IBM Tivoli Tape Optimizer on z/OS, V2.2 delivers enhanced tape management and deepens integration into the Tivoli Enterprise Portal

At a glance

Intended benefits of IBM® Tivoli® Tape Optimizer on z/OS®, V2.2:

- Supports take-action commands through the Tivoli Enterprise Portal (TEP)
- Displays more information on the TEP console
- Provides the ability to allocate a tape drive using a user specified data class to support tape drive-based encryption features
- Copies a multitude of tapes in a single copy job
- Provides multitasking capabilities by running up to ten subtasks concurrently for a single copy job
- Helps preserve tape library information that is associated with the selected DFSMSrmm™ control variables
- Updates the z/OS system catalog automatically
- Supports tape stacking to help maximize the utilization of tape media
- Supports almost all types of tapes and tape devices supported by IBM z/OS systems

Overview

IBM Tivoli Tape Optimizer on z/OS, V2.2 (Tape Optimizer on z/OS) is a tape copy and stacking solution for data residing on tape storage devices that are managed by Data Facility Storage Management Subsystem removable media manager (DFSMSrmm). Tape Optimizer on z/OS, V2.2 can copy tape volumes to other tapes or tape-compatible storage for the z/OS environment while:

- Renaming tape data sets
- Preserving DFSMSrmm tape library information
- Updating the system catalog for the copied tapes
- Performing the above tasks through the Tivoli Enterprise Portal (TEP) common user interface

You can copy a single tape or data set, or potentially your entire tape library. This capability helps make it easier to migrate large amounts of tape data to or from virtual tape servers (VTS) or high-density cartridge tapes. In addition, Tape Optimizer on z/OS, V2.2 helps simplify the routine task of copying data from old tapes that are starting to degrade to newer tapes in order to help preserve data.
New in V2.2

- Deepens integration into TEP by delivering take-action commands through the common user interface
- Consolidates DFSMSrmm copy calls to help reduce the total number of DFSMSrmm calls
- Optimizes request database close calls to help reduce the number of open and close calls per tape
- Supports tape drive-based encryption features with an option that allows allocation of a tape drive using a user specified data class
- Allows users to pass special expiration dates, such as 99000, to system managed storage (SMS) automatic class selection (ACS) routines to help drive management class and vital record processing assignment

Key prerequisites

Refer to the Software requirements section.

Planned availability date

October 23, 2009

Description

Tape Optimizer on z/OS, V2.2 provides an Interactive System Productivity Facility (ISPF) interface from which you can define and submit tape copy jobs. You can use Tape Optimizer on z/OS, V2.2 to:

- Load or unload data from virtual tape libraries
- Create tape copies of data for testing or off-site storage
- Move data off of old tapes that are starting to degrade
- Help optimize tape media and storage devices by stacking data
- Create filters for specifying the exact tapes or data sets to be copied
- Set many copy options, such as those for:
  - Specifying the number of concurrent tasks to run for a copy job
  - Specifying the number of days to retain input tapes
  - Stacking tape volumes on the output tapes
  - Renaming the tape data sets by adding a high-level qualifier
  - Continuing copy processing after certain errors
  - Calling the ADRDSSU utility to copy data sets that have a block size of zero
  - Setting expiration dates for copied tapes based on various criteria

Tape Optimizer on z/OS, V2.2 delivers the ability to perform take-action commands, such as submitting job control language (JCL) to issue tape copies, through the integrated Tivoli Enterprise Portal (TEP). In addition, more information can be displayed on the TEP console. For example, you can see tapes pending replacement due to soft errors. Building on the current TEP integration allows for higher visibility and better integration of Tape Optimizer on z/OS, V2.2 data in your dashboard, providing a superior Data Facility Storage Management Subsystem removable media manager (DFSMSrmm) tape management solution.

Tape Optimizer on z/OS, V2.2 includes new capabilities that can help improve performance. By consolidating the number of DFSMSrmm copy calls, Tape Optimizer on z/OS, V2.2 can help reduce the total number of DFSMSrmm calls. In addition, by optimizing the request database close calls, the number of calls per tape can
be reduced. The use of these options can help improve performance over previous releases of Tape Optimizer on z/OS.

As available with prior versions and releases, you can use Tape Optimizer on z/OS, V2.2 to generate JCL for a batch copy job and display it on screen for review. You can edit, submit, or delete a copy job from the product interface. The progress of a submitted copy job can be monitored by using the System Display and Search Facility (SDSF). After a copy job successfully completes, the copy log and summary copy statistics can be viewed from the product interface. Tape Optimizer on z/OS, V2.2 automatically transfers the DFSMSrmm tape library information to the newly created tapes and updates the system catalog for the copied tape data sets.

Key features

- Supports take-action commands through TEP
- Displays tapes pending replacement information on the TEP console
- Consolidates DFSMSrmm copy calls to help reduce total DFSMSrmm calls
- Optimizes request database close calls to help reduce the number of calls per tape
- Supports tape drive-based encryption features with an option that allows allocation of a tape drive using a user specified data class
- Allows users to pass special expiration dates, such as 99000, to storage management subsystems (SMS) automatic class selection (ACS) routines to help drive management class and vital record processing assignment
- Supports most types of tape devices and tape media, including logical tape volumes in virtual tape servers (VTSs)
- Provides an ISPF interface that can define and submit batch copy jobs
- Copies tape volumes or data sets, including generation data sets that are identified by relative generation data groups (GDGs)
- Allows you to configure up to ten subtasks for a copy job to copy multiple tape chains simultaneously and help complete jobs faster
- Helps you define various types of tape-selection filters for specifying precisely the input tapes to copy
- Enables you to submit a copy job on more than one processor, which helps distribute the CPU and I/O resource load
- Enables you to stop long-running copy jobs and to restart jobs from the point at which they were stopped or failed
- Transfers DFSMSrmm tape library information to the output tapes for most DFSMSrmm versions
- Updates system catalog information for the copied data sets to indicate their new tape locations
- Allows you to stack multiple tape volumes on a single output tape which helps reduce the number of tapes to store and maintain, as well as free VTS space
- Renames tape data sets as they are copied if you specify renaming criteria
- Logs important information about each copy job for future reference

Flexible filtering criteria

The product interface provides many types of filters for specifying the exact input tapes to copy. Filters can be created to include tapes or to exclude tapes from copy jobs. Filtering criteria can include:

- Volume serial numbers (volsers)
- Data set names
- Tape creation program names
- Tape creation date, assigned date, and last reference date
- Tape expiration date
- Various other tape characteristics, such as whether the tapes:
  - Have temporary I/O errors
- Have permanent I/O errors
- Are pending scratch
- Are copies that were previously created

By combining various types of filtering criteria, you can create complex filters. These filters can facilitate large migration projects (for example, migrating from cartridge tapes to a VTS) by helping to avoid unnecessary duplication.

**Multitasking capability**

You can run up to ten subtasks for a copy job in order to duplicate multiple tape chains simultaneously on different tape drives. Each subtask uses two tape drives, an input tape drive and an output tape drive. For example, if you run ten subtasks, you will need twenty tape drives.

This multitasking feature helps complete a copy job much faster. If necessary, you can tailor resource usage based on the resources that are available and on the workload to be maintained.

**Helps preserve tape library information and updates the catalog**

Tape Optimizer on z/OS, V2.2 applies the DFSMSrmm tape library information for input tapes to output tapes based on the DFSMSrmm control variables that are known to the system. From the product interface, you can select or deselect the control variables that Tape Optimizer on z/OS, V2.2 uses for copy jobs. For example, if you install system maintenance that adds control variables that are not supported on the system where you will run a copy job, you would deselect the unsupported variables so that Tape Optimizer on z/OS, V2.2 would not attempt to transfer the associated information and generate errors.

Also, Tape Optimizer on z/OS, V2.2 can automatically update the z/OS system catalog to point to the new locations of copied data sets that were previously cataloged. If you do not want the catalog to be updated, you can select an option to prevent this updating from occurring.

**Supports tape stacking**

Tape Optimizer on z/OS, V2.2 includes an option to stack tape volumes on output tapes to help maximize the utilization of tape media. By using tape stacking, you can reduce the number of tapes to store and maintain at your site and the associated personnel costs. Also, you can set tape utilization thresholds and a maximum file count to control when a new output tape is automatically loaded and tape stacking is enabled.

**Renames tape data sets**

Optionally, Tape Optimizer on z/OS, V2.2 can rename tape data sets as they are copied to output tapes based on the renaming criteria that you provide. This allows you to perform a trial run of a copy job before actually running it. Summary copy statistics can be provided for each copy request and each copied tape volume. This renaming feature is useful if you are retaining the original tape data sets and want to differentiate them from the copies (for example, from backup copies).

**Helpful reports**

Tape Optimizer on z/OS, V2.2 can generate summary reports that you can use to quickly help determine the outcome of a tape copy request. In addition, during a trial run of a copy request, Tape Optimizer on z/OS, V2.2 can generate a detailed tape selection report that shows the tape and data sets to be copied. You can use this report to re-adjust your tape selection filters before submitting the final copy request for execution. In addition, you can access statistics reports of tape copy requests from TEP.
Works with almost all tapes and tape devices

Tape Optimizer on z/OS, V2.2 supports almost all types of tapes and tape devices. It can copy:

- Single or multivolume tapes
- Tapes that have standard labels
- Unlabeled tapes
- Tapes that contain either cataloged or uncataloged data sets
- High-capacity 3592 tape drives and enterprise recording format tape media

Integrates with the IBM Tivoli Monitoring infrastructure through TEP

Tape Optimizer on z/OS, V2.2 integrates with the IBM Tivoli Monitoring V6.2 infrastructure components that enable it to supply TEP with key business performance metrics for enhanced visualization and correlation within new workspaces, as well as with other IBM Tivoli Monitoring V6.2 monitored systems. This integration delivers a single GUI through TEP, which is used by many IBM Tivoli monitoring and management products to help discover and investigate problems, and take immediate corrective actions.

If you have not separately purchased a license to IBM Tivoli Monitoring V6.2, you can obtain the TEP-based function by acquiring a no-charge, limited use license to IBM Tivoli Monitoring Services on z/OS, V6.2 (5698-A79). This limited use license is subject to usage restriction on use of the various IBM Tivoli Monitoring V6.2 components, including without limitation, if you have obtained IBM Tivoli Monitoring V6.2 under a no-charge, limited use license.

You may not use:

- Any IBM Tivoli Monitoring V6.2 operating systems agents, any IBM Tivoli Monitoring V6.2 monitoring agents, or the IBM Tivoli Monitoring Universal Agent unless you have purchased an appropriate IBM Tivoli Monitoring V6.2 program license.
- The DE functionality of IBM Tivoli Monitoring V6.2 and IBM Tivoli Monitoring Services on z/OS, V6.2 in a z/OS environment unless you have purchased the appropriate IBM program license (such as IBM Tivoli OMEGAMON® DE on z/OS).

Refer to the IBM Tivoli Monitoring License Information document for terms applicable to these programs.

IBM Tivoli Service Management Center (SMCz) for System z®

SMCz is an IBM Service Management based methodology and unified product suite designed to increase the availability of business critical IT services as well as their stability. It focuses on helping you to more easily program, manage, and administer a mainframe, which is the most robust platform from which to run the business of the enterprise.

Among the many hard dollar business values it brings to your enterprise, SMCz:

- Helps optimize productivity of IT personnel and increase end-user satisfaction
- Aligns IT operations and the business objectives from a service assurance perspective
- Aligns and supports the IT Infrastructure Library® (ITIL®) processes within your enterprise

SMCz solutions:

- Provide the required visibility, control, and automation across the service, technical support, operations, security, and financial domains
  - Visibility: You have a single, integrated view of your critical applications on your mainframe, showing the linkages between IT assets and business applications.
Control: You can customize your view to support such functions as business services, services requests, finance, security, IT production, support, and operational control.

Automation: Based on your needs, SMCz combines process automation software such as IBM Tivoli Change and Configuration Management Database, IBM Tivoli Application Dependency Discovery Manager, IBM Tivoli Business Service Manager, and IBM Tivoli Service Request Manager.

- Enable the transformation from a System z resource management focus to a centralized System z service management mode

One of the key components of SMCz is System z storage management software from IBM Tivoli. IBM Tivoli software provides a rich set of System z storage management solutions to help IT organizations address today's enterprise challenges. Organizations can benefit from a comprehensive System z storage management solution that bridges silos of people, technology, processes, and information with increased IT operational efficiency and effectiveness.

In addition to traditional Interactive System Productivity Facility (ISPF), batch interfaces, or both, IBM Tivoli System z storage management offerings use TEP to provide simplified graphical user interfaces that help IT staff, who are new to the platform, learn and execute operational tasks. TEP integrates many IBM offerings, creating synergy across the solution. TEP interfaces aggregate and combine performance and availability operational data from many sources, helping to reduce the time and skills needed to diagnose problems and take corrective actions.

You can leverage a new generation of workers in your organization as you grow and maintain System z skills. The System z storage solution helps you manage your disk and tape storage environments and hierarchical storage environments (including tapes) more efficiently and effectively. Key functions:

- Helps prevent storage-related abends
- Helps monitor workload inputs and outputs
- Helps manage performance and availability of both online and offline storage subsystems
- Helps ensure the health and efficiency of the IBM DFSMSShsm™ environment
- Provides backup and recovery
- Checks health
- Helps maintain the critical Integrated Catalog Facility (ICF) catalogs and Virtual Storage Access Method (VSAM) files
- Shares tapes across sysplexes

The IBM System z storage management portfolio includes the following component products (refer to the Web site following the product name for product information).

IBM Tivoli OMEGAMON XE for Storage on z/OS

IBM Tivoli Advanced Reporting for DFSMSShsm

IBM Tivoli Advanced Audit for DFSMSShsm

IBM Tivoli Advanced Catalog Management for z/OS

IBM Tivoli Advanced Allocation Management
IBM Tivoli Tape Optimizer on z/OS


IBM Tivoli Automated Tape Allocation Manager for z/OS


IBM Tivoli Advanced Backup and Recovery for z/OS


Entitlement information

If you have the current offering listed in the table below, you are entitled to Tape Optimizer on z/OS, V2.2. You can move your use entitlements based on the current Subscription and Support pricing of the replacement offering. You must be current on Software Subscription and Support (also referred to as Software Maintenance) to be eligible for move of use entitlements. If you are not current on Software Subscription and Support, you will have to pay a get-current or Software Subscription and Support reinstatement fee.

The use entitlement move is for the same capacity as currently licensed when moving to the replacement offering. You are entitled to use the software on the same systems that you are currently managing.

For information on move of Subscription and Support entitlements, contact your IBM representative.

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<thead>
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<th>Existing entitlement</th>
<th>Replacement entitlement</th>
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<tr>
<td>License PID</td>
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<tr>
<td>5698-A73 5698-S84 IBM Tivoli Tape Optimizer on z/OS, V1</td>
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Accessibility by people with disabilities

A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at


Value Unit-based pricing

Value Unit pricing for eligible IBM System z IBM International Program License Agreement (IPLA) programs enables a lower cost of incremental growth and enterprise aggregation. Each System z IPLA product with Value Unit pricing has a single price per Value Unit and a conversion matrix, called Value Unit Exhibit, for converting from some designated measurement to Value Units. Most commonly, Millions of Service Units (MSUs) is the measurement designated by IBM to be converted to Value Units. Some other measurements are engines or messages. Since MSUs are the most common measurement, that measurement will be used for the remainder of this description.

Value Unit pricing offers price benefits for you. For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the **required license capacity**. Each of the various Value Unit Exhibits stipulate that the larger your required license capacity,
the fewer Value Units per MSU you will need. Value Unit Exhibits are uniquely identified by a three digit code and referred to using the nomenclature VUExxx, where xxx is the three digit code.

Subsequent acquisitions of Value Unit priced programs offer additional price benefits. The quantity of each System z IPLA program that you have acquired is referred to as entitled license capacity. If you wish to grow your entitled license capacity for a System z IPLA program, the calculation to determine additional needed Value Units is based upon the number of Value Units already acquired.

For each System z IPLA program with Value Unit pricing, you should:

- Determine the required license capacity, in MSUs
- Aggregate the MSUs across the enterprise
- Convert the total MSUs to Value Units, using the applicable Value Unit Exhibit
- Multiply the price per Value Unit by the total number of Value Units to determine the total cost

To simplify conversion from the designated measurement to Value Units or vice-versa, use the Value Unit Converter Tool. For additional information or to obtain a copy of the Value Unit Converter Tool, visit the Value Unit Converter Tool Web site

   http://ibm.com/zseries/swprice/vuctool

Note that Value Units of a given product cannot be exchanged, interchanged, or aggregated with Value Units of another product.

To determine the required license capacity for the System z IPLA program you selected, refer to the Terms and conditions section.

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<tr>
<th>Program number</th>
<th>Program VRM name</th>
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<tr>
<td>5698-B26</td>
<td>2.2 IBM Tivoli Tape Optimizer on z/OS</td>
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**Product identification number**

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<th>Program PID number</th>
<th>Subscription and Support PID number</th>
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<td>5698-B26</td>
<td>5698-S84</td>
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**Education support**

Comprehensive education for IBM Tivoli products is offered through Worldwide Tivoli Education Delivery Services. A wide range of training options are available, including classes led by instructors, learning on demand, on-site training, and blended learning solutions.

For additional information, visit


**Offering Information**

Product information is available via the Offering Information Web site

   http://www.ibm.com/common/ssi
Publications

The following hardcopy publications are shipped with the basic machine-readable material.

<table>
<thead>
<tr>
<th>Title</th>
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<tr>
<td>IBM Tivoli Tape Optimizer on z/OS, V2.2 Program</td>
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<td>Directory</td>
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<tr>
<td>IBM Tivoli Tape Optimizer on z/OS, V2.2 Quick Start Memo</td>
<td>GI11-8890</td>
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The publications listed below can be downloaded from the following Web site after the planned availability date.


<table>
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<tr>
<td>IBM Tivoli Tape Optimizer on z/OS, V2.2 User Guide</td>
<td>SC23-9735</td>
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<td>IBM Tivoli Tape Optimizer on z/OS, V2.2 Monitoring Agent Planning and Configuration Guide</td>
<td>SC23-9737</td>
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<td>IBM Tivoli Tape Optimizer on z/OS, V2.2 Monitoring Agent User Guide</td>
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The IBM Publications Center

http://www.ibm.com/shop/publications/order

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. Payment options for orders are via credit card (in the U.S.) or customer number for 20 countries. A large number of publications are available online in various file formats, and they can all be downloaded by all countries, free of charge.

Technical information

Specified operating environment

Hardware requirements

Tape Optimizer on z/OS, V2.2 will run on any machine capable of supporting the required software.

Software requirements

- IBM z/OS V1.9, or later with DFSMSrmm
- Any supported version of Time Sharing Option/Extension (TSO/E)
- Any supported version of ISPF

To run the Tivoli Enterprise Monitoring Agent and its TEP interface, the following software is required:

- IBM Tivoli Monitoring Services on z/OS, V6.2 or Tivoli Monitoring V6.2
- One of the following operating systems for the TEP interface:
  - Microsoft® Windows®
  - Linux®
  - UNIX®

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as...
Planning information

Packaging
Tape Optimizer on z/OS, V2.2 is distributed with:

- International Program License Agreement (Z125-3301)
- License Information document
- 3480 tape cartridge
- Publications (refer to the Publications section)

Security, auditability, and control
Tape Optimizer on z/OS, V2.2 uses the security and auditability features of the operating system software. The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Global Technology Services
Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings for the efficient installation, implementation, or integration of this product.

IBM Tivoli Enhanced Value-Based Pricing

IBM Tivoli software products are priced using IBM Tivoli's Enhanced Value-Based Pricing. The Enhanced Value-Based Pricing system is based upon the IBM Tivoli Environment-Managed Licensing Model, which uses a managed-environment approach -- whereby price is determined by what is managed rather than the number and type of product components installed.

For example, all servers monitored with IBM Tivoli's monitoring product (IBM Tivoli Monitoring) require entitlements sufficient for those servers. Other Tivoli products may manage clients, client devices, agents, network nodes, users, or other items, and are licensed and priced accordingly.

Unlike typical systems management licensing models that require entitlements of specific software components to specific systems, the IBM Tivoli Environment-Managed Licensing Model provides the customer flexibility to deploy its IBM Tivoli software products within its environment in a manner that can address and respond to the customer's evolving architecture. That is, as the architecture of a customer's environment changes, the customer's implementation of IBM Tivoli software can be altered, as needed, without affecting the customer's license requirements (as long as the customer does not exceed its entitlements to the software).

Under Enhanced Value-Based Pricing, licensing and pricing of server-oriented applications are determined based upon the server's use in the customer's environment. Typically, such applications are licensed and priced in a manner that corresponds to each installed and activated processor of the server managed by the IBM Tivoli application to help correlate price to value while offering a simple solution.

Where a server is physically partitioned, this approach is modified. This partitioning technique is the approach used with systems that have either multiple cards or multiple frames, each of which can be configured independently. For servers capable of physical partitioning (for example, IBM System p® Scalable POWERparallel Systems® servers, Sun Ultra servers, and HP Superdome servers), an entitlement is required for each processor in the physical partition being managed by the
Tivoli application. For example, assume that a server has 24 processors installed in aggregate. If this server is not partitioned, entitlements are required for all 24 processors. If, however, it is physically partitioned into three partitions, each containing eight processors, and Tivoli products were managing only one of the three partitions, then entitlements would be required for the eight processors on the physical partition managed by the IBM Tivoli application.

For servers with virtual or logical partitions, entitlements are required for all installed and activated processors on the server. For each IBM Tivoli application managing a clustered environment, licensing is based on the cumulative number of installed and activated processors on each server in the cluster. Where the cluster includes physically partitioned servers, the considerations described above concerning physically partitioned servers apply as well.

Enhanced Value-Based Pricing recognizes the convergence of RISC and UNIX, and Microsoft Windows and Intel® technologies, in order to simplify your licensing requirements, and to provide a smoother, more scalable model. Pricing and licensing does not differentiate between non-System z server platforms or operating systems. For some products, this platform neutrality extends to System z and other host servers as well.

**IBM Tivoli Enhanced Value-Based Pricing terminology definitions**

**Enterprise**

An enterprise is a person or single entity and those subsidiaries with more than 50% ownership.

**Managed processor (charging under full capacity in the managed environment)**

Managed processor charges are based on the active processors on the machines in the computing environment affiliated with the program rather than on the server where the program is run. The managed processors which require Proof of Entitlements (PoEs) are defined in the License Information's program-unique terms.

**Notes:**

1. IBM defines a physical processor in a computer as a functional unit that interprets and executes instructions. A physical processor consists of at least an instruction control unit and one or more arithmetic and logic units.
2. Multicore technology allows two or more processors (commonly called cores) to be active on a single silicon chip. With multicore technology, IBM considers each core to be a physical processor. For example, in a dual-core chip, there are two physical processors residing on the single silicon chip.
3. The program may **not run on some or all** of the processors for which PoEs are required by the program's valuation method.
4. In the System z IFL environment, each IFL engine is considered a single physical processor.
5. Threading, a technique which makes a single processor seem to perform as two or more, does **not** affect the count of physical processors.
6. Where blade technology is employed, each blade is considered a separate server and charging is based upon the total number of processors on the blades with which the program is affiliated.
7. Not all processors require the same number of Value Unit entitlements. To determine the number of Value Unit entitlements required, refer to the processor Value Unit conversion table on the Passport Advantage® Web site

http://www.ibm.com/software/passportadvantage

**Millions of Service Units (MSUs)**

MSU is defined as millions of CPU service units per hour, which is the measure of capacity used to describe the computing power of the hardware processors on which
S/390® or System z software runs. Processor MSU values are determined by the hardware vendor, IBM, or Software Compatible Vendors (SCVs).

For more detailed information about System z software pricing, visit

   http://www-03.ibm.com/systems/z/resources/swprice/

**Processor (per processor charging under full capacity)**

In full capacity charging, PoEs must be acquired for all activated processors (available for use) that are on the server where the program or a component of the program is run.

Notes:

1. IBM defines a physical processor in a computer as a functional unit that interprets and executes instructions. A physical processor consists of at least an instruction control unit and one or more arithmetic and logic units.
2. Multicore technology allows two or more processors (commonly called cores) to be active on a single silicon chip. With multicore technology, IBM considers each core to be a physical processor. For example, in a dual-core chip, there are two physical processors residing on the single silicon chip.
3. In the System z IFL environment, each IFL engine is considered a single physical processor.
4. Threading, a technique which makes a single processor seem to perform as two or more, does *not* affect the count of physical processors.
5. Where blade technology is employed, each blade is considered a separate server and charging is based upon the total number of processors on the blade on which the program is run.
6. When a server is shipped with six processors, but two of them are inactive, four processors are active for the customer.
7. Not all processors require the same number of Value Unit entitlements. To determine the number of Value Unit entitlements required, refer to the processor value unit conversion table on the Passport Advantage Web site
   
   http://www.ibm.com/software/passportadvantage

**Server**

A server is a computer system that executes requested procedures, commands, or applications to one or more user or client devices over a network. A PoE must be obtained for each server on which the program or a component of the program is run or for each server managed by the program. Where blade technology is employed, each blade is considered a separate server.

**Standby or backup systems**

For programs running or resident on backup machines, IBM defines three types of situations: cold, warm, and hot. In cold and warm situations, a separate entitlement for the copy on the backup machine is normally not required and typically no additional charge applies. In a hot backup situation, the customer needs to acquire other license or entitlements sufficient for that server. All programs running in backup mode must be solely under the customer's control, even if running at another enterprise's location.

As a practice, the following are definitions and allowable actions concerning the copy of the program used for backup purposes.

**Cold:** A copy of the program may reside, for backup purposes, on a machine as long as the program is not started. There is no additional charge for this copy.

**Warm:** A copy of the program may reside for backup purposes on a machine and is started, but is idling, and is not doing any work of any kind. There is no additional charge for this copy.
**Hot:** A copy of the program may reside for backup purposes on a machine, is started, and is doing work. The customer must acquire a license or entitlements for this copy and there will generally be an additional charge.

Doing work includes, for example, production, development, program maintenance, and testing. It also could include other activities such as mirroring of transactions, updating of files, synchronization of programs, data or other resources (for example, active linking with another machine, program, database or other resource, and so on), or any activity or configurations that would allow an active hot switch or other synchronized switch over between programs, databases, or other resources to occur.

In the case of a program or system configuration that is designed to support a high availability environment by using various techniques (for example, duplexing, mirroring of files, or transactions, maintaining a heartbeat, active linking with another machine, program, database, or other resource), the program is considered to be doing work in the hot situation and a license or entitlement must be purchased.

**Value Units**

A Value Unit is a pricing charge metric for program license entitlements, which is based upon the quantity of a specific designated measurement used for a given program. Each program has a designated measurement. The most commonly used designated measurements are processor cores and MSUs. However, for select programs, there are other designated measurements such as servers, users, client devices, and messages. The number of Value Unit entitlements required for your specific implementation of the given program must be obtained from a conversion table associated with the program. You must obtain a PoE for the appropriate number of Value Unit entitlements for your implementation. The Value Unit entitlements of a given program cannot be exchanged, interchanged, or aggregated with Value Unit entitlements of another program. Whenever the designated measurement is a processor core, not all processors require the same number of Value Unit entitlements. To determine the number of Value Unit entitlements required, refer to the processor value unit conversion table on the Passport Advantage Web site:

http://www.ibm.com/software/passportadvantage

**Product and licensing Web sites**

A complete list of IBM Tivoli products is available at

http://www.ibm.com/software/tivoli

IBM Tivoli product licensing documents are available at


**Pricing example**

The following pricing example applies to IBM Tivoli Tape Optimizer on z/OS, V2.2.

System z server = one 1,500 MSU System z server

The product in this example employs Value Unit slope Value Unit Exhibit 007 (VUE007). The scales below are used to calculate the equivalent number of Value Units for a specified number of MSUs.

In the example below, if the customer has installed 1,500 MSUs, the applicable number of Value Units is:

<table>
<thead>
<tr>
<th>MSUs</th>
<th>Value Units / MSU</th>
<th>Value Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>3</td>
<td>3.00</td>
</tr>
<tr>
<td>Tier A</td>
<td>42</td>
<td>18.90</td>
</tr>
<tr>
<td>Tier B</td>
<td>130</td>
<td>46.80</td>
</tr>
<tr>
<td>Tier C</td>
<td>140</td>
<td>37.80</td>
</tr>
</tbody>
</table>
When calculating the total number of Value Units, the sum is rounded up to the next integer. In this example, the customer needs to license 344 Value Units.

Value Units for non MSU-based System z processors:

<table>
<thead>
<tr>
<th>System</th>
<th>Value units / System</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP3000 H30</td>
<td>6</td>
</tr>
<tr>
<td>MP3000 H50</td>
<td>8</td>
</tr>
<tr>
<td>MP3000 H70</td>
<td>12</td>
</tr>
<tr>
<td>ESL Models</td>
<td>2</td>
</tr>
</tbody>
</table>

Value Units for IBM 9672 processors are based upon the full capacity of these systems. This is applicable to all System z systems measured on MSU capacity. Information on MSU capacities can be found in the IBM System z Machines Exhibit, Z125-3901.

### Ordering information

Consult your IBM representative.

The program in this announcement has Value Unit-Based pricing.

<table>
<thead>
<tr>
<th>Program number</th>
<th>Program name</th>
<th>Value Unit exhibit</th>
</tr>
</thead>
<tbody>
<tr>
<td>5698-B26</td>
<td>IBM Tivoli Tape Optimizer on z/OS, V2.2</td>
<td>VUE007</td>
</tr>
</tbody>
</table>

For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the **required license capacity**. Your required license capacity is based upon the following factors:

- The System z IPLA program you select
- The applicable Value Unit Exhibit
- The applicable terms
- Whether your current mainframes are full capacity or sub-capacity

### Value Unit exhibit VUE007

<table>
<thead>
<tr>
<th></th>
<th>MSUs minimum</th>
<th>MSUs maximum</th>
<th>Value Units/MSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>1</td>
<td>3</td>
<td>1.00</td>
</tr>
<tr>
<td>Tier A</td>
<td>4</td>
<td>45</td>
<td>0.45</td>
</tr>
<tr>
<td>Tier B</td>
<td>46</td>
<td>125</td>
<td>0.36</td>
</tr>
<tr>
<td>Tier C</td>
<td>176</td>
<td>315</td>
<td>0.27</td>
</tr>
<tr>
<td>Tier D</td>
<td>316</td>
<td>+</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Value Units for mainframes without MSU ratings:

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Value Units/machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP3000 H30</td>
<td>6</td>
</tr>
<tr>
<td>MP3000 H50</td>
<td>8</td>
</tr>
<tr>
<td>MP3000 H70</td>
<td>12</td>
</tr>
<tr>
<td>ESL models</td>
<td>2</td>
</tr>
</tbody>
</table>

### Ordering z/OS through the Internet

ShopzSeries provides an easy way to plan and order your z/OS ServerPac or CBPDO. It will analyze your current installation, determine the correct product migration, and present your new configuration based on z/OS. Additional products can also be added to your order (including determination of whether all product requisites are satisfied). ShopzSeries is available in the U.S. and several countries in Europe. In countries where ShopzSeries is not available yet, contact your IBM representative.
(or IBM Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the ShopzSeries Web site at


**Current licensees**

Current licensees, with support in effect, will automatically be shipped the update.

**New licensees**

Orders for new licenses will be accepted now.

Shipment will begin on the planned availability date.

**Basic license**

**Ordering information for 5698-xxx MSU-based System z offerings:**

Translation from MSUs to Value Units

<table>
<thead>
<tr>
<th>MSUs</th>
<th>Value Units/MSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>1-3</td>
</tr>
<tr>
<td>Tier A</td>
<td>4-45</td>
</tr>
<tr>
<td>Tier B</td>
<td>46-175</td>
</tr>
<tr>
<td>Tier C</td>
<td>176-315</td>
</tr>
<tr>
<td>Tier D</td>
<td>316+</td>
</tr>
</tbody>
</table>

To order, specify the program product number and the appropriate license or charge option. Also, specify the desired distribution medium. To suppress shipment of media, select the license-only option in CFSW.

Program name: IBM Tivoli Tape Optimizer on z/OS, V2.2
Program PID: 5698-B26

<table>
<thead>
<tr>
<th>Entitlement identifier</th>
<th>Description</th>
<th>License option/ Pricing metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>S015230</td>
<td>IBM Tivoli Tape Optimizer on z/OS</td>
<td>Basic OTC, per Value Unit SW S&amp;S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Basic OTC, per MSU-day TUC</td>
</tr>
</tbody>
</table>

Orderable supply ID Language Distribution medium

S015235                English                   3480 tape cartridge

Subscription and Support (S&S) PID: 5698-S84

<table>
<thead>
<tr>
<th>Entitlement identifier</th>
<th>Description</th>
<th>License option/ Pricing metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>S011S02</td>
<td>IBM Tivoli Tape Optimizer on z/OS S&amp;S</td>
<td>Basic MSC, per Value Unit SW S&amp;S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>no charge, decline SW S&amp;S per MSU SW S&amp;S registration</td>
</tr>
</tbody>
</table>

Orderable supply ID Language Distribution medium

S011S10                English                   Hardcopy publication

**Subscription and Support**

To receive voice technical support via telephone and future releases and versions, Subscription and Support must be ordered. The capacity of Subscription and Support (for example, Value Units or number of processors) must be the same as the capacity ordered for the product licenses.

To order, specify the Subscription and Support program number (PID) referenced above and the appropriate license or charge option.
IBM is also providing Subscription and Support for this product via a separately purchased offering under the terms of the IBM International Agreement for Acquisition of Software Maintenance. This offering:

- Includes and extends the support services provided in the base support to include technical support via telephone.
- Entitles you to future releases and versions, at no additional charge. Note that you are not entitled to new products.

When Subscription and Support is ordered, the charges will automatically renew annually unless cancelled by you.

**Customized Offerings**

Product deliverables are shipped only via Customized Offerings (for example, CBPDO, ServerPac, SystemPac®).

CBPDO and ServerPac are offered for Internet delivery, where ShopzSeries product ordering is available. Internet delivery of ServerPac may help improve automation and software delivery time. For more details on Internet delivery, refer to the ShopzSeries help information at

http://www.software.ibm.com/ShopzSeries

Media type for this software product is chosen during the Customized Offerings ordering process. Based on your customer environment, it is recommended that the highest possible density tape media is selected. Currently offered media types are:

- CBPDOs - 3480, 3480 Compressed, 3490E, 3590, 3592*
- ServerPacs - 3480, 3480 Compressed, 3490E, 3590, 3592*
- SystemPacs - 3480, 3480 Compressed, 3490E, 3590, 3592*

*3592 is highest density media. Selecting 3592 will ship the fewest number of media.

Once a product becomes generally available, it will be included in the next ServerPac and SystemPac monthly update.

Production of software product orders will begin on the planned general availability date.

- CBPDO shipments will begin one week after general availability.
- ServerPac shipments will begin two weeks after inclusion in ServerPac.
- SystemPac shipments will begin four weeks after inclusion in SystemPac due to additional customization, and data input verification.

**Terms and conditions**

The information provided in this announcement letter is for reference and convenience purposes only. The terms and conditions that govern any transaction with IBM are contained in the applicable contract documents such as the IBM International Program License Agreement, IBM International Passport Advantage Agreement, and the IBM Agreement for Acquisition of Software Maintenance.

**Licensing**

IBM International Program License Agreement including the License Information document and Proof of Entitlement (PoE) govern your use of the program. PoEs are required for all authorized use.
**Agreement for Acquisition of Software Maintenance**

The following agreement applies for Software Subscription and Support (Software Maintenance) and does not require customer signatures:

- IBM Agreement for Acquisition of Software Maintenance (Z125-6011)

This program is licensed under the IBM Program License Agreement (IPLA) and the associated Agreement for Acquisition of Software Maintenance, which provide for support with ongoing access to releases and versions of the program. This program has a one-time license charge for use of the program and an annual renewable charge for the enhanced support that includes telephone assistance (voice support for defects during normal business hours), as well as access to updates, releases, and versions of the program as long as support is in effect.

IBM System z Operational Support Services - SoftwareXcel is an option if you desire added services.

**License Information form number**

GI11-8891

The program's License Information will be available for review on the IBM Software License Agreement Web site


**Limited warranty applies**

Yes

**Limited warranty**

IBM warrants that when the program is used in the specified operating environment, it will conform to its specifications. The warranty applies only to the unmodified portion of the program. IBM does not warrant uninterrupted or error-free operation of the program or that IBM will correct all program defects. You are responsible for the results obtained from the use of the program.

IBM provides you with access to IBM databases containing information on known program defects, defect corrections, restrictions, and bypasses at no additional charge. For further information, consult the IBM Software Support Handbook found at

http://www.ibm.com/support/handbook

IBM will maintain this information for at least one year after the original licensee acquires the program (warranty period).

**Program support**

Support for the program product will be available for a minimum of three years from the general availability date with a fee-based option to extend support for up to two additional years. Enhanced support, called Subscription and Support, includes telephone assistance, as well as access to updates, releases, and versions of the program as long as support is in effect. You will be notified of discontinuance of support with 12 months' notice.

**Money-back guarantee**

If for any reason you are dissatisfied with the program and you are the original licensee, you may obtain a refund of the amount you paid for it, if within 30 days of your invoice date you return the program and its PoE to the party from whom you obtained it. If you downloaded the program, you may contact the party from whom you acquired it for instructions on how to obtain the refund.
For clarification, note that for programs acquired under any of IBM's On/Off Capacity on Demand (On/Off CoD) software offerings, this term does not apply since these offerings apply to programs already acquired and in use by you.

**Authorization for use on home/portable computer**
You may not copy and use this program on another computer without paying additional license fees.

**Other terms**

**Volume orders (IVO)**
No

**IBM International Passport Advantage Agreement**

**Passport Advantage applies**
No

**Usage restriction**
Yes. Usage is limited to the quantity of Value Units licensed.

For additional information, refer to the License Information document that is available on the IBM Software License Agreement Web site


**Software Subscription and Support (Software Maintenance)**
No. For operating system software, the revised IBM Operational Support Services - SoftwareXcel offering will provide support for those operating systems and associated products that are not available with the Software Subscription and Support (Software Maintenance) offering.

This will ensure total support coverage for your enterprise needs, including IBM and selected non-IBM products. For complete lists of products supported under both the current and revised offering, visit

   http://www.ibm.com/services/sl/products

**System i Software Maintenance applies**
No

**Variable charges apply**
No

**Educational allowance available**
Yes. When ordering through the program number process, a 15% education allowance applies to qualified education institution customers.

Education Software Allowance Program applies when ordering through the program number process.

**ESAP available**
Yes, to qualified customers.
**Sub-capacity terms and conditions**

For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the required license capacity. Your required license capacity is based upon the following factors:

- The System z IPLA program you select
- The applicable Value Unit Exhibit
- The applicable terms
- Whether your current mainframes are full capacity or sub-capacity

For more information on the Value Unit Exhibit for the System z IPLA program you selected, refer to the Ordering information section.

<table>
<thead>
<tr>
<th>Program number</th>
<th>Program name</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>5698-B26</td>
<td>IBM Tivoli Tape Optimizer on z/OS</td>
<td>z/OS-based</td>
</tr>
</tbody>
</table>

**Full-capacity mainframes**

In cases where full capacity is applicable, the following terms apply.

Execution based, z/OS based, full machine based: The required capacity of a System z IPLA program with these terms equals the MSU-rated capacity of the machines where the System z IPLA program executes.

For more information on mainframe MSU-rated capacities, visit


Reference based: The required license capacity of a System z IPLA program with these terms equals the license capacity of the applicable monthly license charge (MLC) program. This MLC program is called the parent program.

**Sub-capacity mainframes**

In cases where sub-capacity is applicable, the following terms apply.

Execution based: The required capacity of a System z IPLA sub-capacity program with these terms equals the capacity of the LPARs where the System z IPLA program executes.

z/OS based: The required license capacity of a System z IPLA program with these terms equals the license capacity of z/OS on the machines where the System z IPLA program executes.

Reference based: The required license capacity of a System z IPLA program with these terms equals the license capacity of the applicable monthly license charge (MLC) program. This MLC program is called the parent program.

Full machine based: The required license capacity of a System z IPLA program with full machine based terms equals the MSU-rated capacity of the machines where the System z IPLA program executes.

For more information on mainframe MSU-rated capacities, refer to *The IBM System z Machines Exhibit, Z125-3901*, or visit the Mainframes section of the System z Exhibits Web site

http://ibm.com/zseries/library/swpriceinfo/

For more information on sub-capacity System z IPLA terms and conditions, refer to Software Announcement ZA04-0227, dated August 10, 2004.
For additional information for products with reference-based terms, System z IPLA sub-capacity programs with reference-based terms adds value to the parent program across the environment, regardless of where in the environment the System z IPLA program executes.

An environment is defined as either a single or standalone machine or a qualified Parallel Sysplex®. You may have one or more different environments across the enterprise. To determine the required license capacity for each System z IPLA program with referenced-based terms, each environment should be assessed separately.

When a System z IPLA sub-capacity program with reference-based terms is used in a qualified Parallel Sysplex environment, the required license capacity of the System z IPLA program must equal with the license capacity of the parent program across the Parallel Sysplex. Qualified Parallel Sysplex refers to one:

- That meets the criteria defined in Hardware Announcement 198-001 (RFA29235), dated January 13, 1998
- Where MLC pricing is aggregated across the sysplex

**Sub-capacity eligibility**

To be eligible for sub-capacity charging on select System z IPLA programs, you must first implement and comply with all terms of either sub-capacity Workload License Charges (WLC) or sub-capacity Entry Workload License Charges (EWLC). To implement sub-capacity WLC or EWLC, a machine must be System z (or equivalent). On that machine:

- All instances of the OS/390® operating system must be migrated to the z/OS operating systems
- Any licenses for the OS/390 operating system must be discontinued
- All instances of the z/OS operating systems must be running in z/Architecture® (64-bit) mode

For that machine, you must create and submit a Sub-Capacity Report to IBM each month. Sub-Capacity Reports must be generated using the Sub-Capacity Reporting Tool (SCRT). For additional information or to obtain a copy of SCRT, visit the System z Software Pricing Web site

http://ibm.com/zseries/swprice

You must comply with all of the terms of the WLC or EWLC offering, whichever is applicable:

- The complete terms and conditions of sub-capacity WLC are defined in the IBM Customer Agreement - Attachment for System z Workload License Charges (Z125-6516).
- The complete terms and conditions for sub-capacity EWLC are defined in the IBM Customer Agreement - Attachment for IBM System z 890 and 800 License Charges (Z125-6587).

Additionally, you must sign and comply with the terms and conditions specified in the amendment to the IPLA contract - Amendment for IBM System z9® and System z Programs Sub-Capacity Pricing (Z125-6929). Once the amendment is signed, the terms in the amendment replace any and all previous System z IPLA sub-capacity terms and conditions.

**On/Off Capacity on Demand (CoD)**

To be eligible for On/Off CoD pricing, you must be enabled for temporary capacity on the corresponding hardware, and the required contract, Attachment for Customer Initiated Upgrade and IBM eServer™ On/Off Capacity on Demand - Software (Z125-6611) must be signed prior to use.
IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a Web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, visit

http://www.ibm.com/support/electronic

Prices

For additional information and current prices, contact your local IBM representative.

Contact your local IBM representative for the applicable charges.

Announcement countries

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