IDEAL NETWORKS

MODERN COMMUNICATION NETWORKS AND SWIFT ERROR ELIMINATION

A classic contradiction?

An overview of the topic

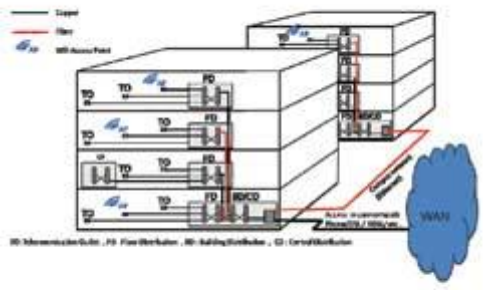
Fast developments in the world of communication require new approaches to effective error isolation as well as well -adapted measuring technology. The combination of effective testing techniques in an easy -to-use device at good value for money determines the competitiveness of measuring technology and service offered on the market today. This article describes key elements within this development and presents the LanXPLORER from IDEAL INDUSTRIES - a family of devices which is capable of meeting these requirements.

Technical background

Today's world of communication has reached a stage of development at which diverse applications increasingly overlap or merge. New areas of application are constantly opening up for modern communication technologies. Data, voice and video information have to be transmitted quickly and in high quality within the same network, often even via the same link. Before too long, building automation and management systems will be standard. There is no end in sight in terms of the growing speed and broadband demands in networks. In recent years, Ethernet has emerged from the LAN area and established itself as the most widespread technology in networks access including many WAN applications. Sophisticated and secure transmission and protocol mechanisms with good scalability for transmission rates of up to 100 Gbit/s are increasingly replacing classic transmission techniques in backbone networks such as SDH, PDH and ATM.

Modern communication networks are based entirely on Ethernet. Nowadays, a wide range of application oriented and transport protocols enables the conversion of data streams of diverse origins for transmission via the internet and on local networks on a standardised technological basis. A transfer rate of 1 Gbit/s has now reached the individual workplace and is the standard network interface in modern PCs.

LAN Topologies



This development makes certain things easier - transmission channels are more transparent and the network components used are more compatible with each other. However, at the same time it requires reorientation and a new approach among all those involved, from the developer to manufacturers, installers and end users.

And the job of the network installer is no longer limited to laying and certifying copper cables. In order to remain competitive, entire network solutions have to be offered.

Local networks are no longer as “local” as the word originally meant, but can branch out across many network levels between different buildings, cities or even continents. The proverbial “bottleneck” can occur anywhere in the network and is often not easy to detect. A locally occurring network problem can potentially be caused by something which is very far away but not immediately recognisable.

In addition to conventional copper cabling, WLAN connections and optical links are now part of the everyday scene. Modern measuring techniques are required to meet these high -level demands and provide a range of tests in a single device which covers as broad a range as possible. The challenge is to address the complex technical correlations within the measuring device and show these to the user in an easily digestible form.

Error phenomena and their causes

In the often tree -like branch structure of networks, the end users at the very lowest level are the largest group of network participants numerically speaking. So it is only logical that most errors occur at this level. The end user is the first to notice any errors which may occur. This is why fault finding starts with the end user. This in turn determines the range of functions of modern network measuring technology in this area.

For the user, a network problem is perceived as a faulty or poor connection. Typical examples are slow data transfer, poor voice quality on voice -over IP, a lack of network connection or, more recently, also faulty power supply in PoE systems (Power over Ethernet).

This purely external error pattern can have various causes which break down into two groups of error:

- Errors in the physical connection - so-called Layer 1 errors •
- Errors at higher protocol layers

Both groups of error must be addressed by the measuring technology used, preferably in a single device.

Several physical media types should be supported so as to cover Layer 1 errors. In view of increasing bandwidth, errors in copper cabling have a growing impact on transmission quality.

However, around 70 - 80% of easily identifiable errors are found in the physical connection. As software intelligence in network nodes and end devices increases and new applications and protocols become established, this percentage might decrease in the future.

The IDEAL LanXPLORER – the all -round talent for network error search:

IDEAL NETWORKS is able to meet many of these conditions with its LanXPLORER device family.

Three configuration levels are available to meet different needs. The following is a description of the fully equipped LanXPLORER PRO.

This robust and handy device is fitted with a high -resolution colour 3.5” TFT display featuring a touch screen. A clearly structured menu guidance system based on symbols and a programmable autotest means that results are produced in no more than three stages. The device can be powered by alkaline batteries, rechargeable batteries or a mains adaptor. Up to 7500 test results can be saved internally and exported in XML format via a USB port. The device is supplied with a carrying case and an extensive range of accessories.

For Layer 1 tests, the classic RJ45 copper port is supplemented with an optical port for standardised Gigabit Ethernet SFP modules and a WiFi interface. SFP -GBIC modules for single mode and multi mode with optical power measurement are supported. A high -performance wiring test, including length measurement, provides detailed feedback on wiring errors not just for each pair of wires but also for each individual wire. Even barely detectable wiring errors such as split pairs can be located and displayed graphically. PoE/PoE+ detection with voltage and current measurement are possible, as is a load test. An integrated tone generator for wire identification rounds off the passive measurement options for copper cables.

The passive tests are supplemented by an extensive selection of active measurements from the LAN area. Here, the LanXPLORER can emulate end devices or network components or monitor data traffic between two network elements in through -mode via the second RJ45 copper port.

Ethernet mode 1000BT/100BT/10BT full or half duplex detection is carried out automatically. The hub -blink function allows detection of connected ports where there is incorrect wiring documentation or none at all. Standard test procedures such as Ping, Traceroute, DHCP, VLAN detection, Top Ten and Top Talker statistics, including protocol identification, are implemented with outstanding tests such as Network Discovery and net -map creation. Net-maps detected and be compared with previously saved net -maps, allowing changes in the network to be identified and documented quickly. The loop -back function for the IP layers 1, 2 and 3 permits traffic and load tests in networks.

The integrated WLAN according to standards 802.11b, g and n allows detection of access points, determination of the bandwidth available, display of conflicts in channel configuration and security settings (SSID).

VoIP tests in through -mode help detect causes of reduced voice quality such as packet jitter, for example.

So the LanXPLORER is a universal tool for rapid error isolation for a broad range of users such as installers, IT administrators, network and building system technicians, self-maintenance technicians and others. It proves its worth quickly when purely software -based tests on a service PC reach their limits and become ineffective, unwieldy or too time -consuming.

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