From: "ravi bhaskaran" <ravi.bhaskaran@broadcom.com>
To: "Rajesh Mattoo" <srobcs1@trai.gov.in>, "DEVENDRA DWIVEDI" <jadvisor-bcs@trai.gov.in>
Cc: "ari jahanian" <ari.jahanian@broadcom.com>
Sent: Saturday, December 7, 2019 10:23:20 PM
Subject: TRAI Consultation paper on Interoperability of Set Top Box

Dear Sir,
Please find response from Broadcom below. (Re-sending as first response was not received).
Warm Regards
Ravi

Q1. In view of the implications of non-interoperability, is it desirable to have interoperability of STBs? Please provide reasoning for your comment.

Yes, STB interoperability is needed and would be a welcome feature.
However, we also need to survey the current scenarios that are present and operate in parallel with STB's.

- Currently the general content market has also gravitated towards OTT (phone and device) and IP based devices.

- These devices are currently providing a platform for aggregating content from different content providers, and hence can be considered interoperable on content.

- In this new era, a cable or DTH STB, being interoperable is desirable but without any feature reduction, (so as to compete with the newer devices). Interoperability would be desirable as long as feature sets like enhanced graphics, HD, 4K etc.,are not compromised. However given the vast nature of feature sets, some trimming might be needed.

- Therefore, our view is that interoperability for 100% of STB's is a huge task. Concentrating on 70% of the STB market where feature sets are similar and middleware is simple might be a good start to achieve this.

Q2. Looking at the similar structure of STB in cable and DTH segment, with difference only in the channel modulation and frequency range, would it be desirable to have universal interoperability i.e. same STB to be usable on both DTH or Cable platform? Or should there be a policy/ regulation to implement interoperability only within a platform, i.e. within the DTH network and within the Cable TV segment? Please provide your comment with detailed justifications.

No. There is currently no SoC support for a single SoC to support both Cable and DTH markets.

- Using the same STB for both cable and satellite would imply an increased cost, as the STB will need to have both cable and DTH SoCs and related hardware (for example Cable does not require LNB circuitry etc).

- Even though DTH and cable differ in modulation and coding, the difference in SoC cost in implementing on a single silicon is quite high due to the cost of having two parallel demodulators, one for each.

- This cost will need to be borne by the end consumer and is hence detrimental to providing an affordable solution.

Q3. Should interoperable STBs be made available through open market only to exploit benefits of commoditization of the device? Please elaborate.

If the STB is truly interoperable then open market will facilitate commoditization. Making this the only reason does not make a strong point.
The more reasons for interoperability would be customer satisfaction with more choices of content from different operators, which is not the case today.

Q4. Do you think that introducing STB interoperability is absolutely necessary with a view to reduce environmental impact caused by e-waste generated by non-interoperability of STBs?

STB interoperability will definitely help in getting rid of negative environmental impact. For example the OTT devices that play content from many sources may have a longer shelf life as the need to change is not necessary.
The software upgrades allow new content to be accessed from different content providers.

Q5. Is non-interoperability of STBs proving to be a hindrance in perfect competition in distribution of broadcasting services? Give your comments with justification.

We do not think non-interoperability is hindering competition as operators are fighting each other based on features and services. However, if interoperability standardizes certain feature sets and architectures, then operators will need to find innovative ways to be more competitive.

Q6. How interoperability of STBs can be implemented in Indian markets in view of the discussion in Chapter III? Are there any software based solution(s) that can enable interoperability without compromising content security? If yes, please provide details.

Section 3.3.2 gives advantages in making DVB-CI 2.0 optional. *"The ubiquitous presence of USB interface in almost all*
new devices makes it a logical and easily integrable solution". We think this should be done without delay, as it would provide a quick workable solution in the near term, whereas a

longer CAS/Middleware based interoperable solution can be worked out in the next couple of years.

Q7. Please comment on the timelines for the development of eco-system to deploy interoperable STBs for your recommended/ suggested solution.

As operators, CAS companies, middleware developers and SoC vendors working with OEM's are necessary to meet, discuss and deploy an interoperable system, the timelines would be 1.5 years at least.

Q8. Do you agree that software-based solutions to provide interoperability of STBs would be more efficient, reduce cost of STB, adaptable and easy to implement than the hardware-based solutions? If so, do you agree ETSI GS ECI 001 (01-06) standards can be adopted as an option for STB interoperability? Give your comments with reasons and justifications.

From an SoC perspective there is no reason that ETSI GS ECI 001 (01-06) standards will not work.
It is upto CAS companies to ratify this and provide a working solution.

Q9. Given that most of the STB interoperability solutions become feasible through a common agency defined as Trusted Authority, please suggest the structure of the Trusted Authority. Should the trusted 65 authority be an Industry led body or a statutory agency to carry out the mandate? Provide detailed comments/ suggestion on the certification procedure?

Again from an SoC perspective this structure is agnostic. CAS companies need to give the basic structure.

Q10. What precaution should be taken at planning stage to smoothly adopt solution for interoperability of STBs in Indian market? Do you envisage a need for trial run/pilot deployment? If so, kindly provide detailed comments.

The main issue is the planning stage itself. As discussed earlier if the target STB's for interoperability are those that encompass 70% of the market (more similar features, hardware architecture, middleware), this would be the first step.
Operators and CAS vendors should align first with the agreement on the exact standard being proposed.
Once this agreement is in place the SoC vendors need to be pulled in to participate along with middleware developers.
If the encryption standard being proposed is with a Trusted Authority, then a pilot deployment may be necessary.

Q11. Interoperability is expected to commoditize STBs. Do you agree that introducing white label STB will create more competitions and enhance service offerings from operator? As such, in your opinion what

cost reductions do you foresee by implementation of interoperability of STBs?

We do not see any real cost reductions of STB's that are interoperable.
Interoperable STB's save cost only if users switch operators without buying new STB's. We need to know the rotation rate.

Q.12 Is there any way by which interoperability of set-top box can be implemented for existing set top boxes also? Give your suggestions with justification including technical and commercial methodology?

This is a very good question. It is difficult for existing STB's to have interoperability. However there is a quick way to get interoperability in a more cost effective way, and very quickly into the market as an interim solution and that is including DVB-CI 2.0 as an option.
In essence, interoperability of current set-top can be extended to also include DVB-CI+ 2.0 as an option, till the new standard comes in, with little change in overall architecture.
This way the SoC cost and the solution cost can be reduced from DVB-CI+ 1.4 standard that uses a PCMCIA card to a ultra low cost USB solution. This will provide an interim optional solution to those OEM's and SoC vendors that want to reduce current interoperability cost of the STB.

Q13. Any other issues which you may like to raise related to interoperability of STBs

Middleware & CAS are essential components of all STB's. Making STB's interoperable will need middleware and CAS companies to work on a solution that can be common across a hardware architecture. This is the crux of an interoperable STB.

- Standardized Hardware Platform that covers a large percentage of deployed boxes
- CAS solution
- Middleware compatibility to CAS and Hardware