

## Case Study: Going mobile with Yahoo!

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### **Yahoo!'s Mobile Video Strategy**

Yahoo! is a global leader in web news and online content, and video is playing an ever increasing role in their product mix. Yahoo!'s online video experience covers a multitude of topics from fast breaking news to sports and entertainment.

Yahoo! has a consistent approach to online video. They lead off with an advertisement followed up by a sequence of 3-4 minute video clips. Once you start watching, the clips keep coming. Yahoo! keeps eyeballs focused on Yahoo! by playing a continuous line-up of relevant content and monetized with an occasional targeted advertisement.

Yahoo!'s mobile strategy is to transfer that same online experience to mobile. The Yahoo! mobile experience is dynamic, yet comfortably consistent and now in the palm of your hand.

### **The Challenge**

Yahoo! had built up a formidable online video presence when the decision was made to go after the mobile space.

That decision came with a multitude of challenges:

- Support an easy-to-maintain interface consistent with Yahoo! look and feel
- The need for highly scalable streaming facilities
- Manage constant content churn across at least 15 categories
- The ability and control to queue up advertisements and content playlists on mobile
- Adapt content to nearly 40 different formats to cover the handset mix
- Deliver video via RTSP, HTTP– progressive download from a single solution
- Provide a quality experience over EDGE, 3G and Wifi networks

Yahoo! first assembled a batch tool chain to ingest, transcode, and deliver the content. As simple as it sounds, it was quickly confirmed that it required too much effort to produce the 30-40 required outputs per content. Furthermore the pace of change in the content

line up made it clear that automation and real-time content determination and on-demand transcoding were going to drive the solution. While the home-grown solution produced good high quality results, it was clear that it was not going to scale into a production system.

First solutions are rarely the ultimate solution and Yahoo! set about searching for a new one.

Yahoo! was looking for a programmable solution that could ingest almost any source content and deliver it to nearly any handset on the market.

## Key Requirements

**Scalability:** The solution needed to initially serve 5000 concurrent sessions and keep growing.

**Flexibility:** The solution had to be flexible enough to support and integrate into the Yahoo! Experience, and support a wide range of wireless devices.

**Real time targeting of content and ads:** The solution had to allow Yahoo! to determine which content and targeted ads to use per user in real time.

**Automated transcoding:** The solution had to automate the transcoding of nearly 40 outputs per clip.

**Customizable:** The solution had to be customizable by Yahoo! to provide usage analytics in real-time and integrate with their proprietary content security.

**Software only solution:** The solution had to run on existing, inexpensive off-the-shelf hardware.

## The Solution

The Dilithium Content Adaptor (DCA) met and exceeded Yahoo's requirements. The solution below shows how the DCA enables Yahoo! to deliver a dynamic video experience across a wide variety of handsets.



The DCA was built from the ground up to perform real-time, on-demand transcoding for mobile devices. For Yahoo! that means total automation of the nearly 40 content transcodings per clip. Since DCA transcodes on-demand, the first user to request new content automatically triggers the transcoding. On-demand preserves the time sensitivity of news items and reduces pressure on operation centers.

The software based solution runs on off the shelf servers, eliminating the need to add more hardware and complexity to the network.

The breadth and depth of the DCA's transcoding capabilities means that Yahoo! can support all the popular internet-enabled handsets from a single platform. This instantly expanded Yahoo!'s reach to iPhone OS 2.0, BlackBerry, Android, Palm, Nokia, Samsung and most 2.5 and 3G handsets.

The DCA provides smart caching as a part of its scaling solution. In order to reach maximum session capacity per server, the DCA 'remembers' what it has transcoded. Once content has been adapted to one of the 40 outputs, it is stored in cache. All future requests are served from cache resulting in a much higher server throughput.

More importantly, the DCA's ability to seamlessly stream clip after clip as a playlist rather than returning the user to the WAP interface again and again gave Yahoo! the ability to match the key online viewing experience on mobile.

The DCA's flexible URL-based API and scriptable interfaces provided Yahoo!' the ability to serve targeted ads and custom playlists in real time on a per user per call basis.

The same API allows Yahoo! to serve content at different bit rates, frame rates and codecs to provide a quality experience for all networks - EDGE, 3G and wifi.

The DCA's clientless approach to all mobile delivery allowed Yahoo! total freedom to design and maintain a WAP application of their choice. Then, through standard HTTP and URL coding, Yahoo could invoke the DCA to serve content as needed.

Due to the open platform approach, Yahoo! was able to integrate their content security scheme on the DCA without professional services.

And the DCA grows as Yahoo! video traffic grows. DCA is deployed on standard Intel-based servers with no custom hardware or expensive DSP requirements. This allows Yahoo! the ability to optimize and plan their server resources more effectively.

Dilithium is the leader in mobile video adaptation and delivery. Dilithium products are deployed in more than 160 companies worldwide. Dilithium products and global support span the globe over six continents.

## **The iPhone Bonus**

Dilithium's DCA was the first to support real-time streaming to the iPhone. The DCA made the impossible possible by making any content streamable to iPhone version 2.0 – the version that did not support streaming.

The aggressiveness and commitment to support early versions of iPhone was a boon for the Yahoo! Experience. Suddenly, Yahoo! was winning in a game that no one else could play.

## **Results**

Yahoo! is unparalleled in understanding what to give the customer and how to keep their 600 million customers visiting every day. The DCA supported the Yahoo mobile strategy by providing real-time, on-demand any-to-any content adaptation, enabling delivery of the widest range of content to the widest range of devices. Support for new wireless devices and new releases for existing devices were achieved quickly and easily. Large savings in storage were achieved as content no longer needed to be stored in multiple formats and continually transcoded. The DCA smart caching ability allowed for much higher server throughput. Finally, no additional or new hardware needed to be added to the network since the DCA runs on off the shelf servers.

Yahoo! continues to evolve its mobile video strategy. Dilithium's DCA is playing a major role by enabling Yahoo! to deploy additional revenue generating services and applications with advanced technical features such as live streaming, Caching, Stream splitting, Dynamic Bit Rate Adaptation and full-featured iPhone OS3.

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