Improving OpenStack services with source code optimizations

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Cloud Computing is a broad research area that uses many aspects of software and hardware solutions, including computing and storage resources, application runtimes or complex application functionalities. Clouds enable the outsourcing of IT infrastructure management for users, allowing them to concentrate on their core competencies to get better performance [1].

OpenStack is an open source cloud computing framework having a built-in modular architecture,based on the IaaS (Infrastructure as a Service)[2] model. It was founded in 2010, currently it is managed by the OpenStack Foundation, a non-profit corporate entity established in September 2012. Since then more than 500 companies have joined the project. It has rapidly grown into a global software community of developers and cloud computing technologists collaborating on an open-source cloud operating system for both public and private clouds. OpenStack clouds are powered by a series of interrelated projects to support virtualized infrastructure and application management forming a robust and complex distributed system [3]. All these services are controlled and managed using Openstack's Dashboard, a web based graphical user interface, which provides administrators and users to access, provision, and automate cloud-based resources.

The aim of this paper is to introduce source code analysis on OpenStack with a predefined tool-chain (including a coding rule checker, metrics calculator, and duplicated code detector), and to discuss how to derive concrete blueprints targeting improvements of the internal quality of the platform. This process requires contributions from both theoretical research and practical development, including software tool releases and prototypes, tracking and fixing known issues and defects in OpenStack software by understanding the complete development work flow and architecture.

References

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