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Giving Wings to Your Data: A First Experience of Personal Cloud Interoperability

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Abstract

Personal Clouds are becoming increasingly popular storage services for end-users and organizations. However, the competition among Personal Clouds, their proprietary nature and the heterogeneity of synchronization protocols have led to a complete lack of interoperability among them. Regrettably, this situation impedes that users *share data transparently* across multiple providers. Even worse, the lack of interoperability has associated serious risks, such as *vendor lock-in*, in which users get trapped in a single provider due to the cost of switching to another one.

In this work, we contribute `DataWings`: The first interoperability protocol for Personal Clouds. `DataWings` consists of an *authentication management protocol* and a *storage API for file storage, synchronization and sharing* that adhere to the current authentication (OAuth) and REST standards, respectively. Moreover, we demonstrate the feasibility of `DataWings` by implementing the protocol in various providers (NEC, StackSync, eyeOS) and performing a real deployment evaluated with real trace replays of production systems (UbuntuOne, NEC). To our knowledge, this is the *first real-world experience* of Personal Cloud interoperability. Our experiments provide new insights on the performance implications that different *types of user activity* and the underlying *sharing network topology* have on the implementation of our protocol. We conclude that `DataWings` is flexible enough to leverage interoperability for heterogeneous Personal Clouds, opening the door for a broader adoption by other vendors.

Keywords: Cloud Storage; Personal Clouds; Syntactic Interoperability; Vendor Lock-in;

1. Introduction

Over the last years, the concept of Personal Cloud has been materialized by several successful commercial offerings. Services like Dropbox, Box or SugarSync provide online file *storage*, *synchronization*, and *sharing*, as well as accessibility from a variety of mobile devices and the Web. Furthermore, Personal Clouds

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