



**Tivoli Business Systems Manager**  
*Resource Management Facility Release Notes*  
*Version 1.5*





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## Tivoli Business Systems Manager Resource Management Facility Release Notes

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## Preface

Tivoli Business Systems Manager provides a robust, system management functionality. In support of the operational perspectives of that functionality, Tivoli Business Systems Manager installs components on both the OS/390 and NT platforms.

## Accessing Publications Online

The following sections describe how to access publications online, order publications, provide feedback about publications and contact customer support.

The Tivoli Customer Support Web site (<http://www.tivoli.com/support/>) offers a guide to support services (the *Customer Support Handbook*); frequently asked questions (FAQs); and technical information, including release notes, user's guides, redbooks, and white papers. You can access Tivoli publications online at <http://www.tivoli.com/support/documents/>. The documentation for some products is available in PDF and HTML formats. Translated documents are also available for some products.

To access most of the documentation, you need an ID and a password. To obtain an ID for use on the support Web site, go to <http://www.tivoli.com/support/getting/>.

Resellers should refer to <http://www.tivoli.com/support/smb/index.html> for more information about obtaining Tivoli technical documentation and support.

Business Partners should refer to "Ordering Publications" for more information about obtaining Tivoli technical documentation.

**Attention:** The following note is an example of exceptional information. If your documentation requires similar, exceptional information, add it in the appropriate section (however, it is likely that your documentation does not require any additional notes or addenda). In all instances, remove this Attention element.

**Note:** For NetView OS/390 customers, additional support is also available on the NETVIEW CFORUM (Customer Forum) through the IBMLink system. This forum is monitored by NetView developers who answer questions and provide guidance. When a problem with the code is found, you are asked to open an official problem management record (PMR) to get resolution.

## Ordering Publications

Order Tivoli publications online at [http://www.tivoli.com/support/Prodman/html/pub\\_order.html](http://www.tivoli.com/support/Prodman/html/pub_order.html) or by calling one of the following telephone numbers:

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- Send e-mail to [pubs@tivoli.com](mailto:pubs@tivoli.com).

- 
- Fill out our customer feedback survey at <http://www.tivoli.com/support/survey/>.

## Contacting Customer Support

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- Submit a PMR electronically through the IBMLink™ system. For information about IBMLink registration and access, refer to the IBM Web page at <http://www.ibm.link.ibm.com>.
- Send e-mail to [support@tivoli.com](mailto:support@tivoli.com).
- Customers in the U.S. can call **1-800-TIVOLI8 (1-800-848-6548)**.
- Customers outside the U.S. should refer to the Tivoli Customer Support Web site at <http://www.tivoli.com/support/locations.html> for customer support telephone numbers.

When you contact Tivoli Customer Support, be prepared to provide the customer number for your company so that support personnel can assist you more readily.



## 1

# Release Notes

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## Overview

Resource Management Facility (RMF) supplies monitors that collect data about system workload and resource utilization. This data addresses all hardware and software components of your system: processor, I/O device and storage activities and utilization, as well as resource consumption, activity and performance of groups of address spaces. Data is gathered for a specific cycle time, and consolidated data records are written at a specific interval time.

RMF provides a wide breadth of data that informs you about the status of almost any resource within the MVS world. RMF issues reports about system performance that you can use for the following:

- Determine if your system is running smoothly
- Detect system bottlenecks caused by contention for resources
- Evaluate the service your installation provides to different groups of users
- Identify workload delays and the reason for the delay
- Monitor system failures, system stalls, and failures of selected applications

RMF comes with three monitors: Monitor I, II, and III. Monitor I provides long term data collection for system workload and resource utilization. The Monitor I session is continuous, and measures various areas of system activity over a long period of time. Monitor II is an online snapshot session that generates a requested report from a single data sample. Monitor III provides short-term data collection and online reports for continuous monitoring of system workflow and delays.

Most performance problems revolve around unacceptably high response times or resource usage. High response time results in service level objectives being exceeded and user complaints about slow response time. High response time is often caused by high workload activity or constrained resources. Generally, a performance problem is the result of some workload not getting the resources it needs to complete in a timely manner. Alternatively, the resource is obtained, but is not fast enough to provide the desired response time.

In order to investigate performance problems, it is important to quantify the workload activity, its use of system resources and their impact on delivered service such as transaction response time. Monitor III provides insight into the components of response time. It shows the resources for which work is being delayed and the address spaces that are holding the resources. It also reports system resources showing stress or sign of a problem, such as CPU, storage, I/O or Sysplex. In addition, Monitor III reports workflow, which indicates how well a workload is able to get the system resources it wants.

---

Tivoli Business System Manager integrates with RMF monitors to generate exceptions when RMF collected metrics exceed customer supplied thresholds. This is achieved through the RMF interface feature of the TBSM Source/390 component. It targets Monitor III with its ability to determine the 'cause of delay' as a data source for real-time performance events. Upon object registration, customers select RMF metrics fields and their threshold information to be used for generating exceptions. When registered, RMF exceptions are captured and posted to Tivoli Business Systems Manager workstation and appear as alerts related to Operating System image object.

## **Overview of RMF Integration with Tivoli Business Systems Manager**

### **Monitoring RMF Data**

Tivoli Business Systems Manager uses RMF data and automated thresholds to monitor OS/390 resources and services. Data captured from RMF is provided in the form of metrics. The implementation of this release of Tivoli Business Systems Manager processes a subset of the RMF Monitor III metrics such as activity, utilization, workflow and delay counters. The complete list of supported metrics for this release is located in "RMF Metrics Table" on page 13 of this manual.

The components used by Tivoli Business Systems Manager in monitoring RMF are the following:

#### **Monitoring Subtask**

starts the collector and the reporter. Sends exception messages

#### **RMF Collector**

calls RMF and receives the response to the request

#### **RMF Reporter**

processes the output from the RMF Collector and checks whether the threshold has been exceeded

#### **RMF Distributed Data Server**

address space that allows Tivoli Business Systems Manager to obtain information from RMF

The Collector uses UDP datagrams as a mechanism for obtaining information from the RMF Distributed Data Server. The Reporter and Monitoring Subtask generate exception messages when captured RMF metrics exceeds registered threshold values. Routing of these exception messages results in updates to the Tivoli Business Systems Manager graphical user interface.

### **Processing RMF Events**

The events collected by the RMF interface are processed by Tivoli Business Systems Manager in the same manner as exceptions collected from other source monitors. Once an exception occurs, Tivoli Business Systems Manager forwards the events to a Windows NT based set of services that post the reported exceptions to the appropriate OS (Operating System) image object. The following diagram depicts the event processing data flow as

- MVS\_IMAGE
- PROCESSOR
- STORAGE
- CENTRAL\_STORAGE
- CSA
- SQA

- 
- ECSA
  - ESQA
  - EXPANDED\_STORAGE
  - ENQUEUE
  - OPERATOR
  - SW\_SUBSYSTEMS
  - JES
  - HSM
  - XCF

RMF reports a unique set of indicators for each resource type. *Delay* is the most common indicator for all resource types (percent delay and the number of delayed jobs). Other indicators include activity or resources counts, workflow and using percentages. The RMF metrics received are evaluated by Tivoli Business Systems Manager against user-established thresholds and an internal exception message is generated if they do not match. For a detailed list of supported exception events, messages, alert states, priorities, and thresholds refer to “RMF Exception Table” on page 17.

## Registration of Exception Data

Tivoli Business Systems Manager provides an upload facility to communicate collection requirements to its OS/390 components. Upon initialization, TBSM Source/390 Object Pump sends the startup message to NT. This event triggers upload of all registration data to OS/390 monitoring components including RMF exception profiles. Tivoli Business Systems Manager is shipped with three profiles for RMF exceptions. The “default profile” includes twenty-five (25) exceptions with production type thresholds. The “stress profile” is provided for testing RMF exception messages and its thresholds are set to low values. The “eliminate profile” is used for RMF exception monitoring.

In order to manage exceptions, the Reporter program needs to know the collection metrics and threshold values. This data is sent to the TBSM Source/ 390 component during the exception registration process. Tivoli Business Systems Manager allows customization of RMF exceptions for each instance of a RMF monitor. The exception registration record supplies the necessary parameters to the Monitoring subtask to start Collector and Reporter programs for each exception. For further details, refer to “RMF Exception Table” on page 17.

The initial registration record defaults to 100 seconds interval aligned on the hour boundary mark. When the monitoring program receives the initial exception registration record, it executes the EXCP ADD command to start the monitoring process.

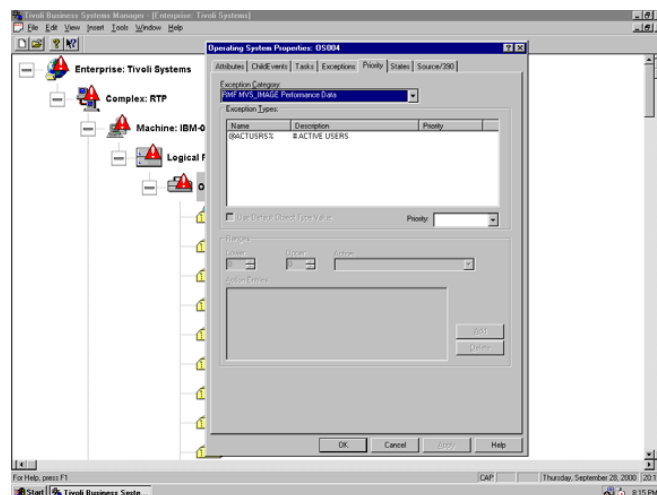
RMF exceptions are refreshed from a Source/390 menu by right-clicking the Operating System or any of its parent objects.

## Processing of Exception Events

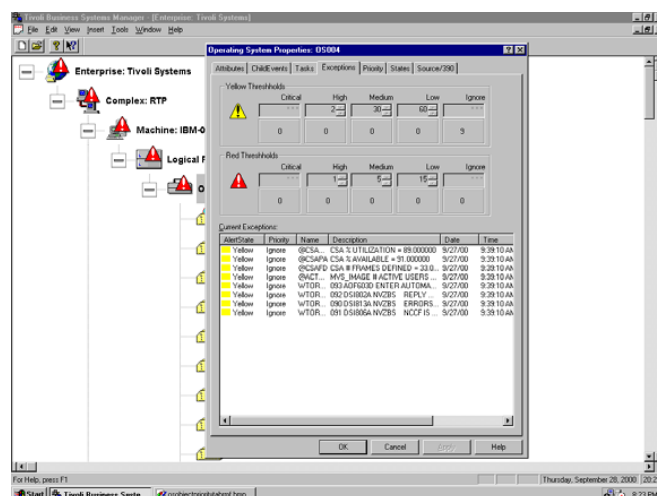
Each exception, upon registration, is associated with a unique Collector/Reporter program pair activated by the AOPMONP program based on the interval cycle provided by the exception registration data. If the exception condition is true, the monitoring subtask sends an exception event to NT.

When the Tivoli Business Systems Manager NT server receives an exception event it generates the pre-defined RMF event and graphically posts the alert icon associated with this event along with the exception message to the affected Operating System.

You view all registered RMF exceptions by resource category. You select the OS object properties and then click the Priority tab (see the following illustration).



You view posted exception messages by displaying the Exception tab of the Operating System (see the following illustration).



## RMF Event Scenario

The following scenario outlines a sample event flow of Tivoli Business Systems Manager events for the RMF exception HMVDLY generated from **Operating System: IP01**:

1. Upon registration of the HMVDLY exception for the IP01 object, Tivoli Business Systems Manager initiates interval based collection and evaluation of the IP01 MVS image resource percent delay value as reported by the RMF gatherer session running on the IP01 system.

- 
2. When the Reporter program detects that percent delay for IP01 MVS image resource exceeds the registered threshold of 50%, it returns the exception data to AOPMONP monitoring subtask that formats the HDMVDLY exception message and passes it to the object pump for transmission to NT server.
  3. Tivoli Business Systems Manager NT Listener for IP01 system receives DMVDLY exception and generates an RMF event based on the registered alert state and priority for this exception. DMVDLY exception message is then inserted into Tivoli Business Systems Manager database.
  4. Tivoli Business Systems Manager Propagation Agent posts DMVDLY exception to IP01 object and tags it and its parent chain with a Red alert icon.

The Reporter program keeps reporting the DMVDLY exception for each expired interval as long as the collected delay value exceeds the 50% threshold. The alert is cleared when the collected delay value drops below the 50% threshold.

For a full list of RMF events see “RMF Exception Table” on page 17.

## RMF Monitoring Task

The framework for rapid development of collector and reporting programs is provided by the monitoring subtask that can be used to monitor a variety of situations. Control is provided by registration data that describes these programs and their parms. The monitoring subtask invokes all collector and reporter programs. For each exception, the collector program is called, followed by the reporter. Exceptions are driven at a predetermined interval. Each exception is named through registration data.

Should the Collector or Reporter program ABEND for an exception, then that exception is disabled. Any return code greater than zero indicates that the collector program is unable to collect the data. A SVC dump is provided for the ABEND.

If the exception data was collected successfully, the collector program ends with a zero return code. A return code of 16 and greater indicates a severe error. In this case, the monitoring task stops invoking this exception and issues a message. The reporter program checks if the exception is on or off. If it is off, the reporter program ends with zero return code. If the exception is true, the reporter ends with a negative return code. In this case the result area contains the data to be sent in the message to NT.

The monitoring subtask is responsible for formatting and sending the exception message to NT. Any other return code by the reporter program indicates that there was an error with the reporter program.

Commands are provided to add, remove, or show exceptions. Each exception has an interval that is specified in seconds and must be a whole division of one hour. An optional ALIGN parameter allows exceptions to be aligned on a boundary (such as the hour or 15-minute mark). If this is not supplied, the exception is invoked after the interval has expired from the time the exception was added.

The Exception status Value indicates whether the exception is true or not, together with any error status. If the exception abends or is turned off by the collector program then that value is returned. If the reporter indicates that the exception is not true then the value of False is

sent once. Subsequent false records are not sent until the situation is true once again. The metric value and exception text fields are only sent when the situation is true.

In support of RMF monitoring, a number of control parameters and error messages have been added to TBSM Source/390 Object Pump. For details refer to “Object Pump Startup Parameters” on page 23 and the *Tivoli Business Systems Manager Messages Guide*. The Tivoli Business Systems Manager Source/390 Object Pump also requires an OMVS segment defined for the userid associated with the Object Pump. For further details, refer to the *OS/390 V2R8.0 SecureWay CS IP Migration Manual, Chapter 7.1.2.1*.

## Customization

### Enabling RMF Functionality

The following instructions enable you to customize your RMF functionality.

1. Make a copy of *Sample\_RMF\_Profiles.sql* to a customer-specific file with the *.SQL* extension (for example, *customer.sql*)

```
C:\TivoliManager\sql> copy Sample_RMF_Profiles.sql customer.sql
```

2. To associate an existing profile to an existing OS, modify a the *RMF\_OBJECT\_RELATION()* portion of the file and discard the rest of the file.

```
--
-- Samples of associating existing OS with existing profile
--
include(BusinessObject.sql)
-----
-- Associate OS(s) 12 with the 'Default' Profile
BEGIN_RMF_PROFILE(Default) RMF_OBJECT_RELATION(OS, 12)
END_RMF_PROFILE()
-----
PRINT 'Done.'
GO
```

**Note:** Use the Object IDs to identify objects while creating relationship statements. Double-clicking the object displays the Object ID while holding down the **Shift and Control** key (or running a *sql* procedure. It returns a 10 digit number (displayed in the title bar of the property sheet) where the left six digits represent ObjectID and the right four digits represent ClassID.

**Note: IMPORTANT:**

The RMF macro, *RMF\_DEFINITION()*, has been replaced by *RMF\_DEFINITION\_EX()*. The older macro, *RMF\_DEFINITION()*, is being maintained for backward compatibility only. All new RMF profiles should be implemented in terms of *RMF\_DEFINITION\_EX()*.

**OLD MACRO SYNTAX:**

**Macro:**RMF\_DEFINITION

**Category:**RMF

**Description:**Definition of a specific RMF exception and threshold.



---

**Usage:**RMF\_DEFINITION(RMF\_METRIC\_BASENAME, RMF\_PARAM\_01, RMF\_PARAM\_02, RMF\_PARAM\_03, METRIC\_COMPARISON, METRIC\_VALUE, METRIC\_ID, METRIC\_CATEGORY, METRIC\_DESCRIPTION)

**Required Parameters:**

RMF\_METRIC\_BASENAME - Unique name of this RMF metric

RMF\_PARAM\_01 - parameter 01

RMF\_PARAM\_02 - parameter 02

RMF\_PARAM\_03 - parameter 03

METRIC\_COMPARISON - GT,LT

METRIC\_VALUE - value which to compare

METRIC\_ID - RMF identifier from RMF documentation; not unique

METRIC\_CATEGORY - RMF category

**Optional Parameters:**

METRIC\_DESCRIPTION - description of the RMF metric (free-form)

**NEW MACRO SYNTAX:**

**Macro:**RMF\_DEFINITION\_EX

**Category:**RMF

**Description:**Definition of a specific RMF exception and threshold.

**Usage:** RMF\_DEFINITION\_EX(RMF\_METRIC\_BASENAME, RMF\_PARAM\_01, RMF\_PARAM\_02, RMF\_PARAM\_03, RMF\_PARAM\_04, RMF\_PARAM\_05, METRIC\_CATEGORY, METRIC\_ID, METRIC\_COMPARISON, METRIC\_VALUE, METRIC\_DESCRIPTION, RMF\_INTERVAL, RMF\_INTERVAL\_ALIGNMENT, RMF\_PROFILE\_DEF\_ENABLED)

**Required Parameters:**

RMF\_METRIC\_BASENAME - Unique name of this RMF metric

RMF\_PARAM\_01- parameter 01

RMF\_PARAM\_02 - parameter 02

RMF\_PARAM\_03 - parameter 03

RMF\_PARAM\_04 - parameter 04

RMF\_PARAM\_05 - parameter 05



METRIC\_CATEGORY - RMF category

METRIC\_ID - RMF identifier from RMF documentation; not unique

METRIC\_COMPARISON - GT,LT

METRIC\_VALUE - value which to compare

**Optional Parameters:**

METRIC\_DESCRIPTION - description of the RMF metric (free-form)

RMF\_INTERVAL - obtain RMF data every RMF\_INTERVAL seconds; default=100

RMF\_INTERVAL\_ALIGNMENT - number of MMSS passed the hour to start the RMF\_INTERVAL; default=0

RMF\_PROFILE\_DEF\_ENABLED - enabled boolean (0,1); default=1

3. To create a new profile and associate with an existing OS, follow the example in the block of code beginning with "Create a new Profile 'Customer\_Default'...", remembering to perform a search and replace for "0x44" and "Customer\_Default".

**Note:** 0x44 is the ObjectID in the following RMF profile.

Sample of customer-defined RMF profile include(*BusinessObject.sqi*)

Create a new Profile 'Customer\_Default' and associate OS(s) 0x44 with the 'Customer\_Default' Profile **RECOMMENDATION:** Create a customer-specific profile like '<customerID>\_Default' (for example, 'DMData\_Default') that is a copy of the following profile.

```
BEGIN_RMF_PROFILE(Customer_Default)
```

```
RMF_DEFINITION_EX(LCSFRAV, %name%, *, CENTRAL_STORAGE, NULL,
NULL, G, 8D0050, LT, 5.00 , Low available frames)
```

```
RMF_DEFINITION_EX(LCSUIC, %name%, *, CENTRAL_STORAGE, NULL, NULL,
G, 8D1260, LT, 15.00 , Low unref interval cnt)
```

```
RMF_DEFINITION_EX(HCSANRL, %name%, *, CSA, NULL, NULL, G, 8D0410, GT,
20.00 , High not released frames % )
```

```
RMF_DEFINITION_EX(HCSAUTL, %name%, *, CSA, NULL, NULL, G, 8D0530, GT,
95.00 , High CSA Utilizat %)
```

```
RMF_DEFINITION_EX(HENQDLY, %name%, *, ENQUEUE, NULL, NULL, G,
8D00E0, GT, 25.00 , High delay %)
```

```
RMF_DEFINITION_EX(HESMIGRA, %name%, *, EXPANDED_STORAGE, NULL,
NULL, G, 8D0FD0, GT, 200.00 , Low migration age)
```

```
RMF_DEFINITION_EX(HHSMMDLY, %name%, *, HSM, NULL, NULL, G, 8D00F0,
GT, 25.00 , High delay %)
```

---

RMF\_DEFINITION\_EX(HIOACTR, %name%, \*, I/O\_SUBSYSTEM, NULL, NULL, G, 8D1E90, GT, 800.00 , High I/O activity rate)

RMF\_DEFINITION\_EX(HIODLY, %name%, \*, I/O\_SUBSYSTEM, NULL, NULL, G, 8D0170, GT, 40.00 , High delay %)

RMF\_DEFINITION\_EX(LIOWFLW, %name%, \*, I/O\_SUBSYSTEM, NULL, NULL, G, 8D1E20, LT, 30.00 , Low workflow %)

RMF\_DEFINITION\_EX(HJESDLY, %name%, \*, JES, NULL, NULL, G, 8D0100, GT, 25.00 , High delay %)

RMF\_DEFINITION\_EX(HMVACTU, NULL, %name%, MVS\_IMAGE, NULL, NULL, G, 8D0620, GT, 100.00 , High # of active users)

RMF\_DEFINITION\_EX(HMVDLY, NULL, %name%, MVS\_IMAGE, NULL, NULL, G, 8D0160, GT, 50.00 , High delay %)

RMF\_DEFINITION\_EX(HMVUNK, NULL, %name%, MVS\_IMAGE, NULL, NULL, G, 8D0470, GT, 25.00 , High unknown delay%)

RMF\_DEFINITION\_EX(LMVWFLW, NULL, %name%, MVS\_IMAGE, NULL, NULL, G, 8D0550, LT, 50.00 , Low workflow %)

RMF\_DEFINITION\_EX(MVEXCVL, NULL, %name%, MVS\_IMAGE, NULL, NULL, G, 8D0EF0, LT, 50.00 , Low Velocity)

RMF\_DEFINITION\_EX(HOPRDLY, %name%, \*, OPERATOR, NULL, NULL, G, 8D0110, GT, 25.00 , High delay %)

RMF\_DEFINITION\_EX(HPRDLY, %name%, \*, PROCESSOR, NULL, NULL, G, 8D0120, GT, 20.00 , High delay %)

RMF\_DEFINITION\_EX(HPRTOTU, %name%, \*, PROCESSOR, NULL, NULL, G, 8D0460, GT, 115.00 , High Total utilization)

RMF\_DEFINITION\_EX(LPRWFLW, %name%, \*, PROCESSOR, NULL, NULL, G, 8D1E10, LT, 60.00 , Low workflow %)

RMF\_DEFINITION\_EX(HSQANRL, %name%, \*, SQA, NULL, NULL, G, 8D0410, GT, 20.00 , High not released frames %)

RMF\_DEFINITION\_EX(HSQAUTL, %name%, \*, SQA, NULL, NULL, G, 8D0530, GT, 95.00 , High SQA Utilizat %)

specify optional parameter(s): RMF\_INTERVAL = 100

RMF\_DEFINITION\_EX(HSTDLY, %name%, \*, STORAGE, NULL, NULL, G, 8D0130, GT, 20.00 , High delay %, 100)

specify optional parameter(s): RMF\_INTERVAL = 100,  
RMF\_INTERVAL\_ALIGNMENT=0,

---

```
RMF_DEFINITION_EX(HSSDLY, %name%, *, SW_SUBSYSTEMS, NULL, NULL, G,
8D0140, GT, 25.00 , High delay %, 100, 0)
```

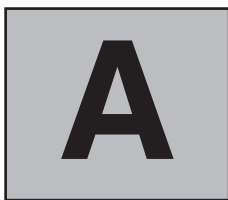
```
specify optional parameter(s): RMF_INTERVAL = 100,
RMF_INTERVAL_ALIGNMENT=0, RMF_PROFILE_DEF_ENABLED=1
```

```
RMF_DEFINITION_EX(HXCFDLY, %name%, *, XCF, NULL, NULL, G, 8D0150, GT,
25.00 , High delay %, 100, 0, 1)
```

```
associate OS(s) 0x44 with the 'Customer_Default' Profile
RMF_OBJECT_RELATION(OS, 0x44) END_RMF_PROFILE() PRINT 'Done.'
```

4. Compile your *customer.sql* file from the `<install_dir>\sql\` directory with the following command to compile *customer.sql* to the *.sqiout/customer.sql* output file:  
**C:\TivoliManager\sql> sh clsql -osqiout customer.sql**
5. Apply the compiled *sqiout/customer.sql* file to your database: **C:\TivoliManager\sql> isql -Sit01 -Usa -Psa\_it01 -n -isqiout/customer.sql**
6. Re-cycle propagation by stopping and starting the *Tivoli BSM Propagation Agent Dispatcher NT* service on the Database host.
7. Upload the new RMF settings to the TBSM Source/390 Object Pump by right-clicking the desired OS and selecting **Upload►Send RMF Registration** from the menu. These RMF profiles are also uploaded automatically when the TBSM Source/390 Object Pump is recycled.

---



## RMF Metrics Table

The RMF metrics supported in this release of Tivoli Business Systems Manager are listed in the following table.

**Note:** RMF metrics designated with the asterisk (\*) character are collected by the reporting task, but no Tivoli Business Systems Manager exceptions are currently generated.

Tivoli Business Systems Manager Supported RMF Metrics Linked to the Operating System	
<b>Resource Name: MVS Image</b>	
	# active users
	# delayed jobs
	# users
	# using jobs
	% delay
	% idle *
	% unknown
	% using
	% workflow
	Execution velocity
	Transaction ended rate
<b>Resource Name: I/O Subsystem</b>	
	# delayed I/O requests
	# delayed jobs
	# using jobs
	% delay
	% using
	% workflow
	Delayed I/O request rate
	I/O activity rate
<b>Resource Name: Processors</b>	
	# delayed job
	# processors online
	# using jobs
	% SRB
	% TCB
	% delay

<b>Tivoli Business Systems Manager Supported RMF Metrics Linked to the Operating System</b>
% partition utilization
% TCB + SRB
% total utilization
% using
% workflow
<b>Resource Name: Storage</b>
# delayed jobs
% delay
<b>Resource Name: Central Storage</b>
# frames online *
% frames CSA *
% frames LPA *
% frames NUC *
% frames SQA *
% frames active *
% frames available
% frames idle *
Unreferenced interval count
<b>Resource Name: CSA</b>
# frames defined *
# frames not released *
% available
% not released
% utilization
<b>Resource Name: SQA</b>
# frames defined *
% available
% not released
% utilization
<b>Resource Name: ECSA</b>
# frames defined *
# frames not released *
% available
% not released
% utilization
<b>Resource Name: ESQA</b>
# frames defined *
# frames not released
% available
% not released
% utilization

Tivoli Business Systems Manager Supported RMF Metrics Linked to the Operating System	
<b>Resource Name: Expanded Storage</b>	
	# frames online *
	% frames CSA *
	% frames LPA *
	% frames SQA *
	% frames active *
	% frames available
	% frames idle *
	Migration age
<b>Resource Name: Enqueue</b>	
	# delayed jobs
	% delay
<b>Resource Name: Operator</b>	
	# delayed jobs
	% delay
<b>Resource Name: Software Subsystems</b>	
	# delayed jobs
	% delay
<b>Resource Name: JES</b>	
	# delayed jobs
	% delay
<b>Resource Name: HSM</b>	
	# delayed jobs
	% delay
<b>Resource Name: XCF</b>	
	% delay
	# delayed jobs

---





## RMF Exception Table

The following tables list the supported RMF exception names and their description. They are grouped by reporting resource. The first table lists RMF exceptions with default threshold settings. These exceptions are activated upon product initiation.

The second table lists the full set of supported exceptions. Only default exceptions are enabled (registered) upon product initiation. Other exceptions require registration by the Tivoli Business Systems Manager administrator in order to be enabled.

All events in Tivoli Business Systems Manager are categorized by alert state and priority. By default, exceptions are assigned Yellow/Ignore status and messages are assigned Green/Ignore status. The Tivoli Business Systems Manager administrator has the ability to override these values in order to "tune" Tivoli Business Systems Manager so that only meaningful alerts are propagated to the user workstation.

Alert State can have the values of Red, Yellow or Green.

Priority can have the values of Critical, High, Medium, Low, or Ignore.

For more detailed information and an understanding on setting alert states and priorities refer to the *Tivoli Business Systems Manager Administration Guide*.

All exceptions are categorized by the event type. Many exceptions have common meaning for performance impact even if they are reported by different resources. The following four types of events are defined:

**Delay** indicates high impact of waiting on resources

**Activity**  
provides high workload activity alerts

**Service**  
provides low service alerts

**Usage** provides high resource usage alerts and low resource availability alerts

### Default Exceptions

Exception Name	Description	Event Type	MetricId	Threshold	Alert State	Priority
Resource Name: MVS Image						
HMVACTU	High # of active users	Activity	0x8D0620	100	Yellow	Low

Exception Name	Description	Event Type	MetricId	Threshold	Alert State	Priority
HMVDLY	High delay %	Delay	0x8D0160	50	Red	Medium
HMVUNK	High unknown delay %	Delay	0x8D0470	25	Yellow	Medium
LMVWFLW	Low workflow %	Service	0x8D0550	50	Red	Medium
MVEXCVL	Low Velocity	Service	0x8D0EF050	50	Yellow	Low
<b>Resource Name: I/O subsystem</b>						
HIODLY	High delay %	Delay	0x8D0170	40	Yellow	Medium
LIOWFLW	Low workflow %	Service	0x8D1E20	30	Yellow	Low
HIOACTR	High I/O activity rate	Activity	0x8D1E90	800	Yellow	Low
<b>Resource Name: Processor</b>						
HPRDLY	High delay %	Delay	0x8D0120	20		
HPRTOTU	High Total utilization	Usage	0x8D0460	115		
LPRWFLW	Low workflow %	Service	0x8D1E10	60	Yellow	Low
<b>Resource Name: Storage</b>						
HSTDLY	High delay %	Delay	0x8D0130	20	Yellow	Medium
<b>Resource Name: Central Storage</b>						
LCSFRAV	Low available frames %	Usage	0x8D0050	5	Yellow	Medium
LCSUIC	Low unref interval cnt	Usage	0x8D1260	15	Yellow	Medium
<b>Resource Name: CSA</b>						
HCSANRL	High not released frames %	Usage	0x8D0410	20	Yellow	Medium
HCSAUTL	High CSA Utilizat %	Usage	0x8D0530	95	Red	High
<b>Resource Name: SQA</b>						
HSQANRL	High not released frames %	Usage	0x8D0410	20	Yellow	Medium
HSQAUTL	High SQA Utilizat %	Usage	0x8D0530	95	Red	High
<b>Resource Name: Expanded Storage</b>						
HESMIGRA	Low migration age	Usage	0x8D0FD0	200	Yellow	Medium
<b>Resource Name: Enqueue</b>						
HENQDLY	High delay %	Delay	0x8D00E0	25	Yellow	Medium
<b>Resource Name: Operator</b>						
HOPRDLY	High delay %	Delay	0x8D0110	25	Yellow	Medium

Exception Name	Description	Event Type	MetricId	Threshold	Alert State	Priority
<b>Resource Name: SW subsystem</b>						
HSSDLY	High delay %	Delay	0x8D0140	25	Yellow	Medium
<b>Resource Name: JES</b>						
HJESDLY	High delay %	Delay	0x8D0100	25	Yellow	Medium
<b>Resource Name: HSM</b>						
HHSMDLY	High delay %	Delay	0x8D00F0	25	Yellow	Medium
<b>Resource Name: XCF</b>						
HXCFDLY	High delay %	Delay	0x8D0150	25	Yellow	Medium

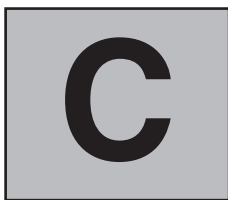
## Supported Exceptions

Exception Name	Description	Event Type	MetricId	Enablement	Alert State	Priority
<b>Resource Name: MVS Image</b>						
HMVACTU	High # of active users	Activity	0x8D0620	Default	Yellow	Low
HMVDLY	High delay %	Delay	0x8D0160	Default	Red	Medium
HMVUNK	High unknown delay %	Delay	0x8D0470	Default	Yellow	Medium
LMVWFLW	Low workflow	Service	0x8D0550	Default	Red	Medium
MVEXCVL	Low Velocity	Service	0x8D0EF0	Default	Yellow	Low
HMVDJOB	High # of delayed jobs	Delay	0x8D12D0	Field	Yellow	Medium
HMVUSER	High # of users	Activity	0x8D0D50	Field	Green	Ignore
LMVUJOB	Low # of using jobs	Service	0x8D1530	Field	Yellow	Low
LMVUSNG	Low using %	Service	0x8D0550	Field	Yellow	Low
LMVTXNR	Low txns ended rate	Service	0x8D1200	Field	Yellow	Low
<b>Resource Name: I/O subsystem</b>						
HIODLY	High delay %	Delay	0x8D0170	Default	Yellow	Medium
LIOWFLW	Low workflow %	Service	0x8D1E20	Default	Yellow	Low
HIOACTR	High I/O activity rate	Activity	0x8D1E90	Default	Low	Yellow
HIODJOB	High # delayed jobs	Delay	0x8D0700	Field	Yellow	Medium
HIODLYRQ	High # of delayed I/O	Delay	0x8D0680	Field	Yellow	Medium
LIOUSNG	Low using %	Service	0x8D04B0	Field	Yellow	Low
HIODIORR	High delayed I/O rate	Delay	0x8D0EB0	Field	Yellow	Medium

Exception Name	Description	Event Type	MetricId	Enablement	Alert State	Priority
HIOACTR	High I/O activity rate	Usage	0x8D0E90	Field	Yellow	Low
<b>Resource Name: Processor</b>						
HPRDLY	High delay %	Delay	0x8D0120	Default	Yellow	Medium
HPRTOTU	High Total Utilization	Usage	0x8D0460	Default	Yellow	Low
LPRWFLW	Low workflow %	Service	0x8D1E10	Default	Yellow	Low
HPRDJOB	High # of delayed jobs	Delay	0x8D0710	Field	Yellow	Medium
LPRUSNGJ	Low # of using jobs	Service	0x8D0DC0	Field	Yellow	Medium
LPRUSNG	Low using %	Service	0x8D04D0	Field	Yellow	Low
HPRSRB	High SRB %	Usage	0x8D05E0	Field	Yellow	Low
HPRTCB	High TCB %	Usage	0x8D05F0	Field	Yellow	Low
HPRLPAR	High LPAR %	Usage	0x8D0420	Field	Yellow	Low
HPRTOTU	HIGH Tot Utilization	Usage	0x8D0460	Field	Yellow	Low
<b>Resource Name: Storage</b>						
HSTDLY	High delay %	Delay	0x8D0130	Default	Yellow	Medium
HSTDLYJ	High # of delayed jobs	Delay	0x8D0720	Field	Yellow	Medium
<b>Resource Name: Central Storage</b>						
LCSFRAV	Low available frame %	Usage	0x8D0050	Default	Yellow	Medium
LCSUIC	Low unref interval cnt	Usage	0x8D1260	Default	Yellow	Medium
<b>Resource Name: CSA</b>						
HCSANRL	High not released %	Usage	0x8D0410	Default	Yellow	Medium
HCSAUTL	High CSA Utilizat %	Usage	0x8D0530	Default	Red	High
LCSAAV	Low available CSA %	Usage	0x8D0050	Field	Yellow	Medium
<b>Resource Name: SQA</b>						
HSQANRL	High not released frames	Usage	0x8D0410	Default	Red	High
HSQAUTL	High SQA Utilization %	Usage	0x8D0530	Default	Yellow	Medium
LSQAAV	Low available SQA%	Usage	0x8D0050	Field	Yellow	Medium
<b>Resource Name: ECSA</b>						
HECSANRL	High not released %	Usage	0x8D0410	Field	Yellow	Medium

Exception Name	Description	Event Type	MetricId	Enablement	Alert State	Priority
HECSAUTL	High ECSA Utilizat %	Usage	0x8D0530	Field	Yellow	Medium
LECSAAV	Low avail ECSA %	Usage	0x8D0050	Field	Yellow	Medium
<b>Resource Name: ESQA</b>						
HESQANRL	High not released %	Usage	0x8D0410	Field	Yellow	Medium
HESQAUTL	High ESQA Utilizat %	Usage	0x8D0530	Field	Yellow	Medium
LESQAAV	Low avail ESQA %	Usage	0x8D0050	Field	Yellow	Medium
<b>Resource Name: Expanded Storage</b>						
HESMIGRA	Low migration age	Usage	0x8D0FD0	Default	Yellow	Medium
HESFRAV	Low % avail frames	Usage	0x8D0380	Field	Yellow	Medium
<b>Resource Name: Enqueue</b>						
HSSDLY	High delay %	Delay	0x8D0140	Default	Yellow	Medium
HSSDJOB	High # of delayed jobs	Delay	0x8D06A0	Field	Yellow	Medium
<b>Resource Name: Operator</b>						
HSSDLY	High delay %	Delay	0x8D0140	Default	Yellow	Medium
HSSDJOB	High delay %	Delay	0x8D06D0	Field	Yellow	Medium
<b>Resource Name: SW subsyst</b>						
HSSDLY	High delay %	Delay	0x8D0140	Default	Yellow	Medium
HSSDJOB	High delay %	Delay	0x8D06E0	Field	Yellow	Medium
<b>Resource Name: JES</b>						
HJESDLY	High delay %	Delay	0x8D0100	Default	Yellow	Medium
HJESDJOB	High delay %	Delay	0x8D06C0	Field	Yellow	Medium
<b>Resource Name: HSM</b>						
HHSM DLY	High delay %	Delay	0x8D00F0	Default	Yellow	Medium
HHSM DJOB	High delay %	Delay	0x8D06B0	Field	Yellow	Medium
<b>Resource Name: XCF</b>						
HXC F DLY	High delay %	Delay	0x8D0150	Default	Yellow	Medium
HXC F DJOB	High delay %	Delay	0x8D06F0	Field	Yellow	Medium

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## Object Pump Startup Parameters

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### **RMF\_SERVER\_IP**

This supplies the IP address of the DDServer address space. This is the IP address of the system upon which the Distributed Data server resides. If this is not provided the default of the local MVS systems IP address is used. This may be used when a single instance of RMF is collecting data for multiple systems within a Sysplex.

### **RMF\_SERVER\_PORT= 8802**

This is the port number upon which RMF responds. This corresponds to the DM\_PORT parameter in GPMSRV00 member of the IEFPARM library.

### **RMF\_SERVER\_INTERVAL=100**

This corresponds to the MINTIME option for RMF Monitor III.

### **RMF\_SERVER\_TIMEOUT=5**

This is the value in seconds that the Collector waits before assuming that the Distributed Data Server is unavailable. If a request should time out, all future collections are not attempted until at least the time indicated by RMF\_SERVER\_INTERVAL has passed.

The previous values are defaults and are used if no others are provided.



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