

Passive Optical Networks



PON: Faster. More efficient. Less money. Yes.

Passive Optical Networks (PON) leverages single mode fiber for a superior network solution beyond any copper cabling. Aside from experiencing better performance, you'll save energy, real estate and money. The key for comparison is examining the total installed cost. Immediately PON's compact size and ease of delivery to the desktop reduces space requirements, network equipment, installation, and construction costs. A PON deployment can be half the cost of copper. And once you're moved in, you'll see even more savings.

Copper vs Single-Mode Fiber

	Copper	Single-Mode Fiber
Bandwidth	1 to 10 GBE maximum	Unlimited
Distance Capabilities	Up to 328 feet	Up to 12 miles
Telecom Real Estate	Multiple telecom rooms	Single small telecom room
Environment Controls	\$5000 – \$20,000 per room annually	\$5000 or less annually
Switches	Yes	No
Speed Upgrades	Regularly	Never



One single-mode fiber cable is equivalent to ninety-six copper cables.

What makes PON the better choice?

All spaces benefit from PON over copper. In spaces over 20,000 sf. and/or high density locations it becomes the clear winner in all categories: cost, performance, security and efficiencies.

Copper deployment means building several large, highly secured, environmentally controlled telecommunication rooms (TR) with fire suppression, surge suppression, several hubs, switches, enclosures and patch panels and thousands of copper cables running on robust cable trays to the rest of the floor.

One single-mode fiber cable is the equivalent of 96 copper cables. It runs up to twelve miles without losing strength or needing boosters, while being less susceptible to interference. One small, secure TR controls your entire network. After you move in, the unlimited bandwidth of PON means never having to update for better speed. And you'll have greater security for your network because fiber doesn't radiate signals and is extremely difficult to tap.

Traditional Network

copper point-to-point deployment



Passive Optical Network

single-mode fiber runs in DIRTT Access Floor

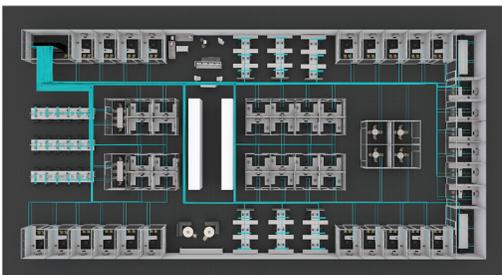


What about on the other end of the fiber?

Computers and VoIP phones still require copper signals. The answer is an Optical Networks Terminal (ONT) to complete the connection. This small piece of equipment is placed at what is called the "edge" in secure locations, such as the ceiling or the interior of a DIRTT wall. Even with one ONT for every eight users, it is still more cost effective than building a large TRs filled with networking hardware and racks.

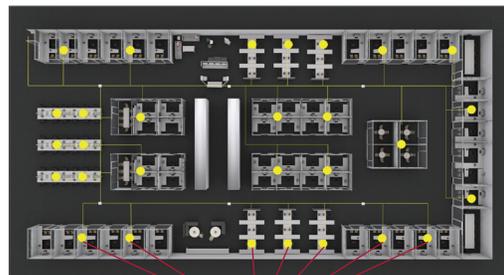
Traditional Network

Conventional Copper Homeruns



Passive Optical Network

Single-Mode fiber runs to ONTs

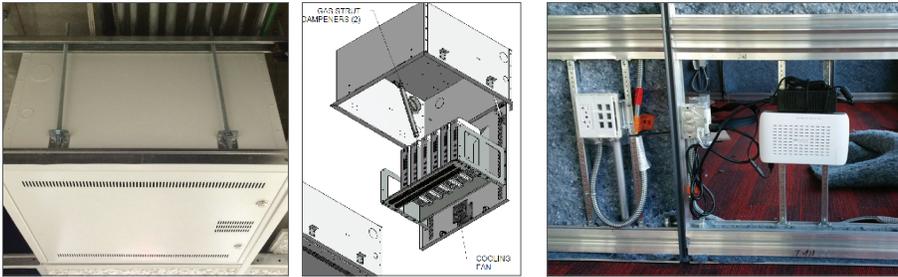


Optical Networks Terminal (ONT)

Mounting Options

Ceiling ONT Chassis

DIRTT Wall Mount ONT



90% less space

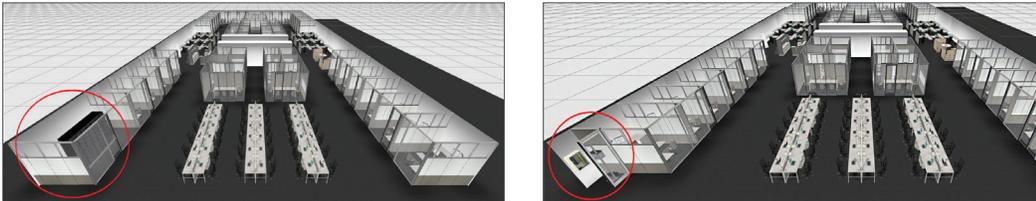
The images below are from a client's project. The left shows the TR originally planned with a copper deployment. The right image shows the TR sized for a PON deployment. The PON TR uses only 10% of the real estate of the copper TR.

Traditional Network

Copper TR – 222 sf.

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PON TR – 22 sf.



The client reclaimed two hundred square feet of usable space. With that, they built two much needed offices.

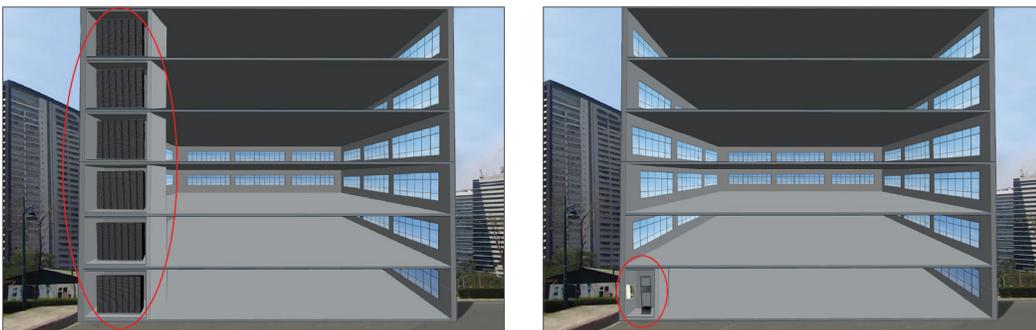
Since a single-mode fiber cable can run up to 12 miles, versus copper cable's maximum length of 328 feet, one small TR serves multiple floors. This frees up space for other uses throughout the building and minimizes the construction of expensive TRs which come with high operating costs.

Traditional Network

Copper TR Building Section

Passive Optical Network

PON TR Building Section



80% less energy

A PON solution requires minimal cooling in the TR as there is only one rack in the room. Plus it does not need switch gear and its associated power. With less cooling and less overall power, PON solutions use 20% of the energy of a copper deployment.

Expense	250 Users	500 Users	1000 Users	Campus 5000 Users	Campus 10,000 Users
Total Cost of Ownership	32%	46%	57%	68%	68%
Capex	31%	41%	48%	55%	55%
OpEx	40%	50%	65%	70%	70%
• Power	48%	61%	68%	75%	75%
• Cooling	48%	61%	68%	75%	75%

% savings compared to a copper deployment

These are significant savings both for day-one capital expenditures and annual operating expenditures due to mitigating power and cooling costs – to say nothing of lowering your carbon footprint.

Half the cost. Less energy. Smaller real estate. Higher performance.
More secure. No upgrades needed. PON by DIRTT.

Contact us:

For more information, please contact us at networksandpowerpricing@dirtt.net (napp@dirtt.net).

