Telecommunications and Computer Cabinets and Racks

As with all other systems of the data center—power, HVAC, and flooring—cabinets and racking systems provide the vital services of proper structural and secure housing for data center equipment. Active and passive equipment have different requirements for mounting, power, ventilation, and cable management.

The following criteria of racks shall conform to applicable codes, standards and regulations (e.g., EIA/ECA-
310-E, IEC 60917):

- Channel dimensions and spacing
- Channel hole dimensions and thread systems
- Channel equipment mounting hole vertical spacing (U or RU)
- Panel opening and usable aperture opening

Maximum height should not exceed 2.4 m (8 ft.)
When in a row, multiple racks and their associated vertical cable managers should be bolted together

The following criteria shall conform to applicable codes, standards, and regulations (e.g., EIA/ECA-310-E, IEC 60917):

- Equipment mounting rail dimensions and spacing
- Equipment mounting rail hole vertical spacing (U or RU)
- Options for cable access into the cabinet shall be available from both the top and bottom.
- Access floor openings beneath cabinets for cable entry shall offer:
- Protection against damage to the cables
- Restrictions against intrusion of dirt and debris
- Restriction of air passage
- Cabinets shall be constructed of noncombustible materials.

Top access ports should provide a means to be closed when not in use.
In seismically active areas, multiple cabinets in a row should be bolted together at the top to provide additional Stability.

Within EDAs, select cabinets, racks, and vertical cable managers whose design minimizes obstruction of exhaust air and recirculation of hot air from behind the equipment to air intakes in the front of the equipment.

Within HDAs, IDAs, and MDAs, select cabinets, racks, and vertical managers whose design optimizes patch cord management, while minimizing air leakage between hot aisle and cold aisle.

In data centers that employ hot aisle/cold aisle orientation, ensure that the warm air is always exhausted toward the hot aisle.

Optical fiber and balanced twisted-pair ports are located at the rear of many servers.

To simplify patching and maintenance, structured cabling patch panels should be mounted so that the ports face the same direction as the network ports on the equipment to which they are patched. These ports are commonly on the rear of servers and the front of network switches.

For equipment that is cooled side-to-side (e.g., certain networking equipment), cabinets, racks, and vertical cable managers should be selected that introduce the least disruption to the proper functioning of the hot and cold aisles and that minimize recirculation of hot air toward the air intakes.

Finishes should conform to applicable codes, standards, and regulations (e.g., ANSI/TIA-942-A, ATIS 0600336);

Conductive finishes are recommended to ensure a good bond between equipment and cabinet or rack ground and to prevent oxidation of the base metal.

For painted racks, a supplementary bonding/grounding bus bar system may be used to ensure a good bond between equipment and cabinet or rack ground.

Cabinet and rack bonding and grounding should comply with applicable codes, standards, and regulations
(e.g., NECA/BICSI-607, TIA-607-B, and ISO/IEC DIS 30129 currently in development).

Racks in entrance rooms, main distribution areas and horizontal distribution areas should have dimensions and cable management capacities in accordance with applicable codes, standards, and regulations (e.g., TIA-942-A).

Twisted pair or coaxial patch panel should be used unless a specific high-density solution of managing the patch cords on the sides for every unit is chosen.

Exceptions exist when a non-angled patch panel features an integrated horizontal management product design.

Vertical cable management should always be provided unless patching is provided directly above or directly below mated passive patch panels (e.g., balanced twisted-pair, coaxial cabling, or optical fiber cabling) or between passive patch panels and active equipment that are installed directly above or below one another.

In such cases, relatively short (typically less than 1 m [3 ft.] patch cord assemblies (or equipment cord assemblies) may be used. When angled patch panels are used, horizontal cable managers are typically not installed.

Vertical cable managers should always be sized to accommodate the anticipated maximum cordage that may be deployed given the equipment requirements at the time of deployment.

Shorter power cords, equipment cords, patch cords, and keyboard-video-mouse (KVM) cabling should be specified to reduce the cable management density in the back of the cabinet or rack.

Rack depth should meet the mounting and protection needs of the equipment they are to host and, as a minimum, conform to the criteria established in applicable standards (e.g., EIA/ECA-310-E, IEC 60917).

Each rack should have vertical cable managers sized for maximum rack capacity attached on both sides. Vertical cable managers between two racks should be sized to serve both racks simultaneously.

Equipment mounting rails should be adjustable front-to-rear and should have rack unit number indications (with numbers starting at the bottom).

Equipment mounting rail dimensions should conform to applicable codes, standards, and regulations (e.g., EIA/ECA-310-E, IEC 60917).
Doors should be removable without tools. Door hinge orientation should be reversible or dual hinged. Side panels should be removable and lockable without requiring intrusion into the equipment mounting
area within the cabinet.

In applications where active equipment, patch panels, and horizontal cable distribution are mixed, floor- tile-width (e.g., 600 mm [24 in] width) cabinets may lack adequate vertical cable management space.

Blank panels should be installed in unused rack positions to maintain separation between hot aisles and cold aisles and prevent hot exhaust air from recirculating and mixing with chilled air at equipment in- takes. Blank panels also improve rigidity of cabinets.

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