Bharti Telemedia Limited ("Airtel's") Response to TRAI's Consultation Paper on Interoperability of Set Top Box dated 11th November 2019

Before we submit our detailed response to the questions raised in the Consultation Paper, we would like to make some elementary submissions as presented below:

1. **Non discovery of a feasible and holistic solution:**
   The deliberations on the technical interoperability is happening for more than a decade and quite understandably due to intricate complexities as well as significant business, commercial and technical challenges which are to be addressed before staging the technical inter-operability. Another fact we need to acknowledge that till date, there has been no discovery of a technical solution wrt inter-operability which balances and integrates the business, commercial as well as technical nuances. Therefore, despite the protracted deliberations, we feel that the best fit solution is still not clear and known. Each of the proposed solutions comes with such underlying challenges that they will outweigh the benefits being expected from them.

2. **Need for technical Inter-operability in the current environment may not be desirable:**

   We also submit that the need for technical inter-operability was understandable at a time when the DTH market was in its nascent stage with few operators and the cost of the set top box was extremely high. The situation since then has undergone a sea change today and with the existence of 5-6 private DTH operators apart from DD Direct, the cost of the set top box has considerably decreased and has become very affordable to the common man. Market forces have led to all DTH operators deploying substantial subsidies directly to all their subscribers, with the result that the set top box prices have become very competitive. The issue of technical interoperability may not be much significance in the present day market conditions. We believe that we should call time on the subject of technical inter-operability as no concrete and fruitful outcome is likely to come of it.

3. **Commercial Inter-operability serves the purpose intended from technical inter-operability:**

   The present commercial inter-operability offered by DTN industry has already provided the subscribers an easy exit option to change their service provider with almost negligible cost. Therefore, the objective being envisaged from the technical inter-operability, to a large extent is already being catered by the commercial inter-operability.

4. **Technical Inter-operability solution is not feasible:**
   If technical interoperability and open architecture was feasible, no DTH operator would have subsidized the cost of set top boxes for end customers and incur huge losses on this account. DTH operators are in the business of offering DTH services and not in the business of selling set top boxes but they are doing so due to failure of a viable technical interoperability solution.

5. **Efforts to further reduce and rationalize the STB cost will add stimulus to the subscribers to change their service provider**

   To further boost the commercial inter-operability, the key is to reduce the cost of STB. Currently, a STB of a DTH operator has the CI slot and CAMs in the set top box to provide

the technical inter-operability as per BIS standards. However, such a provision has not rendered any results and has rather led to rise in the cost of the set top box for all the DTH subscribers. Thus, it is suggested that the set top boxes be manufactured with bare minimum features and without the CI slot and other expensive functions so as to further reduce the cost of the set top box.

We also recommend that the Government to consider withdrawal of customs duty, excise duty and other taxes currently levied on the import and manufacturing of set top boxes. This would advance the reduction in the overall cost of the set top box and would make it more economical and convenient for DTH subscribers to change the service provider.

6. **'One-size-fits-all' approach is neither consumer friendly nor in the benefit of the industry:**

"One Size or a common STB" is neither practically feasible nor is viable. It would further take away or at least slow down all innovations and up-gradation of newer technologies/softwares/features in DTH segment. This will also increase the cost of STB for end customers as they would have to buy new STB compatible with new technologies on their own in the open market. This would push down the adoption of newer technologies even to a below average level.

Any standard STB specifications will restrict the innovation. The current ecosystem has allowed the market to develop and offer competitive CAS and STB's evolving with the changing landscape of the industry as well as allowing to pace up with emergence of new technologies in the sector.

7. **Legacy Systems:**

The Authority is already aware of the fact that different combinations of technology deployed by DTH operators in the set top boxes along with different versions of compression and transmission technology of DTH operator poses a huge challenge for technical inter-operability. While the subscribers of DTH operators using latest technology shall be backward compatible with a DTH operator using old technology but the migration of subscribers of DTH operators (using old technology) to latest technology will not be possible unless the STB is replaced. Thus, technical interoperability is of no resolve in such situations too.

We need to understand that the fundamental objective being intended from technical inter-operability is to facilitate consumer choice to shift service providers. While to a large extent this is already been achieved by commercial inter-operability, it can be further supplemented by reducing the cost of STB. Therefore, a complex and non-feasible approach to concept of inter-operability is akin to boiling the oceans to yield some inconsequential benefits and the magnitude of which may not even correspond with the anticipated benefits.

Moreover, the proposed solutions wrt interoperability are being at the conceptual level and seems like a scratch on the surface with any substantive contours. As also stated by the Authority, they are lab tested and their efficacy is not known in the real word.

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

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

Airtel's Response:

As per TRAI, a non-interoperable device acts as a barrier against consumer choice to change their service providers, but we tend to disagree with TRAI's assumption. The entire DTH industry provides STB on a subsidized cost. The majority of set top boxes provided by most DTH operators are under the rental scheme, wherein set top boxes are provided at subsidized cost and the ownership of set top box is retained by the DTH operator. Therefore, it will not be correct to assume that with such cost subsidization, the consumer can easily exercise the option to change its service provider.

We strongly believe that the present "commercial interoperability" of DTH set top boxes is more consumer-friendly. The subscribers have the option to return the set top box back to their DTH operator which can be re-used by the said DTH operator. To avail the services of another DTH operator, the customer can take a new set top box from the concerned operator. This is a very viable as well as flexible solution available with a customer given that the cost of the DTH set top box is no longer prohibitive and that it provides an alternative to the small margin of subscribers who want to move from one DTH operator to another. Further, this ensures that the movement of subscribers between DTH operators is governed by the prevalent market forces and quality of service levels and not by limitations imposed as a result of technology specifications adopted by the operators.

Considering the magnitude of cost involved in establishing interoperability and the absence of a solution to address the inherent risks related to content security, the inter-operability may not yield the expected benefits. The fact that in existing STBs, cost of CAM module itself would be higher than the cost of the Set Top Box and with cost of integration of CAM module in the STB, the proposal become unviable.

While the Authority has cited implications of non-interoperability, we must not be oblivion to the fact that the introduction and more specifically, implementation of technical inter-operability of STB's is saddled with various business, practical and customer centric issues. The availability of a solution countering to the host of challenges also seems like an illusion. Therefore, the pragmatic approach demands evaluation of the ground reality and plethora of issues, the magnitude and impact of such issues is more severe than the non-interoperability. In this regard, the following reasons will prove beyond a doubt that the technical interoperability of DTH set top boxes in the current eco-system is neither feasible nor viable for operator as well as the customers:

i. **Integration and alignment of different STB technologies deployed by DTH Operators defeats the inter-operability concept:**
All existing DTH operators are using different combinations of technology in set top boxes. The existing options in technology available are as given below:
(a) Compression technology: MPEG 2 and MPEG 4;

(b) Transmission technology: DVB-S and DVB-S2;
(c) Different encryption technologies: NDS, Nagra, Irdeto, Conax, Verimatrix etc.
(d) Different EPG software.

To support inter-operability, the uniform/common technologies is the prerequisite and to achieve this, it calls for a common architecture which is not only a cost intensive activity but demands the overhauling of the complete ecosystem existing at each of the operators end.

ii. **Challenge to accommodate different versions of compression and transmission technology of DTH operators:**
Our company in an attempt to ensure effective utilization of scarce satellite bandwidth and to provide superior quality of transmission to its subscribers is using compression technology of MPEG 4 and transmission technology of DVB-S2, which is the most advanced technology presently available in the market and the same is backward compatible. However, some DTH operators are also using a lower specification of compression and/or transmission technology. Therefore, subscribers of DTH operators using latest technology shall be able to purchase the CAM card sold by DTH operators using old technology and view their DTH services, but there is no possibility of subscribers of DTH operators (using old technology) receiving signals of DTH operators (using latest technology) in their old technology set top box without replacement of the same. To enable technical interoperability, it is of essence that the different version of technologies must be such that they are backward compatible as well as forward compatible or alternatively, the operators on old version of technology migrate to the latest version to support the same versions of modulation and transmission standards as a pre-requisite to inter-operability.

iii. **Common Structure will deprive DTH operators of innovation and created differentiation in services:**
Operators differentiated features and competitive edge lies in the development of STB. Service delivery and product differentiation capability are inbuilt in the STB, which drives value proposition for the end customer. Further, these are all propriety IPR of DPOs. Ideally, interoperability should work across different levels of technologies/software, if the same experience has to be made available for the migrated customers. However, in the event of interoperability, all these differentiated features will not be available on migrated platform for the same customers. Thus, pursuant to migration, customer will have inferior service experience despite having a superior STBs due to non-compatibility of STB versus the service delivery.

iv. **Prohibitive Cost:**
Presently, the cost of CAM module is almost equal to the cost of STB. As a result, even if the STB of all DPOs are interoperable, the cost of migration from one DPO to another DPO will be as good as buying a new STB. Thus, there is no cost advantage to end customer in the case of interoperability.

v. Boot loaders are specific to operator's frequency of operation & chip vendors, which enables the updating of STB software by specific operators after proper verification. These STBs cannot be upgraded (OTA) by any other operator in the case of migration. As a

result, post migration, STB of migrated customer will become outdated for latest technologies.

vi. The CI slot and CAMs in the set top box provide the technical inter-operability and flexibility to such section of DTH subscribers' who are desirous of moving to another service provider. If the subscriber who has obtained a set top box on a rental basis from a DTH operator inserts a CAM card into the set top box and begins to view the services of another DTH operator, this would result in misuse of set top box owned by DTH operator.

vii. However, despite availability of CAM and CI Slot, the results in rise in the cost of the set top box for all the DTH subscribers. Thus, it is suggested that the set top boxes be manufactured with bare minimum features and without the CI slot and other expensive functions so as to further reduce the cost of the set top box.

viii. In CATV the signal is modulated using DVB-C/C2 standard whereas in case of DTH, the signal is modulated using DVB-S/S2 standard. Thus, interoperability between CATV and DTH will lead to unnecessary cost burden due to additional component of front end like tuners and other component which are exclusive for DVB satellite and DVB cable for receiving the transmitted signal. For a STB to be able to receive signal both from DTH and cable, there will be a requirement of switchable demodulator unit, which will further increase the complexity and cost of STB to the end customer.

ix. Industry adapts fast moving changes in technology with respect to new chipset and compression standards like MPEG2, MPEG4, HEVC, 4K, etc. For example, the new compression standards of HEVC have been adopted by some operators to improve efficiencies. However, these boxes will not be interoperable with non-HEVC boxes, resulting into a huge imbalance in the market.

x. Any new technology or feature like Transcoding, In home experience for companion app, Home gateway, 4K (UHD) content with advanced audio codec of DD+, Atmos, compression Codec HEVC requires relative end-to-end changes for proper deployment. All these features work in tandem and are integrated as correct configuration in Backend System and aligned development in STB. So it would not be possible to deploy these features without doing the proper optimization and harness in the STB SW as per operators Backend configuration of elements. This may not become possible on standard STB optimized for multi DPO environment. Therefore, any common platform thus prescribed will not be able to keep pace with these changes thereby causing outdated STB models and customer dissatisfaction.

xi. Currently, all DTH operators are adopting new technologies and are incentivizing their customers to migrate their set top boxes from old technologies to new technologies (say from SD to HD) almost at negligible or zero prices so that their services and end hardware are aligned to one particular technology/software. This has enabled DTH operators to adopt new technologies at a faster pace. This is also viable as no DTH operator can afford

to offer their channels on MPEG and MPEG 4 simultaneously as it would result into double usage of satellite bandwidth, which is a scarce resource in nature. However, interoperability will take away all innovation and adoption of new technologies as innovation in end hardware and/or adoption of new hardware may not keep pace with new technologies being adopted by DTH operators. This is already being witnessed in telecom sector where telecom operators have taken liberalized spectrum and can offer LTE services, but are being forced to offer 2G services over such spectrum as a significant portion of their customer base continues to hold 2G handset and have not migrated to LTE handset.

xii. Considering the adverse impact of interoperability and open architecture on customer experience, level playing field, high cost of set top box, security of network, QoS and revenue of DPOs, the interoperability and open architecture is practically challenging and attracts significant risks. We understand that while TRAI has pitched some solutions but none of them have been tested, conclusive and no specifications are available for the same. Since the issue arising from open architecture has remain unaddressed, we feel that the concept is needs holistic review and approach.

xiii. Use of different Conditional Access System (CAS), compression, encryption, middleware and EPG make the set top box of a DTH operator proprietary and hence such set top boxes cannot be 100% inter-operable with the same services/features. To support inter-operability, the uniform/common/sharing of CAS is the prerequisite and to achieve this, it calls for a common architecture which is not only a cost intensive activity but also exposes to risks of piracy, content leakage, privacy of subscriber data.

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.

Airtel's Response:

The response to this question is without prejudice to our submissions on the STB Inter-operability. We state that the new regulatory framework of TRAI enshrines the concept of "non-discrimination" and has been uniformly applied to all the Distributors. We submit that this concept of non-discrimination should be extended in context to inter-operability as well for all the distribution platforms. We strongly support the concept of same rules to be made applicable to all the Distributors.

Having said that, we must also be cognizant of the fact that in current scenario, the hardware as well as the international standards for STB's of DTH and Cable are significantly different. In DTH and cable TV the delivery mechanism is different and hence this calls for a front end part where Tuner and demodulator of the STB would be different.

Demodulator: While DTH has QPSK /8PSK modulation, Cable TV works on QAM modulation;

Frequency range : The frequency range in DTH for uplink /downlink is in KU band and input to the Set top box is L band -950 to 2150 MHz while Cable TV services work in VHF /UHF band 50-860 MHz.

Tuner & front end: While an LNBF is required to down convert the signal to be fed into the STB and hence it(LNBF) needs to be powered ON by the STB while in cable TV no such requirement is there.

For the concept of a universal inter-operability, the basic requirement is having same STB for DTH and cable operators. To enable this, a single STB catering to both the hardware is to be built with a common STB solution to support inter-operability between DTH and cable. Looking at all these complexities and the quantum of cost involved for integrating two types of STB's including Tuner & demod in single STB, we needs to assess the desirability of such an option for a universal interoperability.

Currently, all DPOs offer exclusive contents/value added services like CLM & Red bug, EPG, Interactive applications, games, add insertion to their customers. Further, for the sake of assumption, even if the cost factor is ignored, such a common STB may not support the VAS/platform services of each operator. A common STB, will leave no scope of offering any innovation in services.

In the case of open architecture, additional revenue stream from these sources will go away as the same is dependent on the software of the propriety STBs. Also the unique proposition of individual DPO is content information with rich metadata filtered under genre and sub-genre of channels and programs, multi lingual EPG language which will get lost with open architecture.

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

Airtel's Response:

The commoditization of an inter-operable STB's in open market may seem lucrative but this outlook may seem myopic. Any proposal merits a thorough analysis of its pros and cons for a holistic evaluation. The concept of open STB would demand a Common CAS and a middleware which concept is equally marred with significant unaddressed issues.

Security of STB is tightly coupled with the hardware and software design of STB, which is unique to operators, thus making operator more reliable and trust worthy from content provider as well operators. In case of open market STB, the network becomes more vulnerable and will compromise the integrity and security of the platform of all DPOs. As the number of subscriber increase on a particular platform, hackers will have all business interest to hack the system and create clones. This will severely impact DPOs' revenue and business and resultant loss of revenue to the government in the form of lower licence fee and other taxes as well as less revenue to Broadcasters.

In the case of open architecture, there will be no assured QoS for end consumer. It will be completely dependent on the quality of CPE (both ODU and IDU) that the customer purchases from open market. The customer will complain about the issues such as no signal due to low quality of CPE and installation wherein DPO will have no control. Since QoS is dependent on STB software compatibility with transmitting signal of operators, an open architecture will lead to huge complaints and customer dissatisfaction.

Any open STB is prone to sensitive issues like customer privacy issues, content security /piracy related issues. Needless to mention, these core concerns are yet to be tackled.

We would appreciate that if the Authority feels that they have been able to address the above issues, we request that the specifications for such STB can be shared and demonstrated to the industry.

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?**

Airtel's Response:
It cannot be denied that the technical STB interoperability will definitely help to reduce e-waste but the larger issue is to find a win-win solution which is in the interest of customer as well as the industry. The ancillary benefit in the form of e-waste can be an outcome of a proposal but it cannot be the sole driving factor for inter-operability. Therefore, the strength of a solution lies in addressing the unique challenges of the current ecosystem.

We, as a company, being sensitive to the society a large, encourage reuse of existing STB's as an endeavor to contribute towards reduction in e-waste.

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.

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

Airtel's Response:
In current scenario different operators use different CA systems and CAS specific secret keys are burnt in the SOC. Using a software based solution would definitely compromise the security of the content in the STB.

Further, we have not come across instances of any successful technical inter-operability followed in the world and not even in the developed economies. Therefore, the concept of its introduction in India markets may be premature until we have a solution that can enable interoperability without compromising content security while also seamlessly integrating in the current ecosystem.

The availability of any software based solutions to securitize content are currently non-existent. Further, the software solutions cannot be merely evaluated on the strength of its technical contours. It calls for an assessment in terms of its feasibility, commercials and existing system's fitment to accommodate such solutions without causing major disturbances in the existing systems in the value chain.

The current existing commercial inter-operability, to a large extent, is offering the advantages which are being envisaged from a technical inter-operability. Further, the timing of introducing the technical inter-operability was ideal at the nascent stage and now when a lot of water has flowed under the bridge, the challenges are more cumbersome, sensitive and vast in magnitude while also being very cost intensive at the same time .

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.

Airtel's Response:
We are of the understanding that ETSI GS ECI 001 is still at a nascent stage of development and it will require sometime before the said standards are fully developed. Therefore, at this stage, it will be premature to comment on this aspect unless the standards are matured.

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 authority be an Industry led body or a statutory agency to carry out the mandate? Provide detailed comments/ suggestion on the certification procedure?

Airtel's Response:
TRAI itself has explicitly acknowledged the drawbacks and the lacunas in the Trusted Authority concept for which there seems to be no reliable solutions. We therefore, feel that seeking any inputs on the constitution of Trusted Authority is akin to putting a cart before the bullock. Further, the concept of Trusted Authority is yet to have an endorsements and support from key players viz; SMS, CAS, STB vendors as well as Distributors. We see lot of challenges in implementing common trusted Authority based solution as also rightly captured in your (TRAI) document. It is at a very nascent stage and has prominent security and commercial concerns that needs to be addressed and agreed upon by partners (CAS & SoC provider, OEM etc) before discussing on the nature of TA.
Therefore, we submit that the stakeholders must first have a consensus on the workable solution for technical inter-operability while assessing it on all aspects before the concept of Trusted Authority can be deliberated upon for its feasibility and other granular aspects. We therefore, request Authority to take up this issue at the appropriate stage.

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.

Airtel's Response:
We feel that the current discussions for finding a viable solution/s supporting technical inter-operability are at a very macro-level. Any proposal merits a comprehensive deliberations with all the stakeholders while also addressing the potential threats and challenges. Needless to mention, the end to end solution must clearly address the challenges as well as distinctly chart out the actions and responsibilities of each and every stakeholder. Once the contours of the proposal are outlined and agreed, there is a definite need that its implications are thoroughly assessed by the relevant stakeholders including but not limited to DTH operators, CAS, SMS and STB vendors too since any successful development as well as implementation of a solution will require participation from all the concerned parties so as to avoid any adverse ramifications on the customers.

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?

Airtel's Response:
For introducing while label STB's the basic need is to introduce STB supporting technical inter-operability which calls for an additional cost involved in development of hardware as well as software for such kind of STB. The cost involved in introducing this STB would nullify any cost benefit that may be reaped by white labelling or commoditizing the STBs. The challenges of open STB are already highlighted in our response.

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?

Airtel's Response:
Any inter-operable solution will either call for a replacement of existing STB's or up gradation of the existing STB's to support such technical inter-operability. Both these measures will involve substantial investments on the part of the DTH service providers. Given the size and scale of DTH operations today the cost of this replacement/up-gradation would be enormous and DTH operator are in a no position to absorb such cost. Since the burden of the cost will be ultimately borne by the customers, the efficacy of such a proposal thus requires the cost benefit analysis. Since the proposed solution of technical inter-operability is still fluid with too many options being presented by TRAI without any testing or confirmation by the DTH industry, it is not only premature but is also difficult to answer this question.

In some cases, even up-gradation of STB's of one operator may not feasible if a particular DTH operator is using a lower specification of compression and/or transmission technology, its upgrade to a higher version may not be practical. Therefore, it will create a non-level playing field when subscribers of DTH operators using latest technology shall be able to purchase the

CAM card sold by DTH operators using old technology and view their DTH services, but a similar options may not be available for DTH operator using old technology set top box and the replacement may only be the probable solution. This may also lead to a high degree of churn among operators using latest technology, thereby creating a non-level playing field among DTH operators in the market. This would be a retrograde step as this would result in movement of STB from a new technology to old technology.

Different STB's may require multiple CAS and SMS to be supported which is not only a technical challenge but is also a cost intensive activity.

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

Airtel's Response: Nil