Electrical Engineering at NTNU. His fields of interests include:

- dependability modelling, analysis and simulation, analysis of operational data,
- communication network dependability; design & management,
- fault-tolerant systems,
- QoS in network and services.

His current research focus is on the dependability of SDN and NFV, and the dependability of services provided by multiple autonomous service providers.



ABSTRACT

Service level agreements (SLAs) is a contract that regulates all aspects of service delivery between actors (network operators, computing infrastructure providers, service providers, end-users, etc.) in the ICT marketplace, cf. ITU-T E.860. SLAs become increasingly more important as there are more actors behind the provision of end user services, and NFV and network slicing invites a tighter interaction between the actors. SLAs are about to become the primary means to manage the delivery of reliable services.

There is, however, a fundamental theoretical and practical challenge in dealing with the reliability aspect of SLAs — For highly reliable and available systems, the failure process is slow in the context of the duration of an agreement. This means that a) it is highly unlikely that we will observe a failure intensity or accumulated downtime that is close to the one that the system is dimensioned for, and b) the delivered service may vary significantly between different instances of the same service. This incurs a significant economic risk for the service provider that should be managed.

The presentation introduces SLAs with emphasis on the reliability aspects, where the distribution of the interval availability is a fundamental property. The theory available for obtaining this property will be very briefly outlined. Next two studies done at NTNU related to issue a) and b) above, will be presented. How should a system be dimensioned with respect reliability parameters in order to minimise the economic risk of not meeting the contacted values? How should various recovery strategies be applied to meet the contacted availability with least resource requirements?