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# TNO research lays the basis for a stable future internet

A couple of significant developments are necessary to ensure that internet in the future can be kept robust and secure. ICANN, the organisation responsible for a secure, stable and proper functioning internet, has commissioned a study to investigate the impact of four key issues. TNO was asked to take part in the international study team that has been examining and identifying the feasibility, risks and priorities.

'A highly prestigious assignment. Pretty much the highest level you can think of when it comes to the future of internet,' says TNO researcher Bart Gijsen. 'ICANN asked us to analyse the core problems of internet for the coming period. TNO is known and acknowledged worldwide as an expertise centre that helps to keep internet functioning properly.'

## STABILITY

There are four major changes ahead, all of which could endanger the stability of the 'root zone', or the core of internet. Tackling or introducing all of them at the same time is not an option.

Gijsen: 'ICANN was looking for expertise to compress all the changes and their effects into a quantitative model. Professor Erik Huizer, my TNO colleague, convinced the ICANN that we have the required quantitative modelling expertise. We analysed all four issues in respect of each other and revealed how the root zone could be scaled up without endangering the stability.'

First is the security issue, for which DNSSEC was conceived. DNS is the internet's 'telephone directory'. You type <mybank.nl> into your browser and the website appears on the screen behind which a system first checks in the 'root', for which ICANN orchestrates the policy, whether <.nl> exists and then within this <mybank>. The world of telephony uses the same kind of system for international calls. But when hackers break in on a website appears on your screen that is not the site of, in this case, <mybank.nl>, with all the contingent risks.

Gijsen: 'The introduction of DNSSEC is the biggest evolution in the internet since its inception. It signals a major step in preventing hackers from

misleading companies and consumers. There is agreement throughout the world of its necessity and while DNSSEC can be introduced perfectly well, it cannot be introduced simultaneously with the other three. So ICANN asked TNO the pertinent question: what priorities should we make?'

## TRANSLATION

TNO and the Root Study team recommend to begin with DNSSEC because its introduction after, for instance, the extension of the generic domain names (com, org, edu, or country extensions like nl) would multiply the risks. The arrival also of the latest version of the internet protocol, IPv6, was also included in the TNO analysis.

ICANN has already incorporated the recommendations from TNO's scalability study into its decision-making process. But not only that. TNO business developer Dimitri Hehanussa: 'The TNO study and Bart Gijsen's presentation during the ICANN conference in Seoul last October strengthened the relationships between TNO, SURFnet, NLnet and SIDN, the organisation responsible for the domain <.nl>. These four parties have each made important contributions to the development of internet in the Netherlands since the 1980s when internet was still just a limited medium for scientists. The global problems that we identified for ICANN are now having a knock-on effect for the Netherlands, with our prominent position consolidated in ensuring an ongoing secure and robust internet.'

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