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Corporate Technology

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# INFO DAY

## Internet of Things and Enterprise Environments

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**Mr. Amine Houyou,** amine.houyou@siemens.com
**Mr. Hans-Peter Huth,** hans-peter.huth@siemens.com
**Dr. Johannes Riedl,** johannes.riedl@siemens.com
**Siemens AG, Corporate Technology**

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## Trends in Automation

- Increasing relevance of IT / Communication in automation industry
- Growing importance of Internet technologies and related standards
- Convergence of automation, office environments; *possibly in future:* inclusion of building automation
- Growing usage of the Internet in the automation industry (e.g., business processes, logistics, remote monitoring; *possibly in future:* remote service, distributed automation)

→ Siemens expertise in industrial networks and automation

## FINAL (Future InterNet in Automation & Logistics) Scope & Consortium Efforts

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***Scope:***

1) Today's Internet technologies do not fit very well to the industrial requirements, add-on's have been developed to make the Internet technologies usable for automation world (e.g., Industrial Ethernet).

   *Consequences:*

   → High additional development effort of the 'industrialized' solutions
   → Various standards
   → Restricted compatibility of products of different vendors
   → Usability in closed environments only, but automation becomes global

2) Communication network complexity needs to be handled by automation specialists

3) Number of connected devices (sensors, actuators, controllers) is enormously growing

***Consortium efforts:***

Alternative 1: discussions with EPoSS ongoing
Alternative 2: several STREPs with focus on specific field problems

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## Objectives & Impact

***Objectives:***

1) Design future communication technologies to make them easily usable
   - for the Automation & Logistics Industry,
   - for the Future Internet, and
   - for the Future Industrial Internet.

   "**Advanced control / communication network services**"

2) Approach operation complexity by innovative plug and play concepts
   **"Plug and Play control / communication networks"**

3) Develop embedded SOA concepts to realize "IP to the field" and "IT to the field" → 'Internet of Things for automation'
   **"Service Oriented Architecture (SOA) in embedded networks"**

4) Combine concepts above
   **"Summary – The holistic view: Plug and play control networks combined with embedded SOA"**

***Technical and Economic Impact:***

- CAPEX and OPEX reduction for high scale future industrial networks,
- Energy efficiency,
- Flexible service/application setup in automation.

 

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## Partners are required in the fields …

(Industrial) application partners needed:

- Manufacturing industry, Process industry
- SMEs with focus on integration of industrial communication systems

Please contact

**Mr. Amine Houyou, Siemens AG,** amine.houyou@siemens.com

 

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# Thank you!

 

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## Advanced control / communication network services

**Technical objectives:**

- Routing / forwarding based on metadata using lower layer information
- Energy efficient communication
- Sophisticated communication services, also considering peer-to-peer networking environments, e.g.,
  - deterministic/real-time communication
  - “zero-loss” communication
- “Industry-hard” mobility
- Wide area overlay networking
- Built-in scalable security for real-time environments and distributed architectures
- Seamless localization

 

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## Plug and Play control / communication networks

**Technical objectives:**

- Concept and Control Plane for
  - topology/device auto-detection
  - device capability auto-detection
  - communication requirements auto-detection
  - communication service self-configuration
- Requires cross-layer architecture
- Enabling role of IPv6
- Security
- Consideration of advanced communication services

 

## Service Oriented Architecture (SOA) in embedded networks

**Technical objectives:**

- Adaptation of web services for use on embedded devices with performance and capacity restrictions
- Standardization of web technologies for the ‘Internet of Things’
- Seamless integration in Future Internet concepts.
- Requirements for the connecting communication infrastructure
- Distribution of functionality in order to enhance performance, scalability or robustness.

 

## Summary – The holistic view: Plug and play control networks combined with embedded SOA

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**Technical objectives:**

- Holistic network management: cross layer optimization e.g. between link topology, QoS and service placement
- Holistic security concept, considering network and service security
- Integration of communication/control, surveillance, VoIP, …
- Integrated network and service management