

# ACROSS: Autonomous Control for a Reliable Internet of Services

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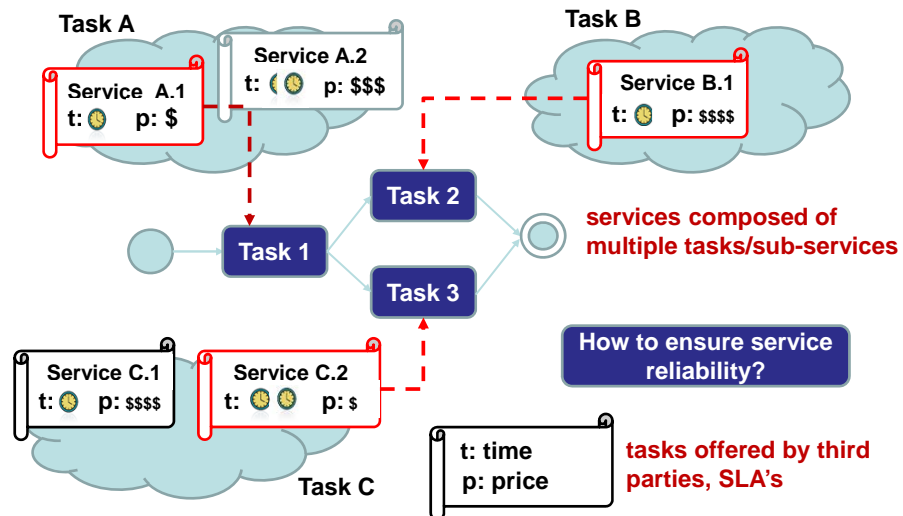
## Agenda points 9 to 13:

- General background and motivation for ACROSS
- Objectives and working program
- Organization and management
- Distribution of tasks
- Promotion of gender balance and early-stage researchers
- Time table
- Budget plan for first period
- Place and date of next meeting

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## Internet of Services



**Service creation:** anyone, anytime and anywhere

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## Reliable IoS: Autonomous Control

**Drivers:**

- **Service reliability crucial for businesses**
- **Need for flexibility in service creation**
- **Higher diversity, cheaper services**

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## Positioning

**Current state-of-the-art:**

- **Main focus on functionality and system design**
- **Proposals for variety of quality frameworks and architectures**
- **Little attention to the development, evaluation and optimization of algorithms for Autonomous Control**
- **Needed: quantitative models and methods for reliable IoS**

**Next steps to be taken within ACROSS:**

- **Models for optimal use of quality-control mechanisms**
- **System monitoring integrated in closed-loop control**
- **Pricing policies to evolve into viable 'eco-system'**
- **Unifying view on IoS where this all comes together**

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## Aim and Objectives

### Overall aim:

Create European network of experts on development of autonomous control methods for reliable and quality-aware Internet of Services (IoS)

### Networking objective:

Establish platform to fuel and coordinate research on reliable IoS

### Technical objectives:

1. Algorithms for autonomous decision and QoS control
2. Scalable methods for monitoring to support QoS control
3. Rules for smart pricing schemes in many-domain environments

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## WG1: Autonomous Control

### Research challenges:

- Scalable, quantitative methods for fully dynamic service composition for large-scale, complex composite services
- Presence of multiple (interacting) control loops in large complex heterogeneous self-adaptive systems. Implications for stability?
- Self-adaptive composition strategies that addresses cross-layer structure of complex service-based systems with SLA-driven risks
- (Autonomous) efficient use of multiple cloud infrastructures (either as a federation or as a multi-cloud) to provide reliable services
- Nature inspired models for establishing autonomous behavior of services and service compositions

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## WG2: Monitoring and Service Prediction

### Research challenges:

- Monitoring data/content driven processes (also in streaming services)
- Reliability of data provided by services (also in a competitive environment, where several competitors cooperate)
- Data-centric process monitoring
- Monitoring environmental impact of services and self-adaptation (development of green metrics)

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## WG3: Pricing and Competition in Many-Domains Systems

### Research challenges:

- Implications of different pricing schemes in many-domain setting?
- How do/should quality levels and pricing policies relate?
- Interaction between Autonomous Control mechanisms (→ WG1) and pricing schemes?
- How to develop pricing mechanisms that create proper incentives towards the users and service providers?
- What governing rules are needed to achieve this?
- What are the implications regarding the required monitoring and measurement functions (→ WG2)?

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# Organisation and Management

1. Phasing of the project
2. Actions per phase
3. Types of activities
4. Milestones
5. Budget plan

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## 1. ACROSS Phasing

Coordination and dissemination

Phase 1: Alignment M01-M12

Phase 2: Research and development

**WG2**

Monitoring & Service Prediction

**WG1**


Autonomous Control Mechanisms

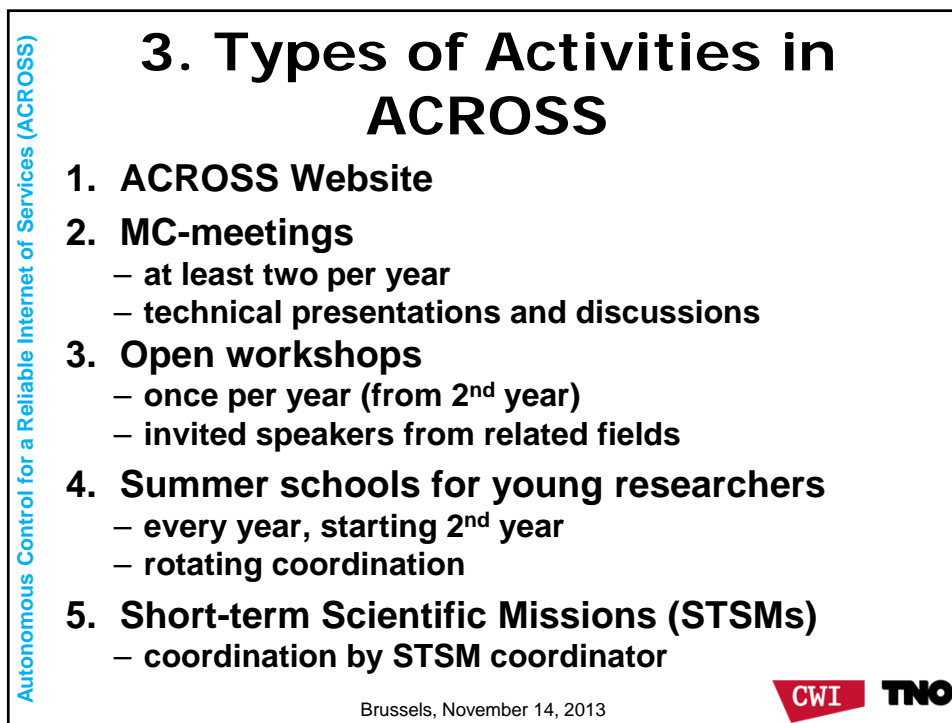
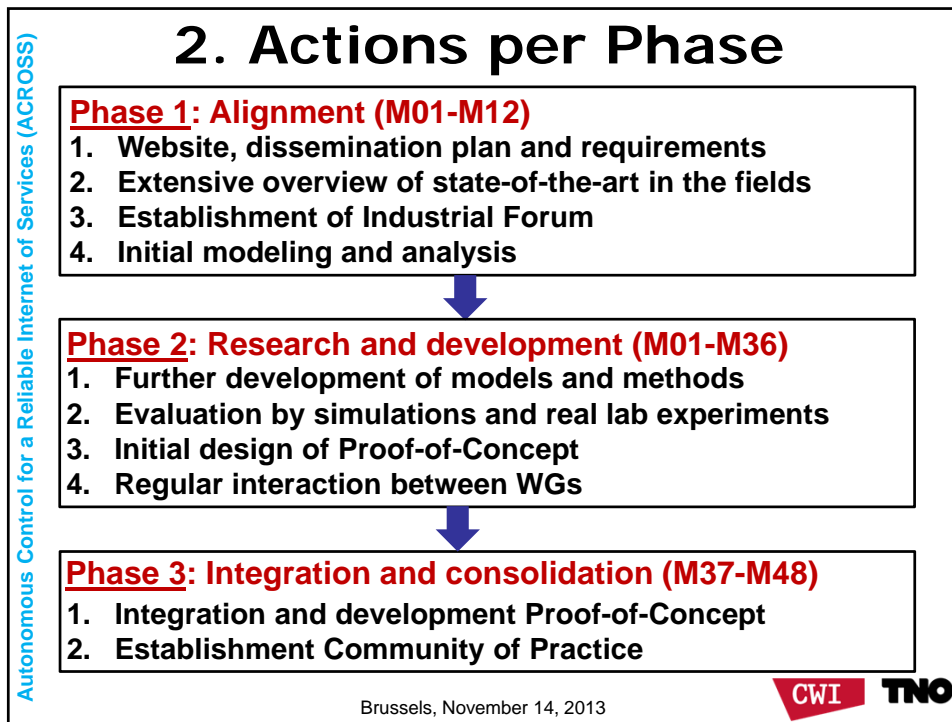
**WG3**

Pricing and Competition

M01-M36

Phase 3: Integration and consolidation M37-M48

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## 4. Milestones

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|  |            |
|--|------------|
| <b>MS1.1:</b> Website, dissemination plan and Industrial Forum established                 | <b>M03</b> |
| <b>MS1.2:</b> Overview state-of-the-art and refined planning (integrated and per WG) ready | <b>M12</b> |
| <b>MS2.1:</b> Initial models per WG (control, monitoring, pricing) ready                   | <b>M24</b> |
| <b>MS2.2:</b> Refined models per WG validated and initial integration models ready         | <b>M36</b> |
| <b>MS3.1:</b> PoC simulations of integration ready   | <b>M40</b> |
| <b>MS3.2:</b> PoC lab experiments of integration ready                                     | <b>M44</b> |
| <b>MS3.3:</b> Book ready, final workshop and establishment Community of Practice           | <b>M48</b> |





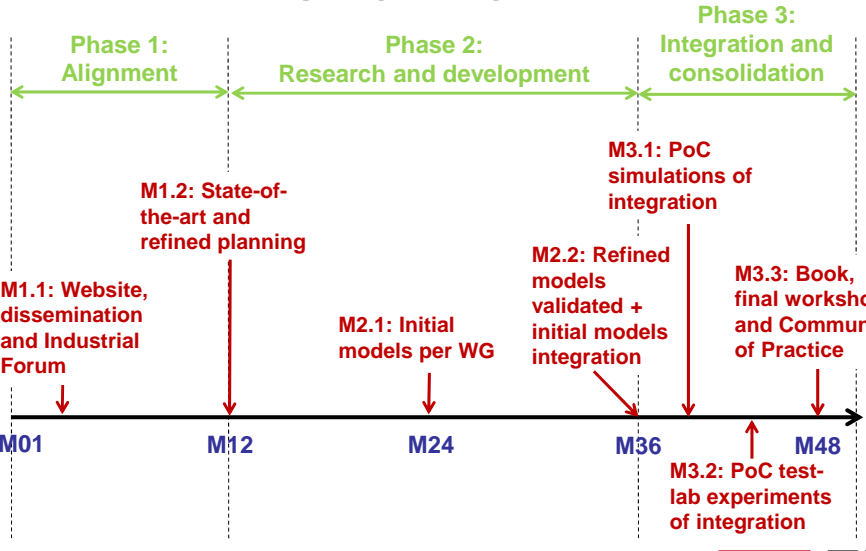





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## Phasing and Milestones Overview

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The diagram illustrates the project's phasing and milestones. It is divided into three phases:

- Phase 1: Alignment** (M01 to M12)
- Phase 2: Research and development** (M12 to M36)
- Phase 3: Integration and consolidation** (M36 to M48)

Milestones and their descriptions are as follows:

- M01:** M1.1: Website, dissemination and Industrial Forum
- M12:** M1.2: State-of-the-art and refined planning
- M24:** M2.1: Initial models per WG
- M36:** M2.2: Refined models validated + initial models integration
- M40:** M3.1: PoC simulations of integration
- M44:** M3.2: PoC test-lab experiments of integration
- M48:** M3.3: Book, final workshop and Community of Practice

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## 5. Budget Plan (rough)

**Overall budget:** some €162k yearly

### Year 1:

|   |      |
|---|------|
| • Kick-off meeting (30 persons)         | 21   |
| • MC meeting M4                         | 21   |
| • MC meeting M10                        | 21   |
| • Website                               | 4.5  |
| • 20k Grant Holder administration (15%) | 18   |
| • Total for Year 1                      | 85.5 |

### Year 2-4:

Additional costs due to

- STSM- meetings
- open workshops
- summer schools

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## Distribution of Tasks

- Leader WG1 (Autonomous Control)
- Leader WG2 (Monitoring and prediction)
- Leader WG3 (Pricing and competition)
- STSM coordinator
- Summer school coordinator
- Website hosting and management

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## Liaisons and Interactions with other Actions

### Related research programs/platforms:

- Networked European Software and Services Initiative (NESSI)
- IFIP WG2.14 (Service Oriented Systems)
- ITU-T FG Cloud (Open Cloud Consortium)
- WWW Consortium (W3C)

### Related COST Actions:

- IC1003: “European Network on Quality of Experience in Multimedia Systems and Services (QUALINET)”

### Related FP7 projects:

- Broker@Cloud, MODA@Cloud, MCN,...

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## Industrial Forum

- Consists of some 10-15 individuals from industry and end-user communities
- **Goal:** alignment of research directions to need from industry and end users
- IF will be established during year 1
- Suggestions for members

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## Gender Balance and ESRs

- ESR = Early Stage Researcher
- Item on all agenda's

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## Time Table

### Year 1:

- Website up and running (M3)
- Dissemination plan ready (M3)
- MC meetings (M4 and M10)
- State-of-the-art review ready (M12)
- Annual Report (M12)

### Years 2-4:

- Summer school for PhD students and ESR's (yearly)
- Annual Report (yearly)
- Open workshop (yearly)
- MC meetings (6 monthly)
- Short-Term Scientific Missions (upon approval)
- Final Report (M48)
- Book (M48)

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# Meetings

## **Next meeting (proposal):**

- **Date: February 13 + 14, 2014**
- **Location: CWI, Amsterdam**

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