

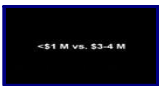

IPTV Deployment Considerations




This paper discusses IPTV in the context of a franchised operator and does not encompass ‘over-the-top video’ services, such as Hulu.com, YouTube, etc., which are often referred to as IPTV. In general, IPTV, in its current form, is difficult to justify for operators that are already providing cable television. The early adopters of IPTV have typically been telcos that want to add video services over their existing twisted-pair, outside plant infrastructure.

To date, most IPTV deployments have been over DSL or Fiber to the Home. Recently, there has been interest in putting IPTV networks over RF plant. This approach especially appeals to operators with both HFC and DSL plants (mostly independent telcos), as a common headend could potentially serve both networks.

The all-IP over RF approach also offers the potential for sharing costly Cable Modem Termination Systems (CMTS) as well as more efficiently utilizing bandwidth by allowing video, voice and data packets to share the same bandwidth. The potential cost savings of this type of approach is more significant for larger operations, as compared to smaller operations due to the increased number of CMTSs needed in a larger system and the aggregate bandwidth saving of serving more subscribers.

In summary, IPTV is still going through growing pains and the industry has not unified around standards and interoperability. Here are the key challenges that must be overcome in order for IPTV to catch up with Transparent Video Systems’ Digital RF Solution:

IPTV Challenges	TVS’ Digital RF Solution
<p>- Cost</p>	<p>With single stream set-tops at less than \$80 (including FCC mandated separable security) and Dual-Tuner HD PVRs for less than \$200, Transparent Video Systems meets the price points IPTV is still struggling to meet.</p> <div style="text-align: center;">  <p>A Less Capital Intensive Up...</p> </div>
<p>- Time to Market</p>	<p>Transparent Video has customers who have deployed complete digital RF solutions within 45 days of equipment order.</p> <div style="text-align: center;">  <p>Timeline to Implementation</p> </div>

IPTV Challenges	TVS' Digital RF Solution
<ul style="list-style-type: none"> - Reliability 	<p>With real world reliability of <0.5% set-top failures, TVS is much more reliable than IPTV systems deployed to date.</p> <div style="text-align: center;">  <p>Set-Top Reliability</p> </div>
<ul style="list-style-type: none"> - System interoperability 	<p>Based on DVB-C and MHP standards, TVS has proven interoperability with established suppliers that have been shipping millions of units per year to Asian and European markets.</p> <div style="text-align: center;">  <p>Open Standards</p> </div>
<ul style="list-style-type: none"> - Ability to add new features 	<p>The MHP platform, combined with a back-office provisioning and subscriber management services, allow small cable operators to create new services by breaking down the silos between voice, video, high-speed Internet and wireless.</p> <div style="text-align: center;">  <p>Ad Insertion and VOD</p> </div>

Questions:

1. [Doesn't combining telephony, Internet and video services onto one network result in lower overall equipment and on-going operational costs?](#)
2. [Because IPTV is based on Internet Protocol, isn't it standardized?](#)
3. [Aren't all operators going with IPTV?](#)
4. [Isn't it easier to add new interactive applications, such as Caller ID on TV, social networking functionality \(e.g. instant messaging on TV\), to IPTV systems than a Digital RF system?](#)
5. [Does an operator have content rights for IPTV?](#)
6. [How long does it take to implement IPTV?](#)
7. [What about FCC mandated separable security?](#)

1) Doesn't combining telephony, Internet and video services onto one network result in lower overall equipment and on-going operational costs?

The promise of IPTV is that it is more efficient to serve up all services on one network resulting in potential cost savings. Potential savings result from less equipment and fewer outside plant

upgrades. The potential for cost savings is greater with larger systems, as the number of distributed CMTSs is reduced and the cost savings associated with using HFC bandwidth more efficiently is greater, as compared to small systems. Each network is unique, however, and all costs need to be accounted for including:

- The monthly and ongoing maintenances costs associated with middleware.
- The cost of home networking multiple set-tops within the household
- The relatively higher cost of the lower volume, IPTV set-top boxes.
- The cost of CMTSs versus the costs of purpose-built MPEG encoders and multiplexers.

Other key items, which factor into the total cost of ownership, include system reliability and the ability to add new applications.

2) Because IPTV is based on Internet Protocol, isn't it standardized?

There are multiple standards efforts underway, including that by the ATIS, IEEE and the DSL Forum that are slowly making progress. Still, there is no single organization leading the standardization efforts for IPTV and, as a result, much work needs to be done before vendors are building to the same specifications. As importantly, there is no organization, which ensures interoperability between IPTV equipment.

Interoperability testing has been limited to ecosystems that are generally centered on middleware providers. IPTV interoperability is a bigger challenge than a traditional RF approach to video, because the access equipment (DSLAMs and DSL modems) must support multicast. What this means is the matrix of equipment that must be tested is much greater than with RF systems (e.g. headend, middleware, billing, DSLAMs (CMTSs in the case of IPTV over RF), DSL (Cable Modems in the case of IPTV over RF) and set-tops).

In practice, what this means is that the middleware provider is almost in a constant testing mode, as it attempts to keep up with firmware and software revisions to its ecosystem partners' equipment. From an operational standpoint, this has been a big problem for operators that have deployed IPTV. Because of the lack of exhaustive interoperability testing, even minor changes in firmware in one of the network elements have caused outages and intermittent problems in IPTV networks.

3) Aren't all operators going with IPTV?

Not necessarily, as the benefits to IPTV depend a great deal upon an operator's starting point and, even so, two similar operators can come up with different approaches. Let us compare two high-profile operators, AT&T and Verizon, which started at similar points, but took entirely different approaches to delivering video. Neither of these entities had a franchised video

offering when they announced their video plans in 2004.

AT&T	Verizon
AT&T chose an IPTV approach for their video delivery network, as it allowed them to reuse their existing copper infrastructure.	Verizon, starting from a similar point, in terms of a legacy network, decided to overbuild and replace their copper network with a Fiber to the Home network that uses a hybrid RF/IP network. One fiber is for broadcast video, while the other fiber is for IP traffic (Telephony, Internet & VOD)
AT&T went with Microsoft's implementation of IPTV. This configuration is finely tuned for AT&T's network.	OCAP is one of the drivers behind Verizon's RF approach. They went with a variant of OCAP (along the lines of the original international standard, MHP) to ensure that their set-tops would be compatible with the interactive applications developed for cable television (TVS is based on the saem MHP standard).
250,000 subs (Q1 2008 estimate) – note AT&T announced their plans in June 2004)	1,000,000 (Q1 2008 estimate) – Verizon announced their video plans in Jan. 2004

4) Isn't it easier to add new interactive applications, such as Caller ID on TV and social networking functionality (e.g. instant messaging on TV), to IPTV systems than a Digital RF system?

In theory, IPTV should be ideal for taking web applications and repurposing them for the television. In reality, there have been a several obstacles to this sort application nirvana. First, the set-tops are often underpowered or may not support the proper plug-ins to take advantage of applications that already exist. Next, these existing applications are designed for the PC and not the television. Finally, the middleware provider typically has to ensure interoperability.

To this last point, the middleware provider is often the gating item in terms of rolling out new services. One middleware provider went 18 months without adding new features to their offering.

It is important to have a system that supports GEM (Globally Executable MHP) in order for applications that are bound to specific content owners' programs. Transparent Video Systems is working with a number of partners on the support of interactive applications, including those that provide the Internet to Television conversion at the headend, eliminating the need for memory-intensive middleware and the associated increases in set-top cost.

5) Does an operator have content rights for IPTV?

NCTC's original content rights were for content delivered over traditional HFC RF networks. In the early days of IPTV, some operators, that were already NCTC members, added IPTV without necessarily informing the programmers of the alternative (IPTV) way of content delivery. It is still not clear whether NCTC has content rights for IPTV delivery of MPEG-4. Acquiring MPEG-4/IPTV content rights is a somewhat low priority for NCTC, as their constituents primarily operate HFC cable plant.

A few years ago and for various reasons, NCTC adopted a moratorium on new memberships. Independent Telcos, that were not already providing cable television service, felt the impact of this moratorium. Other organizations, such as NRTC and Avail Media are filling this void by providing independent operators (primarily independent telcos) with content rights. With these solutions, the cost of content is higher as these organizations do not have subscriber volumes comparable to NCTC.

6) How long does it take to implement IPTV?

Some deployments have literally taken years. Part of the reason for this is the nascent nature of IPTV. Part of the reason for the long deployments cycles are the complexity of having to deal with multiple vendors and the aforementioned interoperability challenges. Organizations such as SES Americom, NRTC and Avail Media are addressing the long lead times by providing entire packages of equipment and content, primarily to independent telcos for deployment over their FTTH or DSL networks.

7) What about FCC mandated separable security?

Many early IPTV deployments did not deploy separable security. Many of these early adopters received waivers from the FCC regarding these requirements with the implicit understanding that separable security will eventually be mandatory, even for IPTV.

Additional References

- [The Challenge of IPTV According to Independent Telcos](#)
- [The Maturation of IPTV](#)
- [State of IPTV circa Feb 2006](#)