

## Formalization and Verification of RESTfulness

### Motivation:

REST and RESTful Web services have recently emerged as a promising alternative approach to simplify the plumbing required to build service oriented architectures. They are currently perceived as a lightweight technology to enable point-to-point integration of service providers with a large number of clients, whereas the more established WS-\* technology stack is seen as more suitable for building service-oriented architectures in enterprise settings. Currently, it appears that the vast majority of the thousands of public Web services API describe themselves as being RESTful.

RESTful Web services publish their state and functionality with a novel abstraction: the resource. Resources are globally addressed through URIs. Clients access them and manipulate their state using a uniform set of methods with predefined safety and idempotency semantics. The interaction between clients and services is stateless and uses self-describing messages in order to reduce coupling between services and their clients.

### Goals:

The goal of this thesis is to formalize the semantics prescribed by the REST architectural style – e.g., REST principles *Addressability*, *Statelessness*, *Connectedness*, and *Uniformity* – and to develop a tool to check the RESTfulness of a given Web service implementation.

### Requirements:

We expect the student to be familiar with or willing to learn program analysis techniques as well as RESTful frameworks.

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