

**Tivoli Decision Support for  
Storage Management Analysis  
Release Notes  
Version 4.2.0  
March 2001**





---

## ***Tivoli Decision Support for Tivoli Storage Manager (March, 2001)***

### **Copyright Notice**

Copyright © 2001 by Tivoli Systems Inc., an IBM Company, including this documentation and all software. All rights reserved. May only be used pursuant to a Tivoli Systems Software License Agreement or Addendum for Tivoli Products to IBM Customer or License Agreement. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, without prior written permission of Tivoli Systems. Tivoli Systems grants you limited permission to make hardcopy or other reproductions of any machine-readable documentation for your own use, provided that each such reproduction shall carry the Tivoli Systems copyright notice. No other rights under copyright are granted without prior written permission of Tivoli Systems. This document is not intended for production and is furnished "as is" without warranty of any kind. **All warranties on this document are hereby disclaimed including the warranties of merchantability and fitness for a particular purpose.**

Note to U.S. Government Users-Documentation related to restricted rights-Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corporation.

### **Trademarks**

The following product names are trademarks of Tivoli Systems or IBM Corporation: AIX, IBM, OS/2, RS/6000, Tivoli, Tivoli Management Environment, and TME 10.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks or registered trademarks of Microsoft Corporation.

Other company, product, and service names mentioned in this document may be trademarks or servicemarks of others.

### **Notices**

References in this publication to Tivoli Systems or IBM products, programs, or services do not imply that they will be available in all countries in which Tivoli Systems or IBM operates. Any reference to these products, programs, or services is not intended to imply that only Tivoli Systems or IBM products, programs, or services can be used. Subject to Tivoli System's or IBM's valid intellectual property or other legally protectable right, any functionally equivalent product, program, or service can be used instead of the referenced product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by Tivoli Systems or IBM, are the responsibility of the user.

Tivoli Systems or IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the Director of Licensing, IBM Corporation, North Castle Drive, Armonk, New York 10504-1785, U.S.A.

---

---

---

# Contents

---

|   |    |
|---|----|
| Summary of Changes .....  | 1  |
| Capacity Analysis .....   | 1  |
| Defects Fixed .....   | 2  |
| Product Overview .....  | 2  |
| Storage Management Analysis Description .....                           | 3  |
| Topics and Views .....  | 4  |
| Tivoli Storage Management Decision Support Loader .....                 | 4  |
| System Requirements .....   | 5  |
| Software Requirements for Storage Management Analysis .....             | 5  |
| Hardware Requirements for Storage Management Analysis .....             | 6  |
| Preparing for Installation .....  | 6  |
| Installing Tivoli Decision Support .....                                | 7  |
| Installing Cognos .....   | 7  |
| Installing the ODBC Drivers .....                                       | 7  |
| Installing Adobe Acrobat .....  | 8  |
| Configuring the Shared Source File Path .....                           | 8  |
| Enabling Event Logging .....  | 8  |
| Installing and Configuring Storage Management Analysis .....            | 8  |
| Preparing to Install a New Version of Storage Management Analysis ..... | 9  |
| Installing Storage Management Analysis .....                            | 9  |
| Enabling DB2 Crystal Reports .....                                      | 9  |
| Importing Storage Management Analysis .....                             | 10 |
| Setting up ODBC Data Source Connections .....                           | 10 |
| Configuring Storage Management Analysis .....                           | 10 |
| Adding, Assigning, and Verifying a Data Source .....                    | 10 |
| Setting the Date Range Parameter in the Cube .....                      | 11 |
| Building the Cubes .....  | 12 |
| Scheduling the Cube Build Task .....                                    | 12 |
| Uninstalling Storage Management Analysis .....                          | 12 |
| Restoring Storage Management Analysis Defaults .....                    | 13 |
| Viewing Crystal Reports .....   | 13 |
| Setting Up Crystal Reports .....  | 13 |
| Using Crystal Reports .....   | 13 |
| Troubleshooting .....   | 14 |
| Solving Cube Building Problems .....                                    | 14 |
| Solving Report Problems .....   | 15 |
| Product Details .....   | 16 |
| Data Sources .....  | 16 |
| Tivoli Storage Manager Database Schema .....                            | 16 |
| Cubes (Tivoli Discovery Administrator) .....                            | 16 |
| Tivoli Storage Manager (1)Tape and Library Usage Cube .....             | 17 |
| Tivoli Storage Manager (2)Forecast Libvolumes Cube .....                | 17 |
| Tivoli Storage Manager Client Activity Cube .....                       | 18 |
| Tivoli Storage Manager Client Bytes Processed Cube .....                | 18 |
| Tivoli Storage Manager Client Filespace Cube .....                      | 19 |
| Tivoli Storage Manager Client Information Cube .....                    | 19 |

---

|  |    |
|--|----|
| Tivoli Storage Manager Client Message Cube .....   | 20 |
| Tivoli Storage Manager Forecast Filespaces Cube .....                                    | 20 |
| Tivoli Storage Manager Server Activity Cube .....  | 20 |
| Tivoli Storage Manager Server Bytes Processed Cube .....                                 | 21 |
| Tivoli Storage Manager Server Message Cube .....   | 21 |
| Tivoli Storage Manager Simultaneous Activity Cube .....                                  | 22 |
| Tivoli Storage Manager Storage Capacity Cube .....                                       | 22 |
| Topics and Views for Capacity Analysis (Tivoli Discovery Interface) .....                | 23 |
| How are tape drives in my libraries used? .....  | 23 |
| How fast are my client's space needs growing? .....                                      | 23 |
| How many clients are using my server? .....  | 23 |
| How many tapes am I using? .....   | 24 |
| How much data do I have stored in tape libraries? .....                                  | 24 |
| How much space are my clients using? .....   | 25 |
| How would the increase in the number of clients affect server storage requirements? .... | 25 |
| What are my database and recovery log requirements? .....                                | 25 |
| What is my server configuration? .....   | 26 |
| What is the resource utilization on my servers? .....                                    | 26 |
| What is the volume of data transferred by clients? .....                                 | 26 |
| What is the volume of data transferred on the server? .....                              | 26 |
| Topics and Views for Event Analysis (Tivoli Discovery Interface) .....                   | 27 |
| Daily Exception Reports .....  | 27 |
| How might I improve my storage health? .....   | 27 |
| Trends in Client Operations .....  | 28 |
| Trends in Server Operations .....  | 28 |
| What does my environment look like? .....  | 28 |
| What messages should I be concerned with? .....  | 29 |
| When do I find the most problems? .....  | 29 |
| Topics and Views for Performance Analysis (Tivoli Discovery Interface) .....             | 30 |
| How are my clients performing? .....   | 30 |
| How are my servers performing? .....   | 30 |
| How does file size affect my performance? .....  | 31 |
| How does time of day and day of week affect my performance? .....                        | 31 |
| Prerequisite and Related Documents .....   | 31 |
| Software Defects, Limitations, and Workarounds .....                                     | 32 |
| Defects .....  | 32 |
| Limitations .....  | 32 |
| Workarounds .....  | 32 |
| Contacting Customer Support .....  | 32 |

# Release Notes

---

This document describes the *Tivoli® Decision Support for Storage Management Analysis Version 4.2.0*. These notes include an overview of the Tivoli Storage Management Decision Support Loader, a prerequisite, companion product for Storage Management Analysis. This document is the most current information for the product and takes precedence over all other documentation. It is intended for systems administrators who are responsible for Tivoli Storage Manager installations.

***PLEASE REVIEW THESE NOTES THOROUGHLY BEFORE INSTALLING OR USING THE PRODUCT.***

These release notes include the following topics:

- Summary of Changes on page 1
- Product Overview on page 2
- System Requirements on page 5
- Preparing for Installation on page 6
- Installing and Configuring Storage Management Analysis on page 8
- Restoring Storage Management Analysis Defaults on page 13
- Troubleshooting on page 14
- Product Details on page 16
- Prerequisite and Related Documents on page 31
- Software Defects, Limitations, and Workarounds on page 32
- Contacting Customer Support on page 32

## Summary of Changes

Tivoli Decision Support for Storage Management Analysis *Version 4.2.0* is an upgrade to Version 4.1.0. *Version 4.2.0* upgraded the product in two ways:

1. A capacity analysis category was added.
2. Defects were fixed.

### Capacity Analysis

Version 4.1.0 addressed two main areas:

- Tivoli Storage Manager Event Analysis
- Tivoli Storage Manager Performance Analysis

*Version 4.2.0* adds a new category:

- Tivoli Storage Manager Capacity Analysis

This category addresses activity and forecasting about storage pools, filespaces and tapes used by the Tivoli Storage Manager. You can use it to analyze current capacity requirements and to identify what your future capacity requirements may be.

### Defects Fixed

The following defects, from Tivoli Decision Support for Storage Management Analysis Version 4.1.0, were fixed in *Version 4.2.0*.

In the Cognos Powerplay Reports:

- Cube level data is ordered so data appears in either numeric or alphabetic order.
- Drill down from date to time now shows hours with an a.m./p.m. extension.
- Days of the week are present and ordered from Sunday thru Saturday.
- Dimensions derived from fields created in Tivoli Decision Support using parameters now have the values listed in the model, so all categorizations show up (e.g. Filesize threshold: Large, Medium, Small)
- In the graphical reports, color display was adjusted so that positive scale values appear in green and negative scale values appear in red.

In the Crystal Reports:

- The displays of date/time format no longer includes microseconds.
- Group totals were added to several reports.
- The locked systems report was modified to display status information when no one is locked out.

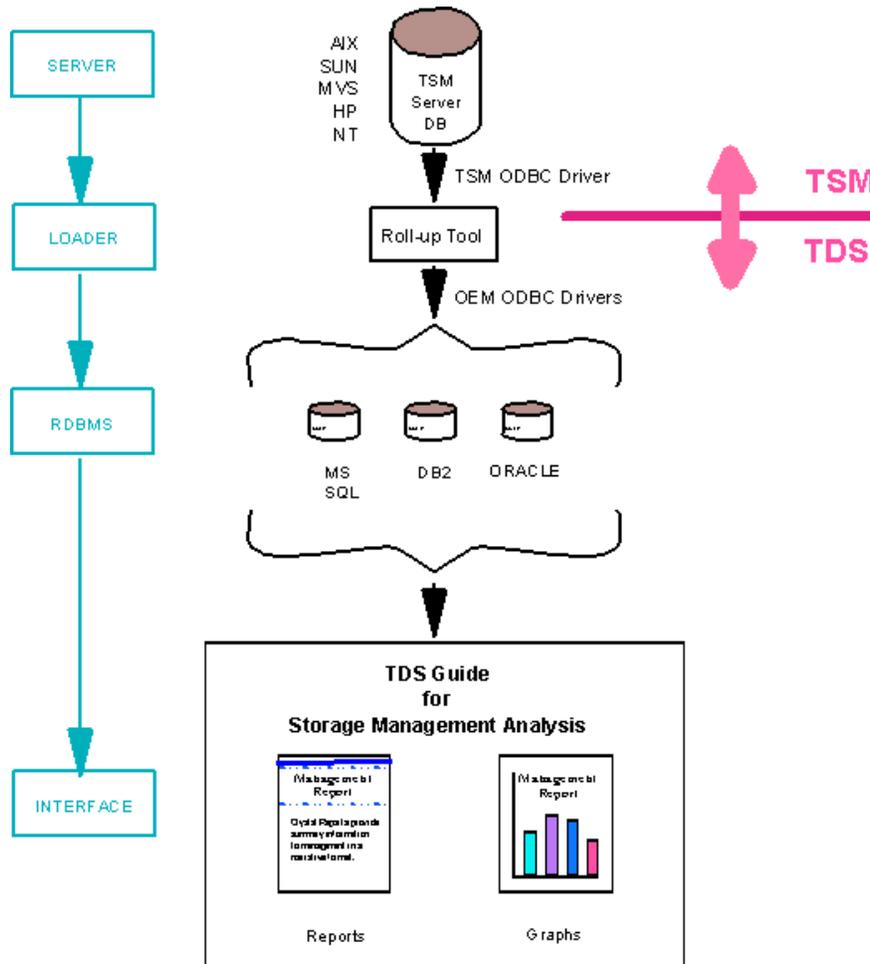
## Product Overview

Tivoli Decision Support for Storage Management Analysis works with Tivoli Storage Manager (TSM) to let you strategically manage your enterprise network. TSM provides automated, policy-based storage management for file servers and workstations.

The Tivoli Decision Support for Storage Management Analysis provides information to guide you in making decisions about storage management events, performance, and capacity. Storage Management Analysis provides an overview of how such a storage system is running. Using data collected from TSM servers, Storage Management Analysis displays multidimensional graphic and detailed text reports.

The Tivoli Decision Support for Storage Management Analysis is designed to work with Tivoli Storage Manager Version 4.1 or later. The Tivoli Decision Support environment runs on Windows® PC's, and it is compatible with TSM on AIX®, Sun Solaris™, HP-UX, Windows NT®, MVS and OS/390® platforms.

Figure 1 provides an overview of the Tivoli Decision Support for Storage Management Analysis system.



## Storage Management Analysis Description

Storage Management Analysis uses the data gathered by the Tivoli Decision Support (TDS) tool to help you make business decisions based on historical data and trend analysis. This information is presented in a variety of graphical formats, such as a summary format that displays details of a particular environment.

The content and detail of the reports depend on the type of data that is collected and the database schema where this data is stored. The data is stored in a relational database (an RDBMS). The schema required to create the RDBMS tables are part of the Decision Support Loader installation package.

Storage Management Analysis requires the Tivoli Storage Management Decision Support Loader. Storage Management Analysis extracts and analyzes the data by means of reports that are displayed in the Tivoli Discovery Interface. You can view those reports after running the Decision Support Loader tool.

The Tivoli Discovery Administrator contains pre-defined queries that extract data from the RDBMS into a delimited text file or a comma separated values (.csv) file. Cognos Transformer builds a cube from the file, and Cognos PowerPlay generates reports from the cube. The Storage Management Analysis text reports are managed by Crystal Reports. Both Cognos and the Seagate Crystal Report runtime driver are delivered as part of the Tivoli Decision Support installation package.

## Topics and Views

The data collected for a Storage Management Analysis guide is organized into topics and views on the Tivoli Discovery Interface. When you open the Discovery Interface, the panel to the left lists these guide components. If you select a view within a topic, either the reporting database is queried to generate a Crystal Report, or the results of a cube build are examined to display a graphical report. Each view (preceded by an icon representing a graphical chart or report page) displays a report in the right panel and a description of that report in the lower panel.

Storage Management Analysis provides three categories of topics and views:

- Topics and Views for Capacity Analysis (Tivoli Discovery Interface) on page 23
- Topics and Views for Event Analysis (Tivoli Discovery Interface) on page 27
- Topics and Views for Performance Analysis (Tivoli Discovery Interface) on page 30

**Note:** You should build all cubes before you start the Discovery Interface so that you can view the graphical reports.

For more information about how to use the Tivoli Decision Support Discovery Interface, see the *Tivoli Decision Support User's Guide*, and the *Tivoli Decision Support: Using Decision Support Guides* documents identified in "Prerequisite and Related Documents" on page 31.

## Tivoli Storage Management Decision Support Loader

The Tivoli Storage Management Decision Support Loader compiles (rolls up) the data needed by Storage Management Analysis. When you schedule the Decision Support Loader, it rolls up data that populates the RDBMS. We recommend you schedule the Decision Support Loader to run once a day. Roll-ups should be done at the same time each day, if possible.

In the case of multiple TSM servers, all your servers should be rolled up to the same RDBMS, or you may not get the results you expect when you attempt to view your reports in the Tivoli Discovery Interface.

The Decision Support Loader performs the following tasks:

- Uses the TSM ODBC driver to extract data from one or more Tivoli Storage Manager databases.
- Formats the extracted data from one or more TSM servers as required by the RDBMS reporting database and provides a key for each field.
- Uses the OEM ODBC driver to write the data to the RDBMS reporting database.

- Analyzes data for trends and provides forecasts based on those trends.

For details about the Decision Support Loader and for installation and configuration procedures, see the *Tivoli Storage Management Decision Support Loader Release Notes*.

## System Requirements

This section describes the system requirements, including software and hardware, necessary to install and use Tivoli Decision Support for Storage Management Analysis.

### Software Requirements for Storage Management Analysis

For a new Tivoli Decision Support installation, review the *Installation Guide* identified in “Prerequisite and Related Documents” on page 31 so that you can determine the needs of your environment.

For existing Tivoli Decision Support environments, review the current TDS 2.1 patches.

The following software must be installed in your environment:

- Tivoli Storage Manager Version 4.1 or later
- Windows NT 4.0 with Service Pack 4 and Y2K Patches, Windows NT 4.0 with Service Pack 5, Windows 95 OSR 2, or Windows 98
- Communication Protocol: TCP/IP
- Tivoli Decision Support 2.1 or 2.1.1, including:
  - Tivoli Discovery Interface
  - Tivoli Discovery Administrator
  - Cognos PowerPlay installed from TDS CD
  - Seagate Crystal Reports runtime driver (automatically installed as part of TDS 2.1)
  - TDS Patches #1 (2.1-TDS-0001), #4 (2.1-TDS-0004), and #5 (2.1-TDS-0005)  
The patches are not needed for TDS 2.1.1.
- Although not required, you can use Microsoft Access to help support Tivoli Decision Support.
- At least one of the following relational database management systems and the 32-bit ODBC database client drivers:
  - IBM® Database 2™ (DB2®) Versions 5.2 or 6.1
  - Microsoft SQL Server Version 7.0 with Service Pack 2
  - Oracle Versions 8.1.5 (and Patch 8.1.5.5) or 8.1.6

To use Storage Management Analysis, you must have the Tivoli Storage Management Decision Support Loader installed. For optimum performance, the Decision Support Loader and Tivoli Decision Support should not be run on the same machine. Scheduling conflicts could result if cube builds and rollups are performed on the same machine.

## Hardware Requirements for Storage Management Analysis

Tivoli Decision Support must be installed on an IBM PC AT-compatible machine. Tivoli does not support platforms (such as the NEC PC 98xx series) that are not 100% compatible with the IBM PC AT.

Hardware requirements depend on the software configuration:

- If TDS is intended as a server installation, the requirements are:
  - **Processor:** Intel-based Pentium 450MHZ (minimum)
  - **Memory:** 256MB (minimum)
  - **Disk Space:** 200MB for the software, 400MB minimum for the cubes (depending on the Tivoli Storage Manager enterprise size)
- If the Tivoli Discovery Interface and Storage Management Analysis are intended as a client installation, the requirements are:
  - **Processor:** Intel-based Pentium 300MHZ (minimum)
  - **Memory:** 128MB (minimum)
  - **Disk Space:** 100MB for the software

We recommend that you use Tivoli Decision Support on a file server. If the TDS client software resides on the file server as a shared resource, and each client loads the application from the file server, a highly fault tolerant configuration is recommended. However, if you install TDS on each client workstation, a file server is not required.

**Note:** The network connection between the file server and the client software must support long file names.

## Preparing for Installation

You must perform the following tasks before installing Storage Management Analysis:

1. Ensure that the software requirements for Storage Management Analysis are met. See “System Requirements” on page 5.
2. If you have not already installed the Tivoli Storage Management Decision Support Loader, see the *Tivoli Storage Management Decision Support Loader Release Notes*. You will need to install the RDBMS and run the Decision Support Loader to see the guide data.
3. If you have not already installed TDS, go to the following steps:
  - Installing Tivoli Decision Support on page 7.
  - Installing Cognos on page 7.
  - Installing the ODBC Drivers on page 7.
  - Installing Adobe Acrobat on page 8.
4. After TDS is installed and upgraded to proper patch level, go to “Configuring the Shared Source File Path” on page 8.

5. Enable event logging on Tivoli Storage Manager. See “Enabling Event Logging” on page 8.

After these tasks are completed, go to “Installing and Configuring Storage Management Analysis” on page 8.

## Installing Tivoli Decision Support

Refer to the *Tivoli Decision Support Installation Guide* listed in “Prerequisite and Related Documents” on page 31.

TDS may be installed in network or standalone mode. We recommend a network installation, configured in three groups:

- Administrator Terminal
- User Terminal
- Data Storage

**Note:** Before you use TDS to build cubes, you must change the default Windows NT short date style:

1. From the Windows NT desktop, select **Start > Settings > Control Panel > Regional Settings Properties** dialog.
2. Select the Date tab.
3. Select **MM/dd/yyyy** from the **short date style** dropdown list and click **Apply**.
4. Click **OK**.

## Installing Cognos

Refer to the *Tivoli Decision Support Installation Guide* listed in “Prerequisite and Related Documents” on page 31.

## Installing the ODBC Drivers

**ATTENTION:** The ODBC drivers shipped on the Tivoli Decision Support CDROM will not work with Storage Management Analysis. Install the OEM ODBC drivers provided by the RDBMS vendors. To ensure that the latest drivers are installed, you may have to download the drivers from the vendor’s Web site.

Storage Management Analysis supports three databases:

- IBM® Database 2™ (DB2) Versions 5.2 and 6.1
- Microsoft® SQL Server Version 7.0
- Oracle Versions 8.1.5 and 8.1.6

Consult your database administrator for the appropriate client configuration.

Your system must have a valid client configuration for the ODBC connection that TDS uses to access your database.

### Installing Adobe Acrobat

Refer to the *Tivoli Decision Support Installation Guide* listed in “Prerequisite and Related Documents” on page 31.

### Configuring the Shared Source File Path

Before using the Tivoli Discovery Administrator and the Tivoli Discovery Interface, you must configure them to locate certain files (called source files) that are stored on your local system or on the network. If you installed TDS in stand-alone mode, your source files are located on your system (typically in C:\Program Files\TDS 2.1). For network mode installations, the source files usually reside on a network server. Specify the path to the source files when you start the Tivoli Discovery Administrator for the first time.

To set the shared source file path, follow these steps:

1. Select **View -> Options**. The Options dialog box appears.
2. Click the **General** tab on the Options dialog.
3. In the **Network** box, type the location (typically <network drive>\Program Files\TDS 2.1) of the following folders:

**Cubes**

**Data**

**Reports**

4. Click **OK**.

**Note:** Be sure that your network administrator provides Discovery Interface users with read only access for network permissions of these folders and files. TDS administrators responsible for building cubes will need different permissions.

### Enabling Event Logging

On the Tivoli Storage Manager server(s), you must enable event logging of client events to the activity log. You can do this on the TSM Administrative Web interface or on the command line. For details, see the *Tivoli Storage Manager Administrator's Guide*. Event logging must be turned on before running the Decision Support Loader.

## Installing and Configuring Storage Management Analysis

This section describes the procedure for installing Tivoli Decision Support for Storage Management Analysis. The procedure can be summarized as follows:

- Preparing to Install a New Version of Storage Management Analysis on page 9.
- Installing Storage Management Analysis on page 9.
- Enabling DB2 Crystal Reports on page 9.
- Importing Storage Management Analysis on page 10.
- Setting up ODBC Data Source Connections on page 10.
- Configuring Storage Management Analysis on page 10.

## Preparing to Install a New Version of Storage Management Analysis

If you are a current user of Tivoli Decision Support, you must uninstall any prior version of Tivoli Decision Support for Storage Management Analysis. If you have customized any part of the Storage Management Analysis guide, you will want to save it before you uninstall.

See “Uninstalling Storage Management Analysis” on page 12 for more information.

## Installing Storage Management Analysis

From the Tivoli Decision Support for Storage Management Analysis CD-ROM:

1. Insert the CD-ROM in your workstation drive, and the autorun feature will prompt you.
2. Select Tivoli Decision Support for Storage Management Analysis.
3. At the Installation dialog, click Tivoli Decision Support for Storage Management Analysis.
4. When the Read me dialog appears, click **Accept**.
5. Click on **Next** and then **Finish** to complete the installation. Then click **Exit**.

The online documentation and the README file is installed in this directory:

```
TDS 2.1\Guide Docs\Tivoli Decision Support for Storage  
Management Analysis
```

## Enabling DB2 Crystal Reports

When you install Tivoli Decision Support for Storage Management Analysis, the Crystal Reports’ defaults are for the Oracle and MS SQL database platforms. If your Tivoli Decision Support is connecting to a DB2 database platform, you will need to run a script that moves DB2 versions of the Crystal Reports into the proper directory and saves the default reports.

In order to enable DB2 reports, use Windows Explorer to open the *Util\Tivoli Decision Support for Storage Management Analysis* directory under the Tivoli Decision Support directory and execute the batch file *swaprpts.bat*. This step is only required at initial installation.

The batch file manages copying and renaming files between the Util directory and the Reports directory.

If you are a current Tivoli Decision Support user with a DB2 database, you will need to run the batch file as part of the reinstall process.

## Importing Storage Management Analysis

To import Storage Management Analysis into the Tivoli Discovery Administrator console, perform the following steps for a new TDS 2.1 installation:

**Note:** See “Running the Tivoli Discovery Administrator for the First Time” in the *Tivoli Decision Support Administrator Guide* for a complete description.

1. When you are prompted to import an installed discovery guide, and to connect to a data source, click **Yes**.
2. Select **Import Installed Decision Support Guide**, and then click **Next**.
3. Select Storage Management Analysis, and then click **Next** and **Finish**.
4. You will be prompted to add a data source. Click **Yes**, and then click **Finish**.
5. Select your configured data source, and then click **Next**.
6. Enter the database userid and password, and then click **Next**.
7. Enter the database qualifier, click **Next**, and then click **Finish**. If you are unsure, contact your database administrator.
8. You will be prompted to assign one or more data sources. See “Adding, Assigning, and Verifying a Data Source” on page 10 for the procedure.

For existing TDS users with other installed guides, perform the following steps:

1. Open the TDS Administrator.
2. Select **Decision Support Guide** from the dropdown list.
3. Select **Import** from the dropdown list.
4. Select **Storage Management Analysis** and then click **OK**.

## Setting up ODBC Data Source Connections

For new TDS installations, you must set up your TSM servers and RDBMS reporting database servers as ODBC data sources. A detailed description of how to set up an ODBC data source connection is provided in the Decision Support Loader Release Notes.

## Configuring Storage Management Analysis

To configure Storage Management Analysis, you must perform the following tasks:

1. Adding, Assigning, and Verifying a Data Source on page 10.
2. Setting the Date Range Parameter in the Cube on page 11.
3. Building the Cubes on page 12.
4. Scheduling the Cube Build Task on page 12.

## Adding, Assigning, and Verifying a Data Source

For each query in a Tivoli Storage Manager cube, you must add, assign, and verify a data source.

To configure ODBC connections with a new TDS 2.1 installation, you will be prompted about assigning data sources; follow the prompts.

The following instructions address data source assignments from the TDS Administrator when you have other guides installed.

1. From the **Data Source** dropdown list, select **Add**. The **Add Data Source** wizard will appear. Follow the wizard prompts:
  - Select the ODBC connection from the dropdown list, then click **Next**.
  - Enter username and password, then click **Next**.
  - Enter the database table qualifier, then click **Next**. (Check with your database administrator for this information.)
  - Click **Finish**.
2. From the **Data Source** dropdown list select **Assign Data Source**. In the **Assign Data Source** window set the **Data Source** field to the ODBC connection you added. All currently added ODBC connects will appear in the dropdown list. Click on **Select All**, and click **OK**.
3. Click the **Data Sources** folder in the Administrator panel.
4. Right click on the data source you just assigned, and then select **Test Connectivity**.
5. If the connection is successful, the **Test Data Source** dialog box displays the message `Connection Successful`.

If the connection is unsuccessful, a Tivoli Discovery Administrator message dialog box appears with the message: `Error connecting to Data Source - DataSourceName`

Click **Details** to display more information about the connection error. Click **OK**, then verify the data source definition, userid, password, and qualifier.

### Setting the Date Range Parameter in the Cube

Most Storage Management Analysis cubes contain a Date Range parameter. The defaults for this parameter vary among the cubes. You should use the defaults until you understand the disk space requirements and processing times required for cube builds.

To change the parameter, do the following:

1. Start the Tivoli Discovery Administrator.
2. In the Administrator panel, select a cube.
3. In the **Properties** panel, double-click on **Parameters**.
4. Right-click on the **Date Range** parameter.
5. Select **Set Values** from the context menu, and enter explicit or calculated values for the range.

**Note:** For cubes (TSM Client Filespaces, TSM Manager Client Info, and TSM (2) Forecast Libvolumes) that do not have a Date Range parameter, cube builds will contain all values from the last extract date. If you want to modify the data collection for these three cubes, contact Tivoli Customer Support.

### Building the Cubes

You should schedule regular cube builds during periods of decreased database activity. Adjust your cube date range to optimize the time required to build a cube. This task is performed from the **Administrator** panel of the Tivoli Discovery Administrator console. Perform these steps to build a cube:

1. Double-click **Cubes** on the Administrator panel
2. Right-click on the desired cube and select **Build**. The Confirm Cube Build dialog box displays the date ranges (if Date Range parameter is used for that cube) and The DB qualifier.
3. Click **Yes**. TDS 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. The Cube Transform Status dialog box displays processing messages after the queries are complete and the actual cube build starts.
4. Review the processing messages for any errors. If an error generates an error dialog box, review the error, and then click **OK**. See “Troubleshooting” on page 14 for help identifying common cube build problems.
5. Click **Close**.

### Scheduling the Cube Build Task

You must periodically rebuild the cube to update your cube data. The build process can be scheduled to build automatically at regular intervals. Stagger the start times for your cube builds for improved performance. Also, make sure the cube builds are scheduled after the Tivoli Storage Management Decision Support Loader runs, because that job must finish in order to have updated data for the cubes.

The following uses the Tivoli Discovery Administrator to create a cube building schedule and to determine the schedule TaskID. You can use the following application to schedule cube builds:

- Tivoli Decision Support Process Scheduler

To see a sample scheduling procedure using the Tivoli Decision Support Process Scheduler, refer to the “Scheduling Cube Builds” section of the *Tivoli Decision Support 2.1 Administrator Guide*.

## Uninstalling Storage Management Analysis

To uninstall Storage Management Analysis:

1. From the Tivoli Discovery Administrator, select the **Decision Support Guides** folder.
2. From the Properties pane, right click on **Storage Management Analysis**.
3. From the submenu that is displayed, choose **Delete** and then **Yes**.

## Restoring Storage Management Analysis Defaults

The queries provided with Storage Management Analysis cubes are not intended to be modified by customers. If you should intentionally or unintentionally change them, Tivoli Decision Support changes the cube's icon to include a plus sign (+). To restore the default settings, do the following

1. From the Discovery Administrator, right click the cube whose defaults you want to restore.
2. From the submenu that is displayed, select **Restore Defaults**.
3. A message appears warning that restoring the defaults will delete any changes that you made to the cube. Click **Yes**.

## Viewing Crystal Reports

Viewing Crystal Reports includes:

- Setting Up Crystal Reports on page 13
- Using Crystal Reports on page 13

## Setting Up Crystal Reports

Do the following procedure only when you access Crystal Reports for the first time in the Tivoli Discovery Interface:

1. Start the Tivoli Discovery Interface. Select the category and topic.
2. Select a Crystal report. (Crystal Reports are designated by the page icon to the left of the report name.)
3. When you open the report, a dialog box is displayed. Enter the name and password for the ODBC driver, and select **Options**.
4. A dialog box is displayed. Set the parameters to the appropriate DSN. The names of all the ODBC drivers configured for your system will appear in the DSN dropdown list, so you can pick the one you wish to use and click **OK**.

## Using Crystal Reports

When you first open Crystal Reports through the Discovery Interface, you will be prompted to enter one or more parameters. Entering parameters allows you to limit the size of the report. In the Discovery Interface, a hint is included in each Crystal Report to identify parameter usage. For reports with date parameters, follow the parameter description in the hints for that specific report.

Most Crystal Reports use the Extract Date field for filtering data. This field requires a unique date range selection string. For Oracle, MS SQL, and DB2 use: YYYY-MM-DD\*. The asterisk at the end of the string is required.

## Troubleshooting

This section describes troubleshooting tips for the following areas:

- Solving Cube Building Problems on page 14
- Solving Report Problems on page 15

### Solving Cube Building Problems

Cube building has the following problems and possible solutions:

- *What do I do when the Tivoli Discovery Administrator message appears:*  
Error building cube.  
*and the Details information includes:*  
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.
- *During use of the Tivoli Discovery Interface, what does it mean when a Cognos PowerPlay report icon appears with a Cannot Execute indicator (a “ghosted” icon), and a report cannot be opened?*  
The cube is unavailable. Contact the Tivoli Decision Support administrator and request that the cube be built.
- *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 2.1\Cubes\Temp** directory to the **TDS 2.1\cubes** directory, where **TDS 2.1\** is the Tivoli Decision Support installation directory.  
The queries returned insufficient data to build a cube. Verify that data is returned by your queries.
- *If all the Tivoli Discovery Interface processes are closed, why doesn't the cube 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. If you find the process *pplay.exe*, end the process and rebuild the cube.
- *Why don't the cubes build automatically 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.
- *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, start and end dates, or a calculated value such as the last three months. The calculated values are relative to the current date. Use the Date Range parameter and the *CubeName\_dt.txt* to set the current period in the following cases:

- **Explicit Date Range:** End date  
**Calculated Values:** Calculated end date  
**No Date Range parameter in cube:** Date the cube is built
- If you want to use the date in the *CubeName\_dt.txt* as the current period, create a new query in the cube model. This query must use the *CubeName\_dt.txt* as a local data file. Also 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 *TDS Administrator Guide*.

- *What if I get an error from the Tivoli Discovery Administrator in MS SQL related to a string having zero length?*

If you export a RDBMS to a file and then import again, fields that are designed to be formatted as NULL are reformatted to the empty string (“”). Cubes will build correctly, but some failures will occur that are related to a string having a zero length. The database administrator should format those columns with the following:

```
update <tablename> set <columnname> = NULL
```

Where <columnname> equals “”

## Solving Report Problems

The following problems can occur:

- *What should I do when the error message `load_graph_from_powercube` appears.*

The cube has not been built. Build the cube.

- *I tried to open a report, but the Tivoli Discovery Interface does not progress past the wait cursor.*

The Tivoli Discovery Interface may have lost its connection to the Cognos PowerPlay task. Close the Tivoli Discovery Interface and Cognos PowerPlay. Restart the Tivoli Discovery Interface, and the reports should open.

- *I opened a report, but 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 TDS.

- *I cannot open a Crystal Report using the Tivoli Discovery Interface.*

Ensure that the RDBMS is available to query and that you are using the correct username and password.

- *My.mdb files are reporting unexpected results.*  
The Microsoft Access engine is limited to 850MB. If your *drillthru.mdb* exceeds 850MB, contact customer support.

**Note:** See the Readme.txt file for other troubleshooting tips.

## Product Details

This section describes some of the details of Storage Management Analysis features and functions, and lists pointers to information supplied on the Tivoli Discovery Interface.

### Data Sources

After you install the Tivoli Storage Management Decision Support Loader, the database schema scripts are run on the database. The Decision Support Loader collects and stores the data in the relational database.

### Tivoli Storage Manager Database Schema

Storage Management Analysis uses the database schema supplied with the Tivoli Storage Management Decision Support Loader. SQL scripts supplied with the Decision Support Loader are used to define the database user and create the schema. A separate SQL script exists for each database. You can view the scripts from the Tivoli Discovery Administrator console. You must run these scripts from the command line specified for the database.

### Cubes (Tivoli Discovery Administrator)

A PowerCube contains data (measure values) organized in dimensions and measures to provide for faster retrieval and drill-down in PowerPlay Explorer and Reporter. Storage Management Analysis has thirteen cubes:

- Tivoli Storage Manager (1)Tape and Library Usage Cube on page 17
- Tivoli Storage Manager (2)Forecast Libvolumes Cube on page 17
- Tivoli Storage Manager Client Activity Cube on page 18
- Tivoli Storage Manager Client Bytes Processed Cube on page 18
- Tivoli Storage Manager Client Filespace Cube on page 19
- Tivoli Storage Manager Client Information Cube on page 19
- Tivoli Storage Manager Client Message Cube on page 20
- Tivoli Storage Manager Forecast Filespaces Cube on page 20
- Tivoli Storage Manager Server Activity Cube on page 20
- Tivoli Storage Manager Server Bytes Processed Cube on page 21
- Tivoli Storage Manager Server Message Cube on page 21.
- Tivoli Storage Manager Simultaneous Activity Cube on page 22
- Tivoli Storage Manager Storage Capacity Cube on page 22

Each cube consists of parameter settings and one or more queries that collect the information from the rollup database.

Each query creates a.csv data file used by the Cognos Transformer to build the powercubes. The queries extract data from the relational database through an ODBC driver. To view the SQL queries, Calculated Columns, and Event Procedures, select a cube from the list in the TDS Administrator console. Then double-click on Queries, and double-click on an individual query title to display the query window and tabbed dialog.

Each cube described below contains a brief description and information about parameters.

**Parameters** The date range parameter is used to control what information is included in the cube. Other TDS parameters are used to categorize raw data to present more user-friendly information.

## Tivoli Storage Manager (1)Tape and Library Usage Cube

The Tivoli Storage Manager Tape and Library Usage multidimensional cube is a new cube in *Version 4.2.0*. It contains information regarding current tape and library usage. The query TSM Library Volumes is shared with the Tivoli Storage Manager (2) Forecast Libvolumes cube to provide the history information. The number (1) in the cube title indicates this cube must be built first.

### Parameters

The table below lists the parameter settings:

**Table 1: TSM (1)Tape and Library Usage Cube Parameters**

| Parameter Name            | Type           | Default Values                                 |
|---------------------------|----------------|--|
| Date_Range                | Range          | Rolling 7 days                                 |
| Near Reclamation          | Categorization | 0-10 Nearly Reclaimable<br>>10 Not Reclaimable |
| New Reclamation Threshold | Categorization | <50 Do Not Reclaim<br>>=50 Reclaim             |

## Tivoli Storage Manager (2)Forecast Libvolumes Cube

The Tivoli Storage Manager Forecast Libvolumes multidimensional cube is a new cube in *Version 4.2.0*. It contains forecast and history information about library volume usage. The query TSM Library Volumes is shared by the Tivoli Storage Manager (1) Tape and Library Usage cube to provide the history information. The number (2) in the cube title indicates this cube must be built second.

## Parameters

The table below lists the parameter settings:

**Table 2: TSM (2) Forecast Libvolumes Cube Parameters**

| Parameter Name   | Type           | Default Values   |
|------------------|----------------|--|
| Confidence Range | Categorization | >.9 Very High<br><=.9 High<br><=.6 Moderate<br><=.4 Low<br><=.2 Very Low |

## Tivoli Storage Manager Client Activity Cube

The Tivoli Storage Manager Client Activity multidimensional cube contains historical error and performance information related to Tivoli Storage Manager client processing. This cube was modified in *Version 4.2.0* to include information about Tivoli Data Protection agents.

## Parameters

The table below lists the parameter settings:

**Table 3. TSM Client Activity Cube Parameters**

| Parameter Name               | Type           | Default Values  |
|------------------------------|----------------|---|
| Date range                   | Range          | Date range to include in cube (default is last month + MTD)<br>Start Date<br>End Dates                        |
| Day or night                 | Categorization | Day - 7am to 5pm<br>Evening - 5pm to Midnight<br>Overnight - Midnight to 7am                                  |
| Performance threshold (KB/s) | Categorization | Good (throughput >5000 kb/s)<br>Average (throughput <= 5000 kb/s & >500 kb/s)<br>Slow (throughput <=500 kb/s) |
| Filesize (KB)                | Categorization | Small (filesize<= 10KB)<br>Medium (filesize> 10KB and less than 256000KB)<br>Large (filesize>256000KB)        |

## Tivoli Storage Manager Client Bytes Processed Cube

The Tivoli Storage Manager Client Bytes Processed multidimensional cube contains historical error and performance information related to Tivoli Storage Manager client processing.

## Parameters

The following table lists the parameter settings:

**Table 4. TSM Client Bytes Processed Cube Parameters**

| Parameter Name               | Type           | Default Values   |
|------------------------------|----------------|--|
| Date range                   | Range          | Start Date<br>End Date<br>Calculated on last Month + MTD   |
| Day or night                 | Categorization | Day - 7am to 5pm<br>Evening - 5pm to Midnight<br>Overnight - Midnight to 7am                       |
| Performance threshold (KB/s) | Categorization | Good (throughput >5 kb/s)<br>Average (throughput >3 kb/s & <=5 kb/s)<br>Slow (throughput <=3 kb/s) |

## Tivoli Storage Manager Client Filespace Cube

The Tivoli Storage Manager Client Filespace multidimensional cube contains client node information related to Tivoli Storage Manager clients. This cube was updated to report client storage capacity in megabytes.

## Parameters

The following table lists the parameter settings:

**Table 5. TSM Client Filespace Cube Parameters**

| Parameter Name                    | Type           | Default Values  |
|-----------------------------------|----------------|---|
| Last client backup date threshold | Categorization | <b>OK:</b> Filespaces that have been backed up within the last day<br><b>Warning:</b> Filespaces that have been backed up between 2 and 14 days<br><b>Critical:</b> Filespaces that have not been backed up for more than 14 days |

## Tivoli Storage Manager Client Information Cube

The Tivoli Storage Manager Client Information multidimensional cube contains historical information related to Tivoli Storage Manager clients.

## Parameters

The following table lists the parameter settings:

**Table 6. TSM Client Information Cube Parameters**

| Parameter Name                    | Type           | Default Values   |
|-----------------------------------|----------------|--|
| Last client access auto threshold | Categorization | <b>OK:</b> Clients have accessed a TSM server in the last 7 days.<br><b>Warning:</b> Clients have last accessed a TSM server between 7 days and 21 days ago.<br><b>Critical:</b> Clients have not accessed a TSM server for more than 21 days. |

## Tivoli Storage Manager Client Message Cube

The Tivoli Storage Manager Client Message multidimensional cube contains client and server messages. This information helps you determine the source of the errors and correct them.

### Parameters

The following table lists the parameter settings:

**Table 7. TSM Client Message Cube Parameters**

| Parameter Name | Type           | Default Values   |
|----------------|----------------|--|
| Date range     | Range          | Date range to include in cube (default is 7 days)<br>Start Date<br>End Dates |
| Severity Name  | Terminology    | W: Warning<br>I: Information<br>E: Error<br>S: Severe<br>D: Diagnostic       |
| Day or night   | Categorization | Day - 7am to 5pm<br>Evening - 5pm to Midnight<br>Overnight - Midnight to 7am |

## Tivoli Storage Manager Forecast Filespaces Cube

The Tivoli Storage Manager Forecast Filespaces multidimensional cube is a new cube in *Version 4.2.0*. It contains information about forecasting use of filespaces.

### Parameters

The following table lists the parameter settings:

**Table 8: TSM Forecast Filespaces Cube Parameters**

| Parameter Name | Type        | Default Values  |
|----------------|-------------|---|
| Forecast Range | Terminology | Name = Number of Days<br>Value = Size of Sample Set (value comes from Post-Processing Setup Options in Decision Support Loader) |

## Tivoli Storage Manager Server Activity Cube

The Tivoli Storage Manager Server multidimensional cube contains historical error and performance information related to Tivoli Storage Manager server activity. This cube was modified to add two new queries, providing additional information about reclamation, migration, and tape activity.

## Parameters

The following table lists the parameter settings:

**Table 9. TSM Server Activity Cube Parameters**

| Parameter Name | Type           | Default Values   |
|----------------|----------------|--|
| Date range     | Range          | Start Date<br>End Date<br>Calculated on last Month + MTD                     |
| Day or night   | Categorization | Day - 7am to 5pm<br>Evening - 5pm to Midnight<br>Overnight - Midnight to 7am |

## Tivoli Storage Manager Server Bytes Processed Cube

The Tivoli Storage Manager Server Bytes Processed multidimensional cube contains historical error and performance information related to Tivoli Storage Manager server processing.

## Parameters

The following table lists the parameter settings:

**Table 10. TSM Server Bytes Processed Cube Parameters**

| Parameter Name | Type           | Default Values   |
|----------------|----------------|--|
| Date range     | Range          | Start Date<br>End Date<br>Calculated on Rolling 7 day                        |
| Day or night   | Categorization | Day - 7am to 5pm<br>Evening - 5pm to Midnight<br>Overnight - Midnight to 7am |

## Tivoli Storage Manager Server Message Cube

The Tivoli Storage Manager Message multidimensional cube contains historical information related to messages issued by Tivoli Storage Manager servers. Its purpose is to summarize and provide specific error information to assist the storage administrator with determining the source of errors and correcting error conditions.

## Parameters

The following table lists the parameter settings:

**Table 11. TSM Server Message Cube Parameters**

| Parameter Name | Type        | Default Values  |
|----------------|-------------|---|
| Date range     | Range       | Date range to include in cube (default is 7 days).<br>Start Date<br>End Dates |
| Severity Name  | Terminology | W: Warning<br>I: Information<br>E: Error<br>S: Severe<br>D: Diagnostic        |

**Table 11. TSM Server Message Cube Parameters**

| Parameter Name | Type           | Default Values   |
|----------------|----------------|--|
| Day or night   | Categorization | Day - 7am to 5pm<br>Evening - 5pm to Midnight<br>Overnight - Midnight to 7am |

## Tivoli Storage Manager Simultaneous Activity Cube

The Tivoli Storage Manager Simultaneous Activity multidimensional cube is a new cube in *Version 4.2.0*. It contains information, regarding start and stop times of Tivoli Storage Manager activities in order to identify which operations are executed concurrently.

### Parameters

The table below lists the parameter settings:

**Table 12: TSM Simultaneous Activity Cube Parameters**

| Parameter Name | Type  | Default Values |
|----------------|-------|----------------|
| Date Range     | Range | Rolling 7 Days |

## Tivoli Storage Manager Storage Capacity Cube

The Tivoli Storage Manager Storage Capacity multidimensional cube is a new cube in *Version 4.2.0*. It is designed to report on current use of filespaces, storage pools, and disk utilization.

### Parameters

The table below lists the parameter settings:

**Table 13: TSM Storage Capacity Cube Parameters**

| Parameter Name | Type  | Default Values |
|----------------|-------|----------------|
| Date_Range     | Range | Rolling 7 days |

## Topics and Views for Capacity Analysis (Tivoli Discovery Interface)

The Tivoli Storage Manager Capacity Analysis category reports and forecasts usage of storagepools, filespace and tapes by Tivoli Storage Manager in your environment.

In the Capacity Analysis category, Storage Management Analysis provides the following specific topics and views:

### How are tape drives in my libraries used?

**Hints:** This topic helps determine the utilization of your sequential access media.

**Table 14: How are tape drives in my tape libraries used?**

| View Title   | Report Filename   | Data Source                  |
|--|-------------------|------------------------------|
| Describe tape libraries in use by all my servers                 | TSM_libraries.rpt | RDBMS                        |
| How many tape mounts occurred by hour by drive by library?       | TSM_srv009.ppr    | Server Activity (cube)       |
| What is the maximum number of concurrent tape mounts per server? | TSM_simact02.ppr  | Simultaneous Activity (cube) |

### How fast are my client's space needs growing?

**Hints:** These questions forecast growth for Tivoli Storage Manager clients.

**Table 15: How fast are my client's space needs growing?**

| View Title   | Report Filename | Data Source                   |
|--|-----------------|-------------------------------|
| What are the top 10 clients with the highest capacity growth?        | TSM_ffsp001.ppr | (2)Forecast Filespaces (cube) |
| What are the top 10 clients with the highest capacity server growth? | TSM_ffsp003.ppr | (2)Forecast Filespaces (cube) |

### How many clients are using my server?

**Hints:** This topic presents information about clients currently registered with Tivoli Storage Manager servers. It also presents forecast data about the growing requirements of your organization.

**Table 16: How many clients are using my server?**

| View Title  | Report Filename | Data Source                   |
|---|-----------------|-------------------------------|
| Forecast the total number of registered clients   | TSM_ffsp004.ppr | (2)Forecast Filespaces (cube) |
| How many clients are registered with each server? | TSM_cli003.ppr  | Client Info (cube)            |

## How many tapes am I using?

**Hints:** This topic addresses detailed utilization patterns of sequential media in your environment. Sequential devices include optical, tape, etc.

**Table 17: How many tapes am I using?**

| View Title   | Report Filename    | Data Source                      |
|--|--------------------|----------------------------------|
| Forecast the availability of scratch tapes by count            | TSM_flbvs001.ppr   | Forecast Library Volumes (cube)  |
| How many tapes am I using per day/week?                        | TSM_tl008.ppr      | (1)Tape and Library Usage (cube) |
| How many tapes are offsite, read only, damaged or unavailable? | TSM_tl002.ppr      | (1)Tape and Library Usage (cube) |
| How many tapes are required to restore a client?               | TSM_restvols.rpt   | RDBMS                            |
| How many tapes are used for copy storage pools?                | TSM_tl003.ppr      | (1)Tape and Library Usage (cube) |
| How many tapes are used for database backups?                  | TSM_tl009.ppr      | (1)Tape and Library Usage (cube) |
| How many tapes are used in each storage pool?                  | TSM_tl001.ppr      | (1)Tape and Library Usage (cube) |
| Show total tapes per library managed by server                 | TSM_libvolumes.rpt | RDBMS                            |

## How much data do I have stored in tape libraries?

**Hints:** This topic addresses information about automated libraries, including both tape and optical libraries, enabling you to see current use and forecasted library needs.

**Table 18: How much data do I have stored in tape libraries?**

| View Title   | Report Filename  | Data Source                      |
|--|------------------|----------------------------------|
| Forecast how many extra tapes would be eligible for reclamation if reclamation thresholds are changed to 'X' % | TSM_tl005.ppr    | (1)Tape and Library Usage (cube) |
| Forecast the rate that new tapes will be added based on current practices                                      | TSM_flbvs002.ppr | Forecast Libvolumes (cube)       |
| How many of the available tapes are scratch/empty by onsite/offsite?   | TSM_tl006.ppr    | (1)Tape and Library Usage (cube) |
| How many private, scratch, and total tapes are available by server by library?                                 | TSM_tl007.ppr    | (1)Tape and Library Usage (cube) |
| How many tapes will soon be eligible for reclamation?  | TSM_tl004.ppr    | (1)Tape and Library Usage (cube) |

## How much space are my clients using?

**Hints:** This topic addresses current client space utilization and presents a forecast of future space needs.

**Table 19: How much space are my clients using?**

| View Title  | Report Filename       | Data Source                    |
|---|-----------------------|--------------------------------|
| Forecast client storage space usage on servers and clients                  | TSM_fcast_srv_clt.rpt | RDBMS                          |
| Forecast the amount of data being stored for specific clients               | TSM_ffsp002.ppr       | (2) Forecast Filespaces (cube) |
| How many MBytes are backed up daily compared to disk storage pool capacity? | TSM_stgcap001.ppr     | Storage Capacity (cube)        |
| How much server storage space is being used by my clients?                  | TSM_srv_stg.rpt       | RDBMS                          |
| What are the top 10 clients using the most client storage space?            | TSM_clfs002.ppr       | Client Filespaces (cube)       |
| What are the top 10 clients using the most server storage space?            | TSM_clfs002.ppr       | Client Filespaces (cube)       |

## How would the increase in the number of clients affect server storage requirements?

**Hints:** This topic provides a report allowing you to enter a projected requirement related to current client use. It also predicts the space you will need at a future point in time.

**Table 20: How would the increase in the number of clients affect server storage requirements?**

| View Title  | Report Filename | Data Source |
|---|-----------------|-------------|
| Forecast how much additional server storage capacity will be required for 'N' additional clients that have the same data projection needs as TSM client 'X' | TSM_stgcapp.rpt | RDBMS       |

## What are my database and recovery log requirements?

**Hints:** This topic reports current use of your Tivoli Storage Manager DB space and recovery log. Forecast information is also available about the Tivoli Storage Manager DB.

**Table 21: What are my database and recovery log requirements?**

| View Title                                    | Report Filename  | Data Source |
|---|------------------|-------------|
| Forecast my database utilization              | TSM_db_fcast.rpt | RDBMS       |
| What is my database size and utilization?     | TSM_db_util.rpt  | RDBMS       |
| What is my recovery log size and utilization? | TSM_log_util.rpt | RDBMS       |

## What is my server configuration?

**Hints:** This topic provides information about the server configurations set for your Tivoli Storage Manager installation.

**Table 22: What is my server configuration?**

| View Title                                | Report Filename | Data Source |
|---|-----------------|-------------|
| Describe server option settings by server | TSM_options.rpt | RDBMS       |

## What is the resource utilization on my servers?

**Hints:** This topic addresses current resource utilization of your Tivoli Storage Manager servers.

**Table 23: What Is the resource utilization on my servers?**

| View Title   | Report Filename  | Data Source                  |
|--|------------------|------------------------------|
| What was the maximum number of simultaneous client sessions? | TSM_simact01.ppr | Simultaneous Activity (cube) |

## What is the volume of data transferred by clients?

**Hints:** This topic question presents information regarding the volume of data being transferred by Tivoli Storage Manager clients.

**Table 24: What Is the volume of data transferred by clients?**

| View Title   | Report Filename   | Data Source             |
|--|-------------------|-------------------------|
| What are the top 10 clients restoring data?                                    | TSM_c11020.ppr    | Client Activity (cube)  |
| What are the top 10 clients transferring the most data?                        | TSM_c1021.ppr     | Client Activity (cube)  |
| What is the total number of bytes (MB) moved per TDP agent?                    | TSM_c11023.ppr    | Client Activity (cube)  |
| What is the total number of bytes (MB) moved per client per day per operation? | TSM_stgcap003.ppr | Storage Capacity (cube) |

## What is the volume of data transferred on the server?

**Hints:** This topic reports current use of your Tivoli Storage Manager DB space and recovery log. Forecast information is also available about the Tivoli Storage Manager DB.

**Table 25: What is the volume of data transferred on the server?**

| View Title  | Report Filename | Data Source            |
|---|-----------------|------------------------|
| How much data is moved by storage pool migration?   | TSM_srv006.ppr  | Server Activity (cube) |
| How much data is moved by storage pool reclamation? | TSM_srv007.ppr  | Server Activity (cube) |

## Topics and Views for Event Analysis (Tivoli Discovery Interface)

The Event Analysis category provides insight into the health of a Tivoli Storage Manager environment. It also highlights areas needing improvement. Reporting is performed for Tivoli Storage Manager server and client processing.

In the Event Analysis category, Storage Management Analysis provides the following topics and views:

### Daily Exception Reports

**Hints:** This topic provides information related to exception conditions that occurred during the last reporting period for your Tivoli Storage Manager clients and servers. This information is used to identify Tivoli Storage Manager client problems that require attention. Both summary information and specific error information is provided.

**Table 26. Daily Exception Reports**

| View Title   | Report Filename  | Data Source            |
|--|------------------|------------------------|
| Classify outcomes for client sessions                              | TSM_c1003.ppr    | Client Activity (cube) |
| Summarize the messages issued in my environment                    | TSM_msg.rpt      | RDBMS                  |
| What are the results of all operations that occurred for a client? | TSM_clmsg.rpt    | RDBMS                  |
| What is the status of non-scheduled administrative operations?     | TSM_srvnosch.rpt | RDBMS                  |
| What is the status of non-scheduled client sessions?               | TSM_c1002.ppr    | Client Activity (cube) |
| What is the status of scheduled administrative operations?         | TSM_srvsch.rpt   | RDBMS                  |
| What is the status of the scheduled client sessions?               | TSM_c1001.ppr    | Client Activity (cube) |
| What potential problems exist in my server environment?            | TSM_srvprb.rpt   | RDBMS                  |

### How might I improve my storage health?

**Hints:** This topic presents potential areas of improvement for your Tivoli Storage Manager environment. This includes reporting the currency of backups, Tivoli Storage Manager clients that have not contacted the server for extended periods, and Tivoli Storage Manager clients that have been locked from the system due to invalid sign-on attempts.

**Table 27. How might I improve my storage health?**

| View Title  | Report Filename | Data Source               |
|---|-----------------|---------------------------|
| How are client schedules affected by day of week?                   | TSM_c1004.ppr   | Client Activity (cube)    |
| How current are my client backups?                                  | TSM_clfs001.ppr | Client Information (cube) |
| Show me my server database backup record                            | TSM_srvdb.rpt   | RDBMS                     |
| What administrators and clients have been locked out of the system? | TSM_lock.rpt    | RDBMS                     |
| When did clients last contact the server?                           | TSM_c1002.ppr   | Client Information (cube) |

## Trends in Client Operations

**Hints:** This topic will help you detect trends related to the operations of your Tivoli Storage Manager clients, and help you gain insight into your Tivoli Storage Manager environment. Use this information for planning purposes as well as identifying areas needing attention.

**Table 28. Trends in Client Operations**

| View Title   | Report Filename  | Data Source                   |
|--|------------------|-------------------------------|
| Summarize client messages issued by platform                 | TSM_clmsg003.ppr | Client Message (cube)         |
| Summarize client messages issued by software level           | TSM_clmsg007.ppr | Client Message (cube)         |
| What is the average daily failed object count?               | TSM_c1005.ppr    | Client Activity (cube)        |
| What is the average daily successful object count?           | TSM_c1006.ppr    | Client Activity (cube)        |
| What time of day do peak data transfers occur?               | TSM_c1b001.ppr   | Client Bytes Processed (cube) |
| Which clients have the highest average failed objects count? | TSM_c1009.ppr    | Client Activity (cube)        |

## Trends in Server Operations

**Hints:** This topic will help you detect trends related to the operations of your Tivoli Storage Manager servers. Information is reported for Tivoli Storage Manager server operations, including database backup, storage pool backup, reclamation, migration, and expiration. This information can help you gain insight into your Tivoli Storage Manager environment. Use this for planning purposes as well as for identifying areas needing attention.

**Table 29. Trends in Server Operations**

| View Title   | Report Filename | Data Source            |
|--|-----------------|------------------------|
| How does time of day affect my server session activity?              | TSM_srvb002.ppr | Server Bytes (cube)    |
| How much data is processed by daily server operations?               | TSM_srv002.ppr  | Server Activity (cube) |
| What is the average daily failed object count for server operations? | TSM_srv001.ppr  | Server Activity (cube) |

## What does my environment look like?

**Hints:** This topic provides information related to your Tivoli Storage Manager client configuration. Information is summarized by policy domain, Tivoli Storage Manager client software level, and Tivoli Storage Manager client platform.

**Table 30. What does my environment look like?**

| View Title  | Report Filename | Data Source               |
|---|-----------------|---------------------------|
| How many clients are registered with each server? | TSM_c1i003.ppr  | Client Information (cube) |
| Which platforms do clients use?                   | TSM_c1i005.ppr  | Client Information (cube) |
| Which software levels do clients use?             | TSM_c1i004.ppr  | Client Information (cube) |

## What messages should I be concerned with?

**Hints:** This topic provides summary information related to messages issued by Tivoli Storage Manager servers and clients. Historical information can be used to determine the most frequent errors that occur in your Tivoli Storage Manager environment. You can also determine which Tivoli Storage Manager clients and servers have the most problems. This information can assist with prioritization, isolation and correction of error conditions in your Tivoli Storage Manager environment.

**Table 31. What messages should I be concerned with?**

| View Title  | Report Filename   | Data Source           |
|---|-------------------|-----------------------|
| Summarize client messages by severity               | TSM_clmsg004.ppr  | Client Message (cube) |
| Summarize server error messages by severity         | TSM_srvmsg002.ppr | Server Message (cube) |
| What are the top 10 client messages?                | TSM_clmsg002.ppr  | Client Message (cube) |
| What are the top 10 clients with the most problems? | TSM_clmsg001.ppr  | Client Message (cube) |
| What are the top 10 server messages?                | TSM_srvmsg001.ppr | Server Message (cube) |

## When do I find the most problems?

**Hints:** This topic will help you detect patterns in error activity that are sensitive to the day of the week and time of day. This can be important in identifying problems and scheduling Tivoli Storage Manager operations.

**Table 32. When do I find the most problems?**

| View Title   | Report Filename   | Data Source           |
|--|-------------------|-----------------------|
| What day of week do peak client error rates occur? | TSM_clmsg005.ppr  | Client Message (cube) |
| What day of week do peak server error rates occur? | TSM_srvmsg003.ppr | Server Message (cube) |
| What time of day do peak client error rates occur? | TSM_clmsg006.ppr  | Client Message (cube) |
| What time of day do peak server error rates occur? | TSM_srvmsg004.ppr | Server Message (cube) |

## Topics and Views for Performance Analysis (Tivoli Discovery Interface)

The Performance Analysis category provides insight into the performance of a Tivoli Storage Manager environment. The category provides information about how well a Tivoli Storage Manager environment is performing as well as about areas needing improvement. Reporting is done for Tivoli Storage Manager server and client processing.

In the Performance Analysis category, Storage Management Analysis provides the following specific topics and views:

### How are my clients performing?

**Hints:** This topic provides information related to the performance of your Tivoli Storage Manager clients. This historical information can be used to determine the Tivoli Storage Manager clients with the highest and lowest throughput. This information can be looked at many different ways (for example, dates, TCP/IP network address, or operating system) to determine underlying factors that affect performance.

**Table 33. How are my clients performing?**

| View Title   | Report Filename | Data Source            |
|--|-----------------|------------------------|
| How does platform affect client throughput rates?        | TSM_clb005.ppr  | Client Bytes (cube)    |
| How does TCP/IP address affect client throughput?        | TSM_cl012.ppr   | Client Activity (cube) |
| How much time is spent waiting for media access?         | TSM_c1014.ppr   | Client Activity (cube) |
| What are client throughput rates?                        | TSM_c1017.ppr   | Client Activity (cube) |
| Which are my 10 fastest clients?                         | TSM_c1010.ppr   | Client Activity (cube) |
| Which are my 10 slowest clients?                         | TSM_c1018.ppr   | Client Activity (cube) |
| Which clients have the longest elapsed processing times? | TSM_c1011.ppr   | Client Activity (cube) |

### How are my servers performing?

**Hints:** This topic provides information related to the performance of your Tivoli Storage Manager servers. This historical information can be used to determine the performance (for example, elapsed time or amount of data processed) for Tivoli Storage Manager server operations (that is, migration, reclamation, database backup, storage pool backup, and expiration).

**Table 34. How are my servers performing?**

| View Title  | Report Filename | Data Source            |
|---|-----------------|------------------------|
| How much time do clients spend waiting for media access?      | TSM_srv005.ppr  | Server Activity (cube) |
| What is the average daily elapsed time for server operations? | TSM_srv004.ppr  | Server Activity (cube) |
| What is the average daily throughput for server operations?   | TSM_srv003.ppr  | Server Activity (cube) |

## How does file size affect my performance?

**Hints:** This topic provides information related to how file size affects the performance of your Tivoli Storage Manager clients. For each Tivoli Storage Manager server, throughput is calculated based on file size. Also, throughput based on file size is calculated for each Tivoli Storage Manager client platform.

**Table 35. How does file size affect my performance?**

| View Title  | Report Filename | Data Source            |
|---|-----------------|------------------------|
| Classify sessions by file size and performance thresholds | TSM_cl016.ppr   | Client Activity (cube) |
| How does file size affect client operation throughput?    | TSM_cl015.ppr   | Client Activity (cube) |

## How does time of day and day of week affect my performance?

**Hints:** This topic provides information related to how the time of day and day of week affects Tivoli Storage Manager client performance

**Table 36. How does the Time of Day and Day of Week affect my performance?**

| View Title   | Report Filename | Data Source                   |
|--|-----------------|-------------------------------|
| How does time of day affect client session activity?         | TSM_clb004.ppr  | Client Bytes Processed (cube) |
| What is the average daily throughput for client operations?  | TSM_c1b002.ppr  | Client Bytes Processed (cube) |
| What is the average hourly throughput for client operations? | TSM_c1b003.ppr  | Client Bytes Processed (cube) |
| What is the average hourly throughput for server operations? | TSM_srvb001.ppr | Server Bytes Processed (cube) |

## Prerequisite and Related Documents

Refer to the following Tivoli Decision Support documentation when installing and using Storage Management Analysis:

| Publication  | Description   | Location           |
|--|---|--------------------|
| <i>Tivoli Storage Management Decision Support Loader Release Notes</i> | Describes the installation and use of the Tivoli Storage Management Decision Support Loader.          | <i>\Guide Docs</i> |
| <i>Installation Guide</i>  | Describes installing TDS and its components in stand-alone and network mode.                          | <i>\Docs\PDF</i>   |
| <i>Decision Support User's Guide</i>                                   | Describes TDS features and concepts and provides procedures for using the Tivoli Discovery Interface. | <i>\Docs\PDF</i>   |
| <i>Tivoli Decision Support Release Notes</i>                           | Provides the most current information about TDS 2.1.  | <i>\Docs\PDF</i>   |
| <i>Administrator Guide</i>   | Explains the features of the Tivoli Discovery Administrator component.                                | <i>\Docs\PDF</i>   |

## Software Defects, Limitations, and Workarounds

This section lists the current defects, limitations and workarounds known for this product.

### Defects

Currently, no known defects are reported for the Storage Management Analysis.

### Limitations

- The size of the Tivoli Decision Support RDBMS tables can affect the cube building process. Use the Decision Support Loader's pruning function to manage the size of the tables.

### Workarounds

This section lists workarounds for the following problems:

| Problem   | Workaround  |
|---|---|
| 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. | A minimum resolution of 800x600 pixels is recommended for monitors. |

## Contacting Customer Support

If you have difficulties with any Tivoli products, 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. At that Web site, you can also get the Customer Support Handbook.

You can e-mail Customer Support at [support@tivoli.com](mailto:support@tivoli.com).

Use the following phone numbers to contact customer support at the Tivoli Customer Call Center in the United States:

- Tivoli: 1-800-TIVOLI8
- IBM: 1-800-237-5511 (after reaching this number, press selection 6 then selection 8 to connect to Tivoli Customer Call Center)

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 this documentation, please send e-mail to [pubs@tivoli.com](mailto:pubs@tivoli.com).