

The background of the slide is a composite image. The top left corner shows a close-up of several orange optical cables plugged into a network switch, with some green status lights visible. The bottom right corner shows a black and white photograph of a dense city skyline with many skyscrapers. A large, bright yellow diagonal band runs from the top left towards the bottom right, partially obscuring the background images.

# Optical Cable OAM Assistant Management

Innovative Monitoring Solution

Presented by

HC Optical Science and Tech Co., Ltd



# CONTENTS

- OAM Status of Optical Network
- Solution - An Innovative Monitoring System
- Equipment Description
- NMS

The background of the slide is a composite image. The top-left corner shows a close-up of several orange optical fibers bundled together and connected to a black patch cord. The bottom-right corner shows a black and white photograph of a dense city skyline with many skyscrapers. A large, bright yellow diagonal band runs from the top-left towards the bottom-right, separating the technical image from the city image. The title text is centered in the white space between these two images.

# OAM Status of Optical Network

# Troubles in Optical Cable Maintenance

## Cable Broken

Natural disaster, engineering accident, tree growth are easy to cause the broken of optical cable.

👤<sup>?</sup> Trouble

## Manual Inspection

- Low Efficiency
- Low Data Accuracy
- Expend manpower and resources

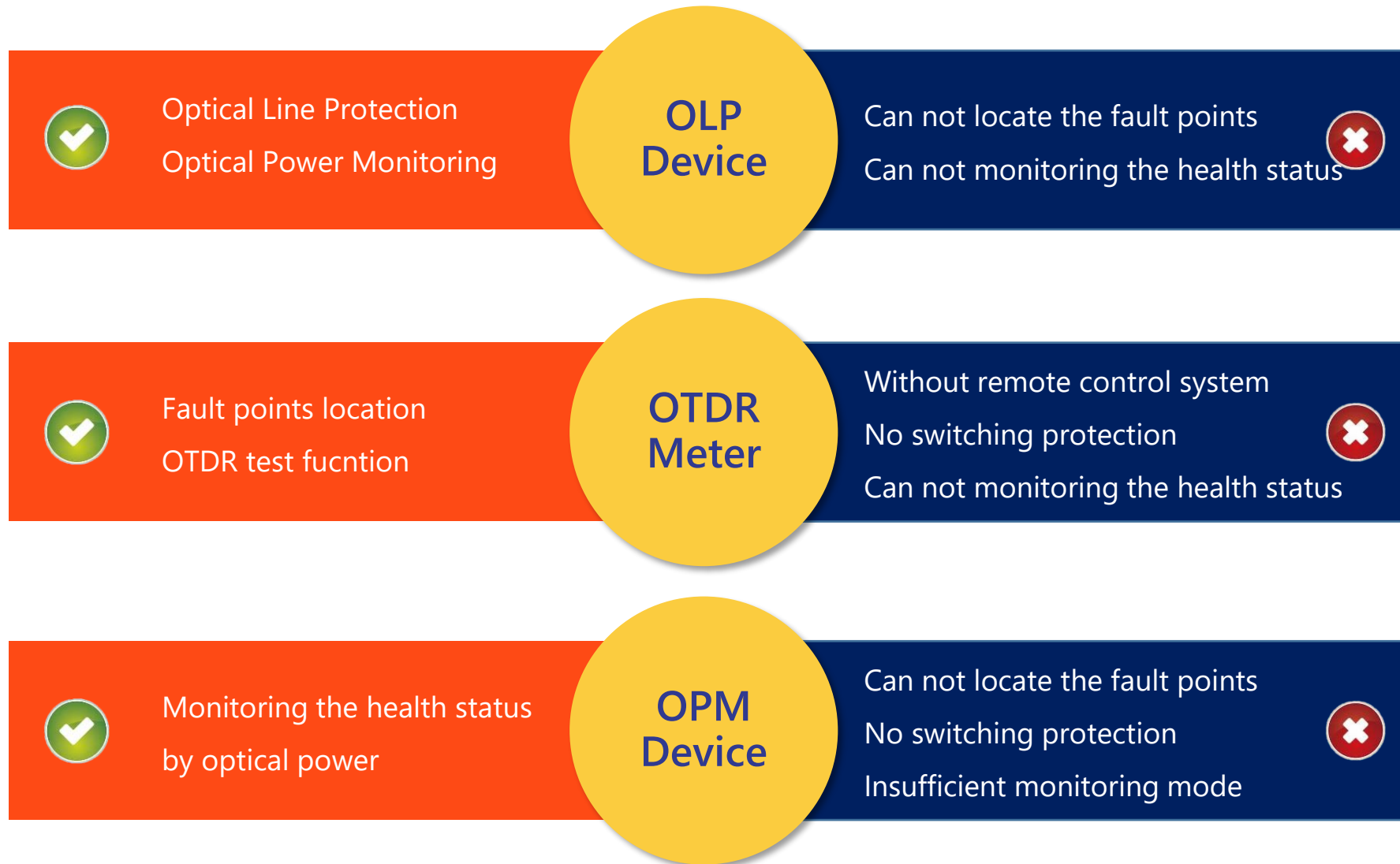
👤<sup>?</sup> Trouble

## Large Amount of Fibers

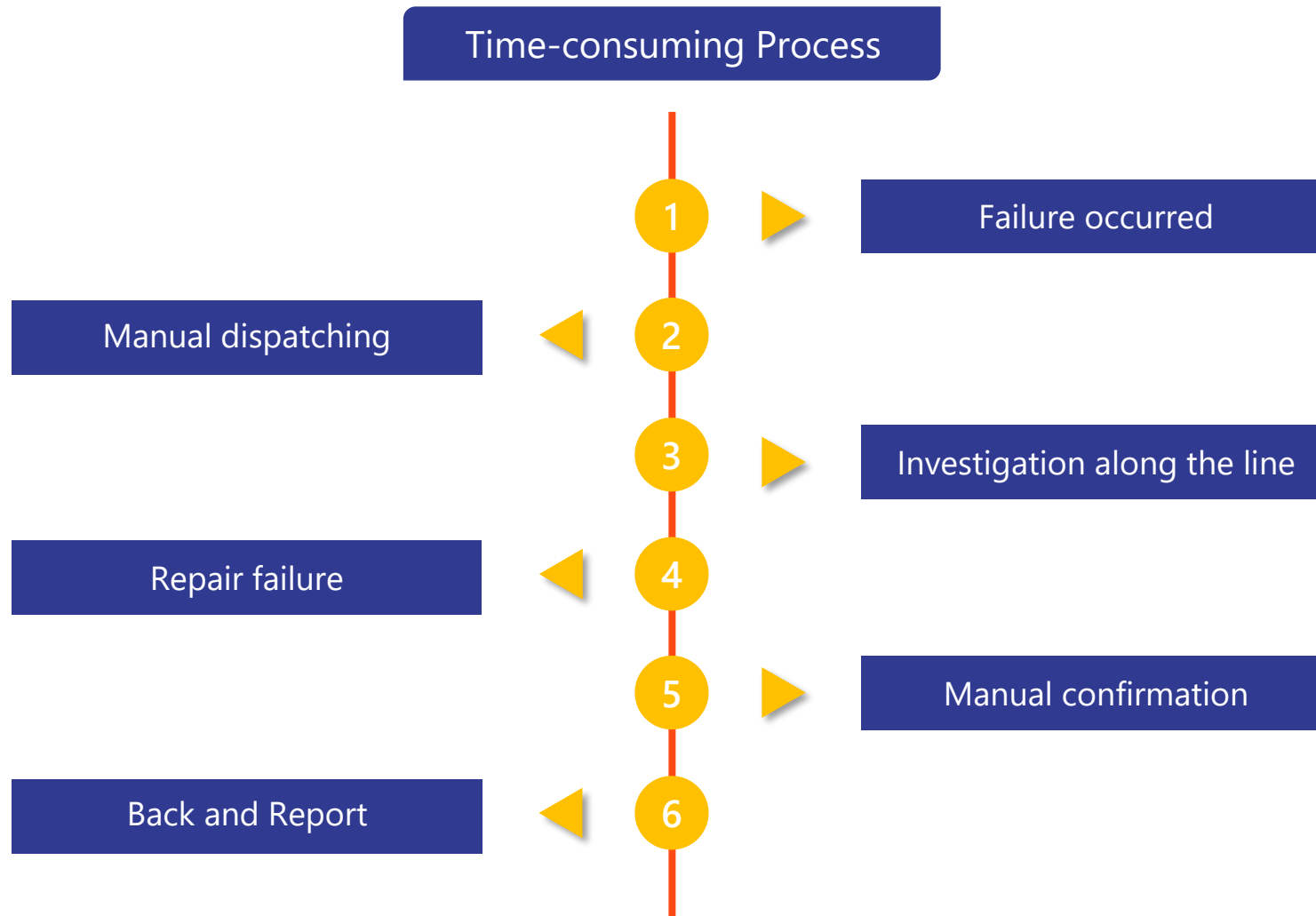
Large amount of fibers, especially the spare fibers as dumb recourse, lack effective monitoring means and can not get their health status.

👤<sup>?</sup> Trouble

# Traditional OAM Tools



# Traditional OAM Process



# OAM Requirements

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With the rapid expansion of the optical cable network, how to improve the efficiency of network OAM is particularly important.



## Real-time Monitoring

Keep track of the health status of optical cables.

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## Fast and Precisely Troubleshooting

Fault points can be quickly and precisely located to shorten the troubleshooting time.

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## Service Protection

Automatic optical line switching can be realized to protect business from interruption.

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## Intelligent Management

Automatic business process management has become a higher level requirement and trend in the network management.

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# **Solution - An Innovative Monitoring System**



# Solution

Gained through years' experience and profound understanding of optical fiber cable management and monitoring, we have designed and developed an innovative **Automatic Optical Cable Monitoring and Switching Protection System**.

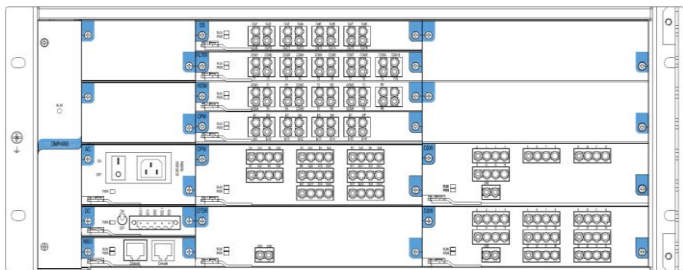
Based on the OTDR/WDM/OPM/OLP/OSW/GIS and other advanced technology, this system combines the monitoring, alarm, fault analysis, fault location, line protection switching, statistics and other functions together, to provide an innovative and efficient solution for the OAM of optical cables.



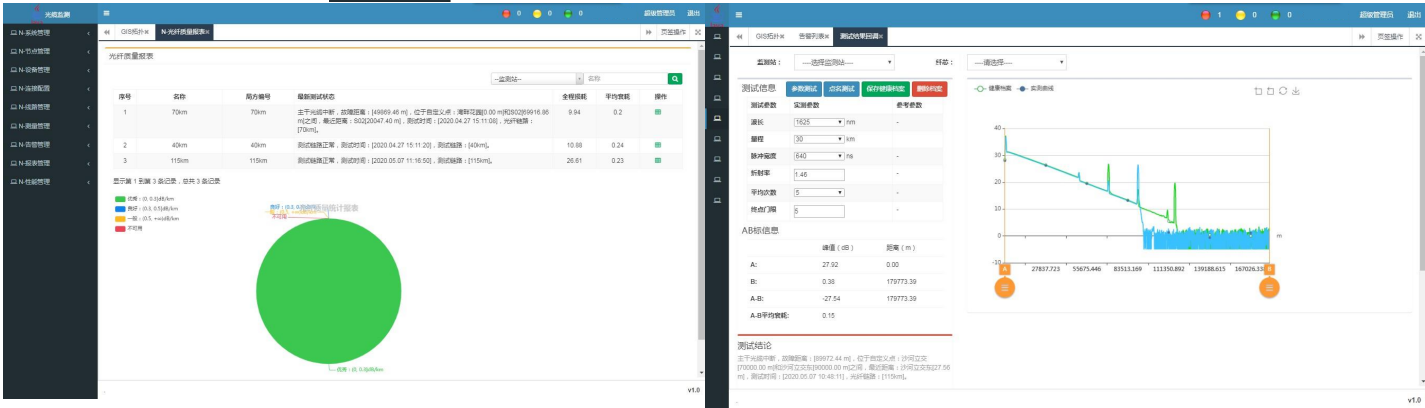
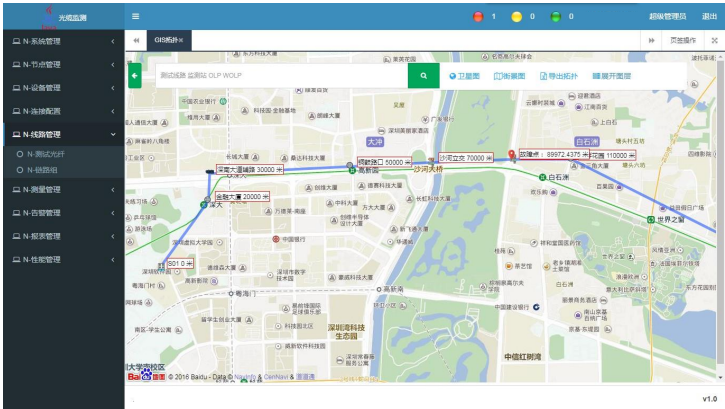
1U



2U



4U



# Functions



Automatic or Manual  
OTDR test



Optical Power Monitoring



Optical Line Protection



GIS Platform

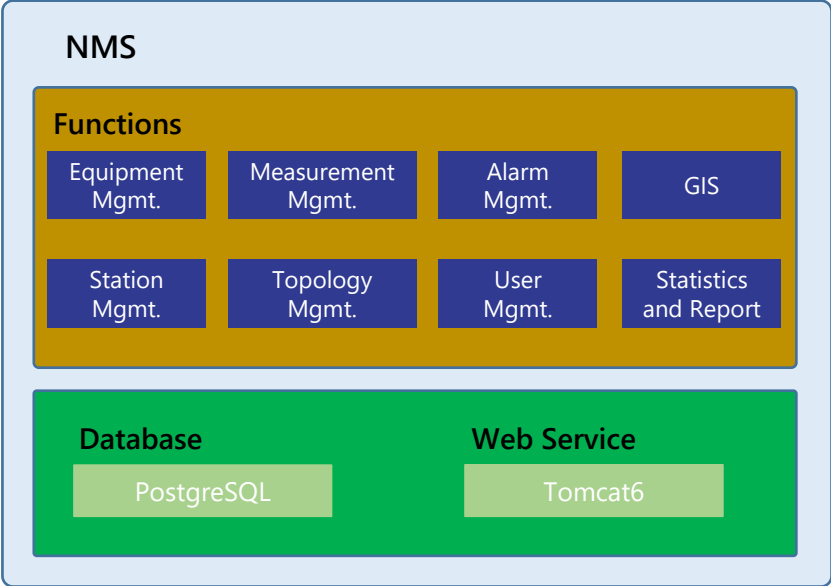
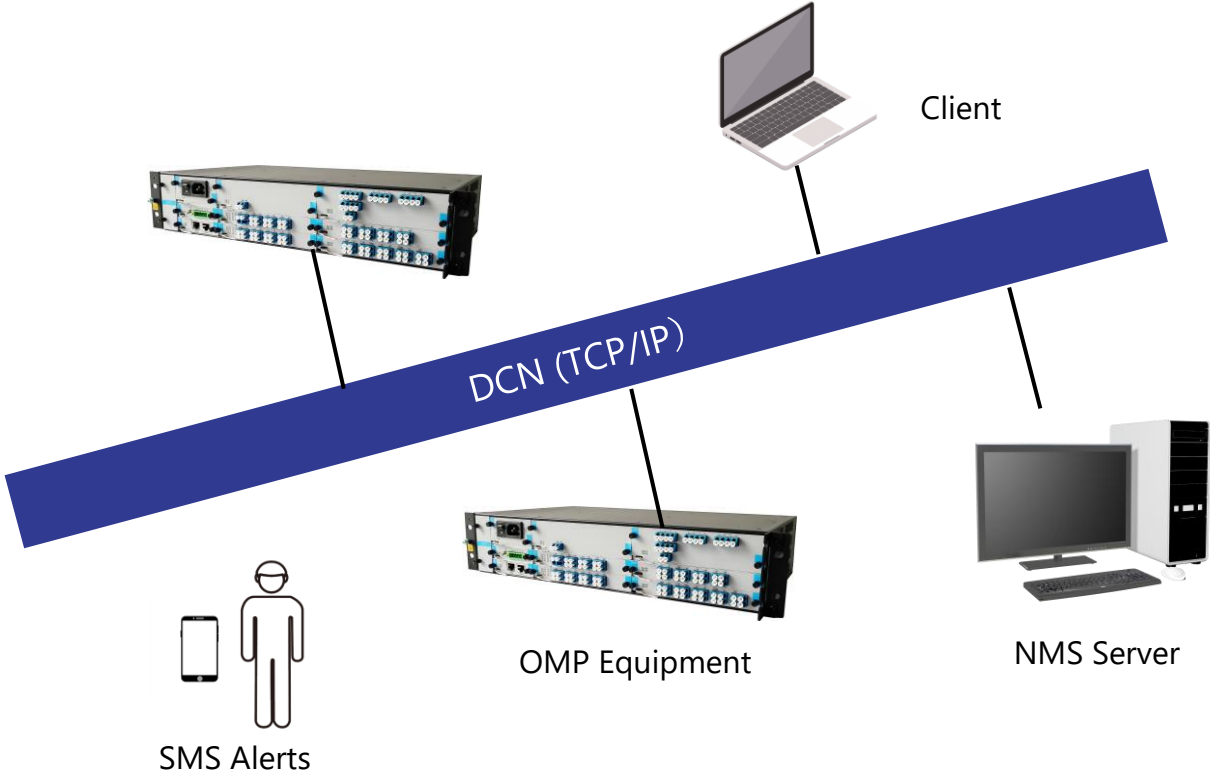


ALM Info. auto-pushing  
by SMS and email



Statistics and Report

# System Architecture

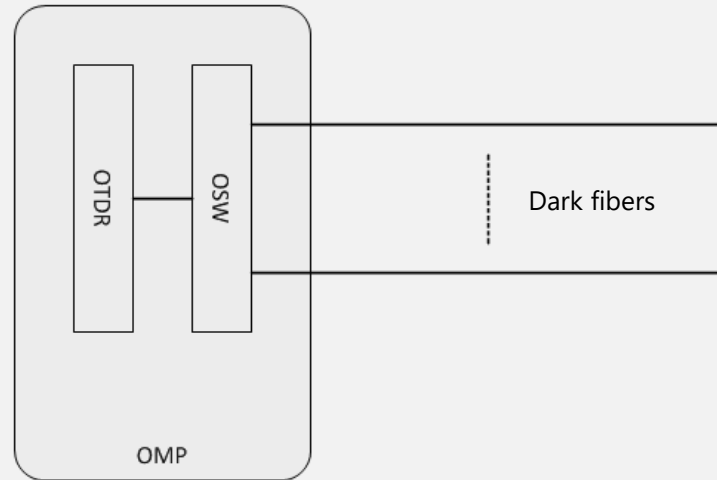


# Typical Monitoring Solution

Monitoring Solution

Periodic Test for Dark Fibers

Diagram



Description

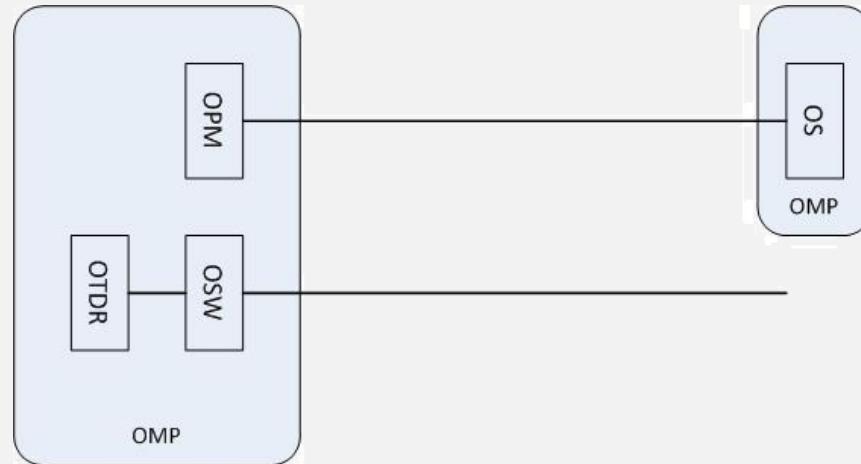
Periodic scan all the dark fibers via Optical Switching Card.  
Characterize the performance of all dark fibers and feedback the risk nodes.  
Get the health status of all dark fibers regularly.  
Pre-determined scan plan.  
Simple and reliable structure.

# Typical Monitoring Solution

## Monitoring Solution

Dual Dark Fibers Monitoring by Optical Power

## Diagram



## Description

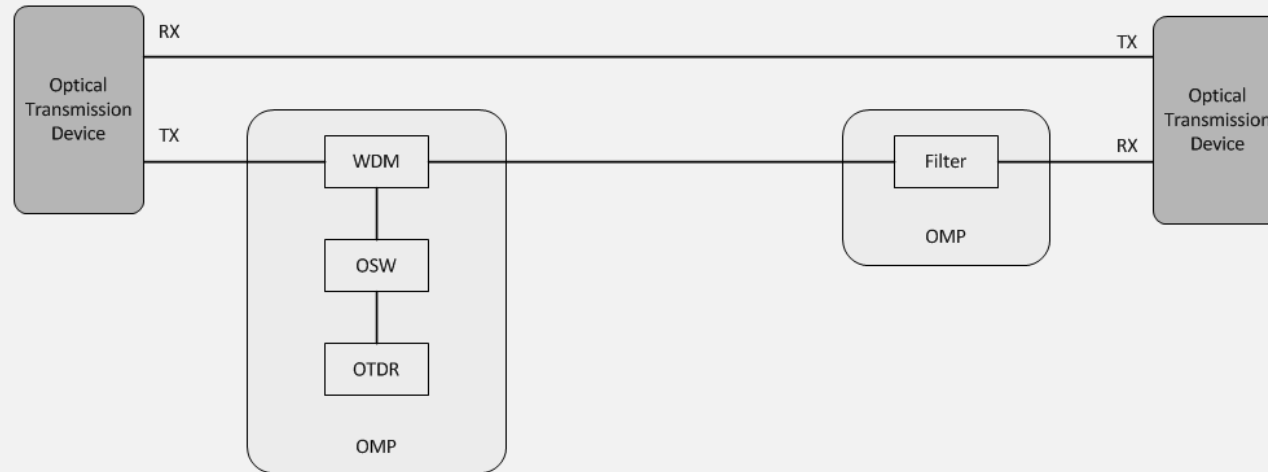
Monitoring the dual dark fibers inside the same cable with the lit fibers.  
Real time optical power monitoring.  
OTDR will be activated immediately while the optical power degrade to the threshold.

# Typical Monitoring Solution

Monitoring Solution

Periodic Test for Lit Fibers

Diagram



Description

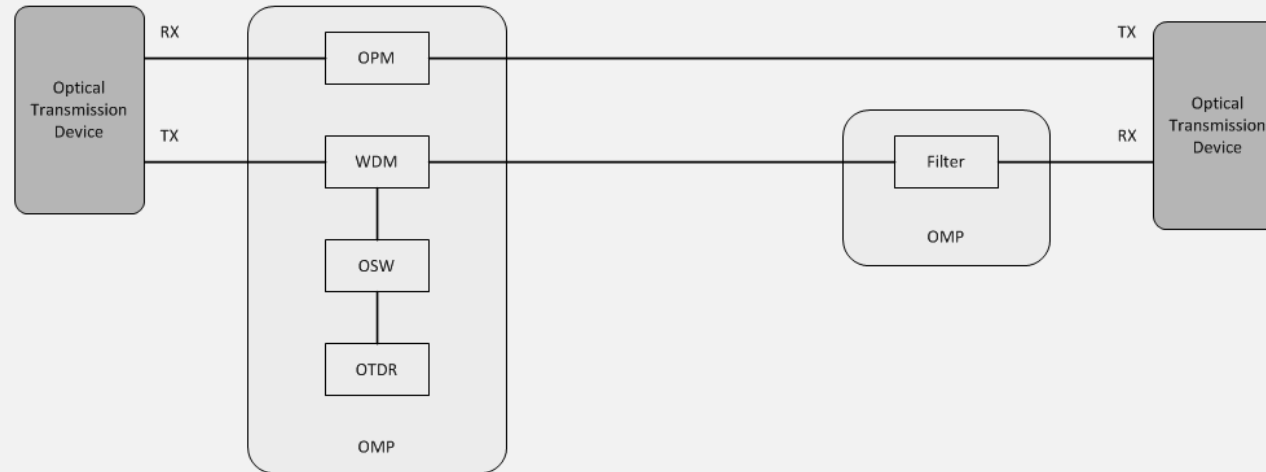
Periodic scan all the lit fibers via Optical Switching Card.  
Characterize the performance of all lit fibers and feedback the risk nodes.  
Get the health status of all lit fibers regularly.  
Pre-determined scan plan.

# Typical Monitoring Solution

Monitoring Solution

Lit Fibers Monitoring by Optical Power

Diagram



Description

Monitoring the lit fibers.

Real time optical power monitoring.

OTDR will be activated immediately while the optical power is degraded to the threshold.

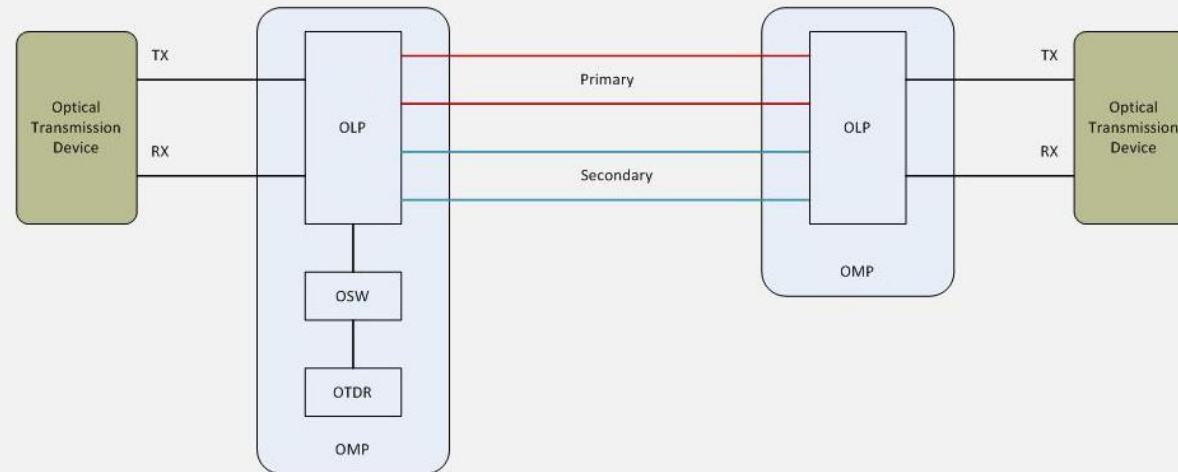


# Typical Monitoring Solution

## Monitoring Solution

### Lit Fibers Monitoring with OLP

## Diagram



## Description

Monitoring the lit fibers.

Real time optical power monitoring via OLP card.

OLP+OTDR, provide carrier grade optical line protection swithing and activated OTDR test at the same time to locate the fault point.

The background of the slide is a composite image. The top-left corner shows a close-up of several orange network cables plugged into a patch panel, with some green indicator lights visible. The bottom-right corner shows a black and white photograph of a dense city skyline with many skyscrapers. A large, bright yellow diagonal band runs from the top-left towards the bottom-right, separating the two background images and framing the central text.

# Equipment Description

# Models

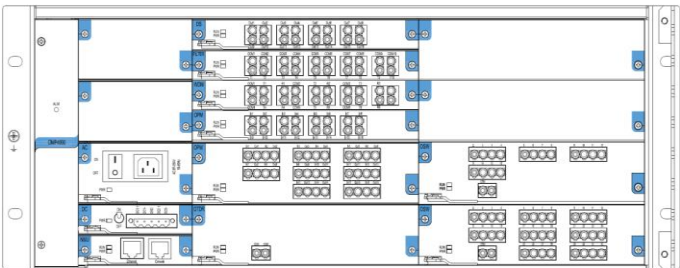
OMP2000



OMP3000



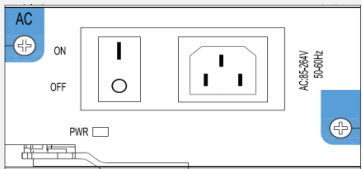
OMP4000



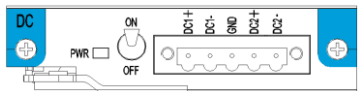
Models	Size	Slots
OMP2000	1U	4
OMP3000	2U	8
OMP4000	4U	16

# Cards

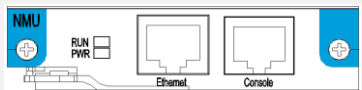
AC Power Supply Unit



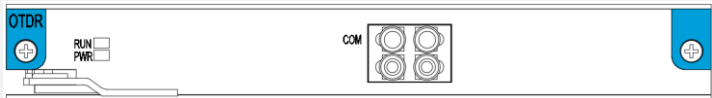
DC Power Supply Unit



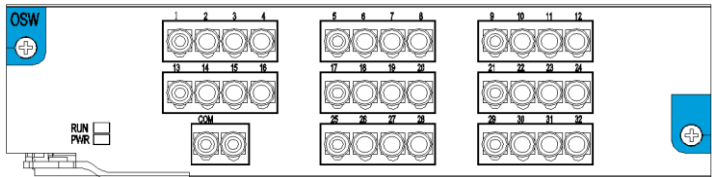
Network Management Unit



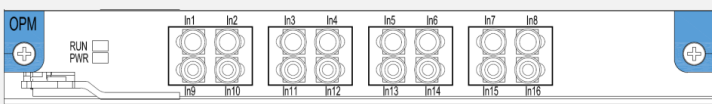
OTDR Card



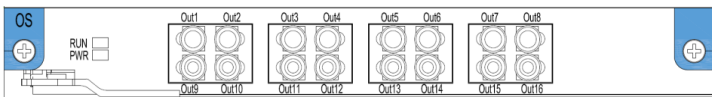
Optical Switching Card



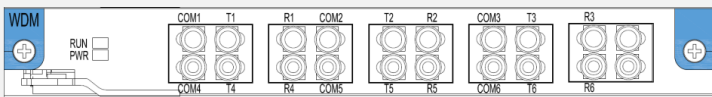
Optical Power Monitoring Card



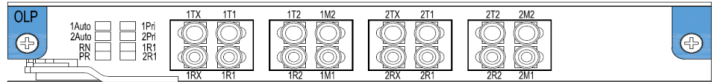
Optical Source Card



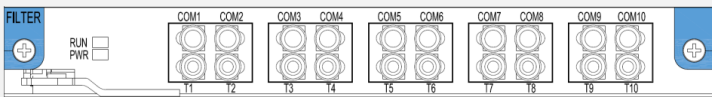
WDM Card



OLP Card



Filter



# Features

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- Flexible and versatile platform
  - Modular Design, highly-scalable configuration
  - High Optical Performance
  - Hot-plugging
  - Dual Power Supply for redundancy
  - Low Concumption
-

The slide features a central white area with the title 'Network Management System' in a dark blue, sans-serif font. This central area is framed by diagonal yellow and light gray stripes. The top-left corner shows a close-up of network cables with orange and red fibers and green status lights. The bottom-right corner shows a black and white photograph of a dense city skyline with various skyscrapers.

# Network Management System

# NMS Platform

## Hardware Requirement

CPU : 3.1GHz or above  
RAM : 4GB or above  
HD : 1TB or above  
Interface : GbE RJ-45  
Display : 1920×1080

## Software Requirement

OS : Windows OS  
Browser : Chrome、360、IE  
Database : PostgreSQL  
Web Service : Tomcat6

## NMS Architecture

### Functions

Equipment Mgmt.	Measurement Mgmt.	Alarm Mgmt.	GIS
Station Mgmt.	Topology Mgmt.	User Mgmt.	Statistics and Report

### Database

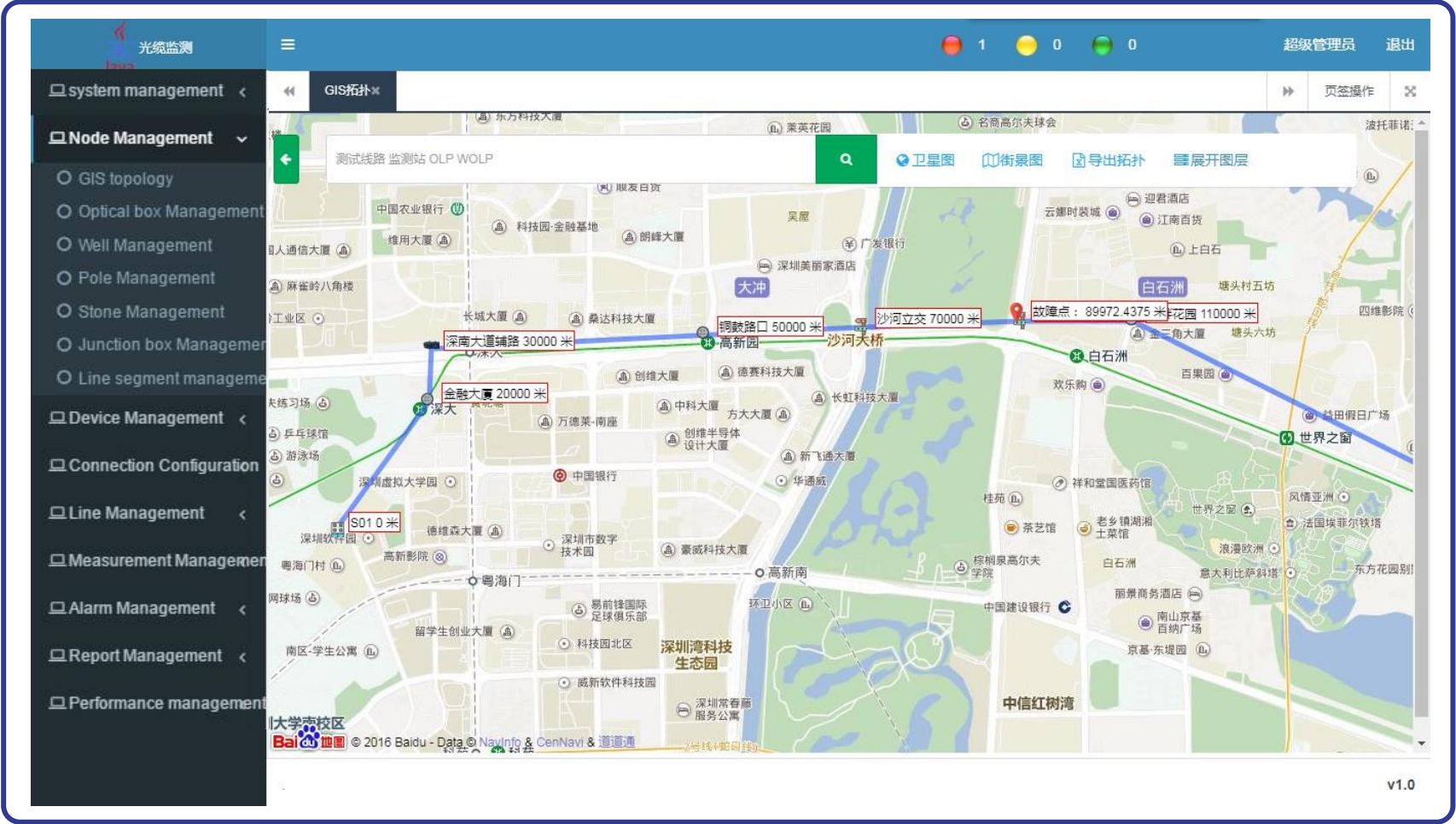
PostgreSQL

### Web Service

Tomcat6



Embedded GIS platform can realize the mapping and visual management of stations, nodes, optical cable routes and other resources, and accurately and clearly locate the fault points.



# Equipment Management

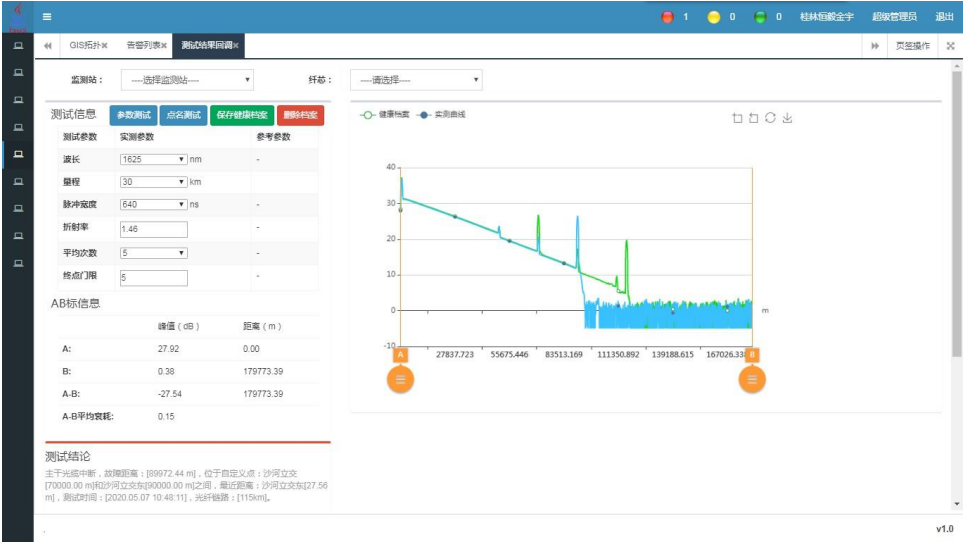
Self identification, self discovery and visual management of functional cards.



# OTDR Test

The high-performance OTDR module with a dynamic range of up to 40dB can precisely locate the fault points, accurately measure the quality of the fibers including length, insertion loss, total loss.

Multiple Test modes:  
Support Manual Test, Periodic Test, Alarm Test, and Bidirectional Test for Ultra-long distance.



The screenshot displays the OTDR software interface showing the test results table. The table is titled '测试结论' (Test Conclusion) and contains a table with 6 columns: 序号 (Serial Number), 名称 (Name), 事件类型 (Event Type), 距离 (Distance), 插入损耗 (Insertion Loss), and 累积损耗 (Cumulative Loss). The table lists 6 events, including 1 S01, 2 --, 3 --, 4 --, 5 --, and 6 S02. The '测试结论' section also contains a detailed description of the test results, including the location of the fault point and the test time.

序号	名称	事件类型	距离	插入损耗	累积损耗
1	S01	反射事件	0	0	0
2	--	反射事件	49869.46	1.12	11.12
3	--	反射事件	69916.86	0.42	15.69
4	--	反射事件	89972.44	0.86	20.85
5	--	反射事件	110003.51	1.52	26.64
6	S02	终点事件	115025.57	0	26.88

# Alarm Management

Provide detailed and complete alarm list.

Support multiple combinations of alarm filtering.

Flexible alarm level configuration.

光纖監測

system management

Node Management

Device Management

Connection Configuration

Line Management

Measurement Management

Alarm Management

Report Management

Performance management

GIS拓扑

N-告警列表

告警列表

--监测站-- 设备IP --告警级别-- --告警类型-- --告警原因--

2020-05-06 00:00:00 至 2020-05-07 11:18:00

当前告警 已确认告警 锁定告警 历史告警

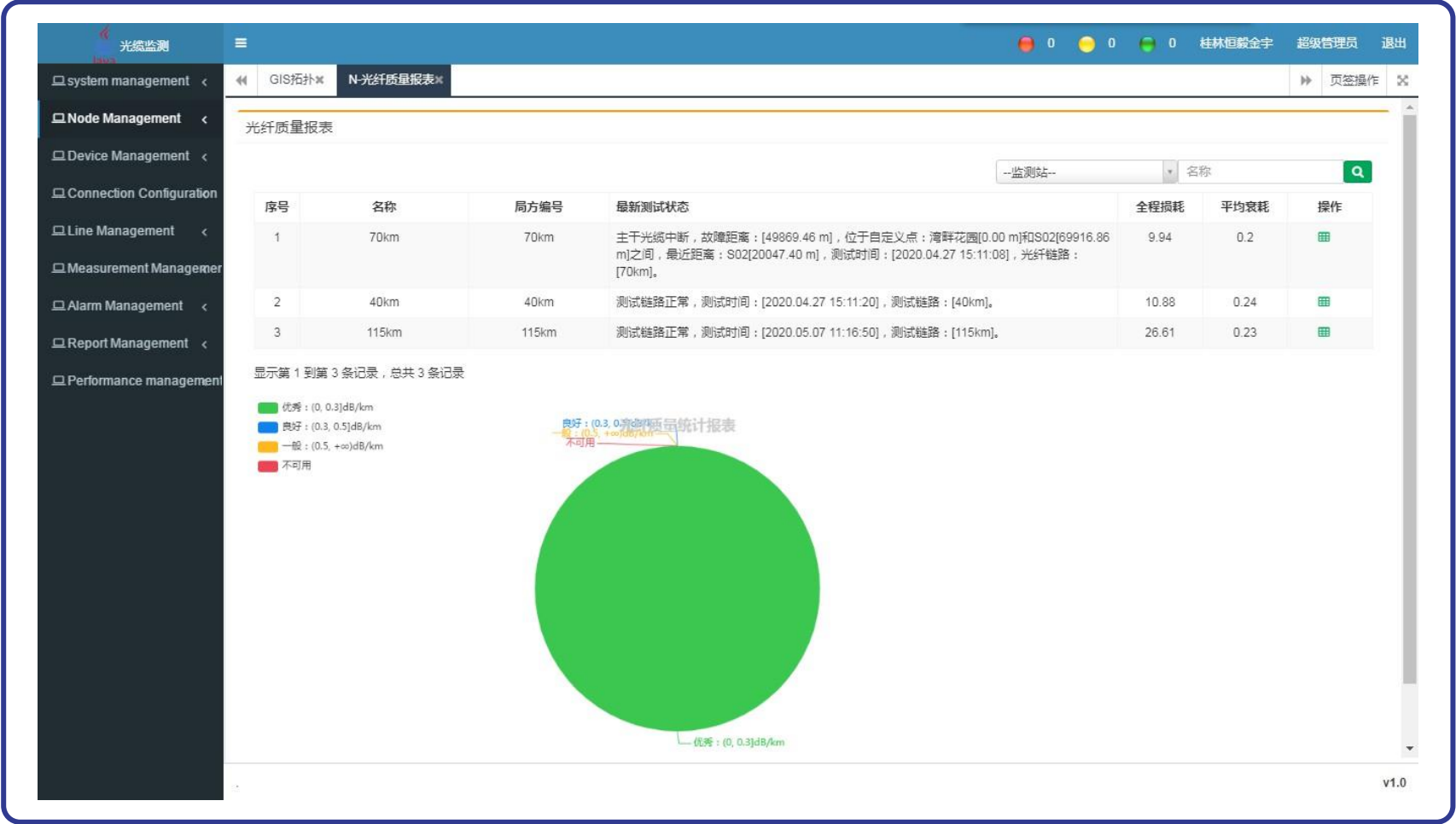
序号	级别	类型	告警原因	监测站	告警时间	告警源	备注	操作
1		线路	主干光缆中断	S01	2020-05-07 11:12:29	115km	89972.44	
2		线路	主干光缆中断	S01	2020-05-07 10:34:23	115km	109987.18	
3		设备	主控失联	S01	2020-05-07 09:46:00	S01-4U-192.168.1.178		
4		线路	主干光缆中断	S01	2020-05-06 11:08:32	115km	89972.44	
5		线路	主干光缆中断	S01	2020-05-06 10:59:25	115km	89972.44	
6		线路	主干光缆中断	S01	2020-05-06 10:52:33	115km	109987.18	

显示第 1 到第 6 条记录，总共 6 条记录

v1.0

# Report Management

Provide complete historical data and report statistics management functions such as event log, test record, switching record, optical fiber quality statistics, etc., to provide strong data support for OAM.



# Database Backup

Provide automatic and manual database backup functions to ensure the safety and reliability of system data.

光猫监测

GIS拓扑

N-数据库备份

system management

Node Management

Device Management

Connection Configuration

Line Management

Measurement Managemer

Alarm Management

Report Management

Performance management

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桂林恒毅金宇

超级管理员

退出

数据库备份

备份规则

手动备份

序号	文件名称	文件大小(m)	操作
1	2020-03-04-15-38-07.backup	0.67	
2	2020-03-05-15-38-46.backup	0.672	
3	2020-03-18-15-38-43.backup	1.665	
4	2020-03-20-15-38-12.backup	1.667	
5	2020-03-23-15-38-51.backup	1.67	
6	2020-03-26-15-38-25.backup	1.673	
7	2020-03-30-15-31-44.backup	1.675	
8	2020-03-30-15-32-07.backup	1.675	
9	2020-03-30-15-33-26.backup	1.675	
10	2020-03-30-15-38-25.backup	1.675	
11	2020-04-07-15-38-18.backup	1.68	
12	2020-04-14-15-38-45.backup	3.92	
13	2020-04-15-15-38-29.backup	11.213	
14	2020-04-17-15-38-35.backup	18.871	

v1.0





THANKS