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Economic conditions
are forcing engineers
to reevaluate IT cabling
distribution methods.

Current conditions and conventional methods in IT cabling design

Both technology and economics are now driving the trends in IT cabling. With the worldwide economy still in question, architects and engineers are required to rethink and develop new approaches as to how new construction buildings are designed and how existing buildings can more cost effectively be repurposed. The conventional method to distribute IT cabling has been to run horizontal cable tray around the facility and to interconnect and cross connect this horizontal cable tray in several different locations. Architects, engineers and owners are calling for a new solution.

In the past, new construction buildings were “future-proofed” by providing additional shell space that could be fitted out at a later date. Currently, each and every square foot of floor space needs to be utilized and pass a cost/benefit analysis. Since traditional methods of IT cable distribution requires horizontal space, the square footage cost of a building is incrementally increased. New construction demands forward thinking designs. These new space utilization requirements are forcing architects to rethink their layouts. Cable architectures within a new building must be designed in such a way, as to support expansions to the existing building in the future, rather than expending the capital to provide for shell space during the initial construction of the building. Since cable trays are typically installed on the premier, this often hinders expansion to this portion of the building.



Existing building renovation and repurposing is ever more prevalent today considering the large capital outlay and the long return on investment for new construction. It is labor intensive to install new cable tray in existing facilities with layers of existing infrastructure like ceiling grids, HVAC, additional support beams and joists, and other facility equipment in these spaces.



Choosing the right management system for voice/data/video (VDV) cabling is driven by a variety of factors, including local codes and standards, personal taste, cost constraints and performance.

Choices for VDV cable management systems include:

- Perimeter systems that route wiring and cabling securely along walls, so, cabling remains easily accessible at all times.
- In-floor systems, such as underfloor and cellular duct, which effectively manage complex data communication and power requirements in environments where aesthetics and flexibility are paramount concerns.
- Cable-tray systems, like ladder, solid bottom, center-spine, and wire mesh trays, which offer a high degree of flexibility.
- Open-space systems, which serve areas that are not adjacent to partitions or walls.

Other Issues encountered with conventional IT cable distribution in cable tray and conduit systems.

Engineers have many issues with the conventional approach of installing cable tray, these lead to additional costs, induced noise on the cables, and overhead interferences.

Some of these issues are:

- Costly to install
- Costs of having to install cable tray support rods or structures from overhead
- Interference factors caused by overhead supports
- Costly to build structure support on walls and cost of rating such structure
- Seismic requirements require costly metal support beams for cable tray
- Cable tray on perimeter walls hinders future building expansion or wall removal
- Possible transference of induced EMF caused by improper grounds or ground voltages
- Unable to increase distances between interference prone cabling
- Not easy to provide separation and grouping of cables from desperate systems such as security, access, fire...
- Creates partition that restricts air flow
- Collection of environmental dirt and dust

- Difficult to reroute cables due to equipment relocations or other changes
- Difficult to manage and maintain service loops
- Difficult to reach over wide cable trays
- Need to provide lift access space on both sides of the tray and providing overhead clear access to cables

Needs are changing and some of the challenges that conventional cable tray and conduit systems cannot resolve are:

- Ability to quickly move and relocate cables
- Ability to separate cables at selected distances and identify cable bundles
- Cost effective method to distribute IT cabling without having to add additional support structures
- Method that can be used as a long term solution but also aid in the installation

Is the old stand-by J-Hook the answer?

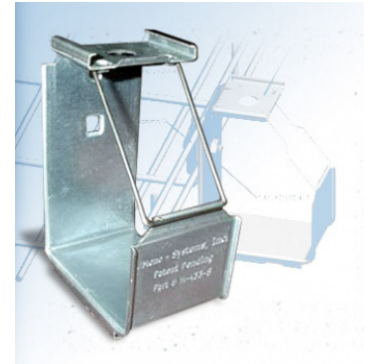
J-hooks are a horizontal pathway promoted in the BICSI® TDM manual as a means to route communications cables. But the conventional J-Hook has its own inherent problems.

- Not easily stackable
- Not self supporting as many are plastic and have structural failure with building vibrations
- Plastic j-hooks often break under the downward load of the cables
- Cables can easily fall out of the hook especially when pulled
- Not easily connected to columns or beams without drilling
- Rough edges cause the bottom cables to be cut by weight of other cables and the act of pulling

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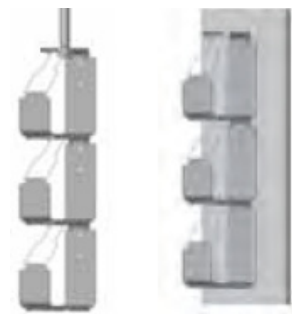
What engineers are turning to is a hybrid between the conventional conduit systems, J-hooks and the Conventional cable trays, a truly flexible vertical cable tray that can be scaled as needed.

The system needs to provide a complete horizontal and vertical raceway with 2" bend radius control that helps prevent degradation of cable performance. The system also needs to be UL 2043 and CAN/ULC S102.2 approved, and suitable for use in air handling spaces and support a large number of cables, as well as TIA 569 compliant. Additionally, the J-hooks should be individually colored to support a visual indication of the types of cables that are installed within the J-hook.



The market for J-hooks continues to grow as they continually increase their percentage of market share. Depending on the installation, hooks are frequently a more efficient choice and continue to increase their sales over the other types of cable management systems on the market.

Some J-hooks have a small surface that supports the cables, frequently causing the cables to bend around the metal and create stress points, which reduce performance. Most installers and end-users, therefore, are gravitating toward the use of wide J-hooks because they have a wider surface on which the cables lay flat. J-hooks are also an excellent choice for installation in congested areas where space is tight or where there is a lot of equipment or ducts to work around. In the future, J-hooks that are bigger and better able to support larger numbers of cables should be developed. J-hooks will continue to see improvements in their manufacture and design, and will provide electrical contractors with faster and more cost-effective installation methods.



Multi tier allows for separation of services. (i.e. Fire, Alarm, Video)

Manufacturers have developed a solution that is unique and a hybrid between the conventional J-hook and the cable tray. One such manufacturer is MonoSystems (an American manufacturer located in Rye Brook, NY) and their product called the Hook pictured below. The hook is a metallic J-hook style device with supportive rounded edges and a unique retaining clip. The Hook can easily be attached to a column or joist by an attached clamp. This Hook is also stackable via a built in snap configuration which does not require screws, and thus, allows several hooks to be attached together to result in a vertical cable tray.

Conclusion

Products like the Hook can provide for a better overall raceway infrastructure while providing flexibility. With growing economic concerns and the pressure to install systems faster, less costly and more adaptable, new solutions are required for the constant reconfiguration that current companies experience. This is driving the market for products like the Hook to grow in popularity. Engineering cost analysis shows that products like the Hook can provide for a better overall raceway infrastructure while reducing cable infrastructure initial costs by as much as 45% and future cable infrastructure operational costs by as much as 25%.

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*** Mark Katko is a well-known network Engineer in the U.S. He has designed and implemented highly sophisticated communication networks for all of the Regional Bell Operating Companies, Fortune 500 Companies such as Dana Corporation, Trinova and is well renowned for his cutting edge work with the Sisters of Mercy Health Care System.,*

Mr. Katko was a Founder and Chief Technology Officer of LightSource Telecom, LLC, a start-up Competitive Local Exchange Carrier which exclusively served the new residential development sector. Besides his recognized accomplishments as an telecommunications engineer, (he holds, or has made application for, five U.S. Patents in telecommunications technologies) Mark has demonstrated leadership and management skills in addition to an aptitude for finance. He has founded and grown several businesses while “wearing multiple hats”----not just his technology one.

Mr. Katko currently serves a President and CEO as well as Senior Engineer of Maxcom Enterprises LTD, LLC