State of Michigan
Technical Standard

1345.00.01 Network and Telecommunications Managed Local Area Network (LAN) Cabling Standard

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Associated Procedures: n/a
Distribution: Statewide

Purpose

To establish a statewide standard for Local Area Network (LAN) cabling within state of Michigan (SOM) government agencies in a consistent manner as well as to comply with Public Act 431 of 1984, as amended.

Contact/Owner

Department of Technology, Management and Budget (DTMB)
Infrastructure & Operations (I&O)
Network and Telecommunications Services Division (NTSD)

Scope

Applicable to all state of Michigan information technology systems that require DTMB NTSD managed Local Area Network (LAN) cabling.

Standard

DTMB NTSD or its appointed designee shall provide installation services to SOM Executive Branch Agencies for information transport cable within their areas that will subscribe to DTMB Managed LAN services. All such managed LAN cabling shall identify and define the following:

- A listing of the most common applicable Standards and Codes bodies.
- A partial listing of standards, codes and best practices for management of information transport systems (ITS) media relating to managed LAN.

Applicable Codes and Standards

A partial list of the most common applicable Codes and Standards bodies follows:

1. National Electrical Code (NEC)

2. National Fire Protection Association (NFPA)
3. Underwriters Laboratory (UL)
4. American National Standards Institute (ANSI)
5. Electronic Industries Alliance (EIA)
6. Telecommunication Industry Association (TIA)
7. Building Industry Consulting Services International (BICSI)

REQUIREMENTS

Information provided herein is a basic guide for the installation of managed LAN information transport system cable. This guide provides general information as to type of cable and terminating hardware to be used in managed LAN buildings. It is the responsibility of DTMB NTSD or its assigned designee for installation services to apply for and obtain all applicable permits as well as meet or exceed all applicable standards and codes.

MANAGED LAN ITS CABLE

1. The information transport system will adhere, but not be limited, to NEC, NFPA, ANSI/EIA/TIA and BICSI codes and standards.
2. Required permits will be on site as work commences.
3. Voice cable will be EIA/TIA CAT 3 or higher.
4. Data cable will be EIA/TIA CAT 5e or higher.
5. Data cable color must be different than the voice cable color. This makes the cables distinguishable. Recommended colors are yellow for voice and blue for data.
6. Voice cable must terminate on RJ45 jacks at the distributed end (work area).
7. Voice jacks and data jacks are to be of different colors. The recommended colors are ivory for voice and orange for data.
8. Data cable from the data room to the distributed end (work area) must be terminated on an RJ45 jack. This jack itself must be rated with a bandwidth at least the same or higher than the cable from the data room that it is being connected to.
9. Patch panels are to be wall or rack mounted and be rated the same or higher bandwidth as the cable to which it is being connected.
10. Plenum cable will be installed in all plenum areas. Non-plenum areas do not require plenum cable.
11. Telecommunication room voice terminations will be made on the wall field.
12. Voice wall field will consist of 110-type termination hardware.
13. Wall fields and equipment racks must contain cable management systems.

14. Telecommunication rooms are to have equipment installed with clearances as required by applicable codes and standards.
15. Both voice and data are to terminate on RJ45 jacks at the distributed end. This is normally at the end user's work area.
16. All labeling will be in accordance with ANSI/TIA/EIA-606-B standard.

Note: Documentation of the ANSI/TIA/EIA, BICSI, NEC and NFPA standards referenced in this document can be purchased from the responsible organization:

- BICSI (www.bicsi.org)
- TIA (www.tiaonline.org)
- ANSI (http://webstore.ansi.org).
- EIA (www.eciaonline.org/eiastandards) standards are now managed by the Electronic Components Industry Association.
- 'NEC' the National Electrical Code is a trademark of the National Fire Protection Association (www.NFPA.org).

GLOSSARY

110 Block

A 110 Block is a punch block used to connect wires in structured cabling. This applies primarily to telecommunications rooms. The '110' refers to an insulation-displacement connect which terminates twisted pair cables.

ANSI

American National Standards Institute – A private, nonprofit organization that functions as an administrator and coordinator of American voluntary standardization systems. Its membership includes private and public sector organizations.

BICSI

Building Industry Consulting Services International – Helps develop standards and guidelines for networking. Its certifications are de-facto standards for cable installers.

BTU

British Thermal Unit.

CAT 3

Category 3 – An unshielded twisted pair (UTP) cable designed to carry voice and data up to 10 megabits per second (Mbps) and with transmission frequency of up to 16 Mhz.

CAT 5e

Enhanced Category 5 – An unshielded twisted pair (UTP) cable that can support data speeds of 1000 Mbps, i.e., gigabit speed. Cables can reach a length of 100 meters.

CAT 6

Category 6 – A UTP cable that is backward compatible with CAT 5e has greater immunity from noise and crosstalk, and can handle data speeds of 10 Gigabits per second (Gbps, i.e. 10 GBase-T).

CBTC

Commercial Building Telecommunications Cabling – A subcommittee of the TIA (see below), tasked with revising the TIA's "Building Automation System Cabling Standard."

CMS

Cable Management System.

DEMARC

Demarcation point – This is the physical point at which the public network of a telecommunications organization, such as a phone or cable company ends and the private network of the customer begins. This is usually where the cable physically enters a building.

ECIA

Electronic Components Industry Association (see EIA below).

EIA

Electronics Industries Alliance – This organization ceased operations in February 2011. It assigned the maintenance of existing "interconnect, passive electro-mechanical (IP&E) standards to the ECA, (Electronic Components Association, which in turn has joined the ECIA (Electronic Components Industry Association). From the ECIA's website as of 5/31/2013, "the EIA standards brand will continue for IP&E standards within ECIA."

LM/Ft2

Lumens per square foot – A standard for measuring brightness.

MTR

Main Telecommunication Room

NEC

National Electrical Code – Set of standards for the safe installations of electrical wiring and equipment. It is not a legally binding regulation, but it is often used by states and municipalities. "NEC" and "National Electrical Code" are registered trademarks of the National Fire Protection Association (NFPA). The NEC has also been approved by ANSI as a national standard.

NFPA

National Fire Protection Association – The organization that sets standards for fire protection and safety, including: requirements for protecting Plenum spaces; standards for plastics used in the construction of Plenum cables.

Plenum Cable

The type of cable deployed in Plenum spaces. They are required by NFPA standards to be coated with fire-retardant cable so that in the event of a fire they do not release toxic gases.

Plenum Space

The space in a building used to circulate air for air-conditioning and heating. It is also commonly used to house the cables for the building's telephone and computer networks. The most common examples are the space between the structural ceiling and the suspended ceiling or the space under a raised floor.

TGB

Telephone ground bar.

TIA

Telecommunications Industry Association – Accredited by ANSI to develop standards for information and communication technologies.

TR

Telecommunications Room.

UL

Underwriters Laboratories – This is a global independent safety science company offering expertise in certification, validation, testing, inspections, auditing, education and advisory services.

APPROVING AUTHORITY

David B. Behen, Director Revised: 2/8/2016