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## - Master-/Bachelorarbeit - Security Level-based scheduling for IaaS Clouds

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### Background

[The Cloud is here](#) and has arrived to redefine the on-demand availability of remotely-located computing Infrastructures, Platforms and Software to the user. Unfortunately, while many of the Cloud's economic and effectiveness advantages are apparent, the migration of key sector applications to these new ecosystems (e.g. eHealth and eGovernment) has been limited due to a major show-stopper: the lack of quantifiable tradeoffs (features, performances, problems and economics) of security. Due to the Cloud's very particular characteristics (e.g. rapid elasticity), [the addressing of security metrics in these IT ecosystems is a much harder issue](#).

Infrastructure as a Service –IaaS- Clouds are becoming more and more common everyday (e.g. Amazon EC2, OpenNebula, ...). A central component of the IaaS architecture is the front-end's scheduler, which is in charge of instantiating new computational or storage resources in the different IaaS nodes according to a predefined policy. In the best of the cases, the scheduling policy will be based on parameters extracted from a Service Level Agreement, but [unfortunately most IaaS schedulers do not take into account security parameters](#).

The security metrics, policies ([Security Level Agreement – SecLA-](#)) and architectures that enable a security-driven IaaS scheduler, are hot research topics in the Cloud security area.

### Tasks

- Propose the [security metrics](#) required to create a scheduling policy for IaaS Clouds.
- Contribute with a [reference architecture](#) for an SecLA-driven scheduler for IaaS.
- Develop a [proof of concept](#) prototype based on an open source IaaS software (e.g. OpenNebula, OpenStack, ...).
- We offer to the candidate further involvement with specialized organizations, in particular the [Cloud Security Alliance](#).

### Prerequisite

- The candidate should have knowledge of IT security.
- IaaS experience will be considered a plus.
- Because this topic involves the development of a proof-of-concept prototype, then the candidate should also have good Java/C++ programming skills.
- Motivation to work within international work groups on Cloud security.
- The thesis has to be written in English
- Immediately

### Start

### Contact

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