Internship (Industrial Training) Report

On

Core Networking System and NOC of ICX at VOICETEL Ltd.

As a partial fulfillment of the degree of Bachelor in Electronics and Communication Engineering at East West University

Prepared By
Shahriar Hossain
ID: 2014-1-50-013
Department of Electronics & Communication Engineering
East West University

Supervised by
Dr. M. Mofazzal Hossain
Professor & Chairperson of Electronics & Communication Engineering Department
East West University
VOICETEL LIMITED

It is an Interconnection Exchange (ICX) operator providing following services:

♦ Routing/ Switching Inter operator Domestic Voice calls.
♦ Routing/ Switching International Calls between ANS and IGW Operators.
♦ SMS, VMS and VAS services.
♦ ENUM, IMEI and number portability Services.
♦ Special Code number, Emergency Number, Call center number
♦ Routing.
Disclaimer

This is to announce this is the internship report dependent on core networking and NOC of ICX at VOICETEL Dhaka Bangladesh. This internship report has not been submitted somewhere else for any reason.

--------------------------
Shahriar Hossain
ID: 2014-1-50-013
Department of ECE
Acceptance

This internship report has been presented to the department of Electronics and Communications Engineering, East West University and submitted in partial fulfillment of the requirement for degree of B.Sc. in Electronics and Telecommunication Engineering, under complete supervision of the undersigned.

Dr. M. Mofazal Hossain
Professor & Chairperson
ECE Department
East West University

Shuvo Ranjan Dey
System Engineer
Core Network Department
Voicetel LTD.
I, Shahriar Hossain, might want to offer my thanks to all-powerful Allah for giving me solidarity to perform my duty as an intern and finish my report in time.

My extraordinary much gratitude goes to Dr. M. Mofazzal Hossain, Professor of ECE department, East West University, who was my scholastic administrator for the course ICE 498 (Industrial Training). He guided me to finish the report effectively by dispensing his most important & valuable time.

I might extraordinarily want to pass on my appreciation to my company supervisor Shuvo Ranjan Dey, System Engineer of Core Network Department, Voicetel LTD., who gave me the opportunity to do intern under his department and guided me with lots of effort and time.
Abstract

This report depends on the core system activities of ICX department of VOICETEL Ltd. It is an Interconnection Exchange (ICX) operator. They provide services on routing/switching inter operator domestic voice calls, routing/switching international calls between ANS and IGW, ENUM, IMEI and number portability services, special code number, emergency number, call center number etc. They have three branches, main office is in Dhaka, others are in Chittagong and Khulna. They are performing their network management successfully.

I have worked in their core part of NOC department. For the greater part of the designing understudy it is vital to deal with a professional workplace. I have adapted such a significant number of things, similar to how to deal with the function weight despite a modern domain.

In this report I have clarified my work encounters. I have figured out how they deal with their function routine and how they check the association. At the point when association gets flopped then they have shown me how to deal with the circumstance and changed the association with other dynamic system.
# Table of Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Introduction</strong></td>
<td>01-02</td>
</tr>
<tr>
<td>1.1 Introduction</td>
<td>01</td>
</tr>
<tr>
<td>1.2 ICX Model in Bangladesh</td>
<td>02</td>
</tr>
<tr>
<td><strong>2. Company Profile (VOICETEL Ltd.)</strong></td>
<td>03-04</td>
</tr>
<tr>
<td><strong>3. Access Network Service</strong></td>
<td>05-13</td>
</tr>
<tr>
<td>3.1 List of ANS Providers</td>
<td>05</td>
</tr>
<tr>
<td>3.2 Mobile Operators</td>
<td>05</td>
</tr>
<tr>
<td>3.3 List of IPTSP</td>
<td>06</td>
</tr>
<tr>
<td>3.4 List of PSTN</td>
<td>11</td>
</tr>
<tr>
<td>3.5 Zonal PSTN</td>
<td>12</td>
</tr>
<tr>
<td>3.6 Rural PSTN</td>
<td>13</td>
</tr>
<tr>
<td><strong>4. ILDTS</strong></td>
<td>14</td>
</tr>
<tr>
<td>4.1 Historical Background of ILDTS Policy</td>
<td>14</td>
</tr>
<tr>
<td><strong>5. ICX</strong></td>
<td>15-17</td>
</tr>
<tr>
<td>5.1 What is ICX?</td>
<td>15</td>
</tr>
<tr>
<td>5.2 Network Topology of ICX</td>
<td>16</td>
</tr>
<tr>
<td><strong>6. Core Networking</strong></td>
<td>18-21</td>
</tr>
<tr>
<td>6.1 What is Core Network?</td>
<td>18</td>
</tr>
<tr>
<td>6.2 Department of Core Network of ICX</td>
<td>19</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>7. Management issues for call routing</td>
<td>22-32</td>
</tr>
<tr>
<td>7.1 Software management</td>
<td>22</td>
</tr>
<tr>
<td>7.2 Hardware management</td>
<td>25</td>
</tr>
<tr>
<td>7.3 Protocol stacks of some boards</td>
<td>30</td>
</tr>
<tr>
<td>8. Call Flowing in hardware level</td>
<td>33-35</td>
</tr>
<tr>
<td>8.1 Uplink Path for ISUP/INAP over MTP3/M2UA</td>
<td>33</td>
</tr>
<tr>
<td>8.2 Downlink Path for ISUP/INAP over MTP3/M2UA</td>
<td>35</td>
</tr>
<tr>
<td>9. Basic configurations and commands in core system</td>
<td>36-41</td>
</tr>
<tr>
<td>9.1 Configuration for the connection of GP INTERNATIONAL</td>
<td>36</td>
</tr>
<tr>
<td>9.2 Basic commands</td>
<td>38</td>
</tr>
<tr>
<td>10. Network Operation Center</td>
<td>42-51</td>
</tr>
<tr>
<td>10.1 Routine Parameters</td>
<td>44</td>
</tr>
<tr>
<td>10.2 Routine Parameter Check</td>
<td>44</td>
</tr>
<tr>
<td>11. Conclusion</td>
<td>52</td>
</tr>
<tr>
<td>References</td>
<td>53</td>
</tr>
</tbody>
</table>
Some Short Terms Shortening

ICX-Interconnection Exchange.
IGW-International Gateway.
IIG-International Internet Gateway.
ITC-International Terrestrial Cable.
PSTN-public switched telephone network.
IPTSP-Internet Protocol Telephony Service Provider.
ILDTS-International Long Distance Telecommunications Services.
PSDN-Packet Switch Data Network.
GTS-Global Telecom Service.
UMG-Universal Media Gateway.
MML-Man-Machin Language.
LT-Location Type
TG-Trunk Group Number.
TGN-Trunk Group Name.
MN-Module Number.
SC-Start Channel.
EC-End Channel.
OPC-Originating Point Code.
DPC-Destination Point Code.
DIR-Direction.
CDR-Call Details Error.
Chapter 1

Introduction

1.1 Introduction

The advancement of Bangladesh's broadcast communications area started with little strides in 1989 with the issuance of a permit to a private administrator for the arrangement of entomb alia cell portable administrations to contend with Bangladesh Transmit and Phone Board (BTTB), the past imposing business model supplier of media communications benefits inside Bangladesh. Noteworthy changes in the quantity of settled and portable administrations conveyed in Bangladesh happened in the late 1990s and the quantities of administrations in activity have accordingly developed exponentially in the previous five years.

Telecom controllers presented an ICX based interconnection routine in 2007 and with that began another time of interconnection in Bangladesh. Correlation of advantages of when the progressions has demonstrated that ICX based course of action can be advantageous to the general interconnectivity situation. Service provider all over the world are now emphasizing on cost optimization and simplified architecture which allows adoption of future technology/services. ICX based interconnection regime can be the solution and the potential of such model is gaining in popularity. International Telecommunications Union (ITU)’s recent publications recommend the concept of an “Interconnect Gateway Exchange” for the multi-service and multi-operator environment. The handbook recommends that nations setting up an ‘Interconnect Gateway Exchange’ in a multi-administrator condition can address the difficulties of multi-administrator and multi-benefit interconnection condition all the more viably and effectively.

Parts of the earlier 2008 interconnection routine in Bangladesh raised specific concerns:

a) The constrained limit of the officeholder (previous BTTB now BTCL) for interconnection with different administrators and

b) The restraining infrastructure of universal door BTTB held an imposing business model on IGW benefits in Bangladesh because of the contemporary administrative methodology. BTTB has underinvested in worldwide portal limit in a way that couldn't take care of market demand. Other than limit development was not expected to empower it to meet the fast development sought after. The imposing business model had likewise prompted abnormal amounts of illicit detour which has lessened the incomes achieved by the Government.
1.2 ICX model in Bangladesh

In the context of having an interconnection regime which harmed overall efficiency and were likely to be holding back overall access to telecommunications services in Bangladesh the policy makers introduced a new era of interconnection with ILDTS2 policy 2007. This policy is governed under the Telecom Act-2001. To implement this policy BTRC has amended the Interconnection regulation-2004 in 10th February-2008. This policy stipulates building a three-tier telecommunication infrastructure for international calls. Initially the government granted three international private sector through auction. Introduction of ICX based interconnection model brought in change in following three frameworks-

- Regulatory
- Technical
- Financial

1.2.1 Regulatory framework

Along with the ILDTS Policy 2007, the following is the guiding framework of interconnectivity in Bangladesh:
1. Bangladesh Telecommunication Act-2001 (as amended)
2. Interconnection Regulations-2004 (as amended)
3. Relevant directives (interim directives on MTR etc.) issued by the regulator (BTRC).

1.2.2 Technical framework

The three layers of network architecture keep the provision of International Gateway, interconnection Exchange and Internet Exchange. Services provided under these 3 layers can be translated into following kind of interconnection:

a) Interconnection for Domestic telephone service
b) Interconnection for International telephone service and
c) Interconnection for International Data service.

1.2.3 Financial framework

Previously revenue share for domestic off-net calls were done as per the pre-fixed termination rate and each operator used to bill the other for the total traffic volume (minutes) as per as respective CDR. For international calls no revenue sharing was in place. As per the ILDTS policy a certain revenue sharing arrangement is now in place among all stakeholders for international calls. Domestic termination rate and revenue sharing of it are also determined by NRA (BTRC). For domestic calls’ a termination rate is still fixed by the BTRC. At present, they are conducting a cost study, the result of which is expected to be adopted by next year.
Voicetel is a telecommunication based Joint Venture Project of Pertex Star Group, Karnaphuli Group and Metro Group. Mr. M.A Hashem is its Honorary Advisor and Mr. Saber Hossain Chowdhury M.P is its Chairman.

There are almost 35+ employees in various departments of Voicetel.

IT INCLUDES
a) Core Network
b) Transmission Network
c) Billing Department
d) ACCOUNTS & FINANCE
e) Corporate Relationship Department.

Voicetel has 3 Operational Zone (Dhaka, Chittagong, Khulna) which are operated by Head Quarter (Dhaka) & Khulna Branch, whereas Chittagong zone is runned by Combined ICX POI.

Voicetel Neuclius Team Consist of:

a) Saber Hossain Chowdhury
   Chairman
b) Aziz al Mahmood
   Managing Director
c) Makin Ur Rashid
   Director
d) Joynal Abedin C.A
   Chief Financial Officer (CFO)
e) Md. Sayeduth Sadath
   Chief Technical Officer (CTO)
f) Mustafa M Hussain
   Chief Operating Officer (COO)

It is an Interconnection Exchange (ICX) operator providing following Services:
- Routing/ Switching Inter operator Domestic Voice calls.
- Routing/ Switching International Calls between ANS and IGW Operators.
- SMS, VMS and VAS services.
- ENUM, IMEI and number portability Services.
- Special Code number, Emergency Number, Call center number
- Routing.
VOICETEL LTD. has world-class network, equipment, best team and international technology partners.

VOICETEL LTD. was formed in the year 2011 by a dedicated team of professionals having wide experience in the fields of Business and Product Development.

Voicetel’s objective is to make an across the country arrange going for making solid value through moderate, dependable and proficient administrations to our key accomplices through persistent mechanical development and permitting progress towards a Digital Bangladesh clearing the way for us to remain at worldwide dimension.

Voicetel’s Objectives

The main objective of Voicetel Ltd. so to facilitate Telecommunications Services to public efficiently by routing calls and interconnecting Telecommunications network in Bangladesh.

Mission

Conveying best quality moderate Telecom Services to the majority of Bangladesh.

Vision

Building Infrastructure for Digital Bangladesh.
Chapter 3
Access Network Service

3.1 List of Access Network Service (ANS) Providers

In 2010, there were 6 Mobile Operators, 41 IPTSP (IP Telephone Service Providers) and 12 PSTN Operators in Bangladesh. At that point Government of Bangladesh confronted association based, income based and VOIP decrease issue. For Solving these issues, Bangladesh Telecommunication Regulatory Commission (BTRC) had presented “International Long Distance Telecommunication System” (ILDTS Policy).

3.2 Mobile Operators:

- Banglalink
- Grameenphone
- Robi/Airtel
- TeleTalk
### 3.3 List of IPTSP:

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Name &amp; Address of the Licensee</th>
<th>License No.</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 1.  | Information Services Network Limited  
TMC Building (4th floor), 52 New Eskaton Road, Dhaka-1000, Bangladesh  
Contact: 8322785-8, 0189213431, Fax: 9345460  
e-mail: ipts@bangla.net, Web: www.bangla.net | BTRC/LL/IPTSP-Nationwide(2) ISN/2009-2  
Dated: 18-08-2009 | |
| 2.  | Agni Systems Ltd.  
Navana Tower (11th floor), Suite-A, 45 Gulshan Avenue, Dhaka-1212, Bangladesh  
Contact: 8812379, 01713075668, Fax: 8811902  
e-mail: info@agni.com, Web: www.agni.com | BTRC/LL/IPTSP-Nationwide(3) Agni/2009-3  
Dated: 18-08-2009 | |
| 3.  | HRCTechnologies Limited  
HR Bhaban, 26/1 Kakrail, Dhaka-1000, Bangladesh  
Contact: 8117752, 8119969, 01711520180  
Fax: 8113319, e-mail: info@hrc-tech.net  
Dated: 03-09-2009 | |
| 4.  | Innovative Online Limited  
JibonBimaBhaban (5th floor), 56 Agrabad C/A, Chittagong-4100, Bangladesh  
Contact: 2526778, 2526779, 03930080542, 01713105160, 01819310483, Fax: 2510124  
e-mail: anwar@iolbd.net, hasan@iolbd.net  
Web: www.iolbd.net  
NOC contact: 25101234, 03930080538 | BTRC/LL/IPTSP-Nationwide(5) IOL/2009-4  
Dated: 20-08-2009 | |
| 5.  | Dhakacom Limited  
Navana Tower (7th floor), 45 Gulshan (south) C/A, Circle-1, Dhaka-1212, Bangladesh  
Contact: 8819252, 01713030203, Fax: 8819221  
e-mail: mahakim@dhakacom.com  
Dated: 20-08-2009 | |
| 6.  | Metronet Bangladesh Limited  
Sonartori Tower (18th floor), 12 Sonargaon Road, Dhaka-1000, Bangladesh  
Contact: 9897612, 9671381, Fax: 9886442  
e-mail: sak@metro.net.nd, Web: www.metro.net.bd | BTRC/LL/IPTSP-Nationwide(7) Metronet/2009-18  
Dated: 01-10-2009 | |
| 7.  | Communication One (Pvt.) Limited  
170/A Outer Circular Road, Bara Moghbazar, Dhaka, Bangladesh  
Contact: 01922110025, Fax: 04476000511  
e-mail: info@communication-1.com  
Dated: 01-10-2009 | |
| 8.  | Access Telecom (BD) Ltd.  
Suite#901, Concord Tower, 113 Kazi Nazrul Islam Avenue, Dhaka-1000, Bangladesh | BTRC/LL/IPTSP-Nationwide(9) AccessTel/2009-12 | |
<table>
<thead>
<tr>
<th>Rank</th>
<th>Company Name</th>
<th>Contact Details</th>
<th>Dated</th>
<th>Line Number</th>
</tr>
</thead>
</table>
| 9.   | Ranks ITT Ltd. | Red Crescent Borak Tower (level-10)  
Contact: 9361369, 9361381, 04474700178, 04474700179, Fax: 9361349  
e-mail: info@ranksitt.net, Web: www.ranksitt.net | BTRC/LL/IPTSP-Nationwide (10)Ranks  
ITT/2009-13  
Dated: 03-09-2009 | 9. |  

| 10.  | Connect BD Ltd. | 20 Chamelibagh, Dhaka, Bangladesh  
Contact: 8816491-2, 8810069, 01713193203  
Fax: 8816493, e-mail: info@connectbd.com  

| 11.  | BDCOM Online Ltd. | House#43 (4th floor), Road#27 (old), 16 New Dhanmondi R/A, Dhaka-1209, Bangladesh  
Contact: 8125074-5, 01713331400, 01711527065  
Fax: 8122789, e-mail: office@bdcom.com  
Web: www.bdcom.com | BTRC/LL/IPTSP-Nationwide (12)BDCom/2009-14  
Dated: 03-09-2009 | 11. |  

| 12.  | Broad Band Telecom Services Limited | Ispahani Building (5th floor), Sk. Mujib Road, Agrabad, Chittagong  
Contact: 0312520550, 031252556, 031714126  
Fax: 031710471, e-mail: info@bbts.net  
Dated: 03-09-2009 | 12. |  

| 13.  | Digital Connectivity Limited | 20-D, 13 Topkhana Road, SegunBagicha, Dhaka-1000, Bangladesh  
Contact: 01714034844  
e-mail: mashhur@excel.net.bd  

| 14.  | BTS Communications (BD) Ltd. | Shawpnil-4, Safeway Complex (3rd floor), Mirjajangal, Sylhet, Bangladesh  
Contact: 0821715361, 715395, 01730060210  
Fax: 0821715361, e-mail: abdul@thekader.net  

| 15.  | X-Net Limited | Suite#1103, Concord Tower, 113 KaziNazrul Islam Avenue, Dhaka-1000, Bangladesh  
Contact: 8321051, Fax: 9335269  
e-mail: info@x-netbd.com  
Dated: 01-10-2009 | 15. |  

| 16.  | Royal Green Online Limited | 33 Karwan Bazar, Shah Ali Tower (2nd floor), Tejgaon, Dhaka-1215, Bangladesh  
Contact: 8142760, 8142761, 01713043416  
Fax: 8143346  
e-mail: royalgreeninc@yahoo.com  
Web: www.royalgreen.net | BTRC/LL/IPTSP-Nationwide (20)RGOL/2009-9  
Dated: 18-08-2009 | 16. |  

<p>| 17.  | Link 3 Technologies Ltd. | Bulu Ocean Tower, Kemal Ataturk Avenue, | BTRC/LL/IPTSP-Nationwide (21)Link- | 17. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name</th>
<th>Address</th>
<th>Contact</th>
<th>Dated</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>Bangladesh Internet Exchange Limited</td>
<td>House#26, Road#28, Block-K, Banani, Dhaka-1213, Bangladesh</td>
<td>9888712, 01711525993, Fax: 9883131</td>
<td>03-09-2009</td>
<td><a href="http://www.link3.net">www.link3.net</a></td>
</tr>
<tr>
<td>20.</td>
<td>ADN Telecom Limited</td>
<td>17 Red Crescent Concord Tower (19th floor), Mohakhali C/A, Dhaka-1212, Bangladesh</td>
<td>8861234-8, 01817042390</td>
<td>01-10-2009</td>
<td><a href="http://www.adnsl.net">www.adnsl.net</a></td>
</tr>
<tr>
<td>23.</td>
<td>IDS Bangladesh</td>
<td>Iqbal Centre (5th floor), 42 Kemal Ataturk Avenue, Banani, Dhaka-1213, Bangladesh</td>
<td>8817458, 9861564, 8823718</td>
<td>11-02-2010</td>
<td><a href="http://www.idsbangladesh.net">www.idsbangladesh.net</a></td>
</tr>
<tr>
<td>24.</td>
<td>Bangladesh Export Import Company Limited</td>
<td>17 Dhanmondi R/A, Road#2, Dhanmondi, Dhaka</td>
<td>8815559, 01713080060, 8815747</td>
<td>05-01-2010</td>
<td><a href="http://www.bol-online.com">www.bol-online.com</a></td>
</tr>
<tr>
<td>25.</td>
<td>Pritty International (Pvt) Limited</td>
<td>House#5/C(3rd Floor), Road#2/E, Block#J, Baridhara, Gulshan, Dhaka-1212.</td>
<td>8837865, 01715402025</td>
<td>03-08-2010</td>
<td><a href="http://www.bol-online.com">www.bol-online.com</a></td>
</tr>
<tr>
<td>No.</td>
<td>Company</td>
<td>Address</td>
<td>Contact Information</td>
<td>Date</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Idea Networks And Communications Ltd.</td>
<td>22/22 Tajmahal Road, Mohammadpur, Dhaka-1207</td>
<td>Contact: 9132764, 9132705, 01713043747 Fax: 9132705 e-mail: <a href="mailto:osama@ideabd.net">osama@ideabd.net</a> Web: ideabd.net</td>
<td>16-09-2010</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>IS PROS LIMITED</td>
<td>41/1 KaziNazrul Islam Avenue, Kawran Bazar, Dhaka.</td>
<td>Contact: 8126957, 8116422, 8125818 Fax: 9138054 e-mail: <a href="mailto:legal@ispros.com.bd">legal@ispros.com.bd</a> Web: <a href="http://www.ispros.com.bd">www.ispros.com.bd</a></td>
<td>28-12-2010</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>ICC Communication</td>
<td>ICC Bhaban (Ground Floor), Plot-15-18, Lane-6, Block-D, Mirpur-12, Dhaka-1216.</td>
<td>Contact: 02 9012047, Fax: 02 8051434</td>
<td>09-02-2014</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>HN Telecom Ltd.</td>
<td>Osman House (2nd Floor), Rai Bahadur Road, Jalesharitola, Bogra-5800</td>
<td>Contact: 051-64222, 01197-337484</td>
<td>27-06-2013</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>eBangla Limited</td>
<td>House#231, Road#12, Block-B, Mirpur-12, Pallabi, Mirpur, Dhaka-1216.</td>
<td>Contact: 02 8080892</td>
<td>31-07-2013</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>Next Online Limited</td>
<td>House#23/1A, Road-Noor Fatha Lane, Lalbagh, Dhaka, Bangladesh</td>
<td>Contact: 8754889, 01711525770, 01713484842 Fax: 8754889, e-mail: <a href="mailto:info@nextonline.com.bd">info@nextonline.com.bd</a> Web: <a href="http://www.nextonline.com.bd">www.nextonline.com.bd</a></td>
<td>03-09-2009</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Inter Cloud Ltd</td>
<td>House#50, Road#11, Block-F, BirUttamKhadimul Bashar Sarak, Banani, Dhaka-1213.</td>
<td>Contact: 02 8899657, Fax: 02 8899654</td>
<td>04-12-2013</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Red Data (Pvt.) Limited</td>
<td>House#5/A, Road#2, Lane-3, Block-G, Halishahar Housing Estate, Halishahar, chittagong.</td>
<td>Contact: 9132764, 9132705, 01713043747 Fax: 9132705 e-mail: <a href="mailto:osama@ideabd.net">osama@ideabd.net</a> Web: ideabd.net</td>
<td>12-08-2014</td>
<td></td>
</tr>
</tbody>
</table>
### 2.2.1 IPTSP – Central

<table>
<thead>
<tr>
<th>Sl</th>
<th>Name &amp; Address of the Licensee</th>
<th>License No.</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 1. | M/s. Fusion Net  
Navana Tower (22\textsuperscript{nd} floor), 45 Gulshan Circle-1, Dhaka-1212, Bangladesh  
Contact: 8857502, 01727777772, Fax: 8857387  
e-mail: info@fusionbd.net  
Web: www.fusionbd.net | BTRC/LL/IPTSP-Central  
Zone (4)Fusion/2009-2  
Dated: 20-08-2009 | |
| 2. | M/s. Media & Multimedia  
House#03, Road#14, Sector#01, Uttara, Dhaka-1230, Bangladesh  
Contact: 8954309, 8823444, 01190587172  
Fax: 8813167, e-mail: musfiq@mailbangla.net  
Web: www.mailbangla.net | BTRC/LL/IPTSP-Central  
Zone (5)Media/2009-3  
Dated: 03-09-2009 | |
| 3. | J F Optical Services  
12/D, 25/B/9, Mirpur, Dhaka  
Contact: 8831899, 01713369090, Fax: 8831899  
e-mail: jaglul_03@yahoo.com | BTRC/LL/IPTSP-Central  
Zone (7)F/2009-5  
Dated: 11-02-2010 | |
| 4. | IT Connect Limited.  
Planners Tower, 14\textsuperscript{th} Floor, Suite#5, 13/A, Sonargaon Road, Dhaka-1000.  
Contact: 9670196, 9676104, 9663215.  
Fax: 9663215.  
e-mail: info@itconnectbd.com  
Web: www.itconnectbd.com | BTRC/LL/IPTSP-Central  
Zone (9)ITConnect/2010-6  
Dated: 21-07-2010 | |
| 5. | Sine-10 (BD) Ltd.  
50, Mohakhali C/A, Dhaka-1212.  
Contact: 8819140, 8819168  
e-mail: info@sine-10.com.  
Web: www.sine-10.com | BTRC/LL/IPTSP-Central  
Zone (11)Sine-10/2010-7  
Dated: 21-07-2010 | |
| 6. | SADIATEC Ltd.  
House#2, Road#7, Sector#3, Uttara, Dhaka-1230  
Contact: 8919351, 8956608.  
Fax: 8963402  
e-mail: apollo@sadiatec.com.  
Web: www.sadiatec.com | BTRC/LL/IPTSP-Central  
Zone (12)Sadiatec/2010-8  
Dated: 21-07-2010 | |
### 3.2.2 IPTSP – Zonal

<table>
<thead>
<tr>
<th>SL</th>
<th>Name &amp; Address of the Licensee</th>
<th>License No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chittagong Online Limited&lt;br&gt;Emdad Villa, 128 Chandanpura, Chittagong&lt;br&gt;Contact: 031714447, 031717437, 01713113113&lt;br&gt;Fax: 031714447 ext 107&lt;br&gt;e-mail: <a href="mailto:ceo@colbd.com">ceo@colbd.com</a>, Web: <a href="http://www.colbd.com">www.colbd.com</a>, <a href="http://www.col.com.bd">www.col.com.bd</a></td>
<td>BTRC/LL/IPTSP-S E Zone(1) COL/2009-1&lt;br&gt;Dated: 18-08-2009</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Chittagong Telecom Services Limited&lt;br&gt;Progressive Tower (1st floor), 1837 Sk. Mujib Road, Agrabad, Chittagong&lt;br&gt;Contact: 031710354, 2512607-8, 01819345608&lt;br&gt;e-mail: <a href="mailto:info@ctgtel.net">info@ctgtel.net</a>, Web: <a href="http://www.ctgtel.net">www.ctgtel.net</a></td>
<td>BTRC/LL/IPTSP-S E Zone(2) CTS/2009-2&lt;br&gt;Dated: 01-10-2009</td>
<td></td>
</tr>
</tbody>
</table>

### 3.3 List of PSTN:

<table>
<thead>
<tr>
<th>SL</th>
<th>Name of Licensee and Address</th>
<th>Name of Zone</th>
<th>Issue Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bangladesh Telecommunications Company Limited.&lt;br&gt;TelejogajogBhaban, 37/E, Eskaton Garden, Dhaka-1000, Tel: 831150 Fax: 8312577</td>
<td>National</td>
<td>29-01-2004</td>
</tr>
<tr>
<td>2.</td>
<td>Tele Barta Ltd.&lt;br&gt;Uday Tower (18th Floor), 57 &amp; 57/A, Gulshan Avenue, Dhaka-1212, Fax: 8827867, E-mail: <a href="mailto:telebarta@dhaka.net">telebarta@dhaka.net</a></td>
<td>National</td>
<td>18-11-2007</td>
</tr>
<tr>
<td>3.</td>
<td>Ranks Telecom Limited.&lt;br&gt;113-116 Old Airport Road, Ranks Bhaban, Dhaka-1215. Phone: 8117066, 8117055, Fax: 8117788&lt;br&gt;E-mail: <a href="mailto:arc@ranksiitt.net">arc@ranksiitt.net</a></td>
<td>National</td>
<td>09-09-2007&lt;br&gt;License Cancellation in 94th Commission Meeting of 2010&lt;br&gt;License Revalidation Date: 14-07-2011</td>
</tr>
<tr>
<td>4.</td>
<td>National Telecom Ltd.&lt;br&gt;Mohakhali Tower (5th &amp; 6th floor), 82 Mohakhali C/A, Dhaka-1212&lt;br&gt;Contact: 03772002423-4, 9564557, 03772000001-4, 9884320&lt;br&gt;Fax: 9564554, 9863347&lt;br&gt;e-mail: <a href="mailto:ntc@nationalphone.net">ntc@nationalphone.net</a>&lt;br&gt;Web: <a href="http://www.nationalphone.net">www.nationalphone.net</a></td>
<td>National</td>
<td>Cancelled in the 94th Commission Meeting.&lt;br&gt;License Revalidation Date: 14-07-2011</td>
</tr>
</tbody>
</table>
## 3.4 ZONAL PSTN

<table>
<thead>
<tr>
<th>SL</th>
<th>Name of Licensee and Address</th>
<th>Name of Zone</th>
<th>Date of Issue</th>
</tr>
</thead>
</table>
| 1. | WorldTel Bangladesh Limited  
Red Crescent Tower (14<sup>th</sup> Floor), 17, Mohakhali C.A, Dhaka-1212.  
Tel: 8861412, Fax: 9893908. | Central Zone | 13-05-2009  
License Cancellation in 94<sup>th</sup> Commission Meeting of 2010 License Revalidation Date: 26-09-2011 |
| 2. | Bangla Phone Limited  
House No. 3, Road No. 23/A, Gulshan-1, Dhaka-1212.  
Tel: 9860352, 9888746, Fax: 8819981  
E-mail: info@banglaphone.net | North-East | 22-06-2004 |
| 3. | Jalalabad Telecom Limited  
UTC Building, 10<sup>th</sup> Level, 8 Panthapath, Dhaka-1215  
Tel: 9110739, 9110637, Fax: 8125829  
E-mail: info@jalalabad-tel.com | North-East | 22-06-2004 |
| 4. | Westec Limited  
52/1, New Eskaton Road, H.H Building (4<sup>th</sup> Floor), Dhaka-1000, Bangladesh.  
Contact: 9336564, 9352824, 9353169  
Fax: 9336550  
E-mail: info@bayphones.com  
Web: www.bayphones.com  
Correspondence Address:  
Westec Limited (Bay Phone)  
Plot # 16 & 18, Aftab Nagar, Main Road, Badda, Dhaka-1212, Bangladesh. | South-East | 08-07-2004 |
| 5. | One Tel Communication Limited  
Bulu Ocean Tower (13<sup>th</sup>-15<sup>th</sup> Floor), 40 Kamal Ataturk Avenue, Banani, Dhaka-1213.  
Tel: 9898391, 8853164  
Fax: 8860861, Ex: 223  
E-mail: info@onetelbd.com | North-West | 02-09-2004 |
| 6. | S.A Telecom System Ltd.  
Finlay House (3<sup>rd</sup> Floor), Agrabad, Chittagong.  
Tel: 31-815012-4, Fax: 31-815015  
E-mail: sagroup@globalctg.net  
sagroup@abnetbd.com | South East | 27-03-2005 |
### 3.5 Rural PSTN

<table>
<thead>
<tr>
<th>SL.</th>
<th>Name of Licensee and Address</th>
<th>Name of Zone</th>
<th>Date of Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Integrated Services Limited</td>
<td>Rural</td>
<td>27-12-2004</td>
</tr>
<tr>
<td></td>
<td>House No. 55, Road No. 4/A, Dhanmondi R/A, Dhaka-1209. Tel: 8619452,9661173. Fax: 9670239. E-mail: <a href="mailto:info@shebanet.net">info@shebanet.net</a></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.1 Historical Background of ILDTS Policy

Media transmission or Telecommunications happens when the trading of data between at least two substances (correspondence) incorporates the utilization of innovation. New advances are changing the manner in which controllers need to oversee interconnection. Attentive thought of inventive thoughts can significantly enhance the productivity in multi-operator's/benefit environment.

In 2010, There were numerous ANS, IPTSP, PSTN in Bangladesh to be associated one another. In the meantime Bangladesh Government were confronting challenges to stop unlawful VOIP Call. That’s why BTRC implemented a policy Named “International Long Distance Transmission System” Policy (ILDTS Policy) in 2010 and later on 2015 it was modified.

Primary explanations for ILDTS Policy were:

a) To diminish between association risk among all the ANS (Mobile Operators, PSTN Operators, IPTSP Operators)
b) Making Revenue Sharing Issues of ANS completely straightforward.
c) Stop Illegal VOIP Call

![Diagram of ILDTS Policy for Voice](image)
5.1 What is ICX?

Exchanging framework which gives interconnection among media transmission systems of administrators all together to offer simple access and permits observing, Lawful Interception (LI) facilities and roaming number portability. It is associated with ANS and IGW for call streaming. There is a switch room in ICX where each office is associated with one another coherently or physically.

Fig 5.1: Call flow diagram
5.2 Network Topology of ICX:

Network Architecture is based on three layers.

The first layer is International Gateway (IGW) which is connected with Sub marine cable and VSAT.

The second layer is Interconnection exchange (ICX) which is connected with IGW and Access Network Service (ANS) operators.

The third layer is the Access Network Service (ANS) operators where the subscribers are connected.

There is purpose of interconnection and purpose of essence association (Fig 4) of ANS and IGW with ICX.
Fig 5.3: POI connection

Fig 5.4: POP connection
Chapter 6

Core Networking

6.1 What is Core Network?

A center system is a media transmission system's center part, which offers various administrations to the clients who are inter connected by the entrance organize. Its key capacity is to coordinate phone brings over people in general exchanged phone arrange.

When all is said in done, this term connotes the exceedingly practical correspondence offices that interconnect essential hubs. The center system conveys courses to trade data among different sub-systems. With regards to big business arranges that serve a solitary association, the term spine is frequently utilized rather than center system, though when utilized with specialist organizations the term center system is unmistakable.

This term is otherwise called system center or spine arrange. Center system for the most part has a work topology that gives any-to-any associations among gadgets on the system which are regularly associated with general society systems.

![Sub-network connection](image)

**Fig 6.1: Sub-network connection**

Department of Core Network of ICX

Core network has two parts. These are-

i. UMG (Universal Media Gateway)

ii. SS (Soft switch)
6.2 Department of Core Network of ICX

6.2.1 UMG (Universal Media Gateway)

A Universal Media Gateway or UMG, is one of the key factors in the Access subsystem of the NGN. This is the nation's principle get to framework being utilized today due to its different capacity and in light of the fact that it is the most temperate arrangement when the telecom organize is part PSTN and part NGN.

UMG8900 has been used in Voicetel. This Universal Media Gateway (UMG) helps to migrate GSM-R services from TDM to all-IP communications, reduce TCO and protect ROI.

The UMG, together with Huawei’s Mobile Switching Center (MSC) server, works together with different gadgets to help different fundamental, beneficial, and esteem included portable administrations a conventional GSM-R organize. Its rearranged system structure additionally contains worked in video systems administration and flagging connection doors. The UMG design empowers quick and adaptable presentation of new administrations.
Soft Switch is a center part for settled center system arrangements. It actualizes call control and flagging and convention preparing to give essential administrations and beneficial administrations. It additionally interworks with application server (AS) to give enhanced esteem added administrations to endorsers. It can likewise work as AGCF, empowering smooth system development and ensuring administrators’ current speculation.

Soft Switch is the media entryway controller. It is in charge of controlling every one of the media portals inside its zone. Delicate Switch is otherwise called SoftX. The SoftX3000 has been utilized in Voicetel. It utilizes bearer class Open Standards Telecom Architecture (OSTA) Platform as its equipment stage and uses Distributed Object situated Programmable Real time Architecture (DOPRA) as its product stage. The consoles bolster 1+1/N+1 hot reinforcement. It receives particular structure, comprising of interface module, framework bolster module, flagging preparing module, benefit handling module and Back Administration Management (BAM) module.
Additional services of Soft Switch:

There works two additional services on the corresponding to soft switch.

These are:

- GW B
- XPTU

6.2.3: GWB:

IGWB abbreviation stands for International Gateway of Billing. It is saved by

- Bill format
- Data format

There are two types of IGWB.

These are:

- IGWB0
- IGWB1

XPTU:

XPTU is a monitoring server which is used for lawful interception.
Chapter 7
Management issues for call routing

7.1 Management issues for call routing

To stream the calls, there are two sorts of the executives issues.

These are:

1. Software management.
2. Hardware management.

7.1 Software management

There are mainly three types of protocols to manage software which work for call flowing.

![Diagram of software management](image)

Fig 7.1: Software management

7.1.1 Protocol Information

**SS7:**

*Signaling System No. 7 (SS7)* is a lot of communication flagging conventions created in 1975, which is utilized to set up and tear down a large portion of the world's public switched telephone network (PSTN) telephone calls. It additionally performs number interpretation, neighborhood number convey ability, prepaid charging, Short Message Service (SMS), and different mass market administrations.
**Principle:**

- Out of band Signaling.
- Higher Signaling data rates (56Kbps & 64 Kbps).
- Signaling traffic is burst and of short duration, hence operates in connectionless mode using packet switching.
- Variable length signal units with maximum size limitation.

**Optimum use of bandwidth.**

**Reliability and flexibility.**

![OSI and SS7 layer](image)

**Fig 7.2: OSI and SS7 layer**

**SIGTRAN:**

SIGTRAN is the name, derived from signaling transport, of the former Internet Engineering Task Force (IETF) working group that produced specifications for a family of protocols that provide reliable datagram service. The SIGTRAN family of protocols includes:

**Stream Control Transmission Protocol (SCTP).**

- ISDN User Adaptation (IUA).
- Message Transfer Part 2 (MTP) User Peer-to-Peer Adaptation Layer (M2PA).
- Message Transfer Part 2 User Adaptation Layer (M2UA).
- Message Transfer Part 3 User Adaptation Layer (M3UA).
- Signaling Connection Control Part (SCCP) User Adaptation (SUA).
- V5 User Adaptation (V5UA).
- DPNSS/DASS2 User Adaptation (DUA).

**Fig 7.3: SIGTRAN Architecture Model**

**ISUP:**

*The ISDN (Integrated Services Digital Network)* User Part or ISUP is part of the Signaling System No. 7 (SS7) which is used to set up telephone calls in the public switched telephone network (PSTN).

An ISUP message contains a settled header containing the circuit distinguishing proof code and the ISUP message type, trailed by a compulsory settled length parameter section, an obligatory variable-length parameter part, and a discretionary parameter part that are reliant on the kind of message being sent. ISUP messages can be sent utilizing the administrations of the Message Transfer Part, or, less regularly, the Signaling Connection Control Part. These messages are transmitted in different phases of call setup and discharge.

**The most widely recognized messages are:**

*Initial address message (IAM) —* First message sent to educate the accomplice switch that a call must be set up on the CIC contained in the message. Contains the called number, sort of administration (discourse or information) and discretionary parameters.
Subsequent address message (SAM)— For systems that help cover dialing methods, and afterward for the situation that the IAM did not contain the full called number, at least one SAMs pursue containing extra digits.

Address complete message (ACM) — Message came back from the ending switch when the endorser is come to and the telephone begins ringing, or when the consider navigates an interworking point and the middle of the road trunk is seized.

Call progress (CPG) — Contains additional information about the progress of a call. Normally sent after the ACM when the status of the call changes from that reported in the ACM.

Answer message (ANM) — Sent when the endorser gets the telephone, an asset is associated or answer supervision is returned by an interworking point. Typically charging begins as of now. It is necessitated that the call be sliced through in the two bearings by this point.

Connect (CON) — Sent when the call is answered by an automatic terminal. This message replaces the ACM, CPG and ANM for calls that are answered by automatic terminals.

Release (REL) — Sent to clear the consider when an endorser goes on snare. This is additionally sent (in direct reaction to an IAM) if the ending switch discovers that the call can't be finished. In either case, the ending switch gives a reason an incentive in the message to clarify the explanation behind the discharge, e.g., "Client occupied".

Release complete (RLC) — Acknowledgment of the release – the circuit is idle afterward and can be used again.

7.2 Hardware Management

Equipment the executives incorporates information design and gadget support. To run a framework, supporters ought to right off the bat include rack, outline, board, module and other uncommon arrangements with the information design directions as indicated by genuine equipment establishment. At the point when the framework is running, the gadget the board gives upkeep directions to endorsers of showcase the running status of the gadget, take care of issues, reestablish the typical running status and upgrade the execution of the framework.

1. Device Panel
2. Board Information of UMG
3. Board Information of SS
7.2.1 Device Panel

1. Shelf Management:

A rack contains four casings and one PDB. The framework gives the rack the board work, including adding racks to the entire NE, checking rack list, including/altering/erasing a rack, invigorating a rack, and exchanging the front and back of racks. These capacities are portrayed beneath.

Operation:

a) Adding a shelf

1- Open the Device Panel, and right click the parent node of Device Panel Management. A shortcut menu appears.
2- Select Add Shelf on the pop-up menu. A window for adding a shelf is displayed. Enter mandatory parameters, which are described in the table below.
3- Click OK.
4- You can also execute the MML command ADD SHF to implement the same function.

b) Modifying a shelf

1- Right click a shelf sub-node on the navigation tree. A shortcut menu is displayed.
2- Select Modify Shelf. A window for modifying the shelf appears. Modify corresponding shelf parameters, which are described in the table below.
3- Click OK.
4- You can also execute the MML command MOD SHF to implement the same function.

c) Removing a shelf

1- Right click a shelf sub-node on the navigation tree. A shortcut menu is displayed.
2- Select Remove Shelf. A window for confirmation appears. Click Yes.
3- You can also execute the MML command RMV SHF to implement the same function.

Note: Before deleting a shelf, you must delete all frames on the shelf.
2. Frame Management:

Double tap a sub-hub in the route tree in the gadget board, all edges are shown in the correct piece of the Gadget Board. The executives window. This part is a basic rack, or straightforward gadget board window. The dark number at the left side in each edge is the quantity of the casing. The framework gives endorsers elements of casing the executives, including outline, expelling outline, altering outline, posting outline, empowering imitated outline, showing the status of on board in the edge, and show or shroud disappointment bar. Elements of casing the board are point by point in the accompanying.

Operation:

a) Adding a frame

1- In the simple panel in the right section of the Device Panel Management window, right click a blank frame.
2- Select Add Frame in the menu and enter a frame number.
3- Click OK to add a new frame.
4- You can also execute the MML command ADD FRM to implement the same function.

b) Removing a frame

1- In the simple panel in the right section of the Device Panel Management window, right click the border of an existing frame.
2- Select Remove Frame in the menu to pop up a window for confirming the operation.
3- Click OK to remove the frame successfully.
4- You can also execute the MML command RMV FRM to implement the same function.

Note: Before removing a frame, all boards in this frame must be removed.

c) Modifying a frame

1- In the simple panel in the right section of the Device Panel Management window, right click the border of an existing frame.
2- Select Modify Frame in the menu to pop up a window.
3- Enter parameters to set attributes to modify the frame. (The parameters are listed below).
4- Click OK to modify the frame.
5- You can also execute the MML command MOD FRM to implement the same function.
3. Board Management:

In the navigation panel in the left section, click TAB of the Device Panel to display all shelves of the NE. Double click a node to open the shelf and the running status of all frames and their boards is displayed.

Operation:

a) Adding a frame

1- Right click the empty slot in a frame to pop up a menu- Select Add Board.
2- In the window displayed, select mandatory parameters (such as Board type). Click OK to add a board in the specified position.
3 - You can also execute the MML command ADD BRD to implement the same function.

b) Removing a board

1- Right click the board in a slot of the frame.
2- Select Remove Board in the menu to pop up a window for confirmation Click YES to remove the board.
3 - You can also execute the MML command RMV BRD to implement the same function.

Note: To remove boards, you should remove the main control board after other boards.

c) Modifying Soft Switch

1- Right click the board in a slot of the frame.
2- Choose Modify Software Switch of Board Loading on the shortcut menu. Then modify the software switch of board loading in the prompted window.
3- You can also execute the MML command MOD LSS to implement the same function.

4. Port Management

Port management can display the status of the port on a specific board. In the system, there are four kinds of ports: E1 port, ATM port, FE port and ATM2M port. To manage ports by operating on the device management window, you must enable the emulation frame. Refer to the Frame Management for detailed operations.
Operation

Displaying port status
1- Enable the emulation frame, and right click a port on a board.
2- Select Display Port on the shortcut menu. (Pay attention to the availability of the shortcut menu)
3- A window displaying the status of the port appears, including the port type, port status, and port loop type.
4- You can execute the MML command DSP PORT to implement the same function.

5- Board Loading Process

Board Loading Process in the device panel navigation, it monitors the procedure of starting or switching the boards, in order to trace the board loading process and the loaded files.
It displays the following information in a tree-like list:
- Board Location
- Load Process
- Board Type
- Load File
- Start Time

It also displays the following information in a history record list:
- Load Date
- Board Location
- Board Type
- Load File
- Start Time
- End Time

For instance, the following figure shows the board loading process of the front board in slot 2 of frame 0 in shelf 0.

Fig 7.4: Board loading process

The following figure shows the history record of the front board in slot 2 of frame 0 in shelf 0.

Fig 7.5: History record of front board
7.3: Protocol stacks of some boards:

1. Protocol stack of the BSGI:

Fig 7.6: Protocol stack of the BSGI.
2. Protocol stack of MSGI:

![Protocol stack diagram]

Fig 7.7: Protocol stack of the MSGI
3. Protocol stack of FCCU:

Fig 7.8: Protocol stack of the FCCU
Chapter 8

Call Flowing in hardware level

Processing Path for ISUP/INAP over MTP3/M2UA section describes the uplink path and downlink path for ISUP/INAP over MTP3/M2UA.

8.1 Uplink Path for ISUP/INAP over MTP3/M2UA

The uplink path in the SoftX3000 for ISUP/INAP over MTP3/M2UA is as shown in Fig 8.1

![Uplink path for ISUP/INAP over MTP3/M2UA](image)

**Fig 8.1:** Uplink path for ISUP/INAP over MTP3/M2UA

**NOTE:**
If the destination BSGI and FCCU are resident in a different frame, the uplink path passes:
1. HSCI in the local frame
2. Core LAN Switch in the local frame
3. HSCI in the destination frame with the destination FCCU
4. Destination BSGI
5. Destination FCCU
1. The BFII performs the following steps:
   * Provides an external IP interface to receive IP packets.
   * Processes messages of the physical layer.
   * Transfers the packets to an IFMI through a fixed connection.

2. The IFMI processes the MAC messages, and then dispatches the messages to a designated BSGI through the Ethernet switching plane for further processing. The dispatch is based on the following:
   * IP protocol type
   * Local IP address
   * Local SCTP port number
   * Peer IP address
   * Peer SCTP port number

   The mapping between the BSGI board number and the combination of the following items must be configured manually:
   * IP protocol type
   * Local IP address
   * Local SCTP port number
   * Peer IP address
   * Peer SCTP port number

   **CAUTION:**
   Media Gateway Control Protocol (MGCP), H.248, and SCTP can only be processed by a BSGI rather than an MSGI or IFMI.

3. The BSGI processes IP, SCTP, M2UA, and MTP3 messages, and then transfers the messages to the ISUP and SCCP dispatch modules of the board itself. The ISUP dispatch module dispatches the received messages to the FCCU that is responsible for their CIC through the Ethernet switching plane based on the NI, OPC, DPC and CIC in the messages. The SCCP dispatch module dispatches the received messages to the FCCU that is responsible for their transactions based on the TCAP/INAP transaction ID.

4. The FCCU processes the ISUP/INAP messages.
8.2 Downlink Path for ISUP/INAP over MTP3/M2UA

The downlink path in the SoftX3000 for ISUP/INAP over MTP3/M2UA is as shown in Fig 8.2

**Fig 8.2:** Downlink path for ISUP/INAP over MTP3/M2UA

1. The FCCU transmits received messages to a BSGI through the Ethernet switching plane based on the BSGI module number of the associated M2UA/MTP3 link.

2. The BSGI performs the following steps:
   * Processes the M2UA and MTP3 messages.
   * Determines an IFMI based on the source IP address of the IP packets.
   * Dispatches associated messages to the designated IFMI through the Ethernet switching plane.

3. The IFMI processes the MAC-layer messages, and then transfers the IP messages to a BFII through a fixed connection.

4. The IP signaling message packets are driven by the BFII then distributed out of the SoftX3000 through the network cable connected to the BFII.
Chapter 9

Basic configurations and commands in core system

9.1 Configuration for the connection of GP INTERNATIONAL (29/09/2012)

**UMG CONFIGURATION:**

**UMG LOC: 1/3/0 Board No. 0 & UMG LOC: 1/3/2 Board No. 0**

- **ADD MTP2LNK:** LNKNO=711, LNKNAME="GP-1152-INT1", IFBT=S4L, IFBN=0, OPN=0, E1T1N=0, STRTTS=16, ENDTS=16, SPFBN=0, SUBBN=0, BITREVERSE=OFF, LNKTYPE=M2UA64K, LKS=136, BINIFID=711;
- **ADD MTP2LNK:** LNKNO=712, LNKNAME="GP-1152-INT2", IFBT=S4L, IFBN=0, OPN=0, E1T1N=1, STRTTS=16, ENDTS=16, SPFBN=1, SUBBN=0, BITREVERSE=OFF, LNKTYPE=M2UA64K, LKS=137, BINIFID=712;
- **ADD MTP2LNK:** LNKNO=713, LNKNAME="GP-1152-INT3", IFBT=S4L, IFBN=0, OPN=2, E1T1N=0, STRTTS=16, ENDTS=16, SPFBN=0, SUBBN=0, BITREVERSE=OFF, LNKTYPE=M2UA64K, LKS=136, BINIFID=713;
- **ADD MTP2LNK:** LNKNO=714, LNKNAME="GP-1152-INT4", IFBT=S4L, IFBN=0, OPN=2, E1T1N=1, STRTTS=16, ENDTS=16, SPFBN=1, SUBBN=0, BITREVERSE=OFF, LNKTYPE=M2UA64K, LKS=137, BINIFID=714;

**SOFTX CONFIGURATION:**

- **ADD N7DSP:** DPX=71, DPC="1152", OPC="11FD", DPNAME="GP-1152-INT";
- **ADD N7LKS:** LSX=71, ASPX=71, LSNAME="GP-1152-INT";
- **ADD N7RT:** LSX=71, DPX=71, RTNAME="GP-1152-INT";
- **ADD N7LNK:** MN=136, LNKN=2, LNKNAME="GP-1152-INT1", LNKTYPE=M64K, M2LSX=136, BINIFID=711, LSX=71, SLC=0, TID=2064;
- **ADD N7LNK:** MN=137, LNKN=2, LNKNAME="GP-1152-INT2", LNKTYPE=M64K, M2LSX=137, BINIFID=712, LSX=71, SLC=1, TID=2096;
- **ADD N7LNK:** MN=136, LNKN=13, LNKNAME="GP-1152-INT3", LNKTYPE=M64K, M2LSX=136, BINIFID=713, LSX=71, SLC=2, TID=6160;
- **ADD N7LNK:** MN=137, LNKN=12, LNKNAME="GP-1152-INT4", LNKTYPE=M64K, M2LSX=137, BINIFID=714, LSX=71, SLC=3, TID=6192;
- **ADD OFC:** O=170, ON="GP-INT", DOT=INTT, DOL=LOW, DPC1="1152";
- **ADD SRT:** SRC=1711, O=170, SRN="GP-INT-1711", RENT=URT;
- **ADD RT:** R=171, RN="GP-INT", IDTP=UNKNOWN, NAMECFG=NO, SNCM=SRT, SRST=SEQ, SR1=1711, STTP=INVALID, REM=NO;
ADD CALLSRC: CSC=171, CSCNAME="GP-INT", LP=0, RSSC=171;
ADD N7TG: TG=1711, TGN="GP-INT-1711", EID="10.0.10.3:2944", G=INOUT,
SRC=1711, SOPC="11FD", SDPC="1152", CSC=171, CSM=MINCIC, RCHS=0,
PRTFLG=ITUT_Q767, NOAA=FALSE, ISM=FALSE, EA=FALSE;
ADD RTANA: RSC=2517, RSSC=23, TM=TMM, R=170;
ADD RTANA: RSC=25, RSSC=170, TM=TMM, R=25;
ADD CNACLD: LP=0, PFX=K'23017, CSTP=BASE, CSA=NTT, RSC=171, MINL=13,
MAXL=13, CHSC=0, EA=NO;
ADD CNACLD: LP=0, PFX=K'25017, CSTP=BASE, CSA=NTT, RSC=2517, MINL=13,
MAXL=15, CHSC=0, EA=YES, DEST=2517, ASF=NO, QCDN=NO, OBDTMFFLAG=NO,
VPNF=NOVC;

ADD 1 STM-1 UMG LOC: 1/3/0 Board No. 0
ADD N7TKC: MN=24, TG=1711, SC=0000, EC=0319, SCIC=0000, TID="2048";
ADD N7TKC: MN=24, TG=1711, SC=0320, EC=0639, SCIC=0320, TID="2368";
ADD N7TKC: MN=24, TG=1711, SC=0640, EC=0959, SCIC=0640, TID="2688";
ADD N7TKC: MN=24, TG=1711, SC=0960, EC=1279, SCIC=0960, TID="3008";
ADD N7TKC: MN=24, TG=1711, SC=1280, EC=1599, SCIC=1280, TID="3328";
ADD N7TKC: MN=24, TG=1711, SC=1600, EC=1919, SCIC=1600, TID="3648";
ADD N7TKC: MN=24, TG=1711, SC=1920, EC=2015, SCIC=1920, TID="3968";

ADD 1 STM-1 UMG LOC: 1/3/2 Board No. 0
ADD N7TKC: MN=23, TG=231, SC=6048, EC=6367, SCIC=2016, TID="6144";
ADD N7TKC: MN=23, TG=231, SC=6368, EC=6687, SCIC=2336, TID="6464";
ADD N7TKC: MN=23, TG=231, SC=6688, EC=7007, SCIC=2656, TID="6784";
ADD N7TKC: MN=23, TG=231, SC=7008, EC=7327, SCIC=2976, TID="7104";
ADD N7TKC: MN=23, TG=231, SC=7328, EC=7647, SCIC=3296, TID="7424";
ADD N7TKC: MN=23, TG=231, SC=7648, EC=7967, SCIC=3616, TID="7744";
ADD N7TKC: MN=23, TG=231, SC=7968, EC=8063, SCIC=3936, TID="8064";
9.2 Basic commands

1. To see running calls: DSP OFTK

![Fig 9.1: MML command for running call observation](image)

2. To see the trunk group number: LST TG

![Fig 9.2: MML command for trunk group number observation](image)
3. To know any information of any IGW’s specific link

Fig 9.3: MML command for IGW’s specific link observation

4. To see the start circuit and end circuit and the trunk group number:

LST CIC

Fig 9.4: MML command for circuit and trunk group number observation
5. To see the summary of total link: LST N7LNK

Fig 9.5: MML command for summary of total link observation

6. List route: LST RT

Fig 9.6: MML command for List of route observation
7. List route analysis: LST RTANA

Fig 9.7: MML command for List of route analysis observation
Chapter 10

Network Operation Center (NOC)

In the practical part of my internship I worked in NOC. NOC abbreviation stands for Network Operations Center. In NOC mainly network alarms are checked. After getting alarm, maintenance are done from the NOC by the server, if it is not possible sometimes then experts take the responsibility for maintenance.

There are four types of alarm found in the NOC. These are:
1. Major alarm
2. Critical alarm
3. Minor alarm
4. Warning alarm

The figures below show the alarms of SOFTX, UMG-DHK, UMG-CTG and UMG-KHL of core system respectively:

Figure : Alarms of SOFTX

Figure : Alarms of UMG-DHK
Apart these there are monitoring issues also.
10.1 Routine Parameters:

CER/CSSR (Call Set up Success Rate): It is the division of the endeavors to make a call that outcome in an association with the dialed number (because of different reasons not all call endeavors end with an association with the dialed number). This portion is generally estimated as a level of all call endeavors made.

ASR (Answering Ratio): The answer-seizure ratio (ASR) is an estimation of system quality and call achievement rates in media communications. It is the level of addressed phone calls regarding the aggregate call volume.

ACD (Average Call Duration): The average call duration (ACD) is an estimation in broadcast communications that mirrors a normal length of phone calls transmitted on media transmission systems. The estimation is commonly founded on the announcing by media transmission hardware by means of call detail records.

10.2 Routine Parameter Check:

1) Hourly Check
2) 24 Hours Analysis
3) Trunk Performance Analysis

10.2.1 Hourly Check:

1) Top-30 route analysis:

Mainly there are 30 countries where outgoing calls are passed through IGW via ICX. The destinations (IGWs) are selected by the ICX according to IGWs performance. Performance is measured by some parameters which are shown in Fig 10.1. These are:

* Attempt- number of calls per 15 minutes
* CER- Call Established Ratio
* ASR- Average Success Ratio (connected + received)
* ACD- Average Call Duration (averagely calling time in second)
Fig 10.1: top 30 list

Fig 10.2: top 30 list hourly check
2) IGW to ANS
   - Performance of incoming calls from IGW to ANS are monitored here.
   - It is monitored per hour.
Fig 10.5: IGW to ANS

3) Temperature Reading

Fig 10.6: Temperature Reading
4) All Traffic
   - Incoming
   - Outgoing

To keep network stable we need to maintain routine checkup of few parameters. For analysis we transform the parameters into report.

10.2.2 24 Hours Analysis:

All destination Performance: All Countries Performances are Analyzed here in a nutshell.

Daily Domestic Traffic:
Fig 10.8: Daily Domestic Traffic incoming

Fig 10.9: Daily Domestic Traffic incoming
Fig 10.10: Daily Domestic Traffic outgoing

Fig 10.11: Daily Domestic Traffic outgoing
domestic traffic data is analyzed here in a nutshell.

**Hourly ANS to Destination:**

ANS to Destination (IGW) call performance is analyzed here.

**Regional Traffic:**

Region wise Domestic traffic (Dhaka, Chittagong, Khulna) Performance is analyzed here.

**10.2.3 Trunk Performance Analysis:**

Call is stored and forward via a memory unit. It is known as “Trunk”. We analysis the trunk performance analysis in the Peak hour (06 pm to 11 pm) in every 30 minutes.

![Trunk Performance Analysis](image-url)
Entry level position or Internship is a chance to get the pragmatic learning over instructive information. "Voicetel" is a presumed ICX based organization and a sister worry of "Partex Group". It was my benefits that they had enabled me to finish my temporary position in such a rumored organization. As an understudy I have worked in their center piece of NOC division. For a large portion of the designing understudy it is imperative to take a shot at a professional workplace. I have adapted such huge numbers of things, similar to how to deal with the function weight regardless of a modern situation. In this report I have clarified my work encounters. I have figured out how they deal with their function routine and how they check the association. At the point when association gets flopped then they have shown me how to deal with the circumstance and changed the association with other dynamic system.

Here I motivated the chance to get the functional learning over Huawei core Management system, universal Media gateway Local maintenance Terminal, SoftTX-3000. I have also learnt about various MML command to ADD/Remove any Mobile Operator IGW to the call flow diagram, increase/decrease the capacity of any operator/IGW. At long last, I have took in the conventions which are required for telecom industry.

At last I want to say that work with core network and besides in NOC is very compulsive. I have got the opportunity to gain practical experiences using my theoretical knowledge. I have learned so many informative things from there to apply in future in professional field.
References

1. www.google.com
2. www.wikianswer.com
3. IT division documentation of Voicetel
12. www.wikipedia.com