

National Fiber Network Reliability Report (July-September, 2017)



**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 first report of the financial year 2017-2018.

DITT has been collecting National fiber reports from the two ISPs (BT and TICL), henceforth DITT will be collecting reports from 20 dzongkhags and BPC as well.

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 are 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 systems 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, monthly fiber reliability reports are collected from the stakeholders (BT, TICL, BPC) and 20 Dzongkhags. Data collected for the months July to September, 2017 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 ($\text{Availability} = ((\text{Service Uptime} / \text{Total time}) * 100)$, $\text{Service Uptime} = \text{Total Time} - \text{Outage Time}$, $\text{Total Time} = 24 * \text{No. Of days in a month}$)
- 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.

Based on inputs provided by the stakeholders and Dzongkhag ICT officers, data has been analysed and compiled in first report for Network Reliability.

Key Findings

Based on the data submitted by the stakeholders and Dzongkhag ICTOs average availability for July-September, 2017 have respective stakeholder has been compiled in tables below.

- 1) Fiber Network Reliability report submitted by TICL

Months	Availability in percent
July	99.69
August	99.76
September	100

Average availability was 99.81%

2) Fiber Network Reliability report submitted by BT

Months	Availability in percent
July	100
August	95.485
September	94.32

Average availability was 96.605%.

3) Fiber Network Reliability report submitted by BPC

Months	Availability in percent
July	100
August	99.87
September	100

Average availability was 99.9%

4) Fiber Network Reliability report submitted by Dzongkhag ICTOs

Dzongkhags	Availability for July month	Availability for August month	Availability for September 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	60	83.33	73.33	72.22	<ol style="list-style-type: none"> 1. Fiber breakage at Toetsho GCC and Gewog office from 27/06/2017 to 15/07/2017. 2. Fiber breakage at Toetsho, Yallang, Khamdang, Bumdeling, yangtse, Tongzhang from 25/08/2017 to 29/08/2017 3. Fiber breakage at Toetsho gewog from 25/09/2017 to 29/09/2017
Haa	100	100	100	100	
Dagana	100	100	100	100	
P/gatshel	100	38.71	100	79.57	Fiber link down from 11/8/2017 to 30/8/2017 at Chimung GC
Samtse	100	100	36.67	78.89	Network problem after migrating the Gewog Network with CC from 15/8/2017 to 4/9/2017
Trongsa	100	100	100	100	
Lhuntse	100	75.935	100	91.98	No fiber link at Kurtoe gewog from 15/8/2017 to 25/8/2017 and 5 days fiber break at Khoma Gewog from 20/8/2017 to 25/8/2017
Mongar	100	64.51	76.67	80.39	<ol style="list-style-type: none"> 1. Fiber break at Saling Gewog on 15/8/2017 for 1 day and 10 days fiber break at Thangrong Gewog from 22/8/2017 to 31/8/2017

					2. Fiber break at Thangrong Gewog from 1/9/2017 to 7/9/2017
Paro	100	35.48	100	78.49	Fiber break at Shaba Gewog from 1/8/2017 to 20/8/2017
Tsirang	100	100	100	100	
Samdrup Jongkhar	96.77	32.26	100	76.34	Fiber break at CC and GC of Gomdar and Wangphu Gewog from 31/7/2017 to 21/7/2017
Wangdue phodrang	100	77.41	100	92.47	Fiber break at Kazhi CC from 16/8/2017 to 23/8/2017
Sarpang	100	100	100	100	
Zhemgang	100	100	100	100	
Gasa	30	30	100	53.33	Fiber Breakage between Khatoed gewog center and Khamaed gewog center from 5/7/2017 to 15/8/2017

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 July to September, both the Telcos/ISPs were not able to maintain availability at 98%. Hence the average availability for the month of July to September is 97.94%. From the report submitted by BPC, the availability was 99.95% for the month of July to September.

DITT has been informed that all the identified fiber breakages have been restored. From the report submitted by the Dzongkhag ICTOs, Gasa Dzongkhag has the lowest percentage availability of fiber with average of 53.33% for the month of July till September 2017, as there was fiber breakage between khatoed and khamaed gewog center for almost 42 days from 5/7/2017 till 15/8/2017. The average availability for 20 dzongkhags for the month of July to September is 90.184%.

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%.