

National Fiber Network Reliability Report (January-November, 2016)



**Telecom Division
Department of IT and Telecom**

Executive Summary

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

The data is collected from the stakeholders (BPC, TICL, BT) on a monthly basis. This is the first report of the financial year 2016-2017.

The major observation of the study is that in most of the cases, the stakeholders have been able to maintain 98% availability though there were cases of fiber breakages which led to availability less than 98%.

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 project, 18 Dzongkhags have been connected with OPGW cables and remaining two Dzongkhags and 201 Gewogs have been connected with ADSS cables. The total length of the fiber cables is approximately 3300 KMs.

The Government (through DITT/MoIC) is the sole owner of the National Fiber network. DITT leases the fibers to Telecom operators and Internet Service Providers free of cost in order to keep the prices of telecommunications and Internet services affordable, to ensure level playing field for operators, and to help improve competition at the service level.

As per the Agreement signed between DITT/MoIC and BPC, BPC manages the Operation and Maintenance of the National Fiber Network at 2.1% of the total fiber asset value. 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). Data collected are reported below.

Objective of the study

To study the National Fiber Network Reliability in Bhutan and improve on the methods to maintain upkeep of the fibers.

Methodology

A dashboard is 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)
- 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) who uses the Fiber network. The stakeholders 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, data has been analysed and compiled in this first report for Network Reliability.

Key Findings

Based on the data submitted by the stakeholders average availability of each month for respective stakeholder has been compiled in tables below.

1) Fiber Network Reliability report submitted by BPC

Months	Availability
January	100
February	97
March	100
April	95.86
May	100

June	97
July	99.97
August	100
September	100
October	99.79
November	99.24

Table 1: Average availability as per BPC’s records

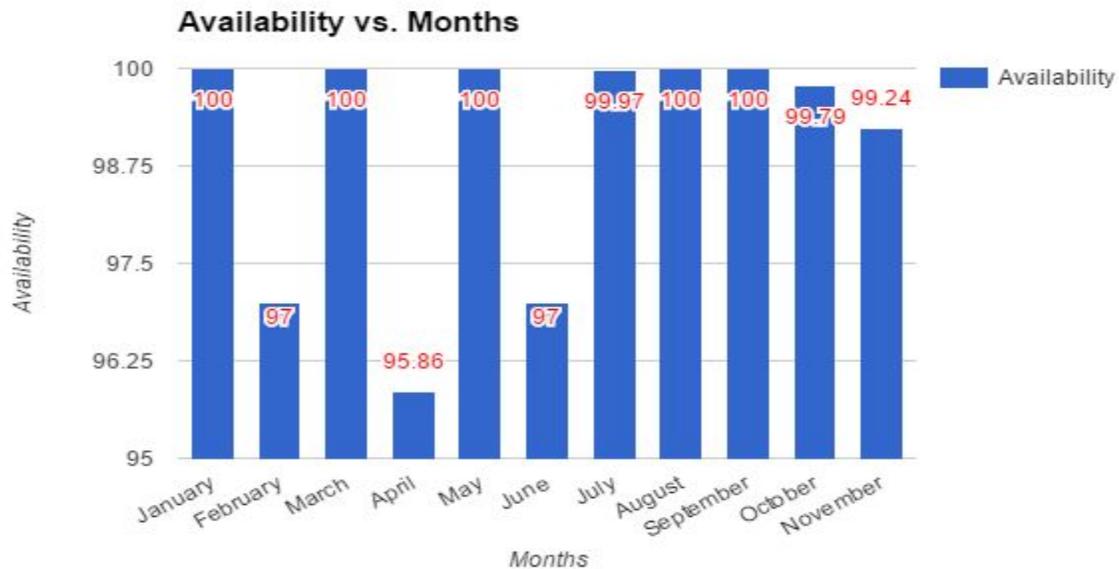


Figure 1: Average availability as per BPC’s records

The following observations were made from the above graph and table:

1. Availability was less than 98% for the months February, April and June.
2. During the other months, BPC was able to maintain 98%< availability of fiber.
3. It was observed that BPC has only maintained record for fiber outages in the OPGW lines and have not recorded the outages occurred in ADSS lines. Therefore it is recommended that BPC must be asked to record fiber outages in ADSS lines as well.

2) Fiber Network Reliability report submitted by TICL

Months	Availability
January	100%
February	99.74%
March	100%
April	96.68%
May	100%
June	100%
July	100%
August	100%
September	100%
October	100%
November	100%

Table 2: Average availability as per TICL

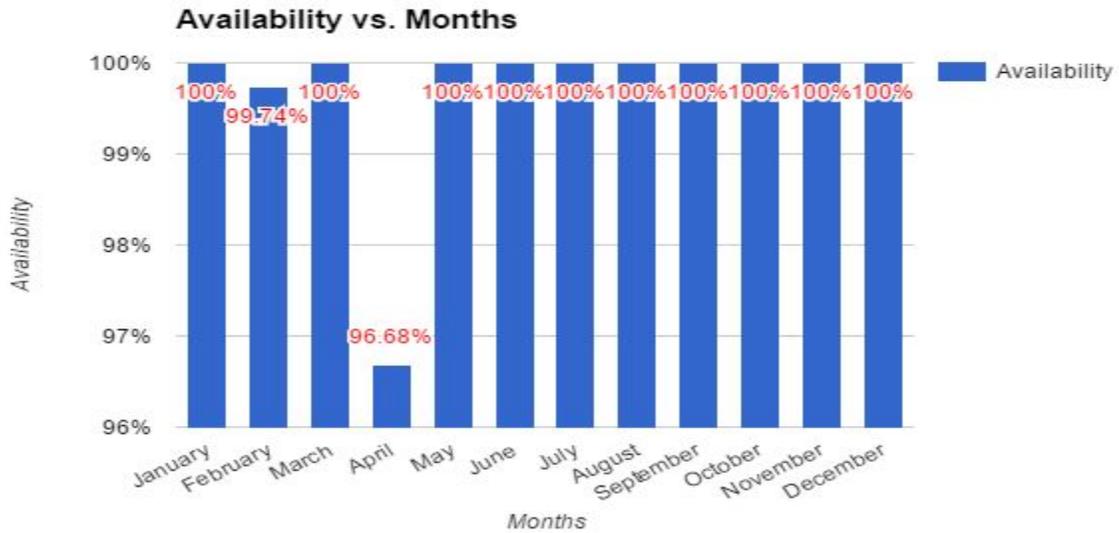


Figure 2: Average availability as per TICL

The following observations were made from the above graph and table:

- Availability was less than 98% for the month April.
- During the other months, TICL was able to maintain 98%< availability of fiber.

3) Fiber Network Reliability report submitted by BT

Months	Availability
January	98.9
February	99.563
March	99.237
April	100
May	96.38
June	98.96
July	90.564
August	98.454
September	91.59
October	98.249
November	99.39

Table 3: Average availability as per BT



Figure 3: Average availability as per BT

The following observations were made from the above graph and table:

- Availability was less than 98% for the months May, July and September.
- During the other months, BT was able to maintain 98%< availability of fiber.

Overall observation

The following observations were made from the records submitted by BPC, BT and TICL:

- BPC have only maintained records for the OPGW lines. It hasn't recorded the fiber outages recorded by other two stakeholders specially in the ADSS lines.
- BT have maintained and recorded all the fiber outages and have submitted a detailed report.
- TICL have maintained and recorded all the fiber outages and have submitted a detailed report.

Conclusion

The above analysis was limited to the monthly network reliability reports submitted by the stakeholders. Availabilities of the fiber networks are consistent and maintained at the required level. It was however observed that the fiber outages recorded by the ISPs were found missing in the records maintained by BPC. This could be due to the fibers leased to the respective stakeholders or issues with record maintenance. The stakeholders could be asked to maintain record for both OPGW and ADSS lines to get accurate results and for better comparison of records submitted by the stakeholders.