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**Fast and reliable restoration method of virtual resources on OpenStack**

**Abstract:**

We propose a fast and reliable restoration method of virtual resources on OpenStack when physical servers or virtual machines are down. Many providers have recently started cloud services, and the use of OpenStack, which is open source IaaS software, is increasing. When physical servers are down, there is a fail-over method using the high-availability cluster software such as Pacemaker to restore virtual resources. However, it takes a long time to restore all virtual resources. There is also a method for monitoring each virtual machine by using Ping or other methods and restoring a virtual machine when it is down. However, data may be destroyed due to the double mounts of virtual machines depending on the timing of failures because restoration methods of failed physical servers and virtual machines are independent. Therefore, we propose a fast and reliable restoration method with a uniform way for plural types virtual resources. In our method, Pacemaker only detects a physical server failure and notifies a failure to a virtual resource arrangement scheduler, then a virtual resource arrangement scheduler determines multiple physical servers to restore virtual resources and calls OpenStack APIs to rebuild. The virtual resource arrangement scheduler also detects virtual machine failures by using a Libvirt monitoring module and restores virtual machines without data loss by handling Pacemaker and Libvirt notifications uniformly. We implemented the proposed method and showed its effectiveness regarding fast restoration through performance measurements.

**Existing System:**

RackSpace uses open source software OpenStack as an Iaas infrastructure. OpenStack, CloudStack, and Eucalyptus are major open source IaaS software and adoptions of open source IaaS software are increasing. Recently, the OpenStack community has been very active and new features are released every six months. We also have launched production IaaS services named cloudn which use OpenStack

**Proposed System:**

We propose a fast and reliable restoration method of virtual resources, such as VMs and logical routers (LRs), when physical servers or VM processes are down for cloud providers to operate reliable production IaaS services on OpenStack. The main function of proposed method is a virtual resource arrangement scheduler which manages empty spaces of physical servers, restoration statuses of virtual resources and restores virtual resources fast when physical servers or VMs are down. With the proposed method, Pacemaker detects a physical server failure and sends a failure notification to the virtual resource arrangement scheduler. As with Pacemaker notification, a Libvirt (VM control library) monitoring module also detects a failed VM and sends a notification. The virtual resource arrangement scheduler determines physical.