



November 4th, 2022

To,

Shri Anil Kumar Bharadwaj,
Advisor (B&CS)-II,
Telecom Regulatory Authority of India (TRAI)
Mahanagar Doorsanchar Bhawan
JLN Marg, Old Minto Road,
New Delhi – 110002, India

Subject: Comments on behalf of Den Networks Limited (**'DEN'**) on the Consultation Paper on “Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) (Fourth Amendment) Regulations, 2022 (**'CP'**).

Dear Sir,

We, Den, would like to express our gratitude towards the Telecom Regulatory Authority of India (*hereinafter referred as 'Authority'*) for providing us with the opportunity to share our comments on the CP.

The captioned CP is likewise a welcome step towards establishing a robust framework for Digital Management Rights for providing IPTV Services by proposing to include 'System Requirement for Digital Right Management (DRM)' as a new Schedule i.e. Schedule X in the Interconnection Regulations. At the outset, it is noted that the comments in this paper are premised on our understanding of the broadcasting and cable TV industry practices, its gradual growth over the decade and the current legislative structure. We humbly acknowledge and appreciate the efforts that the Authority has put

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forth in initiating a CP on such a significant issue that is in relation to the Telecommunication (Broadcasting And Cable) Services Interconnection (Addressable Systems) (Fourth Amendment) Regulations, 2022”.

It is stated that while we stand supportive of the vision that is envisioned by the Authority in this particular consultation paper as the Authority is conscious with the hanging dynamics of the technology and we must ensure that the regulations are such that they are in coherence with the change in technology in order to provide utmost satisfaction and benefits to the customers. Hence, it becomes necessary while incorporating the framework for the Digital Right Management that cautious measures are taken to reap utmost benefits in the future. Accordingly, we would like the authority to take note of the following submissions, before we provide the details of changes in the proposed Schedule X in the format desired by the Authority.

The CP proposes to limit IPTV transmission to multicast. Considering the techno-socio advancements being witnessed in the industry in the past decade, the distinction between various modes of transmission is diminishing. Hence, technology for delivery of IPTV services should not be limited to a particular mode, whether owned and/or under DPO's control, as long as DRM is able to ensure all major objectives of the authority are achieved which are as follows:

- i. Preventing Piracy
- ii. Consumer Interest with respect to Quality of Experience (QoE)
- iii. Seamless Technology (Network) aspect to deliver IPTV Service

In most jurisdictions primarily in the US & Europe, IPTV is not limited to Multicast transmission and is rather diverse. Therefore, in consonance to that being a developing nation we also request the authorities to adopt such futuristic practices for Consumer Benefit. **IPTV using unicast is more secure** since signal is delivered directly to the subscriber and hence there are negligible to zero chances of piracy.

To elucidate the same, it is pertinent to decipher the definition of IPTV Services as provided by TRAI in its Regulations: “Internet Protocol Television Service” or “IPTV service” means (i) **delivery of multi-channel television programmes; (ii) in addressable mode; (iii) by using Internet Protocol over a closed network of one or more service providers**

Hence to provide IPTV services the DPO must ensure the following:

- i. Delivery of multi-channel television programmes**
- ii. addressable mode**
- iii. using Internet Protocol over a closed network of one or more service providers**

It is imperative to highlight the mechanism through which unicast method meets the above requirement stipulated by the Regulator for provisioning of IPTV Services:

i. Delivery of Multi-Channel Television Programmes

Compliance: Like Multicast, Unicast also serves this functionality in the following way:

- (1) Both Unicast & Multicast are transport layer protocols for delivery of Audio Video Streams (Channels) for providing a Multi-Channel Television Programmes experience
- (2) From Headend, DPOs can transmit each Channel over a unique URL/ IP Address for providing multi-channel television programmes either through Unicast or Multicast.
- (3) These URLs/ IP Address would not be accessible in Public Internet

even in case of Unicast transmission so this meets the Closed Network criteria fully

ii. Addressable Mode

Compliance: Like Multicast, Unicast also delivers Channel in an addressable mode so that only authorized channels can be viewed by end-users in the following way:

- (1) All Unicast Streams gets encrypted at Headend/Packager through DRM and Keys get delivered on request to the authorized Set Top Box ('STB') post successful validation of subscription package of the user.
- (2) DRM protection shall ensure that only authorized STBs get the key to decrypt the Audio Video Channels, which is part of user IPTV Subscription package
- (3) DRM shall control the authorization/ entitlement of each and every IPTV STB individually based on subscription package and Unique Subscriber ID
- (4) IPTV Headend shall also have functionality to send Fingerprint and B-Mail individually to intended Set Top Boxes in an addressable mode

iii. Using Internet Protocol Over A Closed Network of One or More Service Providers

Compliance: Like Multicast, Unicast can also be used for providing IPTV in a closed network only, in the following way:

- (1) Unicast Channel URL (IP Address) shall be accessible over a closed network only, which is fully managed by Service Provider(s). In case of Unicast, this can be controlled using DNS/ CDN/ Firewall Network Configuration so a request coming from external network

or device would get blocked.

- (2) IPTV shall not be accessible from any external Network, same can be identified using IP address pool of devices outside of closed network
- (3) IPTV shall not be accessible through any external device or third party STB, same can be identified using User-Agent that gets further validated through Token Exchange for authentication purpose before the stream URL/ IP Address gets entertained

Most importantly, it is to be acknowledged that IPTV services, inherently is an interactive service with controlled QoS. For this IPTV as defined by ITU1 may also be referred to

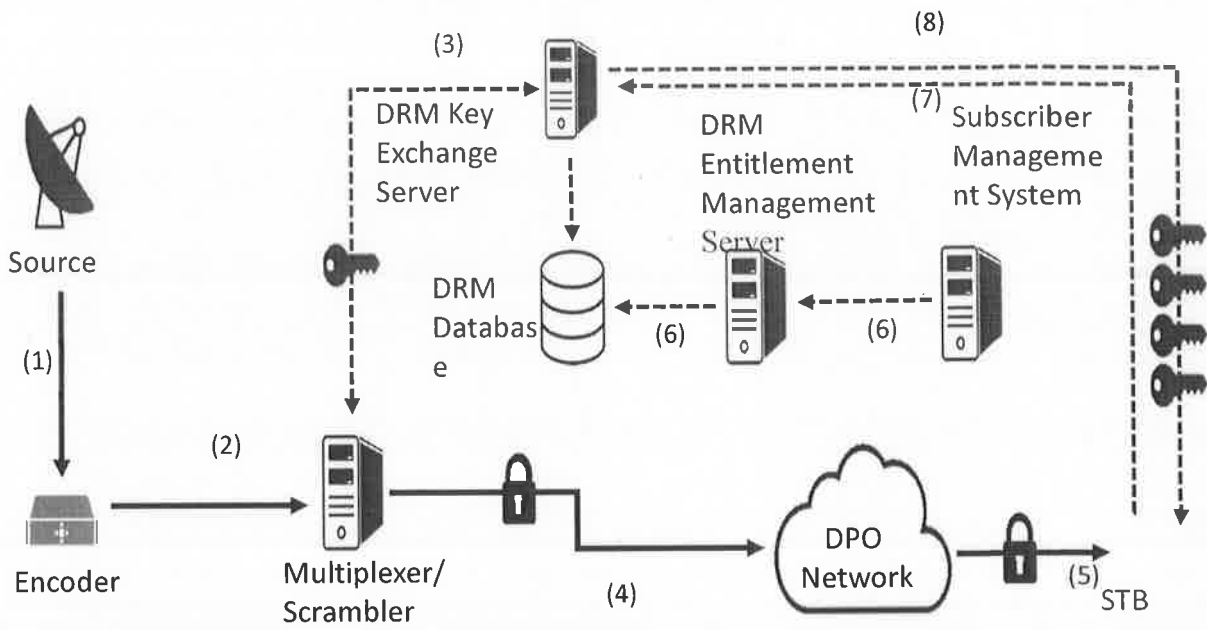
“IPTV is defined as Multimedia services, such as. Television; Video; Audio; Text; Graphics; Data, delivered over IP based networks managed **to provide the required level of QoS/QoE, security, interactivity and reliability.**”

From this it is evident that IPTV service is offering on the network using IP network- with controlled QoS and with interactivity. All such feature are the basic features of unicast instead of multicast. Multi-cast is actually a one-way communication exercise like cable TV. As submitted earlier, IPTV is two way/interactive service, but as a special case it can be made to work only in one direction or as multi-cast – that would render the IPTV service equivalent to cable TV services.

For ease of understanding the Multicast and Unicast solution Architectures are depicted below:

¹ <https://www.itu.int/en/ITU-T/jca/iptv/Pages/tor.aspx>

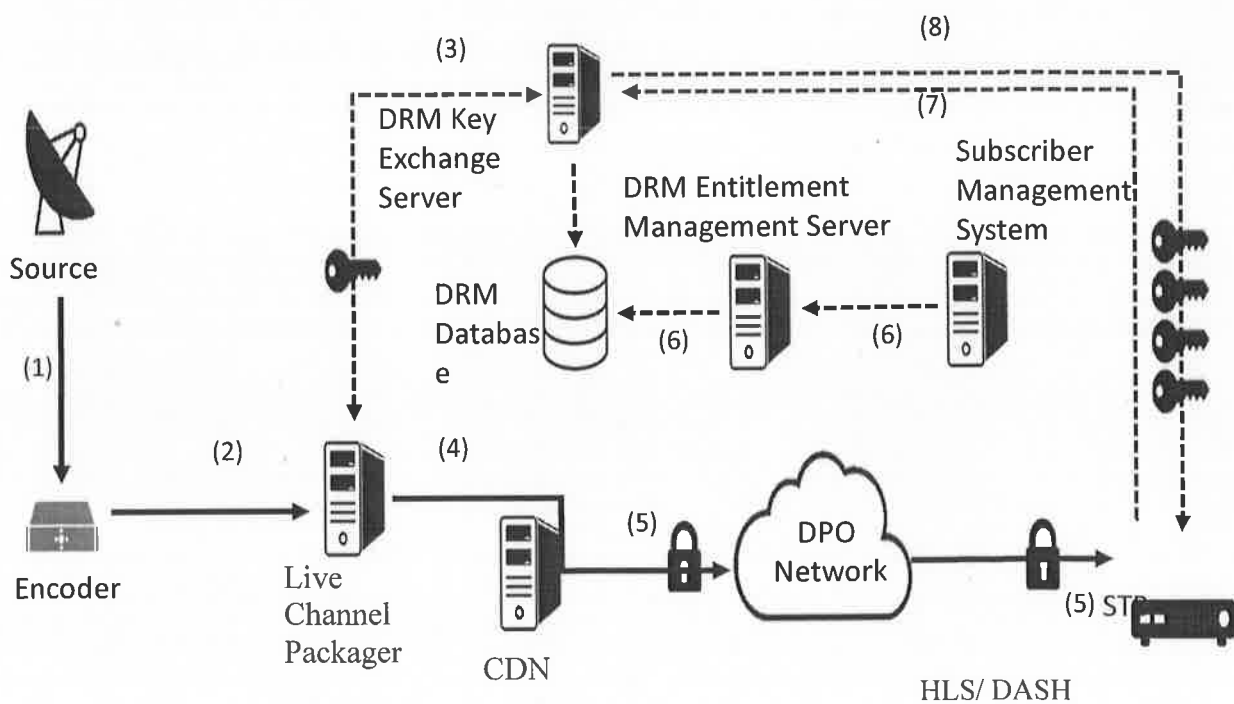
Typical IPTV Solution (Multicast)



Multicast



Unicast IPTV Solution



From the above detailed explanation it is evident that IPTV as per definition can be achieved through both Multicast and Unicast. We therefore strongly request for a reconsideration of Multicast mandatory requirement to deliver IPTV.

In view of the above and other equally important considerations detailed in the CP, we propose the following changes in the proposed **Draft Schedule X** for kind consideration of the Authority:

Sl.no.	Clause no. of Draft Regulation	Do you agree with the Draft Regulation proposed in this CP (Yes/No)	If you do not agree with the amendment proposed in this CP, then provide amended Clause proposed by you	Reasons with full justification for your response
1	C (a)	No	Retransmission of channels shall be over a closed network owned and/or controlled by DPO for electronic delivery of audio video stream of linear channels using Internet Protocol through an encrypted, point-to-point system architecture to set	As in case of all DPOs, the IPTV Provider should also be allowed to share infrastructure of the other service provider (whether TSP or other MSO) for provision of IPTV services. Any ownership requirement would be restrictive only

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			top boxes located within a subscriber's premises. For the avoidance of doubt, IPTV shall not include any electronic delivery for receipt and viewing via (i.e., directly accessible via) the Internet / world wide web/OTT	for IPTV services and will also unnecessarily put financial burden on the DPO.
2	Table 2 P#33	No	IPTV Transmission shall be agnostic to any network topology for both Multicast & Unicast methods provided it complies with all regulatory requirements. STBs with facilities for recording programs shall have a copy protection system	Technological advancements have resulted in vivid similarities between the Quality of Services offered by both Multicast & Unicast and needless to mention the Content Security. Therefore, keeping

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			(i.e., a feature which prevents reproduction of content and/or unauthorized copying and distribution of content) and such recorded content should not be transferrable to any other device.	IPTV Service limited to Multicast would limit the growth Opportunity to Industry Players and make IPTV successful in the market. Further, IPTV being interactive service, would be required to have functionality of unicast as well. As long as all the regulatory requirements and spec are complied with, there should not be any artificial technological barrier like Multicast or

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				Unicast to offer IPTV Services
3	Table 2 P#34	No	IPTV transmission should be allowed to configure any content delivery network (CDN) in their system to deliver linear content to STBs provided it complies with all regulatory requirements	CDN is essential to make the IPTV System over Unicast scalable and robust for best in class Quality of Service needed for a mass deployment. As long as all the regulatory requirements and spec are complied with, there should not be any artificial technological barrier like non-usage of CDN to offer IPTV Services
4	Table 2 P#37	No	IPTV system should allow recording of linear channel at headend/network	In the interest of better user-experience, we should keep both

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			level provided Content is DRM protected and only authorized STB should be able to playback the same in line with Broadcasters Agreements in this regard. It should also be allowed to record at STB/DVR level, without there being any option available to transfer such recorded content to any other device.	options open for end users to enjoy Live Channel Recording feature as per his choice/need. Live Channel recording can be enabled over Cloud or Locally through connected Hard-Disk with DRM protection. Some leading DTH players are already offering similar Cloud Recording features on their existing Hybrid STB
5	Table 2 P#48	No	The DRM may allow insertion of any self-promotion and/or any third party and/or paid advertisements	This should be controlled based on Broadcaster's Agreement with respective DPOs to have more efficient

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			(including banners and Aston bands) before, during or after transmission of linear channels subject to requisite agreement with the concerned Broadcasters in this regard.	way of delivering Ads for targeted audience. This targeted dynamic Ad-insertion will be strictly in compliance with current TRAI regulations on Quality of Service
6	Table 2 P#49	No	The DRM may permit subscribers to record and/or store channels/content from channels subject to requisite agreement with the concerned Broadcasters in this regard.	Channel Program Recording is an essential and sanity feature for any LiveTv Service. All DTH & Cable TV DPOs are already offering the same. Further, pls refer submission to point #3
7	Table 2 P#51	No	The DPO may sub-license the DRM and/or any rights granted to the DPO	Even under the current regime, MSOs are permitted to

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			by the broadcaster to any entity for re-transmission of channels to subscribers subject to requisite agreement with the concerned Broadcasters in this regard.	provide content to other IPTV Service Provider. In view of that, DRM protected content should be allowed to sub-license to other DPOs after obtaining relevant rights from Broadcasters.
8	Table 4 P#16	No	STB may have feature to download 3rd party App/APK directly from in-built App Store and may also have access to a Browser. However, side Loading of any third-party App should not be allowed on the STB. At the same time, STB having an	App Download through App Store is the need of hour in current time with ever-growing App eco-system so direct download from DPO controlled App Store should be allowed. IPTV is an inbuilt service of STB

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			integrated browser to serve relevant Hybrid STB features, it should not allow any unauthorized access to IPTV through Browser.	while Apps are managed through App-Store so there is a clear demarcation between them. Browser is an integral part of STB and required for many use-cases so having Browser is an important element for a comprehensive product offering to end-user
9	Table 4 P#18	No	Already covered under above Point #16	Same as above point #16
10	Table 4 P#21	No	The DRM may allow delivering linear TV channels on HLS, Smooth Streaming, Dash & HTTP/TCP subject to IPTV	IPTV Service should be agnostic to any technology as far as Solution complying to all regulatory

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			service being not accessible on Open Internet, i.e. IPTV Service should strictly be accessible in a managed network with DRM protection	specifications. With advancement in technology now, both Unicast (HLS, Smooth Streaming, Dash & HTTP/TCP) and Multicast offers similar Quality of Service without any compromise on Content Security

At the end we would once again like to thank the Authority for giving us an opportunity for sharing our views on such an important issue and hope that authority would look into our suggestions/comments favourable and incorporate the same in the draft regulation to enable IPTV Service Providers to provide seamless and quality service to its subscribers.

Thanking You,
Yours Faithfully
Den Networks Limited

