Dell end-to-end Rugged ecosystem: Performance, durability and reliability in any environment

May 2015
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Dell provides an unmatched end-to-end rugged portfolio that packages hardware, accessories, security, manageability and support

Executive summary
Dell provides a complete ecosystem of end-to-end solutions ideal for industry and military uses while continuing to build out its deep product line of ruggedized solutions, including desktops, notebooks, servers and accessories. No other Tier 1 vendor can match Dell's end-to-end rugged OEM solutions when paired with its support, software and established OEM programs. The lower total cost of ownership associated with rugged products and replacement parts availability increases value to OEM customers looking to sell in high-demand industries where users require durable, high-performance rugged devices. Dell also extends its capabilities through OEM customers such as Tracewell Systems, which provides Form Factor Engineering services that ruggedize PowerEdge FX architecture products.

Dell’s Latitude Rugged Extreme notebooks, PowerEdge R420xr servers and OptiPlex XE2 desktops, all based on Intel technology; provide the needed durability to withstand environments from the production floor to a remote cell tower to an active warzone. Shock-resistant polymers, reinforced magnesium alloy chassis, port doors and compression gaskets make Dell’s line of Rugged products equipped to handle some of the harshest environments. Dell created its line of Rugged accessories, such as the vehicle docking station, for use by military and first responder vehicles that require durability and mobility. Dell can meet the needs of any industry due to the assistance of its global support team members.

To ensure the rugged capabilities meet the heightened needs of industry clients dealing with extreme conditions, Dell subjects its Rugged product line to several United States Military standard testing procedures, including MIL-STD-810G and ingress protection test standards set by the International Electrotechnical Commission. As part of MIL-STD-810G, Dell tests operational altitude, operational temperature ranges, thermal shock, rapid temperature changes, solar radiation, blowing rain resistance, humidity resistance, salted fog resistance, sand and dust resistance, explosive atmosphere compliance, and vibration standards. Ensuring compliance with military standards makes Dell Rugged products equipped to handle environments in any industry.

Devices in industry and field use are subject to extreme conditions, including temperature, weather, vibration and impact, and the cost of replacing standard commercial units is a key pain point for end customers and can affect their decision to purchase a particular product or solution. Ensuring IT simplicity is difficult due to the high turnover rates of commercial models, which adds to overall operational costs. Furthermore, the time it takes to replace commercial units adds downtime for the system and the resources that rely on these critical systems. According to independent research, commercial notebooks show a failure rate 4.5-times higher than rugged notebooks. The availability of off-the-shelf replacement parts and low turnover rate on rugged models means IT departments can address repairs easily, reduce downtime and reduce IT complexity, lowering their total cost of ownership.

Dell leveraged its history of reliable rugged products built off of Intel technology, trusted service and support, and expansive OEM customer base to create an unmatched end-to-end rugged ecosystem that will enable OEM customers to sell into any industry.

“Being able to interact with OEM engineering really locked up our decision.”
— Dell Rugged Partner
What makes up Dell’s Rugged portfolio?

Industry users are always on the lookout for devices that can perform in the extreme and hazardous environments associated with everyday field use. Dell’s expansive line of rugged devices, accessories support and services enable OEMs to capture opportunities in these high-demand customer pools. Dell’s Rugged product line is built to meet demanding conditions across industries, backed by rigorous third-party testing and proven in-the-field reliability. Dell provides the products, services and support that enable OEMs to stand out among competitors.

Enterprise Solutions

Dell PowerEdge R420xr

Reliability in the field is of the utmost importance; whether for civilian use in the telecommunications industry or military use in a warzone, dependability is critical. Dell PowerEdge R420xr delivers the standard PowerEdge performance based off Intel technology, but with ruggedized features equipped to meet the demands of harsh working environments. With reduced power requirements, a 20-inch rack depth and a starting weight of 26 pounds, PowerEdge R420xr boasts enterprise-level power, backed by its Intel Xeon E5-2400 v2 processors, in a small and portable package. The small size paired with its optional ruggedized sliding rails makes PowerEdge R420xr ideal for standard four-post racks or for easy installation in transit cases for military use. Dell PowerEdge R420xr servers are also built to meet industry-level requirements, as they are shock and vibration resistant, allow for continuous operation in temperatures up to 113 degrees F (45 degrees C), and are NEBS Level 3, ETSI and MIL-STD-810G compliant. Dell also provides an MIL-S-901D-compliant chassis configuration option for the R420xr, which covers high-impact shock testing for shipboard machinery, equipment and systems. Dell PowerEdge R420xr is built for cross-industry use in military, telecommunications, energy, heavy industry and healthcare fields and is suited perfectly for deployments in mobile command centers, control-room system, production floors, remote substations, base stations, mobile cell site and cell towers.

Tracewell-FX

Through a joint effort with Tracewell Systems, Dell provides server products based on its FX architecture and powered by Intel Xeon processors in a Ruggedized form. By using Tracewell’s Form Factor Engineering, Dell FX products are engineered to meet heightened demands related to power consumption, cooling, shock, vibration and weight constraints. Through this collaboration, OEM customers are able to take advantage of a powerful FX platform that enables rapid scalability with the needed performance to meet workload demands. Furthermore, the dual-drive configuration that supports HDD and SSD enables users to tailor system performance to needs, whether new innovative applications or more traditional core business applications. Dell FX architecture blends the modularity of blades and the manageability of racks to create a modular system that provides a cost-efficient, high-performance server environment. Paired with the Form Factor Engineering services provided by Tracewell, industry users can take advantage of cutting-edge architecture that is designed to meet the heightened demands of field deployments.

End-user Solutions

Dell Latitude Rugged Extreme notebooks

Performance, portability and durability are critical in harsh environments and in extreme conditions that are typical of industrial work sites. Dell’s Latitude Rugged Extreme family of notebooks and convertibles is built to meet the heightened needs of industry clients, combining first-class computing performance with military-grade durability, capabilities and features. Based off Intel’s fourth-generation Haswell Core processors, with up to 16GB of DDR3L memory and a solid-state drive of up to 512GB, the Latitude 12 and 14 Rugged Extreme notebooks pack enough power to meet the needs of any industry. Additionally, intensive 3D modeling and CAD programs will no
longer hinder processing power in the Latitude 14 Rugged Extreme due to the available discrete graphics via the NVidia NVS 4200M. Along with the power and performance Latitude Rugged Extremes offer, the durability and capabilities of the notebooks are put through a bevy of extreme-conditions testing, including MIL-STD-810G and MIL-STD-461F, and can operate in temperatures of -20°F to 145°F (-29°C to 63°C). Latitude 12 and 14 come equipped with outdoor-readable displays and glove touch screens, while Latitude 12 boasts a rugged hinge for its convertible feature. Furthermore, the compact design of Latitude 14 Rugged Extreme (2.03-inch thick, 7.79 pounds) and Latitude 12 Rugged Extreme (1.6-inch thick, 5.8 pounds) ensures the Latitude Rugged Extreme family of notebooks provides the needed power when product dimensions are a concern.

**Dell OptiPlex XE2 desktops**

Despite the shifting trend toward mobility, there is still a need for powerful desktops equipped to handle abnormal operating conditions. Dell OptiPlex XE2 packages fourth-generation Intel Core processors, up to 32GB of DDR3 ram, up to 2TB of storage on solid-state drives or solid-state hybrid drives and optional discrete GPUs into a ruggedized chassis meant for deployment in demanding environments. Dell OptiPlex XE2 also features heightened security features including smart card keyboards and added security locks. OptiPlex XE2 provides the option for the small form factor (SFF) or the mini tower (MT) models and is rated for operation in up to 113°F (45°C). All of Dell’s OptiPlex desktops allow for customization to help OEMs create branded products from the BIOS to the packaging to build brand value among customers.

**Cloud Client-Computing**

Through Dell’s selection of cloud client-computing and Wyse thin and zero client offerings, industry users can meet performance demands while conserving space and power. Due to the nature of thin and zero client deployments, the need for on-site desktops and workstations is a thing of the past. Wyse thin and zero client deployments reduce the power consumption of traditional workstations, fit into small spaces due to their reduced internal components and are easily managed from remote locations.

The compact nature of Dell’s wide array of thin and zero client offerings is ideal for industry use, particularly for remote telecommunications or oil/gas deployments, due to robust management capabilities provided through the Wyse Device Manager. The Wyse Device Manager provides options that allow users to centrally manage over 100,000 thin and zero client deployments, engage in secure, encrypted communication with every device, asset tracking, policy management, remote user support and remote device management for quick restarts.

Cloud client-computing ensures security of mission critical applications and data. With no data or applications running on the endpoint, your customer’s data, or critical military data is stored out of harm’s way. While Wyse thin and zero offerings provide the needed computing power on-site, data and applications are contained and secured within the data center at an off-site location. No longer will sensitive data and applications be stored in remote locations and highly vulnerable to security breaches. Through Dell cloud computing and Wyse thin and zero client products, Dell’s industry-ready ecosystem of end-to-end solutions can fulfill any need across verticals.

**Rugged accessories**

As part of its Rugged portfolio, Dell provides a selection of ruggedized accessories ranging from carrying cases to desk and vehicle docking stations. To support the Latitude Rugged Extreme family of notebooks, in conjunction with Havis, Dell produced a rugged vehicle dock in a basic and advanced model. The rugged vehicle dock underwent rigorous testing. It is MIL-STD-810G and SAE J1455 compliant, and both models include USB, speaker and headset outputs. On the advanced rugged vehicle dock, HDMI and VGA ports as well as Serial DB9 ports are available. Rugged vehicle docks are ideal for mobile operations, including military uses and first responders. Dell also provides the option for alternative batteries that provide longer run times depending on model and need as well as options for rugged sliding rails for racks and transit cases for the Dell PowerEdge R420xr server.
Support services
Rounding out the Rugged ecosystem is ProSupport, Dell’s recommended support option for all products in the Rugged portfolio. ProSupport offers consistent, high-quality support in 55 languages and to customers in over 100 countries. With features such as 24/7 access to Dell’s OEM technical experts, collaborative support on a range of third-party hardware and software, user-defined severity levels, escalation management, and a range of response time options, customers can tailor ProSupport to meet the needs of their specific environment.

One element ProSupport does not cover is accidental damage. Ruggedized notebooks are, by definition, mobile and are used typically in difficult and challenging conditions, making them especially susceptible to drops, falls and accidental spills. Dell Accidental Damage Service for notebooks protects your Latitude notebook investment from most accidents and can offer peace of mind for hardware systems exposed to high-risk usage and environments.

What ecosystem of software does Dell provide around the Rugged product portfolio?
Dell’s Rugged offerings center on the hardware and the entire ecosystem of software, support and services to make Dell an unmatched Tier 1 provider of end-to-end rugged solutions. Through strong software offerings that cater to key industry needs such as remote management and endpoint security, Dell’s Rugged product portfolio provides the necessary software suites that improve management, security and functionality regardless of industry or application. The added access to robust cloud computing solutions as well as thin and zero client deployments enable industry users to deploy highly secure, compact, low-power computing products without compromising performance.

Integrated Dell Remote Access Controller
Every Dell PowerEdge server comes equipped with an Integrated Dell Remote Access Controller (iDRAC) that enables users to deploy, update, configure and monitor their Dell PowerEdge servers. This is a critical feature for servers deployed in military, energy and telecommunications industries due to the remote nature of server deployments. PowerEdge servers deployed at remote cell towers, oil platforms or substations can be configured, updated and monitored without having to deploy resources to remote locations, saving time and money for the management of critical systems.

Dell Endpoint Security Suite
Dell’s newly announced Endpoint Security Suite will provide threat protection, authentication and data encryption through a single management console. The security suite will include preset policies and reporting templates as well as consolidated reporting features for easier management, and will be flexible for centralized management and easy deployment. Centralized management capabilities will be vital in managing security procedures for endpoints that are deployed in remote locations.

How does Dell ensure Rugged products perform beyond normal operating conditions?
Dell’s Rugged products are built to withstand extreme conditions and meet the increased demands associated with field use, regardless of industry. All Dell Rugged products are subject to United States Military standard testing to demonstrate that if these products are durable enough for military applications, they can meet the needs of any industry. Along with high levels of military testing, Dell Rugged products are built using impact-resistant polymers, sealed doors and compression gaskets to create a tight, particle-resistant shell.

Testing
Dell subjects all of its products to MIL-STD-810G testing that measures across a multitude of areas. MIL-STD-810G tests include multiple altitude tests, operational ranges in high and low temperatures, thermal shock, rapid temperature changes, solar radiation, blowing rain resistance, humidity resistance, salted fog resistance, sand and dust resistance, explosive atmosphere compliance, vibration standards, and shock resistance up to six feet. Dell Rugged products are also subject to IEC 60529 testing, which measures the units resistance to dust and water to ensure the seals are not compromised by outside particles or liquids. Furthermore, all products are certified for safe operation in hazardous locations and are measured for radiated emissions, electrostatic discharge and electromagnetic interference.

**Ruggedized features**

To meet compliance with the multitude of tests that Dell Rugged products are subjected to, Dell builds its Rugged products using standard Dell off-the-shelf parts, but with ruggedized components to ensure parts availability while delivering the durability needed for industrial and field use. Dell Rugged products are built using shock-resistant polymers to guard against drops, a reinforced magnesium alloy chassis to keep components securely in place, and port gates and compression gaskets to prevent dust and particle ingress.

**Why use Dell Rugged products and Dell OEM solutions?**

Dell has been serving OEM customers for more than 15 years through its end-to-end product portfolios and global capabilities. It is the only Tier 1 vendor to offer a comprehensive ecosystem of support, service and global availability around a robust rugged portfolio. Dell pairs its capabilities and products to enable its more than 2,000 worldwide OEM customers in more than 40 industry verticals to stand out among competitors.

**Total cost of ownership**

Total cost of ownership plays a critical role in IT decision making when it comes to evaluating products. According to TBR’s 4Q14 Corporate IT Buying Behavior & Customer Satisfaction studies, server, notebook and desktop customers rated total cost of ownership as a critical attribute when considering their overall satisfaction with their selected products. Furthermore, independent research concluded that the annual failure rate of commercial-grade notebooks is around 27% compared to the 5.9% annual failure rate of rugged notebooks. Independent research also found commercial notebooks have a 57% higher total cost of ownership than rugged notebooks due to those high failure rates. Dell Rugged products are built to handle the extreme conditions and provide lasting cost benefits that commercial- and business-grade laptops cannot match.

**Replacement parts availability**

As seen with total cost of ownership, respondents in TBR’s 4Q14 Corporate IT Buying Behavior & Customer Satisfaction studies highlight the importance of replacement parts availability. Desktop and notebook users rate replacement parts availability as critical, while server users still rate the attribute as an important factor in overall customer satisfaction. Despite the rugged design features, hardware failures will occur, and when replacement parts are needed, it is critical to business operations to get systems up and running. Dell’s tested global supply chain and top replacement parts availability scores in customer satisfaction across desktop, notebook and server users in TBR’s 4Q14 Corporate IT Buying Behavior & Customer Satisfaction studies demonstrate Dell’s ability to meet part needs on a global scale.

**OEM programs**
Dell maintains several OEM programs that enable OEM customers to take advantage of its global scale, supply chain and support while also promoting their brands through customized hardware and branded products. Through Dell’s OEM Ready and OEM Branding programs, OEMs are provided services through Dell to take generic Dell hardware and add customized logos, software packages, branded BIOS splash screens and support options to provide a branded experience to their customers. Through the Dell OEM XL program, OEM customers can receive expanded stability through consistent BIOS, firmware, CPUs, chipsets, network adapters, hard drives and controller and interface updates. Dell OEM XL customers will also receive expanded product information, expanded support options and an extended end-of-life schedule of 12 months past the immediate replacement date.

Conclusion
Dell aims to serve the cross-industry needs of performance and durability in extreme conditions and hazardous environments. Through its end-to-end portfolio of rugged solutions that draw on a wide array of products, services and support, Dell blends its unmatched rugged capabilities with established OEM solutions and expertise to create true value for OEM customers. By subjecting its products to rigorous military-grade testing, Dell ensures its hardware is capable of meeting specifications for warzone deployment and demanding industrial uses. The strength of Dell’s products, based off Intel technology, software and support paired with replacement parts availability and lower total cost of ownership demonstrates why Dell is the only Tier 1 vendor capable of delivering a true end-to-end rugged solution.

For more information on Dell Rugged testing standards
Dell makes the following independent research and testing results that are referenced in this document available in PDF format upon request:
- Latitude Rugged Extreme Summary of Independent Environmental Testing
- Latitude 14 Rugged Summary of Independent Environmental Testing
- Latitude Rugged Extreme Cycle Testing Summary
- PowerEdge R420xr MIL STD 810G 901D Test Summary

About TBR’s quarterly Customer Satisfaction (CSAT) studies
Technology Business Research Inc. (TBR) measures the expectations, satisfaction and loyalty of enterprise customers in its quarterly CSAT studies. TBR surveys more than 900 individuals responsible for the purchases of notebook PCs at North American enterprises with more than 500 employees on a quarterly basis. TBR ranks major vendors in each form factor area through a series of indices including sales satisfaction, product satisfaction, service satisfaction and loyalty.

About TBR
Technology Business Research, Inc. is a leading independent technology market research and consulting firm specializing in the business and financial analyses of hardware, software, professional services, telecom and enterprise network vendors, and operators.

Serving a global clientele, TBR provides timely and actionable market research and business intelligence in formats that are tailored to clients’ needs. Our analysts are available to further address client-specific issues or information needs on an inquiry or proprietary consulting basis.
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