

# Unlocking HP Labs Technology on HP Cloud Services

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## Abstract

*HP Labs mission is to originate innovative technologies that apply to domains of current and future interest to HP businesses. HP Cloud Services represents a delivery vehicle unlike traditional businesses and “cloudifying” HP Labs innovations on HP Cloud Services presents a new mechanism for unlocking the business potential of HP Labs technology. In this paper we describe how Multimedia Analytics were recently launched as an external cloud service, and how both direct and indirect integration and billing techniques validated via this work serve as an innovative pattern to unlock and monetize other HP Labs intellectual property.*

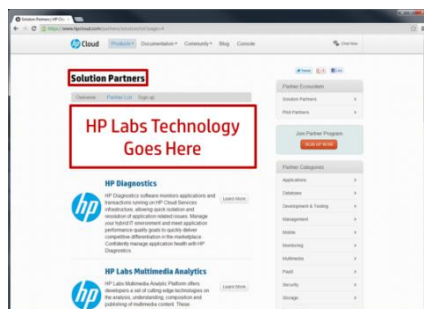
## Problem statement

One of the main areas of critical interest for future HP is Cloud Services. In spring 2011, HP announced its cloud strategy with the goal of offering private, public and managed cloud solutions. As of today, base public HP Cloud Services are entering the General Availability (GA) phase with several thousand active users. On the other hand HP Labs has been driving innovation in HP for more than 40 years. One of the main challenges for the groups in HP Labs is monetizing their innovation. The most common monetizing strategy is technology transfer which requires significant investment on both the HP Labs side and the Business Unit (BU) side to which the technology is being transferred. Such a transfer typically impacts a single product line or application, and the benefits of the HPL innovation are not easily available to other BUs.

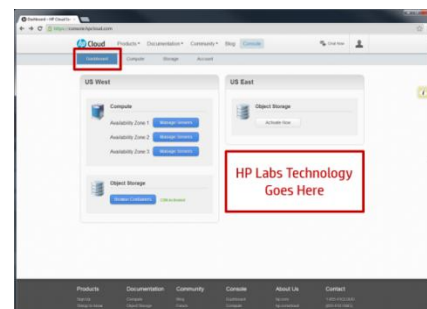
In this paper we are proposing new ways of monetizing HP Labs technology through HP Cloud Services. More precisely, we are demonstrating how HP Labs Intellectual Property (IP) can be offered as services through HP Cloud Services, by “cloudifying” it. This allows HP Labs innovations to be easily used by multiple Business Units and HP Partners, potentially enabling a wide variety of applications and solutions.

## Our solution

In this paper we present two approaches for unlocking HP Labs technology on HP Cloud Services (HPCS): indirect monetization via the “Solution Partners” track and direct monetization via the “Dashboard” track. Figure 1 shows how the two types are exposed in the HP Cloud Services User Interface (UI).



(a): "Solution Partners" Indirect Integration.



(b) "Dashboard" Direct Integration.

Figure 1: Integrating HP Labs technology on HP Cloud Services.

## “Solution Partners” Track

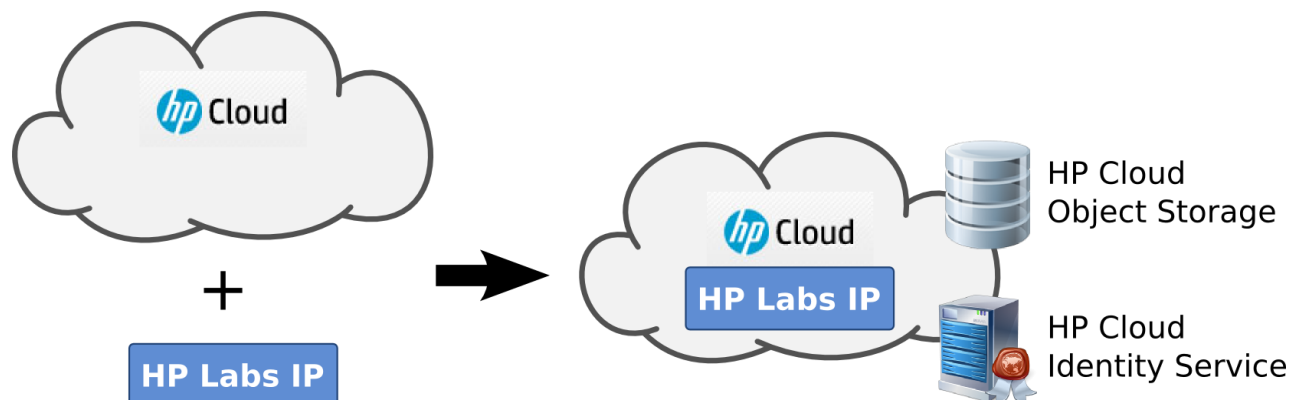


Figure 2: "Cloudifying" HP Labs Technologies.

In the Indirect or “Solution Partners” track, the HP Labs technology is listed in the “Solution Partners” <https://www.hpcloud.com/partners/solution/list> on the HP Cloud Services website. Each technology is part of a “Partner Category” and a one-page description of the technology is provided. In this track the technology is deployed on public HP Cloud servers and offered to the customers as a service through various kinds of APIs (Application Programming Interface). The customer indirectly pays for the access to services via charges against the customer cloud computing instances. Figure 2 shows the process of “cloudifying” HP Labs IP by adding the technology to the HP Cloud Platform and integrating it with HP Cloud storage and identity services.

### Integration with HP Cloud Identity Service

Additionally, the service can be integrated with the HPCS Identity Service. This allows for the service to verify the identity of the caller and track the usage of the service. This integration requires a connection to an HPCS private identity server using a server certificate and special firewall configuration. Once the connection is established, customers append tokens to each service request and the tokens are verified by the service backend.

### Integration with HP Cloud Object Store Service

Moreover, the service can also be integrated with the HPCS Object Storage Service. This integration allows the service to leverage the customer’s Object Store for storing input, output, and intermediate data of the service. Integration with the Object Store Service is a natural next step after integration with the Identity Service, as the token provided by the customer can be used to access customer’s storage containers. This is another straightforward approach to monetizing a technology, as the customers directly pay for the usage of the storage containers (and indirectly, for access to the HP Labs service). Figure 3 shows the integration of HP Labs technology with the HP Cloud Identity and Object Store Service.

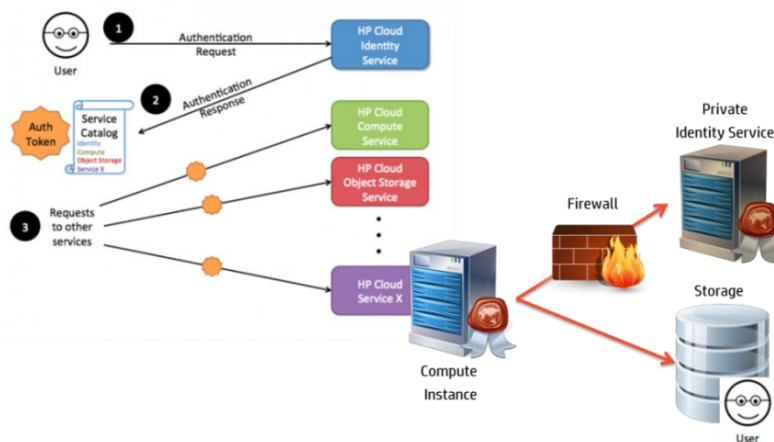


Figure 3: Integration of HP Labs technology with HP Cloud Identity and Object Store Service.

## **“Dashboard” Track**

In the Direct, or “Dashboard” track, the HP Labs technology can be deeply integrated with the HP Cloud Services platform. This allows for the technology to be listed as a first-class citizen of the HPCS platform alongside the Compute, Storage and other major services offered by HPCS. Customers are directly billed for using the service. In this track, the service is deployed on HPCS private machines, instead of public instances. Besides the deployment requirements, multiple configuration phases are required. These configuration phases include: (1) Service Self-Registration Account, (2) Service Registration, (3) Service Activation, (4) Endpoint Registration, (5) Role Registration, (6) Middleware Configuration, (7) Billing Configuration, (8) Service Dependency Configuration, (9) External Control Service configuration, (10) Management Console Design, (11) Provisioning/De-provisioning Configuration.

## **Evidence the solution works**

To prove that the integration methods presented here work, we integrated the Multimedia Analytics Platform (MAP) developed by the Multimedia Understanding and Interaction Research Group in the Printing and Content Delivery Lab at HP Labs onto the HP Cloud Services. For MAP we choose the “Solution Partners” track and as of October 1<sup>st</sup>, 2012, the MAP platform is live in Beta at <https://www.hpcloud.com/partner/hp-labs-multimedia-analytics>. A more detailed description of MAP integration on the HPCS is available in [1].

## **Competitive approaches**

Competitive approaches to leverage HP Labs innovation include: technology transfer to Business Unit, IP Licensing, and starting new Business Unit.

Technology transfer to a Business Unit has the benefit of leveraging the domain-specific knowledge in the BU, and keeping the innovation “in house”. However BUs are beholden to shorter term results, and often want to see evidence that the HP Labs innovation has adequate business value prior to adoption. IP licensing presents a lower-cost, high-ROI path to monetization, but suffers from the concern that we are leveling the playing field with our competitors, and can have long lead times. Starting a new Business Unit to take advantage of HP Labs innovation requires long lead times, deep pockets, and a comprehensive research program with output worthy of BU creation.

## **Current status**

We currently have laid out the two tracks, direct and indirect, of integrating HP Labs technology on HP Cloud Services. We walked through all the steps of the “Partner Solutions” integration track and as a proof of concept we deployed the Multimedia Analytics Platform in the Partner Ecosystem on HPCS. We identified the major steps of integrating a technology through the “Dashboard” track and we are currently working through the steps.

Moreover, we are currently holding seminars and offering consulting to several other groups in HP Labs to use our work as a template. Finally, by the Tech Con time, we plan to have a set of components ready to use for other groups to leverage in order to deploy their services to HP Cloud.

## **Next steps**

As next steps, we are identifying additional textual and image-oriented analytics to be unlocked as cloud services. We are also working with other researchers on graphical services composition [2] and cloud agent [3] approaches. Lastly, we plan to transition an existing Facebook AutoPhotobook application and iPad Photobook Lite tablet application to employ these services as demonstrators and examples.

## **References**

- [1] HP Labs Multimedia Analytic Platform on HP Cloud Services, TechCon 2013 submission.
- [2] The CCloud Application Services Platform (CLASP), Tech Con 2013 submission.
- [3] Cloud Agents: A Lightweight Platform for IT Automation, Tech Con 2013 submission.