

A lightweight access control solution for Openstack

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OpenStack is an open source cloud computing project that is enjoying wide popularity. More and more organizations and enterprises deploy it to provide their private cloud services. However, most organizations and enterprises cannot achieve unified user management access control to the cloud service, since the authentication and authorization systems of Cloud providers are generic and they cannot be easily adapted to the requirements of each individual organization or enterprise.

In this paper we present the design of a lightweight access control solution that overcomes this problem. Our solution access control is offered as a service by a third trusted party, the Access Control Provider. Access control as a service enhances end-user privacy, eliminates the need for developing complex adaptation protocols, and offers user flexibility to switch among the Cloud service and another different services.

We have implemented and incorporated our solution in the popular open-source Cloud stack OpenStack. Moreover, we have designed and implemented a web application that enables the incorporation of our solution into the UMT of IHEP based on Auth2.0. The UMT of IHEP as a tool which is used to manage IHEP user, record user's information, account, password and so on. Moreover, UMT provide the unified authentication service.

In our access control solution for Openstack, we create an information table to record all Openstack accounts and their passwords which will be queried when these accounts were authenticated by the third trusted party. As the new registered UMT user login the Cloud service for the first time, our system will create the user's resources automatically by Openstack API, and record the user information into the information table immediately. Moreover, we still keep Openstack original login web page, so administrators and some special users can access Openstack and do some background management. We have applied the solution to IHEPcloud, an IaaS cloud platform at IHEP. Except UMT, it is easy to expand other third-party authentication tools, for example CERN account management system, google, sina, or tencent.

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Primary author: 胡, 庆宝 (IHEP)

Co-authors: LI, Haibo (Institute of High Energy Physics Chinese Academy of Science); CUI, Tao (IHEP(Institute of High Energy Physics, CAS,China)); CHENG, Yaodong (IHEP)

Presenter: 胡, 庆宝 (IHEP)

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