

The Importance of a Proven and High Performing Cabling Solution

Bandwidth hungry applications are stressing today's networks like never before. Top-of-the-line active equipment does not guarantee data transmission efficiency. In fact, a Real Decisions study found that 50% of network problems are actually related to cabling systems. Yet, often the physical layer is ignored or dismissed as non-critical to network performance. While industry standards guarantee interoperability amongst standards compliant components, they do not guarantee the quality of the cabling system. A better method of judging cabling performance is clearly needed.

Today's need for bandwidth demands that a cabling system be designed and manufactured to ensure robust performance. Recognizing this technological evolution, manufacturers have continually promised higher and higher levels of performance; however, these promises often lack critical elements that validate these claims. Graphs, charts, buzzwords, and fancy marketing pieces often divert attention away from pertinent information.

WHAT CRITERIA SHOULD BE USED TO JUDGE A HIGH PERFORMANCE CABLING SOLUTION?

The litmus test for making a truly informed decision about your cabling system fundamentally comes down to three elements: Performance, Conformance, and Assurance. Below are the key questions to consider prior to specifying the network cabling.

Performance

- » Has the solution exhibited the necessary credentials to be deemed a matched or tuned solution?
- » What are the performance guarantees of the solution post-installation?

Conformance

- » Who is monitoring the performance guarantees?
- » Is the solution performance verified as part of an ongoing independent testing program?

Assurance

- » Does the warranty address applications, labor, and product for all telecommunications cabling in my installation?
- » Does the solution have a proven track record?

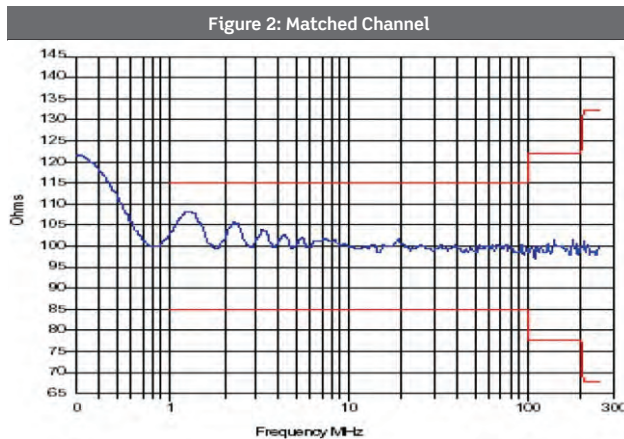
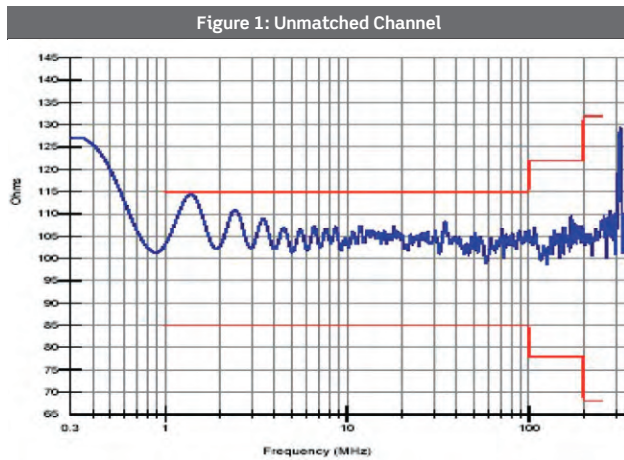
WHAT IS NEXTLAN?

NextLAN cabling solutions, comprised of fiber optic and copper voice and data products manufactured by Leviton and Superior Essex are tuned systems that yield maximum performance designed to meet intense data demands. NextLAN systems include products from two industry leaders with histories rich in quality, innovation, and leading-edge manufacturing.

PERFORMANCE

Matched channels result in higher performance.

Generic cabling solutions whose components are not matched for performance are susceptible to greater variations of impedance. This mismatch between cable and connectors causes a transmitted signal reflected (return loss) back to the source, thereby reducing the amplitude of the signal seen by the receiver. Significantly deteriorated signals trigger retransmission errors (bit error rates) which reduce the overall efficiency of the network. Figure 1 shows the erratic impedance typically associated with unmatched systems. Conversely, matched components minimize bit errors and maximize network performance to yield a more efficient network that is better suited to transmit large files such as streaming video and CAD drawings. Additionally, a tuned solution exhibits stable, enhanced performance over a wide frequency range and has improved immunity to external noise. Figure 2 demonstrates how a matched system exhibits smooth, centered impedance.



The horizontal cabling infrastructure in an installation is comprised of cable and connectivity products functioning together; hence, the performance of the solution as a whole should be scrutinized. These products are not operating individually; therefore, the performance characteristics of each component are somewhat extraneous. Mismatched impedance will diminish the performance of a solution regardless of the quality of the individual components.

The greatest indicator of a matched solution is whether or not that system has been UL Levels XP® verified.

Performance guarantees are not all created equal.

Everybody touts performance; however, simply advertising performance is not enough. One area to question is whether or not the manufacturer’s performance guarantee applies to installed performance or only to pristine laboratory environments. An answer to this can typically be found in the warranty details. The warranty should state that the installed performance meets the published guarantees

at the time of manufacture. Often, the “guaranteed” performance slips away somewhere between the pages 1 and 10 as most warranties revert to guaranteeing industry standards compliance. NextLAN performance with related warranties is explicit.

NextLAN CAT 6eX UTP Channel Specifications

Freq. MHz	Max. Insertion Loss	Min. NEXT	Min. ACR	Min. PSNEXT	Min. PSACR	Min. ACRF	Min. PSACRF	Min. Return Loss
	dB/100 m							
1	2.0	80.2	81.3	78.8	76.9	68.8	66.8	23.0
4	3.7	70.2	69.5	68.8	65.1	56.7	54.7	23.0
10	5.8	63.6	60.7	62.2	56.3	48.8	46.8	23.0
16	7.3	60.2	55.6	58.8	51.2	44.7	42.7	23.0
20	8.2	58.6	53.0	57.2	48.6	42.7	40.7	23.0
25	9.2	57.0	50.4	55.6	46.0	40.8	38.8	22.0
31.25	10.4	55.4	47.5	54.0	43.1	38.9	36.9	21.1
62.5	15.0	50.4	37.7	49.0	33.3	32.8	30.8	18.1
100	19.4	47.0	29.7	45.6	25.3	28.8	26.8	16.0
155	24.8	43.9	21.0	42.5	16.6	24.9	22.9	14.1
200	28.7	42.0	15.2	40.6	10.8	22.7	20.7	13.0
250	32.7	40.4	9.6	39.0	5.2	20.8	18.8	12.0
300	36.5	34.1	-	33.7	-	14.7	11.7	11.2
350	40.1	33.0	-	32.6	-	13.4	10.4	10.6

NextLAN CAT 6+ UTP Channel Specifications

Freq. MHz	Max. Insertion Loss	Min. NEXT	Min. ACR	Min. PSNEXT	Min. PSACR	Min. ACRF	Min. PSACRF	Min. Return Loss
	dB/100 m							
1	2.1	77.2	76.1	74.8	72.7	66.8	63.8	21.0
4	3.9	67.2	64.3	64.8	60.9	54.7	51.7	21.0
10	6.2	60.6	55.5	58.2	55.1	46.8	43.8	21.0
16	7.9	57.2	50.4	54.8	49.0	42.7	39.7	21.0
20	8.8	55.6	47.8	53.2	46.4	40.7	37.7	21.0
25	9.9	54.0	45.2	51.6	43.8	38.8	35.8	20.0
31.25	11.2	52.4	42.3	50.0	40.9	36.9	33.9	19.1
62.5	16.1	47.4	32.5	45.0	31.1	30.8	27.8	16.1
100	20.9	44.0	24.5	41.6	23.1	26.8	23.8	14.0
155	26.7	40.9	15.8	38.5	14.4	22.9	19.9	12.1
200	30.9	39.0	10.0	36.6	8.6	20.7	17.7	11.0
250	35.2	37.4	4.4	35.0	3.0	18.8	15.8	10.0

NextLAN CAT 5e+ UTP Channel Specifications

Freq. MHz	Max. Insertion Loss	Min. NEXT	Min. ACR	Min. PSNEXT	Min. PSACR	Min. ACRF	Min. PSACRF	Min. Return Loss
	dB/100 m							
1	2.1	66.0	62.6	62.5	60.4	58.8	56.4	19.0
4	4.1	60.0	50.7	52.3	48.1	47.0	44.4	19.0
10	6.6	53.3	41.6	45.5	38.8	39.2	36.4	19.0
16	8.4	49.9	36.5	42.0	33.5	35.2	32.3	19.0
20	9.4	48.2	33.8	40.4	30.8	33.3	30.4	21.0
25	10.6	46.6	31.1	38.7	27.9	31.4	28.4	20.0
31.25	11.9	44.9	28.1	37.1	24.9	29.5	26.5	19.1
62.5	17.2	39.7	17.3	33.3	15.7	23.6	20.5	16.1
100	22.3	36.1	9.8	31.9	9.1	19.6	16.4	14.0
155	28.4	32.8	1.4	30.6	1.5	15.9	12.6	12.1

CONFORMANCE

Why is independent testing important?

Without independent testing, and even more important independent verification, manufacturer claims concerning performance are uncorroborated. While single test reports may illustrate great margin over the specification, they do not guarantee repeatable performance.

NextLAN was founded with the principle that an independent and unbiased third party should substantiate advertised guaranteed performance parameters. In 2003, Superior Essex and Leviton contracted Underwriters Laboratories (UL) to verify NextLAN cabling performance periodically. Under this program, NextLAN systems are verified quarterly, and all components used for testing are randomly acquired by UL from normal distribution channels. Clients have embraced and applauded this unbiased 3rd party confirmation of guaranteed installed performance headroom.



Demand the UL verified mark; a UL logo accompanying a test report simply designates that the testing was performed in its laboratory. Quarterly testing generates multiple test reports that verify guaranteed, repeatable performance values illustrating that NextLAN systems ensure headroom for every cable run, every time.

What is the Levels XP program and does NextLAN participate?

The Levels XP program is one of the toughest cabling performance specifications in the world with exacting standards that are independently verified by UL. Only NextLAN and a handful of other cabling solutions from the world's leading cable and connectivity manufacturers have been able to satisfy the stringent requirements of Levels XP.

The Levels XP program combines passive and active testing. Levels XP solutions must meet several critical elements established by UL:

1. **Passive Performance Testing** - All Levels XP components (cable, connecting hardware, and patch cords) are tested individually and as an end-to-end channel to ensure compliance to all relevant national and international standards.
2. **Enhanced Active Performance Testing** - Measures the expanded noise induced signal error rate throughput of all Levels XP related components assembled in end-to-end channels. Assesses the true speed, or data throughput, of the cabling solution in a real-world performance environment.
3. **Matched Solutions** - Verifies that all the components in an end-to-end channel solution work together efficiently to minimize signal error rates and retransmission rates. The components are matched for tuned 100 Ohms performance.
4. **Thorough Follow-Up Testing** - Quarterly testing of randomly selected Levels XP product ensures ongoing compliance to Levels XP standards.

ASSURANCE

The NextLAN Warranty Difference

Although most installations extend beyond the inside building data cabling system, most warranties start and stop with the horizontal cabling infrastructure. This cabling is typically located in favorable and fairly accessible locations. To the contrary, backbone cable (interbuilding and/or intrabuilding), is exposed to harsh conditions and is not easily accessed. Although important to the installation, these necessary products are frequently ignored in terms of warranty. By installing a certified NextLAN cabling system, the project qualifies for:

- » A lifetime warranty on certified horizontal and backbone systems
- » 20-year warranty on all Superior Essex outside plant cabling (fiber and copper)
- » 20-year warranty on all Superior Essex voice-grade cabling used anywhere within the campus project

In addition to the unique and comprehensive product warranty, the NextLAN solution warranty includes an applications assurance warranty covering all future applications introduced by recognized industry standards bodies. Moreover, the NextLAN warranty includes verbiage that unambiguously states that the products that comprise the NextLAN cabling system will meet the applicable NextLAN performance specifications at the time of manufacture. This truly guaranteed headroom warranty is rare.



NEXTLAN: THE CHOICE OF LEADING ENTERPRISES

Be wary of cabling systems that lack a good customer reference list. Reasons can vary, but either way, choosing an unproven solution is probably not a risk worth taking. Vertical markets may have differing needs, but one only needs to see a partial list of recent installations for satisfied customers to recognize the breadth of acceptance that NextLAN cabling systems have garnered.

Education

- » Stanford University
- » Pennsylvania State University
- » Chicago Public School System
- » Chandler, AZ Unified School District

Government/Municipality

- » NASA/Langley Air Force Base
- » Philadelphia Visitors Center
- » Phoenix, AZ GSA Building
- » Denver Municipality

Commercial/Manufacturing

- » Enterprise Rent-A-Car
- » Specialty Minerals, Inc.
- » Omni Hotel
- » PELCO

NEXTLAN IS A TRUSTED SOLUTION

Newly created “proprietary” solutions leave questions concerning future strategies, warranty claims, and support. Cable manufacturers changed courses and entered the foray of connectivity components whereas the NextLAN team continued to strengthen an already unique solution. While historically slanted connectivity manufacturers shifted gears and began dabbling in private-labeled cable, Leviton and Superior Essex continued to define expertise and engineering precision for their respective products proving an end-to-end solution is much more than a homogeneous name. There are many high-performance cabling systems on the market today, but none that offers the completeness of NextLAN performance, conformance, and assurance.