

Panel discussion: ***Developing Scientific Foundation for CIIP and Dependency Analysis***

**MOTIA Final Conference,
March 2012,
Bart Gijzen**



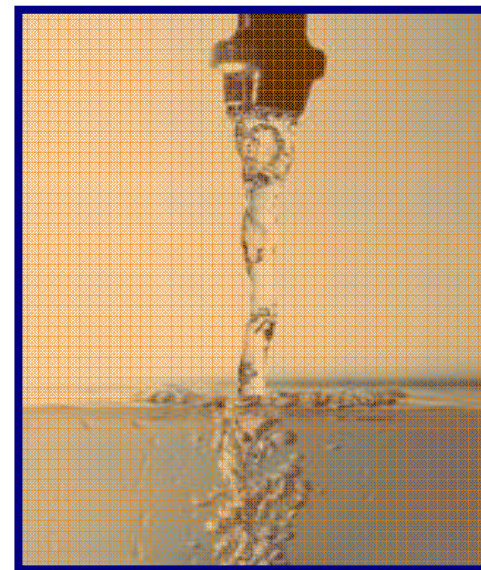
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Vitale ICT ambition: *ICT like running water from the tap*



How to get
there?



 Research Agenda




www.vitale-ict.nl/iipvii/downloads/SRA%20Vitale%20ICT.pdf

Vitale ICT research areas

Vitale ICT

Reliable Internet and Communication Technology



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Goal: Preserve and increase the level of trust in the Internet and communication infrastructures and the services offered on it.


Sector	Business and societal challenge
Internet, Telecommunication and Media	Reliable Internet infrastructure Mobile broadband access Scalable multimedia infrastructure ICT robustness
Public Safety, Disaster Relief and Defense	Reliable, resilient and recoverable ad-hoc communication infra

Research Issues:

- Upgrading Internet dependability to successfully fulfill its increasingly critical role in economy and society.
- Scalable mobile access that keeps up with booming traffic from mobile devices.
- Deployment strategies for combinations of content delivery technologies to meet high quality media stream explosion.
- Reliability engineering and reliability prediction for improved life cycle management with e.g. publicly available 'fact tank' with life-cycle reference data.
- More reliable large-scale ad-hoc communication systems based on a.o. auto-configuration, self-healing and knowledge based data fusion techniques.

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Transportation, Logistic Chains and Mobility	Reliable sensor-based mobility management solutions
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Healthcare	Scalable remote health care monitoring Highly available and privacy assured medical data infrastructure
Power Production and Distribution	Designing mature electricity smart grids Robust management of smart grids
Public Governance	Reliable and large scale integrated e-governance information processing

Research Issues:

- **Failure free and high-volume processing** e.g. in processing of call detail records into bills, executing financial transaction batches, flight data processing, etc.
- **Base business processes and decision support on integrated information** e.g. in sharing of patient data, integrated e-governance and PPDR services, supply chain integration, integrated sensor data from multiple sources, etc.
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Trustworthy ICT Service Chains



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Safety Critical and SCADA Systems



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Power Production and Distribution	Reliable energy production and distribution

Research Questions:

- Make safety critical and SCADA systems more open and unmanned where control on the three particular and notoriously hard to control aspects has increased: disruptions due to human action, software failure and dependency on external services.
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Telecom & internet are linking pin in interdependent ICT

- **Life cycle (legacy) management: classic reliability theory upgrade (multi-phase Weibull? Rare-event simulation?) and public FactTank (to find "laws of reliability" / patterns?) are needed**
- **How to deploy and configure AdHoc, autonomous, Disruption Tolerant Networking for improved resilience?**

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Data collection and processing becomes multi-sourced and integrated ⇔ interdependent:

- **System wide information infra and management (SWIM) ⇔ reliable, scalable and secure**
- **What if interdependent systems do not respond? ⇔ more advanced exception handling is needed**

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Creating trust in ICT service chains is essential for current ICT challenges:

- **How to model trust and accountability? How is it affected (positive and negative)? ⇔ combined reliability / reward models?**
- **What service level exception handling can prevent chain cascading failures? Model based analysis to find the balance between reliability engineering and over-engineering in ICT chains?**

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Safety critical systems are becoming increasingly unmanned and more open / integrated:

- **Implies changing risks: is existing SW assurance level assessment valid for coupled ICT systems? Standardized label needed? how relevant are common cause failures? How to do evidence based risk assessment?**
- **Continuity as a Service ↔ cost effective business continuity /w cloud+escrow solutions**