

# Getting the Most from HPC Budgets: Financing Systems, Software, and Services

**Michael Feldman**

White paper

January 2016

## HPC IS CAPITAL-INTENSIVE

One of the main challenges in deploying High Performance Computing (HPC) at businesses, universities and government agencies is the up-front cost of computing, storage, and network infrastructure. Although individual servers cost only a few thousand dollars, even a relatively moderate-sized HPC cluster can run into hundreds of thousands of dollars, especially when software, support and maintenance costs are bundled into the purchase. For government agencies and the largest commercial organizations that field capability-class supercomputing systems, these costs escalate into the millions of dollars. That's an enormous periodic cash drain for organizations that must also make payroll and keep the lights on.

According to Intersect360 Research surveys we conducted over the last five years (2011 through 2015), users allocated 48 percent of their IT budgets to purchase hardware, while software accounted for 12 percent and services accounted for 7 percent.<sup>1</sup> Together they account for two-thirds of HPC expenditures. Despite the growing use of cloud/utility computing in this area, its small base (currently just three percent of all HPC spending) suggests on-premise infrastructure and software spending will continue to dominate budgets for the foreseeable future.

Since HPC is recognized as a valuable resource by both businesses (as a revenue generator) and non-profit organizations (as a research accelerator), budgets are generally growing. Users cannot design a next-generation airplane, locate the next oil reservoir, deliver more accurate risk assessments for financial portfolios, or improve image searching capabilities, without continuing to invest in HPC technology. Intersect360 Research believes that the strong tie between HPC systems, buyers' core R&D, and business activities will continue to expand HPC spending.

Regardless, capital expenditures (CAPEX) at any organization, whether they employ HPC or not, tend to be under constant pressure. CAPEX efficiencies are always desirable since it frees up money for operational costs and personnel. In HPC, where the cost of running and staffing these large systems is considerable -- 10 percent and 20 percent of the budget<sup>2</sup>, respectively, according to our surveys -- the less money spent on purchasing systems, the more will be available to operate them and pay staff.

## THE BUSINESS CASE FOR LEASING AND FINANCING

Given the financial efficiencies required to compete in the global marketplace, preserving working capital is a top priority in all businesses. When procuring computing systems, there are two principle alternatives to up-front purchasing: leasing and financing.

---

<sup>1</sup> HPC Budget Allocation Map: HPC Budget Distribution, Intersect360 Research, January 2016

<sup>2</sup> *Ibid.*

### **Leasing: A Good Match for the Three-Year Cluster**

Leasing computing equipment offers a number of advantages for customers. First and foremost, it preserves capital for non-infrastructure purchases and expenses that cannot be leased, such as system operation (e.g., power, cooling, and facilities maintenance) and staffing (e.g., system support, application development, and training). Even if leasing over the course of the system's lifetime is more expensive than purchasing the system up-front, the advantages of having additional cash-on-hand for other activities often outweighs the extra cost.

Also, since computer systems, especially HPC systems, become obsolete quickly, leasing offers more flexibility with regard to upgrading to more powerful and energy-efficient systems. Leases typically run one to five years, but there is usually an option to modify the contract in the middle of the term if the customer desires newer equipment. Swapping hardware mid-lease is especially attractive when the latest technology can drive additional revenue or is less expensive to operate.

A typical HPC cluster is replaced or upgraded about every three years according to site survey data collected by Intersect360 Research over a number of years. Conveniently, the aggregate cost of a three-year lease is often on par with a system purchased outright. So if the customer is swapping their HPC systems on this typical cycle, leasing offers a no- or low-cost method of amortizing a purchase. For longer lease terms, one is likely to experience a modest aggregate cost premium compared to an up-front purchase, but with the added advantage of lower monthly payments compared to shorter term leases.

### **Financing: Amortizing the Cost of Ownership**

By providing an alternate source of funds, financing increases the purchasing power of an organization, enabling users to buy larger, more powerful systems than they would if limited strictly to money on hand. In addition, financing can simplify money management, since hardware and software items from multiple vendors can often be consolidated under a single contract. In the current economic environment, characterized by low interest rates, financing is quite reasonable and offers little risk for qualified buyers.

While generally more expensive than leasing, financing (or the related full payout leasing) allows the customer to take ownership of the system, which offers certain tax advantages as well as the option to extend the system's lifetime indefinitely. Short-term financing (one to two years), in particular, is very inexpensive, and even longer term loans (up to five years) do not exact exorbitant premiums at current interest rates.

Like leasing, financing preserves working capital, avoiding the necessity of large cash outlays at purchase time. Where companies are constrained by cash flow, leasing or loans provides financial breathing room as the business migrates from older systems before it is able to monetize the newer technology. During this transition period, which can take up to several months, the organization's ability to generate revenue is often curtailed, so minimizing payments can be crucial to maintaining liquidity.

Some institutions offer zero percent financing for short-term loans, usually a year or less (we describe one such program later in this report). That amounts to free money over the period of the loan and can be extremely advantageous where yearly revenue or funding is adequate to buy a system, software or services, but where cash flow is inadequate at purchase time.

## HPC Purchasing Behavior

Despite the advantages described above, the majority of users purchasing HPC systems buy their systems outright, preferring to own rather than lease systems. This is borne out by the Intersect360 Research surveys cited previously, where users were asked if at least some hardware was leased rather than purchased. From 2011 through 2015, 80 percent of sites reported they did not lease any hardware; 20 percent reported they leased at least some.<sup>3</sup>

There are multiple reasons more HPC users don't take advantage of leasing and/or loans to purchase infrastructure. In the government and academic sectors, the low rate of usage is likely the result of procurement conventions that assumes funding has been allocated prior to making buying decisions, or, in some cases, even before the Request for Proposal (RFP) solicitation is submitted. While commercial HPC customers take advantage of leasing at higher rates, many of them also exhibit the "purchase-only habit.

Presumably much of the reasoning behind this behavior is to avoid interest and financing charges. However, this ignores the fact that cash has its own costs, which is often higher than the cost of debt. More sophisticated buyers will take the Weighted Average Cost of Capital (WACC) into consideration when making purchasing decisions and, when appropriate, employ leasing or financing to optimize their use of capital.

Another reason leasing and financing are underutilized when deploying HPC infrastructure is likely due to the lack of awareness that these services are even available for large infrastructure purchases. In fact, there are only a handful of financial service providers that specialize in IT financing (usually associated with the largest system providers), so it would not be surprising if the average HPC customer was unaware of such resources.

## IBM GLOBAL FINANCING

One such resource is IBM Global Financing (IGF), which offers a range of leasing and financing options geared specifically toward computing infrastructure. Although IGF operates under the corporate umbrella of IBM, its financial services apply to any vendor's IT products or services that are provided under an IBM contract.

As an IT leasing and lending specialist, IGF offers a number of distinct advantages compared to a generic lending institution. Foremost among these is IGF's affiliation with IBM and its partners. Due to this relationship, the vendor can often be encouraged to reduce its margin to close a particular deal in order to meet client needs. In addition, IGF has relationships in place to sell used equipment in the secondary market at the end of the lease, which keeps buyers' costs down.

IGF also understands the budgetary challenges of buying software, as well as the ongoing expense of software updates and bug fixes. As a result, IGF offers financing for software licenses in addition to its support and maintenance. Given the 12 percent budget slice that software claims, such arrangements can free up significant amounts of capital for the buyer for other uses.

## Example Scenarios

IBM Global Financing offers short-term loans (generally one to five years) for any hardware, software and services related to an IT purchase. Alternatively, hardware can also be leased for the same time period. IGF offers two main types of leases: The Fair Market Value lease and the Full Payout lease. With Fair Market Value, a monthly payment is collected for a fixed lease term of one to five years, at the end of which, the equipment is

---

<sup>3</sup> HPC Budget Allocation Map: Industry Averages, Intersect360 Research, June 2015

returned to IGF. The Full Payout lease is slightly more expensive on a monthly basis, but at the end of the contract, the customer retains ownership of the hardware. In that sense, it is more like a traditional loan.

If an HPC customer is intending to replace their system after the typical three-year lifespan and does not plan to derive some residual value from the hardware, the Fair Market Value lease offers essentially a no-cost or even a negative-cost loan. The monthly payment will vary according to the term of the lease, the mix of items selected, the current interest rates, and the country where financing will take place.

In the example below, which is based on the US financing calculator provided on the IGF website, leasing \$250,000 worth of IT equipment and financing \$50,000 worth of software and services will, over the three-year term, cost \$281,664. Even with financing for software and services included, the aggregate cost to the buyer is almost \$20,000 less than the cost of all the equipment, software and services if purchased up-front (realizing that the buyer gives up any residual value that the hardware may represent at the end of the lease). Note that if the term is extended to five years, the aggregate cost rises to \$337,980 or about \$38,000 more than the original cost of the equipment, software and services.

**Amount financed for:**

IGF Hardware - Power	\$ 200000
PC and PC Servers, Monitors and Printers	\$ 10000
Other Non-PC Hardware	\$ 40000
ITS Maintenance Services	\$ 30000
IGF Software FPO	\$ 20000
Other non-HW FPO	\$ 0

**Hardware financing options:**

Fair Market Value Full Payout

<input checked="" type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>

**Estimated monthly payment**

Lease terms	Payment
24 months	\$ 10,675
36 months	\$ 7,824
48 months	\$ 6,478
60 months	\$ 5,633

As expected, selecting the Full Payout lease to retain ownership of the equipment at the end of the contract is a more expensive option. Leasing and financing the same \$300,000 worth of hardware, software and services will cost \$321,660 over three years and \$342,840 over five years. For the longer terms of four to five years, the monthly payouts are not significantly more than in the Fair Market Value arrangement, so in these situations the buyer enjoys similar cash flow advantages.

**Amount financed for:**

IGF Hardware - Power	\$ 200000
PC and PC Servers, Monitors and Printers	\$ 10000
Other Non-PC Hardware	\$ 40000
ITS Maintenance Services	\$ 30000
IGF Software FPO	\$ 20000
Other non-HW FPO	\$ 0

**Hardware financing options:**

Fair Market Value Full Payout

<input type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/>	<input checked="" type="radio"/>

**Estimated monthly payment**

Lease terms	Payment
24 months	\$ 12,963
36 months	\$ 8,935
48 months	\$ 6,944
60 months	\$ 5,714

IGF also offers a 12-month zero percent loan for IBM hardware and software. On the hardware side, this currently includes IBM storage and Power systems up to \$1 million. In this case, the no-cost loan is framed as a full payout lease to purchase hardware in one year. On the software side, IGF will offer this same 12-month zero percent rate for IBM software licenses, subscriptions, and the first year of support. This is especially advantageous to avoid a large upfront bill when purchasing software, but without the annoyance of financing charges. At times, IGF also runs zero percent financing deals beyond the 12-month time frame on specific IBM infrastructure and software. All of this allows the customer to preserve their cash flow and credit lines, which may be needed for other software or hardware purchases.

For situations where the customer owns equipment and is in need of cash, IGF offers a sale-leaseback program in which ownership of the client's hardware is transferred to IBM Global Financing in exchange for its fair market value. The cash (or credit) can be applied to leasing back the equipment, investing in new technology, or for any other purpose.

In concert with the sale-leaseback service, IGF runs an asset recovery program that manages returned equipment of all leased hardware or buybacks. Through this service, IGF will provide hardware disposal or refurbishing that adheres to environmental laws and regulations. According to their website<sup>4</sup>, 99 percent of all equipment is either reused, remanufactured, or recycled. Asset recovery also provides secure data destruction and reverse logistics.

<sup>4</sup> <http://www-03.ibm.com/financing/us/asset-recovery/index.html>

In aggregate, IGF provides an array of financing services for clients with different types of capital needs. Its strength is its understanding of clients' IT needs, its ability to work closely with vendors to forge workable deals, and its end-of-life management of IT equipment.

## **INTERSECT360 RESEARCH ANALYSIS**

In the current economic environment, leasing and financing HPC systems, software and services make a great deal of sense for a wide array of users. The main advantages include:

- Preserves capital at little cost
- Offers greater flexibility upgrading to new technologies
- Simplifies IT payments under a single contract

These reflect some of the same advantages as that of cloud computing, but without the attendant security and data transfer issues that characterize the use of off-premise infrastructure.

By employing these financial services, users can leverage greater amounts of capital, which means they can deploy larger, more powerful systems and/or shift more of their IT budget into non-infrastructure spending areas such as hiring more programmers and support personnel, or buying new software.

As described in this report, the three-month hardware lease is especially well-suited to HPC environments, since it reflects the average lifespan of a typical cluster. For customers that will not derive residual value out of their hardware after this timeframe, a full market value lease can actually turn out to be less expensive than buying the system outright, while offering the cash flow advantage inherent in a pay-as-you-go arrangement.

Where funding for systems, software and services can be secured at the time of purchase, and where the value of older infrastructure can be realized, up-front purchasing will continue to make sense. However, even in these situations, it would be worthwhile to consider how leasing or financing to obtain bigger systems or better technology could enhance the organization's mission.