Experiment No. 11

Title: Design and analyze architecture of Aneka / Eucalyptus / KVM identify different entities to understand the structure of it

Objective: To analyze and understand the structure and different entities of Aneka, Eucalyptus, and KVM.

Tools used: Aneka, Eucalyptus, KVM, Linux Operating System

Prerequisite: Basic understanding of cloud computing and virtualization.

Theory:

Cloud Computing Architectures: Aneka, Eucalyptus, and KVM

Cloud computing has revolutionized the way we think about and interact with computing resources. It has brought about a paradigm shift by providing on-demand access to a shared pool of configurable computing resources. This page will delve into the theory behind three key tools used in cloud computing: Aneka, Eucalyptus, and KVM.

Aneka:

Aneka is a platform for developing distributed applications on a cloud infrastructure. It provides a flexible and extensible framework that supports multiple programming models, including Task Programming, Thread Programming, and MapReduce. Aneka's architecture is composed of three main layers: the Fabric Layer, the Foundation Layer, and the Application Layer. These layers work together to provide a robust and scalable platform for cloud computing.

Eucalyptus:

Eucalyptus is an open-source software infrastructure for implementing cloud computing on clusters. It provides an Infrastructure as a Service (IaaS) platform that is compatible with Amazon's EC2 cloud and S3 storage service. The architecture of Eucalyptus is modular and hierarchical, consisting of five high-level components: Cloud Controller, Walrus, Cluster Controller, Storage Controller, and Node Controller. These components interact to provide scalable and efficient cloud services.

KVM:

Kernel-based Virtual Machine (KVM) is a full virtualization solution for Linux on x86 hardware. It allows for the running of multiple virtual machines (VMs) on a single physical machine, each with private virtualized hardware. KVM's architecture includes a loadable kernel module, kvm.ko, that provides the core virtualization infrastructure, and a processor-specific module,

kvm-intel.ko or kvm-amd.ko. These modules work together to provide a high-performance and secure virtualization solution.

Understanding the architecture of these tools is crucial for anyone working in the field of cloud computing. It provides insight into how these systems are designed and operate, enabling the development of more efficient and effective cloud applications.

Steps to perform the experiment:

1. Install the necessary tools (Aneka, Eucalyptus, and KVM) on your Linux system.
2. Explore the different components and services of each tool.
3. Analyze how these components interact with each other to provide cloud computing capabilities.
4. Understand the role of each entity in the overall architecture.
5. Document your findings and observations.

Conclusion:

By the end of this experiment, I have a clear understanding of the architecture of Aneka, Eucalyptus, and KVM. I understood how these tools leverage different components and services to provide efficient and scalable cloud computing solutions. This knowledge will be beneficial in designing and deploying effective cloud computing applications.