Building Pre-Wiring Guidelines

Applied Integration network installation requires a minimum of Category 5e premise wiring, installed to meet the TIA-568B standard. This document provides additional guidelines that the contractor or electrician should follow to facilitate the smooth installation of the network.

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Introduction

Often overlooked or minimized in its importance, the physical wiring plant associated with any network is a vital component that must be installed properly if the rest of the network is to operate properly.

Applied Integration is not a licensed and bonded wiring contractor. We require a completed wiring plant to be installed and tested prior to our arrival. We will typically supply and install pre-manufactured patch cables of various lengths, but the core wiring throughout your building must be addressed before we arrive.

Typically, network cabling can be installed by any licensed electrician or other contractor, and most are familiar with the TIA-568B standard that is required to support a Category 5e network installation. This document is not meant to provide full documentation of that standard, but rather to supplement it with some general guidelines that will help your installer complete a functional, cost-effective installation that we can easily operate on as we begin your installation.

This document also does not address any local electrical or fire codes that must be met during your installation. You should insure that your contractor is fully aware of all pertinent code requirements before beginning your installation.

Topography

Prior to beginning the wiring installation, locate the area where your primary computer system will be located. You may be getting an equipment rack that will house your system, and if so, you should consider the rack location as the primary termination point for the bulk of the cabling. With this in mind though, it is also important to understand that network cabling is much more flexible in nature than older legacy cabling methods such as RS-232 Serial Cabling.

Network cabling does NOT necessarily require a direct "home run" from each and every device all the way back to the main computer location. Cabling can be run to cluster points around the building, and then these cluster points will have a network switch installed there and use standard length patch cables to go from the switch to several network devices around that cluster point. That cluster point then requires only a single "home run" cable. This method can provide significant savings in terms of overall cable installation costs. Cluster devices should be within a maximum of 25' of the switch that they will connect to. Generally, closer is better, but standard patch cables are available in standard lengths of 3', 5', 7', 14' and 25'.

An example of a simple building layout with a typical "single device home run" and a typical "multiple device cluster" is shown in Figure 1.

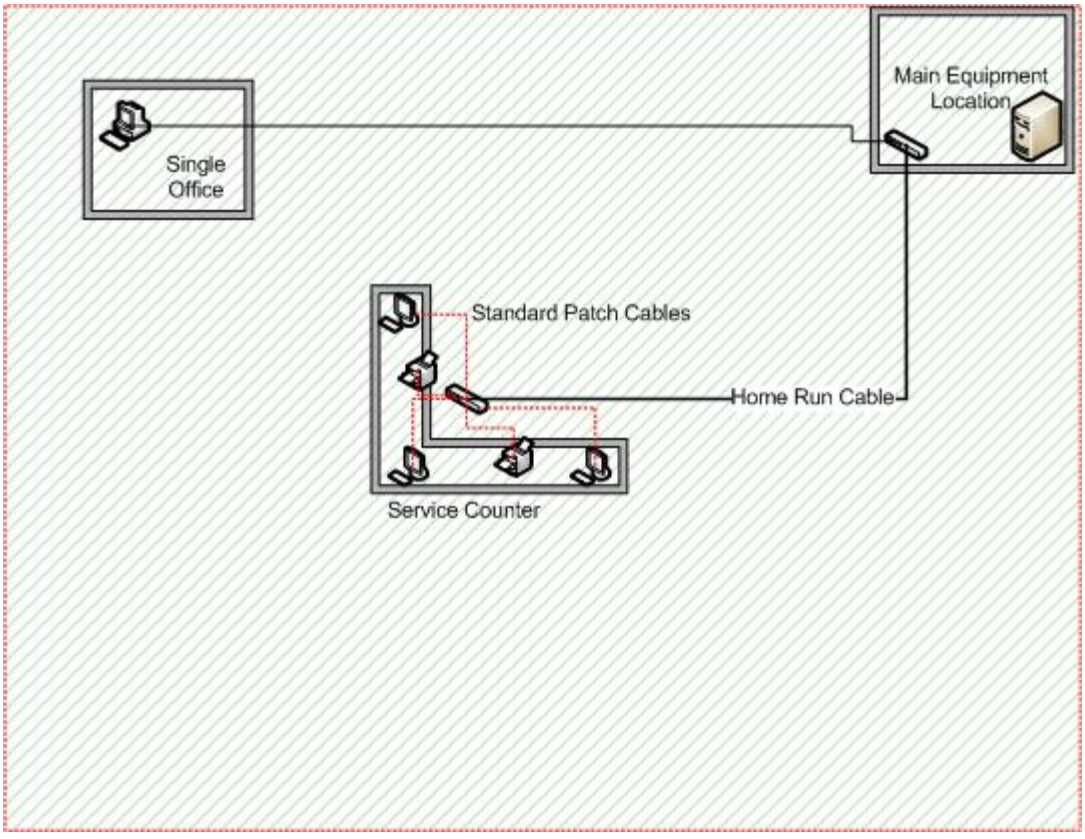

Figure 1

Termination

At the primary computer location, each home run cable should be terminated into Category 5e patch panels. A typical 24 port patch panel is show in Figure 2. This patch panel should be located in a position where it can be located either within the rack, or within standard 12-14' patch cable length from the rack. Larger installations may require either multiple patch panels, or a single panel with more ports.

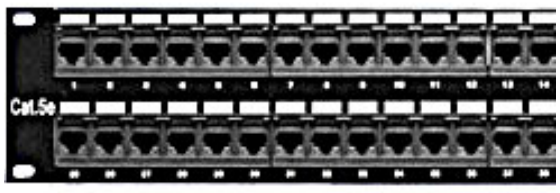

Figure 2

At the device end of each cable, either a surface mount jack (shown in Figure 3) or a flush mount jack mounted into a standard electrical box (shown in Figure 4) needs to be installed. Each remote Termination jack should be labeled or identified so that it's corresponding patch panel port is noted on the jack. One method commonly used for identification is to create a number scheme using the patch panel number and port number to identify a remote connection. Using this method, the remote jack that is connected to port 12 on the first patch panel would have an identification of PP1-12. The PP1 designated patch panel 1, the 12 designates the port number on that respective patch panel. A sticker with that identification number is then placed directly on the remote jack cover. If it desirable not to have a sticker on the termination cover, it is possible to simply create a document that maps out the locations of each jack on a diagram of the building. This might be a simple spreadsheet where each patch panel port is listed in one column and then the office or device location is detailed in a corresponding column.

Figure 3

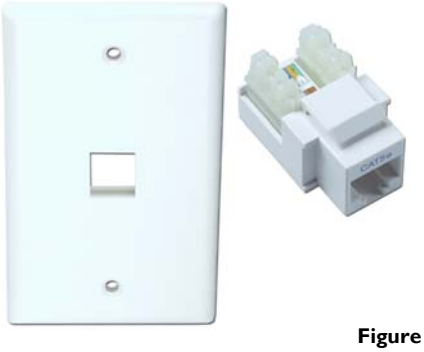

Figure 4

Other Considerations

Outbuildings

In cases where the network must be extended between two or more buildings that are on the same property, special requirements must be addressed to bridge the cabling between the two buildings. In general, the proper approach to extending a network to an outbuilding is to run a single segment of Fiber Optic cabling between the two buildings, and then convert that fiber to Cat5e cabling at each of its termination points. This method maintains a clear separation between the electrical "ground potential" of the two buildings.

Another method that may be effective is to provide a site-to-site Radio Frequency bridge between the two buildings. This is in many cases a more costly approach, and may require additional research to find the appropriate method of bridging, but it is an option.

Occasionally, we find situations where an existing segment of copper wire is already in place. In those cases, it is possible to provide isolation and surge protection equipment on that copper line to protect the equipment, but as with RF Bridging, this method requires a much more in depth look at the particular situation. However, it is important to remember that copper cabling between two building is never a safe situation unless proper attention is paid to the isolation and protection.

Wireless

In many environments, placing wireless access throughout the building may offer significant productivity gains, assuming the proper tools are then also implemented to use the wireless layer. Hand held computers are now reasonably cost effective, and can often be used to take such functions as price checking and inventory cycle counting out onto the showroom floor if a wireless layer is installed.

Wireless technology is common today, but also does still require some additional research to insure that it provides proper coverage and that it is properly secured. Unsecured wireless networks have created many notable security breaches recently, and it is no longer safe to install open wireless networks. Wireless networks must be secured just as carefully as the rest of the network.

Wireless access can also be installed to cover inside the building or even outside the building, in a yard or work area. In general, if wireless access is part of your overall plan, it is best to have a complete site survey done as part of the planning and design part of your network.