ABSTRACT

Cloud data centers play a pivotal role in data storage and service delivery worldwide. However, the increasing prevalence of disasters, including disk failures and security threats, poses significant challenges to data center reliability. Fault tolerance is a critical aspect of cloud infrastructure to ensure continuous availability and reliability. In the context of cloud computing environments, effective data backup and recovery techniques are essential, with the demand for efficient recovery methods steadily rising. Recognizing the importance of disaster recovery, cloud backup emerges as the preferred solution for users. The growing need for resilient cloud data centers has prompted the development of an emergency protection scheme that integrates data backup and service migration, leveraging early warning systems. This project introduces FogDrive, a primary and backup resource allocation strategy designed to provide probabilistic protection for virtual machines against multiple physical machine failures in a cloud environment, thereby minimizing overall capacity requirements. In situations where servers are unable to provide data or data loss occurs due to various failures, data recovery becomes paramount. This project employs FogStore as a data recovery solution, utilizing FogDrive for primary and backup resource allocation. The implementation establishes a flexible data backup operation through FogStore - Disaster Backup Data as a Service (BDaaS) solutions, integrated with FogDrive local storage devices. Results demonstrate that optimal recovery time objectives can be achieved, enabling users to retrieve backups seamlessly from any platform or device with web-browsing capabilities.