

facebook

A Day in the Life of a Facebook Photo

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A photograph of two men taking a selfie outdoors. The man on the left is holding a smartphone, and both are smiling. The background is slightly blurred, showing what appears to be a wooden structure or fence. The image has a dark, semi-transparent overlay.

968 million

daily users

2 Billion

photos shared daily

A photograph of four young women sitting at a wooden table outdoors, looking at a smartphone together. They are smiling and appear to be at a social gathering. The background is a blurred crowd of people. The image has a semi-transparent dark overlay.

100s of different devices

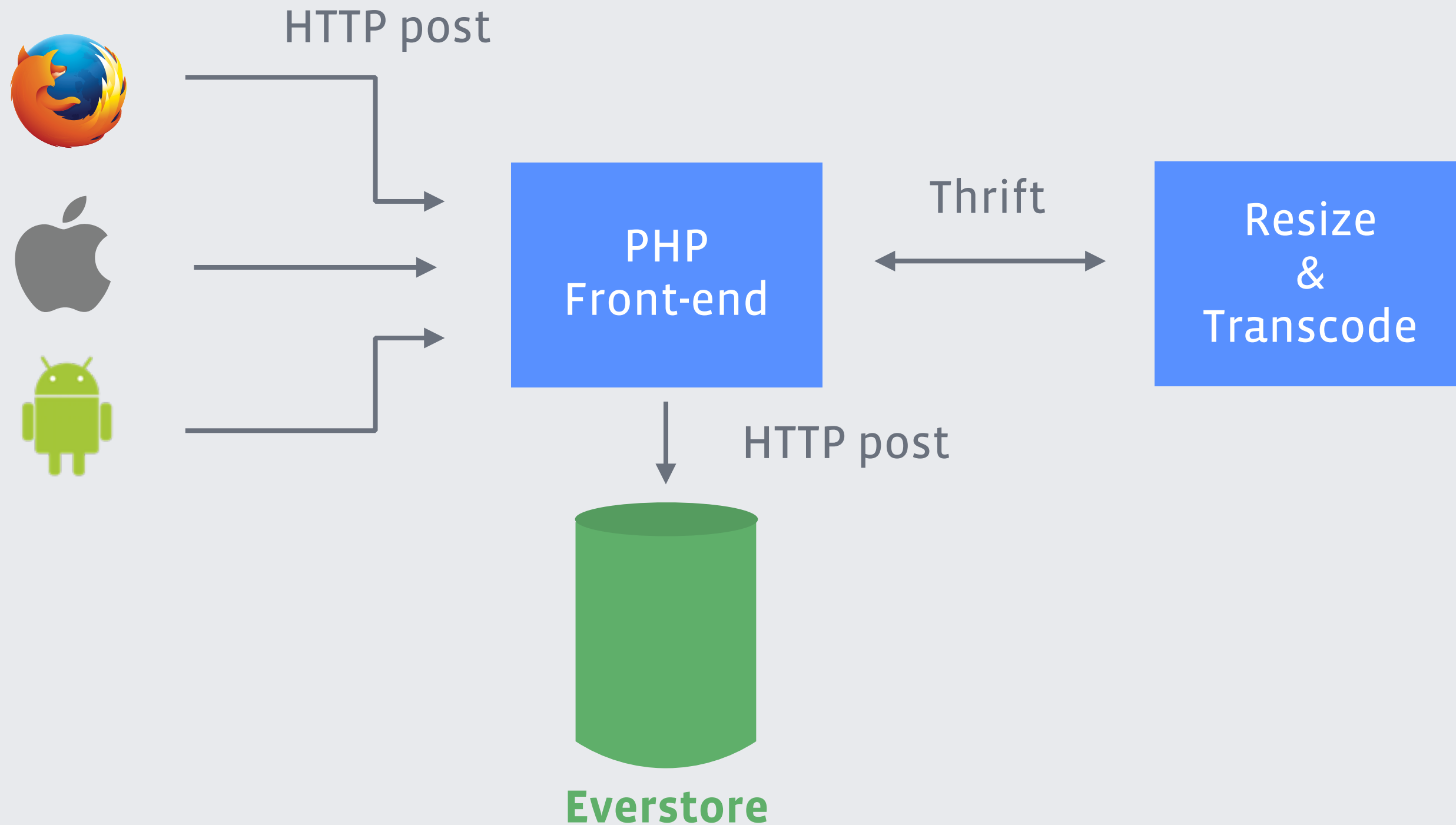
1,000s of locales/connection types

Massive distributed system

Requiring on-the-fly
resizing and transcoding

Basic architecture

Photo Upload



Resizing

On upload we target 960 or 2048

- function of input size & expected output resolutions

Custom resizing reconstruction filter

- Type of separable Lanczos filter
- Designed for speed & quality

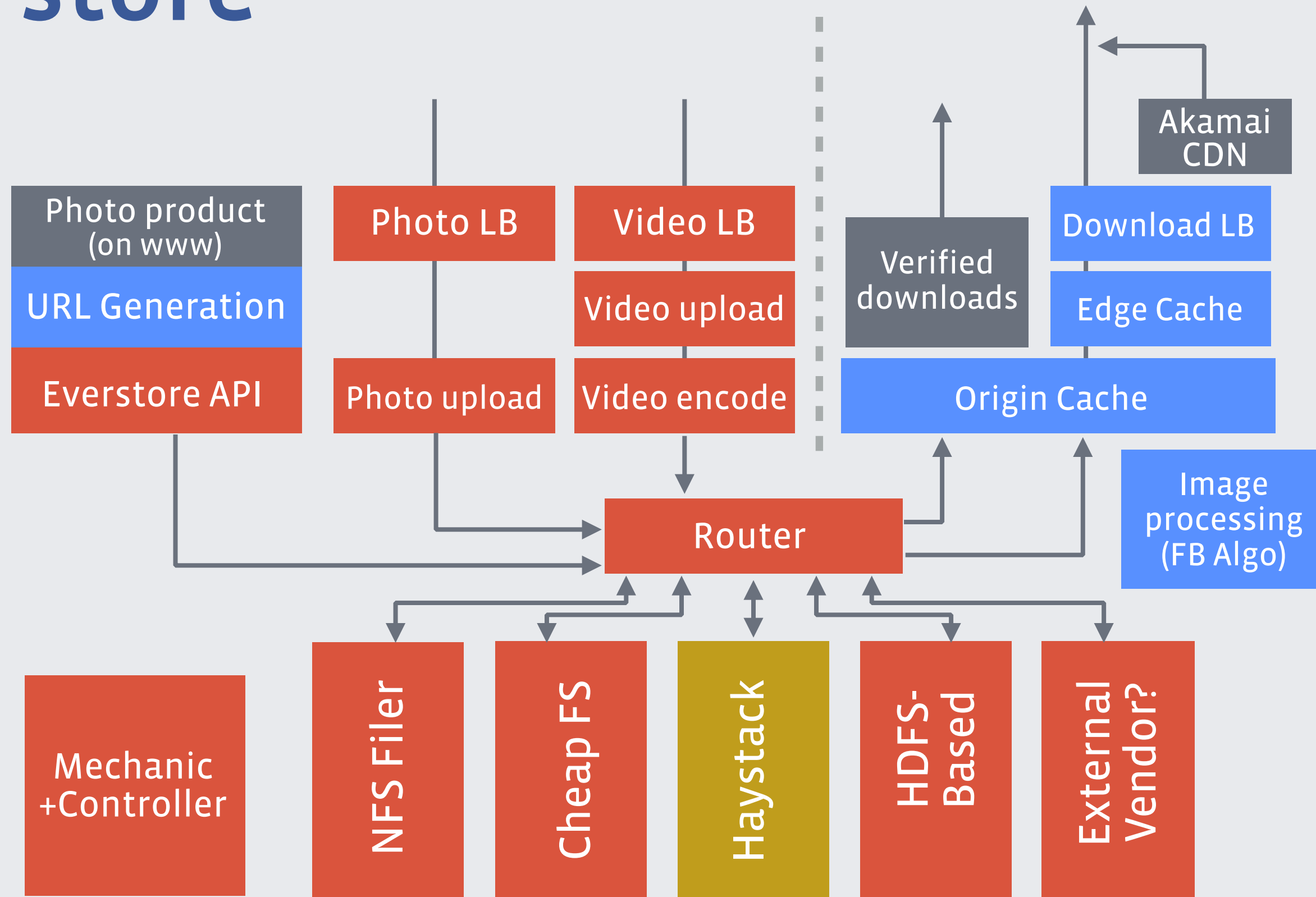
Resizing  re-transcode

Transcoding

We use PJPEG with custom tables

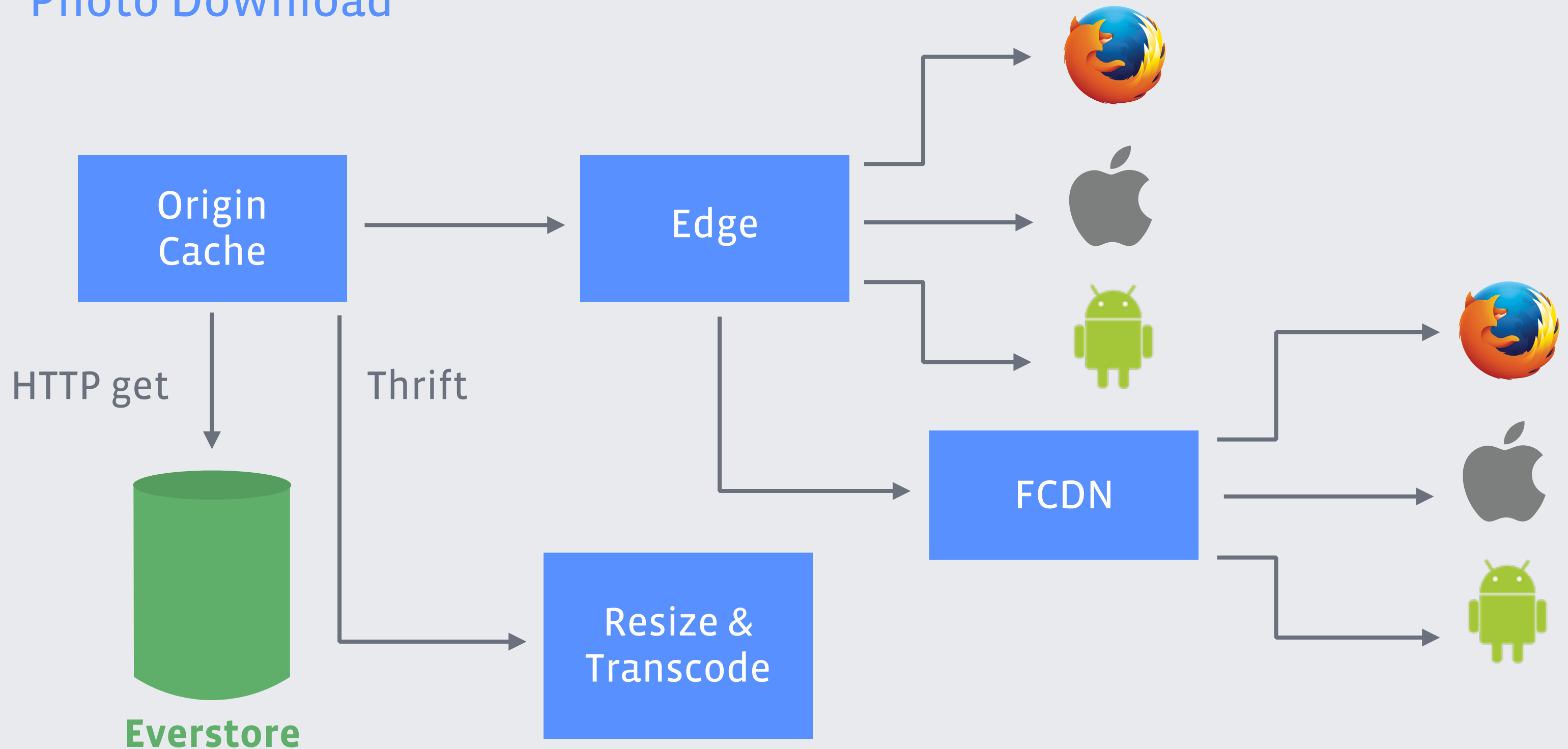
Extensive internal analysis showed that for most images PJPEG was hard to beat

Everstore



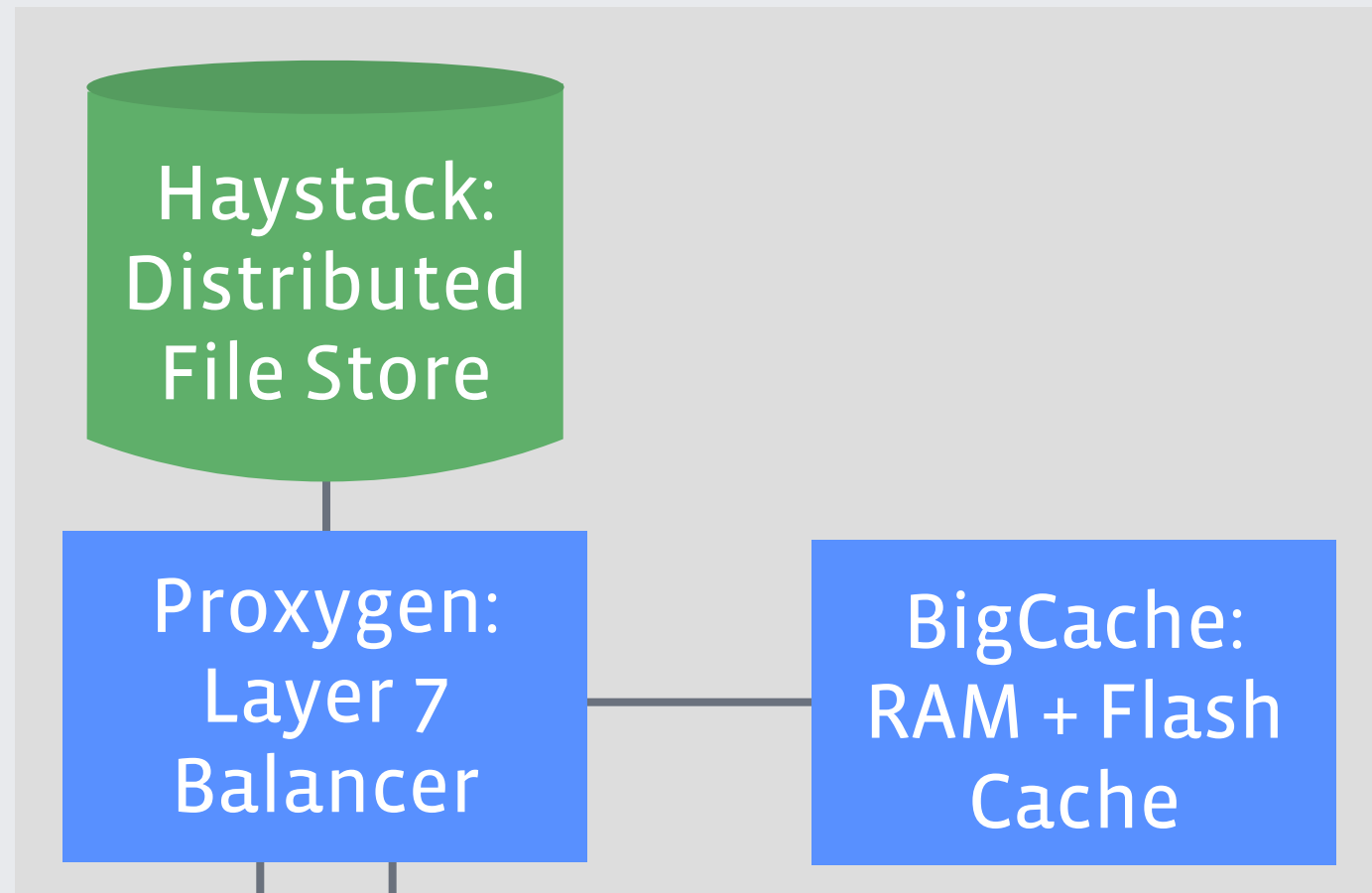
Basic architecture

Photo Download

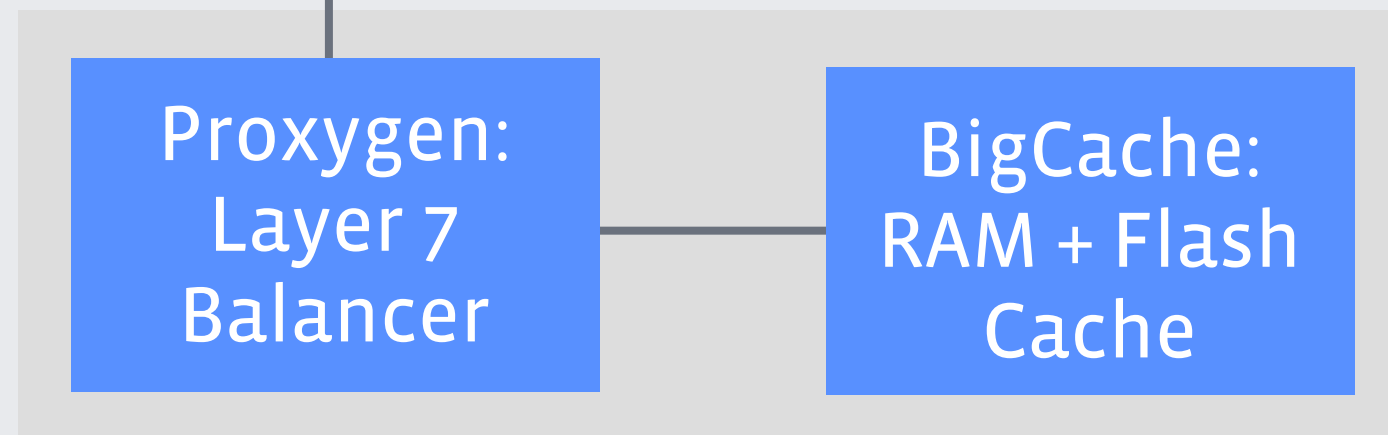


CDN Caching

Facebook Data Centers



Edge Network
dozens of PoPs
around the world



System design & development

Continuous design & development

Controlled rollouts

Extensive instrumentation



- Big spec, design, ... waterfall
- Extensive QA testing

Open questions

Can we do better than JPEG?

Can we eliminate intermediate processing?

Is there a way to arbitrarily deliver different sizes and quality?

How do GPUs and CPUs aggregate in the “large?”

Can we use image specific caching schemes?

Can we use ML to dynamically load adapt?

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