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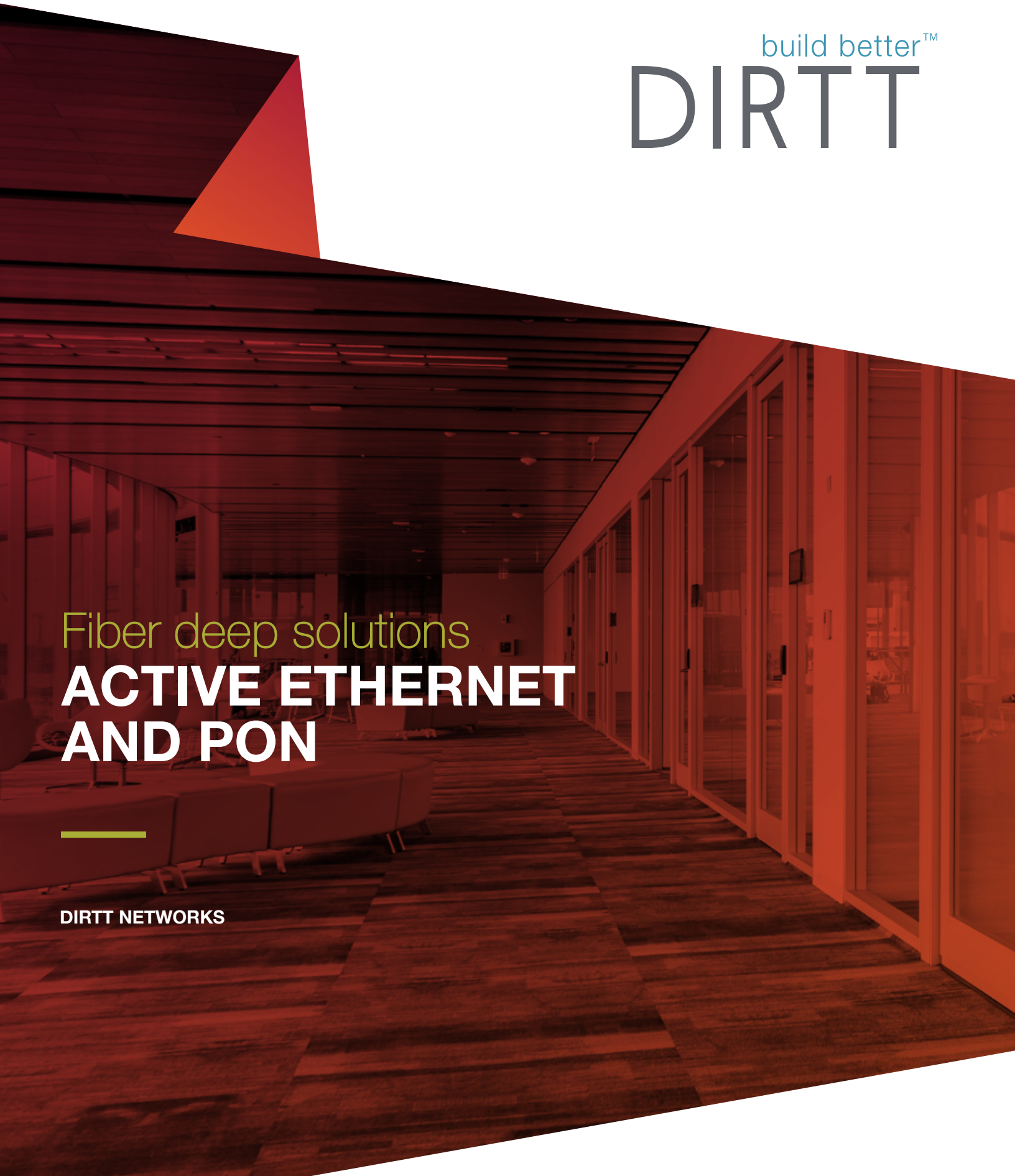


Fiber deep solutions

# ACTIVE ETHERNET AND PON

DIRTT NETWORKS

COPPER-BASED NETWORKS VS. FIBER DEEP NETWORKS

How does a fiber network alternative measure up to the conventional approach? This document explores the difference between traditional copper-based networks and fiber deep network solutions. It sheds light on the common challenges associated with copper networks and the efficiencies fiber solutions bring to the built environment.

## THE CHALLENGE WITH COPPER NETWORKS

Traditional copper-based networks come with inherent constraints and high costs. Until the emergence of fiber-based infrastructure and software-based management electronics, these challenges have been something network architects have had to consider in every design.

**Constraints of traditional copper networks include:**

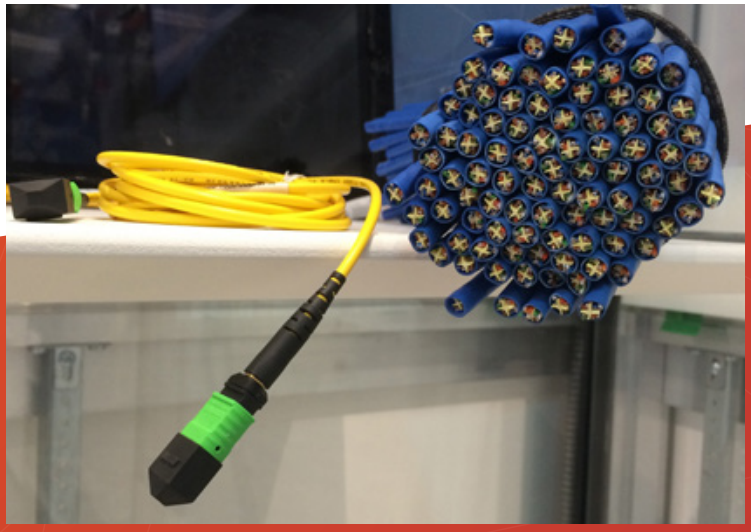
- Distance limitations with cables (328 ft)
- Limited scalability for future networks
- Limited bandwidth and difficult to future proof
- High capital expense requirement, high upgrade and operating expense costs
- Multiple layers of single-purpose cabling

## EXAMPLE OF A TRADITIONAL COPPER NETWORK APPROACH

## THE FIBER DEEP APPROACH

It should first be noted that a fiber deep solution isn't the best fit for all projects. Whether or not to pursue this approach is based on the needs and requirements of each client. Square footage, port counts and specific network criteria all factor into the benefits below. Every case is evaluated individually by our DIRTT network architects to ensure we are recommending the most suitable approach. A fiber deep network utilizes the distance capabilities of single-mode fiber cabling. Instead of terminating at the building entrance, fiber deep deployments carry the fiber deep into the building – almost to the user. This approach results in two major infrastructure benefits:

- **We can remove all wiring closets as the maximum distance allowed is 20 km with single-mode fiber. This removes all the services these rooms require. (UPS power, cooling, fire suppression).**
- **We can remove the need for heavy-duty cable trays as there are far fewer cables with smaller diameters.**



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## PASSIVE OPTICAL NETWORK VS. ACTIVE ETHERNET

There are two design options when deploying a fiber deep network: Passive Optical Network (PON) and Active Ethernet. Both have the overall infrastructure benefits mentioned above. They utilize a software-defined management system that results in the following:

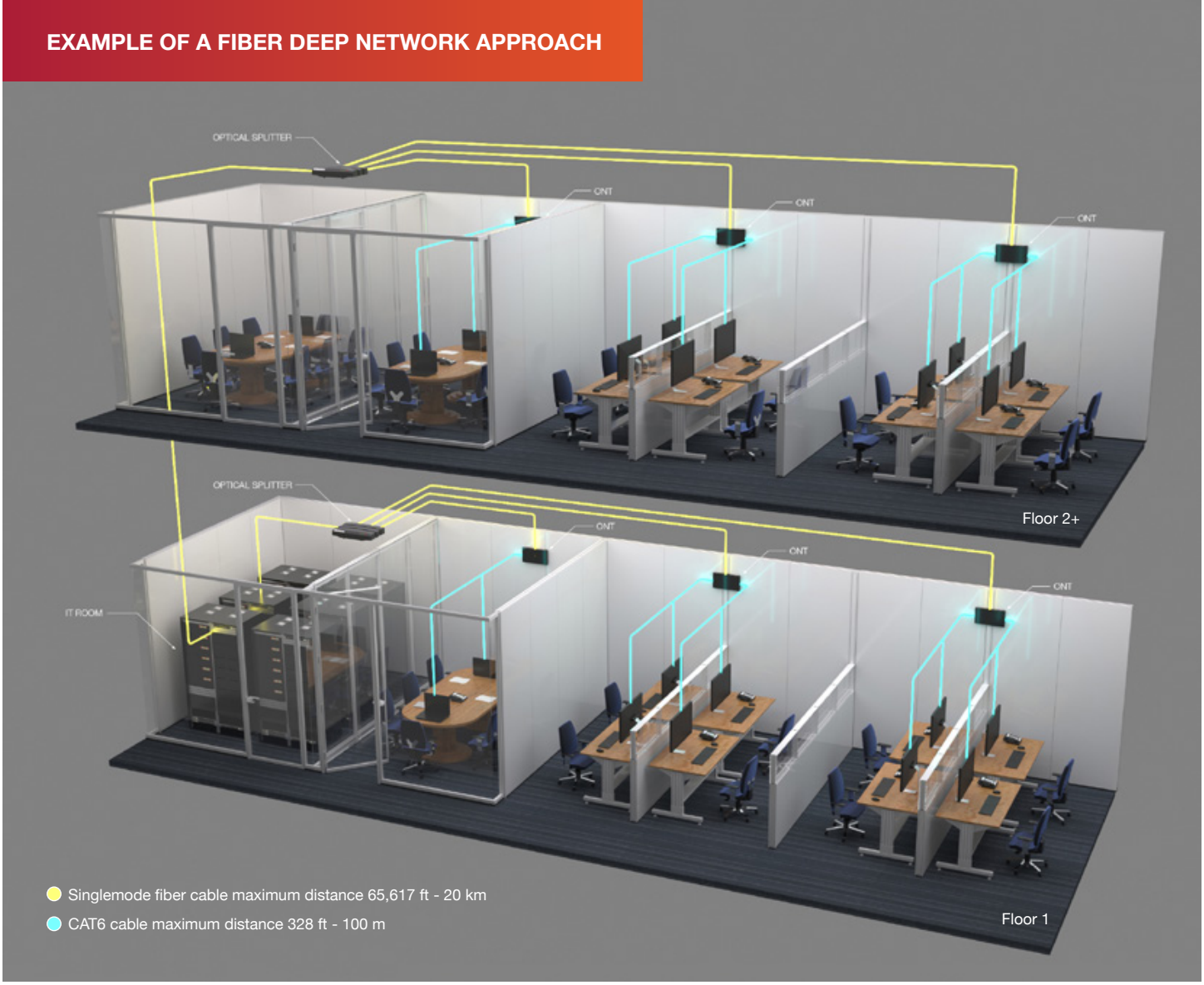
- **Centralized management**
- **Enhanced distance and bandwidth capabilities**
- **Multiple technologies over a single infrastructure (voice, video, network, security)**
- **Lower cost of ownership**
- **Future scalability for higher data demands**

However, there is one significant difference. PON uses optical splitters (passive) and Active Ethernet uses electrically powered switches (active). The reason many of our clients are utilizing Active Ethernet is its dedicated bandwidth capabilities due to the direct lines to the user. In contrast, PON splits the signal multiple times before landing at the device. Please note that there is the ability to deploy both options on the same project. Active Ethernet can be used for high-demand users and PON architecture can be used for less data-driven users.

| PON - OPTICAL SPLITTERS | BENEFIT |
|---|---|
| Point to multi-point | Efficient 1 line = 32 users |
| Point to multi-point | Most economic while exceeding majority of network needs |

| ACTIVE ETHERNET | BENEFIT |
|---|---|
| Point to point | Dedicated high bandwidth |
| Point to point | Higher scalability for future technologies |

## EXAMPLE OF A FIBER DEEP NETWORK APPROACH




## WHY DIRTT NETWORKS?

DIRTT is the only one-stop-shop supplier of these network types. From conception and design consultation to post-install care, everything is covered by DIRTT. We are also the only supplier of pre-terminated and pre-labeled singlemode fiber cabling, allowing for significant cost savings when it comes to labor.

## BENEFITS OF DIRTT NETWORKS

- The entire process is covered – conception to post install
- Modular, quick connect infrastructure
- Fully labeled and tested cable assemblies
- Zones are designed for ultimate flexibility
- Detailed install and as-built drawings
- Partnerships with leading integrator for seamless experience and handoff

To learn more about how fiber network alternatives measure up to the conventional approach, please contact one of our DIRTT network specialists.

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