STUDY ON A NATIONAL SMS HUB SOLUTION FOR BULK SMS AND NATIONAL POLICIES ON SMS REGULATOR IN SRI LANKA

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ABSTRACT

This research was aimed to design a national hub to overcome some difficulties in bulk SMS business in Sri Lanka. As of now in Sri Lanka Bulk SMS usage (advertising, voting in reality shows etc.) is not regulated. Since this could lead to national cyber security issues and some social issues, it is an urgent requirement in Sri Lanka to decide on the policies to handle Bulk SMS. Also there must be a technical solution to safely operate bulk SMS by all mobile operators. In this solution, it is proposed to issue a new license to a National SMS HUB operator (or two) and all mobile network operators and bulk SMS service providers should provide their services through the National SMS Hub. The network architecture in which these connections are to be made also proposed in this paper. Mobile network operators connect their Short Message Service Center (SMSC's) to the National SMS Hub and bulk SMS service providers connects their SMS gateways to the hub. As a part of this research a National policy to manage bulk SMS and the license to be given to Hub operator(s) by Telecommunications Regulatory Commission (TRCSL) also proposed. Mobile network operators, bulk SMS service providers and National Hub operator should be responsible for adhering to the policy. A survey was conducted and the responses to the survey were used in formulating the policy. Also discussed with mobile network operators, mobile equipment vendors, as well as bulk SMS service providers in Sri Lanka. Their ideas were useful to propose an architecture with SMS Hub and decide on several policies.

***Key words*:** Tele-voting, Bulk SMS, SMS HUB, Short Message Service Center (SMSC)

1. INTRODUCTION

In Sri Lanka bulk SMS (Short Message Service) is becoming a very popular mobile application among mobile phones users. These mobile users can be categorized as Buyers, Customers, Clients, Social networkers, Members, Share – holder, Technician, Participants, Viewers, Resellers, Retailers, Whole seller, Distributors, Employees, Workers, Patients, Doctors, Professionals, Students, Professors, Associates, Partners, Spectators, Donors, Citizens, Union members, Parents, Teachers, Campaigners, Sales executive, Sales Promoters, Marketers, Purchasers, Jobseekers etc. When any person, company, industry and business needs to send urgent and important information to unlimited number of people regularly and if they have very little time to convey some information, bulk SMS is the only solution. Bulk SMS is very economical, reliable and a real time service to communicate with a large number of people within few moments. Another popular mobile application is Tele-voting. When a television channel or such a company organizing competitions, the organizer allows to vote via the mobile phone just sending a SMS with specific short code. In Sri Lanka many television channels organize different kinds of events, like singing competitions, dancing competitions, etc.

and mobile users can vote easily by their mobile phone, just sending a SMS. In this case in Sri Lanka what is normally done is the competition organizer, probably the television channel, pays money to a third party company and the company deals with all mobile operators in Sri Lanka. Then each operator passes the relevant SMS to the third party company. The third party company gives the final results to the organizer. In both cases above, in Sri Lanka we still don't have national policies to control that. This research was aimed to draft suitable polices and design National Hubs under license issued by Telecommunication Regulatory Commission Sri Lanka (TRCSL).Then these hubs should be connected with all SMS servers belonging to each mobile operator. This should also be under national polices and regulation that we draft.

2. EXISTING SOLUTIONS ON SMS GATEWAY CONCEPT

When we consider the existing bulk SMS technology, there are existing ways to do this in industrially. Either can use web interface with connecting a GSM modem device to a GSM network. Another way is bulk SMS service provider can use their SMS server connecting with a SMS gateway in a commercial way. And the SMS gateway should be connected to the mobile network operator via the SMSC (Short Message Service Center). In existing solution SMPP protocol has used as it's the latest protocol SMPP version 5.0.Also SS7 is the signaling protocol that can be use between SMSC's in the core GSM network. It can carry SMS messages using the SS7 protocol. SS7 works through ISDN lines or through IP. The IP version is not as widely used as the ISDN version. The IP version of SS7 is called SIGTRAN. SMS gateway enables you to connect directly to mobile network operators SMSC over the Internet or a leased line using TCP/IP. The other most common protocols are UCP and CIMD2 [2].

On existing policies of bulk SMS, we observed existing several bulk SMS policies in different countries. These all policies that we observed belong to above existing SMS gateway solution.

3. PROPOSED SOLUTION

Here we propose a technical solution for a National Hub (Hub's). Basically there is a National SMS Hub and all mobile operators are connected (via SMSC's) to the Hub and every bulk SMS service providers must to connect (via the application server) to the National Hub, architecture is as given below (Figure 2) .Here, by orange color shows existing solution and by green color shows the new elements proposed by this study.

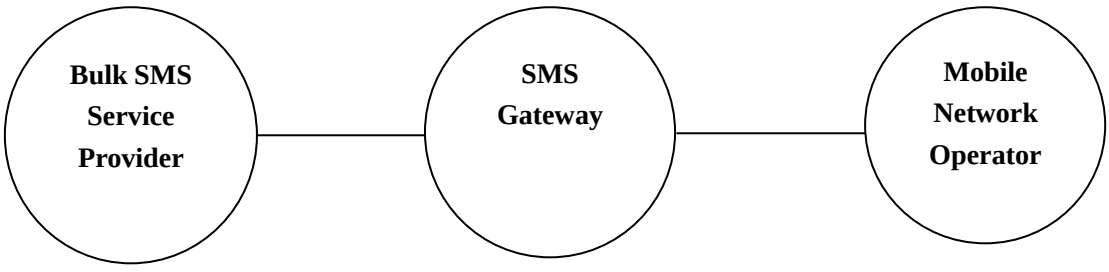

Figure 1: The block diagram of existing SMS gateway solution [2]

3.1 Suggested protocols for the Hub

Here we had to consider the several technical matters regarding the protocol. Normally in SMS gateway solution used SMPP protocol; it is possible to use SMPP for this suggested architecture too. When we consider the throughput of SMS delivering, SMPP is having enough throughputs as we need. Also SS7 (Sigtran) has a high throughput than SMPP so we can suggest this protocol also. Why SMPP? Because most of the mobile network operators (their SMSC's) are supporting SMPP protocol also having reliability, Security, high capacity and two-way messaging (Message Origination and Terminating) allow in SMPP [3].

3.1.2 Physical Interface and Signaling

All the interfaces of SMS Hub shall be based on open and standard interface. The physical layer connectivity between the nodes shall be E1 interface and FE/GEIP interface. The SMS Hub shall be provided with SFTP/FTP to establish connectivity with billing server through Internet to transfer EDR (Event Detail Record) of SMS for billing purpose. The proposed SMS Hub shall be able to support connection with at least SMSC of GSM, CDMA and FIXED line Operators. Optionally, it shall support SMPP based interface to the third part SMS application vendors to send/receive SMS.

3.2 Special Features Hub should have

- It shall be capable to support end-to-end delivery of messages from SMS applications to the end user.
- All messages shall pass through the anti-SPAM module. Anti-SPAM shall support following features but not limited to.

1. Analysis of content against preened banned patterns.

2. Such content policies should be established per operator wise.

3. Should protect the consumers from getting unsolicited messages. (Black Listing)

4. Anti-SPAM capabilities shall be applied to both SMPP and SS7 traffic.

5. It shall support secured connectivity on all interfaces wherever available.

It shall allow monitoring facilities to monitor the traffic statistics. Reports shall provide at least but not restricted to,

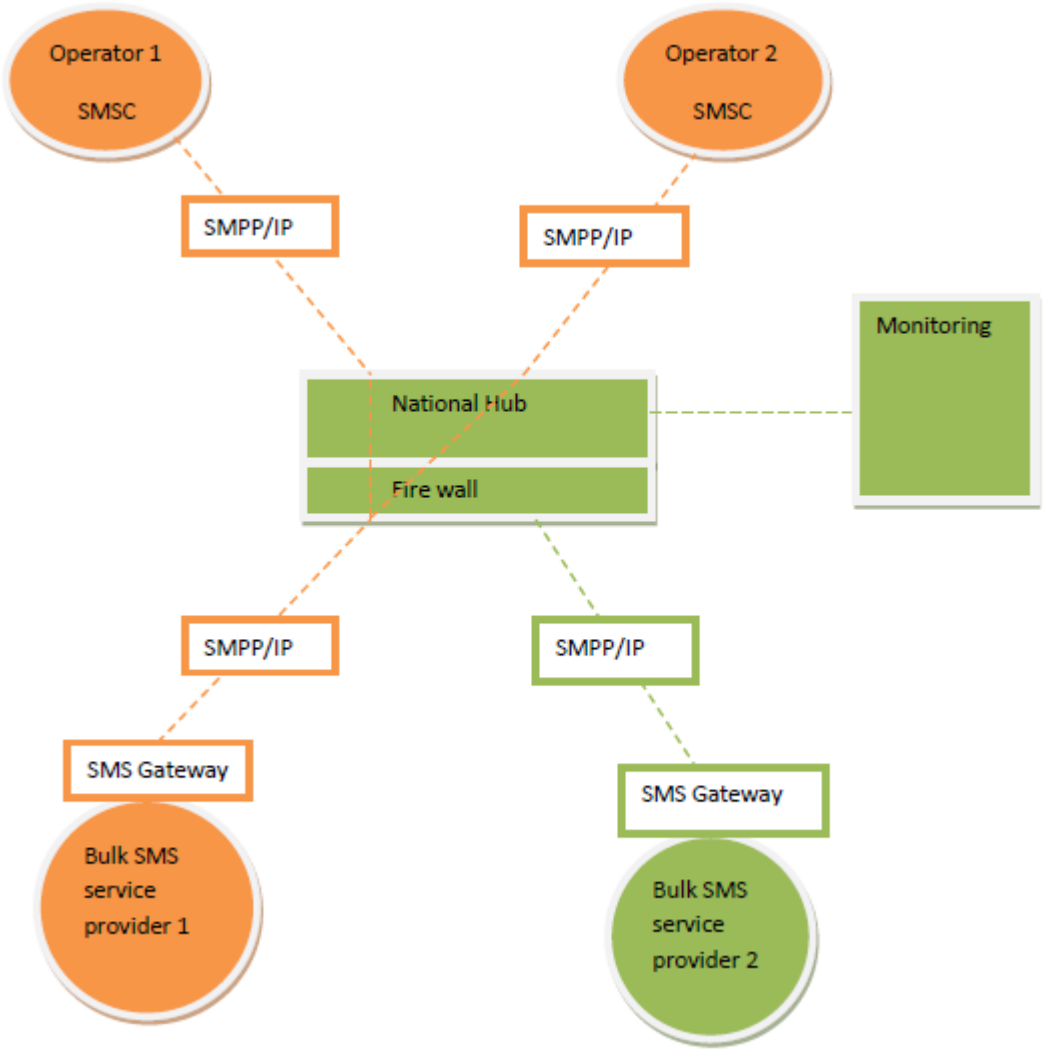

Figure 2: The suggested architecture of Hub.

1. IN/OUT SMS count per each SMPP account, Operator, Short Code.
2. Monthly SMS summary counts.
3. Provide a means of verifying the SMS campaigns such as public Polling.
4. It shall support Anti spoofing feature to restrict the usage of origination short codes by each of the SMS Application.

3.3 Sub Features of SMS Application connectivity Interfaces

- The hub should have a mechanism to monitoring SMS content, monitoring live SMS traffics and mechanism to block specific SMS's.
- The Hub should have a mechanism to limit/ stop the message originating and terminating.
- The Hub should have a mechanism for logging and auditing.
- Throughput control- Traffic incoming / outgoing from / to a SMPP account should be throttle controlled. This should allow account wise fine traffic regulation to keep offending

clients, which gives an indirect way of SPAM controlling

- HTTP

1. A generic API based on XML etc to send / receive SMS

2. It shall allow send / receive SMS via such an interface

3. It shall allow sending of single SMS to multiple recipients

4. It shall support Authentication encryption of the communication path

- Network Management facilities. The system should provide with means of management on the information service system for operation and maintenance. The user should be able to query the running status, configuration, performance of the system, alarms and interface connections.
- Scalability-The system software(s) shall be modular in structure and shall be capable of merging new files and programs with existing files at the site without any interruption of service in the following cases.
- Redundancy Protection against failure-The SMS Hub shall have redundant design philosophy. Service degradation shall not be allowed during fault conditioning any one or more of the system modules or servers. Change-over from main to standby modules or Servers should not affect system's performance.

4. DATA ANALIZING AND PROPOSED POLICIES.

When analyze the result of our survey, 63 peoples have responded. Here I have shown below some important result that we needed to suggest some policies. Rests of other policies were decided with discussing several parties which related to this research project title.

1. Most of people like to vote for reality shows conducting by television channels (56%)

2. Most of them expect to length of a message up to 100 characters (49%).

3. Most of people strongly dislike to receive any unlawful, threatening, abusive, libelous or indecent information or such a content via bulk SMS (84%).

4. Most of them recommend for allowing bulk SMS 8AM to 8PM (87%).

4.1 Propose policies

4.1.2 Suggested polices for mobile operators.

- Every each mobile operators should be connected (Registered) to the national Hub and must do all bulk SMS and Tele-voting messaging business via the National Hub.
- Mobile operators have the permission to charge from customers and then mobile operator can share money with other parties. The tariff for each service should be approved by TRCSL. If advertising company implements a new subscription service or any bulk SMS service or any tele-voting service they have to get approval from TRCSL for charging.
- Mobile operators have the permission to send urgent information like tsunami warning, urgent messages useful for national security purposes at any time via the National Hub.
- A mobile operator should not try to access or use data, subscriber information from any other mobile operators.

4.1.3 Suggested polices for advertising companies (bulk SMS service providers)

- Every advertising company (their application servers) should be connected to the national Hub.
- All promotion bulk messages shall be sent between 8 AM and 8 PM, except critical messages that are required to be sent immediately.
- For the Tele-voting messaging the time period can be vary, for that need to have approval from TRCSL.

4.1.4 Suggested polices for the National Hub operator(s)

- The Hub operator should be responsible for regulation of above polices.

For different bulk SMS services, specific short code series can be used.

- Hub operator has permission to monitor live SMS traffic, to have a record of past SMS traffic details, any parameters needed, and when required, has the permission to check the content of the message.
- The hub operator should be responsible for not allowing accessing any types of data or subscriber information from one operator to another operator.
- Hub operator shall be responsible for sending promotion bulk SMS during 8AM to 8PM
- Hub operator shall not be responsible in any manner due to errors caused on account of internet delays, disconnection, time outs, routing problems etc.

4.1.5 General polices for all parties in this architecture

- All parties should be responsible for not transmit any material or content which violates or infringes in any way upon the rights of others, is unlawful, threatening, abusive, defamatory, invasive of privacy or publicity rights, vulgar, obscene, and profane or otherwise violate any law, or which, without National Hub operator express prior approval, contains advertising or any solicitation with respect to products or services.
- All parties should be responsible to not trying to access or use of unauthorized data, systems or networks in the national Hub including any attempt to probe, scan or test the vulnerability of a system or network or to breach security or authentication measures without adhering express authorization of the authorized operator of the National Hub.
- All parties should be responsible for sending bulk SMS's only for lawful purposes. It shouldn't be any content which is misleading in any manner which induces involvement of money
- Bulk SMS shall not be responsible in any manner whatsoever to the subscriber or any other third party for delayed, incomplete and non-delivery of SMS due to technical reasons.
- Subscriber agrees to pay in Sri Lankan Rupees

5. CONCLUSION

We could suggest a successful technical solution for a national hub. In conclusion every mobile network - operator has to connect its SMSC to the National SMS hub through SMPP protocol. Bulk SMS service providers can connect their

SMS gateways through the SMPP protocol. Each network nodes in this architecture can connect via a VPN (Virtual Private Network).The transmission medium can be either wire or wireless. We have suggested policies for national security, regulatory the charging policies keep the reliability of Tele-voting campaigns and protect the subscriber. All parties in this architecture, mobile-network operators, bulk SMS service providers and hub operator should be responsible for the policies regulatory by TRCSL. Above suggested policies should be adopted by the TRCSL and then we can regulate the SMS of all operators. Hub operators should be given a guideline to mobile network operators and bulk SMS service providers, and then they should follow the guidelines of the TRCSL. This hub and this architecture are suitable and reliable to do what we wish to do by a national SMS Hub.

6. REFERENCES

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