BROADCASTING FROM THE CLOUD

USING CLOUD INFRASTRUCTURE TO FULFIL BROADCASTER NEEDS

The cloud concept involves **scalable deployment models** for **virtualized services** on generic IT-hardware. Virtualization of services using a **hybrid cloud** setup will optimize resources and minimize operational costs by elastically changing the amount of encoding or distribution nodes/tasks in a private and public cloud. Potential benefits include:

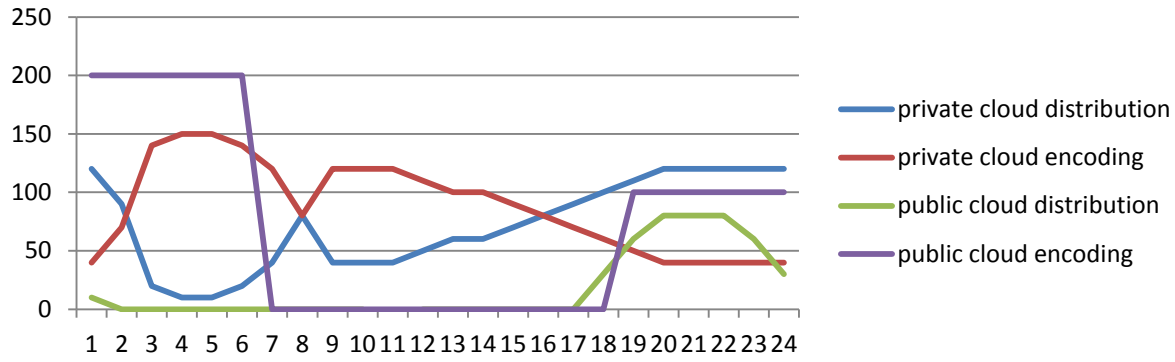
- a payoff when choosing wisely between temporarily rented and structurally allocated capacity
- flexibility that allows a broadcaster to adapt to the sudden growth in popularity for a service, as one can temporarily upscale the capacity
- more transparent costs, as capacity can be allocated to specific projects rather than to the infrastructure as a whole

BROADCASTER USE CASE

For this demo our imaginary broadcaster needs to efficiently allocate resources to three main content flows related to online delivery:

1. Encoding of a constant flow of files for publication in multiscreen on-demand services
2. Serving a variable amount of concurrent users accessing published content in online on-demand services during the day
3. Transcoding of an archive library for on-demand services

The first operation requires a constant capacity; the second typically peaks during the prime viewing period in the evening; and the third is not a daily routine but more a one-time effort with a separately allocated budget. While it's relatively easy to allocate resources to a constant, predictable process, it doesn't make sense to install permanent servers for a one-time activity or to handle traffic peaks.



The total constant capacity of the private cloud/cluster can be used by different virtualized services throughout the day. The public cloud is used only for offloading distribution peaks or cost-efficient upscaling of transcoding jobs.

OPTIMIZING THE CLOUD FOR BROADCASTER USE

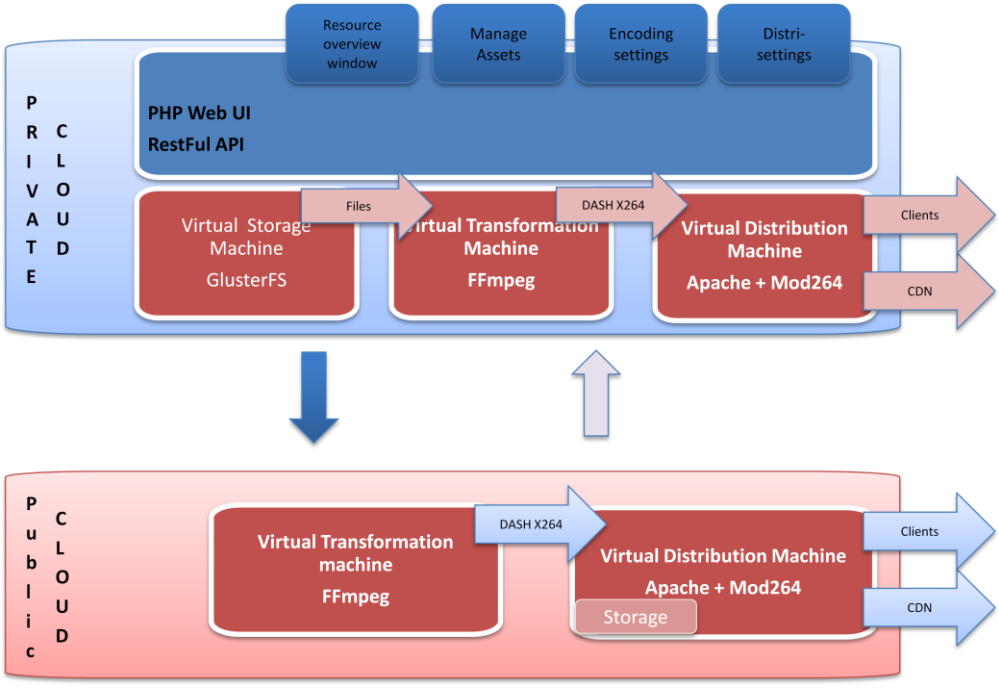
A hardware encoder or streaming server is optimized for its specific task, creating a higher output. The efficiency in the cloud lies in the fact that different processes can run on the same machines, meaning they don't lie idle when less capacity for one type of job is needed. Inefficiencies can also arise from the potential increase of network traffic between the nodes of your own infrastructure. The scheduling algorithm of the controlling (IaaS) software layer should lower network traffic by migrating strongly coupled virtualized services to the same host or next to each other.

When installed directly on generic servers the software used in our IBC demo can maximize the output of those machines. It does not use an IaaS layer but gives us more control as we are able to directly allocate the CPU, RAM, storage and network capacity to encoding or distribution tasks. Both encoding and distribution operations can run in parallel as CPU capacity is needed for encoding while network capacity is core for the distribution. The demo shows how a more optimal allocation of these capacities can be reached for the delivery chain from encoding and distribution using a hybrid cloud setup.

FREE CLOUD INFRASTRUCTURE FOR ENCODING TO DISTRIBUTION

The software used for the EBU demonstration at IBC 2013 is available without cost as open source software on the EBU GitHub (https://github.com/ebu/OSCIED). OSCIED stands for **Open Source Infrastructure for Encoding to Distribution**. This package can be used in many ways. One can install it directly on servers (minimum 2) creating a private cluster/setup, but it can also run on a cloud infrastructure (IaaS) like OpenStack or even on a simple desktop for testing purposes.

From such a private setup one can automatically install virtual encoding or distribution machines in the public cloud or any other cloud infrastructure layer (See below). At IBC we've deployed two OSCIED instances in parallel (due to the low internet access capacity), where we have a full version installed on the private setup of 4 servers and use a full version in the public cloud (Amazon Elastic Compute Cloud).



FIND OUT MORE

For code or more information: https://github.com/ebu/OSCIED
EBU Strategic Programme: http://tech.ebu.ch/groups/bbn
Contact: tullemans@ebu.ch

The Open Source Cloud Infrastructure for Encoding to Distribution is a collaborative project of the EBU and hepia, the Geneva University of Applied Science (http://hepia.hesge.ch).