

THE FOLLOWING IS AN EXECUTIVE WHITE PAPER ON:

SERVER APPLIANCES – A PACKAGE DEAL

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MICROSOFT IN THE EMBEDDED INDUSTRY – LONG HISTORY, DEEP ROOTS, MARKET LEADERSHIP

Embedded systems technology has been around for many years. The types of devices that constitute an embedded system come in a variety of form factors. Historically, these embedded devices were standalone and represented islands of information.

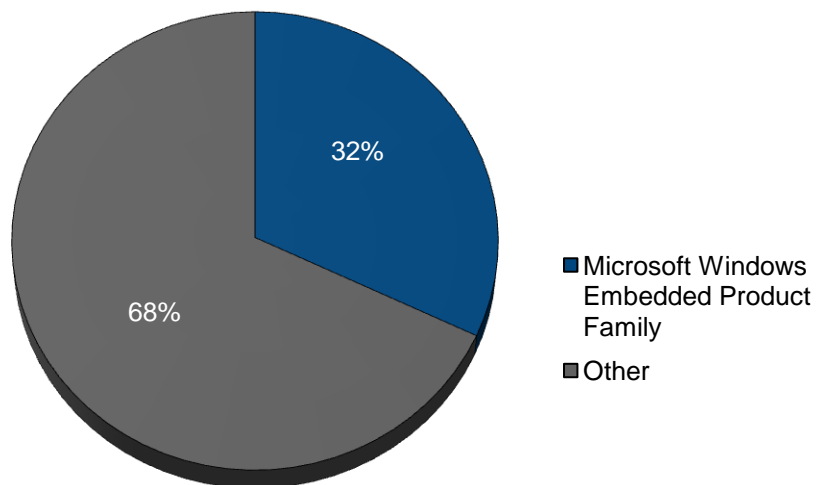
Microsoft has been a long-term trusted supplier of software solutions in the embedded system market, achieving a position of leadership in the market by offering a family of operating system platforms that leverage the familiarity and popularity of Microsoft software development toolsets and end user experiences. The strategic goal amongst all of these platforms is to offer a scalable environment of building blocks that enables familiar interfaces, rich applications, and services targeted at next generation devices.

Wrapped around all of these platforms is a worldwide ecosystem of strategic partners, a large and growing developer community, and the longevity, financial support, and well-known Windows brand that offer a variety and choice to device manufacturers based on a broad set of specialized device design types.

Since its entry into the embedded market, Microsoft has built momentum with device manufacturers through their platforms for both small, resource-constrained non-x86 based (such as ARM) devices and devices that can benefit from an x86 architecture. Over time, Microsoft's embedded business unit has continued to adapt to the forces and trends within the market and executed on their product, partner, and support strategies and has obtained a leadership position within the embedded software market.

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Worldwide Shipments of Embedded / Real-Time Operating Systems & Related Services in 2009
(Percent of Dollars)



Source: VDC Research Embedded Software & Tools 2010 Market Intelligence Service Track 1: Embedded Software Engineering Market Technologies Volume 1: Embedded/Real-time Operating Systems

The Windows Embedded product family includes a broad product portfolio of platforms

Today, embedded device manufacturers continue to face pressure to rapidly deliver more complex products with increasingly advanced capabilities. The Windows Embedded product family includes a broad product portfolio of platforms that span the needs of a number of vertical markets and device types from real-time severely constrained to fixed-purpose scenarios including server appliances:

- Windows Embedded Compact ;
- Windows Embedded Standard ;
- Windows Embedded Automotive ;
- Windows Embedded POSReady;
- Windows Embedded Handheld;
- Windows Embedded Enterprise; and
- **Windows Embedded Server.**

SERVER APPLIANCES

What is a server appliance? Server appliances, as fixed-function devices, represent a broad set of use cases that have become increasingly popular because of quick installation, simple maintenance, and high reliability.

These devices come prepackaged in many cases with an operating system, a database, network connectivity, and application software configured and integrated on custom, or off-the-shelf hardware platforms. This device category is becoming important to enterprise IT organizations as server hardware shipments increase worldwide and organizations look to take advantage of seamless integration in enterprise IT infrastructures.

Server appliances can be broad-based/horizontal, serving IT infrastructure needs across industries, or optimized to support specific industry requirements that can be stand-alone, or connected to infrastructure servers and services. Applications can include medical, security and surveillance, factory/plant automation, telecom infrastructure, network security, retail in-store appliances, and many others.



Windows Embedded Server is a fully functional version of Microsoft's commercially available Windows Server

For enterprise IT organizations, the potential benefits of server appliances include factors such as lower cost of ownership, ease of integration into an enterprise environment, regulatory compliance and dedicated or fixed function support on either a custom or off-the-shelf hardware platform as a turnkey solution.

MICROSOFT WINDOWS EMBEDDED SERVER

Windows Embedded Server is a fully functional version of Microsoft's commercially available Windows Server that includes built-in security, reliability, and availability and is licensed to embedded systems manufacturers for use in devices such as dedicated embedded server appliances. This foundation offers OEMs scalability, optimization, long-term product availability and support, and the possibility to achieve faster time to market. For IT organizations, this can translate to system stability, simple management, lower operational costs, customization options, and the ability to integrate applications and systems with critical data from edge devices with existing Windows infrastructure.

For many IT organizations, there is also a level of familiarity with Windows-based development and the tools being used from Microsoft including: Visual Studio 2010, SQL Server, and .NET – and – support through various channels including MSDN, Microsoft's partner ecosystem, and the greater developer community around Windows.

MARKET OPPORTUNITIES

Technology has continued to move toward the center of the ways in which consumers and business are interacting with and exploring their environment. By 2015, VDC estimates that greater than 10 billion connected devices will be produced per year. Consumers' and businesses' growing expectations for interconnectivity will need to be buttressed by an underlying support network capable of real-time data storage and analytics.

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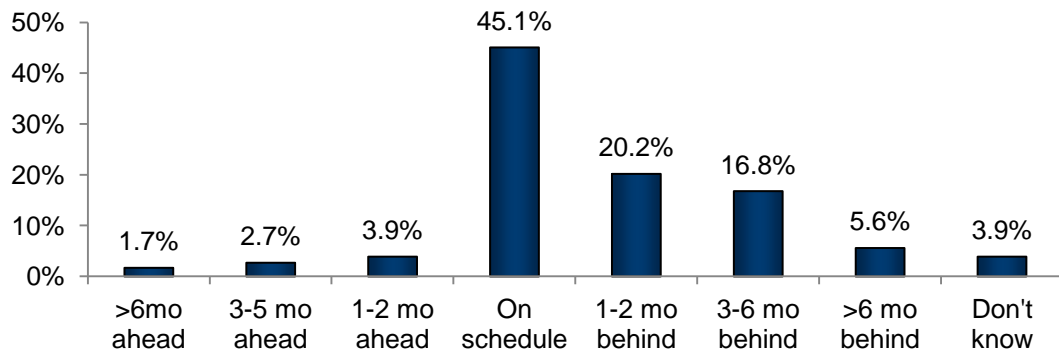
Software development already represents greater than 50% of total embedded project development costs. Although interconnectivity has become a given in some applications such as factory automation monitoring or telecommunications infrastructure, many other embedded device classes, however, are just beginning to have the internal resources capable of supporting this next level of functionality. As more and more of these devices are required to incorporate these new features, engineering organizations will be forced to once again reevaluate the build versus buy paradigm.

Many embedded design projects are already falling short of meeting their ever tightening time-to-market goals. Based on VDC's 2010 embedded engineer survey, greater than 42% of current development projects are behind scheduled completion and the major factors most attributable to late projects include:

- Changes in specifications;
- Lack of manpower;
- Customer changing requirements; and
- Unrealistic schedules.

Time-to-market is a constant pressure point for OEM development schedules especially in light of unrealistic schedules that are management-mandated. Fixed-purpose scenarios such as server appliances offer OEMs an integrated commercial software solution, such as Windows Embedded Server, and commercial-off-the-shelf hardware that can help minimize risk to schedule and jump-start IT organizations development of their application or integration of a vast ecosystem of available applications.

Current Project Development Schedule Completion
(Percent of Respondents)



Within this server appliance segment, Scalable Edge Nodes (SEN) is an emerging new class of server appliance.

Within this server appliance segment, Scalable Edge Nodes (SEN) is an emerging new class of hardware platform that incorporates the density of an appliance with the flexibility of an embedded computer to enable mission critical applications including control applications and migration to cloud services. These devices reside on the edges of networks or local points - of presence enabling embedded application migration to cloud-based models – enterprise, factory, laboratory, retail floor, etc. – and offer the same prepackaged solution benefits to OEMs and IT organizations as server appliances in general.

Based on a recent VDC survey of Information Technology (IT) users who have deployed an SEN platform, the type of applications vary and include supporting direct links to enterprise IT infrastructure, security, financial management, custom specific applications, and others. Considering these types of applications, it is no surprise that the top three requirements that needed to be satisfied in selecting an SEN platform include bandwidth, high availability (five 9s) and ease of use/support.

However, migrating traditional enterprise class infrastructure to SEN platforms is not without challenges to IT users faced with a complex installed base and choices on where to invest. These challenges include selecting/creating the right software framework and hardware and integrating legacy enterprise and embedded software and hardware.

Server appliance is a device class that looks to abstract the complexity of hardware and software in a package deal that offers benefits to software providers, OEMs, and IT organizations

In particular, the challenges associated with the integration of legacy enterprise systems and embedded devices comes to the forefront as IT user respondents within the same survey cite that greater than 50% of embedded computers deployed in their company's enterprise are not connected to their enterprise infrastructure. Increasingly, software and network integration will be drivers for IT users seeking out various partners who can offer integrated software frameworks and hardware platforms upon which their applications are developed, deployed, and connected.

We expect that end-to-end integrated software frameworks such as those offered by Microsoft can only become increasingly valuable to organizations attempting to combat schedule, resource, connectivity, and system requirement challenges.

CONCLUSIONS

Finite boundaries that once existed between embedded, desktop and IT are blurring as user expectations have driven diverse technologies to evolve into flexible platforms capable of supporting a wide range of functionality. The design of highly sophisticated systems has become the norm with the complexity of both software and hardware platforms continuing to advance.

Server appliance is a device class that looks to abstract the complexity of hardware and software in a package deal that offers benefits to software providers, OEMs, and IT organizations. As a global technology leader, Microsoft offers Windows Embedded Server as a platform that offers OEMs a reliable foundation to deliver server appliances. The evolution of embedded system functionality will continue to place greater value on those solutions that can provide the backbone for device interconnectivity, enhance system reliability, and speed time-to-market beyond what can be accomplished efficiently by already overly burdened engineering teams.

ABOUT VDC RESEARCH GROUP

VDC Research Group (VDC) is a technology market research and strategy consulting firm that advises clients in a number of technology markets including: Automatic Identification and Data Collection, Embedded Hardware and Systems, Embedded Software and Tools, Industrial Automation and Control, Mobile and Wireless, and Power Conversion and Control. Using rigorous primary research and analysis techniques, the firm helps its clients identify, plan for, and capitalize on current and emerging market opportunities. We strive to deliver exceptional value to our clients by leveraging the considerable technical, operational, educational and professional experience of our research and consulting staff. During our nearly four decades of ongoing operation, we have had the pleasure of serving most of the world's leading technology companies, many high-profile start-ups, and numerous blue-chip early and later stage investors. Our products and services consist of research reports, annual research programs, and custom research and consulting services. Founded in 1971, the firm is located in the Boston area. Please visit our website at www.vdcresearch.com to learn more.

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