

# C<sup>o</sup>NECTED

REAL ESTATE MAGAZINE

## Wireless is the **FOURTH UTILITY**



The Reality Behind In-Building DAS Costs

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# What Type of Wireless Network DO YOU NEED?

BY DOMINIC VILLECCO

In *Connected Real Estate Magazine's* debut issue, we explored the fundamentals of in-building wireless and wireless through the generations. We've gained a better understanding of what wireless is and how we've evolved, but one question still remains: what type of wireless network do you need? As a building owner, knowing what type of system you're deploying in your buildings, if it is a reliable network and how much it will cost you is most important.

## ALONG CAME DAS

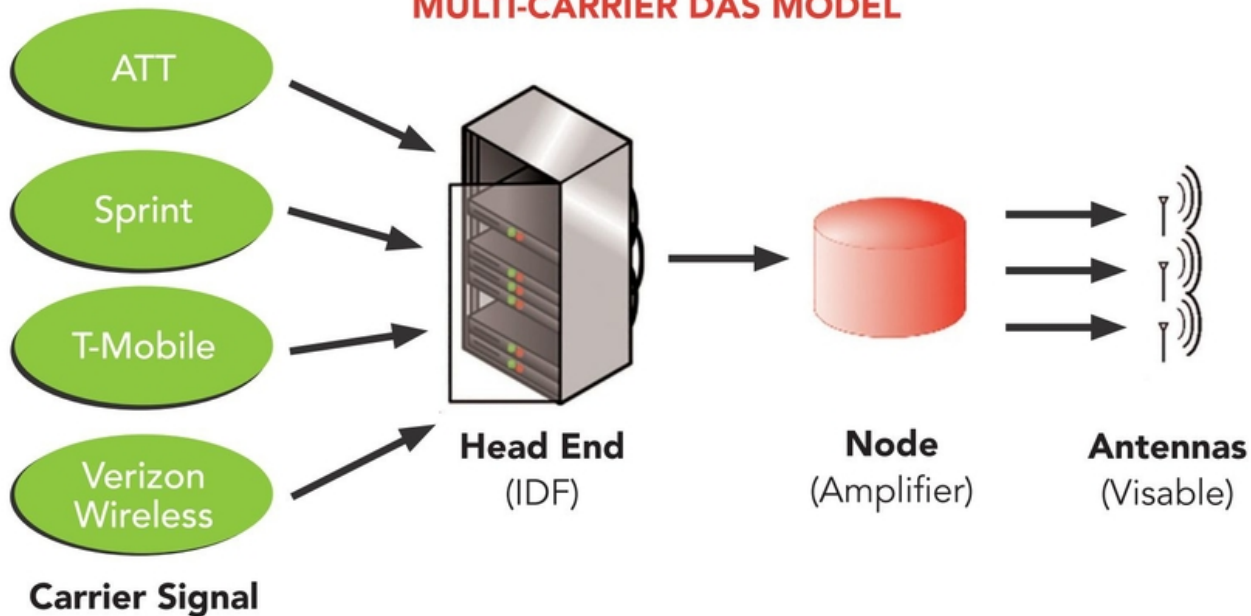
A Distributed Antenna System, otherwise referred to as "DAS", is exactly what it sounds like. In the most basic sense, it is a system of antennas distributed throughout a building. Cell towers serve the greater area with radio signals from the four major carriers: AT&T, Sprint, T-Mobile and Verizon Wireless. (Note: through industry consolidation, there are more names than networks; Cricket runs on AT&T's network, MetroPCS runs on T-Mobile's network and so on.) Signals from cell towers penetrate many smaller buildings and single-family residences, but often times larger buildings aren't fully covered. Two key points from the last article are coverage (penetration) and capacity (ability to utilize coverage). If you're in a larger building with minimal coverage and capacity, the network will be unfit for public consumption and

people will complain. This is where DAS plays a major role. Imagine breaking a cell tower into a handful of pieces, and then distributing those pieces throughout a building. That is essentially how a Distributed Antenna System works; like having your own personal cell tower. This solves any coverage problems and adds inherent capacity specifically to your building.

## WHAT DOES DAS LOOK LIKE?

A typical DAS model begins with your IDF closets/rooms usually found on multiple floors of a building. The IDF houses the central equipment for the system, also known as the Head End. The Head End is the main hub where the signal originates. The system then distributes the carrier signals through fiber optic cables to nodes and antennas on each floor, which emit the signal to your wireless devices.

## MULTI-CARRIER DAS MODEL





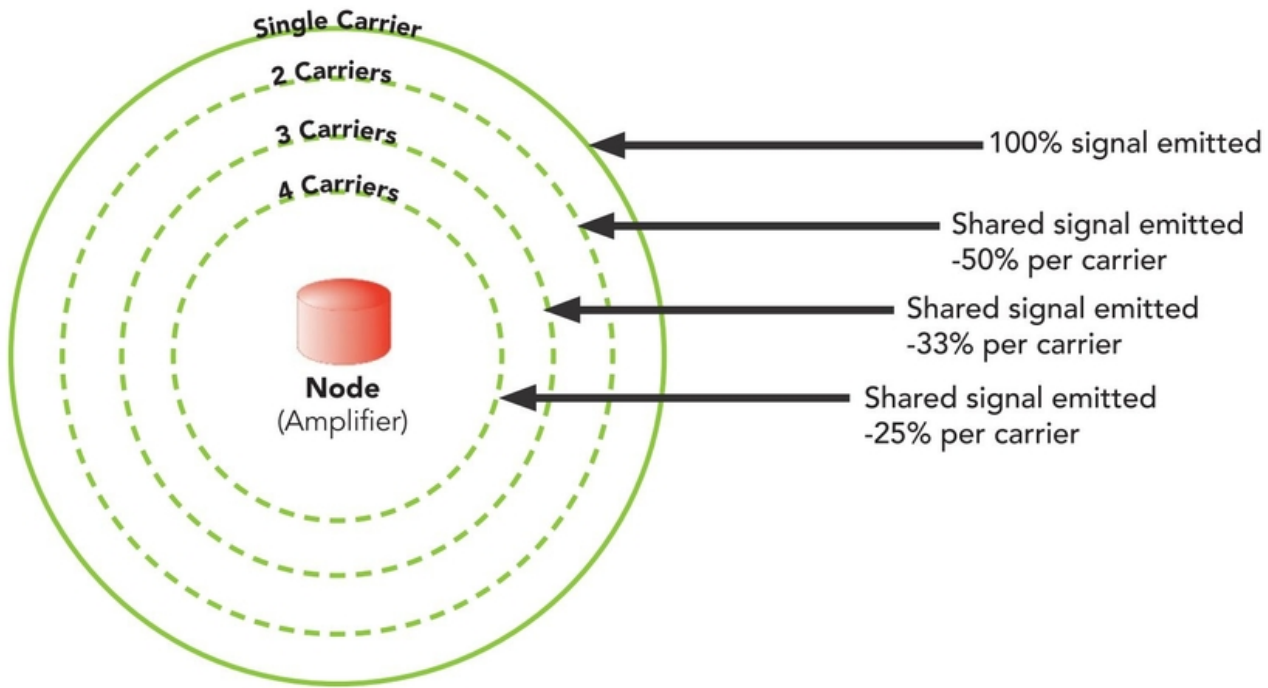
**SINGLE VS. MULTI-CARRIER**

Before deploying a network, the building owner needs to decide whether the building will host a single-carrier network or a multi-carrier network. The underlying issue here is more carriers means more equipment, and more equipment means higher costs.

But why? Nodes are amplifiers with a certain power limit. On a single carrier network, each node can emit 100 percent of the carrier’s signal, meaning less nodes are needed. When a node emits signals for two, three or even four carriers, the power is divided amongst each signal and more nodes are necessary to cover the same area.


In some cases, single-carrier networks make more sense; a business under contract with one wireless provider, for example. However, most systems are expandable. If you initially choose to open your network to one or two carriers, others can be added later, but it’s a much more expensive route than if you built it all up-front. DAS costs are driven largely by labor costs. The price of building a multi-carrier system may seem steep, but you only have one labor cost component. Each time you enhance a system, you restart the labor costs. Not to mention, enhancing your DAS network may require re-opening walls and ceilings, which is an additional cost. The main point to remember when deciding what type of system you need is to start with your end goal.

**EXAMPLE SIGNAL RANGE PER NODE**



**IN SUMMARY**

DAS networks are an extension of a cellular/wireless network, and of several options to enhance in-building wireless coverage/capacity. Multi-carrier networks are usually referred to as “neutral host” networks as you are hosting each of the wireless carriers on your network. Most networks are expandable, but cost considerations sometimes prohibit expansion. Think through your wireless needs and apply those requirements to your DAS network design up-front to improve tenant/client services and reduce costs over time. With all of

this in mind, you’re well on your way to achieving a reliable and cost-effective DAS network for your wireless needs. Later in this series, we’ll discuss how these principals apply to public safety first responder radio coverage. 

*Dominic Villocco is the president and founder of V-COMM, LLC, a telecommunications engineering consultant firm located in the northeast specializing in wireless system performance, design and implementation. Mr. Villocco is a 36-year veteran of the wireless industry, recognized as an expert at the FCC and currently Vice President of the Board of Trustees for the New Jersey Wireless Association. Visit [www.vcomm-eng.com](http://www.vcomm-eng.com) for more information.*