

National Fiber Network Reliability Report (July-September, 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 first report for the financial year 2018-2019.

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 July to September, 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 ($\text{Availability} = ((\text{Service Uptime} / \text{Total time}) * 100)$, $\text{Service Uptime} = \text{Total Time} - \text{Outage Time}$, $\text{Total Time} = 24 * \text{No. Of days in a month}$)
- 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.

Key Findings

Based on the data submitted by the stakeholders and Dzongkhag ICTOs average availability for the month July-September, 2018 has been compiled in tables below.

1) Fiber Network Reliability report submitted by TICL

Months	Availability in percent
July	100
August	100
September	100

Average availability was 100%

2) Fiber Network Reliability report submitted by BT

Months	Availability in percent
July	97.67
August	95.725
September	98.97

Average availability was 97.455%.

3) Fiber Network Reliability report submitted by BPC

Months	Availability in percent
July	100
August	100
September	100

Average availability was 100%

4) Fiber Network Reliability report submitted by Dzongkhag ICTOs

Dzongkhags	July month	August month	September month	Average	Remarks
Punakha	NA	NA	NA	NA	
Tsirang	NA	NA	NA	NA	
Dagana	NA	NA	NA	NA	
Zhemgang	NA	NA	NA	NA	
Bumthang	100	100	100	100	
Chhukha	100	100	100	100	

Tashigang	NA	NA	NA	NA	
Thimphu	NA	NA	NA	NA	
Tashiyangtse	100	100	100	100	
Haa	NA	NA	NA	NA	
Trongsa	NA	NA	NA	NA	
Pemagatshel	NA	NA	NA	NA	
Samtse	NA	NA	NA	NA	
Lhuentse	77.41	100	100	92.47	Fiber break at Kurtoe Gewog on 2/7/2018 for a period of 7days.
Mongar	NA	70.96	100	85.48	Fiber break at Shermubung CC from 9/8/2018 till 18/8/2018
Wangdue phodrang	99.73	61.29	64.51	75.176	<ol style="list-style-type: none"> 1. Fiber break at Dangchu and Sephu Gewog from 9/8/2018 till 20/8/2018. 2. Fiber break at Phibji and Gangtey CC from 22/9/2018 till 25/9/2018 3. Fiber break at Phibji and Gangtey CC from 28/9/2018 till 5/10/2018
Samdrup Jongkhar	NA	NA	NA	NA	
Sarpang	NA	NA	NA	NA	
Gasa	95.69	99.30	96.38	97.12	<ol style="list-style-type: none"> 1. Fiber break at Khamaed Gewog Center and Khamaed CC on 19/7/2018-20/7/2018 for 31 hrs. 2. Fiber Breakage at Khamaed Gewog Center and Khamaed CC Office, Bjishong Central School on 7/8/2018 for 5 hrs. 3. Fiber break at Khamaed Gewog Center and

					Khamaed, CC Office of Khatoed and Khamaed Gewog, Bjishong Central School on 27/9/2018-28/9/2018 for 26 hrs.
Paro	100	100	100	100	

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 2018, Bhutan Telecom Ltd. were not able to maintain availability at 98%. However the average availability between the two Telcos/ISPs is 98.7275%.

From the report submitted by BPC, the availability was 100% for the month of July to September 2018.

DITT has been informed that all the identified fiber breakages have been restored. From the report submitted by the Dzongkhag ICTOs, Wangdue Phodrang Dzongkhag has the lowest percentage availability of fiber with average of 75.176% for the month of July till September 2018. The average availability for 20 dzongkhags for the month of July to September 2018 is 93.78075%.

Constraints

1. Some of the Dzongkhags (Punakha, Tsirang, Dagana, Zhemgang, Tashigang, Thimphu, Haa, Trongsa, Samtse, Samdrup Jongkhar, Sarpang) are not able to share their reports on given date and time even after repeated reminders and follow up made through the department. 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%.

