FUTURE NII DEMON-STRATION 2012

TNO innovation for life

In close cooperation with the Netherlands Ministry of Defence, TNO organises the Future NII Demonstration 2012. The aim of this demonstration is to show which changes the combat warrior can expect the coming 10 years with respect to information provisioning and how this might influence his mission. The scope of the demonstration will be on mobile and dismounted users.
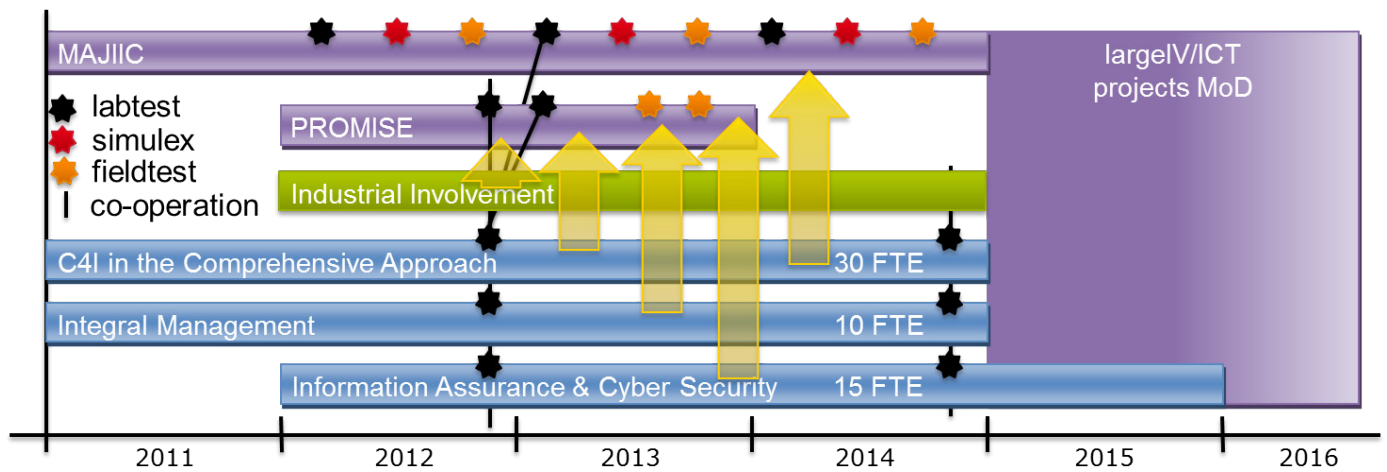
The demonstration will be based on TNO's and MoD's Network Information Infrastructure (NII) vision, for which TNO has developed an architecture that will lead to new ways to disclose information. To enable this architecture, TNO investigates new technical solutions, which will be demonstrated together with solutions provided by the industry and MoD.

TNO invites companies to get involved in this experiment by demonstrating their solutions in a military environment to the MoD and/or improving, adapting or developing solutions for the NII together with TNO.

In the Future NII Demonstration, TNO – in cooperation with MoD and industry - will show the latest solutions to the future NII. The demonstration will integrate new technical solutions in real-life military networks to be tested by military of the Airborne Brigade.

The demonstration will combine three of TNO's Research Programmes:
1. "C4I in the comprehensive approach"
2. "Integral Management"
3. "Information Security"

- ★ labtest
- ★ simulex
- ★ fieldtest
- | co-operation

MAJIIC

PROMISE

Industrial Involvement

C4I in the Comprehensive Approach — 30 FTE

Integral Management — 10 FTE

Information Assurance & Cyber Security — 15 FTE

largeIV/ICT projects MoD

2011 2012 2013 2014 2015 2016

FUTURE NII VISION – TAILORED INFORMATION PROVISION

TNO's future NII vision, derived from the MoD NII vision, is based on three principles:

1. Providing the information that is required, permitted and feasible.
2. Using commercial technology where possible, military solutions where it should.
3. Open but controlled and secure information logistics.

Providing the information that is required, permitted and feasible

The NII should provide information tailored to the user's specific need in a form he can and is allowed to use.

Required information refers to the content and the form of the information that a user needs to fulfil his task. To determine the required information, a user is part of several Communities of Interest (CoI). A CoI is defined as a group of users with the same information requirement. A CoI can be determined by place, time, role, organisation, etc. and can have a short or long lifetime.

Permitted information refers to information that a user is allowed to obtain. This is enforced by policies that govern the information exchange. It deals with aspects such as priorities and confidentiality.

Feasible information refers to the technical possibilities and limitations of the path and end devices.

Using commercial technology where possible, military solutions where it should

No technology can provide seamless connectivity under all circumstances. Therefore a mix of transmission and network technologies is required. When available, optimal use should be made of commercial infrastructures such as the Internet and 3G/4G communication. This means that safe and secure interfaces between civil and military networks should be in place, allowing for seamless roaming between them without user interference. Looking at the need for close cooperation with non-military parties, introduction of military owned and controlled commercial networks seems inevitable. Even so, the introduction of (ruggedised) PDA's and tablets will provide more information handling possibilities to the disadvantaged user. It will even allow the user to use the same end-device for military and personal information (e.g. social media) by providing (virtual) separated user environments.

Open but secure, controlled information logistics

Bandwidth limitations are there to stay, especially in expeditionary context. Although growing, they will never meet the user's requirements. High bandwidth is available for short ranges, but this is hampered by the current tendency towards a thinning battle field. Therefore, a paradigm shift is required.

Information provisioning consists of three primary processes: transport, storage and processing, taking into account aspects such as power consumption, weight and size. By optimizing these processes, significant improvement in information provisioning can be achieved, giving the user an "always on" perception.

Transport: information should be transported via all means available, over all kinds of heterogeneous networks and different user environments. The aim is to enable successful information transport in a way that is seamless to the end-user. This also implies separation of the security tasks availability, integrity, authentication and confidentiality. The first two should be provided by the network by using the Protected Core Network concept.
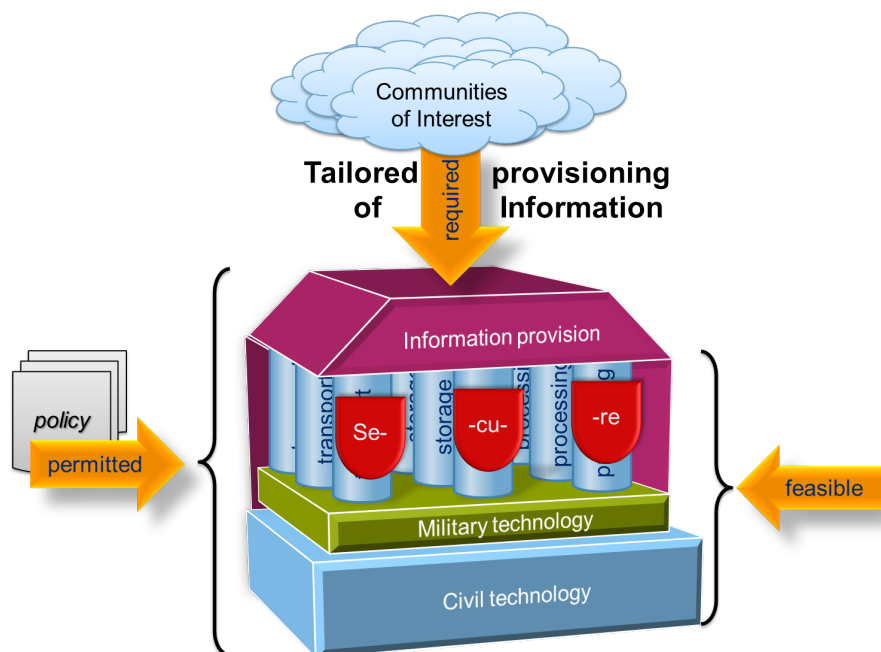
Future NII vision – Tailored Information Provision.

Imagery to the disadvantaged user.
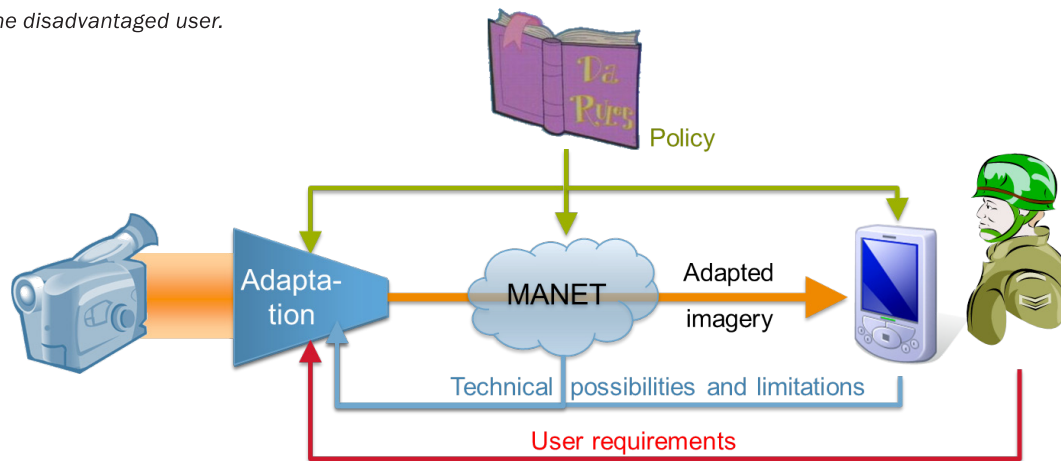
Confidentiality should be implemented as close to the source as possible. This will give implementation to the paradigm shift from protect the network to protect the data and enable seamless use of all ICT resources (transmitters, routers, processing and storage) in the battlefield.

Storage: smart storage concepts, comparable to cloud computing can dramatically reduce the amount of data to be transmitted and in the same time increase robustness and availability of information.

Processing: instead of moving the data to the algorithm, moving the algorithm to the data might be more beneficial. Combined with cloud computing concepts, the algorithm can be shared amongst several users providing sufficient processing power to do the work. This implies a paradigm shift in constructing algorithms. These should be modular and robust. Distribution implies that failure of a module to be processed should be taken into account.

FUTURE NII DEMONSTRATION 2012
In line with the three principles of the Future NII Vision, the following solutions will be demonstrated in a military setting.

Imagery to the disadvantaged user
This demonstration will show the provisioning of imagery to a mobile or dismounted user, which is adapted to the requirements of the user, the possibilities of the network and end-device and the present policy. It includes solutions for:
• Real time adaptation of streaming media.
• Video streams over a Mobile Ad-hoc Network (MANET).
• Sharing information of capabilities through the OSI layers (cross layer).
• Enforcement and interpretation of policies.

Safe incorporation of commercial technology and infrastructures
This demonstration will show the safe interaction between civil and military owned networks as well as the use of commercial technology in military environments. It will show solutions for:
• Military owned and controlled 3G/4G technology for vehicles on the move, on the hold and dismounted soldiers.
• Seamlessly applying a mix of media (3G/4G, Wifi, military radios).
• Policy based media selection.
• PDA as smart interface for both military and civil networks.
• Virtualisation on PDA.

Secure federations of clouds
This demonstration will show separation of security functions as well as resource sharing. This implies solutions for:
• Protected Core Networks (network, security and management implications).
• Cloud Computing in MANET.
• Inter domain management in cooperation with Tele Management Forum.

INVOLVEMENT MOD
This demonstration will be executed in close cooperation with the MoD projects PROMISE and MAJIIC. This means that successful experiments will be incorporated in these defence projects.
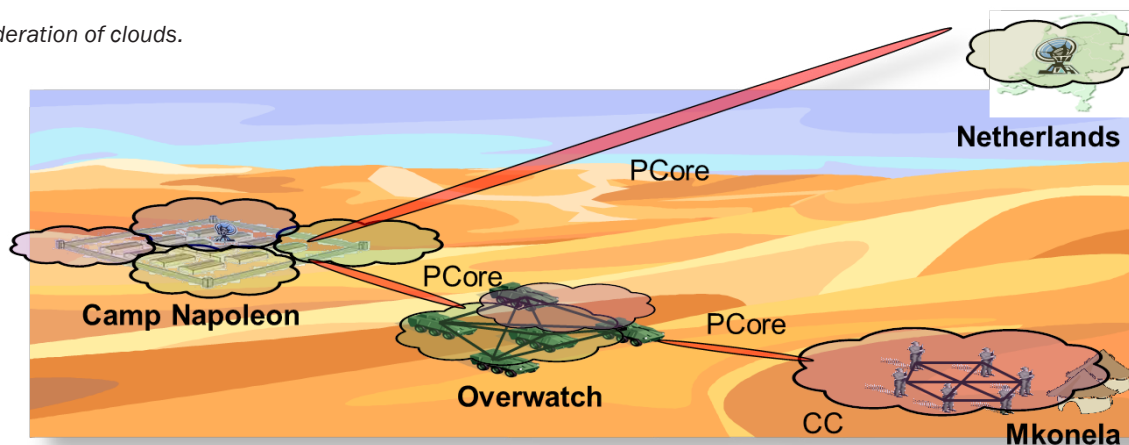
PROMISE
PROMISE (*PROject Multi-touch Information System Experiment*) focuses on using commercial available end-devices in military operations. It requires an innovative infrastructure to support their new applications, services and devices. This will be provided by the Future NII Demonstration.
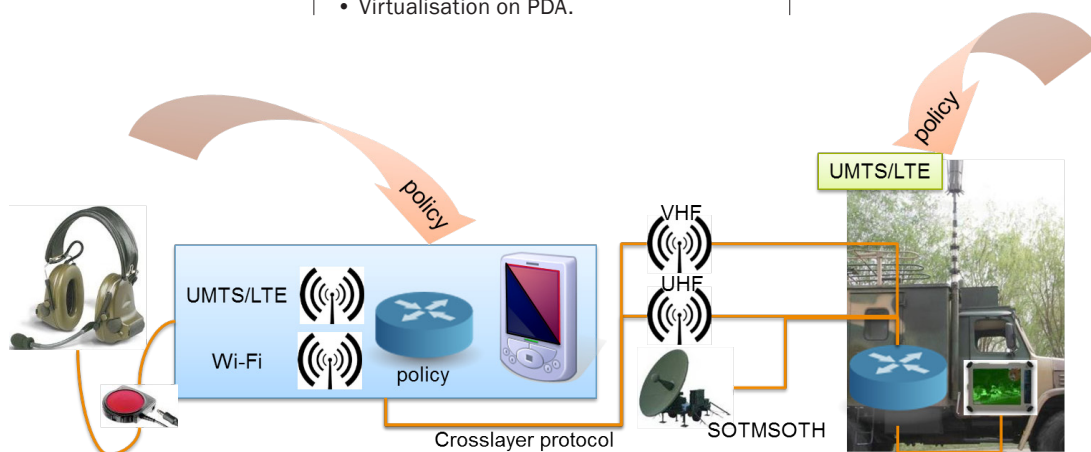
Safe incorporation of commercial technology and infrastructures.

Secure federation of clouds.

PROMISE.

MAJIIC

MAJIIC is a major NATO development of 9 countries to disclose intelligence information (e.g. imagery and document). It comprises distributed storage, publishing of meta data and subscription to information streams. Results form the experiment will aid to disclose this information to the disadvantaged user. When successful, the results will be incorporated in the MAJIIC exercise 2013. If necessary they will be improved to meet the higher technology readiness level requirements.

TNO INVITES THE INDUSTRY TO PARTICIPATE

The challenges for the future NII are huge. TNO is convinced that partial solutions exist today. The challenge is to identify them and incorporate them into the NII. TNO invites the industry to step into this experiment and to combine forces to help the military to overcome the information age challenge. TNO offers you to:
• Demonstrate your solution in a military environment to the military.
• Improve, adapt or develop solutions (with TNO) for the NII.

Demonstration of your solution

Demonstration of your solution in a life or lab-based military environment gives you the opportunity to:
• Test your solution in a real military environment.
• Promote your solution to the MoD.
• Improve your solution based on test results.
• Position your solution for future procurement.
We are looking for applications, tooling, hardware and software solutions.

Improve, adapt or develop solutions for the NII

Together we can improve, adapt or develop solutions for the NII, based on your products. When successful, the solution will be incorporated in the next experiment, planned for 2014. This implies:
• Incorporation of TNO knowledge and experience in your products.
• Gain or improve domain knowledge of the NL MOD.

Consequences and conditions
• IPR will always remain with the contributing party;
• Prior to discussions an NDA will be made up.
• Solutions will be incorporated in the NII architecture as developed by TNO. It will describe the solution not the implementation.
• Solutions can be procured by the NL MOD in a separate open procurement.
• No guarantee that NL MOD will select your solution.
• (financial) Conditions will be discussed individually.

❭ TNO.NL

TNO is an independent innovation organisation connecting people and knowledge to create innovations that sustainably boost the competitive strength of industry and the welfare of society. TNO focuses its efforts on seven themes including 'Information Society' to research the impact of the information society and stimulate the introduction of new services, applications and policy, based on the latest ict, media and aerospace technology.

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