National Fiber Network Reliability Report
(October- December, 2019)

Division of Telecom and Space
Department of IT and Telecom

Executive Summary

In order to check and monitor the national network reliability, the DITT/MoIC has prepared the following report.

The data is collected from the stakeholders, Bhutan Power Corporation(BPC), Bhutan Telecom Limited (BTL), and Tashi InfoComm Limited (TICL) on a monthly basis and the report is prepared on a quarterly basis.This is the second report for the financial year 2019-2020.

Introduction

Department of Information Technology and Telecom (DITT) under MoIC (Ministry of Information and Communications) has implemented National Broadband Master Plan Implementation Project (NBMP) to establish a fiber optic backbone network throughout the country. Under the said project, 18 Dzongkhags have been connected with OPGW cables and remaining two Dzongkhags and 201 Gewogs have been connected with ADSS cables.

DITT is the sole owner of the National Fiber network. DITT leases the fibers to Telecom operators and Internet Service Providers for free of cost in order to ensure a level playing field for operators and to help improve competition at the service level. In addition, the fibers is also used by the department to establish connectivity to Community Centers.

BPC manages the Operation and Maintenance of the National Fiber Network.As of now, there are no fiber monitoring system to conduct online detection and rectification of fiber outages. The fiber breakages are manually detected and rectified. According to the agreement signed between DITT and BPC on September 30th, 2011, BPC is mandated to maintain 98% point to point availability of fibers, except where disruptions are caused by force majeure conditions. Therefore, in order to check the consistency and availability of fibers, a monthly fiber reliability reports are collected from the stakeholders (BTL, TICL, BPC).Data collected for the month of October to December, 2019 are reported below.

Objective of the study

To study the National Fiber Network Reliability in Bhutan

Methodology

A dashboard was prepared for maintaining the Fiber network reliability based on different parameters listed as follows:
- Fault Time (Time at which the fault occurred/detected)
- Fault Resolution (Time at which the fault was rectified)
- Outage Time (Duration of outage)
- Availability (Availability= ((Service Uptime/Total time)*100), Service Uptime=Total Time-Outage Time, Total Time=24*No. Of days in a month)
- Fault Type (Fiber breakages,Force Majeure, Equipment Faults, Schedule Maintenance)
- Customer Impact (No. of Dzongkhag affected, No. of sites affected)

This dashboard is shared with the relevant stakeholders (BTL, BPC and TICL) who uses the Fiber network.The stakeholders were instructed and trained on the usage of the dashboard via email, letter and telephone after which they were asked to maintain records on above parameters on a monthly basis. This data collection is an ongoing process.

Key Findings

Based on the data submitted by the stakeholders the average availability for the months of October to December 2019 has been compiled in tables below.

1) **Fiber Network Reliability report submitted by TICL**

Months	Availability in percent	Fault Type	Remarks
October	100	NA	NA
November	100	NA	NA
December	100	NA	NA

Average availability was 100%

2) Fiber Network Reliability report submitted by BTL

Months	Availability in percent	Fault Type	Remarks
October	99.70	ADSS Fiber break	Break between Tsirang to Drujegang for 17hrs and 6 mins
November	94.1666	BPC ADSS fiber break	Break between Gelephu and JIgmeling for 9hrs and 43mins, Gedu and Lhamoizingkha for 75hrs 18mins, Kanglung and Tshenkharla&Tyangtse for 41hrs 21mins
December	99.2875	BPC fiber break and fiber maintenance	Break between Jigmeling and Sarpang for 5hrs 6mins, Wangdue and Baychu for 2hrs, Mongar and Gyelposhing for 13hrs 2mins,Sipsu and Tendru for 1hr 1mins

Average availability was 97.7180%.

3) Fiber Network Reliability report submitted by BPC

Months	Availability in percent	Fault Type	Remarks
October	100	NA	NA
November	100	NA	NA
December	100	NA	NA

Average availability was 100%

Conclusion

The above analysis was limited to the monthly network reliability reports submitted by the Telcos/ISPs and BPC. From the reports collected for October to December 2019, BTL average was 97.7180% and TICL average was 100% .

From the report submitted by BPC the availability for the month of October to December 2019 was 100%. BPC was able to maintain the availability above 98%.

Constraints

1. There was a delay in the report submitted by ISPs and BPC for the month of October to December. This creates delay while publishing the quarterly report for DITT.
2. The fiber fault types for December month submitted by Bhutan Telecom were due to fiber maintenance by the fiber team
3. It takes time for the BPC team to detect and identify the exact location of fiber breaks since the fiber breakages are manually detected and rectified. Therefore there is a need of automatic fiber monitoring system to tackle this issue.
4. It was observed that the fiber outages recorded by ISPs/TSPs were missing in the records maintained by BPC.This could be due to the fibers leased to the respective stakeholders or issues with record maintenance.