

FLUKE SOLUTIONS FOR DATA CENTERS

Data Centers Distribution Map



Main Distribution Area, MDA

Test Point

Single-mode or multi-mode fiber with duplex LC/SC connection or multi-core MPO connection

Test Tool

- CertiFiber Max for Optical Loss Test Set
- FI-3000 FiberInspector™ Pro Optical Fiber End-face Inspection Microscope



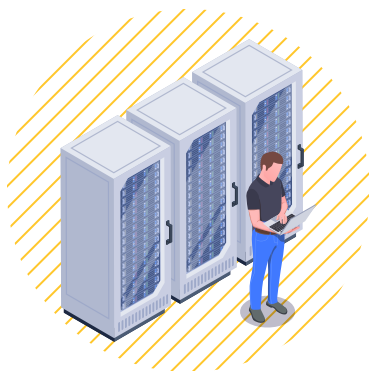
Horizontal Distribution Area, HDA

Test Point

Optical fiber connection, horizontal cross connection, and copper cable connection of Class 6/6A or higher level

Test Tool

- DSX2 CableAnalyzer™ Series Test Instrument



Zone Distribution Area, ZDA

Test Key Point

Copper cable of Class 6A or above, supporting up to the 25GBASE-T/40GBASE-T application

Test Tool

- DSX2 CableAnalyzer™ Series Test Instrument



Entrance Room, ER

Test Point

Location of optical fiber common faults

Test Tool

- OptiFiber® Pro Optical Time-Domain Reflectometer (OTDR)
- FI-3000 FiberInspector™ Pro Optical Fiber End-face Inspection Microscope



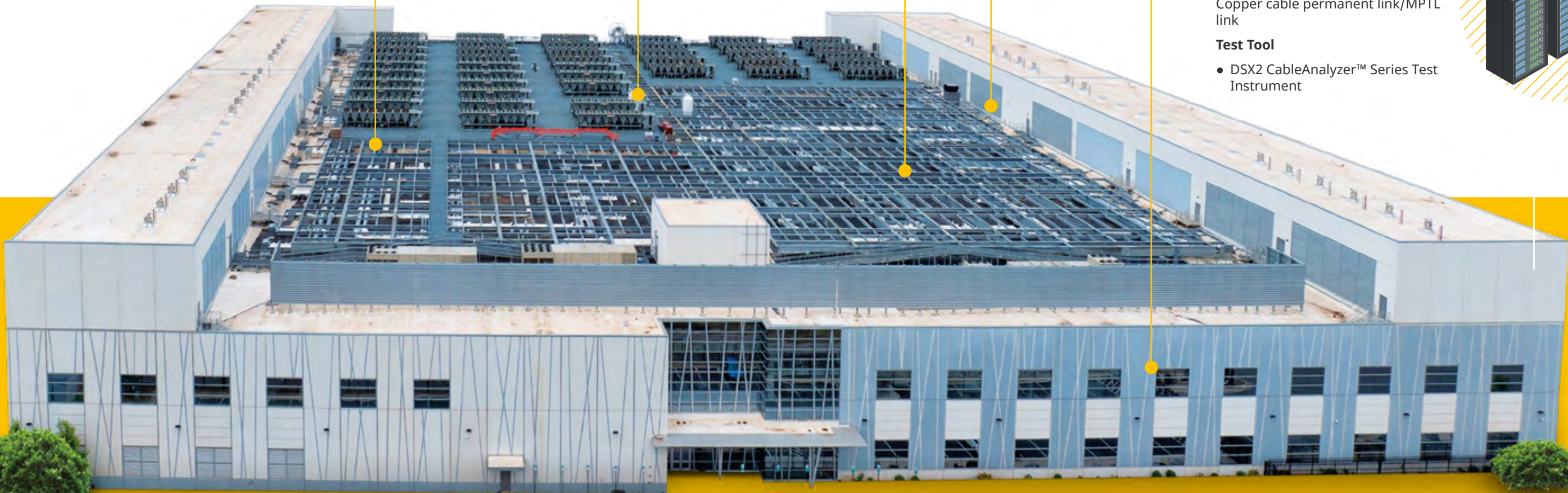
Equipment Distribution Area, EDA

Test Key Point

Copper cable permanent link/MPTL link

Test Tool

- DSX2 CableAnalyzer™ Series Test Instrument



The Infrastructure Generic Cabling System

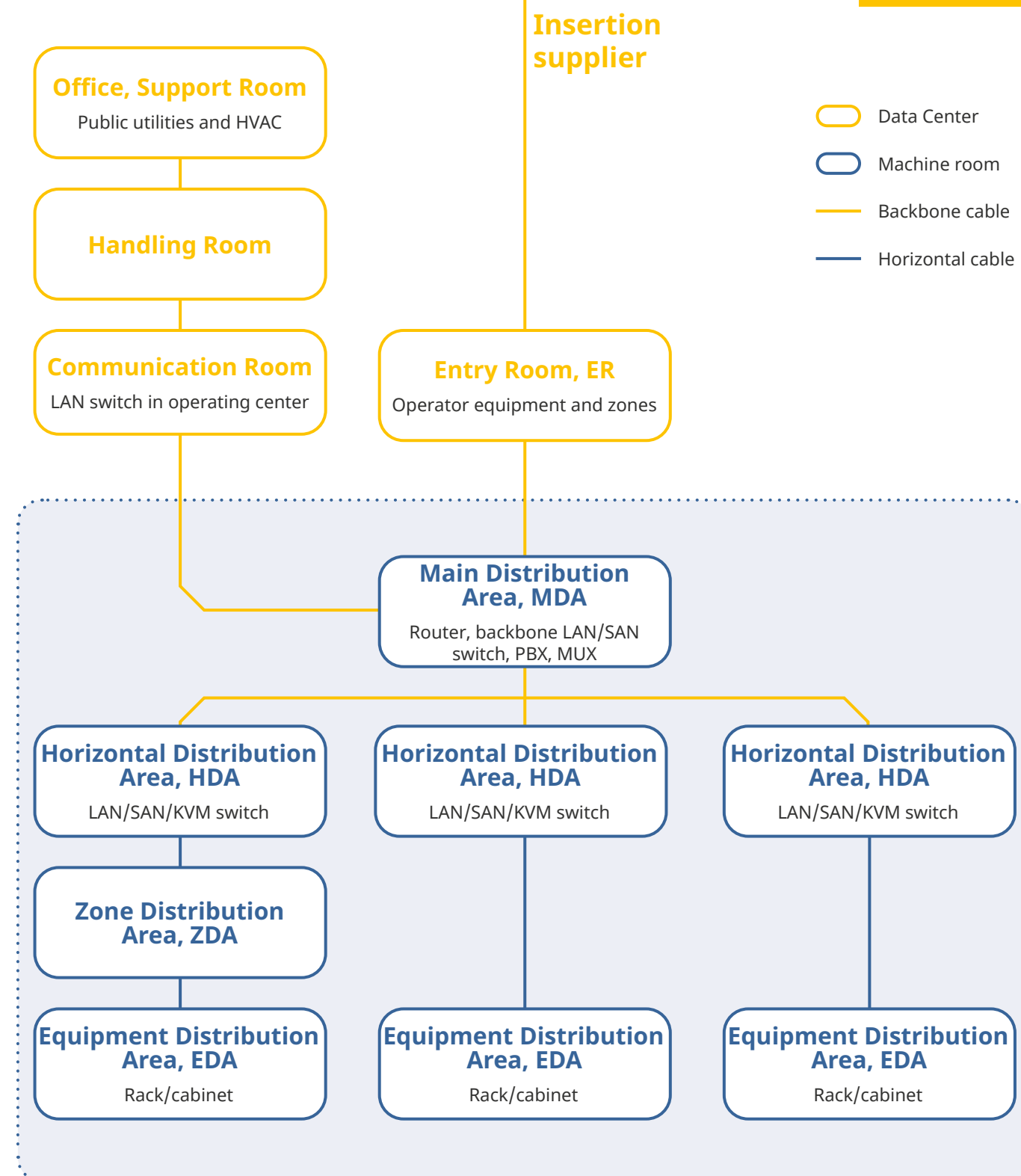


In order to meet increasing demand in data processing, a data center continues to expand its capacity, and supports data transmission between devices with high bandwidth and low latency. It not only requires the underlying cabling infrastructures connected to all links of a data center comply with the industry standard, but also requires the generic cabling system be inspected according to such standard.

ANSI/TIA-568: Includes provisions on cabling topology, maximum transmission distance, connecting hardware performance, cabling practices and test methods.

ISO/IEC 11801: 2017 An international standard, designed to ensure the quality and performance of the cabling system while supporting a variety of communication technologies and applications.

GB/T 50312-2016 Code for engineering acceptance of generic cabling system.



Structural routing topology is essential because a data center owns many devices and features complex grid combination programs.



DATA CENTER.1

Entrance Room, ER

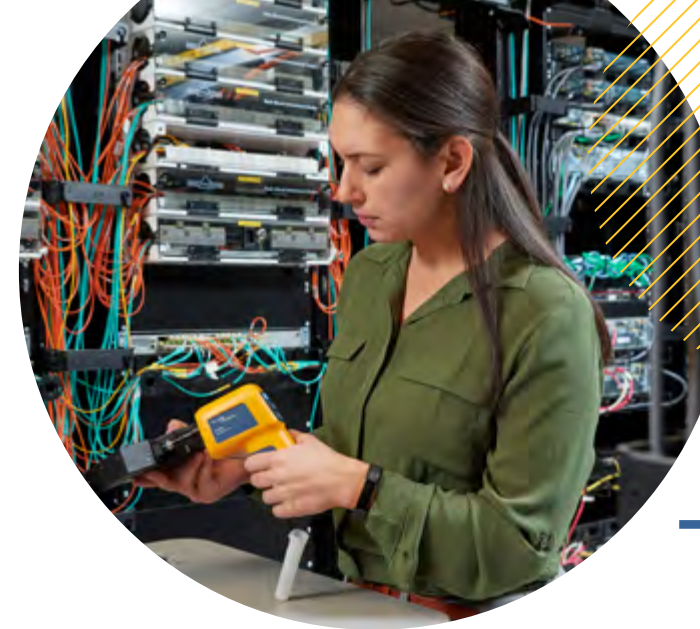
Application Points Technical Analysis

Test Focus:

The ER may have single-mode or multi-mode backbone fiber connection that is connected to other buildings. Due to the long outdoor optical cables between the buildings, it is difficult to inspect optical fiber and common fusion splices on site.

Fluke Networks OptiFiber® Pro Optical Time-Domain Reflectometer (OTDR) can be used to perform professional fault locating and analysis, locate the fusion splices, and identify the causes for high-loss measurement value during fault diagnosis and troubleshooting.

At the transition points between the outdoor cable and the backbone of a data center, the main cabling type is single-mode fiber for 40G and 100G applications, such as 40GBASELR4, 100GBASE-LR4 or 400GBASE-LR4. To enable the transmission from OSP fiber to building fiber in the ER, welding is the most common method terminating the optical distribution frame which contains the duplex single-mode fiber connection used for connecting the service provider device.



FLUKE®

Recommended Products

OptiFiber® Pro Optical Time-Domain Reflectometer (OTDR)

- With built-in criteria, support a data center with automatic OTDR path line analysis and setting
- Automatically recognize connectors, fusion splices, bending, indicate them graphically, and provide corrective actions and suggestions
- SmartLoop™ OTDR technology supports the test on one side of the link, completes the dual-fiber bidirectional test in a quick and easy way, and takes the average test result.
- The test mode can be changed to support copper cable and fiber certification testing, providing test result analysis and test reports

FI-3000 FiberInspector™ Pro Optical Fiber End-Face Inspection Microscope

- For single strand and 1 or 2 rows of 8/12/16 UPC or APC connectors
- Auto focus/Auto centering multi-camera design for real-time imaging
- Built-in criteria, automated “pass/fail” available in seconds
- Support connection to iOS and Android devices via Wi-Fi or connect with Versiv host for simple collaboration;
- Integrate with Versiv™ and LinkWare™ to easily manage projects and generate reports



DATA CENTER.2

Main Distribution Area, MDA

Application Points Technical Analysis

As a distribution center, MDA contains the core switch and router used for connecting LAN, SAN and other areas of a data center.

The MDA usually contains the cross connection (transition area) between the high-density backbone multi-mode fiber or single-mode fiber and the multi-mode fiber. Besides twin-core fiber connection, multi-core MPO connection which is more common, is used to support high-speed applications with higher bandwidth, such as 100GBASESR4/400GBASE-SR8.

Test Focus:

The test focuses on single-mode or multi-mode fiber with duplex LC/SC connection or multi-core MPO connection. The other end of these links is located in the middle distribution area, HDA or EDA. Loss is the main performance parameters to be tested, which is very important for supporting applications, especially 100GBASE-SR4/400GBASE-SR8 application with strict requirement for insertion loss. The Fiber Loss tester can provide accurate loss measurement.



FLUKE®

Recommended Products

CertiFiber® Max: accelerates accurate fiber loss testing and troubleshooting

- Maximum Efficiency: Measure loss, length and polarity of up to 24 fibers in one second
- Integrated test counter/timer, VFL, and power meter, plus optional inspection
- Maximum Flexibility: Field-replaceable UniPort adapters connect to existing (MPO12/16/24), pinned and unpinned, and future connector/pin configurations of up to 32 fibers
- The Versiv/LinkWare ecosystem supports Tier I (OLTS) and Tier II (OTDR) fiber testing, copper certification, fiber inspection
- Maximum Accuracy: Standards-preferred 1-jumper reference for all connector types provides the least uncertainty in fiber measurements



FI-3000 FiberInspector™ Pro Optical Fiber End-Face Inspection Microscope

- For 1 or 2 rows of 8/12/16 or single core UPC or APC connectors
- Auto focus/Auto centering multi-camera design for real-time imaging
- Built-in criteria, automated “pass/fail” available in seconds
- Support connection to iOS and Android devices via Wi-Fi or connect with the Versiv host for simple collaboration
- Integrate with Versiv™ and LinkWare™ to easily manage projects and generate reports



DATA CENTER.3

Horizontal Distribution Area, HDA

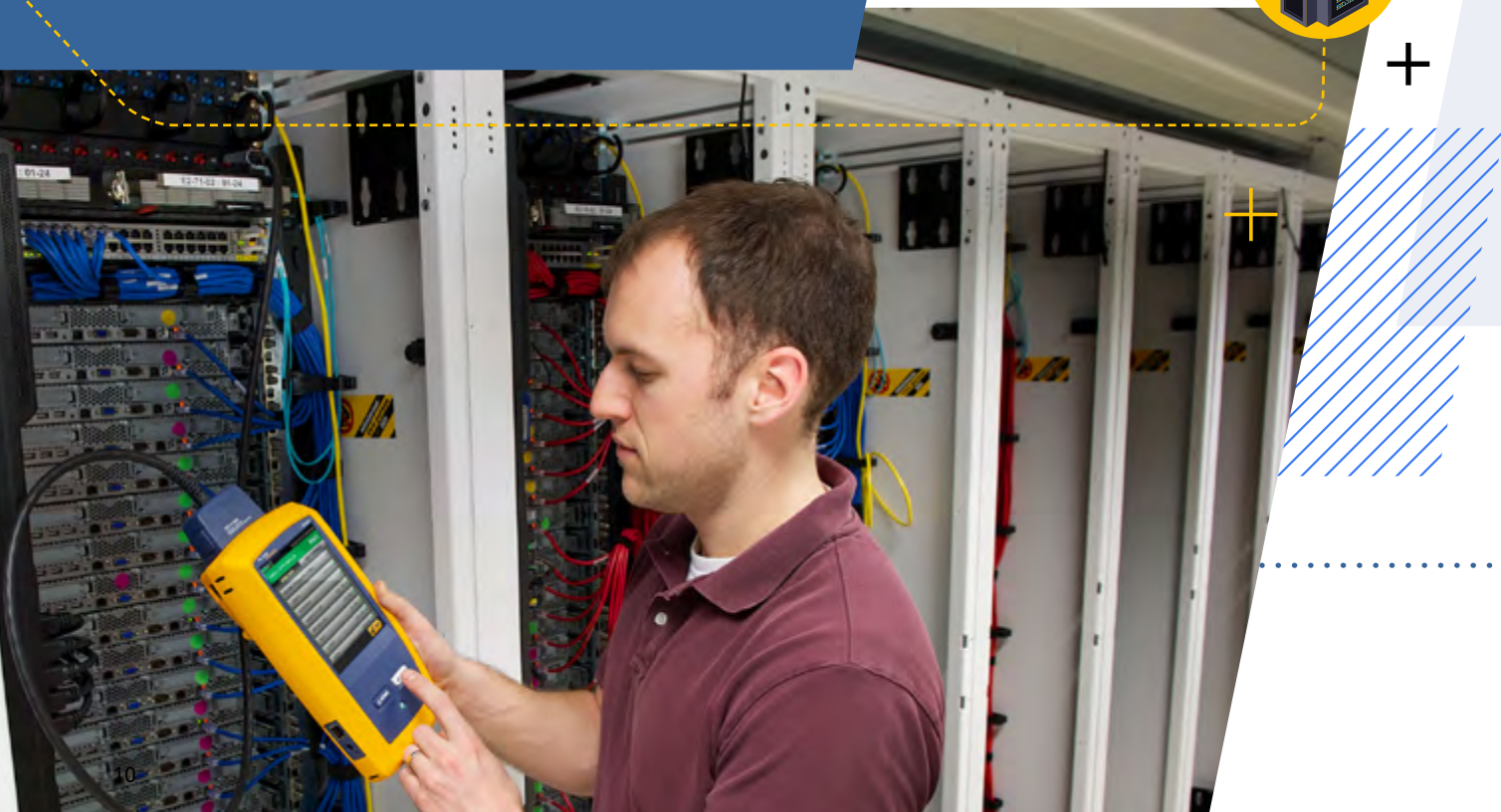
Application Points Technical Analysis

Test Focus:

The HDA contains fiber connection similar to that in the MDA. Due to the low speed of switch in this space, the connection before the optical distribution frame generally contains duplex LC/SC connection. The HDA also contains horizontal cross connection, and Class 6/6A or above copper cable connection, which are used to connect the switch to the EDA through the applications 1000BASE-T, 10GBASE-T, or even 40GBASE-T.

The HDA is an area where Class 8 cables of a data center are arranged, which may use horizontal cables of various performance levels. The test instrument required is a copper cable certification tester capable of testing all cables from Class 5e to 8.

The aggregation layer switch, access layer switch, SAN switch and keyboard/video/mouse (KVM) switch are arranged in HDA, which serve the server. They can be concentrated in a separate area, or arranged in the end of row or middle of row of the device they serve. The HDA and all EDAs in single rows should be tested.



Recommended Products

DSX2 CableAnalyzer™ Series

- Provide plenty of test criteria and fault diagnosis tools, and run a diagnosis when the test fails or critically passes
- Comply with severe accuracy requirement (in compliance with TIA Level 2G during Intertek certification)
- Cat 6A test takes only 8 seconds, with super fast certification
- OTDR and OLTS loss test modules can be added in DSX2 test, and a complete Tier 2 fiber test is supported

DSX2-5000 CH: Cat 5e, 6, 6A and Class D, E, EA, F and FA twisted pairs are certified, up to 1000 MHz

DSX2-8000 CH: Cat 5e, 6, 6A Cat 8 and Class D, E, EA, F, FA and CLASS I/ II twisted pairs are certified, up to 2000 MHz

CertiFiber™ Pro Fiber Loss (Class I) Certification Analyzer

- Accelerate each step in fiber certification process
- The Fiber Loss test set takes a very short time for certification, and completes the test for two optical fibers on two wavelengths in 3 seconds
- Comply with the compliance requirements of ANSI/TIA and ISO/IEC for encircled flux
- Portable quad module can support multi-mode and single-mode loss test
- ProjX™ management system ensures that all operations are completed correctly and efficiently
- Provide auto pass/fail analysis according to industry standard or preset test limit
- Feature reference wizard with animated setting, avoiding test operation error
- Come with Visual Fault Locator (VFL)

FI-3000 FiberInspector™ Pro Optical Fiber End-Face Inspection Microscope



DATA CENTER.4

Zone Distribution Area, ZDA

Application Points

Technical Analysis

ZDA serves as the gathering point of the horizontal distribution between the HDA and EDA. It does not contain active devices, but may contain interconnection terminating the horizontal distribution of the EDA. If it is impossible to install the optical distribution frame in the HDA to connect the EDA, then the ZDA will be very necessary, which supports a large data center to finish re-configuration more easily.

Test Focus:

Test the copper cable permanent link/MPTL link between the HDA and ZDA separately, and then test the entire link from the HDA to EDA, including the ZDA, to rule out all problems with the terminations to the ZDA.



DATA CENTER.5

Equipment Distribution Area, EDA

Application Points

Technical Analysis

EDA means a space assigned to terminal device. The space in EDA is extremely valuable due to the increasing number of applications and virtualized servers. The horizontal cables from the HDA (or ZDA) are terminated in the cabinet or rack corresponding to the device they serve.



Test Focus:

The EDA is another important area of a data center. It contains Class 8 cables (30m in length) and supports the applications 25GBASE-T and 40GBASE-T. Point-to-point cabling between devices is allowed in this area, for example, in TOR scenario, the access switch is generally located in the EDA of each cabinet, and directly connected to the MDA or the middle distribution area, thus eliminating the HDA.

Recommended Products

DSX2 CableAnalyzer™ Series

- Provide plenty of test criteria and fault diagnosis tools, and run a diagnosis when the test fails or critically passes
- Comply with severe accuracy requirement (in compliance with TIA Level 2G during Intertek certification)
- Cat 6A test takes only 8 seconds, with super fast certification
- OTDR and OLTS loss test modules can be added in DSX2 test, and a complete Tier 2 fiber test is supported.

DSX2-5000 CH: Cat 5e, 6, 6A and Class D, E, EA, F and FA twisted pairs are certified, up to 1000 MHz

DSX2-8000 CH: Cat 5e, 6, 6A Cat 8 and Class D, E, EA, F, FA and CLASS I/ II twisted pairs are certified, up to 2000 MHz

World leader of precision calibration instruments, industrial test and measurement tools, and certification, troubleshooting and installation tools.



The infrastructure generic cabling system is critical to a data center, because it relates to the flexibility, scalability, simplified management, high performance and reliability of a data center, and needs to support a variety of applications and future expansion. Therefore, during the construction and design of a data center and at its later maintenance stage, the generic cabling system should be treated as an important consideration. Fluke provides a range of services, including network authentication, fault diagnosis and troubleshooting plans, and various installation tools, especially the test and maintenance of the cable medium layer, thus fundamentally guaranteeing the smooth operation of a data center.

Contact us:

Singapore

Fluke South East Asia Pte Ltd
www.fluke.com/en-sg
Address: 1 Clementi Loop, #06-02/03/04, Singapore 129808
For sales / product enquiry: +65-6799-5566 / fsea.info@fluke.com
For servicing and calibration: +65-6799-5588 / service.asean@fluke.com

Malaysia

Fluke Electronics (M) Sdn Bhd
www.fluke.com/en-my
Address: Suite D-3A-4, Level 3A Block D Southgate Commercial Centre, Jalan Dua, Chan Sow Lin, 55200 Kuala Lumpur.
For sales / product enquiry: +60-3-9223-1216 / fsea.info@fluke.com

Indonesia

BUT. Fluke South East Asia Pte Ltd
www.fluke.com/id-id
Address: Cyber 2 Tower, 15th Floor, Zone F, Jl. H.R Rasuna Said Block X-5 Jakarta 12950, Indonesia
Phone number: +62 812 3032 676
WhatsApp: +62 81 110 35853 (+62 81-110-FLUKE)
Email: flukeid@fluke.com

Vietnam

Fluke South East Asia Pte Ltd Representative Office in HCMC
www.fluke.com/vi-vn
Address: 3rd floor VOV Building, 07 Nguyen Thi Minh Khai Street, District 1, Ho Chi Minh City, Vietnam
For sales / product enquiry: +84-28-2220-5371 / Flukeviet@fluke.com

Philippines

www.fluke.com/en-ph

Thailand

www.fluke.com/en-th

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