

DATA CENTER DESIGN AND DEVELOPMENT—

CABLE MANAGEMENT

Cable management systems (CMS) provide a structured, organized solution for power and communications cable installations within a broad range of enclosure applications—from two- or four-post open-frame racks to wall-mount and free-stand cabinets. In datacom applications, cable management applications include overhead and/or under-floor cable runways, communications wiring closets, enterprise information technology (IT) data rooms and central office and data centers.



Cable Manager

CABLE MANAGEMENT INSTALLATION GUIDELINES

Although the breadth of applications varies greatly, the following functions should always be considered.

INDUSTRY TRENDS

IT innovations occur everyday. Thus, the ideal CMS solutions are designed to facilitate easy cable moves, adds and changes (MACs) within the IT environment, allowing fast updates while saving valuable resources.

CABLE TYPE

Common cable types include fiber, CAT 5e, CAT 6 and CAT 6A. In recent years, higher capacity CAT 6 and CAT 6A cables—which are designed to handle increased data transmission—have grown in popularity. Yet, many CMS solutions are designed for these smaller cables, making it difficult to integrate the latest high capacity cables.

CABLE PERFORMANCE

CMS solutions should reduce stresses, bends and pressure points, which can lead to poor performance. In particular, weight from larger diameter cables can create these problem points, so CMS solutions should be designed for even distribution of the cable weight.

SPACE AND ORGANIZATION

CMS solutions for cables external to a cabinet and within a cabinet are modular in design and can be pieced together to fit any space. Cables can be strung low, high and in-between, with runs located above cabinets, up and down walls and under raised floors.

CABLE INGRESS/EGRESS POINTS

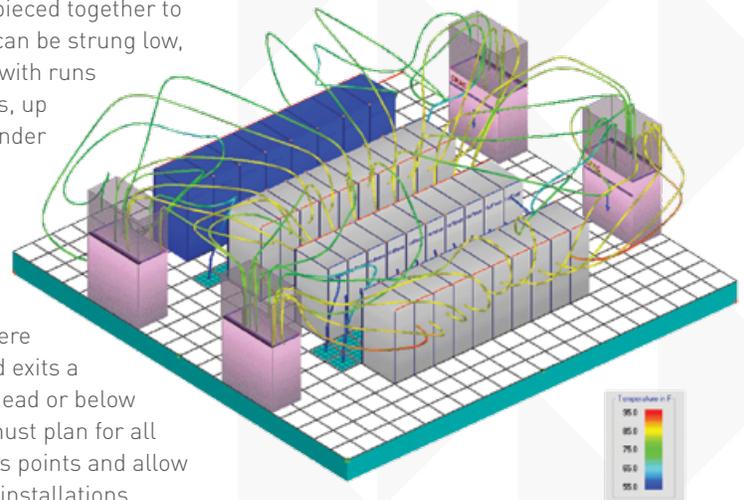
Ingress and egress points—the points where the cabling enters and exits a cabinet—can be overhead or below the floor. Designers must plan for all current ingress/egress points and allow room for future cable installations.

CABINET AIRFLOW REQUIREMENTS

Airflow cubic feet per minute (CFM) measurements should exceed requirements to keep critical electronic components cool. Cabling should be designed to maximize airflow.

APPEARANCE

By providing superior cable organization, the aesthetics of a room greatly improve. Aesthetic considerations include open or closed designs and available finishes.

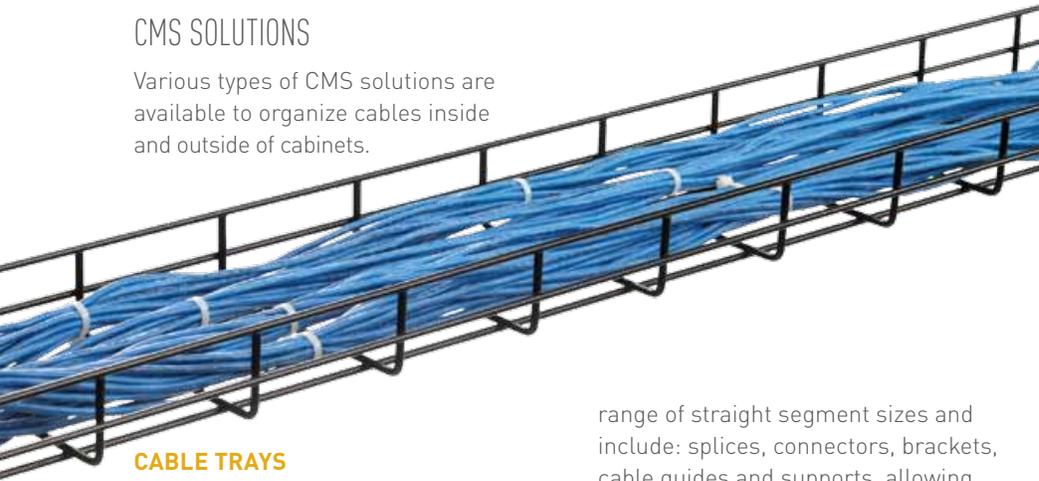


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CMS SOLUTIONS

Various types of CMS solutions are available to organize cables inside and outside of cabinets.



CABLE TRAYS

Cable trays are basket-like trays that are pieced together to provide a support system for cables. They provide an alternative solution to open wiring and are useful when frequent MACs are expected, as new cables can be simply placed in the tray rather than pulled through a pipe. While solid-bottom cable tray designs deliver superior protection against environmental elements, these trays require cutting or fittings for cable entry and exit. Alternatively, ventilated trays provide superior air circulation around the cables, so dust does not accumulate. Specifiers should first make sure a cable tray meets their fill requirements, according to the type of cable that will be used and whether it will be bundled or separate.

Additional factors include the bend radius of cables, connection points, mounting requirements, ease of installation and removal, as well as accessibility above or below the raised floors. Trays are available in a wide

range of straight segment sizes and include: splices, connectors, brackets, cable guides and supports, allowing specifiers to piece together a solution that will meet their specific needs. Specifiers should also consider available ratings and aesthetics.



LADDER RACKS

Resembling a typical ladder, this type of CMS conveniently routes cables via a modular pathway through unused space on the floor, wall or ceiling. Ladder racks provide another method of creating cable runs into the top of cabinets, and a variety of straight and curved sections are highly adaptable to accommodate virtually any room layout. Due to the open design, ladder rack keeps cables accessible for easy maintenance. Installation guidelines for cable tray also apply to ladder rack.

VERTICAL AND HORIZONTAL CABLE MANAGERS

Vertical and horizontal cable managers are used inside the cabinets or racks. A sturdy, yet flexible system that supports CAT 5e, 6 and 6A cables provides the necessary capacity for today's ever-evolving installations. Cable managers should comply with IEA/EIA standards by establishing the ideal cable bend radius. Desired features include deep "fingers" to hold wider cables, large pass-through holes to facilitate efficient cable routing and arrowhead fingers that funnel cable into bases and provide a secure hold.



IN CONCLUSION

By understanding these cable management installation guidelines, as well as the available solutions, installation managers can implement cable management that will accommodate current data center needs as well as future growth.

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