



# IoTSec

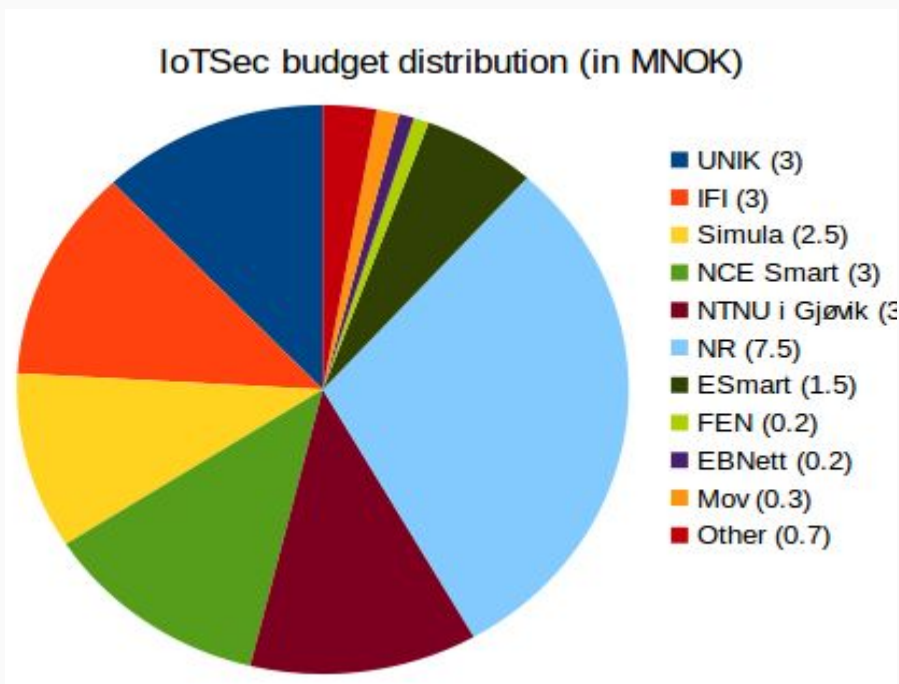
## Major Achievements of Year 1

by Christian Johansen (COO)

# Core Team and Resources



- UNIK@UiO (from 1Jan2017 Institutt for Teknologisystemer (Seraj Fayyad, Christian Johansen, Danica Radovanovic, MSc, ++)
- IFI@UiO (Olaf Owe, Josef Noll, Toktam Ramezani, Elahe Fazeldehkordi, MSc ++)
- Simula (Yan Zhang, Ming-Chang (Leo) Lee)
- NCE Smart (Dieter Hirdes, Heidi Tuiskula, Håkon Duus)
- NTNU (Einar Snekkenes, Adam Szekeres)
- Norwegian Computing Centre (NR) (Habtamu Abie, Ivar Rummelhoff, Sigurd Eskeland)
- eSmart Systems (Davide Roverso)
- Fredrikstad Energi (Vidar Kristoffersen)
- Glitre Energi Nett (Otto Andreas Rustand)
- Movation (Seraj Fayyad)



- Public (and Admin) [wiki](#) with most of our work (a wiki can be edited by everyone, and the information is meaningfully managed)
  - Publications pages with links to all public documents, presentations, etc.
  - Research description of the project, with public deliverables available
  - Student corner, with MSc topics (open, ongoing, and finished)
  - Consortium and other collaborators descriptions and contact points
  - Meetings info with minutes and presentation materials, etc.
- Sharing platforms
  - Google Docs, OwnCloud server, mailing list,
- Disseminating together
  - Active Twitter account available to all members

# Working together



# Project info - Y1 highlights



- 2 PhD and 3 PostDoc positions are filled, offer for the final PhD position was accepted
- Consolidated plans for Smart Grid Security Centre are established.
- Extended Collaboration with Groups and Initiatives, grown from 11 to 19 partners
  - UiA joined, and 6 external professors (UiA, UiO/Simula, Chalmers, Univ Copenhagen)
- EU Horizon 2020 project INVADE accepted
  - coordinated by IoTSec partner NCE Smart, with 3 partners from IoTSec
- JU ECSEL project proposal SCOTT submitted as IA,
  - UiO as Technology Leaders and Norwegian consortium coordinator
- Strategic Research Partnership of UiO with the Virtual Vehicle Research Centre (Austria) on security and digital systems
- Personal Awards
  - Dieter Hirdes got membership in the Advisory Board for EU Energy Group of H2020,
  - Josef is Research Fellow at the Virtual Vehicle Research Centre in Austria

# Networking, Dissemination, Collaboration



- **Organized** meetings and workshops to collaborate inside the project, but also with externals.
  - 17 physical meetings including workshops and face-to-face consortium meetings
  - 6 phone consortium conferences, supporting the face-to-face meetings
  - Industrial forums, with externals invited to present results from their institutions, e.g.:
    - KraftCert,
    - Eidsiva Energi Nett,
    - Datatilsynet and
    - Chalmers University.
- We **participated** in a variety national and international forums relevant to the topics of IoTSec; these include both industrial forums as well as research ones.
  - 10+ presentations in relevant events (international or national)  
At e.g.: SmartGrid Conference, Nemko, Sintef, NCE partners forum, Energi Norge, LO IKT konferansen, 12th Int.Conf. Integrated Formal Methods, ACSAC Conference, NWPT.

# Networking, Dissemination, Collaboration



- **Partners** overall increased to 19.
  - Ongoing discussions with NVE, Nkom, Oxford, TU Darmstadt.
- Dedicated face-to-face meetings organized with other actors :
  - Hafslund, Agder Energi, Eidsiva Energi, Kragerø Energi
- **Extended the collaboration**
  - Include 6 academic collaborators
  - Invited 6 associated international partners to strengthen our academic visibility
  - Extended IoTSec with 8 associated national partners to build the ecosystem
  - Great involvement of Public sector
    - Datatilsynet, Forbrukerrådet, and Norwegian SmartGrid Centre
- **Teaching and Students**
  - MSc (1 finished, 5+ ongoing, 10+ open topics) - see [Student Corner](#) on wiki
  - **New courses** : IoT Security (UNIK) and Energy Informatics (Ifi)  
plus existing courses on security, networking, modelling, (now geared towards IoT)

# Y1 goals and focus



- First year allowed the partners a more **exploratory work** so to investigate various aspects of IoT, Security and Privacy, and the Electricity grid.
- **Purpose** was to
  - analyse problems from the various facets of the Grid and IoT
  - identify the most urgent and with most impact.
- Their conclusions were fuelling the Smart Grid Security Centre (SGSC) topics and initial agenda.
- The **goal with immediate impact** was
- Establish SGSC
  - as a knowledge centre for the (Smart) Electricity Grid industry
  - offering services that would help the industry with the most stringent problems
  - help with the transition to the future SmartGrid and the IoT
  - expertise on business opportunities and novel services in SmartGrid and SmartHome

# Arena for students/industry



- **CPS Lab** at UiO (for Cyber Physical Systems) starting in 2017.
  - **Applicants:** Christian, Josef, Olaf, Josh (from IoTSec), and Frank Eliassen, Amir Tahercordi (close partners to IoTSec managing the Energy Informatics at UiO), and Gyorgy Kalman (from Mnemonic)
- **Purpose:** create a meeting point for Industry and Students, working on practical problems coming from IoTSec domain (i.e., IoT, Energy, Privacy, and Networks).
  - Students (MSc and BSc) get hands-on and practical problems, + the necessary lab material, e.g., IoT devices to hack, SmartMeters, software licences, etc
  - Industry get a point to meet (and select) students, to interact with experts (researchers) and to test their devices and ideas.
- Will be **provided to the Smart Grid Security Centre.**



# Scientific achievements



- Semantic system description
  - Understanding the system and describing security through semantic modelling
  - [Measurable security](#) - the [novel](#) security concept
- Security modelling
  - Development of privacy-aware models and measures
  - Adopting and enhancing adaptive security for system of systems
  - Formal languages for semantically proving security/privacy
- System versus Goal analysis
  - [Application-specific](#) security/privacy, e.g. billing vs privacy and profiling
  - Human/technical interface, security usability
- Operational security for IoT-based critical infrastructure
  - IoTSec ecosystem -> [extended network](#) of collaborators
  - [Roadmap](#) for [Smart Grid Security Centre](#) (SGSC)
  - (Gap Analysis of security methods for critical infrastructures)

# Challenges



- Scientific challenges
  - missing descriptions of distribution grid
  - “security by obscurity”
  - different security viewpoint
- Collaboration challenges
  - Academic versus industrial viewpoint
    - “language mismatch”
    - Academic: long term, open available information, e.g. Smart Home focus
    - Industry: current challenges, e.g. focus on grid
  - Focus on Smart Grid Security Centre (SGSC)
    - Different expectations about contributions into the SGSC
    - Academia wants focus on science

Increasing visibility through active participation in international proposals.

The **accepted grants** are:

- **INVADE** (Horizon 2020)
  - NCE Smart are Coordinators (Dieter and Heidi)
  - Budget ca. 16 M€ for 12 European partners (including eSmart Systems)
  - In the field of SmartGrid & Storage.
- **SCOTT**: Secure COnnected Trustable Things (ECSEL-Joint Undertaking)
  - VIF in Austria are overall coordinators for 56+ partners from 12 countries.
  - UiO (Josef and Christian) are overall Technology Leaders and coordinate the seven Norwegian partners.
  - Overall Requested funding ca. 34 M€ with Norwegian requested funding ca. 3 M€.

# New Grants



- Excellent growth of scientific network
  - from 11 to 19 partners
  - extended both towards industry, public entities, and international collaborations
- Good Scientific outcome
  - PhD students hired
  - PostDocs in operation
  - Topics identified, future work addressed
  - Key concepts, a.o.
    - “Measurable Security” adapted in SCOTT (54 partners from 14 countries)
    - “Privacy labelling” suggested in collaboration with Consumer Services
- Good involvements of students and teaching
- Excellent success rate of novel projects
  - H2020 Invade, JU ECSEL SCOTT

# Summary of Y1 Major Achievements



# More organization matters



## Steering representatives:

- UiO: Olaf Owe
- UNIK: Stian Løvold
- NTNU: Nils Kalstad Svendsen, Sofie Nystrøm
- NR: Åsmund Skomedal
- Simula: Yan Zhang
- NCE Smart: Dieter Hirdes
- eSmart Systems: Davide Roverso
- Glitre Energi Nett: Otto Andreas Rustand
- Fredrikstad Energi Nett: Vidar Kistoffersen
- Movation: Bjarne Haugen

## Project leadership:

- Josef Noll
- Christian Johansen, COO
- Stian Løvold, Project owner

## Steering Board leader:

- Bjarne Haugen

## Security Officer:

- Otto Rustand

# Confidential and security-critical material



Information available on the wiki

[http://cwi.unik.no/wiki/IoTSec:Secure\\_and\\_Confidential\\_information](http://cwi.unik.no/wiki/IoTSec:Secure_and_Confidential_information)



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About



## Confidential and secure information

The steering board has decided on the [Steering board meeting 27Oct2016](#) to adapt the following guidelines and continues work on these topics.

### Confidential information

- Documents which are given to the project being confidential to the project shall be watermarked by *IoTSec confidential, shall not be distributed outside of the project without consent*"
- Deliverables being confidential shall be stored on the project server, e.g. owncloud.unik.no

### Security-critical information

Each project participant is asked to not publish security-critical information. If a participant regards information as potentially security-critical, he shall ask IoTSec's security officer for

