

A Working Paper on

“An Alternate Method(s) for Calculating LDI’s share out of the total MRITT System cost”

1. *Definitions and MRITT Specific Description*

Cost: It primarily consists of two types of Costs, The capital cost and the Operating Cost.

Capital Expense: Normally called CAPEX; it is the cost of the infrastructure, civil works, monitoring taps, server probes, hardware, software, pre and post processing, GUI Interfaces, power and cooling provisioning, security, remote sensing and communication links etc. In MRITT case it excludes some expenses borne by PTCL, TWA, other operators and PTA due to their license obligations e.g. provision of space, electricity and cooling. PTCL have additionally provided extensive WAN links connecting various sites due to the spread of their infrastructure. TWA too have done the same within the geographical limits set by their Cable Landing Station License.

It is anticipated that the Cable Landing Stations will further meet their obligations and come up with an alternate proposal more acceptable to the LDIs and conducive to the environment.

Operating Expense: Normally called OPEX, includes all running expenses, including but not limited to Vendor O&M. In case of MRITT, PTA has so far borne most of the Operating Cost – deploying its own officers for monitoring the health of the field infrastructure on a need basis, running a central analysis facility and bearing all utility bills, year round post-analysis of CDRs, link update, monitoring clock synchronization, unauthorized IP blocking, multi-facet report generation, , security, etc.

MRRIT: Monitoring and Reconciliation of International Telephony Traffic. Authority has already approved MRITT-2010 Regulations through extensive consultation and industry assistance.

Minutes of Traffic: \sum_n Number of Minutes of each International incoming/Outgoing call. It can be further segregated based on the LDI who is bringing it, LDI which is acting as a transit, to the terminating operator.

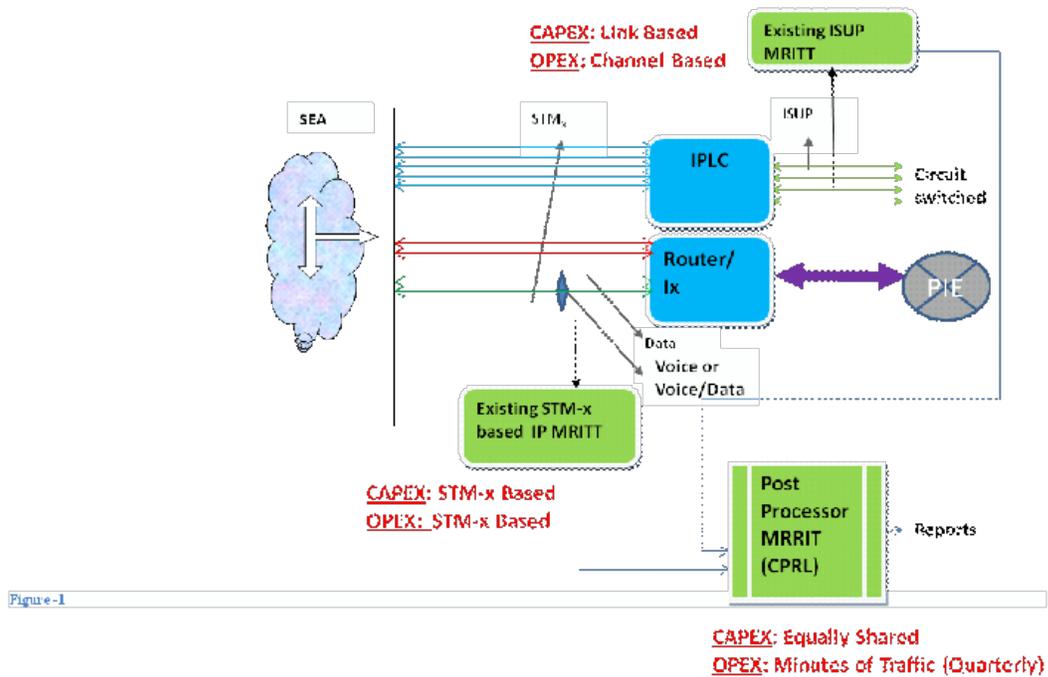
Post Processor: The integrated post-analysis and reconciliation system consisting of hardware and software installed at a PTA site.

2. Background

During the Y2006, an MRRIT system was installed to monitor the international bandwidth at the landing stations owned and operated by the incumbent PTCL, and TWA. This system monitors both,

the IP as well as the ISUP traffic to identify minutes of international i/c or o/g traffic. **MRITT**

Block Diagram



3. Post Installation Issues/ Problems

One of the issues arising out of the post installation is the determination of a just, fair and stable CAPEX and OPEX charging mechanism. Continuous Variations in the i/c International Telephony Traffic on a monthly basis and correspondingly justifying the CAPEX share of a consortium member and subjecting its members to the Operating Cost, particularly related to O&M is not only the Regulator's concern, being unjust and unfair but the subject has also been raised repeatedly on several forums on the subject and more specifically in the recent meeting with LDIs.

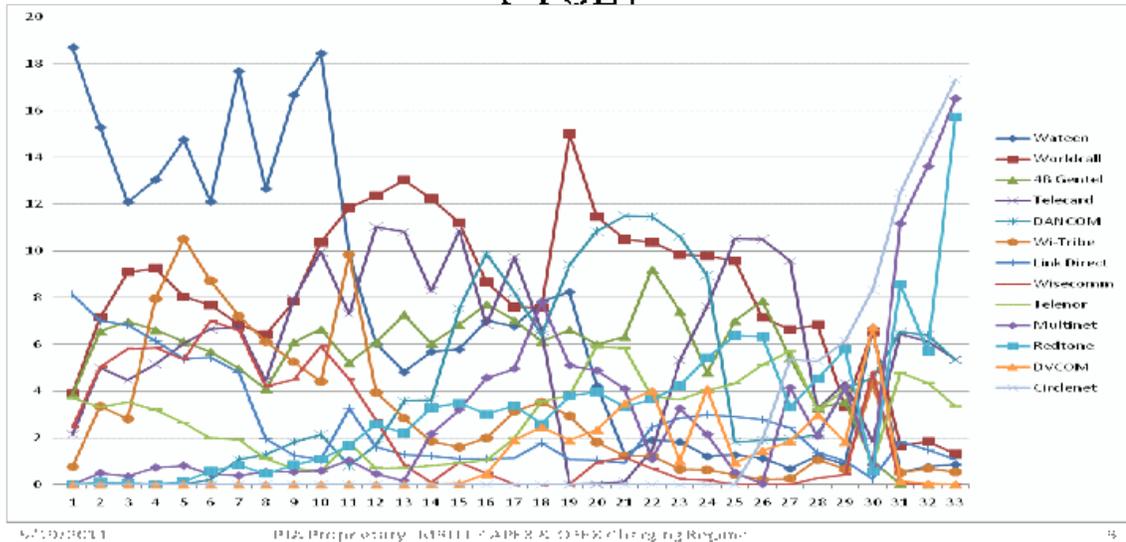
This paper particularly addresses the issue of “Developing A Rational Methodology to Identify MRITT CAPEX & OPEX Charging Mechanism with relative stability over time”. The intent of this paper and consultation with the stake holders is to bring all stake-holders on-board, discuss with the consortium members for their agreement followed by its implementation.

4. Existing Charging Mechanism

4.1 Existing Charging Mechanism

- 4.1.1** At the time of installation, the CAPEX and OPEX issues were unknown to all. It was mutually decided at the inception of the project that the initial capital cost of the solution may be divided among all the LDIs including PTCL in accordance with their recorded ‘Minutes of I/C Traffic’.
- 4.1.2** The above mechanism continued for some time but It appears that the same charging mechanism has proven to be unjust and lost its significance.
- 4.1.3** In addition to the above CAPEX cost, Operating Cost/expenses were not decided upon. Now as the warranty of major sub-systems have either expired or are about to expire, it has become imperative to come up with a fair OPEX charging mechanism.

LDI Min. Comparison of 33 months (excl PTCL)



4.2 Problems in existing mechanism

Problems faced and observed with the passage of time are:

- 4.2.1 The Minutes of the Traffic fluctuate rapidly on a monthly basis.
- 4.2.2 Field Traffic monitoring equipment cost is primarily based on **STM-x** links and **ISUP** links, but the cost sharing formula among LDIs for CAPEX recovery is based on the Minutes of traffic.
- 4.2.3 The warranty of major sub-systems have either expired or are about to expire, resulting in a shift of an OPEX from vendor to operator.

4.3 Example, existing charging mechanism on existing system: Suppose Operator A has acquired total 35mbps BW, 25mbps BW from CLS-1(PTCL) and 10mbps BW from CLS-2(TWA) and Operator B has acquired 35mbps from CLS-1(PTCL). And Operator C acquired 25mbps from CLS-2(TWA).

| | Operator | CLS | BW | I/C Min | Monitoring Interface (MI) |
|----|------------|------|--------|---------|-----------------------------|
| 1. | Operator A | TWA | 10mbps | 40,000 | Min. STM-1 MI, Charged: MoT |
| 2. | Operator A | PTCL | 25mbps | 10,000 | Min. STM-1 MI, Charged: MoT |
| 3. | Operator B | PTCL | 25mbps | 50,000 | Min. STM-1 MI, Charged: MoT |
| 4. | Operator C | TWA | 25mbps | 50,000 | Min. STM-1 MI, Charged: MoT |

Note: MOT = Minutes of i/c international traffic

- Both 2&3 having same BW at CLS-1, are paying different costs as per their I/C min.
- 1&2 require two separate STM-1 interface CAPEX to monitor at different landing stations.
- Operator A & B are paying equal as both have equal I/C Minutes. Although, OP-A requires two STM-1 Monitoring Interfaces, one on each CLS and OP-2 requires only One at PTCL CLS.
- OP-C s is paying the same cost as OP-B.

5. An Alternate Method 1

Calculation of LDI share for the EXISTING MRITT Monitoring System

Suggested Mechanism for sharing the existing Monitoring-System Cost

The % share of ISUP and IP monitoring equipment may be adjusted in accordance with respective LDI's interface types i.e. the respective equipment cost. It can ideally be split into three broad categories for all LDIs based on:

Share (Cost) of an LDI = Post Processor Cost + IP Interface cost + ISUP interface cost

- a) 'Post-Processor cost' –calculated separately for CAPEX and OPEX share .
- b) 'PHY **IP Interconnection Interface**' based Monitoring Cost (CAPEX+OPEX)– calculated separately for each Cable Landing Station.
- c) 'PHY **ISUP Signaling Interconnection Interface**' based Monitoring Cost (CAPEX+OPEX) - calculated separately for each Cable Landing Station.

5.1 Post Processor CAPEX & OPEX Sharing:

5.1.1 CAPEX: Equally Shared Post-Processor CAPEX cost among all LDIs.

5.1.2 OPEX: Can be shared based on “% of processed minutes for the LDI”. *It would include ½ leg minutes also.*

5.1.3 Variations in total monthly processing and minutes, of all LDIs together, do not differ by an order of magnitude.

NOTE: More money needs to be inducted to cater for future increased processing.

5.2 IP bandwidth STM-x level Monitoring / PHY IP Interconnection' based Monitoring CAPEX+OPEX, of existing System

5.2.1 Current CAPEX Charging Mechanism

Till date LDIs are charged based on, “% Share of Int’l I/C Min”

5.2.2 Suggested CAPEX & OPEX for IP Bandwidth

5.2.2.1 **CAPEX:** Instead of charging based on ‘Minutes of Usage’, it is most appropriate to charge based on Acquired Bandwidth.

5.2.2.2 **However,** instead of following 5.2.2.1, a better approach would be to limit the acquired bandwidth monitoring level to the available interfaces – All may be charged on the multiples of STM-1. And the basic cost of STM-1 would be derived from the monitored interface at CLS.

5.2.2.3 **Example: A CLS has STM-16 Monitored interface.**

5.2.2.4 Cost of 1 STM-1= Cost of STM-16/ 16

5.2.2.5 Each CLS to ensure that, links are monitored.

5.2.2.6 If data cannot be segregated by CLS then all Links to be monitored. If IP-Voice can be segregated from IP-Data then only Voice be monitored, initially.

5.2.2.7 **OPEX:** Can be shared based on “BW ACQUIRED”

Example, suggested Charging mechanism on existing System: Suppose Operator A has acquired total 35mbps BW, 25mbps BW from CLS-1(PTCL) and 10mbps BW from CLS-2(TWA) and Operator B has acquired 35mbps from CLS-1(PTCL).

| Operator | CLS | BW | I/C Min | Monitoring Interface (MI) |
|---------------|------|--------|---------|------------------------------|
| 1. Operator A | TWA | 10mbps | 40,000 | minimum TWO STM-1 MI, |
| 2. Operator A | PTCL | 25mbps | 10,00 | one on each CLS |
| 3. Operator B | PTCL | 25mbps | 50,000 | minimum one STM-1 MI |
| 4. Operator C | TWA | 25mbps | 50,000 | minimum one STM-1 MI |

- Both 2&3 having same BW at CLS-1, are paying same CAPEX but different OPEX as per their I/C min.
- 1&2 require two separate STM-1 interface CAPEX to monitor at different landing stations.
- Operator A & B may pay equal OPEX (depending on cost of processing at each CLS) as both have equal I/C Minutes. However, OP-A requires two STM-1 Monitoring Interfaces, one on each CLS and OP-2 requires only One at PTCL CLS, so CAPEX will be different for both.
- OP-C s may pay the same CAPEX and OPEX as OP-B.

Note: For each CLS, CAPEX and OPEX rates may differ.

5.3 'PHY ISUP Signaling Interconnection' based Monitoring CAPEX+OPEX Cost

5.3.1.1 **CAPEX** for ISUP Monitoring is recommended to be based on Signaling Links, on each CLS separately.

- STM-1
- E1

5.3.1.2 **OPEX**: based on % share of signaling channels.

Note: PTCL should look into better channel utilization and tapping based on provisioning within the ISUP monitoring equipment.

6. **An Alternate Method 2**

Payment of Total in-placed monitoring System Expenses by a party

6.1 Anyone can apply to PTA for the payment of the total monitoring system expenses or a significant segment of the system, however the system in place will be based on PTA's ToR/RFP.

6.2 The party must opt for one of the following options if paying the total system expenses:-

6.2.1 Option A: The party will not charge at all from anyone for the monitoring in all times to come. It will offer monitoring services for free for all future times. It will be fully allowed to handle the selection and coordination with the Vendor. PAT & FAT will be done by PTA as per their SOP.

6.2.2 Option B: The party may recover its investment, full or partial, by charging the customers as per para 5, Method-1 discussed above. However the entire process of selection of vendor, payments, PAT, FAT etc will be done as per the exiting consortium working methods and further decisions of the Authority.

Recommendation for Existing Monitoring Hardware Table

Cost Share per LDI = Post Processor Cost + IP Interface cost + ISUP interface cost

| Cost Share/LDI | CAPEX | OPEX | Note for CLS |
|---|---------------------------------------|---|--|
| A. Post Processor Share | Divided Equally | Based on % share of the Quarterly Traffic Minutes | |
| B. IP Bandwidth Share | Based on <u>Interface Cost</u> | Based on Acquired Bandwidth | 1. Tap entire IP BW else, Segregate Voice & Data. 2. All Links to be STM-16 |
| C. ISUP Signaling CH Share | Based on ISUP Signaling Links & Ch | Based on ISUP Signaling Channels | |
| No - encryption, compression, proprietary interfaces for signaling. Voice/Data Undertaking a must. | | | |

Recommendation for 10GE, Future

| Cost Share/LDI | CAPEX | OPEX | Note for CLS | Comments |
|---|---|---|---|---|
| D. Post Processor cost Share | Divided Equally | Based on % share of the Quarterly Traffic Minutes | | Same as the current system in place |
| E. IP Bandwidth Share | Based on Acquired Bandwidth at PIE | Based on Acquired Bandwidth at PIE | <u>Tap at 10GE Interface</u> <u>(Expected high Cost reduction)</u> | <u>Replacement of the current system *</u> |
| F. ISUP Signaling CH Share | Based on ISUP Signaling Links (STM-1, E1) and Sig Channels. | Based on ISUP Signaling Channels | | Same as the current system in place. |
| No encryption, no compression, no proprietary interfaces for signaling. Voice/Data Undertaking a must. | | | | |

Note:

- (1) *Estimated Cost of 100Gbps- Future 10GE System = \$ X*
- (2) *Estimated Cost of 100Gbps-Monitoring System based on expansion of existing deployed technology ≥ \$ 4X*
- (a) *Therefore the investment on the new 100Gbps-10GE system is ≤ 25% of the total investment to upgrade the existing system to 100Gbps from 13 Gbps. The cost savings are greater than 75%.*