



# **Symbiosis Institute of Telecom Management**

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## **Consultation Paper**

**On**

**Technical Interoperability of DTH Set top Boxes**

To,

Mr. Subodh Kumar Gupta,  
Advisor (B& CS)  
Telecom Regulatory Authority of India  
Mahanagar Doorsanchar Bhawan,  
Jawahar Lal Nehru Marg, New Delhi-110 002  
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Dear Sir,

**Subject: Comments on Consultation Paper on “Technical Interoperability of DTH Set Top Boxes”.**

We welcome the opportunity to respond to the Telecom Regulatory Authority of India’s (TRAI) Consultation Paper on “Technical Interoperability of DTH Set Top Boxes”. We appreciate TRAI for this excellent consultation which will help in establishment of new standards as well as finding new policies for interoperability in DTH industry.

Please find below our selective response to the consultation paper.

We would like to participate in any case any further opportunity is provided to discuss these issues. Also, we are available for discussions in taking some of these recommendations forward.

Yours Sincerely,  
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**Disclaimer: Please note that the views presented in the paper are of the students and not of the Institute.**

**3.1 Is it possible to have an Open Architecture based Set Top Box (STB) for DTH services that could ensure technical interoperability i.e. technical compatibility and effective interoperability among different DTH operators who have adopted same or different standards?**

**Answer 3.1.**

Technically interoperability in DTH is feasible. It is just like MNP that India might see in some time. A subscriber can retain his handset but change operator by changing SIM. Interoperability is similar case in which subscriber will have one STB and subscriber can change the operator with the help of an entity named CAM (Conditional Access Module). This entity can be plugged and detached from STB. So subscriber has to purchase new CAM for new DTH operator.

Now in DTH there are three accountable factors for interoperability as far as DTH technologies are concerned

1. Broadcasting Technology
2. Compressing Technology
3. Encryption Technology

Apart from these 3 factors one operator specific software is also concerned called as EPG which takes care of schedules of programs.

**Broadcasting**

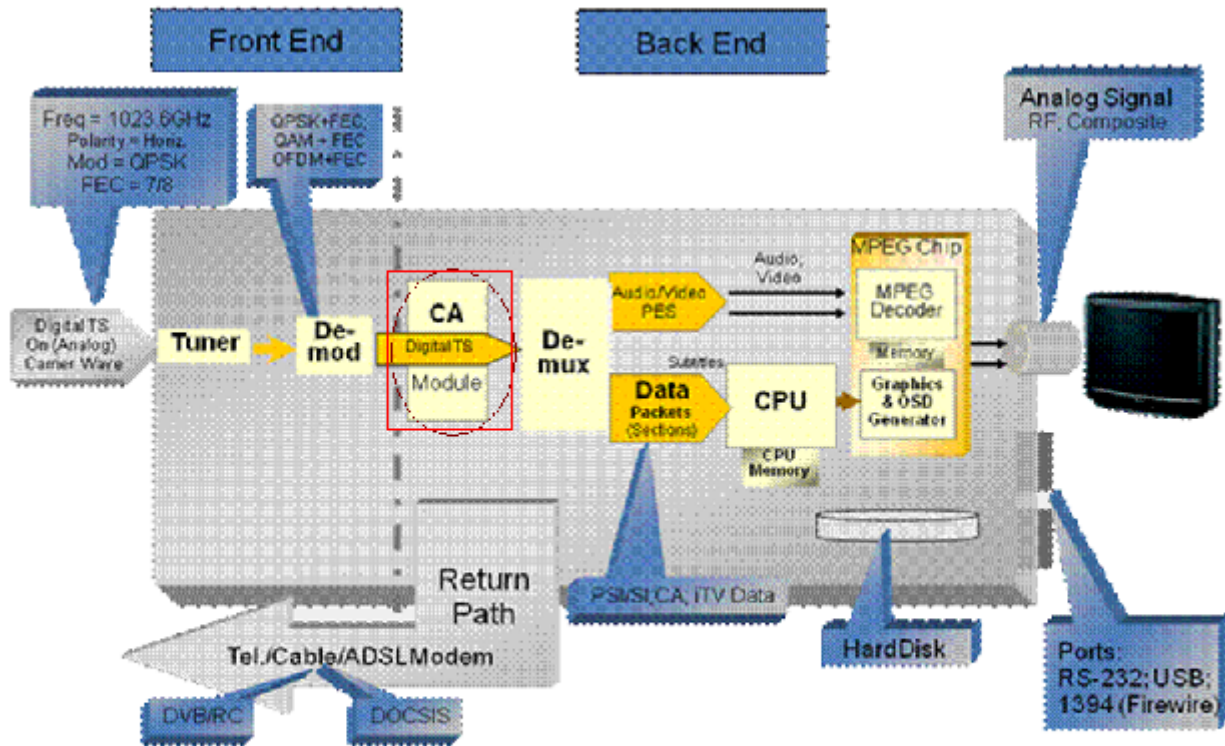
For interoperability to happen different broadcasting, compression, encrypting technologies have to be compatible. In India DTH operators are using two different broadcasting technologies named DVB-S and DVB-S2 where DVB-S2 is advanced and it can save up to 30% of bandwidth and margin gain of up to 2.5 dB as multi transport streams can be transmitted on same carrier. There are chip manufacturers that are facilitating chips providing DVB-S2 compatibility with DVB-S as well as DVB-DSNG (Digital Satellite News Gathering).

**Compression**

Currently some operators are using MPEG-2 and some are using MPEG-4. So interoperability will allow both the compression technology on single STB. Chipmakers are trying to provide compatibility between two technologies so that interests of old subscribers of operator are not disturbed. MPEG-4 is almost 50% more efficient than MPEG-2 in terms of performance. MPEG-4 will not only provide HDTV but also maintains the provision for SDTV services.

## Encryption

Now encryption is possible with the help of CAS in currently used STBs. What can be proposed in order to ensure complete interoperability is CAM. Now let's see where exactly CAM fits in the current STB in order to make it interoperable.



An Example of a Set Top Box Hardware

It can be seen that CAM is inserted after demodulator. There is also a provision of detachable CAM which can be utilized through CI (Common Interface). So CAM will solve the problem of interoperability as far as problem of different encryption technologies used by different operators. CAM will be proprietary to the operator. However price concerns are there regarding CAM which will be discussed in the other sections of paper.

## EPG (Electronic Program Guide)

Just like CAM, EPG is also proprietary to the operator. To facilitate interoperability of this facility we recommend that EPG software can be inserted inside the CAM. In this way CAM and EPG, both proprietary entities of an operator can be assembled in a single chip.

### **3.2 If yes, how can the interoperability be implemented and what would be the implications to the stakeholders?**

#### **Answer 3.2.**

There are two major issues for interoperability:

- Technical Interoperability
- Commercial Interoperability

Technically a STB is said to be interoperable if it can receive service from any network. DTH operators use different techniques, like for compression they use either MPEG2 or MPEG4 techniques. Similarly some of them use DVB-S and others DVB-S2 for broadcasting. For interoperability there should be common standards and techniques for all the operators or there should be facilitation to make different technologies compatible with each other. These problems can be solved by the chipsets which are designed to enable any STB to carry MPEG-2, MPEG-4, DVB-S and DVB-S2. STB236 developed by NXP is an example of such chipset. This chipset will enable any STB manufacturer to create affordable digital TV and hybrid IP STBs with both SD and HD picture quality. In other words this chipset will provide backward interoperability for MPEG-2 with MPEG-4 and DVB-S with DVB-S2.

Once the problem for interoperability of broadcasting and compression is solved now next matter of concern is encryption. i.e. (Conditional Access Services) and EPG (Electronic Programming Guide). CAS cannot be made interoperable for all the operators. It will be proprietary to operator as CAS is the only way with the help of which we regulatory bodies can make a track of number of subscribers of different operators. CAS refers to the encryption technique which protects unauthorized viewing of TV content. All the operators are using different CAS systems. For enabling interoperability plug-in CAM (Conditional Access Module) can be used. In this case every operator will have to launch its own CAM.

After interoperability of CAM next thing to be considered is EPG which is the graphical interface for channel navigation, again every operator has its own EPG and CAM cannot be interoperable. This problem can be easily solved if the operators provide embedded software of EPG in the CAM module.

All the facts mentioned above will work for the new customers when standards are set by BIS and government. But for old customers getting services on different standards there will be some complications. For example: Dish TV and Tata Sky offer set top boxes with MPEG2 video compression while Airtel's Digital TV and Reliance's Big TV offer MPEG4, a more advanced technology. Therefore either Dish & Tata Sky will have to upgrade their STBs or Airtel and Reliance will have to make theirs backwards compatible. On implementation of interoperability new standards will be followed and old subscribers can continue to use the services. In case if

any subscribers want to switch the DTH operator then there must be 50-50 sharing. Subscriber will be getting only 50% of money back what is mentioned on the STB bill. Now operators can tie up and some possible clauses can be set with the third party vendor to sell these old STBs and these vendors can rework on these STBs to make them interoperable and resell them at the market price.

### **IMPLICATION TO THE STAKE HOLDERS:**

- 1. OPERATORS:** The concept of interoperability will not be easily accepted by operators. Many operators will have to change the technology which they are currently using and it will increase the cost. Moreover it will pose a threat of subscriber churning out to many established operators. Costs which operators are now incurring for subsidizing the STB will be saved as now STB will not be proprietary to operator and STB business will be completely open to third party vendors. Only entity that comes under operator is CAM and EPG. Concluding, now operator is freed from subsidizing the STB. With the help of DVB-S2/MPEG-4 more number of transport streams can be forwarded on same carrier so more number of channels can be transmitted with less number of transponders and hence reduction in cost.
- 2. SUBSCRIBER:** In case a subscriber does not like the services given by the current operator then that subscriber can easily change the service provider. With the fear of losing the subscriber, the operator will improve his services, moreover the prices of subscription will come down which will lead to increased penetration of DTH among masses. As mentioned in point 1. Cost reduction of operators by use of new technology also results in fall of packages and hence there is possibility of increase of DTH penetration in India which are currently not up to mark. Adoption of new technologies will also increase provision of HDTV in Indian market and hence raise the entertainment level.
- 3. INDEPENDENT OEMS:** If industry agrees to the interoperability then there will be some standards for STB manufacturing and accordingly there will be some provision to provide compatibility between currently used and new technology according to new standards formulated. Hence third party manufacturers will start manufacturing the STBs which will increase the competition and this will lead to lowering the prices of STB's.

### **3.3 Is there a need to mandate any particular standard so that the objectives of technical interoperability can be achieved? If so, which standard?**

#### **Answer 3.3.**

Yes, there should be a common standard to achieve the target of interoperability. Some facts are illustrated below relating to old standards set by BIS highlighted in blue and some of the new proposed standards.

Major highlights as per earlier standards set by BIS (IS 15377: 2003) on June 2003 are as under

The STB shall be open architecture (non-proprietary) and shall ensure technical compatibility and effective interoperability amongst different DTH service providers in the country. The STB must have at least one common interface slot complying with EN 50221. EN 50221 is European standard for Common Interface specification. On forward path STB shall support reception and processing of DVB-S (EN 300421) compliant digitally modulated signal. The conditional access system/scrambling shall conform to DVB-S (EN 300421) and DVB-CSA (ETR-289).

New standard is mandatory so that entire industry can follow one stream. We propose the concept of up gradation in old standards. New standards should be designed by keeping in mind the compatibility of new and advanced technology with old standards so that interests of old subscribers are not disturbed. Advancement of MPEG-2 is MPEG-4 and in the same way advanced version of DVB-S is DVS-2. So as per current technological scenario we propose to go for DVB-S2/MPEG-4 standard.

Following are the some examples of companies in different countries following DVB\_S2/MPEG-4 standards for different purposes:

#### **DTH:**

- **United States:** DirecTV announced fourth quarter sales rose in 2008 by 17 percent largely due to high-definition upgrades (requiring the use DVB-S2/MPEG-4 set top boxes).
- **Ukraine:** Viasat announced plans to launch a platform in early Q2 2008 with a basic DTH package for as little as \$10-13 per month.

#### **Satellite Broadband and IP Trunking:**

- Hughes Network Systems announced shipments of over 400,000 DVB-S2/IPoS-compliant end units, out of a cumulative base of over 1.5 million broadband HNS satellite VSAT terminals worldwide in 2008.

- **United States:** Crawford Satellite Services launched an MPEG-4/DVB-S2 MCPC HD primary distribution platform on SES's AMC-18 satellite for domestic distribution into cable and DTH providers.

**Digital Media Distribution:**

- **United States:** TBC Integration announced plans to upgrade its DVB-S/MPEG2 e-learning "SCN" satellite network to MPEG-4/DVB-S2.

**3.4 If technical interoperability for STB is not possible, is there any other mechanism to safeguard the interests of the subscribers.**

**Answer 3.4.**

In case if it is not possible to implement technical interoperability then the only possible way for saving the subscribers interest is commercial interoperability.

**3.5 Any other relevant issue that you may like to mention or comment upon.**

**Answer 3.5.**

Few issues that are revolving around the paper are mentioned below

**Cost Factor:**

The market estimation of the CAM cost is expected to vary from Rs 700 to Rs 900. When a subscriber wants to migrate from his existing operator to a new operator then he will have to buy a new CAM module of that operator. Moreover he/she has to pay subscription charges to the new operator which varies from Rs 150 to Rs 250. The overall costs will be same as if subscriber is going for a fresh DTH connection. In such a situation interoperability will not make much sense. For the success of interoperability, the subscriber may subsidise the price of its CAM module in order to show aggressiveness in DTH industry. Another option can be

1. Technical interoperability for STB
2. Commercial interoperability for CAM



## **International Research**

This paragraph talks about research done by NSR. NSR is an international market research and consulting firm specializing in satellite and wireless technology and applications. NSR primary areas of expertise include satellite technology, IP applications, wireless convergence and broadcast services. With extensive expertise in all regions and a number of broadband sectors, NSR is a leading provider of in-depth market insight and analyses

NSR projects global shipments of 142 million advanced units (MPEG-4, DVB-S2) for send/receive sites and teleports between 2009 and 2014. Equipment manufacturers are expected to achieve revenues of over \$18 billion for the sale of these units that include MPEG-4 DTH set top boxes and Digital Video Recorders (DVR), DVB-S2 modulators and IP receivers, MPEG-4 video encoders, advanced satellite broadband terminals with Adaptive Code Modulation (ACM), SCPC carrier-canceller and LDPC modem options, video edge processors, and integrated receiver-decoders (IRDs).

### **Factors facilitating growth of MPEG-4/DVB-S2 in global market include:**

- HD-ready households and content availability fostering churn-enhancing HD/DVR adoption in DTH
- use of MPEG-4 compression for standard definition DTH distribution in high-growth markets such as India
- wider manufacturer support for ACM in ASIC chipsets enabling new enhanced satellite broadband systems
- cable digitization benefiting from HITS distribution
- regional high space segment costs together with technology maturation shortening pay-back cycles for SCPC and IP trunking equipment using carrier-overlapping and flexible LDPC coding