

WHITE PAPER

Recognizing the Value of Remanufactured Equipment

Sponsored by: Sun Microsystems

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EXECUTIVE SUMMARY

IT managers are responsible for assembling and maintaining a collection of server systems that meets the computational needs of the enterprise efficiently and reliably. They are also responsible for managing to a budget and stretching that budget as far as possible. When servers are needed to support the most critical and demanding workloads, the IT department has historically purchased new equipment. As new systems replace existing ones, IT planners migrate legacy servers to support less critical, less demanding workloads. The result is a collection of servers matched to meet enterprise requirements in a cost-effective manner.

As IT departments face increasing capacity demands and tightening budgets, an interesting question arises. Is it possible to acquire more legacy systems without losing system reliability? The answer is yes. Current- and previous-generation servers — tested, certified, and with warranty for reuse — are available. As expected, there are direct cost advantages — used equipment is less expensive to buy. Indirect costs are lower as well because the IT staff is familiar with how to integrate legacy servers into the overall IT architecture. The availability of current-generation used servers has provided IT managers with an alternative to new.

The market for used equipment is clouded by products that do not carry system supplier warranties, service eligibilities, or right-to-use licensing and that are not manufactured to customer requirements. IDC encourages IT organizations to weigh all costs and liabilities when choosing among new and used products.

Sun Microsystems offers remanufactured equipment that is manufactured to "like new" standards to ensure customer expectations for high-quality performance. As an ongoing practice, Sun regularly reviews service records to confirm that its remanufactured equipment is as reliable as its new equipment. Sun ensures that the bill of materials conforms to critical revision requirements to further reduce risk of failure. As an added value, the same licensing, warranties, and service agreements that are offered on Sun's new products are offered on Sun's remanufactured products at no additional cost. Remanufactured equipment is sold and supported by Sun's direct sales and VAR channels into the global IT product marketplace.

It has been estimated that the used equipment market for Sun hardware is \$1 billion annually. Therefore, for over 15 years, the company has invested in growing this product line to be an integral part of its global sales strategy. "Like new" is Sun's conclusion after its studies of remanufactured hardware reliability showed scant problems with tens of thousands of products successfully deployed to carry many different enterprise workloads.

Introduction

Times have been tough, and IT budgets are under especially careful scrutiny. The old rule of thumb that every new application requires a new server is no longer always true. Both business and IT managers have realized that many enterprise applications simply do not need the performance advantages offered by the newest high-performance server. IDC believes that IT is in the era of "adequate" computing. "Adequate computing" means that as long as the IT organization and its customers are entirely pleased with system performance and availability, a mix of new and less expensive used servers makes good business sense.

IDC investigated user attitudes about used equipment in two initiatives: a series of focus groups conducted in North America, Europe, and Asia and a collection of in-depth interviews with users who have integrated remanufactured hardware into their datacenters. In the in-depth interviews, IDC found that users expect remanufactured equipment to be as reliable as new and are increasingly willing to use remanufactured equipment in support of mission-critical workloads. IDC also found that workloads such as back-office batch applications, software development, and testing are commonly hosted on remanufactured equipment. Respondents also favor remanufactured equipment for unbudgeted projects with marginal ROIs and as replacement equipment for legacy systems.

Remanufactured Products from Sun

For over 15 years, Sun has offered a wide range of remanufactured servers and workstations through its direct sales force and authorized resellers. These products are distributed worldwide by the same sales force that offers new products and Sun services. Remanufactured equipment is offered to all customers, including the largest and most important IT organizations, government agencies, and those served by Sun's authorized resellers.

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Sun's Remanufacturing Process Ensures Quality

Sun has refined its remanufacturing process to ensure that remanufactured products have the same high level of quality as its new equipment. Details of the process are as follows:

- ☒ Product is received, dekkitted, and audited. At this point, serial numbers are recorded to provide traceability during testing and throughout all factory processing.
- ☒ Prior to integration, components are individually inspected and tested. Revision levels are screened to meet field serviceability requirements.
- ☒ Sun's proprietary testing procedures are an integral part of the manufacturing process, and all systems must pass these demanding tests before moving on to the next step in the process.
- ☒ Upon successful completion of system tests, Sun quality control personnel record all internal component serial numbers and each system receives a new serial number to ensure field quality and traceability.
- ☒ Products are then given a final visual inspection to ensure a "like new" appearance. All Sun remanufactured products are packed in new packaging material that is prequalified to OEM standards for safe shipment.

Over the years, the quality of Sun remanufactured equipment has remained so high that Sun can warrant this equipment as if it were new. According to Sun, years of field maintenance data for tens of thousands of remanufactured products reveal only a small number of quality-related problems — no more than would be expected with new equipment. Sun's remanufactured equipment group has invested in quality management systems that regularly track field service activity and customer feedback.

Why Only the OEM Can Remanufacture

As descriptions of the remanufacturing process reveal, the OEM is uniquely capable of rebuilding products to the highest quality standards. Sun engineers have complete access to all of the relevant intellectual property — proprietary designs, specifications, testing scripts, and quality monitoring data. When remanufacturing servers, Sun can draw on all of the expertise developed during the manufacturing of new systems. Table 1 summarizes Sun's four-tier categories of used equipment and shows how Tier 1 remanufactured equipment compares with other categories of used equipment.

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TABLE 1

Categories of Used Equipment

	Tier 1 Remanufactured	Tier 2 Refurbished	Tier 3 Dust and Wipe	Tier 4 Where-is/As-is
Disassemble, reassemble, and upgrade to meet serviceability requirements	Yes	No	No	No
Replace failed parts	Yes	Yes	Yes	No
Clean and test	Yes	Yes	Yes	No
Configure to customer requirements	Yes	Yes	No	No
Warranty	1 year	90 days	30 days	None
Risk taker	Supplier	Shared	Shared	Consumer

Source: Sun Microsystems, 2004

Sun's Scope of Operations

Sun's remanufactured equipment business is global. Doing business in regions of the world such as South America and Asia is complex, and remanufactured equipment raises different issues for different countries. To allay concerns about quality, for example, Sun and its regional partners have developed ways to document and substantiate the standardized methods used in the remanufacturing process, to provide notarized proof of authenticity, and to explain the pricing structure for new and remanufactured equipment.

Sun's remanufactured equipment business is global.

A Business Case for Remanufactured Servers

In two research efforts supported by Sun, IDC has investigated user attitudes and behavior regarding the place of preowned IT hardware in the enterprise architecture. An extensive study was conducted in 2002 with focus groups in San Francisco, New York, London, Frankfurt, and Shanghai. A second study conducted in 2003 investigated viewpoints on remanufactured equipment with in-depth interviews of senior IT managers, system resellers, and system integrators. In both research projects, IDC selected the respondents.

"It's not a question of new versus used," said the enterprise system architect for a national telecommunications company. "After I install a server and turn it on, it's used. This is a question of providing sufficient processing for my customers at the best price point. And we're not talking about buying unreliable gear. So long as certified servers are available directly from the manufacturer at a discount over new ones, we'll be looking for ways to put them into use."

"It's not a question of new versus used. [...] This is a question of providing sufficient processing for my customers at the best price point."

When drilling down on the issues in these interviews, IDC learned more about how remanufactured equipment is put to use. For example, the IT director for a nationwide manufacturing and direct sales company explained, "When we upgrade a critical system, we demote its hardware to a lower tier in our four-tier architecture. When we need more processing in the lower tiers, and I have no legacy gear to demote, it makes good sense to buy remanufactured servers. I use remanufactured servers in the third and fourth tiers, and I would consider remanufactured servers for the second tier as well."

"When ... I have no legacy gear to demote, it makes good sense to buy remanufactured servers."

Increasingly Careful Thinking About IT Investments

Information technology has become pervasive in enterprises, and matching different workload characteristics to available technology solutions is increasingly important to IT planners. Most planners are keenly aware of the risks that need to be mitigated for mission-critical workloads.

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If customer satisfaction suffers because of slow system response times, for example, then investment in higher-performance servers is crucial. And, when the cost of downtime for a workload is measured in thousands of dollars per hour, investment in the most highly available systems is easily justified.

However, as IDC learned from IT planners, although most workloads are business critical (i.e., reliability is always important), many workloads support less demanding functions for the enterprise. These workloads are the candidates for hosting on remanufactured servers. Typical examples from our research are:

Many workloads support less demanding functions for the enterprise. These workloads are the candidates for hosting on remanufactured servers.

- ☒ Remanufactured servers are ideal candidates to replace equipment lost in a disaster. The time needed to return to business as usual may be reduced if the original hardware can be replaced with remanufactured servers running the same operating environments and configured with the same I/O and storage subsystems.
- ☒ Development, maintenance, and testing of IT systems are other functions that need not run on the highest-performance hardware available. Software systems can be tested with a fraction of the data handled under full production loads. Regression testing after maintenance upgrades can be accomplished efficiently on remanufactured servers.
- ☒ Organizations run batch operations to generate reports, summarize transactions, and prepare analyses of business operations. These batch systems are not customer facing, and ordinarily the results of batch operations are not as time sensitive. Remanufactured servers make good sense as platforms for this kind of internal workload.

Regression testing after maintenance upgrades can be accomplished efficiently on remanufactured servers.

- ☒ Unbudgeted projects are another category of unexpected workloads that may be best supported by remanufactured servers. Either these projects are at the margin when an ROI is computed, or they may be lesser business functions in need of IT support that are overlooked in the IT planning process. The cost advantages of remanufactured equipment will help minimize the overbudget impact.

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IDC believes that there is a business case for remanufactured servers. Our research indicates that the key parameters for that business case are reliability, performance, and cost:

- ☒ Respondents to our research consistently indicated that remanufactured servers need to be as reliable as any equivalent equipment in the datacenter. As one IT manager put it, "Availability is expected everywhere in the IT architecture these days. Few systems can go down without interrupting some important business function. Email is my favorite example."
- ☒ Performance is less critical, but it is still valued by the IT managers with whom IDC spoke. "I don't mind being one generation of processor behind what is available new," said one IT director. "But that's all." Another respondent indicated that he orders his remanufactured servers with current-generation processors to ensure performance.
- ☒ Remanufactured servers are an ideal solution for workloads that have outgrown legacy server capacity. A VAR explained it this way: "When you need to add more processing power for existing applications, you don't want to augment legacy servers with new ones. You want to add servers just like the ones you already have." The legacy equipment may not be available as new.
- ☒ Although cost savings is certainly a part of the business case, respondents clearly indicated that the savings would vanish if reliability or performance were compromised. "If they were unreliable, these remanufactured machines could easily eat up my cost savings in downtime and maintenance expenses," an IT architect explained. "We brought in just a few and watched to see what happened. Our remanufactured servers are trustworthy."

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Requirements for Business-Critical Servers

Understanding IT operational risk is central to understanding the IT organization's requirements for business-critical servers. Understanding human nature also helps. Key lessons learned from IDC's research are as follows:

- ☒ IT managers believe that all servers in the enterprise need to be certified, licensed, and included under warranty programs. Failure to license server operating system software puts the organization as much at risk as failure to license desktop software products. Certification of equipment ensures that all components are functioning correctly and that operating environment updates are current. Placing all equipment under a uniform warranty or maintenance program avoids irregular and unexpected repair or replacement expenses.

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- ☒ Some IT organizations are establishing explicit policies about the use of used servers. When policies exist, they dictate that remanufactured equipment support less critical workloads and new equipment support mission-critical workloads. When policies are informal or decisions are made on a case-by-case basis, this same principle underlies the decision. However, as one respondent remarked, "Of course, all of our legacy equipment is used and we redeployed it."
- ☒ Although most respondents are unwilling to support top-tier and customer-facing workloads with remanufactured equipment, they readily admitted that they have no evidence to support their decision. That is, in most cases, they have not collected maintenance and availability data with which to contrast the cost and reliability of new and remanufactured equipment. The single respondent with such contrasting data found no differences at all and is willing to provision any business application with remanufactured equipment.
- ☒ All respondents indicated that they are comfortable with the idea of using remanufactured servers for lower-priority workloads. Such workloads are abundant in the enterprise. As one respondent said, "While the budget is smaller, demand for plentiful IT services continues to increase."
- ☒ Respondents value suppliers that can ship remanufactured equipment quickly, build equipment to customer requirements, and add faster processors when necessary to support customer workloads.

When policies exist, they dictate that remanufactured equipment support less critical workloads.

"While the budget is smaller, demand for plentiful IT services continues to increase."

IDC ANALYSIS

Situation Analysis

Sun's customers can choose to buy new equipment or used equipment that is remanufactured, refurbished, or sold as-is.

The challenge for both suppliers and consumers is to distinguish among these product categories. In addition, consumers must fully weigh the direct and indirect costs of each:

- ☒ The cost of refurbished and as-is products will ordinarily be lower than the cost of new and remanufactured products. However, buyers should expect to incur additional costs and risks. Suppliers of refurbished and as-is equipment ordinarily offer more limited warranties and less robust support services than OEMs.
- ☒ New and remanufactured equipment from Sun is built to the customer's order. The products are certified, licensed, and warranted in the same way as new equipment. Bringing remanufactured equipment into a datacenter means that the equipment meets current standards necessary for system integration and umbrella service agreements will be extended to include the new systems.

The challenge for both suppliers and consumers is to distinguish among four product categories.

New and remanufactured equipment from Sun is built to the customer's order.

Remanufactured Versus Refurbished Servers

The distinction between remanufactured and refurbished servers is not always apparent. IDC learned that IT organizations are offered or can easily find used equipment that is not remanufactured but rather is refurbished to some degree or sold as-is.

"It's been a matter of education for my customers," said a respondent from a Sun-authorized VAR that has been asked by customers to install and support uncertified servers and system components. "However inexpensive a component might be, it could be defective and cause systemwide damage to other components. And, after recertifying, licensing, and bringing a server under warranty, the cost savings aren't really there."

Ordering remanufactured servers from Sun is, in the view of one respondent, better than the "luck of the draw" in finding the right used equipment that is not remanufactured. Namely, equipment that is refurbished or as-is will not always be precisely aligned with the IT department's actual requirements. Bending workloads to match available servers raises the cost of operations when compared with using systems built to order.

Importance of Sun's iForce Distribution Partners

Sun has created an authorized distribution channel for its customers to ensure the quality of products and services. End-user customers can buy from an authorized channel partner with the knowledge that the Sun products are being supplied through a quality-controlled supply chain. Further, when buying a Sun product, either directly from Sun or from an authorized iForce partner, a customer should feel assured in knowing that the product comes with a warranty and an authorized Solaris license and is eligible for service and support through qualified Sun Service personnel or authorized Sun Service providers.

Sun authorized iForce partners are selected to provide quality and effective pre-sale knowledge and post-sale support of Sun hardware and software products. Sun's selection process for its authorized iForce partners includes an evaluation of the partner's sales and technical expertise as well as business focus and capabilities. Sun provides a lengthy checklist of benefits that customers should expect to accrue when working with the vendor and its authorized partners (see Table 2). Sun contends that control over the distribution channel is essential to providing quality products and services to its customers.

TABLE 2

Sun's Authorized Channel Benefits Checklist

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| <ul style="list-style-type: none"> • Sun products include a valid Solaris Operating Environment license as part of the cost of the system. • Sun products are covered by Sun's manufacturer warranty, and buyers may be eligible to upgrade the warranty at a substantial price discount. • Purchasers of authorized Sun products avoid the possibility of buying products that have been tampered with, are counterfeit, or were acquired fraudulently. • Buyers are eligible to participate in Sun's financing programs that include leasing options and technology refresher programs. • Purchasers of Sun products participate in Sun's upgrade allowance programs (UAPs), which allow customers to upgrade their systems to the latest generation of technology at financially attractive terms. | <ul style="list-style-type: none"> • Sun products are eligible for Sun support and maintenance. Equipment purchased from an unauthorized reseller will need to be recertified to qualify for Sun support and maintenance. • Sun products contain Sun authorized components, up-to-date engineering changes, and current versions of the particular product's firmware and Solaris Operating Environment software. • Where applicable, customers receive Sun site assessment and installation services delivered by qualified Sun personnel. • Purchasers of Sun products may be eligible to be credited for Sun's volume end-user (VEU) discount program, which can result in cost savings. • Customers of Sun products are eligible to receive sales support from Sun representatives, including Sun's knowledgeable technical engineering support team. |
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Source: Sun Microsystems, 2004

The refurbished and as-is equipment market is volatile, and, as a result, players in this market operate on thin margins and prosper only when conditions are favorable. The glut of excess used equipment produced by the collapse of the dot-com industries and the onset of recessionary times favored brokers that gained access to large inventories of machines at fire-sale prices. Access to such large inventories of used equipment is increasingly unlikely. And, as time passes, components of the servers and workstations become obsolete.

System suppliers can actively influence the mix of new and remanufactured equipment that they sell. Terms for trade-in programs and the price differential between new and remanufactured equipment are variables under the supplier's control. Suppliers such as Sun have a sustained interest in customer satisfaction and in providing competitive pricing for new and remanufactured equipment to existing customers.

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Opportunities

☒ Sun's remanufactured products group has the opportunity to provide customers with a lower-cost product based on used and new components without customers' incurring the risks associated with used products. IT consumers became price-sensitive during recessionary times, and this behavior is likely to continue. It is increasingly common for the returns on IT investments to be scrutinized. Insofar as remanufactured equipment offers the same return at a lower price point, business-oriented IT organizations will want to bring these products into the mix.

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☒ In the new, competitive market for managed services, Sun has an opportunity to offer remanufactured products that will help service providers lower their costs and improve their margins. When seeking outsourcing contracts, managed service companies will often compete against the cost of their customer maintaining workloads on legacy equipment. Using remanufactured hardware to lower fixed costs will be particularly valuable to this emerging segment of the IT services industry.

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☒ As suggested earlier, over a modest time frame, legacy hardware is an important asset for the IT organization. Not only is it less expensive, but the capabilities of legacy equipment are also understood by the IT organization. Access to remanufactured workstations and servers directly from Sun provides IT organizations with the opportunity to augment legacy Sun equipment when capacity demands increase.

☒ Sun has the unique opportunity to market its remanufactured equipment in conjunction with existing branded programs, certified resellers, and its overall corporate marketing and sales activities. Sun's reputation for quality equipment is not limited to new products alone.

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Challenges

- ☒ Communicating the value proposition for the advantages of remanufactured versus refurbished and as-is equipment remains a primary challenge. In our research, IDC found that the exact differences were not always well understood, even by sophisticated IT managers. In particular, Sun must convince its prospects that the difference between remanufactured and refurbished is not merely related to semantics but rather that there is real value to be found and risk to be avoided in understanding the difference.
- ☒ There is a chance that as the economy improves, the need to save money may diminish the demand for remanufactured equipment. This leads to a discussion about the price differential between new and remanufactured equipment. To keep sales of remanufactured equipment steady, Sun may need to adjust this price ratio as the economy improves.
- ☒ The high rate of improvement in workstation and server price/performance is another challenge for Sun. As long as Sun, and the industry as a whole, continues to offer improved price/performance ratios, consumers will be drawn to the leading edge — tomorrow's equipment at yesterday's prices. And, if major system suppliers compete with Sun at the flanks, then commodity suppliers present a rear-guard threat. There is no market for refurbished PCs.

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Meeting the Challenges

- ☒ Sun's marketing initiatives that focus on certification, licensing, and warranty should help to address the misconception that remanufactured and refurbished equipment are indistinguishable. Further, IDC encourages Sun to emphasize the flexibility and high levels of expertise in maintenance and service that a large system supplier can bring to customers with remanufactured systems built to order.
- ☒ Continuing user education will be required to sharpen the distinction between remanufactured servers with high quality and predictable lead times and the unknown quality and unpredictable availability of equipment on the refurbished and as-is "spot market."
- ☒ Sun would be well advised to develop proof points that empirically demonstrate the reliability of remanufactured equipment with respect to new equipment. Our research indicates that such data is not commonly available.

IDC encourages Sun to emphasize the flexibility and high levels of expertise in maintenance and service that a large system supplier can bring to customers with remanufactured systems built to order.

Conclusion

IT managers should seriously consider the purchase of remanufactured equipment to support the many less demanding workloads in an organization. IDC research indicates that IT organizations can successfully integrate remanufactured equipment into their IT architectures without compromising reliability. For some applications, such as augmenting capacity for legacy systems, remanufactured equipment can be better than new.

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