

Tivoli Decison Support for Server Performance
Prediction



Release Notes

Version 2.1 (Revised July 22, 2002)

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Prediction



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Tivoli Decision Support Guide Documentation

Each Tivoli Discovery Guide is delivered with on-line documentation. During the installation process, the applicable documentation is copied to the Tds\Guide docs installation directory on your system.

ISO 9001 Certification This product was developed using an ISO 9001 certified quality system. Certification has been awarded by Bureau Veritas Quality International (BVQI), Certification No. BVQI - 92086/A. BVQI is a world leader in quality certification and is currently recognized by more than 20 accreditation bodies.

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Preface

This document describes the Tivoli Decision Support for Server Performance Prediction product. The Tivoli Decision Support for Server Performance Prediction is designed to augment the Tivoli Distributed Management (DM). This product lets you strategically manage your enterprise network.

Note: The Tivoli guides, as a group, are called discovery guides. The Tivoli Decision Support for Server Performance Prediction is a discovery guide that is also called the *Server Performance Prediction* guide or *SPP* guide.

Who Should Read This Book

This document is intended for the users of the Tivoli Decision Support for Server Performance Prediction (hereafter, also referred to as SPP guide).

Before using the SPP guide, you should be familiar with the following:

- The operating system on your machine
- The basic use of discovery guides and the Tivoli Discovery Interface

To set up the SPP guide, your system administrator should be familiar with the following:

- The Tivoli Discovery Administrator
- The basic use of Crystal Reports
- The basic use of Cognos PowerPlay
- The Open Database Connectivity (ODBC) for your database

What is New in This Version of the Book

This version of the Release Notes was issued on July 22, 2002, as an update of the former Release Notes. All changes to this document with respect to the former version are indicated with change bars, as shown at left.

This document has been updated with the following information:

- Two new limitations have been added. See items number 3 and 4 in Chapter 5, **“Software Defects, Limitations, and Workarounds”**.

Server Performance Prediction Guide Documentation

Refer to the following documentation when installing and using the SPP guide:

Document	Description and Location
<i>Tivoli Decision Support for Server Performance Prediction Release Notes</i>	Provides copyright, prerequisites, installation procedures, and trouble shooting for the SPP guide. File name on the CD-ROM: <d:>\Tivoli Decision Support for Server Performance Prediction\tds_spp_rel_notes.pdf (where <d:> is the letter of your CD-ROM drive) File name on your system: TDS\Guide docs\Tivoli Decision Support for Server Performance Prediction\tds_spp_rel_notes.pdf
<i>Tivoli Decision Support Installation Guide</i>	Provides installation procedures for Tivoli Decision Support and its components in standalone and network mode. File name on your system: TDS\Docs\Pdf\install.pdf
<i>Tivoli Decision Support Users Guide</i>	Describes Tivoli Decision Support features and concepts, and provides procedures for using the Tivoli Discovery Interface. File name on your system: TDS\Docs\Pdf\user-gd.pdf
<i>Tivoli Decision Support Administrator Guide</i>	Explains the features of the Tivoli Discovery Administrator. File name on your system: TDS\Docs\Pdf\admin-gd.pdf
<i>Tivoli Distributed Monitoring 3.6.1 Patch readme.txt files</i>	Provides descriptions and other useful information about the patches needed for Tivoli Distributed Monitoring 3.6.1. On CD-ROM, each readme.txt file is located in the appropriate patch directory in: <d:>\Tivoli Distributed Monitor patches (where <d:> is the letter of your CD-ROM drive) For example, the readme.txt file for the 361-DMN-0008 patch is located in: <d:>\Tivoli Distributed Monitor patches\361DMN08.image

Contacting Customer Support

When contacting Tivoli Customer Support, please have your customer identification information available.

To contact Tivoli Customer Support:

- Access the Tivoli Customer Support home page at <http://www.support.tivoli.com>. After you link to and submit the customer registration form, you can access many customer support services on the World Wide Web. Refer to the *Customer Support Handbook* for a listing of Tivoli Customer Support services, hours of operation, and contact numbers. This handbook is available online at <http://www.support.tivoli.com>.
- Send an e-mail to tosupport@tivoli.com.
- In the United States, call Tivoli Customer Support at **1-800-TIVOLI-8**.

- Outside the United States, refer to your *Customer Support Handbook* for a list of support numbers in your country. This handbook is available online at <http://www.support.tivoli.com> .

To provide comments and suggestions about our documentation:

- We at Tivoli are very interested in hearing from you about your experience with Tivoli products, documentation, and services. We welcome your suggestions for improvements. If you have comments or suggestions about our documentation, please send e-mail to pubs@tivoli.com

Chapter 1. Introduction

This document describes the Tivoli Decision Support for Server Performance Prediction, (hereafter also referred to as Server Performance Prediction guide or SPP guide).

The purpose of the SPP guide is to supply data to help plan network growth using basic trending of key system metrics. Most of the performance problems in a workstation network are the result of system workload gradually growing to the point where it exceeds the capacity of the system or because soft errors gradually increase in volume until a catastrophic hard (unrecoverable) error occurs.

The SPP guide relies on Tivoli Distributed Monitoring (DM) as the source of the network activity data, and if available, the Tivoli Inventory supporting enterprise system hardware information.

The SPP guide presents information collected by 39 system metrics from the Tivoli DM collection and archived by the Tivoli DM Roll-Up module. The roll-up module collects the raw data from the monitors, collates the data, and stores it in a user-specified RIM database. Every 24 hours, the data samples from the Tivoli DM data collection will be aggregated and rolled up from each Tivoli profile subscribed host into the Tivoli DM Roll-up database by a TME« Task Library task. You can specify in the roll-up job what time of day to run the roll-up.

If you use Tivoli Inventory, you can also access the Tivoli Inventory database to secure information about your enterprise hardware environment. Inventory information is not required to use the SPP guide, but it does provide a richer profile related to the system metrics returned by Tivoli Distributed Monitoring.

The SPP guide creates six multidimensional cubes using the Tivoli Discovery Administrator. The cubes are progressively dependent and must be built in a specified order. For more information, see the section “Building the Cubes” on page 21. The refresh of the multidimension cubes created for the SPP guide is determined by the Tivoli Discovery Administrator.

This guide also supplies 20 reports with information about network performance, CPU utilization, memory performance, and I/O performance. Using these reports you are able to identify performance trends and resource utilization patterns in order to optimize their network performance.

The SPP guide targets capacity management in both a centralized and distributed system environment. Tivolis approach to trend analysis uses time-of-day and day-of-week variances along with a standard deviation that are factored back in to create a trend wave. Key forecast values are calculated based on the trend wave; 30/60/90 day forecasted daily and peak hour averages are provided. How many days until the peak hourly average exceeds a critical threshold (for example, the pain point) is also provided. This information can be used to monitor for normal behavior.

Chapter 2. Installation and Customization

The following table lists the sequence of tasks required to install the SPP guide and set up the environment that enables you to operate the SPP guide. You must configure:

- Tivoli DM, to store data in the relational database management system (RDBMS) database you are using (see “**Step 1. Setting Up the Database**” on page 5 through “**Step 5. Verifying the Tivoli DM RIM Database Connection**” on page 11).
- Tivoli Decision Support, to be able to retrieve that data and show the appropriate reports (see “**Step 1a. Verifying the ODBC Driver Installation**” on page 12 through “**Step 7a. Setting the Date Range Parameter in the Cube**” on page 17).

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Install the Tivoli Distributed Monitoring 3.7 or Tivoli Distributed Monitoring Roll Up Patches	Step 2. Installing the Tivoli DM Roll-Up Tool	5
Create the Tivoli DM RIM object on Tivoli DM	Step 3. Creating the Tivoli DM RIM Object	5
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Configure the SPP guide on Tivoli Decision Support	Step 5a. Configuring the Server Performance Prediction Guide	15
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Set the date range parameter in the cube	Step 7a. Setting the Date Range Parameter in the Cube	17
Build the cube	Building the Cubes	21
Schedule the cube build task	Scheduling the Cube Build Task	22

Software Requirements

Before you install the Tivoli Decision Support for Server Performance Prediction, ensure that you review the following sections.

Tivoli Application Dependencies

- Tivoli Decision Support Version 2.1.1.
- The latest version of Tivoli Distributed Monitoring. For information on the patches that are available for Tivoli Distributed Monitoring, see the Tivoli Customer Support web site (<http://www.support.tivoli.com>).
- Optionally, Tivoli Inventory Version 3.6 or later.

Prerequisites

This section lists the products that are prerequisites for the SPP guide. For information about installation procedures, refer to the appropriate product documentation.

- Microsoft® Windows® 95, Windows 98, or Windows NT® 4.0 or later (with the latest service pack installed).
- Tivoli Decision Support with the following components:
 - Tivoli Discovery Interface
 - Tivoli Discovery Administrator
 - Cognos (Administrator)
 - Seagate Crystal Reports (required only when creating new reports)

ODBC Drivers

Previous versions of the SPP guide included ODBC drivers. These ODBC drivers are not included with this release. Use the ODBC drivers provided by your database client software when configuring the ODBC connection for this discovery guide. If a previous version of your SPP guide installed ODBC drivers, you may continue to use these drivers. To obtain the latest version of the Tivoli Decision Support product, contact Tivoli Customer Support.

- The Microsoft Access ODBC driver must be installed on your system before you can use an ED Drill Through data source with Seagate Crystal Reports.
- Microsoft Access is recommended, though not required.

Supported Databases

The Tivoli Decision Support for Server Performance Prediction Version 2.1 supports the following databases:

- DB2 Version 6.1
- Informix Version 7.3
- MS-SQL Version 7.0
- Oracle Version 8.0.5
- Sybase Version 11.9.2

Supported Languages

This version of the SPP guide supports only the English language.

Installing and Configuring the Server Performance Prediction Guide on Tivoli Distributed Monitoring

To install and configure the SPP guide on Tivoli Distributed Monitoring (DM), perform the steps described in the following sections.

Step 1. Setting Up the Database

Tivoli DM uses an external relational database management system (RDBMS) to store application performance data gathered from the endpoints.

A component of the Tivoli Framework called the RDBMS Interface Module (RIM) is utilized to move Tivoli DM data. It shields access to the RDBMS from the Tivoli application.

When Tivoli DM is installed, you must carry out configurations actions to make sure your data is collected and stored in a database as follows:

- Install the RDBMS client/server software
- Configure the RDBMS client

Installing the RDBMS Client/Server Software

The prerequisite for setting up the Tivoli DM database components, is to have your relational database management system (RDBMS) client/server software already installed and working correctly.

Installation of the database (if it is not already installed) is carried out by your Database Administrator, who holds the required system authority and access. Refer to the documentation for the database you are using, for installation and usage information.

Configuring the RDBMS Client

When the RDBMS software has been installed, ensure that it is accessible through the network. (For a list the databases supported in this version of the SPP guide, see the section “Supported Databases” on page 4.)

Step 2. Installing the Tivoli DM Roll-Up Tool

Ensure that you have Tivoli DM installed and updated on your system:

- If you have installed Tivoli DM 3.6.1, the following patches must be installed in the given order. (The patches are provided in the Tivoli Decision Support for Server Performance Prediction 1.0.1 CD-ROM. They are located in \Tivoli Distributed Monitor patches.)
 1. 361-DMN-0008 Patch
 2. 361-DMN-0003 Patch (UNIX« only)
 3. 361-DMN-0009 Patch (this patch has two parts: 361-DMN-0009A and 361-DMN-0009C)
- If you have installed Tivoli DM 3.6.2 or 3.7:
 1. In the Tivoli Desktop window, select **Desktop->Install->Install Product**. The Install Product dialog is displayed.
 2. Select **Tivoli Distributed Monitoring TDS Configuration 3.7** and click **Install & Close**.
 3. The Install Options dialog is displayed for you to create a Tivoli DM RIM object. See the section “Creating the RIM Object by using the GUI” on page 6.

Step 3. Creating the Tivoli DM RIM Object

The Tivoli RIM is the interface that enables Tivoli applications (such as Tivoli DM) to support different RDBMS products. The RIM provides the Tivoli applications with a common application programming interface to these database products.

The Tivoli Managed Node through which Tivoli communicates with the relational database is known as the RIM host. The RIM daemon and agent processes run on this system and must therefore have the database client installed.

The TMR server, Tivoli DM RIM host, and database server can run on the same machine. However, the recommended configuration is for the TMR server, Tivoli DM RIM host, and database server to be on separate machines. This separation creates an effective balance of the processing load across the TMR.

To enable Tivoli DM to communicate with the database, create a RIM object. Only a Tivoli TMR administrator with the required authorization of senior or super can create and maintain the RIM object. This authorization is required regardless of the operating system being used. By default, a TMR root administrator has such authority.

Useful information on installation of the RDBMS on several platforms and on the RIM usage can be found in the IBM« redbook SG24-5112, *Using Databases with Tivoli Applications and RIM*, which can be downloaded from <http://www.redbooks.ibm.com>.

Tivoli DM provides two methods for creating the RIM object:

- By using the GUI
- By using a shell script

Creating the RIM Object by using the GUI

To create a RIM object by using the GUI, when you install Tivoli DM:

1. In the Install Options dialog that is displayed when you install Tivoli Distributed Monitoring TDS Configuration 3.7 (see “Step 2. Installing the Tivoli DM Roll-Up Tool” on page 5) set the following fields:

Database Vendor	The vendor name of the RDBMS product to manage the Tivoli DM data. The supported databases are Sybase, Oracle, MS-SQL, DB2, and Informix.
Database Home	The directory on the RIM host where the database software is installed.
Database ID	A unique name for the database.
Database User ID	ID of the user who is authorized to access the database.
Database Server ID	The name of the RDBMS server. This is an alias to enable client/server connection.
Instance Name (DB2 only)	DB2 instance name.
Database User ID Password	<p>The database users password (the default is DM_TDS). After the RIM creation you can change the password by using the Tivoli Management Framework command wsetrimpw.</p> <p>For DB2 users, the password must match the password of the DB2 instance owner.</p> <p>For Sybase users, the password must be at least 6 characters.</p> <p>For Informix users, the password must match the Informix NT or UNIX user password.</p>

2. Click OK

Creating the RIM Object by a Shell Script

To create a RIM object, Tivoli Framework applications use the **wcrtrim** command. Tivoli DM provides you with a shell script called **cr_spp_rim.sh** that prompts you for a required input. You can run this script from any managed node as a Tivoli administrator on any UNIX shell or Tivoli bash shell (Windows NT) with the Tivoli environment set.

The **cr_spp_rim.sh** script attempts to retrieve your Tivoli DM RIM object attributes. If the **cr_spp_rim.sh** cannot find the Tivoli DM RIM object (as in the case of a first time installation), you will be prompted to enter the required information that will be used from the **wcrtrim** command:

- Change to the following directory: `$BINDIR/TME/SENTRY/TDS/spr`
- Run the RIM creation script as follows:

Platform	Command
NT	<code>sh cr_spp_rim.sh</code>
UNIX	<code>cr_spp_rim.sh</code>

Information you are required to supply depends on the vendor product requirements for the specific database. You can also use this script to change the Tivoli DM RIM object parameters. If a RIM object *spr_rim* already exists, you are asked to remove it and create a new one by supplying the following information:

Database Vendor	The vendor name of the RDBMS product to manage the Tivoli DM data. The supported databases are Sybase, Oracle, MS-SQL, DB2, and Informix.
RIM Host	The machine where the database client software is installed.
Database Home	The directory on the RIM host where the database software is installed.
Instance Home (DB2 only)	DB2 instance install directory.
Database Server ID	The name of the RDBMS server. This is an alias to enable the client/server connection.
Database ID	A unique name for the database.
Database User ID	ID of the user who is authorized to access the database
Database User ID Password	The database users password (the default is DM_TDS). After the RIM creation you can change the password by using the Tivoli Management Framework command wsetrimpw . For DB2 users, the password must match the password of the DB2 instance owner. For Sybase users, the password must be at least 6 characters. For Informix users, the password must match the Informix NT or UNIX user password

In the following table there is specific database information for the RIM parameters. Included with each title, there is the related parameter of the **wcrtrim** command used by the **cr_spp_rim.sh** script.

You should note that some of the parameters use database specific environment variables highlighted in bold.

Database Vendor (-v)	Database ID(-d)	Database User ID (-u)	Database Home (-H)	Database Server ID (-s)	Instance Home (-I)
DB2	The name of the database that Tivoli DM will use, or an alias for that database, if an alias exists \$DBINSTANCE	Instance owner id	DB2 CAE install directory \$DB2DIR	You must specify the string tcpip \$DB2COMM	DB2 Instance install directory \$INSTDIR
Informix	Database source name (DSN) defined in the ODBC control panel (NT) or <i>.odbc.ini</i> file (UNIX)	informix user	Informix client install directory	Informix server name defined in sqlhosts	N/A
MS_SQL	Tivoli DM database name (default <i>dm_db</i>)	MS-SQL user for Tivoli DM (default <i>DM</i>)	MS-SQL client install directory	Hostname for MS-SQL Server host	N/A
Oracle	\$ORACLE_SID (or service name for Oracle 8.1+)	Oracle user for Tivoli DM (default <i>DM</i>)	Oracle client install directory \$ORACLE_HOME	\$TWO_TASK	N/A
Sybase	Tivoli DM database name (default <i>dm_db</i>)	Sybase user for Tivoli DM (default <i>DM</i>)	Top level directory of the Sybase client install. \$SYBASE	\$DSQUERY	N/A

Verifying the Tivoli DM RIM Object Creation

Verify that the RIM object has been created correctly by issuing the command **wgetrim spr_rim**. If any of the settings are not correct, use the **wsetrim** command with the appropriate options to change the object labeled *spr_rim*.

Step 4. Creating the Tivoli DM Database

A successful Tivoli DM installation copies the RDBMS script files to the \$BINDIR/TME/SENTRY/TDS/rdbcfg or %BINDIR%\TME\SENTRY\TDS\rdbcfg directory of your managed nodes where Tivoli DM is installed. The file name extensions identify which database vendors they are written for:

- Db2 = DB2
- Inf = Informix
- Mssql = MS-SQL
- Mssql7 = MS-SQL 7.0
- Ora = Oracle
- Syb = Sybase

The RDBMS client and server software should already have been installed and configured beforehand to create the Tivoli DM database structure. You have two different ways to create the Tivoli DM tables for the database:

1. Use the Tivoli DM script **cr_rollup_db.sh** to create the database schema. The method of use differs slightly.

If you run the database creation script from a shell with the Tivoli environment set on the Tivoli DM RIM host, the script **cr_rollup_db.sh** attempts to fetch your database configuration from the RIM object attributes. If it cannot find the Tivoli DM RIM object, you will be prompted to enter the required information.

- **Oracle, Sybase, or MS-SQL.** To use these databases, run the shell script **cr_rollup_db.sh** from the RIM host where the database client part is installed. You should run the command from a Tivoli bash shell (Windows NT) or from any UNIX shell (UNIX).
- **DB2 and Informix.** For these databases, the script must be run from a DB2 command line on the database server, because you cannot execute the DB2 database creation script from the *DB2 Client Command Line Processor* without an existing database connection. Informix uses the *dbaccess* facility, which is shipped as part of the Informix server.
 - **UNIX.** Where the DB2 or Informix server is on a UNIX machine that is completely unrelated from the TMR, you should copy or have available as an NFS mount, the file **cr_rollup_db.sh** and the files **cr_db.db2** and **cr_tbl.db2** (or the files **cr_db.inf** and **cr_tbl.inf**) located in `$BINDIR/TME/SENTRY/TDS/rdbcfg` or `%BINDIR%\TME\SENTRY\TDS\rdbcfg` on the managed node where Tivoli DM is installed.
 - **Windows NT.** Where the DB2 or Informix server is on a Windows NT machine that is completely unrelated from the TMR, you can run on the RIM host, the shell script **cr_rollup_db.sh** located in `$BINDIR/TME/SENTRY/TDS/rdbcfg` or `%BINDIR%\TME\SENTRY\TDS\rdbcfg` ignoring the displayed error messages, to generate the **cr_db.db2.sql** or **cr_db.inf.sql** file and copy them on the RDBMS server to run them in the SQL processor.
- 2. After customizing the scripts **cr_db. xxx** and **cr_tbl. xxx**, (where **xxx** can be **syb**, **ora**, **mssql**, **mssql7**, **inf**, or **db2**), use the interactive SQL processor. Run these SQL scripts on the RDBMS client or server.

Running the RDBMS Configuration Scripts from a Shell

Before running the Tivoli DM RDBMS configuration scripts, you are recommended to back your RDBMS database. See your RDBMS documentation, for information about backup and restore procedures.

If you run the database creation script from a shell with the Tivoli environment set on the Tivoli DM RIM host, you need to run the script `$BINDIR/TME/SENTRY/TDS/rdbcfg/ cr_rollup_db.sh` or `%BINDIR%\TME\SENTRY\TDS\rdbcfg\cr_rollup_db.sh`. If you do not have the Tivoli DM RIM object already created, you will be asked for the parameter identified in the section *Creating the RIM Object by a Shell Script*. The other configuration parameters are:

Database Device (Sybase and MS-SQL only)	Do not use the master device for the Tivoli DM database. The master database, model database, and temporary database all reside on the master device. Currently, the master device cannot be expanded onto any other device.
Database Space (Informix only)	Do not use the rootdbs dbspace for the Tivoli DM database. You must create a separate dbspace for this database.

Database Size	The size (in MB) of the Tivoli DM database to be created. For Sybase, MS-SQL, and Informix only, the maximum size is the size of the device (or dbspace) dedicated for the Tivoli DM database.
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When prompted to do so, enter the database administrators passwords.

Running the RDBMS Configuration Scripts through the SQL Processor

Your database administrator can customize the SQL templates such as **cr_db.xxx** and **cr_tbl.xxx**, and then run these SQL scripts on the RDBMS client or server using the interactive SQL processor.

RDBMS Vendor	Configuration File	Interactive SQL Processor	RDBMS Administrator
Oracle	tnsnames.ora	sqlplus	sys
Sybase	interfaces	isql	sa
MS-SQL	interfaces	isql	sa
DB2		db2	instance owner
Informix	sqlhost	dbaccess	informix

To run the RDBMS configuration scripts on the RDBMS client or server using the SQL processor, perform the following steps as shown for Sybase:

1. On the managed nodes where Tivoli DM is installed, customize the **cr_db.syb** and **cr_tbl.syb** scripts to meet your needs and then save them as **cr_db_syb.sql** and **cr_tbl_syb.sql**.

If the current managed node where Tivoli DM is installed is the Tivoli DM RIM host with the RDBMS client software installed, skip to Step 4.

2. Copy the **cr_db_syb.sql** and **cr_tbl_syb.sql** files from the \$BINDIR/TME/SENTRY/TDS/rdbcfg directory on the managed nodes where Tivoli DM is installed, to a temporary directory on the RDBMs server.
3. From the directory that now contains the script, start an isql session as super administrator (sa) and run the **cr_db_syb.sql** script as follows:

```
isql U sa P <pwd> -i cr_db.syb.sql
```

where <pwd> is the RDBMS password for the RDBMS user system administrator.

The script creates the Tivoli DM user and the Tivoli DM database in the Sybase RDBMS. The password is the one you specified in the Tivoli DM RIM object creation.

4. Install the layout by entering the following command:

```
isql U DM P <pwd> -i cr_tbl.syb.sql
```

where <pwd> is the RDBMS password for the DM user.

5. Prepare to test the configuration by entering the following command:

```
isql U DM P <pwd>
```

where <pwd> is the RDBMS password for the DM user.

6. In the sql session, check that the Tivoli DM repository was installed by entering the following:

```
> select * from <table>
> go
```

where <table> is the name of the table you created in Step 5.

Results should indicate that zero rows were found. If results indicate that <table> is unknown, the Tivoli DM repository was not installed.

7. Log out of isql by entering the following command:
 > quit

Verifying the Database Client/Server Connections

After you have installed the Tivoli DM database, verify the connection to the database created from the Tivoli DM RIM host by means of the interactive SQL processor provided by your database Vendor. (See Steps 6 and 7 of the section “Running the RDBMS Configuration Scripts through the SQL Processor” on page 10.)

For details about the database Client/Server connection parameters for the different platforms, refer to the IBM Redbook SG24-5112, *Using Database with Tivoli Applications and RIM*, which you can download from <http://www.redbooks.ibm.com/>.

Step 5. Verifying the Tivoli DM RIM Database Connection

When the Tivoli DM RIM object is created from any managed node or managed nodes where Tivoli DM is installed, test the Tivoli DM RIM connection to the database by means of the following Tivoli Framework commands: `wrimtest -l spr_rim`.

Example:

```
C:\Tivoli\bin\w32-ix86\TME\SENTRY\TDS\rdbcfg>wrimtest l
spr_rim
Resource Type: RIM
Resource Label: spr_rim
Host Name: amadeus
User Name: DMVendor: MS_SQL
Database: dm_db
Database Home:d:\mssql7
Server ID:
Instance Home:
Opening Regular Session...Session Opened
RIM: Enter Option >x
Releasing session

C:\Tivoli\bin\w32-ix86\TME\SENTRY\TDS\rdbcfg>
```

About Upgrading Tivoli DM Roll-Up Tool

If you upgraded Tivoli Distributed Monitoring from Version 3.6.1 or 3.6.2 to Version 3.7, apply the changes requested for the SPP guide by running the file `update_db_schema.sh` located in `$BINDIR/TME/SENTRY/TDS/rdbcfg/` or `%BINDIR%\TME\SENTRY\TDS\rdbcfg`.

Installing and Configuring Performance Prediction Guide on Tivoli Decision Support

To install and configure the SPP guide on Tivoli Decision Support, perform the steps described in the following sections.

Step 1a. Verifying the ODBC Driver Installation

To verify that the Microsoft ODBC Driver Manager and the ODBC driver for the database you are using are installed on your machine:

1. From the Control Panel, select **ODBC Data Source**. The ODBC Data Source Administrator dialog is displayed.

–OR–

On Windows 95, 98, and NT, enter the following command from a command line:

```
odbcad32.exe
```

The ODBC Data Source Administrator dialog is displayed.

2. Depending on your operating system, click the **Drivers** or **ODBC Drivers** tab.
3. Verify that the ODBC driver appropriate for your database is shown in the list.

Step 2a. Setting Up an ODBC Data Source Connection

Before creating an ODBC connection, you must install and configure your database client and install the ODBC driver provided with the client. Contact your system administrator for specific information about how to set up the database client and ODBC driver.

If you are using DB2, to create the ODBC connection see the section “**Registering the DB2 Database**”.

1. From the Control Panel, select **ODBC Data Source**. The ODBC Data Source Administrator dialog is displayed.
2. Select the **System DSN** tab.
3. Click **Add**. The Create New Data source dialog is displayed.
4. Select the ODBC driver appropriate for your database, and click **Finish**.
5. Type a meaningful Name for the ODBC data source.

Note: Record the data source name you have specified, because you will later use it in “Step 4a. Importing the Server Performance Prediction Guide” on page 14.

6. Type a Description for the data source.
7. From the drop-down list, select the server to which you want to connect the data source.
8. If you use Sybase, type the Tivoli DM database name in the Database Name field.

For DB2:

The ODBC drivers for DB2 Databases are included with the DB2 Client Application Enabler that is provided on the DB2 Client Application Enablers CD-ROM or can be downloaded from the IBM DB2 web page. The DB2 CLI/ODBC driver is installed during the installation of the DB2 Client Application Enabler.

Registering the DB2 Database: Register the DB2 database with the ODBC driver manager as a data source. On Windows 95, 98, and NT, you can make the data source available to all users of the system (a system data source), or the current user only (a user data source). You can add the data source by using the Client Configuration Assistant (CCA) or Microsoft 32-bit ODBC Administrator Tool, as described hereafter.

To add the data source by using the Client Configuration Assistant (CCA):

1. Select the DB2 database alias that you want to add as a data source.
2. Click the **Properties** push button. The Database Properties window is displayed.
3. Select the **Register this database for ODBC** check box.
4. On Windows 95 and NT, select the appropriate radio button to add the data source as either a user or system data source.

To add the data source by using the Microsoft 32-bit ODBC Administration Tool:

1. On Windows 95 and NT, a list of the user data sources appears by default. To add a system data source, click the **System DSN** push button or tab (depending on the platform).
2. Click **Add**.
3. From the list, double-click **IBM DB2 ODBC Driver**.
4. From the Database alias drop-down list, select the database alias to add and click **OK**.

Automating the Process of Registering a DB2 Database: On Windows 95 and NT, there is a command that can be issued in the command line processor to register the DB2 database with the ODBC driver manager as a data source. An administrator can create a command line processor script to register the required databases. This script is then run on all of the machines that require access to the DB2 databases through ODBC.

Configuring the DB2 CLI/ODBC Driver Using CCA: The following is an optional procedure:

1. Select the DB2 database alias you want to configure.
2. Click **Properties**, the Database Properties window opens.
3. Click the **Settings** push button. The CLI/ODBC Settings window is displayed.
4. Click **Advanced**. Set the configuration keywords in the dialog that is displayed. These keywords are associated with the database alias name, and affect all DB2 CLI/ODBC applications that access the database.

Editing the db2cli.ini File: Add the following line to every database entry in your db2cli.ini file:

```
[DM_DB]
DBALIAS=DM_DB
UID=db2
PWD=db2
```

Accessing DB2 Data Using ODBC Applications: After you have correctly configured your system to use ODBC, you can access DB2 data using ODBC applications. Start the ODBC application and go to the Open window. Select the ODBC database file type. The DB2 databases that you added as ODBC data can be selected from the list. Many ODBC applications will open the table as read-only unless a unique index exists. To test an ODBC connection, see "Step 6a. Assigning and Verifying a Data Source" on page 16.

Step 3a. Installing the Server Performance Prediction Guide

To install the SPP guide on Tivoli Decision Support:

1. Insert the Tivoli Decision Support for Server Performance Prediction CD-ROM in the CD-ROM drive of your Tivoli Decision Support server, and from the Start menu select **Run**.

The Run dialog is displayed.

2. Type <d:>\setup.exe (where <d:> is the letter of your CD-ROM drive), and click **OK**.

The Tivoli Decision Support Installation Program window is displayed.

3. Select **Tivoli Decision Support for Server Performance Prediction**.
4. The Tivoli Decision Support for Server Performance Prediction dialog is displayed. Click **Next**.
5. The Setup Complete dialog is displayed. Click **Finish** to complete the setup.
6. You are returned to the Tivoli Decision Support Installation Program window. Click **Exit**.

The SPP guide files are stored in the following directories:

- <TDS\>ActiveX
- <TDS\>Cubes
- <TDS\>Data
- <TDS\>Doc
- <TDS\>Install
- <TDS\>Models
- <TDS\>Reports
- <TDS\>Util

where <TDS\> is the complete path where you installed Tivoli Decision Support.

- The online documentation is stored in <TDS\>Guide docs\Tivoli Decision Support for Server Performance Prediction
- The updated Tivoli Decision Support readme file is stored in <TDS\>Docs\TDS21ReadMe.txt

Step 4a. Importing the Server Performance Prediction Guide

To import the SPP guide:

1. From the Start menu, select **Programs->Tivoli Decision Support 2.1->Tivoli Discovery Administrator**.

2. If you are installing a discovery guide on your system for the first time:

The Import Discovery Guide window is displayed. Click **Yes**.

The Add Decision Support Guide Wizard is displayed, with Import Installed Decision Support Guide already selected for you. Click **Next**.

Select Server Performance Prediction and click **Next**.

After completing the import, the Add Data Source dialog is displayed. Click **Yes** to add a data source.

The Add Data Source Wizard is displayed.

According to your environment, from the drop-down list select the Datasource Name and click **Next**.

(Select the ODBC data source connection for either the Tivoli Distributed Management roll-up database or Tivoli Inventory database. You created these connections in “**Step 2a. Setting Up an ODBC Data Source Connection**” on page 12.)

Enter the database User Name and Password, and click **Next**. For a list of the default database user names and passwords, see the following table.

Database Connection	Default User Name	Default Password	Default Qualifier
MS-SQL, Oracle, and Sybase Tivoli DM rollup database	DM	DM_TDS	DM
Informix Tivoli DM rollup database	informix	informix	informix
DB2 Tivoli DM rollup database	db2admin	db2admin	db2admin
MS-SQL, Oracle, and Sybase Tivoli Inventory database	tivoli	tivoli	tivoli
Informix Tivoli Inventory database	informix	informix	informix
DB2 Tivoli Inventory database	db2admin	db2admin	db2admin

Enter the database Qualifier, and click **Next**. For a list of the default database qualifiers, see the previous table.

Note: Your database qualifier may be different. Contact the database administrator for additional information if the default settings were not used.

Ensure that your settings are correct and click **Finish**.

–OR–

3. If a discovery guide was already installed on your system:

The Tivoli Discovery Administrator window is displayed. From the action bar, select **Decision Support Guides**, and from the corresponding menu select **Import**.

In the Import Decision Support Guides dialog, select **Server Performance Prediction** and click **OK**.

Step 5a. Configuring the Server Performance Prediction Guide

The SPP guide uses two Tivoli application databases: the Tivoli Distributed Monitoring (DM) Roll-up module database and the Tivoli Inventory database. The Inventory database is optional for the operation of the SPP guide and supplies additional enterprise hardware data when you have this product in your environment. After the SPP guide has been successfully installed, several steps are required to complete its configuration. If the Inventory database is not available, you must move a set of default files into the data/export directory for the guide.

Refer to the following sections for a description of these configuration tasks.

Copying the Default Inventory Export Files

If the Tivoli Inventory database is not available, the SPP guide will need to use a set of default files that were copied to your system during the guide installation to TDS\Util\Tivoli Decision Support for Server Performance Prediction. For the other five SPP guide cubes to build successfully, these files must be available as the default files (or populated with inventory data if the Inventory database is available). Always retain the copy of the default versions of these files:

- DM_INV_Memory.csv
- DM_INV_OsType.csv
- DM_INV_Processor.csv
- DM_INV_SysByIP.csv

Move these files from:TDS\Util\Tivoli Decision Support for Server Performance Predictionto:TDS\data\export

Customizing the Queries for DB2 and Informix

If you are working with DB2 and Informix, to use the Server Performance Prediction (1) Inventory Hw cube, you must copy the contents of the following files to the following queries of the cube:

Copy the contents of this file:	To this query:
TDS\Util\DB2 and Inf\IP_Network_DB2_Inf.sql	IP Network
TDS\Util\DB2 and Inf\Memory_DB2_Inf.sql	Memory
TDS\Util\DB2 and Inf\OS_Type_DB2_Inf.sql	OS Type
TDS\Util\DB2 and Inf\Processor_DB2_Inf.sql	Processor
Where <TDS> is the complete path where you installed the Tivoli Decision Support.	

To copy the contents of the files to the queries:

1. From the Start menu, select **Programs->Tivoli Decision Support 2.1->Tivoli Discovery Administrator**.
The Tivoli Discovery Administrator window is displayed.
2. In the left pane of the window, expand the **Server Performance Prediction (1) Inventory Hw** cube and click **Queries**.
The right pane of the window shows the list of queries.
3. Double-click the first query in the list.
The Cube Query window is displayed.
4. Ensure that the SQL Columns tab is selected and replace the contents of the SQL Columns page with the contents of the appropriate file (see the previous table).
5. Click **OK** to save the contents and close the Cube Query window.
You are returned to the Tivoli Discover Administrator window.
6. Repeat steps 3 to 5 for each query of the Server Performance Prediction (1) Inventory Hw cube.

If you will later change database and move from DB2 or Informix to MS-SQL, Oracle, or Sybase, perform the steps 1 to 6 to copy the following files to the following queries of the Server Performance Prediction (1) Inventory Hw cube:

Copy the contents of this file:	To this query:
<TDS>\Util\Other databases\IP_Network.sql	IP Network
<TDS>\Util\ Other databases \Memory_.sql	Memory
<TDS>\Util\ Other databases \OS_Type.sql	OS Type
<TDS>\Util\ Other databases \Processor_.sql	Processor
Where <TDS> is the complete path where you installed the Tivoli Decision Support.	

Step 6a. Assigning and Verifying a Data Source

To assign and verify a data source for the SPP guide:

1. From the Start menu, select **Programs->Tivoli Decision Support 2.1->Tivoli Discovery Administrator**.

2. From the action bar, select **Data Sources** and from the corresponding menu, select **Assign Data Source**.
3. From the Data Source drop-down list select Tivoli Inventory data source or, if Tivoli Inventory is not installed on your system, select the blank line.
4. Select the following queries for the Server Performance Prediction (1) Inventory Hw cube or SPP (1) Inventory Hw (DB2/Informix) cube, and click **OK**:

Query
IP Network
Memory
OS Type
Processor

5. From the Data Sources menu, select **Assign Data Sources**.
6. From the drop-down list, select the Tivoli DM roll-up db data source.
7. Select the queries for the remaining cubes, according to the following table, and click **OK**:

Query	Cube Name
Update System Averages	Server Performance Prediction (2) Summary
Rank Systems	Server Performance Prediction (3) Rank
Daily Info	Server Performance Prediction (4) Daily
Forecasts	Server Performance Prediction (5) Trend
Note: The Sever Performance Prediction (6) Hourly cube does not have any queries. This cube is created from the data in SPP cubes 1-5.	

8. Click the **Data Sources** folder.
9. Right-click each data source you assigned, and select **Test Connectivity**.
If the Tivoli Discovery Administrator dialog is displayed with the message *Error connecting to Data Source DataSourceName*, click Details to display more information about the connection error. Click **OK** to close the dialog with the detailed information. Verify that the data source definition, user name, password, and qualifier are correct.
If the connection is successful, the Test Data Source dialog appears with the message *Connection Successful*. Click **OK**.
10. Repeat the previous step until all the data sources are tested.

Step 7a. Setting the Date Range Parameter in the Cube

This step is optional.

The SPP guide sets the current period by the most recent date in the records that are returned by the query. Use the Date range parameter in each cube to select a specific range of records.

The following sections describe the parameters that you should set for each cube.

Server Performance Prediction (2) Summary

Date Range Parameter: Set this date range to Rolling 6 months because the Visual Basic function called in the query makes the linear regression computation 6

months of data. The Guide will also work properly with lower values. Note that the more data you have the more accurate the trend.

Server Performance Prediction (3) Rank

System Purpose Parameter: You must assign the association between the hostname and the server type (DNS Server, Notus Server, Mail Server, etc.). The hostname in the Tivoli DM database is stored as the full DNS name. The guide strips out this information from the first part of the DNS name so that it works with the Inventory data. You cannot use the same hostname for a different domain. Use the first part of the DNS name as the hostname for this parameter.

Server Performance Prediction (4) Daily

Date Range Parameter: Set this date range to Rolling 6 months because the Visual Basic function called in the query makes the linear regression computation using a maximum of 6 months of data. The Guide can also work properly with fewer values. Note that from a statistical point of view, the more data you have the more accurate the trend.

Server Performance Prediction (5) Trend

Date Range Parameter: You can set this date range to Explicit Values that you specify as a start and end date, or to Calculated Values that you select from a list. Note that from a statistical point of view, the more data you have the more accurate the trend.

Critical Threshold Parameter: This table contains the DM monitors names used in the SPP guide with their respective threshold values. When this threshold value is exceeded, the value becomes critical. The default values are reasonable, but they can be modified.

Forecast Accelerator Parameter: This parameter is the percentage of acceleration to be added to the trend value for the next 30 days. For example at a certain date, an administrator knows that some metrics will grow faster than the usual because users are being added. In this case the administrator specifies the affected hostname and the corresponding percentage of acceleration. This value also can be negative. The default value should be set to zero. The value pair is hostname:percentage. Note that here the hostname is the full DNS name. This is because this parameter is passed to the Visual Basic function that makes a query directly to the database where the DM hostname requires the as full DNS name.

Step 8a. Configuring the Shared Source File Path

This step is optional.

If the Tivoli Discovery Administrator or the Tivoli Discovery Interface cannot locate your shared source files, use the procedure in this section to set the location of the shared source files. These files are stored on your (local) system or on the network.

If you installed Tivoli Decision Support using the standalone installation option, the default shared source file path is the file path to the Tivoli Decision Support installation directory on your system. For other installations, the source files usually reside on a network server. Contact your system administrator for the location of the Tivoli Decision Support shared source files.

Setting the Shared Source Path

To set the shared source file path:

1. From the **View** menu, select Options.
The Options dialog is displayed.
2. On the **General** page, in the Network box, type the file path to the following Tivoli Decision Support folders:
 - Cubes
 - Data
 - Reports
3. Click **OK**.

Removing the Tivoli DM Database

To uninstall the database components, use the directions in this section. This is not part of the first-time installation process. The instructions here remove the database connection, Tivoli DM user ID, and database schema.

Use the Tivoli DM script **rm_rollup_db.sh** to remove the database schema. The method of use differs slightly.

- **Oracle, Sybase, or MS-SQL.** To use these databases, run the shell script **rm_rollup_db.sh** from the RIM host where the database client part is installed. Run the command from a Tivoli bash shell (Windows NT) or from any UNIX shell (UNIX).
 - **DB2 and Informix**
 - **UNIX.** Where the DB2 or Informix server is on a UNIX machine that is completely unaltered from the TMR, you should copy or have available as an NFS mount, the file **rm_rollup_db.sh** and the files **rm_db.db2** and **rm_tbl.db2** (or the files **rm_db.inf** and **rm_tbl.inf**) located in
\$BINDIR/TME/SENTRY/TDS/rdbcfg or
%BINDIR%\TME\SENTRY\TDS\rdbcfg on the managed node where Tivoli DM is installed.
 - **Windows NT.** Where the DB2 or Informix server is on a Windows NT machine that is completely unrelated from the TMR, you can run on the RIM host, the shell script **rm_rollup_db.sh** located in
\$BINDIR/TME/SENTRY/TDS/rdbcfg or
%BINDIR%\TME\SENTRY\TDS\rdbcfg ignoring the displayed error messages, to generate the **rm_db.db2.sql** or **rm_db.inf.sql** file and copy them on the RDBMS server to run them in the SQL processor.
1. Go to the following directory:\$BINDIR/TME/SENTRY/TDS/rdbcfg (for UNIX)
–OR– %BINDIR%\TME\SENTRY\TDS\rdbcfg (for Windows)
 2. Run the uninstall script:rm_rollup_db.sh
 - a. Notes for Oracle: For Oracle users, after you run the script **rm_rollup_db.sh**, connect to Oracle as internal, then shut down the database, and then delete the files **usr_name_DATA** and **user_name_TEMP** from the operating system, usually located in \$ORACLE_HOME/dbs or \$ORACLE_HOME/database, to delete the physical database files.
 - b. Since Oracle does not provide the SQL statement to perform these functions, leaving the data file in the database will interfere with the re-creation of the same database.
 - c. When finished, restart the database.

Chapter 3. Operating the Server Performance Prediction Guide

The following sections explain how to use the SPP guide.

Building the Cubes

To use the SPP guide, build the cubes that will gather data from the database. Perform the following steps:

1. From the Start menu, select **Programs->Tivoli Decision Support 2.1->Tivoli Discovery Administrator**.

The Tivoli Discovery Administrator window is displayed.

2. In the Tivoli Discovery Administrator window, from the Administrator pane, double-click **Cubes**.

3. Right-click one of the SSP cubes, and select **Build**.

Cubes must be built in the following order:

- a. Server Performance Prediction (1) Inventory Hw
- b. Server Performance Prediction (2) Summary
- c. Server Performance Prediction (3) Rank
- d. Server Performance Prediction (4) Daily
- e. Server Performance Prediction (5) Trend
- f. Server Performance Prediction (6) Hourly

Note: If you did not install the Tivoli Inventory on your system, you do not need to schedule or build the Server Performance Prediction (1) Inventory Hw cube.

4. The Confirm Cube Build dialog is displayed. The date ranges appear in the dialog. Click **Yes**.

Tivoli Decision Support connects to your database and retrieves the records specified in your query. The size of your data and the network speed affect the time required to retrieve all records. Use the status bar to check the status of the processing.

5. The Cube Transform Status dialog is displayed, showing you messages about the processing status. Review the messages for any errors.

If an error generates a dialog, review the error and click **OK**.

6. Repeat Steps 2 to 4 until all the SSP cubes are successfully built.

–OR–

Click **Close**.

7. Start the Tivoli Discovery Interface.

8. Use the discovery guide to review the views for each topic (a topic is presented as a question).

Schedule cube builds on a regular basis and during periods of decreased database activity. Adjust your cube date range to optimize the time required to build a cube.

For more information about how to use the Tivoli Decision Support Discovery Interface, see the *Tivoli Decision Support Users Guide*, and the *Tivoli Decision Support Using Decision Support Guides* documents described in the *Required Documentation* section.

Scheduling the Cube Build Task

You must periodically rebuild the cubes to update your cube data. The build process can be scheduled to build automatically at regular intervals (for example, schedule nightly cube builds). Stagger the start times for your cube builds for improved performance. The SPP cubes must be built in the following order:

1. Server Performance Prediction (1) Inventory Hw
2. Server Performance Prediction (2) Summary
3. Server Performance Prediction (3) Rank
4. Server Performance Prediction (4) Daily
5. Server Performance Prediction (5) Trend
6. Server Performance Prediction (6) Hourly

The following procedure uses the Tivoli Discovery Administrator to create a cube building schedule and to determine the schedule TaskID. The cube build is then scheduled using the Cognos Scheduler. Use the following procedure to define a cube building schedule:

1. From the Start menu, select **Programs->Tivoli Discovery Support 2.1->Tivoli Discovery Administrator**.
2. On the Scheduled Task menu, point to Add, and click **Cube Build**.
The Add Schedule Wizard appears.
3. Type a name for the schedule you are creating in the Schedule Name box, and click **Next**.
4. Continue to click **Next** until you are prompted for the date range for the schedule.
5. In the Effective from date box, type or select a date that is prior to the current date.
6. Select the To checkbox to display the ending date box.
7. In the ending date box, type or select the date that you entered in the Effective from date box, and click **Next**.
8. Click **Finish**.
9. In the Tivoli Discovery Administrator pane, click **Scheduled Tasks**.
10. In the Properties pane, right-click the scheduled task you created, and click **Edit**.
The Edit Schedule dialog is displayed.
11. In the Task page, record the schedule Task ID for use in Step 15.
12. Click **OK**.
13. From the Start menu, select **Programs->Cognos->Scheduler** to start the Cognos Scheduler.
14. From the Insert menu, click **Recurring task**.
The Insert Task dialog appears.
15. In the Identification page, type the following command string in the File name box:
`<TDS>\edamin.exe /TaskID=<X>`

(where <TDS> is the complete path where you installed Tivoli Decision Support and <X> is the schedule Task ID from Step 11).

Note: Enclose the Tivoli Decision Support path and the edamin.exe in quotes as shown in the following example: c:\Program Files\TDS\edamin.exe /TaskID=1.

16. Type a brief description of the cube and the schedule in the Description box.
17. In the Timetable page, specify the cube building frequency, run time, and duration.
18. Repeat this procedure for each cube.
19. Minimize the Cognos Scheduler.

Note: Cognos Scheduler must be running for the cube to build at the scheduled time.

Setting Up Crystal Reports in the Tivoli Discovery Interface

Rather than directly accessing the DM Roll-up Database, the *Subsystem Trend Information* Crystal Report in the SPP guide retrieves its information from the ED Drill Through data source. This data source is generated when Server Performance Prediction (5) Trend cube is built. You must build SPP cubes 2-4 before building cube 5.

Specifying the Database Logon for Crystal Reports

The first time you run a Crystal Report using the Discovery Interface, you must set the data source using the *Server Performance Prediction Database Logon* dialog. Specify the DSN, the Qualifier, and the Database name and type for the data source you defined.

The following are the default qualifiers:

- For DB2, enter DB2ADMIN
- For MS-SQL and Oracle, enter DM
- For Sybase, enter dm
- For Informix, enter informix

Note: Your database qualifier may be different. Contact the database administrator for additional information.

Reinstalling a Discovery Guide

To reinstall the discovery guide, you must first uninstall all the discovery guides on your system, and then uninstall Tivoli Decision Support. You must now reinstall Tivoli Decision Support and then reinstall the discovery guides.

Chapter 4. Troubleshooting

Cube Building

- *In the Tivoli Discovery Administrator the following message appears: Error building cube. If you click Details on the message dialog, the following message appears: Error 91 Error getting query parameters; object variable or with block variable not set.*

The data sources have not been assigned to the cube queries. Assign the data sources to the queries.

While using the Tivoli Discovery Interface, a Cognos PowerPlay report icon appears with the symbol (a circle bisected by a diagonal line), and you cannot open the report. What does this indicate?

This symbol indicates that the cube is unavailable. Contact your Tivoli Decision Support administrator, and request that the cube be rebuilt.

- *Why does the Tivoli Discovery Administrator report that a cube could not be built?*

The cube you are attempting to rebuild is currently in use, and Tivoli Decision Support cannot overwrite this cube with the new cube data. Close all copies of the Tivoli Discovery Interface that are running. Copy the <CubeName>.mdc file from the Tds\Cubes\Temp directory to Tds\cubes directory (where Tds\ is the Tivoli Decision Support installation directory), replacing the existing cube.

The queries returned insufficient data to build a cube. Verify your queries.

- *You closed all the Tivoli Discovery Interface processes, and the cube still does not build.*

A copy of Cognos PowerPlay may still be running in the background. This can also prevent cube builds from succeeding. Open the Task manager, and look for the process pplay.exe. If you find it, end the process, and rebuild the cube.

- *Your cubes do not automatically build overnight.*

For scheduled cube builds to occur, the Cognos Scheduler must be running. Start Cognos Scheduler. Review the schedule definitions in Cognos Scheduler and the Tivoli Discovery Administrator. You may have to redefine the cube building schedule definitions if the following conditions exist:

- You have defined a cube building schedule
- One or more schedules cube builds was not executed because the Cognos Scheduler was not running.

- *How are relative dates calculated in a report?*

The Date Range parameter for a cube determines the time period that you want to examine. This parameter uses explicit values, a start date and end date, or a calculated value (for example, the last three months and the last six months).

The calculated values are relative to the current date. The current period for a Tivoli Decision Support cube is set using one of the following methods:

- Use the Date Range parameter and the <CubeName>_dt.txt to set the current period as shown in the following table:

If the <i>Date Range</i> parameter is defined for a query using	then the resulting date in the <CubeName>_dt.txt ¹ is the
Explicit Date Range	End Date
Calculated Values	Calculated End Date

If the <i>Date Range</i> parameter is defined for a query using	then the resulting date in the <CubeName>_dt.txt ¹ is the
No Date Range Parameter in the Cube	Date the Cube is Built
¹ where <cubeName> is the name of the cube that is being built	

- If you want to use the date in the <CubeName>_dt.txt as the current period, then you must create a new query in the cube model. This query must use the <CubeName>_dt.txt as a local data file. Also, the Set the current period option must be set only for this query.
- Use the Date Range parameter, but do not use the <CubeName>_dt.txt. This selects only records between the specific start date and end date, and sets the current period to the most recent date in the data.
- Do not use either the Date Range parameter or the <CubeName>_dt.txt. This selects all the records, and sets the current period to the most recent date in the data.
- Use the <CubeName>_dt.txt, but do not use the Date Range parameter. This selects all the records, and sets the current period to the date of the current cube build.
- For more information on how to set the current period and select records, see the *Tivoli Decision Support Administrator Guide* document.

Report Problems

- *The following error message appears: load_graph_from_powercube.*
This indicates that the cube has not been built. Build the cube.
- *You tried to open a report, and the Tivoli Discovery Interface gets stuck at the wait cursor.*
The Tivoli Discovery Interface may have lost its connection to the Cognos PowerPlay task. Close the Tivoli Discovery Interface and PowerPlay. Restart the Tivoli Discovery Interface, and your reports should open.
- *You opened a report, and it contained no data.*
There may be data in the report, but there is no data in the drill down. The report may be filtered on a dimension. Look at the dimension bar and check if any of the values (especially the date dimension) are drilled down.
- *The Crystal Reports do not have a left margin.*
The type of printer attached to a workstation influences the alignment of crystal reports. Try disconnecting the printer and restarting Tivoli Decision Support.
- *You cannot open a Crystal Report using the Discovery Interface.*
You must build SPP cubes 2 to 5 before you can open the SPP Crystal Report *Subsystem Trend Information*.

Year 2000 (Y2K)

THIS INFORMATION DOES NOT CONSTITUTE A CERTIFICATION OR WARRANTY, EXPRESS OR IMPLIED, OF ANY KIND.

Microsoft Y2K Service Packs

- *I installed a Microsoft service pack for Y2K, and Tivoli Decision Support no longer works correctly.*
The installation of certain service packs for Y2K can alter the system registry. To correct this problem, perform the following steps:

1. Save your customizations to Tivoli Decision Support by making copies of the following Tivoli Decision Support directories: \cubes, \data, \models, and \reports.
2. Reinstall Tivoli Decision Support, any Tivoli Decision Support patches, and the Microsoft ODBC Driver 2.6.5.

Note: Install Tivoli Decision Support in the same directory as the previous installation.

3. After installing Tivoli Decision Support and the patches, overwrite the new Tivoli Decision Support data and configuration files with your original files by copying the directories you saved earlier into the Tivoli Decision Support installation directory.

Tivoli DM Database

- *How do you ensure that the database and database client that Tivoli Decision Support uses are Y2K compliant?*

To help ensure that Tivoli Decision Support continues to select data correctly after January 1, 2000, the database used to store historical data must be Y2K certified. Please contact your system administrator and your database vendor if you have any questions concerning the Y2K compliance of your database or database client.

Seagate Crystal Reports Version 6

- *How do you ensure that Seagate Crystal Reports is Y2K compliant?*

Seagate Crystal Reports version 6 is Y2K ready if you download the required patches. Seagate Software considers a product Year 2000 ready if the product performance and functionality are unaffected by processing of dates prior to, during and after the Year 2000, but only if all products (for example hardware, software and firmware) used with the product properly exchange accurate date data with it.

Based on testing to date the following versions (in all available languages) of Seagate Crystal Reports, Seagate Crystal Info and Seagate Info are currently Year 2000 ready¹:

Product Name and Version - All Versions, STANDARD & PRO

Seagate Crystal Reports 7 - Shipped Year 2000 Ready

Seagate Crystal Reports 6²

1. For the compiled report option of Seagate Crystal Reports 6 to be Year 2000 ready, the appropriate version update must be downloaded from the Seagate Software Web site.

2. If you are using a native connection to Sbase (.dbf) database files, a patch must be downloaded from the Seagate Software Website. Please refer to the FAQ for more information. The official disclosure is posted on Seagate Software's Year 2000 Readiness page at <http://www.seagatesoftware.com/y2k>.

Chapter 5. Software Defects, Limitations, and Workarounds

Defects

The following is a list of some of the more important software defects. Workarounds are provided when applicable.

- Auto rerank does not work when using the view *Busiest Systems* under the topic *How is my overall performance?*

Workaround:

Use the following procedure to after you drill down into this view to rerank the view. From the View menu, point to Powerbars, and click File. Click the Rank icon in the File Power bar. In the Rank dialog, select the Bar option and click OK.

- The *By System Purpose* dimension can contain invalid data when the *System Purpose* parameter in cube 3 does not contain a list of all the valid hostnames and the values that identify the system purpose.
- The view *Systems That Need More Memory* under the topic *How might I improve the performance of my systems?* is dependent on information taken from the *computer_system_memory* and the *computer_system* tables in Inventory database. If this data is incomplete, the reports may not display properly.

Limitations

The following is a list of known software limitations. Workarounds are provided when applicable.

1. Manage the size of the DM_METRICS table in the DM Roll-up database. This will optimize the cube building process.
2. Measures on simple bar graphs appear twice centered on the graph and over the Y-axis. On low resolution monitors, the measure names may overlap.

Workaround:

The recommended minimum resolution for your monitor is 800 x 600 pixels.

3. Tivoli Decision Support does not allow publishing to html (graphics) of "drill-through" reports such as Subsystem Trend Information (dm_trend.rpt). Subsystem Trend Information is located under "How is my overall performance?" under Tivoli Discovery Interface. The report is unavailable in the scheduler dialog as a published schedule in Tivoli Discovery Administrator. The Subsystem Trend Information report is not listed.

4. **Note on Profiles and Profile Managers:** the objects created by the Tivoli Decision Support component of Distributed Monitoring (Classic Edition) Version 3.7 are not supposed to be customized or renamed. This is because the after scripts of the Distributed Monitoring patches assume that the objects have the name they had when they were created.

In details:

- The "SPR_ProfileMgr" Profile Manager must be included in the "...SPR_Region" Policy Region and cannot be moved or renamed.
- The SPP profiles and all the subscribers must be in the "SPR_ProfileMgr" Profile Manager and cannot be moved or renamed.
- The wgetjob for SPR_DataAggregation assumes the primary region for the profile manager and if a new region is created for the SPR_ProfileMgr and its

| profiles, then the job will need to be edited to correct the region specification
| as well or of this needs to be the primary region. The output file designated
| for SPR_DataAggregation is /tmp/spr_out.log.

Chapter 6. Defects Fixed

The following is a list of defects that were fixed in Version 2.1 (the number in brackets refers to the APAR):

- (IC26200) Scalability issue with trend cube build
- (IC26279) Cube building too slow due to wrong and/or missing index
- (IC27200) Current date in cube 5 or 6 is incorrectly set
- (IC28239) Growth rate function in dmtrend.dll causing incorrect values for some views

Chapter 7. Functional Description

The SPP guide analyzes the data from the network applications used to manage your network.

Tivoli Decision Support relies on data collected in a relational database (uses the DM Rollup database schema) by the DM Roll-up program. The data in this relational database is then processed by Tivoli Decision Support using queries that are used to create multi-dimensional cubes from which reports are generated. Crystal Reports are also used to gather data from the relational database.

Tivoli DM Roll-Up Database Schema

The Tivoli DM Roll-up database schema is capable of storing data for metrics that are monitored by Tivoli DM. The data schema is fairly generic. Tivoli DM provides the scripts to create the database schema tables that are filled during the aggregation process.

The schema consists of:

- 2 tables: DM_METRICS, which is used by the Tivoli DM roll-up program, and DM_SYSTEM_SUMMARY, which is used by the SPP guide.
- 1 view, called DM_METRIC_SUMMARY.
- 1 trigger, called DM_METRIC_INSERT, that transforms and fills the date field when a UNIX timestamp field is filled by the Tivoli DM roll-up.

The table **DM_METRICS** contains the following columns:

Column Name	Field Type	Description
COLLECTION_DATE	date	Date when the Tivoli DM data was aggregated. The field type varies according to the vendor DB.
DT_STAMP	integer	The UNIX timestamp that is converted in date by means of a trigger
HOSTNAME	varchar(32)	Host name where the Tivoli DM Roll-up piece runs
ENDPOINT	varchar(32)	
PROFILE_COLLECTION	varchar(64)	
PROBE_COLLECTION	varchar(32)	
PROBE	varchar(32)	Unique Tivoli DM Monitor name
PROBE_DESC	varchar(64)	
PROBE_ARG	varchar(32)	
MIN_VALUE_00	float	Minimum monitor value during the hour
MAX_VALUE_00	float	Maximum monitor value during the hour
AVG_VALUE_00	float	Average monitor value during the hour
MIN_VALUE_01	float	Minimum monitor value during the hour
MAX_VALUE_01	float	Maximum monitor value during the hour
AVG_VALUE_01	float	Average monitor value during the hour

Column Name	Field Type	Description
MIN_VALUE_02	float	Minimum monitor value during the hour
MAX_VALUE_02	float	Maximum monitor value during the hour
AVG_VALUE_02	float	Average monitor value during the hour
MIN_VALUE_03	float	Minimum monitor value during the hour
MAX_VALUE_03	float	Maximum monitor value during the hour
AVG_VALUE_03	float	Average monitor value during the hour
MIN_VALUE_04	float	Minimum monitor value during the hour
MAX_VALUE_04	float	Maximum monitor value during the hour
AVG_VALUE_04	float	Average monitor value during the hour
MIN_VALUE_05	float	Minimum monitor value during the hour
MAX_VALUE_05	float	Maximum monitor value during the hour
AVG_VALUE_05	float	Average monitor value during the hour
MIN_VALUE_06	float	Minimum monitor value during the hour
MAX_VALUE_06	float	Maximum monitor value during the hour
AVG_VALUE_06	float	Average monitor value during the hour
MIN_VALUE_07	float	Minimum monitor value during the hour
MAX_VALUE_07	float	Maximum monitor value during the hour
AVG_VALUE_07	float	Average monitor value during the hour
MIN_VALUE_08	float	Minimum monitor value during the hour
MAX_VALUE_08	float	Maximum monitor value during the hour
AVG_VALUE_08	float	Average monitor value during the hour
MIN_VALUE_09	float	Minimum monitor value during the hour
MAX_VALUE_09	float	Maximum monitor value during the hour
AVG_VALUE_09	float	Average monitor value during the hour
MIN_VALUE_10	float	Minimum monitor value during the hour
MAX_VALUE_10	float	Maximum monitor value during the hour
AVG_VALUE_10	float	Average monitor value during the hour
MIN_VALUE_11	float	Minimum monitor value during the hour
MAX_VALUE_11	float	Maximum monitor value during the hour
AVG_VALUE_11	float	Average monitor value during the hour
MIN_VALUE_12	float	Minimum monitor value during the hour
MAX_VALUE_12	float	Maximum monitor value during the hour
AVG_VALUE_12	float	Average monitor value during the hour
MIN_VALUE_13	float	Minimum monitor value during the hour
MAX_VALUE_13	float	Maximum monitor value during the hour
AVG_VALUE_13	float	Average monitor value during the hour
MIN_VALUE_14	float	Minimum monitor value during the hour
MAX_VALUE_14	float	Maximum monitor value during the hour
AVG_VALUE_14	float	Average monitor value during the hour
MIN_VALUE_15	float	Minimum monitor value during the hour
MAX_VALUE_15	float	Maximum monitor value during the hour

Column Name	Field Type	Description
AVG_VALUE_15	float	Average monitor value during the hour
MIN_VALUE_16	float	Minimum monitor value during the hour
MAX_VALUE_16	float	Maximum monitor value during the hour
AVG_VALUE_16	float	Average monitor value during the hour
MIN_VALUE_17	float	Minimum monitor value during the hour
MAX_VALUE_17	float	Maximum monitor value during the hour
AVG_VALUE_17	float	Average monitor value during the hour
MIN_VALUE_18	float	Minimum monitor value during the hour
MAX_VALUE_18	float	Maximum monitor value during the hour
AVG_VALUE_18	float	Average monitor value during the hour
MIN_VALUE_19	float	Minimum monitor value during the hour
MAX_VALUE_19	float	Maximum monitor value during the hour
AVG_VALUE_19	float	Average monitor value during the hour
MIN_VALUE_20	float	Minimum monitor value during the hour
MAX_VALUE_20	float	Maximum monitor value during the hour
AVG_VALUE_20	float	Average monitor value during the hour
MIN_VALUE_21	float	Minimum monitor value during the hour
MAX_VALUE_21	float	Maximum monitor value during the hour
AVG_VALUE_21	float	Average monitor value during the hour
MIN_VALUE_22	float	Minimum monitor value during the hour
MAX_VALUE_22	float	Maximum monitor value during the hour
AVG_VALUE_22	float	Average monitor value during the hour
MIN_VALUE_23	float	Minimum monitor value during the hour
MAX_VALUE_23	float	Maximum monitor value during the hour
AVG_VALUE_23	float	Average monitor value during the hour
MIN_DAILY_VALUE	float	Minimum monitor value during the day
MAX_DAILY_VALUE	float	Maximum monitor value during the day
AVG_DAILY_VALUE	float	Average monitor value during the day
MIN_HOURLY_AVG	float	Minimum of average monitor value during hour
MAX_HOURLY_AVG	float	Maximum of average monitor value during hour

The table **DM_SYSTEM_SUMMARY** contains the following columns:

Column Name	Field Type	Description
HOSTNAME	varchar(32)	Host name where the Tivoli DM Roll-up piece runs
PROBE	varchar(64)	Unique Tivoli DM Monitor name
AVERAGE_VALUE	float	Average monitor value

Tivoli DM Roll-Up Program

The Tivoli DM Roll-Up program is responsible for the following tasks:

- Collecting raw data.
- Collating raw data.
- Storing raw data in a user-determined RIM database.

To enable Tivoli DM Roll-Up to collect raw data, perform the following steps:

1. From \$BINDIR/TME/SENTRY/TDS/spr or %BINDIR%\TME\SENTRY\TDS\spr, copy the **moncfg.data** file to the following directory:
 - \$DBDIR/.sntcfg (on managed nodes)
 - \$LCF_DATDIR (on endpoints)
2. Edit the **moncfg.data** file by specifying a value for each monitor argument listed. The following table lists the kind of value appropriate for each monitor argument:

Monitor argument	Value to specify
spaceutil_disk	On AIX: the disk name issued from the iostat command On HP-UX and Solaris: the device name issued from the sar d 1 command
reqwait_disk	The device name issued from the sar - d 1 command
reqtime_disk	The device name issued from the sar - d 1 command
spaceutilkb_disk	On AIX: the disk name issued from the iostat command On HP-UX and Solaris: the device name issued from the sar - d 1 command
inodeused_fs	The name of a file system
neteff_interface	The interface name issued from the netstat - ir command
errratel_an_interface	The interface name issued from the netstat - ir command
collratel_an_interface	The interface name issued from the netstat - ir command
xferratekb_interface	The interface name issued from the netstat - ir command
xferratepkt_interface	The interface name issued from the netstat - ir command
davail_daemon	The name of a daemon

3. Save and close the **moncfg.data** file.
4. In the Tivoli Desktop window, select **Desktop->TMR Connections->Top Level Policy Regions**. The Top Level Policy Regions dialog is displayed.
5. Double-click < *hostname* > **_SPR_Region**, where < *hostname* > is the host name of your machine. The Policy Region dialog is displayed.
6. Double-click **SPR_ProfileMgr**. The Profile Manager dialog is displayed.
7. Distribute the SPR_NtProfile and SPR_UnixProfile respectively to the Windows NT and UNIX subscribers.

A set of DM monitors is distributed to the subscribers.

Tivoli DM Monitors

The following sections list all of the Tivoli DM monitors, grouped by category.

CPU Performance

- Percent busy: For multiple-CPU machines, returns the average of all CPUs
- Percent user time: For multiple-CPU machines, returns the average of all CPUs

- Percent system time: For multiple-CPU machines, returns the average of all CPUs
- Waiting job length: The total number of waiting jobs for the system
- Process number: The total number of processes in the system
- CPU idle waiting for anything else (percentage)
- Number of processes totally waiting
- Availability of daemons

Memory Performance

- Page-ins per second, in number of pages
- Page-outs per second, in number of pages
- Page scans per second, in number of pages
- Percent swap space available
- Part of the logical reads from the buffer cache
- Part of the logical writes to the buffer cache
- Number of swap outs/sec. (This metric is not available on AIX«.)
- Used virtual storage in percentage

Network Performance

- Input packets per second: Returns the total across all interfaces on the system
- Output packets per second: Returns the total across all interfaces on the system
- Input packet errors per second: Returns the total across all interfaces on the system
- Output packet errors per second: Returns the total across all interfaces on the system
- Packet collisions per second: Returns the total across all interfaces on the system. (This metric is not available on Windows NT.)
- Network efficiency in percentage for the LAN with the heaviest load
- Network efficiency (ratio of the collisions/sec to sent packets/sec) in percentage for a specified LAN
- LAN error rate/sec for a specified LAN
- Collision rate/sec for a specified LAN
- Transfer rate per LAN (read and write) in Kbytes/sec
- Transfer rate per LAN (read and write) in packets/sec
- Number of NFS accesses/min to the system

I/O Performance

- Peak system throughput in kilobytes per second: Returns the peak throughput on currently highest throughput disk.
- Peak disk transfers per second in number of transfers on the currently fastest disk.
- Disk space available on the specified disk: If no file system is specified, the root or system drive is assumed.
- Disk space used for the most used file system (percentage).
- Disk utilization used for the most used disk (percentage).
- CPU idle, waiting for I/O (percentage).
- Disk space utilization for a specified disk.
- Number of I/O requests for disk waiting.

(This metric is not available on AIX.)

- Time the I/O requests are waiting for disk.

(This metric is not available on AIX.)

- Disk space utilization for a specified disk (read and write) in Kbytes/sec.
- Inode-used in percentage per file system

Table 1. Universal Monitors

Category	Metric Name	Monitor Name	Monitor Arg	Metrics Unit	Comments
Memory	Swap space available	Swapavail	–	(Mbytes)	
I/O	Disk space available	Totalfree	filesystem	(Mbytes)	

Thirteen DM monitor implementations already exist on Windows NT. Two other monitor implementations, Page scan rate and Packet collection, are not provided because there are no equivalent measurements on Windows NT. Table 2 lists the Windows NT monitors.

Table 2. Windows NT Monitors

Category	Metric Name (in Guide)	Monitor Name	Monitor Arg	Metrics Unit	Comments
CPU	Processes	NT_Objects Processes	–	(count)	
	CPU percent busy	NT_System PrcTotCpuTime	–	%	
	CPU percent user time	NT_System PrcTotUsrTime	–	%	
	CPU percent system time	NT_System PrcTotPrivTime	–	%	
	CPU run queue length	NT_System CpuQueLen	–	(count)	
Memory	Memory page-in rate	NT_Memory PagesInputPerSec	–	(per second)	
	Memory page-out rate	NT_Memory PagesOutputPerSec	–	(per second)	
	Memory page-scan rate				No equivalent measurement
Network	Network packet input rate	NT_Network Interface PktsRcvPerSec	Interface	(per second)	
	Network packet input error rate	NT_Network Interface PktsRcvErrors	Interface	(count)	
	Network packet output rate	NT_Network Interface PktsSentPerSec	Interface	(per second)	
	Network packet output error rate	NT_Network Interface PktsOutErrors	Interface	(count)	
	Network packet collision rate				No equivalent measurement

Table 2. Windows NT Monitors (continued)

Category	Metric Name (in Guide)	Monitor Name	Monitor Arg	Metrics Unit	Comments
IO	Disk IO rate	NT_PhysicalDisk DskBytesPerSec	Physical disk	(per second)	
	Disk transfer rate	NT_PhysicalDisk DskTranPerSec	Physical disk	(seconds)	

Table 3 lists the corresponding UNIX monitors that are implement on the HPux10, Solaris2, and AIX4-r1 UNIX platforms. These new monitors were added to the Unix_Sentry monitoring collection.

Table 3. UNIX Monitors

Category	Metric Name (in Guide)	Monitor Name	Monitor Arg	Metrics Unit	Comments
CPU	Processes	Unix_Sentry totalprocs	Restricted choice 1/5/15/60 minute	(processes)	Total number of processes in system
	CPU percent busy	Unix_Sentry avgcpubusy	Restricted choice 1/5/15/60 minute	%	
	CPU percent user time	Unix_Sentry avgcpuusr	Restricted choice 1/5/15/60 minute	%	
	CPU percent system time	Unix_Sentry avgcpusys	Restricted choice 1/5/15/60 minute	%	
	CPU run queue length	Unix_Sentry runjobs	Restricted choice 1/5/15/60 minute	(jobs)	Average waiting jobs
	Percent of time CPU is waiting for anything else	Unix_Sentry cpuidleelse	Restricted choice 1/5/15/60 minute	%	
	Number of processes waiting	Unix_Sentry pwait	Restricted choice 1/5/15/60 minute	number	
	Daemon availability	Unix_Sentry davail	Restricted choice 1/5/15/60 minute Daemon	0 or 1	
Memory	Memory page-in rate	Unix_Sentry pageinrate	Restricted choice 1/5/15/60 minute p	ages/sec	
	Memory page-out rate	Unix_Sentry pageoutrate	Restricted choice 1/5/15/60 minute	pages/sec	
	Memory page-scan rate	Unix_Sentry pagescanrate	Restricted choice 1/5/15/60 minute	seeks/sec	
	Logical reads from the buffer cache	Unix_Sentry logicalreads	Restricted choice 1/5/15/60 minute	number	
	Logical writes to the buffer cache	Unix_Sentry logicalwrites	Restricted choice 1/5/15/60 minute	number	
	Number of swap-outs/s	Unix_Sentry swapouts	Restricted choice 1/5/15/60 minute	number	
	Percent of virtual storage used	Unix_Sentry vstorage	Restricted choice 1/5/15/60 minute	%	

Table 3. UNIX Monitors (continued)

Category	Metric Name (in Guide)	Monitor Name	Monitor Arg	Metrics Unit	Comments
Network	Network packet input rate	Unix_Sentry netinrate	Restricted choice 1/5/15/60 minute	packets/sec	
	Network packet input error rate	Unix_Sentry netinerrate	Restricted choice 1/5/15/60 minute	packets/sec	
	Network packet output rate	Unix_Sentry netoutrate	Restricted choice 1/5/15/60 minute	packets/sec	
	Network packet output error rate	Unix_Sentry netouterrate	Restricted choice 1/5/15/60 minute	packets/sec	
	Network packet collision rate	Unix_Sentry netcollirate	Restricted choice 1/5/15/60 minute	packets/sec	
	Percent of net efficiency for the heaviest loaded LAN	Unix_Sentry neteff	Restricted choice 1/5/15/60 minute	%	
	Network efficiency for a specified LAN	Unix_Sentry networkefficiency	Restricted choice 1/5/15/60 minute Interface	%	
	Error rate for a specified LAN	Unix_Sentry errratelan	Restricted choice 1/5/15/60 minute Interface	err/sec	
	Collision rate for a specified LAN	Unix_Sentry collratelan	Restricted choice 1/5/15/60 minute Interface	coll/sec	
	Transfer rate for a specified LAN (kb/s)	Unix_Sentry xferratekb	Restricted choice 1/5/15/60 minute Interface	kb/sec	
	Transfer rate for a specified LAN (pkt/s)	Unix_Sentry xferratepkt	Restricted choice 1/5/15/60 minute Interface	packets/sec	
	Number of NFS accesses to the system per minute	Unix_Sentry nfsaccesses	Restricted choice 1/5/15/60 minute	number/min	

Table 3. UNIX Monitors (continued)

Category	Metric Name (in Guide)	Monitor Name	Monitor Arg	Metrics Unit	Comments
I/O	Disk I/O rate	Unix_Sentry peakdiskrate	Restricted choice 1/5/15/60 minute	kb/sec	The Highest rate of the one of the local disk.
	Disk transfer rate	Unix_Sentry peakdiskxfer	Restricted choice 1/5/15/60 minute	transfers/sec	The highest rate of the one of the local disk
	Percent disk used for the most used fs	Unix_Sentry diskusedmostusedfs	Restricted choice 1/5/15/60 minute	%	
	Percent busy for the most used disk	Unix_Sentry diskutilmostuseddisk	Restricted choice 1/5/15/60 minute	%	
	Percent of time CPU waiting for I/O	Unix_Sentry waitforio	Restricted choice 1/5/15/60 minute	%	
	Percent busy for a specified disk	Unix_Sentry spaceutil	Restricted choice 1/5/15/60 minute Physical disk	%	
	Number of pending I/O requests for a specified disk	Unix_Sentry reqwait	Restricted choice 1/5/15/60 minute Physical disk	Number of requests	
	Time of pending I/O requests for a specified disk	Unix_Sentry reqtime	Restricted choice 1/5/15/60 minute Physical disk	time	
	Space utilization for a disk (kb/s)	Unix_Sentry spaceutilkb	Restricted choice 1/5/15/60 minute Physical disk	kb/sec	
	Percent of inodes used for a specified fs	Unix_Sentry inodeusedfs	Restricted choice 1/5/15/60 minute File system	%	

All the monitors require the user to specify the sampling period. With the restricted choice button, the user can choose: 1-minute, 5-minute, 15-minute, or 60-minute sampling period. The default value of the sampling time is 1-minute.

Cubes (Administrator)

A multidimensional cube contains data (measure values) organized into dimensions that allow faster retrieval and drill-down in PowerPlay Transformer and Explorer. You can use the Discovery Interface to quickly retrieve and view your data.

The SPP guide uses 6 cubes. The cubes must be built in numerical order (the cube build order is 1,2,3,4,5, and then 6). For more about building the SPP cubes, see the section “Scheduling the Cube Build Task” on page 22.

Server Performance Prediction (1) Inventory Hw and SPP (1) Inventory Hw (DB2/Informix)

For MS-SQL, Oracle, and Sybase, the SPP guide uses the Server Performance Prediction (1) Inventory Hw cube. For DB2 and Informix, the SPP guide uses the SPP (1) Inventory Hw (DB2/Informix) cube.

These cubes use hardware information retrieved from the Inventory database. The information is stored in export data files with the following names:

- IP address (DM_INV_SysByIP.csv)
- Memory (DM_INV_Memory.csv)
- Operating System (DM_INV_OsType.csv)
- Processor (DM_INV_Processor.csv)

Queries

The following SQL queries are used to create the flat files in comma separated value (csv) format. These files are used to feed the dimensions (structure query) and measures (transaction query) of this PowerPlay cube.

1. IP Network

IP Network (from Tivoli Inventory database) retrieves information about the following:

- Hardware system ID
- Network node name and address
- IP octect subaddress
- Network domain and subdomains
- Hostname

SQL COLUMNS

For MS-SQL, Oracle, and Sybase:

```
SELECT
    T1.HARDWARE_SYSTEM_ID,
    T2.NETWORK_NODE_NAME,
    T2.NETWORK_NODE_ADDRESS,
    1 AS SYSTEMS_BY_IP
FROM
    {oj ?[DB Qualifier].COMPUTER_SYSTEM T1 LEFT OUTER JOIN
    ?[DB Qualifier].NETWORK_NODE T2 ON T1.HARDWARE_SYSTEM_ID =
    T2.HARDWARE_SYSTEM_ID}
WHERE
    (T2.NETWORK_PROTOCOL = 'TCP' OR T2.NETWORK_PROTOCOL IS NULL)
AND
    (T2.CONFIG_CHANGE_TYPE in ('INSERT', 'UPDATE') OR
    T2.CONFIG_CHANGE_TYPE IS NULL)
```

For DB2 and Informix:

```
SELECT
    T1.HWARE_SYS_ID AS HARDWARE_SYSTEM_ID,
    T2.NET_NODE_NAME AS NETWORK_NODE_NAME,
    T2.NET_NODE_ADDR AS NETWORK_NODE_ADDRESS,
    1 AS SYSTEMS_BY_IP
FROM {oj ?[DB Qualifier].COMPUTER_SYS T1 LEFT OUTER JOIN
    ?[DB Qualifier].NET_NODE T2 ON T1.HWARE_SYS_ID =
    T2.HWARE_SYS_ID}
WHERE
    (T2.NET_PROTOCOL = 'TCP' OR T2.NET_PROTOCOL IS NULL)
AND
    (T2.CFG_CHG_TYPE in ('INSERT', 'UPDATE') OR T2.CFG_CHG_TYPE IS NULL)
```

CALCULATED COLUMNS

```
IP_A_NETWORK
IP_B_NETWORK
```

```

IP_C_NETWORK
NETWORK_DOMAIN
NETWORK_SUBDOMAIN
NETWORK_SUBDOMAIN_2
HOSTNAME

```

2. Memory

Memory (from Tivoli Inventory database) retrieves:

- The hardware system ID
- The physical memory

SQL COLUMNS

For MS-SQL, Oracle, and Sybase:

```

SELECT
    HARDWARE_SYSTEM_ID,
    PHYSICAL_MEMORY_KB,
    1 AS SYSTEMS_BY_MEMORY
FROM ?[DB Qualifier].COMPUTER_SYSTEM_MEMORY

```

For DB2 and Informix:

```

SELECT
    HWARE_SYS_ID AS HARDWARE_SYSTEM_ID,
    PHYSICAL_MEM_KB AS PHYSICAL_MEMORY_KB,
    1 AS SYSTEMS_BY_MEMORY
FROM ?[DB Qualifier].COMPUTER_SYS_MEM

```

CALCULATED COLUMNS
PHYSICAL_MEMORY

3. OS Type

OS Type (from Tivoli Inventory database) retrieves category values for the following:

- Hardware system ID
- Operating system booted name and version
- Computer kernel
- Windows NT service pack
- Operative system name
- Version
- Sub-version

SQL COLUMNS

For MS-SQL, Oracle, and Sybase:

```

SELECT
    T1.HARDWARE_SYSTEM_ID,
    T1.BOOTED_OS_NAME,
    T1.BOOTED_OS_VERSION,
    T1.COMPUTER_KERNEL_VERSION,
    T2.NT_SERVICE_PACK,
    NULL as NW_SUBVERSION,
    1 AS SYSTEMS_BY_OS
FROM {oj ?[DB Qualifier].COMPUTER_SYSTEM T1 LEFT OUTER JOIN
    ?[DB Qualifier].NT_INFO T2 ON T1.HARDWARE_SYSTEM_ID =
    T2.HARDWARE_SYSTEM_ID}

```

For DB2 and Informix:

```

SELECT
    T1.HWARE_SYS_ID AS HARDWARE_SYSTEM_ID,
    T1.BOOTED_OS_NAME,
    T1.BOOTED_OS_VER AS BOOTED_OS_VERSION,
    T1.COMPUTER_KRNL_VER AS COMPUTER_KERNEL_VERSION,
    T2.NT_SVC_PACK AS NT_SERVICE_PACK,
    'NULL' as NW_SUBVERSION,

```

```

1 AS SYSTEMS_BY_OS
FROM {oj ?[DB Qualifier].COMPUTER_SYS T1 LEFT OUTER JOIN
      ?[DB Qualifier].NT_INFO T2 ON T1.HWARE_SYS_ID =
      T2.HWARE_SYS_ID}

CALCULATED COLUMNS
OS_NAME_VERSION
OS_SUBVERSION

```

4. Processor

Processor (from Tivoli Inventory database) retrieves information about the following:

- Hardware system ID
- Number of processors
- Model
- Speed
- CPU rating

SQL COLUMNS

For MS-SQL, Oracle, and Sybase:

```

SELECT
    T1.HARDWARE_SYSTEM_ID AS HARDWARE_SYSTEM_ID,
    COUNT(*) AS NUM_PROCESSORS,
    MIN(T2.PROCESSOR_MODEL) AS PROCESSOR_MODEL,
    MIN(T2.PROCESSOR_SPEED) AS PROCESSOR_SPEED,
    1 AS SYSTEMS_BY_CPU
FROM
    ?[DB Qualifier].INSTALLED_PROCESSOR T1,
    ?[DB Qualifier].PROCESSOR T2
WHERE
    T1.PROCESSOR_ID = T2.PROCESSOR_ID
GROUP BY
    T1.HARDWARE_SYSTEM_ID

CALCULATED COLUMNS
MULTIPROCESSOR
PROCESSOR_INFO
CPU_RATING

```

For DB2 and Informix:

```

SELECT
    T1.HWARE_SYS_ID,
    COUNT(*) AS NUM_PROCESSORS,
    MIN(T2.PROCESSOR_MODEL) AS PROCESSOR_MODEL,
    MIN(T2.PROCESSOR_SPEED) AS PROCESSOR_SPEED,
    1 AS SYSTEMS_BY_CPU
FROM
    ?[DB Qualifier].INST_PROCESSOR T1,
    ?[DB Qualifier].PROCESSOR T2
WHERE
    T1.PROCESSOR_ID = T2.PROCESSOR_ID
GROUP BY
    T1.HWARE_SYS_ID

```

Parameters

Parameter Name	Type	Value Name	Value
CPU Rating	Terminology	110 MHz microSPARC II 110 MHz Single Processor	Mid-range workstation
		125 MHz hyperSPARC 125 MHz Single Processor	Mid-range workstation
		150 MHz Ross,RT626 150 MHz Dual Processor	Mid-range server
		170 MHz FMI,MB86907 170 MHz Single Processor	High-end workstation
		200 MHz UltraSPARC 200 MHz Dual Processor	Mid-range server

Parameter Name	Type	Value Name	Value
		200 MHz UltraSPARC 200 MHz Single Processor	High-end workstation
		248 MHz SUNW,UltraSPARC-II 248 MHz Multiple Processor	High-end server
		248 MHz SUNW,UltraSPARC-II 248 MHz Single Processor	High-end workstation
		269 MHz SUNW,UltraSPARC-III 269 MHz Single Processor	High-end workstation
		486 DX4 SLE 75 MHz Single Processor	Low-end PC
		50 MHz microSPARC I 50 MHz Single Processor	Low-end workstation
		70 MHz microSPARC II 70 MHz Single Processor	Low-end workstation
		85 MHz microSPARC II 85 MHz Single Processor	Low-end workstation
		90 MHz hyperSPARC 90 MHz Single Processor	Low-end workstation
		AMD-K6 Model 6 200 MHz Single Processor	Mid-range PC
		Intel Pentium 100 MHz Single Processor	Low-end PC
		Intel Pentium 120 MHz Single Processor	Low-end PC
		Intel Pentium 127 MHz Single Processor	Low-end PC
		Intel Pentium 133 MHz Single Processor	Low-end PC
		Intel Pentium 166 MHz Single Processor	Mid-range PC
		Intel Pentium 200 MHz Single Processor	Mid-range PC
		Intel Pentium 90 MHz Single Processor	Low-end PC
		Intel Pentium II 266 MHz Single Processor	High-end PC
		Intel Pentium II 300 MHz Single Processor	High-end PC
		Intel Pentium II 332 MHz Single Processor	High-end PC
		Intel Pentium II, Model 3 266 MHz Single Processor	Mid-range workstation
		Intel Pentium II, Model 5 266 MHz Single Processor	High-end PC
		Intel Pentium II, Model 5 350 MHz Single Processor	High-end PC
		Intel Pentium Pro 180 MHz Single Processor	High-end PC
		Intel Pentium Pro 200 MHz Single Processor	High-end PC
		Model 140 UltraSPARC 143 MHz Single Processor	Mid-range workstation
		Model 170 UltraSPARC 167 MHz Single Processor	Mid-range workstation
		Model 41 SuperSPARC SPARCmodu 40 MHz Single Processor	Low-end workstation
		Model 51 SuperSPARC SPARCmodu 50 MHz Dual Processor	Mid-range server
		PA-RISC_1.0 12 MHz Single Processor	Low-end workstation
		PA-RISC_1.1 100 MHz Single Processor	Mid-range workstation
		PA-RISC_1.1 120 MHz Single Processor	Mid-range workstation
		PA-RISC_1.1 132 MHz Single Processor	Mid-range workstation
		PA-RISC_1.1 160 MHz Single Processor	Mid-range workstation
		PA-RISC_1.1 180 MHz Single Processor	Mid-range workstation
		PA-RISC_1.1 33 MHz Single Processor	Low-end workstation

Parameter Name	Type	Value Name	Value
		PA-RISC_1.1 48 MHz Single Processor	Low-end workstation
		PA-RISC_1.1 60 MHz Single Processor	Low-end workstation
		PA-RISC_1.1 75 MHz Single Processor	Low-end workstation
		PA-RISC_1.1 80 MHz Single Processor	Low-end workstation
		PA-RISC_2.0 160 MHz Single Processor	Mid-range workstation
		PA-RISC_2.0 180 MHz Single Processor	Mid-range workstation
		POWER MHz Single Processor	Low-end workstation
		POWER 0 MHz Single Processor	Mid-range workstation
		POWER2 0 MHz Single Processor	Mid-range workstation
		PowerPC MHz Single Processor	Low-end workstation
		PowerPC 0 MHz Dual Processor	Mid-range server
		PowerPC 0 MHz Single Processor	Mid-range workstation
		PowerPC_601 MHz Dual Processor	Mid-range serve
		PowerPC_601 MHz Single Processor	Mid-range workstation
		PowerPC_601 0 MHz Single Processor	Mid-range workstation
		PowerPC_604 MHz Single Processor	Mid-range workstation
		PowerPC_604 0 MHz Dual Processor	Mid-range server
		PowerPC_604 0 MHz Multiple Processors	High-end server
		PowerPC_604 0 MHz Single Processor	Mid-range workstation
Number of processors	Categorization	Dual Processor	1
		Multiple Processors	2
		Single Processor	0
Physical Memory	Categorization	<32 Megabytes	0
		>4 Gigabytes	4194304
		1-4 Gigabytes	1048576
		256-1024 Megabytes	262144
		32-64 Megabytes	32768
		64-256 Megabytes	65536

Dimensions

The dimension defined for the Server Performance Prediction (1) Inventory Hw and SPP (1) Inventory Hw (DB2/Informix) cubes is dummy. These cubes should be built only to create the flat .csv files containing Inventory data that is used as queries from the SPP cubes.

Measures

Measures are not used in the Server Performance Prediction (1) Inventory Hw and SPP (1) Inventory Hw (DB2/Informix) cubes.

Server Performance Prediction (2) Summary

This cube uses metric averages from the export data file (DM_Averages.csv) that is created from queries against the database. The data range is based on a maximum of 6 months. Building this cube updates the Tivoli DM Roll-up database table DM_SYSTEM_SUMMARY.

Queries

The following SQL queries are used to create the flat files in comma separated value (csv) format. The .csv files will be used to create the dimensions (structure query) and measures (transaction query) of this multi-dimensional cube.

1. Update System Averages

Update System Averages (from Tivoli DM database). This cube calls the UpdateSystemSummary Dll function that refreshes the Tivoli DM System Summary table. The SQL Columns tab panel executes a dummy query. The function call is necessary because the ODBC driver for Oracle does not support multiple queries and because the date type is managed differently by each database.

```
SQL COLUMNS
SELECT
  COUNT(*)
FROM ?[DB Qualifier].DM_METRICS
CALCULATED COLUMNS
None
```

Parameters

Parameter	NameType	Values
Date range	Range	Start Date End Date Calculated on Rolling 6 months
Ranking Names	Categorization	0 - 1.5 Relatively Idle 1.5 2 Somewhat Busy 2 3.5 Moderately Busy > 3.5 Very Busy

Dimensions

The dimension defined for this cube is dummy. This cube must be built before the Discovery Administrator can create the .csv files containing Average values data that will be used as queries from the Server Performance Prediction cubes.

Measures

The measures are the numbers you can use to value the performance of your business. This is a dummy cube and the measures are not used.

Server Performance Prediction (3) Rank

The Server Performance Prediction Rank cube creates from exported data the DM_Ranking.csv file. This export file is used to build cubes 4 to 6.

Queries

The following SQL queries are used to create the .csv files. These files will be used to create the dimensions (structure query) and measures (transaction query) of this multi-dimensional cube.

1. Rank Systems

Rank Systems (from Tivoli DM database). Each subsystem under study (CPU, IO, MEMORY, NETWORK) has been characterized by a metric that represents the overall performance for that system. For example, the CPU system the metrics range for cputotpct and loadavg has been split in four category

(relatively idle, somewhat busy, moderately busy and very busy as described in the *Parameters* section). So, the average of these two rank values give us a value representing the CPU utilization rank.

```
SQL COLUMNS
    SELECT DISTINCT
        HOSTNAME AS NETWORK_NODE_NAME,,
        1 AS NUM_SYSTEMS
    FROM
        ?[DB Qualifier].DM_SYSTEM_SUMMARY
CALCULATED COLUMNS
    CPU_RANK
    MEMORY_RANK
    IO_RANK
    NETWORK_RANK
    OVERALL_RANK
    CPU_RANK_DESCRIPTION
    MEMORY_RANK_DESCRIPTION
    IO_RANK_DESCRIPTION
    NETWORK_RANK_DESCRIPTION
    OVERALL_RANK_DESCRIPTION
    HOSTNAME
    SYSTEM_PURPOSE
```

Parameters

The System Purpose parameter should be specified after the guide is installed. You need must make an association between the hostname and the server type (DNS Server, Lotus Notes Server, and so forth).

Parameter Name	Type	Name Values	Values
System Purpose	Terminology	Host names	Server type
Ranking Names	Categorization	0 - 1.5 Relatively Idle 1.5 2 Somewhat Busy 2 3.5 Moderately Busy > 3.5 Very Busy	

Dimensions

The dimension defined for this cube is dummy. This cube must be built before the Discovery Administrator can create the .csv files containing Average values data that will be used as queries for the Server Performance Prediction cubes.

Measures

The measures are numbers by which you value the performance of your business. This is a dummy cube and the measures are not used.

Server Performance Prediction (4) Daily

This cube retrieves data from the database and creates categories and daily average measurements for its multi-dimensional cube. Building this cube creates the export file (DM_Daily.csv) with 1 record/day/host/probe.

Queries

The following SQL queries are used to create .csv files. These files will be used to create the dimensions (structure query) and measures (transaction query) of this multi-dimensional cube.

1. Daily Info

Daily Info (from Tivoli DM database). Retrieves information about the daily values of the DM metrics. Those values will be used to create the cube measures.

```
SQL COLUMNS
```

```

SELECT
    HOSTNAME AS NETWORK_NODE_NAME,
    COLLECTION_DATE,
    PROBE,
    PROBE_ARG,
    MIN_DAILY_VALUE,
    AVG_DAILY_VALUE,
    MAX_DAILY_VALUE,
    MIN_HOURLY_AVG,
    MAX_HOURLY_AVG,
    1 AS NUM_DAYS
FROM
    ?[DB Qualifier].DM_METRICS
WHERE
    COLLECTION_DATE Between ?[Date Range].[Start Date] AND ?[Date
    Range].[End Date]
AND PROBE IN ('totalprocs','avgcpubusy','avgcpusys',
    'avgcpuusr','runqjobs','pageinrate','pageoutrate','pagescanrate',
    'swapavail','netinrate','netoutrate','netinerrate','netouterrate',
    'netcollirate','peakdiskrate','peakdiskxfer','totalfree',
    'Processes','PrcTotCpuTime','PrcTotUsrTime','PrcTotPrivTime',
    'CpuQueLen','PagesInputPerSec','PagesOutputPerSec','PktsRcvPerSec',
    'PktsSentPerSec','PktsRcvErrors','PktsOutErrors','DskBytesPerSec',
    'DskTranPerSec','diskusedmostusedfs','diskutilmostuseddisk',
    'neteff','waitforio','cpuidleelse','spaceutil','reqwait',
    'reqtime','spaceutilkb','logicalreads','logicalwrites',
    'inodeusedfs','swapouts','vstorage','pwait','networkefficiency',
    'errratelan','collratelan','xferratekb','xferratepkt',
    'nfsaccesses','davail')

CALCULATED COLUMNS
    PROBE_NAME
    HOSTNAME
    WEEKDAY
    WEEKDAY_NAME
    PROBE_NAME_FILTERED

```

Parameters

Parameter Name	Type	Value Name	Value
Date range	Range	Start Date End Date	Calculated on Rolling 6 months
Probe Name	Terminology	totalprocs	Processes
		avgcpubusy	CPU percent busy
		avgcpuusr	CPU percent user time
		avgcpusys	CPU percent system time
		runqjobs	CPU run queue length
		pageinrate	Memory page-in rate
		pageoutrate	Memory page-out rate
		pagescanrate	Memory page-scan rate
		swapavail	Swap space available
		netinrate	Network packet input rate
		netoutrate	Network packet output rate
		netinerrate	Network packet input error rate
		netouterrate	Network packet output error rate
		netcollirate	Network packet collision rate

Parameter Name	Type	Value Name	Value
		peakdiskrate	Disk IO rate
		netcollirate	Network packet collision rate
		peakdiskrate	Disk IO rate
		peakdiskxfer	Disk transfer rate
		totalfree	Disk space available
		Processes	Processes
		PrcTotCpuTime	CPU percent busy
		PrcTotUsrTime	CPU percent user time
		PrcTotPrivTime	CPU percent system time
		CpuQueLen	CPU run queue length
		PagesInputPerSec	Memory page-in rate
		PagesOutputPerSec	Memory page-out rate
		PktsRcvPerSec	Network packet input rate
		PktsSentPerSec	Network packet output rate
		DskBytesPerSec	Disk IO rate
		DskTranPerSec	Disk transfer rate

Parameter Name	Type	Value Name	Value
Probe Name Filtered Terminology		PktsRcvErrors	Network packet input error rate
		PktsOutErrors	Network packet output error rate
		Processes	Processes
		PrcTotCpuTime	CPU percent busy
		PrcTotUsrTime	CPU percent user time
		totalprocs	Processes
		avgcpubusy	CPU percent busy
		avgcpuusr	CPU percent user time
		diskusedmostusedfs	Percent disk used for the most used fs
		neteff	Percent of net efficiency for the heaviest loaded LAN
		diskutilmostuseddisk	Percent busy for the most used disk
		waitforio	Percent of time CPU waiting for I/O
		cpuidleelse	Percent of time CPU waiting for anything else
		spaceutil	Percent busy for a specified disk
		rewqwait	Number of pending I/O requests for a specified disk
		reqtime	Time of pending I/O requests for a specified disk
		spaceutilkb	Space utilization for a disk (kb/s)
		logicalreads	Logical reads from the buffer cache
		logicalwrites	Logical writes to the buffer cache
		inodeusedfs	Percent of inodes used for a specified fs
		swapouts	Number of swap-outs/s
		vstorage	Percent of virtual storage used
		pwait	Number of processes waiting
		networkefficiency	Network efficiency for a specified LAN
		errratelan	Error rate for a specified LAN
		collratelan	Collision rate for a specified LAN
		xferratekb	Transfer rate for a specified LAN (kb/s)
		xferratepkt	Transfer rate for a specified LAN (pkt/s)
		nfsaccesses	Number of NFS accesses to the system per minute
		davail	Daemon availability
		diskutilmostuseddisk	Utilization of most busy disk
		avgcpubusy	CPU percent busy
		pageoutrate	Memory page-out rate
		networkefficiency	Network efficiency for a specified LAN

Dimensions

The model (a multidimensional representation of a business comprising the structure and specifications for a cube) for this cube (dm_daily.mdl) has most of dimensions used to slice the Inventory data:

- **By Date:** The date dimension that will have the categories automatically generated during the cube build. The last level of detail is day (*Note: this is a PowerPlay limitation*)
- **By System Purpose:** A terminology property of the System Performance cube that you defined as a parameter by the user.
- **By Operating System:** Based on the OS type and version in the Inventory database.
- **By CPU Type:** This dimension is based on the hardware system and processor table in Inventory database. It includes the number of processors and processor type.
- **By Physical Memory:** Retrieves data from the memory table of Inventory databases.
- **By Network Address:** This dimension breaks down the IP address into its four component parts. This should not be applied to network devices or to Inventory data since you will likely have a 1-255 ratio at this level which would not make for a very useful drill-down.
- **System Metric:** The categories that populate this dimension are the metric names collected by the DM roll-up (see the *Tivoli DM Monitors* table).
- **System Metric Filtered:** This dimension is used to filter the metrics required by the report Daily Average Performance Trend (Limited to Some Monitors). The categories that populate it are the metric names of the parameter Probe Name Filtered.

Dimension Map

A Dimension map is a table that shows the PowerPlay model of a business in rows and columns. The columns are the dimension, the rows are the levels within the dimensions.

By Date		By Day of Week	By System Purpose	By Operating System	By CPU Type	By Physical Memory	By Network Address	System Metric	System Metric Filtered	
Year	WEEK	WEEK DAY_NAME	SYSTEM_PURPOSE	BOOTED_OS_NAME	MULTI PROCESSORS	PHYSICAL_MEMORY	IP_A_NETWORK	PROBE_NAME	PROBE_NAME_FILTERED	
Month			HOSTNAME	OS_NAME_VERSION	PROCESSOR_SPEED	HARDWARE_SYSTEM_ID	IP_B_NETWORK			
Day				OS_SUB_VERSION	PROCESSOR_INFO	HOST NAME	IP_C_NETWORK			
					HARDWARE_SYSTEM_ID	HARDWARE_SYSTEM_ID				NETWORK_NODE_ADDRESS
					HOSTNAME	HOSTNAME				HOST NAME
						HARDWARE_SYSTEM_ID				

Measures

The measures are the numbers by which you value the performance of your business.

Measure Name	Rollup Function	Type
Daily average	Average	Column = AVG_DAILY_VALUE
Peak hour average	Average	Column = MAX_HOURLY_AVG
Minimum hourly average	Minimum	Column = MIN_HOURLY_AVG
Maximum hourly average	Maximum	Column = MAX_HOURLY_AVG
Minimum daily value	Minimum	Column = MIN_DAILY_VALUE
Maximum daily value	Maximum	Column = MAX_DAILY_VALUE

Check of the Allowed Measures and Dimensions Combination

A measure scope highlights relationships between the measure and levels within a dimension. The following table lists the measures for the cube and whether they are or not in the scope with dimensions. When a dimension is out of scope the relative level is shown in square bracket and the letter in the round bracket has the following meaning.

By default, PowerPlay Transformer uses yellow to show direct association between the measure and a level, green to show that the measure is allocated to a level, and white to show no association between the measure and a level.

1. Level derived indirectly (Query scope) from columns in queries associated with the selected query. Valid for query scope dimension maps only (light yellow)
2. Level derived directly (Query and Measure scope) from a column within the selected query; or, a measure that has direct meaning at the level (yellow)
3. Level derived from a query with missing columns (Query scope). a level derived from a column in a query that lacks the columns required to generate categories for higher levels in the dimension. Valid for query scope dimension maps only (red)
4. Level with allocated measures (Measure scope). levels whose measure values are allocated by transformer. Valid for measure scope dimension maps only (green)
5. Not applicable (out of Measure and Query scope) (white)

The best situation is to have all data ranked (2).

Measure	In scope (with these dimension)	Out of scope (with these dimension)
Average daily value	All except <i>By Network Address</i> (2)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (4)]
Average peak hour value	All except <i>By Network Address</i> (2)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (4)]
Minimum hourly average	All except <i>By Network Address</i> (2)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (4)]
Maximum hourly average	All except <i>By Network Address</i> (2)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (4)]
Minimum daily average	All except <i>By Network Address</i> (2)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (4)]
Maximum daily value	All except <i>By Network Address</i> (2)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (4)]

Server Performance Prediction (5) Trend

This cube uses data from the exported file (DM_Trend.csv) which is created by a query against the database and categories for computing the forecast measurements.

Queries

The following SQL queries are used to create .csv files. These files will be used to create the dimensions (structure query) and measures (transaction query) of this multi-dimensional cube.

1. 1. Forecasts

Forecasts (from Tivoli DM database) provides calculated columns using a Visual Basic DLL program. This module:

- Forecasts the average hourly value based on a linear regression of average values for the future 30/60/90 days (using an algorithm developed by IBM research that takes into account time of day and day of week variance)
- Forecasts the peak hour average value based on the above linear regression algorithm (30/60/90 days); calculates the number of days to reach a given level using either the average value or the peak hour average value
- Does an hour-by-hour forecast of the next N days that factors in time of day and day of week sensitivity
- Calculates a recommended threshold using the mean and standard deviation of the busiest hour and busiest day
- Calculates the number of times that the monitor exceeded a given threshold (either a user specified one or the calculated recommendation)
- Factors in a projected acceleration rate to any of the above values, so that you seed the growth projection with data that indicates you plan to grow faster in the future than you did in the past (the acceleration rate is a monthly growth rate expressed as a percentage).

SQL COLUMNS

```
SELECT
    HOSTNAME AS NETWORK_NODE_NAME,
    PROBE,
    PROBE_ARG,
    AVG(AVG_DAILY_VALUE) AS DAILY_AVG,
    AVG(MAX_HOURLY_AVG) AS PEAK_HOURLY_AVG,
    MAX(MAX_HOURLY_AVG) AS DAILY_MAX,
    MIN(COLLECTION_DATE) AS FIRST_DAY,
    MAX(COLLECTION_DATE) AS LAST_DAY,
    COUNT(*) AS NUM_DAYS
FROM
    ?[DB Qualifier].DM_METRICS
WHERE
    COLLECTION_DATE Between ?[Date Range].[Start Date] AND
    ?[Date Range].[End Date]
    AND PROBE IN ('avgcpubusy','avgcpusys',
    'avgcpuusr','runqjobs', 'pageinrate','pageoutrate','pagescanrate',
    'netinrate', 'netoutrate','netinerrate','netouterrate',
    'netcollirate', 'peakdiskrate','peakdiskxfer','PrcTotCpuTime',
    'PrcTotUsrTime', 'PrcTotPriv Time','CpuQueueLen','PagesInputPerSec',
    'PagesOutputPerSec', 'PktsRcvPerSec', 'PktsSentPerSec',
    'PktsRcvErrors', 'PktsOutErrors', 'diskusedmostusedfs',
    'diskutilmostuseddisk', '|neteff','waitforio',
    'cpuidleelse','spaceutil','reqwait','reqtime','spaceutilkb',
    'logicalreads','logicalwrites','inodeusedfs','swapouts','vstorage',
    'pwait','networkefficiency','errratelan','collratelan','xferratekb',
    'xferratepkt','nfsaccesses','davail')
```

```

GROUP BY
    PROBE,
    HOSTNAME,
    PROBE_ARG

CALCULATED COLUMNS
    CRITICAL_THRESHOLD
    DAYS_TO_CRITICAL_THRESHOLD
    FORECAST_30_DAY_AVG
    FORECAST_30_DAY_PEAK
    FORECAST_60_DAY_AVG
    FORECAST_60_DAY_PEAK
    FORECAST_90_DAY_AVG
    FORECAST_90_DAY_PEAKFORECAST_ACCELERATOR
    NUM_HOURS
    PROBE_NAME
    TIMES_CRITICAL
    GROWTH_RATE
    HOSTNAME
    FORECAST_STD_DEV
    PROBE_NAME_FILTERED

```

Parameters

The Critical Threshold parameter has some default of reasonable values that you can change to accommodate proper system performance. The Forecast Accelerator is the percentage accelerating added value in the next 30 days to the trend value. For example at a certain date an administrator knows that some metrics will grow faster than usual because users will be added, so the Administrator specifies the host name and the corresponding growth percentage (this value can also be negative).

Parameter Name	Type	Value Name	Value
Date range	Range	Start Date End Date Calculated on Rolling 6 months	
Critical Threshold	Terminology	avgcpusys	50
		avgcpubusy	98
		avgcpuusr	60
		netinerrate	200
		netinrate	50000
		peakdiskrate	10000
		runqjobs	6.5
		netcollirate	300
		netouterrate	100
		netoutrate	75000
		pageinrate	5000
		pageoutrate	2500
		pagescanrate	8000
		peakdiskxfer	8000
		PrcTotCpuTime	98
		PrcTotUsrTime	60
		PrcTotPrivTime	50
		PagesInputPerSec	5000

Parameter Name	Type	Value Name	Value
		PagesOutputPerSec	2500
		PktsRcvPerSec	50000
		PktsSentPerSec	75000
		DskBytesPerSec	10000
		DskTranPerSec	8000
		PktsRcvErrors	200
		PktsOutErrors	100
		CpuQueLen	6.5
		diskusedmostusedfs	100
		diskutilmostuseddisk	90
		waitforio	99
		cpuidleelse	100
		spaceutil	99
		reqwait	10
		reqtime	500
		spaceutilkb	10000
		inodeusedfs	98
		swapouts	1000
		vstorage	95
		pwait	200
		errratelan	20
		collratelan	30
		xferratekb	10000
		xferratepkt	20000
		nfsaccesses	500
		neteff	20
		logicalreads	1000
		logicalwrites	1000
		networkefficiency	20
Forecast Accelerator	Terminology	Default	0
Probe Name	Terminology	totalprocs	Processes
		avgcpubusy	CPU percent busy
		avgcpuusr	CPU percent user time
		totalprocs	Processes
		avgcpusys	CPU percent system time
		runjobs	CPU run queue length
		pageinrate	Memory page-in rate
		pageoutrate	Memory page-out rate
		pagescanrate	Memory page-scan rate

Parameter Name	Type	Value Name	Value
		swapavail	Swap space available
		netinrate	Network packet input rate
		netoutrate	Network packet output rate
		netinerrate	Network packet input error rate
		netouterrate	Network packet output error rate
		netcollirate	Network packet collision rate
		peakdiskrate	Disk IO rate
		netcollirate	Network packet collision rate
		peakdiskrate	Disk IO rate
		peakdiskxfer	Disk transfer rate
		totalfree	Disk space available
		Processes	Processes
		PrcTotCpuTime	CPU percent busy
		PrcTotUsrTime	CPU percent user time
		PrcTotPrivTime	CPU percent system time
		CpuQueLen	CPU run queue length
		PagesInputPerSec	Memory page-in rate
		PagesOutputPerSec	Memory page-out rate
		PktsRcvPerSec	Network packet input rate
		PktsSentPerSec	Network packet output rate
		DskBytesPerSec	Disk IO rate
		DskTranPerSec	Disk transfer rate
		PktsRcvErrors	Network packet input error rate

Parameter Name	Type	Value Name	Value
		PktsOutErrors	Network packet output error rate
		Processes	Processes
		totalprocs	Processes
		PrcTotCpuTime	CPU percent busy
		PrcTotUsrTime	CPU percent user time
		avgcpubusy	CPU percent busy
		avgcpuusr	CPU percent user time
		diskusedmostusedfs	Percent disk used for the most used fs
		diskutilmostuseddisk	Percent busy of the most used disk
		neteff	Percent of net efficiency for the heaviest loaded LAN
		waitforio	Percent of time CPU waiting of I/O
		cpuidleelse	Percent of time CPU waiting for anything else
		spaceutil	Percent busy for a specified disk
		reqwait	Number of pending I/O requests for a specified disk
		reqtime	Time of pending I/O requests for a specified disk
		spaceutilkb	Space utilization for a disk (kb/s)
		logicalreads	Logical reads from the buffer cache
		logicalwrites	Logical writes to the buffer cache
		inodeusedfs	Percent of inodes used for a specified fs
		swapouts	Number of swap-outs/s
		vstorage	Percent of virtual storage used
		pwait	Number of processes waiting
		networkefficiency	Network efficiency for a specified LAN
		errratelan	Error rate for a specified LAN
		collratelan	Collision rate for a specified LAN
		xferratekb	Transfer rate for a specified LAN (kb/s)
		xferratepkt	Transfer rate for a specified ALN (pkt/s)
		nfsaccesses	Number of NFS accesses to the system per minute
		davail	Daemon availability
Probe Name Filtered	Terminology	diskutilmostuseddisk	Utilization of most busy disk
		avgcpubusy	CPU percent busy
		pageoutrate	Memory page-out rate
		networkefficiency	Network efficiency for a specified LAN

Dimensions

The model for this cube (dm_trend.mdl) contains most of the dimensions used to slice the Tivoli Inventory data:

- **By System Purpose:** A terminology property of the System Performance cube that you defined as parameter.
- **By Operating System:** Retrieves the OS type and version as scanned by Tivoli Inventory.
- **By CPU Type:** Based on the hardware system and processor table in the Inventory database. Includes the number of processors and processor type.
- **By Physical Memory:** Retrieves information from the memory table of the Inventory database.
- **By Network Address:** This dimension breaks down the IP address into its four component parts. This should not be applied to network devices or to Inventory data since you will likely have a 1-255 ratio at this level, which would not make for a very useful drill-down.
- **By Activity Level:** Contains the information relative to the subsystem rank description.
- **System Metric:** The categories that populate this dimension are the metric names collected by the DM roll-up (see the *Tivoli DM Monitors* table).
- **System Metric Filtered:** This dimension is used to filter the metrics required by the report Daily Average Performance Trend (Limited to Some Monitors). The categories that populate it are the metric names of the parameter Probe Name Filtered.

Dimension Map

A Dimension map is a table that shows the PowerPlay model of a business in rows and columns. The columns are the dimension, the rows are the levels within the dimensions.

By System Purpose	By Operating System	By CPU Type	By Physical Memory	By Network Address	By Activity Level	System Metric	System Metric Filtered
SYSTEM_PURPOSE	BOOTED_OS_NAME	MULTI-PROCESSOR	PHYSICAL_MEMORY	IP_A_NETWORK	OVERALL_RANK_DESCRIPTION CPU MEMORY NETWORK IO	PROBE_NAME	PROBE_NAME
HOSTNAME	OS_NAME_VERSION	PROCESSOR_SPEED	HARDWARE_SYSTEM_ID	IP_B_NETWORK		HOSTNAME	
	OS_SUBVERSION		HOSTNAME	IP_C_NETWORK			
	HARDWARE_SYSTEM_ID	HARDWARE_SYSTEM_ID		NETWORK_NODE_ADDRESS			
	HOSTNAME	HOSTNAME		HARDWARE_SYSTEM_ID			
				HOSTNAME			

Measures

The measures are the numbers by which you value the performance of your business.

The measurements of this cube are relative to the utilization rank of each subsystem and to the forecast over 30/60/90 days computed for the average value and for the peak value of the metric highlighted.

Measure Name	Rollup Function	Type
Number of systems	Sum	Column = NUM_SYSTEMS

Measure Name	Rollup Function	Type
Daily average value	Average	Column = DAILY_AVG
Average Peak Hour value	Average	Column = PEAK_HOURLY_AVG
Maximum value	Maximum	Column = DAILY_MAX
30 day forecasted average	Average	Column = FORECAST_30_DAY_AVG
60 day forecasted	Average	AverageColumn = FORECAST_60_DAY_AVG
90 day forecasted average	Average	Column = FORECAST_90_DAY_AVG
30 day forecasted peak value	Maximum	Column = FORECAST_30_DAY_PEAK
60 day forecasted peak value	Maximum	Column = FORECAST_60_DAY_PEAK
90 day forecasted peak value	Maximum	Column = FORECAST_90_DAY_PEAK
Days to critical threshold	Minimum	Column = DAYS_TO_CRITICAL_THRESHOLD
Times critical threshold exceeded	Sum	Column = TIMES_CRITICAL
Overall Utilization Rating	Average	Column = OVERALL_RANK
CPU Utilization Rating	Average	Column = CPU_RANK
Memory Utilization Rating	Average	Column = MEMORY_RANK
IO Utilization Rating	Average	Column = IO_RANK
Network Utilization Rating	Average	Column = NETWORK_RANK
Growth Rate %	Average	Column = GROWTH_RATE
Processor Overload	Calculate	DPERCENT ((CPU Utilization rating Network Utilization Rating), Network Utilization Rating)

Check of the Allowed Measures and Dimensions Combination

Measure	In Scope (with these dimension)	Out of Scope (with these dimension)
Number of system	All except <i>System Metric</i> (b)	<i>System Metric</i> [PROBE_NAME (d)]
Daily average value	All (b)	
Average Peak Hour Value	All (b)	
Maximum Value	All (b)	
30 day forecast average	All (b)	
60 day forecast average	All (b)	
90 day forecast average	All (b)	
30 day forecast peak value	All (b)	
60 day forecast peak value	All (b)	
90 day forecast peak value	All (b)	
Days to critical threshold	All (b)	
Times critical threshold exceeded	All (b)	

Measure	In Scope (with these dimension)	Out of Scope (with these dimension)
Overall Utilization Rating	All except <i>System Metric</i> (b)	<i>System Metric</i> [PROBE_NAME (d)]
CPU Utilization Rating	All except <i>System Metric</i> (b)	<i>System Metric</i> [PROBE_NAME (d)]
Memory Utilization Rating	All except <i>System Metric</i> (b)	<i>System Metric</i> [PROBE_NAME (d)]
IO Utilization Rating	All except <i>System Metric</i> (b)	<i>System Metric</i> [PROBE_NAME (d)]
Network Utilization Rating	All except <i>System Metric</i> (b)	<i>System Metric</i> [PROBE_NAME (d)]
Growth Rate %	All (b)	

Server Performance Prediction (6) Hourly

The Server Performance Prediction (6) Hourly cube retrieves data from the .csv file generated by the previous cube Server Performance Prediction (5) Trend which builds DM_hourly.csv file, and creates categories for its multi-dimensional cube.

Queries

There are no queries for this cube, because the hourly detail data that supply the dimensions for this cube are provided by the DM_hourly.csv file. This file is generated by a Visual Basic DLL function called by the Trend cube.

Parameters

None.

Dimensions

The model for this cube (dm_hourly.mdl) contains most of the dimensions used to slice the Tivoli Inventory data:

- **By Date:** The date dimension for which the categories are automatically generated during the cube build. The last level of detail is day (*Note: this is a PowerPlay limitation*).
- **By System Purpose:** Retrieves the terminology property from the System Performance cube (you defined this using a parameter).
- **By Operating System:** Retrieves the OS type and version from the Inventory database.
- **By CPU Type:** Uses the hardware system and processor table in the Inventory database. Includes the number of processors and processor type.
- **By Physical Memory:** Retrieves information from the memory table of the Inventory database.
- **By Network Address:** This dimension breaks down the IP address into its four component parts. This should not be applied to network devices or to Inventory data since you will likely have a 1-255 ratio at this level which would not make for a very useful drill-down.
- **By Time:** Contains a set of timestamps (strings) at level of hour. This dimension is created using data from the DM_Hourly.csv file.
- **System Metric:** The categories that populate this dimension are the metric names collected by the DM roll-up (see *Tivoli DM Monitors* table).

Dimension Map

A Dimension map is a table that shows the PowerPlay model of a business in rows and columns. The columns are the dimension, the rows are the levels within the dimensions.

By Date	By System Purpose	By Operating System	By CPU Type	By Physical Memory	By Network Address	By Time	System Metric
Year	SYSTEM_PURPOSE	BOOTED_OS_NAME	MULTIPRO-CESSORS	PHYSICAL_MEMORY	IP_A_NETWORK	PROBE_HOUR	PROBE
Week	HOST NAME	OS_NAME_VERSION	NUM_PRO-CESSORS	HARDWARE_SYSTEM_ID	IP_B_NETWORK		
Days		OS_SUB VERSION	PROCESS-OR_INFO	HOST NAME	IP_C_NETWORK		
		HARDWARE_SYSTEM_ID	HARDWARE_SYSTEM_ID		NETWORK_NODE_ADDRESS		
		HOSTNAME	HOSTNAME		HOSTNAME		
					HARDWARE_SYSTEM_ID		

Measures

The measures are the numbers by which you value the performance of your business.

The measurements for this cube are relative to the low and high forecasted values and the hourly average value of the highlighted metric.

Measure Name	Rollup function	Type
Low Forecasted Value	Average	Column = LOW_FORECAST
Hourly Average Value	Average	Column = HOURLY_AVG
High Forecasted Value	Average	Column = HIGH_FORECAST

Check of the Allowed Measures and Dimensions Combination

Measure	In Scope (with these dimension)	Out of Scope (with these dimension)
Low Forecasted Value	All except <i>By Network Address</i> (b)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (d)]
Hourly Average Value	All except <i>By Network Address</i> (b)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (d)]
High Forecasted Value	All except <i>By Network Address</i> (b)	<i>By Network Address</i> [HARDWARE_SYSTEM_ID (d)]

Topic Map & Views (Interface)

The SPP guide provides the following questions that are answered by data collected from the Tivoli DM data repository.

Category Server Performance Prediction

The purpose of the SPP guide is to provide you with the capacity to plan using basic trending of key system metrics. Most of the workstation performance problems in a network can be avoided because they are a result of system workload that gradually grows to the point where it exceeds the capacity of the system.

How is my overall performance?

This topic is a good starting point for reviewing and analyzing system performance.

View Title	Report Title	Data Source
All System Metrics	dm_trend_01.ppr	Server Performance Prediction (5) Trend
Busiest Network Segments	dm_trend_03.ppr	Server Performance Prediction (5) Trend
Busiest Systems	dm_trend_04.ppr	Server Performance Prediction (5) Trend
Fastest Growing Systems	dm_trend_13.ppr	Server Performance Prediction (5) Trend
Subsystem Trend Information	dm_trend.rpt	DM Rollup Database
System Utilization Rating	dm_trend_14.ppr	Server Performance Prediction (5) Trend

How might I improve the performance of my systems?

This topic contains views that identify areas in the enterprise where the efficiency and performance of existing hardware can potentially be improved by shifting the workload or by changing the hardware.

View Title	Report Title	Data Source
Performance Anomalies	dm_trend_12.ppr	Server Performance Prediction (5) Trend
Systems that need more memory	dm_trend_40.ppr	Server Performance Prediction (5) Trend
Underprovisioned/Overprovisioned Systems	dm_trend_39.ppr	Server Performance Prediction (5) Trend

Is my resource utilization growing?

This topic provides weekly growth rates for key system performance metrics.

View Title	Report Title	Data Source
Daily Average Performance Trend	dm_daily_103.ppr	Server Performance Prediction (5) Trend
Daily Peak Hour Performance Trend	dm_daily_104.ppr	Server Performance Prediction (5) Trend
Daily Average Performance Trend (Limited to Some Monitors)	dm_daily_103_52.ppr	Server Performance Prediction (5) Trend
System Performance Comparison	dm_daily_103_53.ppr	Server Performance Prediction (5) Trend

What are my busiest days?

This topic shows the daily history of performance data.

View Title	Report Title	Data Source
Average Performance by System Purpose	dm_daily_106.ppr	Server Performance Prediction (5) Trend
Average vs. Peak hour Performance History	dm_daily_105.ppr	Server Performance Prediction (5) Trend
Peak Hour Performance by System Purpose	dm_daily_107.ppr	Server Performance Prediction (5) Trend

What are my busiest times?

This topic shows system performance metrics on an hourly basis.

View Title	Report Title	Data Source
Hourly Performance by System Purpose	dm_hourly_02.ppr	Server Performance Prediction (6) Hourly
Performance history vs. model	dm_hourly_01.ppr	Server Performance Prediction (6) Hourly

What performance problems are on the horizon?

This topic identifies performance problems that might be encountered in the near future.

View Title	Report Title	Data Source
Metrics most quickly approaching critical threshold	dm_trend_08.ppr	Server Performance Prediction (6) Trend
Systems most quickly approaching critical thresholds	dm_trend_02.ppr	Server Performance Prediction (6) Trend

* = Server Performance Prediction (5) Trend cube

Related Views

View Name	View Description	DataFile Name	Related Views
All System Metrics	<p>This view shows a summary of all system performance metrics sorted by system purpose. This is a good starting point for looking for bottlenecks in an enterprise. The following metrics are intended for both the UNIX and the Windows NT platform:</p> <p>CPU percent busy/user time/system time = %</p> <p>CPU run queue length = jobs #</p> <p>Disk IO rate = Kb/sec (bytes/sec on Windows NT) (the highest rate of the one of the local disk)</p> <p>Disk transfer rate = transfers/sec (the highest rate of the one of the local disk)</p> <p>Memory page-in/out rate = pages/sec</p> <p>Memory page-scan rate = seeks/sec (no equivalent measurement on Windows NT)</p> <p>Network packet collision rate = packet/sec (no equivalent measurement on Windows NT)</p> <p>Network packet input/output rate = packets/sec</p> <p>Network packet input/output error rate = packets/sec (packet # on Windows NT)</p>	dm_trend_01.ppr	
Busiest Network Segments	<p>This view highlights the busiest segments in your network based on the network packet collision rate for the systems on that segment. The metric for this view can only be used for UNIX systems because there is no equivalent measurement on Windows NT:</p> <p>Network packet collision rate = collisions/sec</p>	dm_trend.ppr	Busiest Systems

View Name	View Description	DataFile Name	Related Views
Busiest Systems	This view shows the busiest systems based on the average daily run queue length metric for each system. The run queue length metric is the number of processes that are ready to run (processes not waiting for Input/Output or user input) that the system cannot dispatch until it has free processor cycles. Run queue length is the key metric for determining processor load and is measured in average number of waiting processes.	dm_trend_04.ppr	Busiest Network Segments
Fastest Growing Systems	This view shows the percentage growth rate expected over the next 30 days. The initial view shows the average growth rate of all the system performance metrics. Drill down into an average metric to review the growth rate of individual systems. Note: A negative growth rate indicates that system utilization is declining.	dm_trend_13.ppr	
Sybsystem Trend Information	This view shows a summary of all system performance metrics sorted by hostname and subsystem (CPU, Disk, Memory, Network). The current values for the following metrics are included in the view: daily average, peak hour, and the forecasted values based on historical trends for this data.	dm_trend.rpt	
System Utilization Rating	This views shows the overall system utilization rating sorted by system purpose. The Utilization rank calculation is based on a quartile ranking for each of the major subsystems (CPU, IO, Network, and Memory) based on two key metrics. The range is from relatively idle to very busy. This view is useful for isolating imbalances in an enterprise. For example, if a system of a particular type is very busy and another system of the same type is relatively idle, consider redistributing the workload more evenly between the two systems.	dm_trend_14.ppr	Busiest Network Segments Busiest Systems
Performance Anomalies	This view identifies areas where one or more systems is not performing as expected. Hardware activity is proportional the network activity. Systems with the same purpose and the same hardware configuration should have similar processor utilization and network activity. To use this view, select a system purpose and then drill down into it. The systems should show a general upward trend from left to right. If a system has higher CPU utilization than other systems in the group with the same network activity, then check that systems for a problem (for example, an unauthorized workload).	dm_trend_12.ppr	System Utilization Rating

View Name	View Description	DataFile Name	Related Views
Systems that need more memory	<p>This view identifies systems with a high page scan rate. When evaluating this metric, review the amount of physical memory on the system (for example, a scan rate of 1000 pages/second may be considered very high on a system with 64 MG of physical memory, but not on one with 256 MG of physical memory). The amount of physical memory and other metrics are provided as a layer in this view.</p> <p>The page-scan rate is pages scanned per second.</p> <p>Note: The page-scan rate metric is not available for Windows NT systems. Use the page-in rate metric to monitor Windows NT memory utilization.</p> <p>If the following error message appears,</p>	dm_trend_40.ppr	
Underprovisioned/Overprovisioned Systems	<p>This view identifies systems with CPU activity that is disproportionate to their network activity. This view is ranked from under-provisioned systems (systems that are not equipped to handle this volume of network activity) to over-provisioned systems (systems that can handle additional network activity). Hosts with a negative processor overload (less than 0%) represent over-provisioned systems.</p> <p>If a system shows very high CPU utilization but has relatively low network activity, then that system may be under-provisioned (for example, the CPU is inadequate for the workload). If a system shows very low CPU utilization and shows relatively high network activity, then the system may be over-provisioned (for example, the CPU is excessive for the workload).</p> <p>This view uses the processor overload measure that is expressed as a percentage of the difference between the CPU and network utilization divided by the network utilization.</p>	dm_trend_39.ppr	
Daily Average Performance Trend	<p>This view shows the 12-week growth trend for critical system performance metrics. The metrics used are average daily values. This data is useful for identifying the growth trends and for identifying changes in resource utilization patterns.</p> <p>To use this view, select a system purpose and then drill down into it. The systems should show a general upward trend from left to right. If a system has higher CPU utilization than other systems in the group with the same network activity, then check that system for a problem (for example, an unauthorized workload).</p>	dm_daily_103.ppr	Fastest Growing Systems

View Name	View Description	DataFile Name	Related Views
Daily Average Performance Trend (Limited to Some Monitors)	<p>This view shows the 12-week growth trend for five critical system performance metrics:</p> <ul style="list-style-type: none"> • CPU percent busy • Memory page-out rate • Utilization on most busy disk • Percent disk space used • Network efficiency <p>The metrics used are average daily values. This data is useful for identifying the growth trends and for identifying changes in resource utilization patterns.</p> <p>To use this view, select a system purpose and then drill down into it. The systems should show a general upward trend from left to right. If a system has higher CPU utilization than other systems in the group with the same network activity, then check that system for a problem (for example, an unauthorized workload).</p>	dm_daily_103_52.ppr	Fastest Growing Systems Daily Average Performance Trend System Performance Comparison
System Performance Comparison	<p>This view shows the 12-week growth trend for critical system performance metrics. This view shows all servers on one graph for each metric as the default starting point. The metrics used are average daily values. This data is useful for identifying the growth trends and for identifying changes in resource utilization patterns.</p> <p>To use this view, select a system purpose and then drill down into it. The systems should show a general upward trend from left to right. If a system has higher CPU utilization than other systems in the group with the same network activity, then check that system for a problem (for example, an unauthorized workload).</p>	dm_daily_103_53.ppr	Fastest Growing Systems Daily Average Performance Trend Daily Average Performance Trend (Limited to Some Monitors)
Daily Peak Hour Performance Trend	<p>This view shows the 12-week growth trend for critical system performance metrics based on the daily peak hour performance. This data is useful for identifying the growth trend and for identifying changes in resource utilization patterns.</p> <p>To use this view, select a system purpose and then drill down into it. The systems should show a general upward trend from left to right. If a system has higher CPU utilization than other systems in the group with the same network activity, then check that system for a problem (for example, an unauthorized workload).</p>	dm_daily_104.ppr	Fastest Growing Systems
Average Performance by system Purpose	<p>This view shows the daily average values and peak values for the last 30 days for key system performance metrics sorted by system purpose. Use this view to identify the peak days and overall growth trend for a family of systems.</p>	dm_daily_106.ppr	

View Name	View Description	DataFile Name	Related Views
Average vs. Peak Hour Performance History	This view shows the daily averages and the peak hourly averages for the last 30 days for key system performance metrics. By default, this view shows all systems. Drill down into the specific systems.	dm_daily_105.ppr	
Peak Hour Performance by System Purpose	This view shows the peak hour values for the last 30 days for key system performance metrics sorted by system purpose. Use this view to identify the peak hours and overall growth trend for a family of systems.	dm_daily_107.ppr	
Hourly Performance by System Purpose	<p>This view shows historical data for hourly averages for the system performance metrics broken down by system purpose. The following metrics are intended for both UNIX and Windows NT:</p> <p>CPU percent busy/user time/system time = %</p> <p>CPU run queue length = jobs #</p> <p>Disk IO rate = Kb/sec (bytes/sec on Windows NT) (the highest rate of all the disks on the local system)</p> <p>Disk transfer rate = transfers/sec (the highest rate of all the disks on the local system)</p> <p>Memory page-in/out rate = pages/sec</p> <p>Memory page-scan rate = seeks/sec (no equivalent measurement on Windows NT)</p> <p>Network packet collision rate = packet/sec (no equivalent measurement on Windows NT)</p> <p>Network packet input/output rate = packets/sec</p> <p>Network packet input/output error rate = packets/sec (packet # on Windows NT)</p>	dm_hourly_02.ppr	

View Name	View Description	DataFile Name	Related Views
Performance History vs. Model	<p>This view shows a history of hourly averages, and low and high forecasted values for the system performance metrics. The following metric are intended for both UNIX and Windows NT platform:</p> <p>CPU percent busy/user time/system time = %</p> <p>CPU run queue length = jobs #</p> <p>Disk IO rate = Kb/sec (bytes/sec on Windows NT) (the highest rate of all the disks on the local system)</p> <p>Disk transfer rate = transfers/sec (the highest rate of all the disks on the local system)</p> <p>Memory page-in/out rate = pages/sec</p> <p>Memory page-scan rate = seeks/sec (no equivalent measurement on Windows NT)</p> <p>Network packet collision rate = packet/sec (no equivalent measurement on Windows NT)</p> <p>Network packet input/output rate = packets/sec</p> <p>Network packet input/output error rate = packets/sec (packet # on Windows NT)</p>	dm_hourly_01.ppr	
Metrics most quickly approaching critical threshold	This view shows the systems that are approaching critical thresholds. This view is sorted by system purpose. Problem areas include processor, memory, IO, or network-related problems. The WARNING exception is highlighted in yellow, and the CRITICAL exception is highlighted in red. Click on a metric to highlight the metric in the legend.	dm_trend_08.ppr	
Systems most quickly approaching critical thresholds	<p>This view shows the systems that are predicted to hit a critical performance threshold within the next 180 days. The WARNING exception is highlighted in yellow, and the CRITICAL exception is highlighted in red.</p> <p>Click on a metric to highlight the metric in the legend.</p>	dm_trend_02.ppr	

Report Definitions

How is my overall performance?

View Name	Data File Name	Cube or Data-base	Chart Type	Rank	Re-port Type	Period	Measure	Row	Column	Layer
All System Metrics	dm_trend_01.ppr	Trend(5)	PP		Exp	NA	Daily Average Value	System Purpose	System Metric	

View Name	Data File Name	Cube or Data-base	Chart Type	Rank	Re-port Type	Period	Measure	Row	Column	Layer
Busiest Network Segments	dm_trend_03.ppr	Trend(5)	PP	Col, Last, All, Desc	Exp	NA	Daily Average Value	Network Packet Collision Rate	By Network Segment	
Busiest Systems	dm_trend_04.ppr	Trend(5)	PP	Col, Last, All, Desc	Exp	NA	Daily Average Value	CPU run que length	By Hostname	
Fastest Growing Systems	dm_trend_13.ppr	Trend(5)	PP	Col, Last, All, Desc	Exp	NA	Growth Rate %	Percentage of growth in next 30 days	By Hostname	System Metric
Subsystem Trend Information	dm_trend.rpt	drill-thru	CR							
System Utilization Rating	dm_trend_14.ppr	Trend(5)	PP		Exp	NA	Number of systems	By Overall Activity Level	By System Purpose	

How might I improve performance on my systems?

View Name	Data File Name	Cube or Data-base	Chart Type	Rank	Report Type	Period	Measure	Row	Column	Layer
Performance Anomalies	dm_trend_12.ppr	Trend (5)	PP		Exp	NA	Daily Average Value	By System Purpose	By Network Activity Level	
Systems that need more memory	dm_trend_40.ppr	Trend (5)	PP	Col, Last, All, Desc	Exp	NA	Daily Average Value	By Physical Memory	By Hostname	By Physical Memory
Underprovisioned/ Overprovisioned Systems	dm_trend_39.ppr	Trend (5)	PP	Col, Last, All, Desc	Exp	NA	Processor Overload	Processor Overload	By Hostname	

Is my resource utilization growing?

View Name	Data File Name	Cube or Data-base	Chart Type	Rank	Report Type	Period	Measure	Row	Column	Layer
Daily Average Performance Trend	dm_daily_03.ppr	Daily(4)	PP		Exp	Last 12 weeks	Daily Average	Last 12 Weeks	By Day of the Week	System Metric

View Name	Data File Name	Cube or Data-base	Chart Type	Rank	Report Type	Period	Measure	Row	Column	Layer
Daily Peak Hour Performance Trend	dm_daily_104.ppr	Daily(4)	PP		Exp	Last 12 weeks	Peak hour average	Last 12 Weeks	By Day of the Week	System Metric
Daily Average Performance Trend (Limited to Some Monitors)	Dm_daily_103_52.ppr	Daily(4)	PP		Exp	Last 12 weeks	Daily Average	Last 12 Weeks	By Day of the Week	System Metric Filtered
System Performance Comparison	Dm_daily_103_53.ppr	Daily(4)	PP		Exp	Last 12 weeks	Daily Average	Last 12 Weeks	By Day of the Week	System Metric

What are my busiest days?

View Name	DataFile Name	Cube or Data-base	Chart Type	Rank	Report Type	Period	Measure	Row	Column	Layer
Average Performance by system Purpose	dm_daily_106.ppr	Daily(4)	PP		Exp	Last 60 Days	Daily Average	By System Purpose	Last 60 Days	System Metric
Average vs. Peak Hour Performance History	dm_daily_105.ppr	Daily(4)	PP		Exp	Last 30 Days	Measures	Measures	Last 30 Days	System Metric
Peak Hour Performance by System Purpose	dm_daily_107.ppr	Daily(4)	PP		Exp	Last 60 Days	Peak hour average	By system purpose	Last 60 Days	System Metric

What are my busiest times?

View Name	DataFile Name	Cube or Data-base	Chart Type	Rank	Report Type	Period	Measure	Row	Column	Layer
Hourly Performance by System Purpose	dm_hourly_02.ppr	Hourly(6)	PP		Exp	By Date	Hourly Average Value	By System Purpose	By Time	System Metric
Hourly Performance by System Purpose	dm_hourly_02.ppr	Hourly(6)	PP		Exp	By Date	Hourly Average Value	By System Purpose	By Time	System Metric

View Name	DataFile Name	Cube or Data-base	Chart Type	Rank	Report Type	Period	Measure	Row	Column	Layer
Performance history vs. model	dm_hourly_01.ppr	Hourly(6)	PP		Exp	By Date	Measures	High Forecasted Value	By Time	System Metric

What performance problems are on the horizon?

View Name	Data File Name	Cube or Data-base	Chart Type	Rank	Report Type	Period	Measure	Row	Column	Layer
Metrics most quickly approaching critical threshold	dm_trend_08.ppr	Trend(5)	PP		Exp		Days to critical threshold	System Metric	By System Purpose	
Systems most quickly approaching critical thresholds	dm_trend_02.ppr	Trend(5)	PP	Col, Last, All, Desc	Exp		Days to critical threshold	By Host-name	By Host-name	System Metric



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