In this study, cloud performance is benchmarked in the context of web service using a workload approach with cloud service architecture as a variable. Three sets of cloud service architectures are studied to measure their impact on cloud service performance. Hypotheses are developed and benchmarking tests conducted to compare the differences in cloud service performance. The important implications of this study are that cloud performance is a contextual variable; cloud service performance is a cloud architecture driver; and architecture options should be exhausted before any other options are considered when existing cloud service performance needs to be improved.