

Ylva – A Pragmatic Modeling and Risk Analysis Framework for SmartCloud using Big Data

In today's world, Cloud Computing (CC) is becoming one important part of our daily life, **shaping our future**. The featured products are delivered by Amazon, IBM, Google, Microsoft, Apple, VMware, Citrix, Salesforce.com, Facebook, LinkedIn and so on, which are **in widespread use** in many areas, such as banking, e-commerce, retail industry, and academy.

Quality of service (QoS) properties, such as response time, execution time, uptime, cost, etc., are usually defined in **Service-Level Agreement (SLA)**. Violations of SLA will result in **penalty cost** as well as **low customer satisfaction**, which is however the **key aim** in business selling process. Therefore, it is intriguingly enough to **predict the risks** of having SLA violations at runtime, which can then be used to **avoid and/or mitigate** such (potential) violations. This activity is also in the importance of **development of SmartCloud**, as well as **business-critical, mission-critical** and **safety-critical CC services**.

Our research project *Ylva*, **a pragmatic modeling and risk analysis framework for SmartCloud** aims to provide a means of solving the aforementioned problems, in the sense of **challenging the status quo**, and **thinking differently comparing others**. Specifically, *Ylva* uses a **treasure trove** and **intertwined buddy** of CC, i.e. **big data** (unstructured data or semi-structured data), together with the proposed analysis methods using **cross-domain techniques**, to calculate **accurate** risks of having SLA violations, as well as to determine the **current trend** of the consumption w.r.t. certain QoS properties. To this end, CC service providers can use such pieces of information to make **proactive** and **evidence-based decisions** for **service management center**, which can shape the **overall performance**. Besides, *Ylva* also proposes a **modeling approach** based on **our prior work at MIT**, which has some nice extensions of modeling the typical behavior of services w.r.t. **message-passing, performance, energy consumption** and **big data**, in a **pragmatic** manner. From this perspective, *Ylva* has a **good industrial learning scale**, and can be a **good fit** for modeling large-scale SOA systems. Other contributions of *Ylva* are also related to **requirements management** w.r.t. functional and **non-functional requirements**, by providing **pragmatic analysis techniques**.

Currently, we are getting in touch with the companies about our research in **SmartCloud** and **the similar but broader context**, which are distributed in **SE, US, and CN**, where there is **pouring money only for ready minds**. We hope to create **more win-wins** on the side of both companies and ourselves.



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