



BYDESIGN

ByDesign India Private Limited's

Response to

Telecom Regulatory Authority of India's

Consultation Paper

On

Framework for Technical Compliance of Conditional Access System (CAS) and Subscriber Management Systems (SMS) for Broadcasting & Cable Services

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Failing to Plan is Planning to Fail

ByDesign India Private Limited (BIPL) has been offering its services since 2016 along with its product Indian Conditional Access System – iCAS® which is an advanced embedded security Conditional Access System and Subscriber Management System Platform.

The platform has been designed and developed by BIPL completely in India under a program run by Ministry of Electronics and Information Technology – MEITY, Government of India. It boasts of having been widely accepted in India and has been deployed at more than 225 + DVB-C Multi Service Operators as well as by India's public Broadcaster Doordarshan for its Direct to Home DVB – S2 DD FreeDish Services. Currently it is deployed for more than 2 Million Set Top Boxes / subscribers.

It has been observed that because of lack of systematic framework different ecosystem partners are affected as mentioned below:

- a. Quality of the Service to the end consumer suffers.
- b. End Consumer is made to pay the same amount whether he/she is getting service using a standard product or a sub-standard product.
- c. Broadcasters have to deal with different type of products and need to arrive at a bare minimum set of requirements to run the show.
- d. For Broadcasters there is a consistent threat of content security and hence they are unable to offer the quality and variety of content which they are able to offer in other delivery platforms like IPTV and OTT
- e. Government of India loses revenue because of non-standardization and lack of transparency in the systems prevalent in the market.

BIPL would therefore like to sincerely appreciate the effort put by Telecom Regulatory Authority of India in developing the framework for the Technical Compliance of Conditional Access System (CAS) and Subscriber Management Systems (SMS) for Broadcasting & Cable Services for India.

This would be a major pathbreaking measure which if executed and implemented would bring in more transparency and robustness into the entire system. There are many examples in recent years where the Government of India initiative has done a lot of value unlocking of the ecosystem by bringing in more clarity and competition in getting foolproof systems and the advantages of these are felt by a common man in the country. Systems backed by innovative technology application in conventional areas are the need of the hour. Such examples being AADHAR, UIDAI, UPI, NPCI etc have directly affected the common man on the street and a similar approach by TRAI in developing a framework for technical compliance of CAS and SMS would result into affecting the life of the common man where the content consumption, needs to be reformed and de-cluttered by bringing in more semblance for all ecosystem partners.

BIPL has proudly provided its inputs to TRAI over a period of time on many matters and feel obligated in doing so, in the larger interest of the industry and the country.





Issues for Consultation

Question 1.

List all the important features of CAS & SMS to adequately cover all the requirements for Digital Addressable Systems with a focus on the content protection and the factual reporting of subscriptions. Please provide exhaustive list, including the features specified in Schedule III of Telecommunication (Broadcasting and Cable) Services Interconnection (Addressable Systems) Regulations, 2017?

ByDesign's Response to Question 1

Ever since the Digitalization of the Broadcasting and Cable Services has commenced a lot of work has been undertaken by MIB and TRAI in recommending and implanting the features for the CAS and the SMS.

Please find below the detailed list from content protection and the factual reporting of subscriptions perspective as per our understanding and experience in the field.

Conditional Access System – CAS

1. The CAS in use, must not have any history of hacking.
2. It shall not be possible to alter the data and logs recorded in the CAS.
3. The CAS should not have the facility to activate and deactivate a Set Top Box (STB) directly from the CAS terminal.
4. Every instance of the activation and deactivation of each STB must be captured in the logs and the reports of the CAS which should be traced back to the respective instance in the SMS and that this should happen simultaneously.
5. The CAS must have the capability of upgrading STBs over-the-air (OTA), so that the connected STBs can be upgraded without sending the STBs physically to the manufacturing location.
6. The CAS should be able to receive commands from the SMS and activate or deactivate services or STBs of at least Five percent (5%) of the subscriber base of the distributor within 24 hours.
7. The CAS should be capable of individually addressing subscribers, for the purpose of generating the reports, on channel by channel and STB by STB basis.





8. The CAS shall be independently capable of generating, recording, and maintaining logs, for the period of at least immediate preceding two consecutive years, corresponding to each command executed in the CAS including but not limited to activation and deactivation commands issued by the SMS.
9. The CAS shall be able to tag and blacklist VC numbers and STB numbers that have been involved in piracy in the past to ensure that such VC or the STB cannot be re-deployed.
10. It shall be possible to generate the following reports from the logs of the CAS:
 - (a) STB-VC Pairing / De-Pairing
 - (b) STB Activation / De-activation
 - (c) Channels Assignment to STB
 - (d) Report of the activations or the deactivations of a particular channel for a given period.
11. The CAS vendor must have the technical capability in India to maintain and provide support to the deployed systems on 24x7 basis throughout the year.
12. There should be provision for global messaging, group messaging and the individual STB messaging.
13. The CAS should have forced messaging capability including forced finger printing display.
14. Control Word Protection:
 - a. The CAS and its implementation must ensure that the Control word is always protected.
 - b. The CAS and its implementation must have the protection against Control Word sharing.
 - c. The Control word must be sent in an encrypted format in the Entitlement Control Message (ECM).
 - d. The CAS and its implementation must ensure that it is not possible to get the Control Word by various snooping methods.
15. Entitlement Control Message (ECM) & Entitlement Management Message (EMM) protection - The CAS and its implementation must ensure that
 - a. The ECM and EMM are encrypted.
 - b. It is not possible to get the ECM and EMM by snooping methods
 - c. It has mechanism for Custom EMM generation and handling.
16. The CAS should support Hardware Key Ladder within the System on Chip (SoC)



17. The CAS should supports Hardware Descrambling within the System on Chip (SoC)
18. The CAS must have secure boot loader which provides protection against the malicious software download in an STB and which allows only authenticated software to boot up the STB.
19. The CAS must ensure that the Set Top Box (STB) gets de-entitled to the services automatically on the expiry date set at the beginning of the subscription period and does not need a command from the Subscriber Management System (SMS) to get de-entitled
20. The CAS must be deployed on hardened server hardware specifically supplied by CAS provider and not just on any commercially available generic servers thereby providing extra layer of data / cyber security and removing the probability of any backdoors and malicious software deployments.

21. Fingerprinting

The CAS should have controls in place to run finger printing at regular intervals. Other important aspects of the fingerprinting features are mentioned below:

- a. The STB should support both visible and covert types of finger printing, provided that only the STB deployed after coming into effect of these amendment regulations shall support the covert finger printing.
- b. The fingerprinting should not get invalidated by use of any device or software.
- c. The finger printing should not be removable by pressing any key on the remote of STB.
- d. The finger printing should be on the top most layer of the video.
- e. The finger printing should be such that it can identify the unique STB number or the unique VC number.
- f. The finger printing should appear on the screens in all scenarios, such as menu, Electronic Program Guide (EPG), Settings, blank screen, and games etc.
- g. The location, font color and background color of fingerprint should be changeable from head end and should be random on the viewing device.
- h. The finger printing should be able to give the numbers of characters as to identify the unique STB and/or the VC.
- i. The finger printing should be possible on global as well as on the individual STB basis.



- j. The overt finger printing should be displayed by the distributor of television channels without any alteration with regard to the time, location, duration and frequency.
 - k. Scroll messaging should be only available in the lower part of the screen.
 - l. The STB should have a provision that finger printing is never disabled.
22. The CAS should generate reports in Non-Editable Format only like pdf
23. The CAS must provide correct, genuine and authentic data
24. The CAS must not have any backdoors to manipulate the data by the operators
25. The CAS should allow users to configure new reports and does not depends only on Canned reports/ predefined reports
26. The CAS must generate logs which are not accessible by any user for manipulation and/ or modification.
27. The CAS must ensure that it has option to back up all the critical data as per the configuration.

Subscriber Management System – SMS

- 1. The SMS shall be independently capable of generating, recording, and maintaining logs, for the period of at least immediate preceding two consecutive years, corresponding to each command executed in the SMS including but not limited to activation and deactivation commands.
- 2. It shall not be possible to alter the data and logs recorded in the SMS.
- 3. The activation and deactivation of STBs shall be done with the commands of the SMS only.
- 4. Every instance of the activation and deactivation of each STB must be captured in the logs and the reports of the SMS which should reflect in the respective instance in the CAS as this is happening simultaneously.
- 5. The SMS together with CAS should be able to activate or deactivate services or STBs of at least Five percent (5%) of the subscriber base of the distributor within 24 hours.





6. The STB and Viewing Card (VC) shall be paired from the SMS to ensure security of the channel.
7. The SMS should be capable of individually addressing subscribers, for the purpose of generating the reports, on channel by channel and STB by STB basis.
8. The SMS should be computerized and capable of recording the vital information and data concerning the subscribers such as:
 - (a) Unique customer identification (ID)
 - (b) Subscription contract number
 - (c) Name of the subscriber
 - (d) Billing address
 - (e) Installation address
 - (f) Landline telephone number
 - (g) Mobile telephone number
 - (h) E-mail address
 - (i) Channels, bouquets and services subscribed
 - (j) Unique STB number
 - (k) Unique VC number
9. The SMS should be capable of:
 - (a) Viewing and printing of historical data in terms of the activations and the deactivations of STBs
 - (b) Locating each and every STB and VC installed.
 - (c) Generating historical data of changes in the subscriptions for each subscriber and the corresponding source of requests made by the subscriber.
10. The SMS should be capable of generating reports, at any desired time about:
 - (a) The total number of registered subscribers.
 - (b) The total number of active subscribers.
 - (c) The total number of temporary suspended subscribers.
 - (d) The total number of deactivated subscribers.
 - (e) List of blacklisted STBs in the system.
 - (f) Channel and bouquet wise monthly subscription report in the prescribed format.
 - (g) The names of the channels forming part of each bouquet.
 - (h) The total number of active subscribers subscribing to a particular channel or bouquet at a given time.
 - (i) The name of a-la carte channel and bouquet subscribed by a subscriber.





(j) The ageing report for subscription of a particular channel or bouquet.

11. The SMS shall be capable of generating bills for each subscriber with itemized details such as the number of channels subscribed, the network capacity fee for the channels subscribed, the rental amount for the customer premises equipment, charges for pay channel and bouquet of pay channels along with the list and retail price of corresponding pay channels and bouquet of pay channels, taxes etc.
12. The SMS vendor must have the technical capability in India to maintain and provide support to the deployed systems on 24x7 basis throughout the year.
13. Upon deactivation of any subscriber from the SMS, all program/ services shall be denied to that subscriber.
14. The SMS should generate reports in Non-Editable Format only like pdf
15. The SMS must provide correct, genuine and authentic data
16. The SMS must not have any backdoors to manipulate the data by the operators
17. The SMS should allow users to configure new reports and does not depends only on Canned reports/ predefined reports
18. The SMS generates must logs which are not accessible by any user for manipulation and/ or modification.
19. The SMS should not allow users to put any ghost / dummy servers which may be used in manipulating the data directly or indirectly
20. The SMS must ensure that it has option to back up all the critical data as per the configuration.





Question 2.

As per audit procedure (in compliance with Schedule III), a certificate from CAS / SMS vendor suffices to conform the compliance. Do you think that all the CAS & SMS comply with the requisite features as enumerated in question 1 above? If not, what additional checks or compliance measures are required to improve the compliance of CAS/SMS?

ByDesign's Response to Question 2

As a CAS and SMS solution provider itself it would not be apt for BIPL to comment on whether other CAS and SMS providers comply with the requisite features as enumerated in question 1 above or not.

However, BIPL feels that self-certification for a critical function is **NOT SUFFICIENT** and hence would like to recommend certain additional audit measures which can be utilized by the TRAI and / or its appointed auditors.

- 1. For Checking the Control Word Sharing:**
 - a. The output Transport Stream (TS) of the Headend can be snooped by using TS analysers or IP snooping tools (Wireshark).
 - b. If the ECMs are encrypted, the CW cannot be traced using the snooping tool. This test case will also help to identify if the ECMs and EMMs are encrypted or not.

- 2. For Checking Factual reporting of the subscriptions:**
 - a. Auditor can check the package/product subscription report for its expiry date assigned to the STBs.
 - b. The expiry date assigned to a particular STB for a particular package/product subscription in the SMS should match with the CAS report of that STB for that particular package/product subscription.

3. All CAS companies should declare the CAS IDs with which they are operating in India. They should also update the IDs as and when they change it. This ID is provided by DVB and hence a DVB certificate should be attached for the same.

4. All CAS companies should provide basic framework/ architecture of the CAS and all modules, which are offered to its customers in India, including the names of standard algorithms used at different stage of the product.





5. All CAS companies should declare security mechanism adopted to provide content protection
6. All CAS companies should provide the roadmap to move towards the Embedded security.
7. All CAS companies should provide the details of the SoCs with which their CAS is working at the time of declaration. They should also provide the Roadmap for working with more SoCs in next 3 years.
8. All CAS companies should provide their company/ parent company details and ownership structure with an undertaking that none of the major shareholders/ decision makers are blacklisted or are with some doubtful background anywhere in the world.
9. All CAS companies should provide the details of the CAS key flashing locations. Government should insist that the keys are flashed within the territory of India in a time bound manner giving itself an option to audit and regulate it if required.
10. Get Globally acknowledged third party (Riscure, CRI, SMI etc) report for the SoC in which the CAS is implemented covering various countermeasures taken by them to stop back doors, security vulnerabilities, physical attacks and other possible hacking options
11. All CAS companies should provide the 3rd party verification report and certificate for the content security mechanism.
12. All CAS companies should provide the Key features of the product and parameters of its operations.
13. All CAS companies should provide the declaration about owning the IPR of the product and authenticity of the code / algorithms used during operation of the product.
14. All CAS companies should declare the user base which is getting served by them, operator wise, on a monthly basis. It can be compared with the operator's disclosures to see the differences if any.
15. All CAS companies should give a declaration, that they are not deploying any Ghost server, alternate mechanisms, data base replication to do the billing and generating the reports and that if found guilty a suitable action can be taken up as permitted under Indian Laws.





16. All CAS companies should mention their service support details as well as issue escalation hierarchy on their website so that all concerned ecosystem partners know how to get the issue resolved in case of any problem.
17. All CAS companies should have a registered office in India as well should have a certificate of Incorporation given by a Registrar of the Company.
18. All CAS companies should share their annual balance sheets and related financial documents (P&L account etc) on an annual basis. The report should also mention the amounts repatriated to the home country from India.
19. All CAS companies not registered in India should provide details of their home country addresses so that issues can be tracked to them in case the CAS company decides to close business in India. A PBG of a suitable amount should be collected so that a suitable solution may be provided to the end customer and the operator who is getting hit as the CAS company moves out / sold out to some other company.
20. The STQC and BIS should recommend specifications of the SMS, Mandatory features, System Security, Proof of business logics etc.
21. Special attention has to be provided by taking help of various arms of government dealing with revenue and tax for the billing mechanism modules. Various loopholes should be identified by such experts and then provisions made in the specifications for the Billing systems to plug them.
22. All the Bespoke systems should be given a date to stop their operations with a sunset clause.
23. STQC and BIS should also provide certification for such SMS systems and the it should be made mandatory to allow/ permit only those SMS systems to operate which have STQC and BIS certification.
24. Some Disincentive mechanism should be sought based on the potential impact which a spurious system can cause to the government from the application providers as well as the operators.
25. Global System Experts / Bodies / Organizations / Institutions should be consulted along with Indian to arrive at a mechanism to review and update such specifications / standards / performance criterions from





time to time as the technology, user preferences, counter mechanisms keep on changing regularly.

26. One of the major issues faced by the Operators / Broadcasters / Regulatory and Governing Bodies today is that out of various applications used in the country and the companies which have developed these applications, many don't have bonafide credentials. Hence Basic Registration with MIB of all the CAS and SMS companies should be made mandatory by providing at least following details

1. Name of the Company in India
2. Company Registration Number in India provided by RoC
3. Address and phone numbers of registered office/s in India
4. Official Indian Representative Name
5. Official E Mail ID and Mobile Number for communication
6. Additional information from Foreign companies
 - i. Overseas Registration Number in the parent country
 - ii. Overseas Official address and phone numbers in the parent country
 - iii. Ownership equity structure details
7. Year of operation commencement in India
8. Previous 3 years Annual Tax / Income Returns filed in India
9. If the company is operating through its authorized dealers and distributors in India, then the it should provide below mentioned details of their authorized distributors in India
 - i. Name of the Company in India
 - ii. Company Registration Number in India provided by RoC
 - iii. Address and phone numbers of registered office/s in India
 - iv. Official Letter of Agreement / Contract and Scope of services between the Parent Company and its distributors in India
 - v. Official Indian Representative Name
 - vi. Official E Mail ID and Mobile Number for communication





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- vii. Previous 3 years Annual Tax / Income Returns filed in India
- 10. Customer List – Name of MSOs where the CAS / SMS server is deployed
- 11. Total Licences sold year wise / customer wise
- 12. Service Centre Details both in India and abroad (if applicable)
- 13. Name and contact details of the STB OEMs with whom their CAS is integrated with and their manufacturing locations with contact details of such locations
- 14. Details of the Platform as deployed in India
 - i. CAS: Advanced Embedded Security / Card Based security / Both / Other
 - ii. Security Audit Report for CAS
 - iii. Middleware: Own / Third Party / Both
 - iv. Subscriber Management System: Own / Others
 - v. Software quality certificates / Awards details if received
 - vi. Other Products sold in India





Question 3.

Do you consider that there is a need to define a framework for CAS/ SMS systems to benchmark the minimum requirements of the system before these can be deployed by any DPO in India?

ByDesign's Response to Question 3

BIPL has long been an advocate for standardization of the systems which creates a level playing field and a fair operating environment for all ecosystem partners.

A defined framework with minimum requirements would ensure

- a. Quality of the Service to the end consumer improves.
- b. End Consumer gets value for his/ her money.
- c. Broadcasters does not have to deal with different features for the same products
- d. That there isn't a consistent threat of content security and hence Broadcasters can offer same quality and variety of content to all category of end consumers as long as they are willing to pay for it.
- e. Product Management is must better for the CAS / SMS Vendors
- f. Government of India does not lose revenue because of non-standardization and lack of transparency in the systems prevalent in the market.

While it is required to create / have competition, it is also mandatory that in the garb of creating competition the end consumer is not served with poor quality of product and service where he / she does not get the value for their money.

Standardization also helps, in implementing measures by the regulator, government or the statutory bodies which are focussed on consumer welfare, consumer safety and consumer satisfaction, in a democratic setup where the end consumer is the king.

A standard framework also allows the product / application developers / providers to plan their resources and price their products / services in accordance to the market offerings and end consumer requirements. This helps in running sustainable business operations with healthy competition and implementing growth strategies thereby providing confidence and satisfaction to its investors, shareholders as well as its employees.

Standard framework stops random planning and reactionary systems / mechanisms which always results in erosion of value of the enterprise in the long run.

Based on above mentioned points BIPL strongly feels that YES there is a dire need to define a framework for CAS/ SMS systems to benchmark the minimum requirements of the system before these can be deployed by any DPO in India.





Question 4.

What safeguards are necessary so that consumers' as well as other stakeholders do not suffer for want of regular upgrade/ configuration by CAS/ SMS vendors?

ByDesign's Response to Question 4

As detailed in the response to Question 2 of this document one of the major problems faced by various operators and Broadcasters is that they have no track of the company which is providing the software/ application and hence they suffer a lot for want of regular upgrades / configuration by CAS / SMS vendors.

To avoid such situation following measures can be taken so that all the stakeholders remain current with the software provided by the application providers:

1. The application service providers should provide all the details as detailed in point number 26 of the response of question number 2
2. Software deployed in the network should be the certified version by STQC / BIS
3. An online directory to be maintained with STQC /BIS which is published on various internet / social media platforms of STQC / BIS detailing the list of the latest software version approved by STQC for that application provider to be deployed in the field. This list should be updated on a monthly basis by STQC / BIS.
4. There should be a legally enforceable Service Level Agreement (which can be checked by the TRAI appointed Auditors during the statutory Audit) along with the option of AMC between the application provider and service providers which should have some mandatory clauses like
 - a. The operator would not deploy substandard STBs with very basic software as generally, the substandard STBs come with very minimal hardware configuration and hence deployed with very basic software which may not have the capability of upgrading(through OTA) to the latest requirements.
 - b. Introduce the Audit checks as mentioned in the response above for Question 1.
 - c. Software deployed in the network should be the certified version by STQC / BIS
 - d. Commitment that the application provider would upgrade the software in the network within a specified time limit once it is approved by the STQC / BIS.





Question 5

- (A) Who should be entrusted with the task of defining the framework for CAS & SMS in India? Justify your choice with reasons thereof. Describe the structure and functioning procedure of such entrusted entity.
- (B) What should be the mechanism/ structure, so as to ensure that stakeholders engage actively in the decision making process for making test specifications / procedures? Support your response with any existing model adapted in India or globally.

ByDesign’s Response to Question 5

The task of defining the framework for CAS & SMS in India should be entrusted with a committee with a chairperson who should be reporting to the regulator.

The committee members should include but not limited to

S No	Representation	Justification
1	Representative from the Regulator / TRAI – Chairperson of the Committee	Key Executive to drive the effort with various stake holders in government ministries as well as other statutory bodies and various national and international forums.
2	Representative from the Regulator / TRAI – Project Coordinator for the Committee	An Executive to coordinate with all the ecosystem partners and stakeholders and present an unbiased view objectively to the committee members without any conflict of interest considering the timelines and delivery dates as fixed by the Regulator.
3	Representative from the Ministry of Information & Broadcasting / MIB	MIB is the nodal Ministry, responsible to issue the Licences to various operators, to get this reform rolled and executed and hence its



		<p>executive shall play an important role in formulating the framework taking into considerations various industry issues as well as objectives of the Government of India</p>
4	<p>Representative from the Ministry of Electronics and Information Technology / MEITY</p>	<p>The implementation of the framework has to be done on the STB hardware the representation of MEITY is mandatory.</p> <p>Also since MEITY is the parental body for STQC it is important to have its presence in the committee so that adequate resource allocations for testing and standardization is allocated during implementation of this framework.</p> <p>MEITY's presence may also be important to decide on various recommendations it provides for deciding the taxes and duties for imported hardware.</p> <p>It is an important body to recommend BIS specs for various hardware products.</p> <p>It also provides recommendations on data security which is a major area getting affected by bringing the framework</p> <p>MEITY has already got developed the CAS and SMS platform and has experience/ knowledge on various issues related to it.</p>
5	<p>Representative from Ministry of Home Affairs / MHA</p>	<p>As the framework committee has to deal with various issues of content</p>

		<p>security, data security, International Application providers/ Vendors and their whereabouts, which fall under the jurisdiction of MHA.</p> <p>Also MHA approvals are needed to implement and rollout the framework once ready it is important to have their representative participate in the process from the beginning.</p>
6	Representative from Ministry of Finance / MoF	<p>Ministry of Finance representation is needed to deal with matters related to enforcement of TAX laws and handling the issues of financial misappropriation as well as revenue recognition.</p> <p>It is a nodal body to understand and enact mechanisms to handle Foreign Exchange managed by various International application providers of CAS and SMS</p>
7	Representative from Ministry of Company/ Corporate and Consumer Affairs	<p>As the framework envisages Application providers to have a authentic / genuine entity operating in the country the MCA representative would be required at certain point of time to provide their inputs.</p>
8	Representative from the Prasar Bharti	<p>Prasar Bharti is one of the major independent entity which transacts with various ecosystem partners at some point of time and proffers the knowledge of the technical systems as well as processes utilized by the operators.</p>

9	Representative from STQC	<p>STQC is the main body to provide Software Testing and Quality Certification for various software application and systems deployed by Government of India.</p> <p>A major part of responsibility of executing the framework would lie with STQC it is mandatory to have its representatives participate in the committee right from the beginning so that they can make the process more smooth and avoid any technical or process roadblock which may come across during the execution / rollout of the framework.</p>
10	Representative from BIS	<p>Once implemented, the body which has to provide its go ahead in accommodating the recommendations in its standards, BIS is the key agency and hence its participation in drafting and finalising the framework is mandatory.</p>
11	Representative from Leading Indian Academia like IISc / IITs having Cryptography Experts	<p>The framework committee would need Domain experts of Cryptography and its application in CAS so that they can understand the systems proposed by various vendors and its practical use in the overall system, hence presence of such experts from leading Indian Academia would be key to develop and implement the required framework. Their knowledge would be crucial so that none of the</p>

		important factors are missed out at the same time irrelevant points are kept at bay thereby saving crucial time and effort of all concerned in this project.
12	Representative from UIDAI / NASSCOM who can help in providing Standard Operating Procedures / Processes for Software Quality Maintenance / Version Upgrades / Software Testing / Latest Trends on above	The framework would need inputs from Process experts who have designed, developed and implemented such frameworks for applications which have a nationwide impact and appeal.

Consultative Process / Mechanism and Other Recommendations

The Project Coordinator should be made responsible to coordinate with various industry representatives like

(B) What should be the mechanism/structure, so as to ensure that stakeholders engage actively in the decision making process for making test specifications / procedures? Support your response with any existing model adapted in India or globally.

1. Representatives from the CAS Provider Companies
2. Representatives from the SMS Provider Companies
3. Representatives from DVB-C Operators/ MSOs / DPOs / LCOs
4. Representatives from DVB-S2 DTH Service Providers
5. Representatives from Broadcasters / Content Provider companies
6. Representatives from Broadcasting Hardware Manufacturing and Software / Application Provider companies
7. Representative from Indian as well as Foreign STB Manufacturing Companies and Design Houses
8. Representatives from Secure Chipset Manufacturing Companies
9. Independent Industry Subject Matter Experts
10. Various Industry Associations like IESA / CEAMA / MAIT / State Cable Operator Associations / Regional LCO Associations
11. Other agencies like BARC/ BECIL / TAM / DVB / Movie Labs / CI Plus LLP / C-DOT / C-DAC / Telecom Billing Application Platform providers / Other Services Billing platforms providers.
12. Any other Party / Body / Association / Company / Consultant which is directly or indirectly affected by the implementation of the framework.



BIPL does not recommend to make above, the part of the framework committee as it would lead to

- a. Conflict of Interest
- b. Unwarranted delays as the regulator does not have a governing right to get the outputs/ responses from them
- c. Vested Interests
- d. The committee would be become too big to coordinate and directionless because each representative would have their own point of view which may / may not be applicable to others.

However since their views matter and are important for the rollout, the Project Coordinator of the framework committee should consult each one of them in a time bound manner and take their views and present the consolidated view of the above representatives to the Framework Committee, objectively without any fear or favour.

Although active participation of the ecosystem partners is required in decision making process but at the same time it is also required to work in a time bound manner so that the industry can get the fruit of this labour.

(B) What should be the mechanism/ structure, so as to ensure that stakeholders engage actively in the decision making process for making test specifications / procedures? Support your response with any existing model adapted in India or globally.

The mechanism can be consultative in the process and should document the feedback of all the stake holders along with its technical, commercial, statutory logic as well as its relevance to the overall effort.

The committee should be given a strict timeline to come out with the framework and a time bound execution methodology

Adequate budget and resources should be provided to this committee so that they can execute their activities without running into shortages thereby stopping the work.

The final recommendations/ framework of the committee should be made mandatory and should be backed by a law.

There are various examples within India where such an approach was successfully adopted by Government Agencies like UIDAI and NPCI. It is for the very same reason representatives from such agencies have been proposed to be a part of the Framework committee so that they with their foresight can guide the committee in such a way to avoid doing potential mistakes. Such models were successfully implemented in above examples and today India is able to reap rich dividends for getting such an exercise done in past.





Question 6

Once the technical framework for CAS & SMS is developed, please suggest a suitable model for compliance mechanism.

- (A) Should there be a designated agency to carry out the testing and certification to ensure compliance to such framework? Or alternatively should the work of testing and certification be entrusted with accredited testing labs empanelled by the standards making agency/ government? Please provide detailed suggestion including the benefits and limitations (if any) of the suggested model.
- (B) What precaution should be taken at the planning stage for smooth implementation of standardization and certification of CAS and SMS in Indian market? Do you foresee any challenges in implementation?
- (C) What should be the oversight mechanism to ensure continued compliance? Please provide your comments with reasoning sharing the national/ international best practices.

ByDesign's Response to Question 6

- (A) Once the technical framework for CAS & SMS has been developed the most important activity would be to get it implemented.

STQC should be assigned the primary responsibility to carry out the testing and certification to ensure compliance to such framework. As a nodal agency STQC should plan the rollout and develop an execution plan of the framework.

STQC should have a mixed approach as it is well known that there is lack of expertise currently in India. The execution plan may include taking services from various national and international experts who can offer services to STQC by signing

- Service Level Agreements
- Confidentiality Agreements
- Non-Disclosure Agreements
- IPR Protecting Agreements
- Financial Bank Guarantees
- Undertakings to prevent and maintain the secrecy of confidential information/ business rules and logics which they come to know in the process of providing services to STQC.





These agencies / bodies would be needed to get the expertise which are not available with STQC currently and which STQC would learn and develop over a period of time.

These agencies can be shortlisted based on their track record of undertaking such jobs globally and their experience with latest methods and techniques in executing such test.

The benefit of having such an approach would

- a. Save time
- b. Provide faster Rollout
- c. Get the best Global Expertise
- d. Develop such expertise over a period of time indigenously
- e. Some of the Application providers have already dealt with such agencies and both understand each other methodology of working
- f. Raising the Quality Levels to Global Standards

(B) Enough precaution should be taken at the planning stage for smooth implementation of standardization and certification of CAS and SMS in Indian market.

This would include

- a. Selection of the correct committee members. It is very important that right committee members with objectivity in mind and sense of purpose as well as target achievement being their highest priority. Past experience in framing and executing such initiatives by Government of India would definitely be an added advantage.
- b. Having **FRAND approach** which means the framework should be **Fair, Reasonable and Non-Discriminatory**.
- c. Taking into consideration business aspects, legal aspects, commercial aspects, Financial aspects, Criminal Aspects of non-compliance and its repercussions
- d. Take into consideration IPR sensitivities of the platform providers specifically for CAS
- e. Taking into consideration proprietary nature of implementation of the platform providers and related sensitivities specifically for CAS
- f. Taking into consideration impact of business rules and logics so implemented by the application platform providers
- g. Taking into consideration various legal aspects and legal challenges which can emerge during its execution should be done with highest priority

(B) What precaution should be taken at the planning stage for smooth implementation of standardization and certification of CAS and SMS in Indian market? Do you foresee any challenges in implementation?





- h. Taking into considerations of compliance / non-compliance of existing /legacy systems

If the framework drafting process has been executed after following the due consultative process with each and every ecosystem partner / stakeholder then the number and quantum of challenges in rolling out the framework would be minimal.

Still there can be challenges of a lot of legacy networks already running with Non Compliant systems. Hence a suitable roadmap of upgradation to be provided with a sun set clause so that the implementation is smooth and frictionless. A lot of inputs can be received during the initial consultative process and the subject matter experts as well as the process experts who are a part of the Framework drafting committee can deliberate to formulate a process which is manageable and executable.

- (C) Current oversight system enforced by MIB and TRAI has been successful in ensuring compliance to current specifications/ mandates. However, going forward once the new framework is adopted and implemented, one may need to re-look at the oversight mechanism considering various national and international best practices and new complexities introduced in the new framework.

It may well be noted that as the framework evolves the committee would come up with different challenges and possible loopholes which can emerge during execution. A suitable process needs to be proposed by the committee to plug such loopholes. With the help of domain experts as well as process experts who are a part of the committee such loopholes plugging process should be part of the recommendations of the committee.

(C) What should be the oversight mechanism to ensure continued compliance? Please provide your comments with reasoning sharing the national/ international best practices.

For example

- a. The new oversight mechanism may look at taking services of ethical hackers who may be given the task to find vulnerabilities in the existing systems and report it back to the Compliance team. Such services are offered by Farncombe/ Cartesian, Kingsmead Security Ltd, Cerberus Security Laboratories Ltd. ATsec. Various other NIST Certified Labs.
- b. The new oversight mechanism may take services of cyber crime and financial forensic fraud detection as offered by various consultants of international repute like KPMG, Ernest and Young, Grant Thornton, Deloitte and PWC to name a few.





Question 7

Once a new framework is established, what should be the mechanism to ensure that all CAS/ SMS comply with the specifications? Should existing and deployed CAS/ SMS systems be mandated to conform to the framework? If yes, please suggest the timelines. If no, how will the level playing field and assurance of common minimum framework be achieved?

ByDesign's Response to Question 7

As a significant amount of effort would have been put in developing and implementing the new framework by various parties it is very important that all the application providers comply to such specifications. The matter would gain National importance and significance.

The committee can look at options to get the compliance achieved by all application providers to the Service Providers.

To ensure that all the CAS / SMS companies comply with the specifications, all the mandatory features can be included in the TRAI mandated Audit requirements. Hence, during the Audit if it is found that the CAS / SMS companies are non-compliant, then the vendors can be given time to enhance the features as per the requirement.

Audit can be re-iterated based on the timeline mentioned earlier by the Auditor. If the Audit non-compliance as reported, is not honoured by the vendors, a mail with the message can be sent to the vendors before taking the strict action against the vendors.

Another option can be to link the renewal of the service provider licence. The firms / entities which are using the legally compliant software only would be eligible to get their licences renewed.

Any new firm / entity would be applying for a fresh licence would have to choose from the pre-approved / compliance approved applications

It would be highly recommended that existing and deployed CAS/ SMS systems be mandated to conform to the framework. It can be achieved by enacting a Sunset clause in the recommendations of the framework committee for existing application providers.

The committee can collect the data and decide the timing of the sunset clause. Typically such clauses provide a timeline of 18 - 24 months for getting the compliance achieved as per the given process (Considering 12 months to technically achieve





incorporate the features and rest of time to get the compliance certificate from the mandated agency).

The System domain and process experts would also be able to provide a phase wise rollover to the existing application providers within the sunset clause. The compliance by all providers is important as it would ensure the level playing field.

It is well understood that the list of features which are mandatory and can not be compromised would definitely be a part of minimum feature list and hence needs compliance by all. These features need to be the features which are the very basis / genesis of getting a new framework rolled out in the first place.

The committee would probably make the list of minimum features which need compliance based on what is achievable within a time frame or what is not achievable within a timeframe.

Certain features which are STB hardware dependent and can not be changed as the STB hardware is already there in the field would need an extended sunset clause so that when the STB hardware life gets over, the new framework compliant hardware should be deployed along with associated hardware. A strict vigil needs to be kept for the items which are imported / produced / deployed during this transition time to reduce / avoid the losses for the service providers in future.

Generally accepted SD STBs life with Non Compliant CAS is around 36 to 60 Months and for HD STBs with Non Compliant CAS is around 18 to 24 Months (as the HD content is expensive) on which the framework committee can take a view.

There should be a thorough information dissemination campaign run by the respective authorities and agencies across the country so that all the stake holders are made aware of such a change which needs to be adhered to within a specified time limit. This may include news paper advertisements, social media / digital marketing campaigns, mandatory notification on various content channels during prime time. Special seminars / webinars / meetings / online transactions to be planned with service providers across various regions in India. Interaction of various Executives of the framework and Implementation committees with ecosystem partners from time to time would be helpful in running the awareness and reach out campaign for successful understanding by the different stakeholders and ecosystem partners so that they provide their buy-in into the whole approach.

Interaction with consumer forums across the country and consumer awareness campaigns shall also be helpful in achieving the desired objective.





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An interim agreement to comply by end of sun set clause could be made mandatory to be signed by the service providers during the regular audit done by TRAI recommended auditors.

This would keep the signatories committed in acknowledging, and understanding the new system, its advantages and the repercussions of non-adherence.





Question 8

Do you think standardization and certification of CAS and SMS will bring economic efficiency, improve quality of service and improve end- consumer experience? Kindly provide detailed comments.

ByDesign's Response to Question 8

ByDesign has been a strong advocate of standardization right from the beginning. The advantages of standardization are not just limited to

- a. Economic efficiency
- b. Improving quality of service
- c. Improving end consumer experience

but also extends to

- a. Ease of doing business
- b. Easing adaptation of new technology / technology upgrades
- c. Easing changes recommended / proposed over a period of time
- d. Interoperability between applications
- e. Application of Law

As envisaged and described in earlier sections of the document as well as the response to Question number 3, there are multiple advantages not just for the end user but also other ecosystem partners ***(the benefits to End Consumers are enumerated at various point in the document when responding to other questions and hence BIPL would like to focus on benefits provided to other ecosystem partners in this section)*** like :

- a. **Broadcasters / Content Providers** – Once the standardized products are deployed by the Service Operators the broadcasters would not be required to spend time, efforts and resources to verify the application time and again for getting their content secured and payment as per actual usage. They can focus on their main activity to produce good quality content and offer them at the price which market is willing to pay.
- b. **Service Providers / DPOs / MSOs / DTH Service Providers** – The service operators would benefit as there is transparency in the system and they would not get worried that competition is gaining market access by some fraudulent means and sub standard product giving the competitor an unfair advantage. Their focus would get diverted to provide better quality of service and enhance their service levels so that they can compete in the market based on the quality of service and not cheap/ fraudulent methods/ means.





The operators can now deploy trained manpower which does not have to worry about the nuances of operating different types of applications and are deft with all the applications as they are standardized.

It will also help the operators to get the hardware at cheaper rates because once the product is standardized the economies of scale would help to reduce the rates.

- c. **Local Cable Operators** – The last mile operators or Local cable operators can demand better service from their MSOs if the systems deployed by their MSOs are standard products certified by respective government authorities. It gives them the peace of mind and helps them in easing their operations.
- d. **CAS Application Companies** – It will set a level playing field for all the CAS companies as they would be clear that they can win business by not cutting corners instead by offering better performance and transparent systems certified by respective government authorities.
- e. **SMS Application Companies** - The SMS companies would be able to reject the demands of providing alternate revenue recognition mechanism by their customers. They can rather focus on providing more enhanced features to ease the work flow and make their system more robust which can work seamlessly with all CAS applications with high load as well high uptime. Upgrades from one vendor application to another would also become easy thereby increasing competition and hence providing ultimate benefit to the end user.
- f. **Headend Equipment Suppliers** - The Headend equipment suppliers typically the companies providing Multiplexing Equipment and Scramblers would get a Standard Compliant Product to Interface / Integrate with. Hence they can focus in ensuring that compliance to standards like DVB is adhered to completely and they are not asked by the CAS companies to tweak some feature to work specifically with them where some compromise may be possible which has gone unnoticed until now.
- g. **STB Design Houses / OEMs/ Manufacturers** – It will give clear guidelines to comply with and would not leave any chance for confusion/ wrong representation / decrease ambiguity and guesswork, guarantee quality thereby boost productivity. Both in terms of hardware and software design the standardization would bring level playing field among STB design houses / OEMs and Manufacturers which will allow them to win





the business on merit and not be short changing on features which give unfair advantage to some.

- h. Component Suppliers / Chip Suppliers** – As the standardization would bring clarity in the features required/ content security and Firmware requirements of the STBs the Chip / Component suppliers can allocate their resources adequately in the areas where the business potential is high. They can decide the life of their chips and can retire/ remove the chips from their portfolio, which no longer be required in the field. This will reduce their inventory carrying cost and will make sure that they focus on getting the products which are more relevant and fulfil wider consumers interests/ requirements.
- i. Statutory Bodies and Law Enforcement Agencies** - The statutory bodies and law enforcement agencies would have to put less efforts on going after issues which although are miniscule but create major hassle among the consumers and the market. A standard certified product would remove all the doubts from the minds of these statutory bodies, and they would be able to focus on broader aspects of financial compliances as well as revenue recognition.
- j. Various Ministries of Government of India** – It is always an endeavour of all the ministries of Government of India to promote and work with standard products, complying to certain standards. This helps in improving country's image not just within India but in Global Community as well and helps in boosting the rating of the country in various performance metrics tracked by Global agencies for activities like Ease of Doing Business etc. Why should one particular domain / industry not follow a certified product when it is doing so in other domains / industries.
- k. Academic Institutes** – Once the products are standardized the academic institutes can initiate various courses in training and help in providing qualified trained manpower to the industry which is the need of the hour. A lot of Service operators are not able to operate optimally because either they don't have standard products or they don't have trained manpower to run / operate their systems because there are not enough training / academic institutes to provide quality training. A lot of human resource available has learnt the technical aspects of their product / systems on the job and are somehow able to manage the operations with a lot of help from the vendor thereby increasing the dependency and increasing the cost of operations significantly.



- l. Standardization Bodies** – The standardization bodies would benefit as it would help to develop competency in a new area. Such competency can then be utilized in other areas in enhancing the quality of those products. The content security and fool proof billing systems are a niche areas and local expertise in such areas is difficult to get.

During the process of developing the framework for standardization and executing its rollout would enable the Standardization bodies to get into the aspects which they were not really aware of and utilize their skills gained erstwhile in their previous experiences to apply it in getting the right product and develop the process which is useful for all.

- m. Job Seekers** – Having a standard certified product helps in providing jobs to the job seekers / unemployed people of the society. Developing expertise in Niche areas is good on one hand but is highly risky as the requirement for such skill may change over a period of time once the technology enhances or their employers change the equipment because of commercial or other reasons. If the human resources are trained on standard certified products, then they can find jobs at other avenues in case their employers have changed the equipment, or the technology has been upgraded. There would be many training institutes where the job seekers can get additional skills if required provided the roadmap followed by the product suppliers are known which is the case in an standardized solution providers case.

Looking at the multifaced benefits and the unique advantage being made available to so many ecosystem partners along with end consumers, it makes a strong case for getting the Framework formulated for Technical Compliance of Conditional Access System (CAS) and Subscriber Management Systems (SMS) for Broadcasting & Cable Services in India.

It would be worthwhile to get a feather in the cap for India to show its brilliance in attempting the above initiative and rolling out like it has done for other mass utilization platforms like UIDAI/ NPCI etc.



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Question 9

Any other issue relevant to the present consultation.

ByDesign's Response to Question 9

ByDesign (BIPL) has tried to capture various aspects of drafting the Framework for Technical Compliance of Conditional Access System (CAS) and Subscriber Management Systems (SMS) for Broadcasting & Cable Services in India in its response to Question 1 o Question 8 above.

In addition to the above responses BIPL feels that such efforts should be notified and backed by suitable legislature if possible so that any effort to derail / thwart / deflect such initiative is taken care right in the beginning.

Once backed by a suitable Law this initiative would be a game changer for the industry and the benefits of the same would be enjoyed by all ecosystem partners for a long time.

We would like to wish TRAI and all those who have been working on this initiative

"ALL THE VERY BEST".

