National Fiber Network Reliability Report
(April-June, 2018)

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 (BPC, TICL, BT) and 20 Dzongkhag ICTOs on a monthly basis and the report is prepared on a quarterly basis.This is the final report for the financial year 2017-2018.
DITT has been collecting National fiber reports from the two ISPs (BT and TICL), BPC and 20 dzongkhags.

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 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 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 (BT, TICL, BPC) and 20 Dzongkhags. Data collected for the months April to June, 2018 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 (BT, BPC and TICL) and Dzongkhag ICTOs who uses the Fiber network.The stakeholders and ICTOs were given instructions 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 and Dzongkhag ICTOs average availability for the month April-June, 2018 has been compiled in tables below.

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

Months	Availability in percent
April	100
May	99.19
June	96.93

Average availability was 98.706%

2) **Fiber Network Reliability report submitted by BT**

Months	Availability in percent
April	97.81
May	99.86
June	99.38

Average availability was 99.016%.

3) **Fiber Network Reliability report submitted by BPC**

Months	Availability in percent
April	99.51
May	100
June	99.901

Average availability was 99.80%

4) **Fiber Network Reliability report submitted by Dzongkhag ICTOs**

Dzongkhags	Availability for April month	Availability for May month	Availability for June month	Average for three months	Remarks
Punakha	100	100	100	100	
Bumthang	100	100	100	100	
Chhukha	100	100	100	100	
Thimphu	100	100	100	100	
Tashigang	100	100	100	100	
Tashiyangtse	100	100	100	100	

Haa	100	100	100	100	
Dagana	100	100	100	100	
P/gatshel	100	100	100	100	
Samtse	100	100	100	100	
Trongsa	100	100	100	100	
Lhuntse	50	100	100	83.33	Fiber break at medtsho gewog for 15 days for the month of April
Mongar	100	100	40	80	1. Fiber break at Shermuhung CC from 4/6/2018 to 22/6/2018
Paro	100	100	100	100	
Tsirang	100	100	96.67	98.89	Fiber issue on 18/6/2018 for one whole day at darjay ss
Samdrup Jongkhar	100	56.67	100	85.56	Fiber break at Martsalla CC and GC from 30/4/2018 to 12/05/2018
Wangdue phodrang	100	99.306	100	99.77	Fiber break at Gasetshogom CC for 5hrs on 24/5/2018
Sarpang	100	100	100	100	
Zhemgang	100	100	100	100	
Gasa	100	100	93.33	97.78	Fiber Breakage between Khatoed gewog office,Khamaed CC office and Khamaed gewog center from 19/06/2018 to 21/6/2018

Conclusion

The above analysis was limited to the monthly network reliability reports submitted by the Telcos/ISPs, BPC and Dzongkhag ICTOs. From the reports collected for April to June 2018, both the Telcos/ISPs were able to maintain availability at 98%, with the average availability of 98.861%. From the report submitted by BPC, the availability was 99.80% for the month of April to June 2018.

DITT has been informed that all the identified fiber breakages have been restored. From the report submitted by the Dzongkhag ICTOs, Mongar Dzongkhag has the lowest percentage availability of fiber with average of 80% for the month of April till June 2018, as there was fiber breakage at Shermuhung Community Center from 4/6/2018 to 22/6/2018.The average availability for 20 dzongkhags for the month of April to June 2018 is 97.2665%.

Constraints

1. Some of the Dzongkhag ICTOs are not able to share their reports on given date and time due to their own obligations. This creates delay while publishing the quarterly report for DITT.
2. While calculating the fiber availability some of the fault types are mainly because of equipment faults such as switch and media converter faults. Such type of faults are not considered while calculating the fiber availability.
3. As per the agreement signed between BPC and DITT, BPC is supposed to maintain 98% availability for the National Fiber Network. However, based on the reports submitted by Telcos/ISPs and Dzongkhags, there are cases when the availability was less than 98%.