META Group

White Paper

metagroup.com • 800-945-META [6382]

Mainframe Rehosting Market Evaluation: Tools and Relative Costs

A META Group White Paper

May 2003

Contents

Mainframe Rehosting Market Evaluation: Tools and Relative Costs

Operations Strategies
Corey Ferengul and William Snyder

Findings

META Group performed a comparison between the mainframe operational tools environment and a duplication of the same software environment on Solaris. While all the functionality under consideration is not necessarily packaged in the same way across platforms, it is clear that all like functionality is available across both platforms. In addition, the relative cost of third-party tools tends to be lower and fluctuate more up and down between vendors in a Solaris environment, leading to the opportunity for cost savings in operating a Solaris-based production environment.

Introduction

Organizations are constantly seeking ways to balance the two goals of becoming more efficient and ensuring consistent delivery of top-notch service. Although many companies have considered moving applications off their mainframe system and onto distributed systems, the complex ROI analysis process impedes the ability to determine what actions should be undertaken. In order to truly assess this possibility, IT organizations must understand how to map current operational tools to the new environment. From job scheduling and print management to monitoring needs, companies have constructed a broad array of management capabilities to understand and support the current environment. A prudent step toward transitioning to distributed systems is to gain a comprehensive understanding of equivalent tool products and their associated costs. The good news is that, despite being complex, the translation can be successfully accomplished.

Many tools are mapped exactly between mainframe and distributed systems — specifically Unix (e.g., job scheduling, monitoring, backup) — while in some areas, they are not (e.g., output management, security). When the mapping is not exact, it may be due to architectural differences between mainframe and client/server systems, as a result of the tools having matured beyond previous functional lines; or vendors consolidating tools within their own product line, which results in fewer tools being necessary.

Estimating cost for third-party tools in a Unix environment is complex, because there are more options available. Although mainframe vendors have generally used the amount of MIPS as the foundation for pricing, client/server licensing metrics and pricing vary substantially among vendors. Vendors will use anything from number of CPUs, to quantity of servers, to size of servers, to number of users, and sometimes even align the pricing methodology of software they are managing (e.g., adopt the WebSphere MQ pricing model for pricing third-party tools). In addition, Unix tools are often sold with numerous necessary or optional add-ons, requiring an informed buyer to ensure that the right products are acquired at the right price. Yet one major benefit of Unix tools is that they are typically less expensive than equivalent mainframe tools and frequently are more modular, allowing users a greater range of flexibility in choosing appropriate tool combinations.

Goal of This White Paper

This paper is designed to offer a translation of key management tools between mainframe and Unix — specifically Solaris — environments as well as to provide relative pricing. META Group has normalized this pricing as much as possible, providing a pricing range based on a variety of applicable tools. In cases where each vendor may have provided a unique pricing model, the paper has taken those prices and worked to translate them into a common base (e.g., price per CPU).

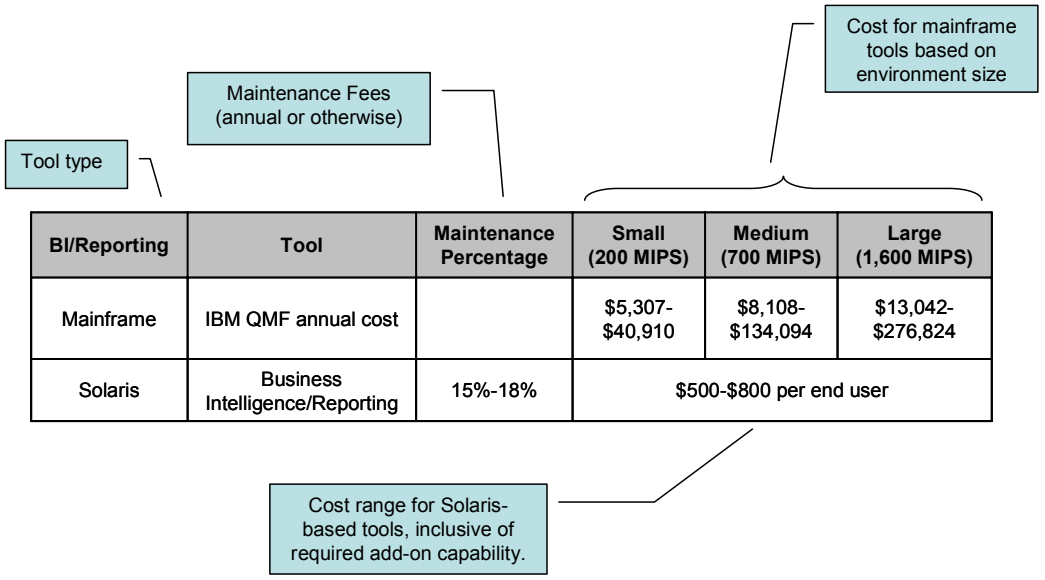
The only way to way to get a true price for any environment is to directly contact the vendor and share the details of the configuration.

How to Use This Paper

Users should leverage this paper to understand relative costs of management tools between mainframe and Solaris environments. Within each management discipline, a table is provided that identifies mainframe and Solaris tools (see Figure 1). For mainframe-based tools, the table communicates average tool price, based on MIPS, including pricing for small, medium, and large deployments (see Addendum for descriptions of environment sizes). For the Solaris section of the table, each tool carries a price range. A range is provided because the pricing of vendor offerings differs dramatically across the same capability. The pricing also reflects add-on technology that IT organizations should expect to license to ensure that the tool meets functional requirements.

Users can use these tables to determine best-case and worst-case scenario costs for the Solaris-based tools. It is important to understand that the tool vendors often discount tools substantially, and that all prices listed are based on list prices, not discounts.

Figure 1 — Table Description



BI/Reporting	Tool	Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	IBM QMF annual cost		$5,307-$40,910	$8,108-$134,094	$13,042-$276,824
Solaris	Business Intelligence/Reporting	15%-18%	$500-$800 per end user		

Source: META Group

Pricing Guide

- ***Mainframe pricing:*** All mainframe prices represent an annual cost plus ongoing maintenance costs calculated as follows (unless otherwise specified) for perpetual licenses: The one-time charge component is normalized to an annual cost by averaging the upfront cost over five years, and then adding the cost of annual maintenance. For example, a $100,000 perpetual license would be calculated at one-fifth the perpetual license cost (i.e., $20,000) plus maintenance cost (15% or $15,000) for a total annual cost of $35,000. It should be noted that, after the one-time fee is paid, only maintenance payments are made for subsequent years, at the rate of 15%-20% of list price. Leased licenses (which are inclusive of maintenance) are based on annual charges.
- ***Solaris pricing:*** Solaris tool pricing is a perpetual license fee. The maintenance fees are charged against that perpetual license fee and added to the cost of the tool for the first year and become the reoccurring charge for Solaris tools after that point.

Tool Analysis

Our tool analysis covers the core technology as well the eight add-on tool areas necessary to create an operational mainframe environment:

- Automation
- System and performance monitoring
- Security
- Capacity planning
- Cost recovery
- Business intelligence/reporting
- Output management
- Storage management

Each section covers the mainframe versus the Solaris-based tools, provides a brief description of the relative functionality in moving from a mainframe environment to a Solaris environment, and lists key third-party vendors that can provide tools for a Solaris environment.

Core Technology

	Small (200 MIPS & up to 300 users)	**Medium** (700 MIPS & up to 700 concurrent users)	**Large** (unlimited user license)
IBM OS MVS (*annual fee, with bundled support)*	$345,852	$686,843	$1,088,585
IBM CICS TS (5655-147) (*annual fee, with bundled support)*	$123,348	$230,336	$367,571
Sun MTP & MBM Bundle *(one-time charge)*	$350,000	$700,000	$1,200,000
Support for Sun MTP and MBM *(one-time charge)*	Prime shift support = 25% of list price	24x7 support = 35% of list price	

Relative Functionality

Mainframe customers must have the underlying operating system (OS) that provides some of the features/functionality of the categories in this report. In general, third-party tools have flourished as a result of the modest abilities of these included tools in the native environment.

Any Sun mainframe rehosting customer will be using a technology set that eliminates the need for or is an alternative to third-party tools for some management functions. This means that:

- The customer either has nothing additional to purchase to perform a function they currently pay separately for on the mainframe, or
- The customer has the choice of using a Sun-provided technology rather than purchasing a third-party management tool.

The key technologies included for mainframe rehosting include Sun's Mainframe Transaction Processing (MTP) and its Mainframe Batch Manager (MBM).

Automation

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	Automation tools (annual fee)	15%-20%	$28,823-$30,160	$50,481-$77,880	$115,386-$166,366
	CICS automation (annual fee)	15%-20%	$10,865-$14,423	$35,612-$50,481	$73,518-$115,386
	Job scheduling	15%	$41,420-$43,600	$71,315-$112,640	$106,880-$240,619
	Job restart	15%	$15,280-$19,820	$39,440-$42,728	$84,251-$97,665
Solaris	Automation tools	Provided with Sun MBM			
	CICS automation	Provided with Sun MBM			
	Job scheduling	20%	$3,000-$10,000 per server — additional $30,000+ for scheduling the tool's own core components		
	Job restart	Provided by Sun — not a standalone capability in Solaris environments			

Relative Functionality

Sun Mainframe Batch Manager software is used to replicate a mainframe batch environment. It treats the mainframe batch workload exactly as the mainframe

does (e.g., jobs consist of discrete tasks requiring individual restart and automation). In addition, MBM provides a macro language that translates job control language (JCL) to the MBM environment. Users will use the MBM macro language as their JCL after a conversion. Sun's Mainframe Transaction Processing software is the CICS environment of the rehosted environment. MTP provides application transaction management as well as resource and session management without the need for wholly separate products. In addition, MTP leverages some capability of MBM and the Sun Mainframe Administration Tool (MAT) capability for monitoring.

The capability for operating system automation does not exist in the Solaris environment; consequently, there are no third-party tools offered. OS automation is accomplished using job scheduling tools, and most native Solaris applications are built with the understanding that the new operating structure does not accomplish automation in the same functional way. This also applies to CICS automation, since there are no third-party CICS tools offered (outside of the Sun offerings).

Job scheduling and restart functions in Solaris environments are also similar to mainframe operations in their basic function. They schedule a "job" and execute it, though the definition of what constitutes a job differs. A "job" for Solaris is a singular unit of work (e.g., one script) that is grouped with other jobs in a container for a batch workload; in the mainframe, a job is a collection of batch work (job steps) containing many separate execution activities. Although Solaris-based schedulers can be used to "bundle" tasks, most user environments break the batch work into discrete "jobs," with each carrying its own rule set (e.g., restart, failure routines, alerting). Job start capabilities are contained within the Unix scheduling products, and each task becomes a standalone job. On the mainframe side, there is effectively no standalone market for mainframe job restart, which means there are no tools to purchase, and the function of job restart is contained within the job scheduling tool.

Key Vendors

- BMC Software — All automation
- Computer Associates — All automation
- IBM/Tivoli — All automation

System and Performance Monitoring

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	*System Monitoring*				
	OS	18%-20%	$18,586-$30,720	$65,050-$162,624	$148,685-$176,961
	CICS	18%-20%	$14,423-$22,480	$50,481-$60,600	$115,386-$129,453
	DB2	18%-20%	$13,455-$22,480	$39,760-$60,600	$90,880-$129,453
	MQ	18%-20%	$11,360-$22,480	$39,760-$160,640	$90,880-$129,538
	Performance Monitoring				
	OS	Included in monitoring tools			
	CICS	Included in monitoring tools			
	DB2	Included in monitoring tools			
Solaris	*System Monitoring*				
	OS	18%-20%	$400-$995 per CPU		
	CICS	Provided with Sun MTP and Sun MAT			
	MQ	20%	$100-$800 per MQ capacity unit		
	DB2	18%-20%	$1,000-$2,500 per CPU		
	Performance Monitoring				
	OS	18%-20%	$400-$995 per CPU		
	DB2	18%-20%	$2,000-$10,000 per database instance		
	MQ	Included in monitoring tools			
	CICS	Provided with Sun MTP and Sun MAT			

Relative Functionality

Monitoring is essentially the same between both platforms, with the simple difference that monitoring tools in Solaris environments typically cover system monitoring as well as performance monitoring all in one tool. This can be accomplished in mainframe environments as well, but on occasion, additional tools are sourced.

Sun Management Center (SMC) is available at no charge for an unlimited number of servers and offers basic monitoring, but lacks historical data trending, centralized management, and complex alarm responses. SMC Advanced Systems Monitoring

option can be obtained for approximately $2,700 per server. CICS capability is provided as part of Sun MAT, which also handles monitoring.

Key Vendors

- BMC Software — MQ, DB2, OS
- Computer Associates — MQ, DB2, OS
- Candle Corporation — MQ, DB2, OS
- Hewlett-Packard/Openview — DB2, OS
- Quest Software — DB2, OS
- IBM/Tivoli — MQ, DB2, OS

Security

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	OS enforcement (annual fee)		$20,160-$40,994	$39,988-$134,370	$63,078-$277,393
	CICS enforcement		Pricing included in core products		
	DB2 enforcement (annual fee)		$0-$17,218	$0-$56,436	$0-$116,508
	MVS auditing & reporting	15%	$20,578	$67,442	$139,229
Solaris	OS enforcement (access control)	20%	$700-$2,400 per CPU ($2,000 average)		
	CICS enforcement	Provided as part of Sun MTP			
	DB2 enforcement	Provided as part of the database			
	User management	15%-20%	$7-$15 per user, with additional charges for tool infrastructure starting at $5,000		
	System auditing & reporting	15%-20%	$1,000 per IP address, with additional charges for tool infrastructure ranging from $2,500 to $12,500		

Relative Functionality

The key difference between the mainframe and Unix is that the mainframe has no centralized access control embedded within the operating system (it requires RACF or ACF/2), while Unix/Solaris does it all with files natively, resulting in file-level security. Therefore, Unix/Solaris acts as and can provide access control, which dramatically changes the requirements for this capability as a result of its being embedded in the OS. Solaris provides some additional improvement over mainframe technology. The Solaris third-party tools are also more flexible and adaptable (e.g., better cross-platform consistence, workflow, and request handling), and more automated in creation of users and managing their accounts. All new development is occurring in the distributed tools market, so organizations remaining on mainframe tools will be behind the curve. This is leading many IT organizations to adopt Unix-based tools for enterprisewide use.

Sun provides MTP Secure as part of an MTP deployment, providing the same level of security that RACF provides CICS. On Solaris databases, security is primarily handled within the database. Reporting on the configuration and vulnerabilities of the environment is not substantially different from that of the mainframe environment.

Key Vendors

- Computer Associates
- Symark
- BMC Software
- Oblix
- NetIQ
- Symantec
- ISS

Capacity Planning

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	MVS capacity planning	20%	$22,480-$24,535	$37,435-$60,640	$65,500-$129,538
	CICS	This data is contained within the RMF records on the mainframe — therefore executed by OS capacity planning tools			
	DB2	This data is contained within the RMF records on the mainframe — therefore executed by OS capacity planning tools			
Solaris	Operating system	20%	Entry-level price of approximately $200 per CPU		
	CICS	Provided as part of Sun MTP			
	Database/DB2	18%-20%	$80-$250 per CPU (of server that DB resides on)		

Relative Functionality

The primary difference between the mainframe and Solaris environments is that there is less data generated by Solaris, leading to a more difficult capacity-planning problem. Mainframe usage records are native to the mainframe environment (via CICS) and the Unix world has no default equivalent. Through use of the Sun Mainframe Transaction Processing software, the additional data (RMF-like records) can be collected. However, to make use of this added detail, Solaris third-party tools will require customization. The Sun MTP data records do provide the data necessary to perform capacity planning and chargeback in the same manner as a mainframe, but only via either a mainframe-based capacity-planning tool or a Solaris-based tool that can accept external records to provide the functionality.

There are no significant differences between Solaris and Mainframe-based DB2 tools.

Key Vendors

- BMC Software
- TeamQuest
- Hyperformix
- SAS
- Opnet

Cost Recovery

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	Chargeback	12%-15%	$26,794-$44,058	$87,824-$144,413	$181,305-$298,127
Solaris	Chargeback	18%-20%	$100,000-$200,000 entry-level cost for the entire data center (network, database, and servers all covered)		

Relative Functionality
There are significant differences in tool functionality. The native Solaris environment does not have the same volume of accounting records that exist on the mainframe; therefore, other alternatives must be explored.

With Sun MTP replacing CICS, RMF records can be generated (via Sun MTP/MBM) and then fed to other capacity planning and chargeback products. Organizations often take this data and feed it to the mainframe tools they already have in place. Another option is to turn on Solaris accounting, which is not preferred by most organizations (due to system overhead associated with data collection), and collect that data for chargeback. Other options include use of the *pact* records and data from the *crontab* to feed the chargeback and to monitor network traffic and chargeback based on network-measured consumption of an application.

Key Vendors
- CIMSlab
- Apogee
- SAS Institute

Business Intelligence/Reporting

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	IBM QMF annual cost		$5,307-40,910	$8,108-$134,094	$13,042-$276,824
Solaris	Business intelligence/reporting	15%-18%	$500-$800 per end user		

Relative Functionality
There is little real difference between the role played by client/server reporting tools and mainframe reporting tools. In addition, Sun has a version of Easytrieve that will operate on Solaris.

This is a very competitive market, with discounts in the 45%-50% range being normal for any deal involving more than 1,000 users.

Key Vendors
- Cognos
- Business Objects
- Brio
- MicroStrategy

Output Management

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	Printer packaging and delivery	15%	$19,092-$30,055	$19,092-$98,513	$19,092-$203,372
	Printer support (VTAM)	15%	$15,806	$32,837	$54,499
Solaris	Printer packaging and delivery	20%	$100 per concurrent user, with core product infrastructure charge of $10,000-$25,000		
	Low-end printer management	NA	No cost (provided by printer vendors)		
	Full-scale printer, output routing, & output control	20%	$250,000		

Relative Functionality
There is little difference between Solaris and mainframe print management tools; this functionality primarily controls output access and output, often including online viewing.

Advanced Function Printing (AFP) is an IBM technology for print formatting (e.g., font choice, text spacing). When this is desired in a Solaris environment, there are a three alternatives:

- Convert all output to a different presentation control, namely postscript
- Keep an AFP environment in place and convert the stream to IPDS, to be read by an IP-connected printer
- Work with a Sun partner vendor (e.g., Macro4) that can specially operate an AFP environment on Unix

Depending on the option used, consulting may be required (a vendor option being AFP Consulting), or a conversion tool may be used for conversion of the output.

VTAM is a telecommunications method (still used internally by MVS), which has been replaced by TCP/IP; it is a protocol for printers. In Solaris, there is no VTAM printing and the users will use IP. A print manager for the output spool is required to manage printers. In a Solaris environment, users primarily do printer management, with separate management of the network. Where VTAM tools in the mainframe are specific to management of the network and attached devices, tools for IP networks take on the role of printer management or become much broader (encompassing routing, spooling, and other printer interface functions).

Key Vendors

- Computer Associates
- Quest Software
- BMC Software
- Mobius
- Plus Technologies
- Macro4

Storage Management

		Maintenance Percentage	Small (200 MIPS)	Medium (700 MIPS)	Large (1,600 MIPS)
Mainframe	Storage migration	Usage	$13,500 (covers migration up to 1 terabyte)	$25,500 (covers migration up to 4 terabytes)	$51,000 (covers migration up to 10 terabytes)
	Backup	15%-20%	$22,500-$43,600	$48,555-$112,640	$110,983-$240,619
	Tape management	20%	$22,600-$43,600	$48,555-$112,640	$110,983-$240,619
Solaris	Storage migration	Usage-based	$12,000-$15,000 per server (up to 4 CPUs per server)	$ $25,000-$30,000 per server (up to 8 CPUs per server)	$40,000-$60,000 per server (up to 16 CPUs per server)
	Backup	20%	$1,500-$3,000 per CPU		
	Tape management	Not a separate capability in Solaris environments; handled by the backup tools			

Relative Functionality

Storage migration is functionally the same between the mainframe and Unix technologies, with the only difference being the platform on which the conduit (i.e., data mover) is installed since this determines the volume of data that can be moved. Open systems products are not “big” sellers in the market, and often are sold as part of a larger deal for other storage management technology.

Backup functionality is essentially the same in the mainframe and Solaris environments (though formats and access varies). Customers typically will purchase a database interface for each database server that they wish to backup. Each backup tool requires additional master servers, with quantities depending on network capacity, locations, and data volume.

Tape management tools in Solaris are dramatically different from those on the mainframe. In the Solaris environment, tape management and backup systems are combined. Tape devices are not used in the traditional way in Solaris implementations (e.g., sequential access devices); instead, most data is

located on databases, with tape devices being used primarily for backup purposes. There are isolated situations where tape devices are used for hierarchical storage management (HSM). When HSM is used, a separate solution is purchased, with HSM software directly interfacing with tape devices.

Key Vendors

- BMC Software
- Computer Associates
- IBM/Tivoli
- Veritas
- EMC
- Legato
- Fujitsu Softek

Corey Ferengul is vice president and principal analyst with Operations Strategies, a service of META Group, Inc. William Snyder is a program director with Operations Strategies. For additional information on this topic or other services, contact info@metagroup.com.

Addendum

Assumptions

Mainframe Environment Sizing

Environment	Small	Medium	Large
Mainframe	200	700	1,600
Solaris (single server)	4 CPUs	8 CPUs	16 CPUs

Mainframe license pricing is largely consistent, based on a set number of MIPS within a single-footprint mainframe. Multiple footprints are generally more expensive. Costs are a range of the high and low costs of the most popular products, calculated as follows:

- Lease licenses are at annual cost
- Perpetual licenses are calculated at annual maintenance cost plus one-fifth initial license cost (five-year license depreciation).

Pricing for tools in Solaris environments varies widely, based on a combination of multiple factors (e.g., by server, CPU, product function, and product component). However, most vendors will use the list price as a guideline, and will discount more often then in the mainframe world.

Product pricing is based either on the server size provided or on the product function (e.g., storage volume), with additional explanation included in the charts. Although relevant prices for add-on capabilities are listed, they are generally a subset, since some tools have as many as 100 possible add-on capabilities.

Solaris tools are calculated at list price, based on a simple environment. To truly determine a more accurate user price for a given environment, consideration must be given to the number of servers, CPUs, storage size, number of physical locations, number of product add-ons included, type and number of databases in use, and number of other applications to be supported (e.g., SAP), in addition to the unique information each vendor requires.

Pricing

Pricing is based on the environment size as well as on the list price of the vendor's products (explained in the chart of each section). Some prices are estimated based on customer contracts to which META Group has access (as well as on published pricing), primarily for vendors who do not publish their prices publicly.

Discounts in the 30%-50% range are common for most deals in the Solaris world, and 10%-20% discount is common for mainframe deals.

Both Solaris and mainframe tools tend to be sold as perpetual licenses (unless otherwise noted in the table). A perpetual license means that the customer has purchased the tool outright and owns it in perpetuity (as opposed to leasing or subscription licenses). Customers typically pay for one year of maintenance in advance (often with one year free for mainframes tools).

Mainframe maintenance on perpetual licenses generally includes the right to telephone support, patches, fixes, and new versions. Upgrade fees are generally charged only when one of the licensing parameters is exceeded (e.g., higher MIPS, acquisition/divestiture). Customers often purchase a perpetual license for a product, with maintenance (support) for a set period of years (e.g., three years, five years) and pay the vendor in advance for the maintenance (or finance the maintenance). In the mainframe world, many products are included in three- to five-year enterprise license agreements (ELAs) encompassing license and maintenance fees. At the expiration of the ELA, the maintenance agreement is renegotiated. Maintenance will often have increased substantially since the last contract, since the renewed maintenance typically is at list price, not discounted list price. Warranties on perpetual licenses (no cost support) are usually one year in length (first year of ownership), with maintenance fees beginning upon expiration of warranty (customers will often negotiate additional warranty periods).

About META Group

Return On Intelligence[SM]

META Group is a leading provider of information technology research, advisory services, and strategic consulting. Delivering objective and actionable guidance, META Group's experienced analysts and consultants are trusted advisors to IT and business executives around the world. Our unique collaborative models and dedicated customer service help clients be more efficient, effective, and timely in their use of IT to achieve their business goals. Visit metagroup.com for more details on our high-value approach.