Video and The Edge…

Service Providers have a continuous need to supply the continuing demand for bandwidth, especially in the Video arena. In this white paper, we will consider 'Video' to be both Video on Demand, Television, as well as Audio only services such as podcasts and Radio.

Customers are wanting to watch video on many different devices, and more often than not, a family will be wanting to watch different Video at the same time on multiple devices, from IP Connected Smart Televisions to other Portable Electronic Devices (Phones and Tablets).

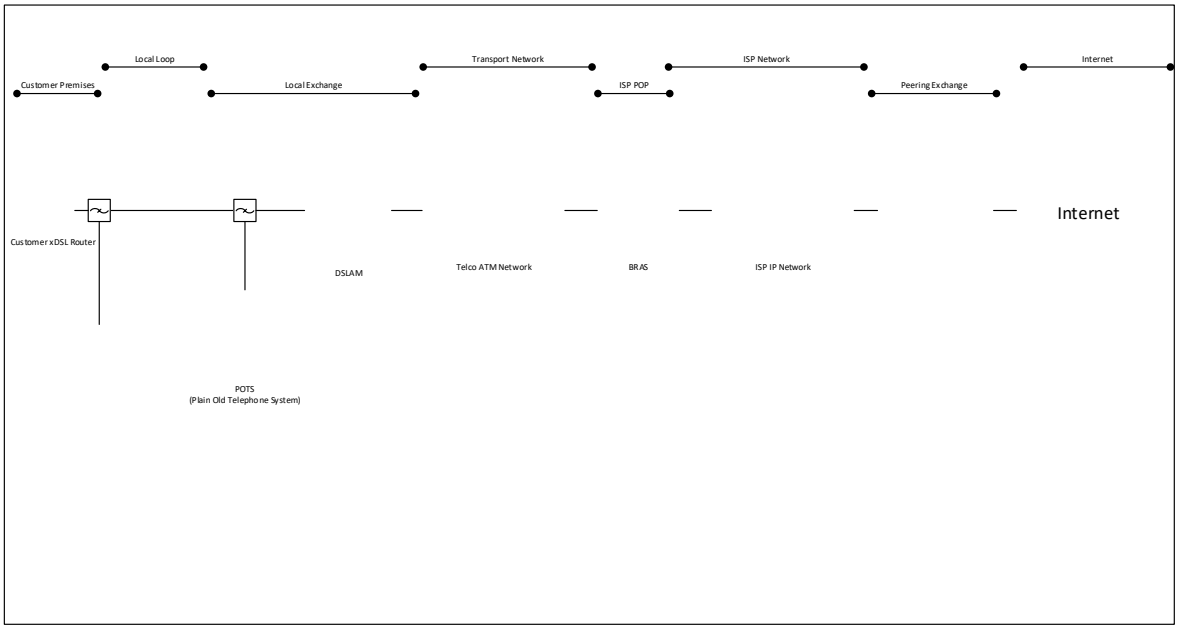
Traditionally, Video has been delivered and consumed using a broadcast RF (Radio Frequency) model, such as VHF/UHF/DVB-T, or Cable (DVB-C). However, customers are demanding Video on IP connected devices.

This shift to IP connected devices puts stresses on ISP networks. BFBS Media Innovation has delivered products to help alleviate the IP challenges both with local IPTV headends and IPTV Edge servers.

Let us first explore some different ISP topologies and where BFBS Media Innovation can deliver solutions.

The Legacy xDSL (ATM) Model

This first generation model of xDSL networks has delivered IP and POTS to end customers in a reliable way, but has its limitations.



First Generation ATM DSLAM and the ISP

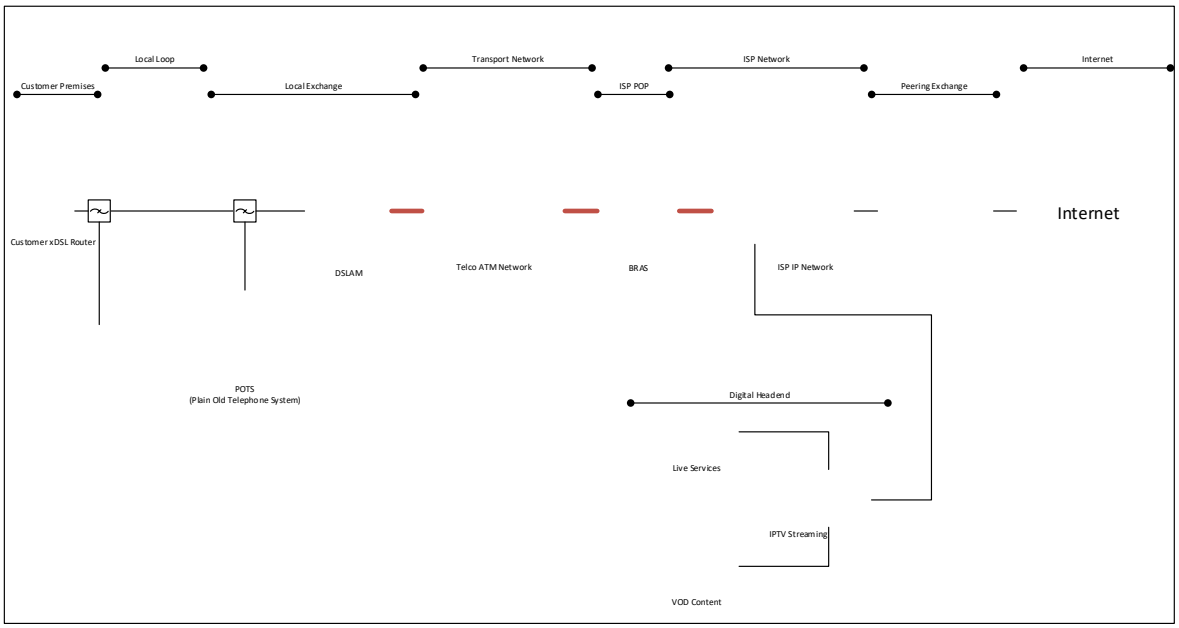
This Legacy xDSL network, or first generation xDSL network uses a pure ATM network at the distribution or transport layer to backhaul the traffic from the DSLAM (Digital Subscriber Line Access Multiplex) to the BRAS (Broadband Remote Access Server). IP (Internet Protocol) is used downstream from the Customer xDSL Router and upstream from the BRAS.

The Challenges to the ISP include managing their upstream peering/transit/internet bandwidth. With traditional web traffic, the use of caching servers at the ISP Core help

reduce the traffic on the ISP upstream as the identical customer requests can satisfied by a single upstream request.

However, with Video, especially Live services, this is not always possible. Within this scenario BFBS Media Innovation can provide a MiPlayer Digital IPTV Headend at the ISP to deliver Live and catch-up TV/Radio services, local VOD (Video on Demand) services, as well as catch-up services for TV and Radio.

This local IPTV Digital Headend will typically take live Video from Satellite or Terrestrial DVB sources and transcode, package, and stream the channels, combined with locally ingested VOD material.



ISP Local Digital Headend IPTV Services

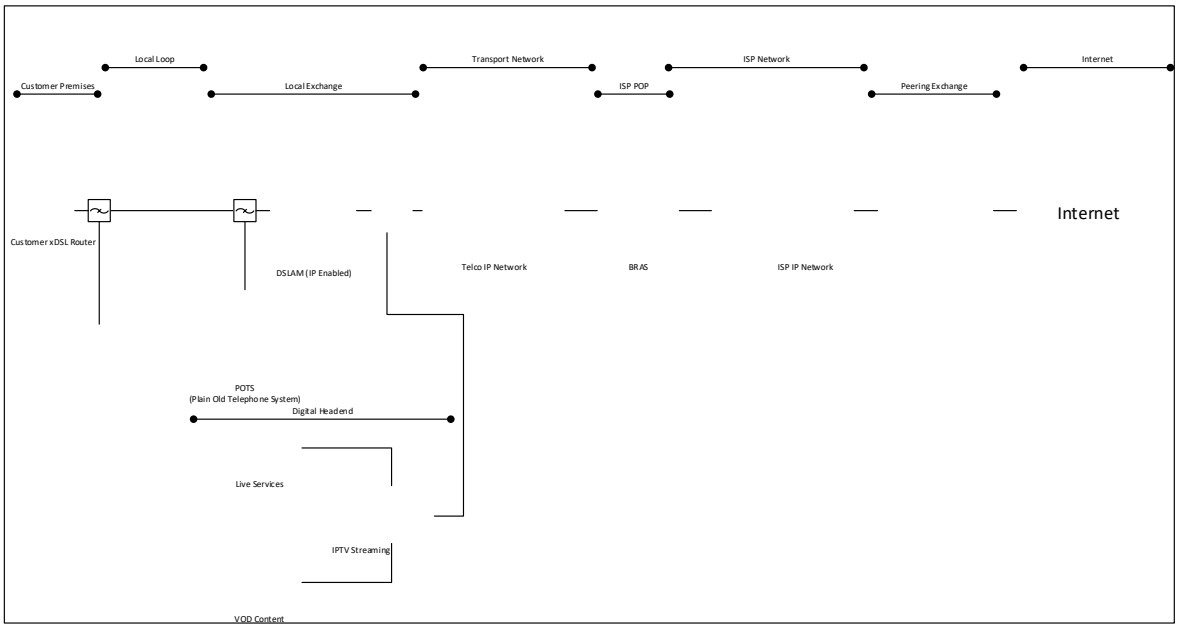
This solution reduces the load on the ISP's upstream connections. If 1000 customers are watching the same TV channel, assuming 2Mbps streaming, then 2Gbps of upstream connectivity is freed up by this solution. This delivers an immediate opex saving.

However, we still have the challenge of delivering the 2Gbps over the TDB (Transport/Distribution/Backhaul) ATM Network. Unfortunately, in this first generation xDSL model, there is no possibility to break out IP at the exchange. The ISP Core is the IP Edge.

The IP DSLAM

The next development of the xDSL model was to migrate from an ATM Transport to an IP transport, using multiple 10G fibre Ethernet between DSLAM and BRAS, enabling much faster xDSL experiences for customers. This leads the local Exchange / DSLAM to be the IP Edge.

However, being able to inject Video at this new IP edge can still be important in reducing bandwidth requirements on the TDB and in larger networks this can be a significant opex reduction.

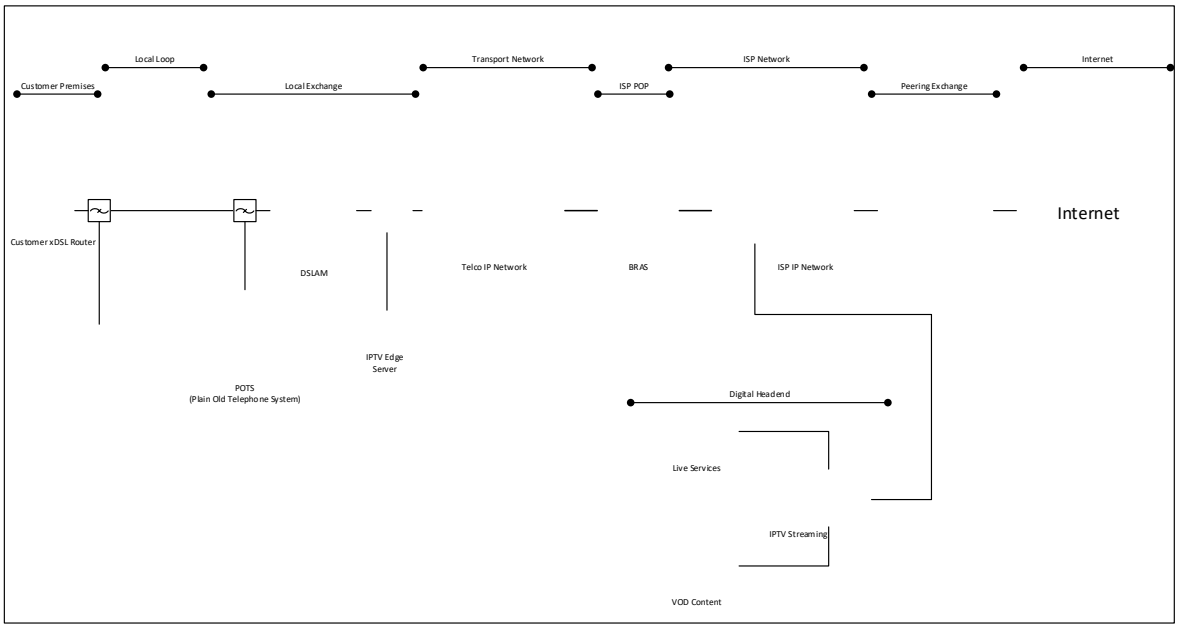


ISP Local Digital Headend IPTV Services at the Edge

This MiPlayer Digital IPTV Headend at the IP Edge (Exchange) can additionally provide local variants of services as well as customized local delivery, other direct revenue sources.

However, there is an intermediate solution that BFBS Media Innovation can provide – The MiPlayer Edge Server. The MiPlayer Edge Server will establish constant sessions with the Core MiPlayer IPTV Digital Headend (we call this the origin server). So, for 20 channels, 2Mbps streams, will be a constant 40Mbps data stream. Easily budgeted for and managed within the Bandwidth Budget for the TDB network.

The MiPlayer Edge Server can then serve all the local customer requests, so 1000 customer streams (2Gbps) would be handled and supplied locally without any dynamic or scaled load on the TDB network, leading to a more satisfied customer (lower latency, no 'buffering' due to contention on the TDB network).

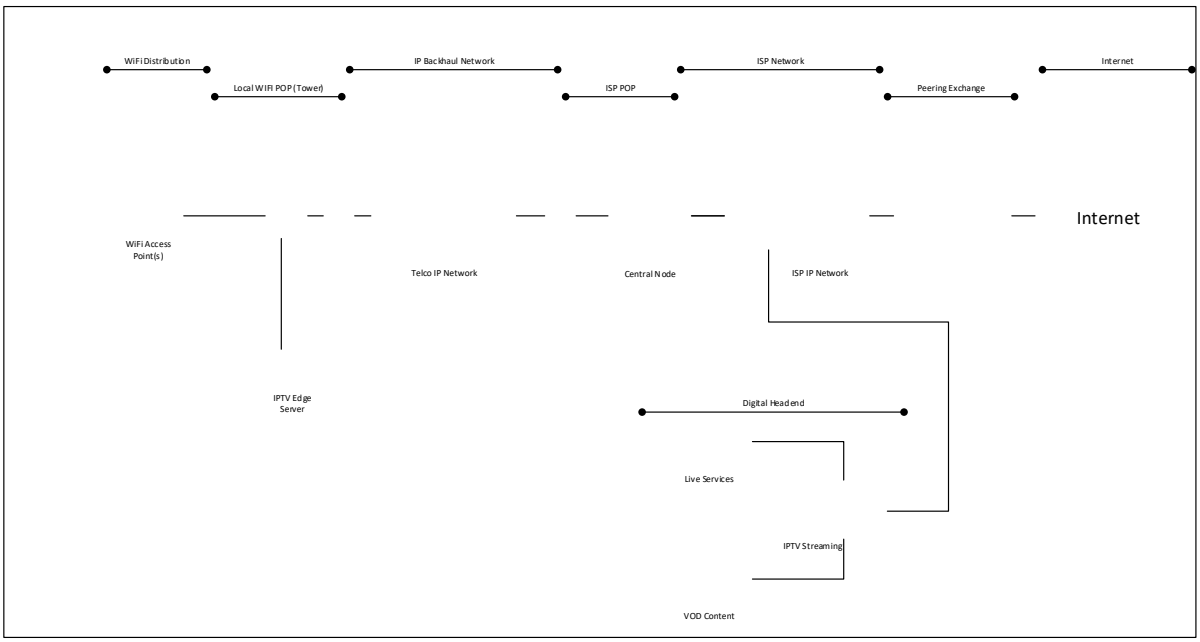


ISP Local Digital Headend IPTV Services

The MiPlayer Edge Server is not only much more cost effective than the full MiPlayer IPTV Digital Headend, as it does not need to ingest and transcode services, and does not need any DVB RF Distribution such as Satellite dishes etc; a much lower footprint, especially in collocated exchange premises is a definite cost advantage.

The WiFi-ISP

This ISP model often sees the most bandwidth challenges in the TDB network. Here, the local MiPlayer IPTV Digital Headend combined with MiPlayer Edge Servers can produce massive savings on Bandwidth and customer experience with Video services.



ISP Local Digital Headend IPTV Services

In this initial model, the MiPlayer Edge Server is deployed at the edge – the large customer premises, such as a school, library, or hot spot – thus delivering a Video solution with constant bandwidth over the backhaul regardless of the number of end users at the site.

In the particular solution of a WISP in a Rural Area, where Backhaul is used to link each Village back to a Central POP, the MiPlayer Edge Server situated in each Village delivers Video solutions to the end users, again with constant bandwidth requirements over the Backhaul links.

The Rural Telephony Edge

Complementing the MiPlayer Edge Server, the MiPlayer Telephony Edge Server is a new product from BFBS Media Innovation specifically targeted at the Rural Wifi WISP. This is in response to challenging Mobile coverage in Rural Areas. BFBS Media Innovation deliver a SIP Telephone exchange within the Edge Solution, allowing local calls at the edge, and SIP trunks to the Telco/ISP exchange. Again, this MiPlayer Edge solution keeps local calls within the village within the local IP network and does not impact the Backhaul network bandwidth. It also delivers lower latency for local calls by keeping the traffic local.

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