

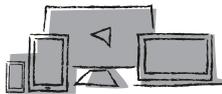
TV CDNs for service providers:

BUILDING A TV CDN SERVICE FOR **BROADCASTERS AND CONTENT OWNERS**

WHY OFFER A TV CDN SERVICE?

If you provide communications services to broadcasters and TV content owners then you might be best-placed to deliver their TV content by building and running your own TV CDN service.

	GENERAL CDN	TV CDN
PC Software updates	✓	✗
Best effort TV	✓	✗
Optimized for TV	✗	✓
Built for real-time TV delivery	✗	✓
Controlled quality	✗	✓
Economy of scale	✗	✓



HOW CAN EDGEWARE MAKE YOUR TV CDN DIFFERENT?

CASE STUDY 1:

A national telecoms operator in Europe uses its Edgware TV delivery infrastructure to deliver TV over broadband for the national public broadcaster, providing live TV, catch-up and network-based PVR services. It has located TV edge servers in over 100 points within its network around the country and shares their capacity across both its own TV services and the broadcaster's.



What's wrong with existing CDN services?

General-purpose CDNs were developed to help distribute large amounts of frequently used content – such as PC software updates – but they were not optimized for TV. They often deliver their content via lowest-cost peering points or from wherever they have spare storage capacity – and they are not built for real-time service delivery. They offer no economies of scale, new services are hard to add and content owners often lose control over the quality of their viewers' experience. You can offer them a purpose-built TV CDN service that will deliver a far better experience for their viewers – at lower costs – than a conventional CDN.

When does it make most sense to offer a TV CDN service?

Developing your own TV CDN service makes most economic sense when your infrastructure footprint is closely matched to one or more broadcasters. For example, if you are a national service provider, most of your national broadcasters' will have viewers sharing the same geographic footprint as your infrastructure. Most of these viewers will be watching the same content. You will probably have greater density and more points-of-presence than general-purpose global CDN providers, so you can deliver TV more effectively than they can. You can cache content deeper in your network, closer to your customers' viewers, saving network transport costs and delivering higher performance.

An Edgware TV CDN offers you:

- **An amazing viewing experience**
With low-latency, guaranteed resources and no buffering, your TV CDN service can easily add new services such as Live-TV, Time-shift TV, Ad Insertion, Cloud DVR, Encryption and Fast Channel Change – all from one shared platform.
- **Insight and control**
You can give your customers a unique insight into their viewers' behavior, because you can correlate viewing analytics with network performance. So now they can understand what is really happening to their content delivery. Each customer can upload, schedule and manage their own recordings. And you can use routing rules to control restricted content for your customers.
- **The cost-effective way to scale**
A TV CDN service can scale to huge levels of take-up – without huge levels of cost. That's because it uses a unique architecture to scale different functions in different ways.

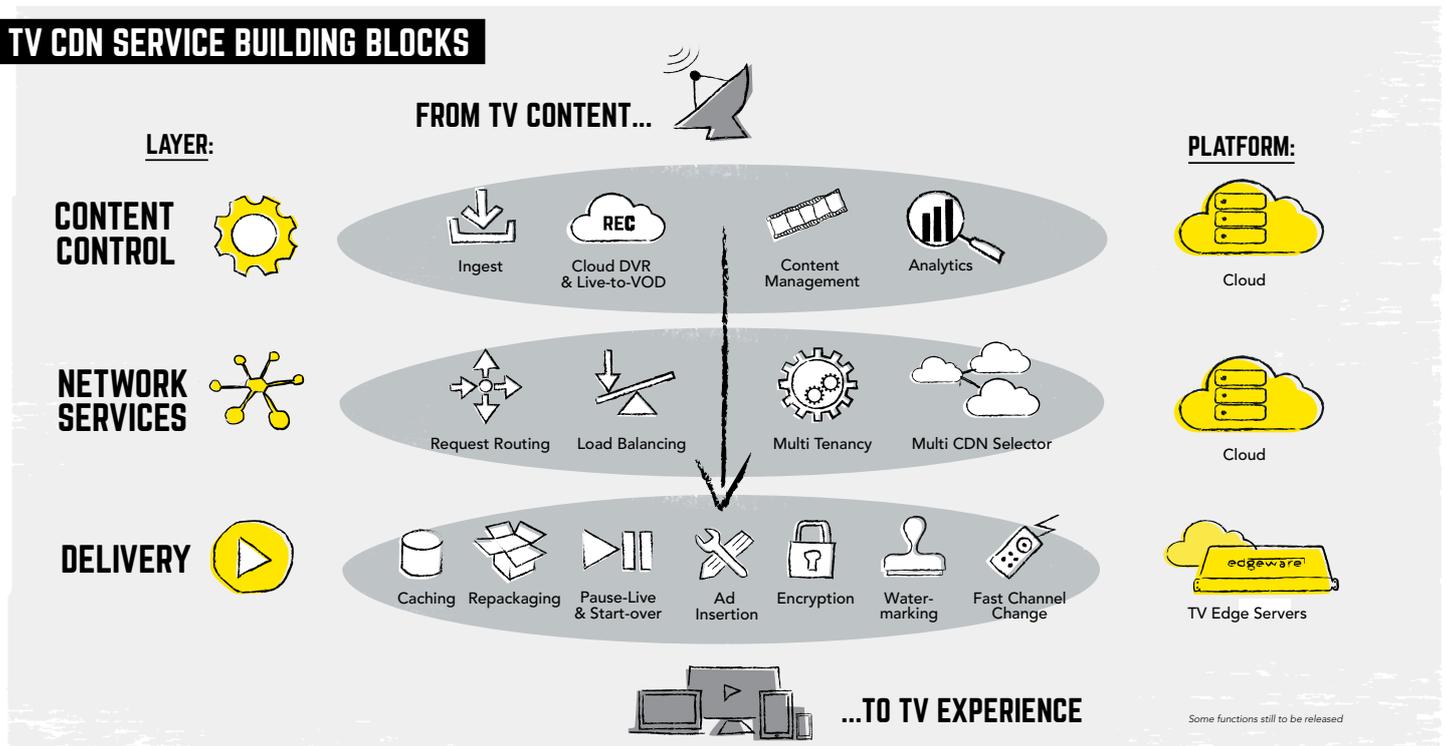
BUILDING YOUR TV CDN

To build your TV CDN service, you'll need to add a number of different functions to your existing network, BSS systems and billing capabilities.

Functions that are content related – such as Ingest, Content Management and creating Live-to-VOD and Catch-up TV content – need to scale to support large volumes of TV assets. Edgware delivers these functions in software, with its Content Control Layer. These functions can be run on your existing data center or cloud IT infrastructure. The capacity of these functions can be segmented across your different tenants, offering each a different number of channels or storage periods for catch-up TV, for example.

For small-scale service take-up, or initial roll-outs, this software layer can also deliver TV streams directly to viewers. But to scale to higher volumes, the delivery architecture must be distributed.

TV CDN SERVICE BUILDING BLOCKS



Network services connect the Content Control Layer to a distributed edge. These services include request routing, load balancing and support for multi-tenancy. These functions need to scale to very large volumes of viewing requests – characterized by many small transactions – and are delivered with a software based routing layer, that also runs on your standard IT or cloud infrastructure. This layer uses a TCP stack optimized for TV, that can correlate viewing analytics to network behavior.

To create personalized TV streams for huge numbers of viewers, Edgware's Delivery Layer uses distributed TV Edge Servers located at peering points or in your own points-of-presence. The TV Edge Servers perform functions such as streaming, caching, repackaging, pause-live TV, ad insertion and encryption. You can use general-purpose servers at the edge, or take advantage of hardware accelerated TV Edge servers, that can support multiple services without suffering from CPU bottlenecks between storage and network delivery. This enables a unique deterministic experience for the viewer – so that you can deliver TV streams without buffering or delays.

The architecture can deliver multicast (IPTV) and unicast (OTT) services simultaneously, as well as 4k and 8k TV Ultra High Definition formats, and is even ready for Virtual Reality TV services.

TIME FOR A TV CDN SERVICE

CASE STUDY 2:

A regional service provider in central Europe uses its Edgware TV delivery infrastructure to deliver a wholesale TV streaming service for smaller content owners in the region. It has located TV edge servers in a number of internet peering points and sells TV streaming capacity on an 'as-needed' basis.



Edgware Multitenant TV CDN gives you:

- ✓ Unique management interface for tenants and network operators (e.g. for tenants to upload content or schedule recording)
- ✓ Early indicators of potential bottleneck in resources based on advanced forecasting and trend analysis
- ✓ Instant expansion of capacity (streaming and storage) in edge caches by simply unlocking license keys
- ✓ Access to monitoring and reporting dashboard for each tenant
- ✓ Weekly or monthly reporting in PDF for both tenants and operators (e.g. content and viewer behavior, cache miss, etc.)
- ✓ Enforcement of content policies and control such as geo or device blocking and concurrency session
- ✓ Ability to route traffic to third party CDNs via CDN Selector
- ✓ External origins can be added through API

EDGEWARE HAS BUILT MORE TV CONTENT DELIVERY NETWORKS THAN ANYONE ELSE

Edgware has already built over 100 TV delivery networks around the world – more than any other vendor – for network operators (such as KPN, Telia Company, Cincinnati Bell and Vodafone), cable companies (such as Televisa) and content owners and broadcasters (such as TVB Hong Kong).

If you provide services to the media industry, Edgware can help you create a new service proposition – a TV CDN service – that scales cost-effectively, gives your customers unique visibility into how their viewers are experiencing their content and, most important of all, delivers an amazing viewing experience.



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