

# The TLOUDS Integrated Project Privacy and Resilience for Internet-scale Critical Infrastructures

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## Extended abstract

Protecting critical infrastructures providing communications, energy, or health-care presents increasing ICT challenges as ICT itself has become vital to them. Internet-scale ICT infrastructures (infrastructure clouds) promise scalable virtualised computing, network, and storage resources over the Internet. They provide scalability and cost-efficiency but pose significant new privacy and resilience challenges. Clouds may evolve into a single point of failure, threaten all dependent ICT, and put the Future Internet at risk. TLOUDS builds a resilient Future Internet platform by progress in four areas:

1. Addressing the legal and business implications while building a regulatory framework for enabling privacy-enhanced cross-border infrastructure clouds.
2. Architecture and prototypes for a federation of trustworthy infrastructure clouds that build on complementary and mutually re-enforcing technical approaches:
  - (a) A Trustworthy Infrastructure Cloud enables individual providers to offer more resilient and privacy-aware infrastructure clouds;
  - (b) Privacy and Resilience for Commodity Clouds enables end users to put a security layer on top of existing commodity infrastructure clouds to enforce their security objectives;
  - (c) Federated Cloud-of-cloud Middleware offers privacy-protection and resilience beyond any individual cloud. This expands trust from trusted (enterprise-internal) clouds to less trusted (off-shored) ones or federates a set of partially trusted providers into a trustworthy and adaptive federation.
3. Validation and impact through benchmark scenarios:
  - (a) web-based smart lighting system to control the smart grid infrastructure for efficient management of public lighting;
  - (b) Home healthcare provides prophylaxis to citizens. We focus on the privacy and usability challenges of cross-border usage of personal data.
4. Collaboration with complementary standardization and FP7 projects maximizes impact and fosters a European Trustworthy Cloud ecosystem. Cloud computing is essentially changing the way services are built, provided and

consumed. Despite simple access to Clouds, building elastic services is still an elitist domain and proprietary technologies are an entry barrier especially to SMEs and consequently, it remains largely within the domain of established players. This talk will explain how the 4CaaS project will bring significant benefits to the European economy, by providing an easy to use Infrastructure for a More Competitive Environment, greatly simplifying design and delivery of tailored services and compositions.