MBrace: Cloud Computing with Monads

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Abstract

pleted with examples and an informal description of semantics. We continue with distributed data (section 3), explaining the use and management of distributed data entities. In section 4 we present an overview of the MBrace runtime. Section 5 offers performance and scalability benchmarks on the MBrace framework, comparing results with Hadoop. In section 6, we give a brief overview of related work and finally, in section 7, discuss conclusions and future work.

2. Cloud Workflows

Cloud workflows form the essential pillar of MBrace; the program-

```
cloud {
    for i in [| 1 .. 100 |] do
```

3. Distributed Data

Cloud workflows offer a programming model for distributed computation. But what happens when it comes to big data? While the distributable execution environments of MBrace do offer a limited form of data distribution, their scope is inherently local and almost certainly do not scale to the demands of modern big data applications. MBrace offers a plethora of mechanisms for managing data in a more global and massive scale. These provide an essential de-

Cloud Refs

The MBrace programming model offers access to persistable and distributed entities-2506(kno)25(wn-2506(as)]TJ/F36 8.9664 Tf 121.703 0 Td [(cloud)-206(r)37(efs)]TJ/F33 8.9664 Tf 35.248 0 Td [(.)-206(Cloud)-2

```
let getRef () : Cloud<CloudRef<string []>> =
   cloud {
       let! html = download "http://www.m-brace.aRGhJ0g0G0.40.40.4rg0.40.40.4RG[(")]TJ0g0GJ/F317.9701Tf-20.922-8.967Td[(let!)]TJ/F2

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               inthetethecitentin
                    computatio:d
```

MBrace comes out of the box with implementations for FileSystem, SQL and Azure storage providers, while providing pluggable,

References

[1] Jeffrey Dean and Sanjay Ghemawat. MapReduce: simplified data processing on large clusters. In *Proceedings of the 6th conference on Symposium on Opearting Systems Design & Implementation - Volume 6*