

Avoid the Wiring Trap

In-building wiring is essential for the stable internet access all residents demand. Sound strategy and planning can help asset managers, operators and developers avoid the worst wiring pitfalls.

By Andrew Marshall / *Campus Technologies Inc.*

Owners rarely think much about the low-voltage wiring in their properties once they've been built and residents have moved in. Why should they? The wiring works, and it's invisible.

If the properties were all built in the last few years and built to the correct specifications, there may not be much to worry about. However, older properties, or even newer properties built to unknown and possibly subpar specifications and standards, could be a cause for concern. In fact, they could be ticking time bombs – a six-figure problem per property.

WHY WORRY ABOUT WIRING?

Even in a wireless-centric student living community, the wired network is an essential component. It's the workhorse that delivers data to connected gaming consoles, TVs and streaming devices in each unit; to the wireless access points that deliver wireless signals; and increasingly to closed-circuit TV and access control systems as well.

The wiring used in most buildings is unshielded twisted-pair (UTP) wiring, sometimes referred to as Category or Cat 6 (or its predecessors, Cat 5 and Cat 5E).

Why is it a problem? When properties are built, UTP wiring is an easy, common target for value engineering, aka saving money. Using lower-grade or no-brand components, using unqualified installers, not following an appropriate specification – all these things may save money in the short term, but in the



Figure 1: A student apartment wall jack after several years of painting and repairs

longer term, they can and will cause problems. Even low-voltage wiring that hasn't been value engineered may not have been built to an adequate standard.

In some cases, the wiring infrastructure may just be too old – some properties were wired 15 to 20 years ago, and the wiring isn't up to the job. In others, the wiring is fit for purpose,



Figure 2: Outdated wiring from 1999 still in use today

but the jacks on the wall are worn out, broken or paint-filled from countless turns or unreliable after many repairs.

Because the demands on wiring increase over time, older wiring may not be able to support the bandwidth required for a building to be competitive in a market. As many new properties deliver well over 100 Mbps per bed, and current wireless access points need

1,000 Mbps and beyond, an older infrastructure may not be able to cope.

The cost of remediating wiring problems can be jaw-dropping, and they absolutely have to be remediated because student residents will not tolerate poor internet service under any circumstances. Poor service will directly affect occupancy rates and net operating income.

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Cable ID: 1102A

Date / Time: 09/07/2017 12:59:17 PM
Headroom 9.7 dB (NEXT 45-78)
Test Limit: TIA Cat 5e Channel (+All)
Cable Type: Cat 5e U/UTP
NVP: 89.0%

Operator: GABE
Software Version: V5.1 Build 4
Limits Version: V6.1
Calibration Start Date:
Main (Module): 08/09/2017
Remote (Module): 08/09/2017

Test Summary: PASS

Model: DSX-8000
Main S/N: 1703075
Remote S/N: 1703076
Main Adapter: DSX-CHA804
Remote Adapter: DSX-CHA804

Worst Case Margin		Worst Case Value		
N/A	MAIN	SR	MAIN	SR
Worst Pair			12	45
TCL (dB)			24.1	20.8
Freq. (MHz)			326.0	334.0
Limit (dB)				
N/A	MAIN	SR	MAIN	SR
Worst Pair			12-36	78-36
CDNEXT (dB)			15.3	18.6
Freq. (MHz)			310.0	324.0
Limit (dB)				
N/A	MAIN	SR	MAIN	SR
Worst Pair			36	36
CMRL (dB)			2.8	5.1
Freq. (MHz)			273.0	139.0
Limit (dB)				
N/A	MAIN	SR	MAIN	SR
Worst Pair			36	45
ELTCTL (dB)			20.3	19.9
Freq. (MHz)			313.0	350.0
Limit (dB)				

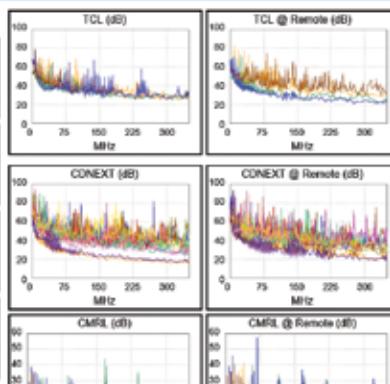


Figure 3: A cable certifier output like this one should be on file for every wire on a property.



Figure 4: Ten years of turn painting takes its toll. This jack is not functional.

STRATEGIES FOR OWNERS

However, all is not lost. Several strategies can help owners understand and avoid these risks.

Look before you leap.

During due diligence when acquiring a property, make sure the wiring infrastructure is part of the technology survey so you can take the state of the wiring and the cost of any remediation into account. The survey should include physical inspection of the wiring in random units and sample testing using a tool called a certifier. This survey should, at a minimum, determine the quality and grade of the wire in place, the state of the jacks and patch panels

TURN TIP:

Buy a big bag of modular plugs – they’re inexpensive – and make sure painters insert them into the jacks before painting and remove them when painting is complete. (Before use, they must be crimped to avoid damaging the jacks.)

and whether there is adequate slack to allow retermination of jacks when they wear out. This will arm you with information about whether you need to replace any of the wiring infrastructure, when you will have to do it and how much you will need to spend.

Build it right.

When building new construction, make sure the specification is adequate and the contractor and subcontractor that install the wiring follow those standards. Best practice is to conduct inspections during construction and have the technology operator audit the end result before move-in. Make sure your contracts enforce certification (not just testing) of all UTP drops. A well-installed, good-quality wiring system should have a life span of 20 years and beyond.

Plan for a 10-year maintenance interval.

Plan to replace all the jacks and reterminate and recertify all UTP wiring every 10 years or so. Jacks wear out after repeated insertions and removals, and student apartments are painted frequently, with contractors continually getting paint in the jacks.

In the worst case, replace the wiring.

When all else fails, you’re left with limited options, and you may end up having to replace all the UTP wire at a property. This is both expensive and disruptive.

COMMON MISUNDERSTANDINGS

Owners often believe that in-building wiring is someone else’s problem or not a problem at all. These beliefs are usually based on misunderstandings.

I don’t need wiring because everything is going wireless.

Those wireless access points need to be connected to a wired network – without it, they don’t work. In addition, to provide the best user experience, game consoles, media streamers and TVs should be connected by wire to a wired network, which is faster than the wireless network.

I installed Cat 6 wiring throughout my new property, so I don’t need to be concerned.

The physical wire is only one part of a Cat 6 system; unless all the other parts – patch panels, patch cables, jacks – are also Cat 6 components and have been installed to Cat 6 standards and certified, the system is not a Cat 6 system. In addition, sufficient slack or “service loop” needs to be left to allow several reterminations.

Developers frequently pay for what they think is a Cat 6 system and then find that it will certify only at a lower standard. This is why good specifications are needed.

My internet supplier or management company is on the hook to take care of this.

Most, if not all, internet service contracts make inside wiring the responsibility of the owner.

SUMMARY

If you don’t know what problems you may have in your portfolio, now is the time to find out. Have your properties surveyed, and make sure your capex plan takes the results into account. If you’re building new construction or major rehabs, make sure you build to the right quality standard. ❖

STANDARDS REFERENCES:

ANSI/TIA-568.0-D, Generic Telecommunications Cabling for Customer Premises, Ed. D, 09-2015
ANSI/TIA-568.1-D, Commercial Building Telecommunications Cabling Standard, Ed. D, 09-2015
ANSI/TIA-568-C.2, Balanced Twisted-Pair Telecommunication Cabling and Components Standard, Ed. C, Err. 04-2014

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