



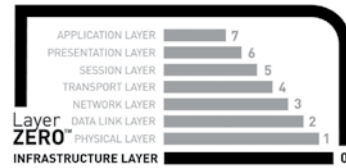
NetClear[®]

Data Center Solutions

Berk-Tek[®]
A NEXANS COMPANY

legrand[®]

Ortronics



Layer Zero™ is the new foundation layer for the OSI model proposed by Legrand | Ortronics. It addresses the critical role that the physical infrastructure plays in network performance. Layer Zero encompasses the entire physical infrastructure and can have a dramatic effect on the system by lowering the overall temperature in the data center, reducing the risk of equipment failure and enhancing system performance. Legrand | Ortronics expertise in layer one technology enables the development of superior infrastructure solutions for Layer Zero.

Layer Zero solutions optimize the physical support of the NetClear structured cabling systems. These solutions leverage gains across the entire network, providing greater reliability and performance while enabling improved efficiencies for network equipment cooling and design flexibility.

Berk-Tek, a Nexans Company and Legrand | Ortronics offer a holistic approach to the design of data center architecture through the integration and optimization of network cabling and physical support systems. An integrated approach to the development and deployment of these foundational network elements is critical to ensure the continuous availability, maximized performance, and long term flexibility of the mission critical data center.

NetClear® cabling systems bring together the expertise of two industry leaders to create co-engineered layer one network infrastructure solutions designed to meet the needs for the most demanding data centers. All systems ensure full network and application availability by providing robust, high performance channels for the complex and challenging data center environments of today and tomorrow.

the **NetClear** advantage

BERK-TEK: 50 YEARS OF CABLING EXCELLENCE

Founded in 1961, Berk-Tek has spent the last 50 years maximizing the capabilities of cabling systems. This single-minded focus has enabled us to develop the expertise required to create innovative cabling that addresses the particular needs of the data center, including high-speed transport, high-density installations and rapid deployment.

The products offered by Berk-Tek lead the industry in performance, reliability and robustness. Independent verification to product specifications, not just industry standards, offers customers an added level of certainty of the quality being delivered.

LEGRAND | ORTRONICS: EXPERTISE TO INTEGRATE LAYER ONE AND LAYER ZERO™

Legrand | Ortronics is a global leader in high performance network infrastructure solutions, offering a complete range of Category 5e, 6, and 10 Gig copper, fiber optic and residential/MDU connectivity solutions, as well as Layer Zero physical support solutions including Cablofil® wire mesh cable tray and Wiremold® pathways.

No one offers more ways to connect. Whether running copper or fiber... for a LAN, SAN, or data center... with a distributed, centralized, or zoned architecture, Legrand | Ortronics keeps data moving to the people and resources that matter most. We understand the impact

of structured cabling and physical support on networks, and design systems that deliver a comfortable margin of extra performance to ensure they connect flawlessly.



The importance of
the data center to
every organization
will only continue
to increase.

for Today's Business

As the business demands being placed on data centers continue to increase, the technology available to improve their operation continues to evolve and change. This evolution presents a wide variety of options to data center managers and CTOs who must define and build systems today that will address future business and operational challenges.

As organizations consider the implications of a 40G/100G future and weigh the merits and possibilities presented by virtualization, cloud computing, Converged Enhanced Ethernet, Fiber Channel over Ethernet and other technologies, there are certain fundamentals that cannot afford to be overlooked. Chief among these fundamentals is the network infrastructure.



Today's data centers support the most demanding business requirements, running critical applications that range from financial transactions, data processing and storage, to medical imaging, collaboration and archiving. In these environments the uninterrupted operation of the network and applications is as vital to the success of the business as the business processes that utilize them.

High-quality network infrastructure, exceptional network performance

Designing an optimized network infrastructure requires looking beyond the surface and understanding the role that high-performance layer one and Layer Zero™ components play in enabling, maintaining, and maximizing the performance of active network components and applications.

NetClear® Solutions from Berk-Tek, a Nexans Company and Legrand | Ortronics deliver capabilities and solutions to address the key business issues data center managers face today.

Improving Total Cost of Ownership (TCO)

Maximizing Operational Efficiency

Enabling Virtualization

Ensuring Network & Application Availability

Improving TOTAL COST OF OWNERSHIP

EXTENDING NETWORK LIFESPAN

As with all organizational units, data center managers must continually maximize their budgets through investment and optimization strategies. Data centers represent long-term investments for organizations seeking to position themselves for ongoing success. As such, the best approach to determining the optimal course of action involves assessing the Total Cost of Ownership (TCO) associated with data center investments, not simply immediate costs.

LEVERAGING VARIABLE LIFESPANS FOR MAXIMUM EFFECTIVENESS

For data centers to achieve their operational goals, they must support continuously expanding user demands. The result is that data center managers typically obtain a three to five year useful lifespan for active networking components as they upgrade equipment to capitalize on improvements in processing speeds and operating efficiency. In contrast, the structured cabling system can be designed to last through two or three generations of active equipment.

To maximize the return on the structured cabling investment, network designers should design an infrastructure capable of supporting future generations of active equipment. This means designing systems that are able to support 10G throughout the network and 40G/100G Ethernet transmission in the aggregation layer.

THE CASE FOR 10 GIGABIT

When there is a need to expand the structured cabling system or build a new facility, the economic case for specifying 10G is clear. What seems like a fairly significant cost increase at installation, possibly as great as 53%, yields a 23% lower total cost of ownership when the lifespan of the structured cabling system is included in the analysis.

For those that select a lower initial cost and install Category 6 today, with the assumption of upgrading to Category 6A in five years, the total cost of ownership over ten years rises to 65% more than simply installing a Category 6A system today.

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The NetClear GTX Category 6A UTP cabling system from Berk-Tek and Legrand | Ortronics offers all the value of a 10G infrastructure with the benefit of engineered reliability and compact design.



ACCELERATING BEYOND 10G TO 40/100G ETHERNET

Taking advantage of the benefits of virtualization, Converged Enhanced Ethernet, and Fibre Channel over Ethernet requires data center network designers to consider the impact these technologies will have on their backbones and in the aggregation layer. To ensure that bandwidth bottlenecks are avoided in the data center core, today's data center manager is planning for 40G and 100G Ethernet over an optical fiber cabling system. The most cost effective implementation will utilize OM3 or OM4 grade multimode fiber installed in 12 and 24 fiber increments terminated in MTP* connectors with cassettes to ensure a smooth migration from 10G to 40G/100G.

*MTP is a registered trademark of US Conec

A NETWORK FOR TOMORROW AND BEYOND WITH NETCLEAR MM10

- NetClear MM10 uses the most advanced optical fiber and low-loss connectivity to ensure guaranteed 10G performance today and 40G/100G performance tomorrow
- Supports 40G/100G Ethernet for the next generation of equipment
 - GIGAlite® OM3 systems will support 10G to 300 meters and 40/100 to 100 meters.
 - GIGAlite OM4 based systems support 10G to 500 meters and 40/100G to 150 meters.

Maximizing OPERATIONAL EFFICIENCY

RAPID DEPLOYMENT | EFFICIENT CHANGES | ENERGY MANAGEMENT

Network uptime is a critical component to a company's success, and bringing a new data center online on time or ahead of schedule is invaluable. In addition to eliminating network downtime, providing quicker uptime is also essential in keeping today's mission critical data centers operational 24x7x365.

Operational efficiency of the network can be enhanced through improved management of onsite physical infrastructure installation and maintenance costs. Factory-terminated copper and fiber cabling systems from Berk-Tek and Legrand | Ortronics achieve this enhancement in infrastructure management.

Operational efficiency can also be viewed through the lens of energy efficiency. When considering the array of possibilities available to better manage the energy usage in data centers, it is important to not overlook the gains that can be realized through smart infrastructure choices, such as the use of blanking panels and smaller diameter cabling that does not impede the airflow needed for optimized passive cooling.

NetClear cabling systems offer some of the most compact cable designs in the industry, optimizing airflow in high density installations.

Factory-Terminated Solutions For Rapid Deployment and Management

NetClear® systems include both copper and fiber high-performance factory-terminated solutions to help operate data centers more efficiently. With both Clarity SNAP™ and Berk-Tek Pre-Terminated Fiber assemblies you realize:

- Faster installation and turn up time with assemblies that arrive tested from the factory
- Solutions tailored to your specific needs
- Reduced Total Cost of Ownership
- Increased flexibility for MACs
- Bandwidth to support speeds from 100Mbps through 100Gbps



Creating efficiencies at Layer Zero™

A well thought out Layer Zero infrastructure will bring a new level of stability to your network, reduce the risk of network failure and assure a design that will support technology demands from the physical layer. Layer Zero can help you optimize your network real estate, while still increasing cooling and aiding operational efficiency through energy savings.

- The Mighty Mo® cabinet features airflow baffles that maintain the integrity of a hot aisle/cold aisle arrangement by directing airflow more effectively when side to side vented network equipment is being deployed
- For front to back vented equipment, the Mighty Mo cabinet incorporates airflow dams (barriers), which facilitates proper airflow by eliminating recirculation of hot air back into the cabinet
- Deeper cable channels allow for greater airflow, even when the switch is loaded to capacity

Enabling VIRTUALIZATION

MAXIMIZING BANDWIDTH

Virtualization presents organizations with a new opportunity to more efficiently manage IT budgets by decreasing the capital expenditure on network hardware and equipment while simultaneously reducing the amount of operating capital spent on monitoring, powering, cabling and maintaining network hardware and equipment.

By replacing multiple small physical servers with fewer, larger physical servers running multiple applications, businesses achieve higher utilization rates and realize multiple benefits. Virtualization reduces the overall amount of cabling infrastructure required to support business applications since there are fewer physical devices that require connections. However, the remaining infrastructure must be appropriately scaled to provide sufficiently reliable access as slow connections or infrastructure failures will now affect multiple applications simultaneously.

Headroom within the cabling system increases in importance as these multiple applications now share a single pathway. The extra margin of performance built into high-performance cabling systems enables them to manage interference sources that could negatively affect a minimally compliant network.



Specifying a NetClear structured cabling system will ensure support for today's network equipment, as well as future equipment, and extends the useful life to achieve a lower total cost of ownership.

ENSURING VIRTUALIZATION THROUGH THE ASSURANCE OF NETCLEAR GTX

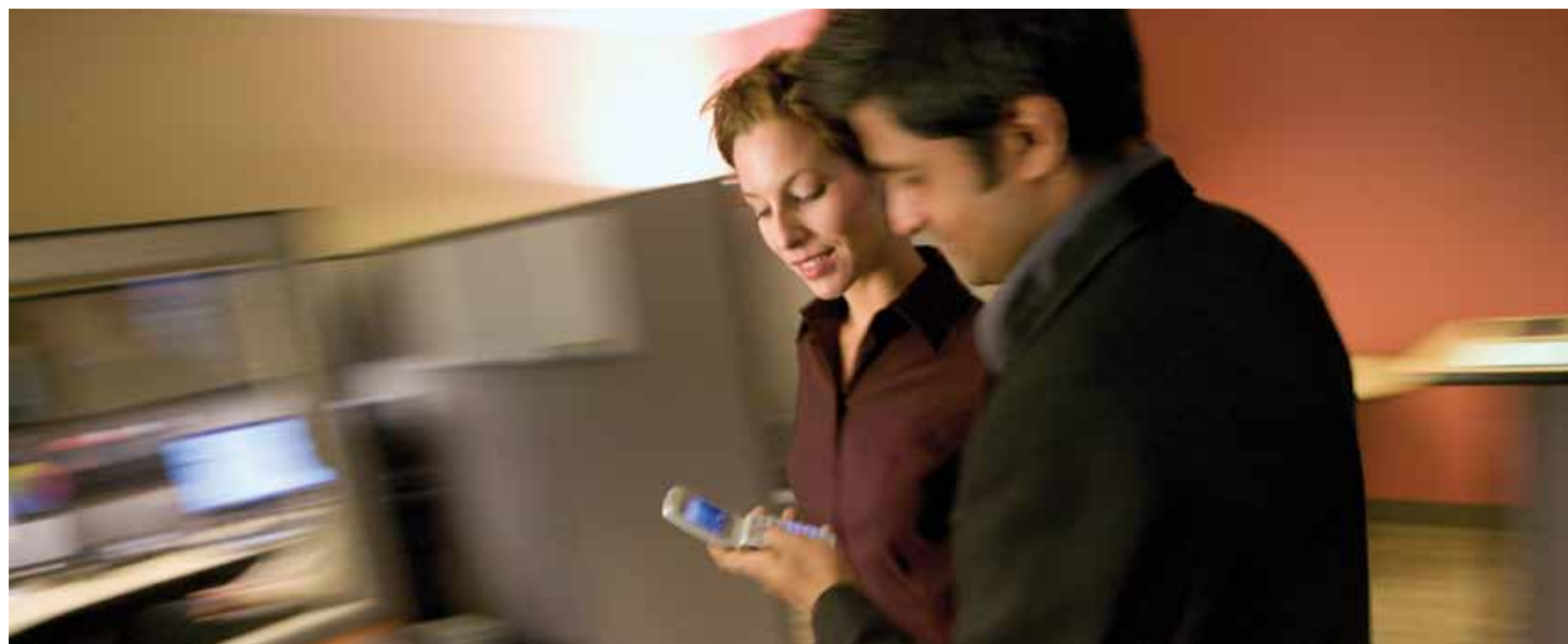
Alien crosstalk has been identified as the single largest threat to performance for network speeds of 10Gigabit and higher. This cable-to-cable noise can interfere with signal transmission; slowing the network and disrupting vital business processes. And in a virtualized environment, no level of disruption can be tolerated.

The NetClear GTX 10G cabling system guarantees zero bit-error performance and provides channel integrity second to none. Tested in the harshest 6-around-1 configurations, NetClear GTX passes with flying colors, allowing it to be installed in mixed pathways with other NetClear Category 6 solutions and in lengths from 7-100 meters.

- Guaranteed 10G Ethernet support from 7-100 meters
- Can be installed in mixed pathways
- Independently tested compliance to TIA 568C.2 Category 6A performance specifications

Ensuring Network & Application AVAILABILITY

GUARANTEED PERFORMANCE | INDEPENDENTLY VERIFIED



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In today's hyper-connected world, where data and applications are expected to be constantly available for everything from mobile devices to business transactions and financial trading, the data center network's uptime is critical. The success of most organizations lies in their ability to communicate information on a large scale where factors such as time, accuracy and security determine success. According to an Infonetics research study large businesses lose 3.6% of their annual revenue to network downtime each year. Gartner has estimated that the average cost of network downtime is about \$42,000

per hour. In fact, ratings have been put in place for the purpose of creating a data center environment that maintains predictable IT uptime and tolerates down time of no more than 28.8 hours (Tier 1) or 0.4 hours (Tier 4).

While statistics vary from study to study as to the root causes of network downtime, a recurring theme is that the cabling system is at times a part of the failure mechanism. With so much depending on the reliability of your data center network it only makes sense to install a high performance cabling network system to prevent downtime and maintain full network availability.

NETCLEAR® CABLING SYSTEMS AND LAYER ZERO™ PHYSICAL INFRASTRUCTURE ARE THE ANSWER.

Engineered to provide unparalleled reliability for networks running at 100 Mbps to 100 Gbps, each NetClear system offers transmission performance independently verified and guaranteed to provide performance headroom above industry standards. This headroom ensures business critical applications operate error free with a minimized chance of down time. NetClear cabling systems are installed by trained Certified Installers and backed by a comprehensive 25-year system and applications assurance warranty.

NETCLEAR® GTX CATEGORY 6A UTP SOLUTION

NetClear GTX is the highest performing Category 6A UTP cabling system available today. Designed to optimize the performance of 10Gbps Ethernet with a signal to noise ratio margin that exceeds the IEEE 10GBASE-T requirements, NetClear GTX cabling systems ensure that systems ranging from point of sale or financial transactions to medical and life safety, stay up and running.

NetClear GTX delivers true end-to-end 10G performance over a component and channel compliant Category 6A UTP system.

- Provides guaranteed end-to-end 10Gbps support for channels from 7-100meters
- Full backwards compatibility supports legacy 1G applications and transitions to 10G
- Small, round design of LANmark-10G2 allows for accurate tray fill calculations and effortless cable management
- Optimizes the performance of 10Gbps Ethernet with a signal to noise ratio margin that exceeds the IEEE 10GBASE-T requirements
- Fully standards-compliant to ANSI/TIA 568-C.2 and IEEE 802.3an for 10GBASE-T

NetClear GTX Components

Berk-Tek® Horizontal Cable

- LANmark™-10G2 UTP cable

Ortronics Connectivity

- Clarity® 10G UTP TracJack® modular jacks and outlets
- Clarity 10G patch panels
- Clarity 10G UTP patch cords

NETCLEAR MM10 MULTIMODE FIBER SOLUTION

NetClear MM10 uses the most advanced OM3 and OM4 optical fiber and low-loss connectivity to ensure guaranteed 10G performance today and 40G/100G performance when needed. It offers users flexibility to build networks that guarantee availability of applications for the long-term.

- Ensures link loss budgets and bandwidth to support today's 10G and tomorrow's 40G/100G networking speeds
- Multifiber MTP to MTP* backbone cables and Momentum® cassettes to support 10, 40, and 100G Ethernet speeds.
- GIGAlite® optical fiber provides a clear migration path forward as throughput needs increase
- OM3 systems will support 10G to 300 meters and 40/100 to 100 meters
- OM4 based systems support 10G to 500 meters and 40/100G to 150 meters
- Berk-Tek Micro Data Center Plenum (MDP) cabling provides the highest concentration of optical connections in the smallest package available, with no preferential cable bend issues
- Harness assemblies support high-density SAN switch patching, enable rapid scaling and gradual build-outs and improve capital management

*MTP is a registered trademark of US Conec

Channel Components

Berk-Tek Cable with GIGAlite-10, -10XB Fiber

- PD Series—Premise Distribution Cable
- Adventum™ Series Indoor/ Outdoor (Riser/Plenum) and OP Series (Outside Plant)
- Micro Data Center Plenum (MDP) Backbone cable
- All cables available as a pre-terminated cable assembly

Ortronics Connectivity

- OptiMo® Pre-Polished and Anaerobic
- Field-Installable Connectors
- 615 Series Surface Mount Fiber Cabinets
- FC Series Rack Mount Fiber Cabinets
- TracJack® or Series II® Fiber Modules/Outlets
- OptiMo Fiber Optic Patch and Interconnect Cords
- Momentum® 2 and Momentum 3 Pre-terminated MTP/MPO Cassettes

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NetClear Solutions

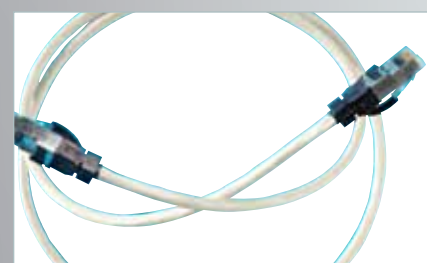
for Every Application

NETCLEAR GTS 10G F/UTP SOLUTION



The NetClear® GTS system was the first system to offer full IEEE standards compliance and guaranteed 10 Gb/s support. The system fully complies with the IEEE 802.3an standard's signal-to-noise ratio and alien crosstalk specifications, for 10GBASE-T. NetClear GTS is high performance without limits.

The LANmark™-6 FTP cables are Category 6 cables constructed of four twisted pairs under a common foil shield which offers performance advantages over UTP. F/UTP virtually eliminates noise from external sources, including alien crosstalk. Clarity® 6 shielded jacks are ETL verified TIA Category 6 components and are center tuned to Clarity 6 shielded patch cords for optimum performance.



NetClear GTS Components

Berk-Tek® Horizontal Cable

- LANmark™-6 FTP cable

Ortronics® Connectivity

- Clarity 6 FTP TracJack modular jacks and outlets
- Clarity 6 FTP patch panels with Clarity 6 TracJacks
- Clarity 6 FTP patch cords



NETCLEAR GT3 PREMIUM CATEGORY 6 UTP SOLUTION

The NetClear® GT3 structured cabling system gives you a cabling solution that provides an unsurpassed margin of additional performance over Category 6 requirements with guaranteed and verified channel performance 8 dB above all Category 6 crosstalk requirements and 6 dB above all Category 6 return loss requirements for standards compliant designs and installations.

The Premium Category 6 NetClear GT3 solution has successfully transmitted error free data in some of the most challenging conditions. These include channels in the presence of electrical fast transient noise, as well as in unusually hot environments – all of which can be found in today's data centers.

NetClear GT3 Components

Berk-Tek® Horizontal Cable

- LANmark™-2000 UTP, Plenum/Non-Plenum

Ortronics® Connectivity

- Clarity® 6 TracJack® and Series II® Modular Jacks/Outlets
- Clarity 6 Modular 110 Patch Panels
- Clarity 6 Patch Cords with Paralign™ 2 Plug Design



NETCLEAR SM SINGLE-MODE FIBER SOLUTION

NetClear® SM single-mode fiber solutions are guaranteed to support Gigabit Ethernet, 10 Gigabit Ethernet and 40/100 Gigabit Ethernet in mission-critical environments such as Data Centers, SANs and LANs.

The NetClear SM fiber solution was developed to facilitate advanced network requirements. NetClear SM offers backbone and campus fiber solutions that guarantee performance and network longevity.

The NetClear SM solution is supported by Berk-Tek single-mode fiber, which exceeds the requirements of EIA/TIA and ITU-T G.652D for low water peak single-mode fiber. Low attenuation and superior fiber geometry also allow for low-loss fusion splicing and improved results during field termination.

NetClear SM Components

Berk-Tek® Cable

- Pre-terminated cable assembly
- PD Series–Premise Distribution Cable
- Adventum™ Series Indoor/Outdoor (Riser/Plenum) and OP Series (Outside Plant)
- Micro Data Center Plenum (MDP) Backbone Cable

Ortronics® Connectivity

- OptiMo® Pre-Polished and Anaerobic Field-Installable Connectors
- FC Series Rack Mount Fiber Cabinets
- 615 Series Surface Mount Fiber Cabinets
- OptiMo Fiber Optic Patch and Interconnect Cords
- Momentum® 2 and Momentum 3 Pre-terminated MTP/MPO Cassettes



NetClear Solutions for Every Application

Holistic design and development for optimal performance at every speed

Though most data center builds and expansions today merit the installation of infrastructure elements to support data transmission rates of 10G and beyond, every project and organization is unique. For those not yet ready to install higher speed infrastructure, NetClear Solutions provide high-performance, superior quality systems designed to support every transmission rate.



Berk-Tek
132 White Oak Road
New Holland, PA 17557
Tel: 800-BERK-TEK, 717-354-6200
Fax: 717-354-7944
www.berktek.com

Legrand | Ortronics
125 Eugene O'Neill Drive
New London, CT 06320
Tel: 800-934-5432, 860-445-3900
Fax: 860-405-2992
www.legrand.us/ortronics

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