

# **Tivoli Decision Support for Storage Management Analysis Release Notes**

**Version 1.1.1**

December 1999





## ***Tivoli Decision Support for Tivoli Storage Manager (December, 1999)***

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# Release Notes

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This document describes the Tivoli Decision Support for Storage Management Analysis product Version 1.1.0. 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. This document 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:

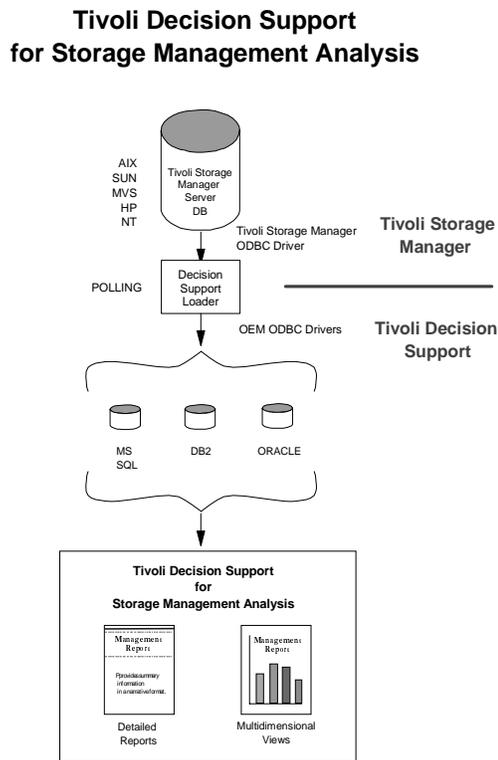
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- "System Requirements" on page 3
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- "Uninstalling Storage Management Analysis" on page 9
- "Preparing Crystal Reports" on page 9
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- "Product Details" on page 12
- "Prerequisite and Related Documents" on page 21
- "Software Defects, Limitations, and Workarounds" on page 21
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## 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. Through the Tivoli Discovery Interface, Storage Management Analysis provides information to guide you in making decisions concerning storage management. 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 views and detailed reports.

Storage Management Analysis works with Tivoli Storage Manager Version 3.7 or later on the AIX, Sun Solaris, HP-UX, Windows NT, MVS and OS/390 platforms.

Figure 1 provides an overview of the 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. Storage Management Analysis extracts and analyzes the data by means of reports that are displayed in the Tivoli Discovery Interface.

Storage Management Analysis requires the Tivoli Storage Management Decision Support Loader. This Decision Support Loader, which is installed in a TMR environment, contains the scripts necessary to create the database schema and to perform the rollup job. The Decision Support Loader job is run daily to collect and aggregate the data into the database table.

The Tivoli Discovery Administrator is used to define queries that extract data from the TDS database 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. You can use the Tivoli Discovery Interface to view these reports. You can also use Crystal Reports to generate text-based views.

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## Topics and Views

Data collected for Storage Management Analysis is organized into topics and views on the Tivoli Discovery Interface. When you select a view within a topic, either the TDS database is queried to generate a Crystal Report or the results of a cube build are examined to display a report. Each view displays a report and a view description (in the **Hints** panel at the bottom of the interface). Storage Management Analysis provides two categories of topics and views:

- "Topics and Views for Event Analysis" on page 17
- "Topics and Views for Performance Analysis" on page 19

## Tivoli Storage Management Decision Support Loader

The Tivoli Storage Management Decision Support Loader gathers the data needed by Storage Management Analysis. 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.

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 Storage Management Analysis, and to install and configure the Tivoli Storage Management Decision Support Loader.

### Software Requirements for Storage Management Analysis

The following software must be installed on your system:

- Tivoli Storage Manager Version 3.7 with PTF 1 or later
  
- Windows NT 4.0 with Service Pack 5 or higher
- Communication Protocol: TCP/IP
- Tivoli Decision Support 2.1, including:
  - Tivoli Discovery Interface
  - Tivoli Discovery Administrator
  - Cognos PowerPlay
  - Seagate Crystal Reports (installed as part of TDS)
- 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:
  - DB2 Version 5.2
  - Microsoft SQL Server Version 7.0

- Oracle Version 8.1.5

To use Storage Management Analysis, you must have the Tivoli Storage Management Decision Support Loader installed. However, Decision Support Loader and TDS should not be 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 network size)
- If the Tivoli Discovery Interface and Storage Management Analysis are intended as a client installation, the requirements are:
  - **Processor:** Intel-based Pentium 300MH (minimum)
  - **Memory:** 128MB (minimum)
  - **Disk Space:** 100MB for the softwareTivoli Storage Manager

Use of a file server in the TDS architecture is recommended. 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 the TDS client software resides on each client workstation, configuration of the 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 3.
  2. If you have not already installed the Tivoli Storage Management Decision Support Loader, see the Tivoli Storage Management Decision Support Loader *Release Notes*.
  3. If you have not already installed TDS, go to the following steps:
    - a. "Installing Tivoli Decision Support" on page 5
    - b. "Installing Cognos" on page 5
    - c. "Installing the ODBC Drivers" on page 5
  4. After TDS is installed, go to "Configuring the Shared Source File Path" on page 5.
  5. Enable event logging on Tivoli Storage Manager. See "Enabling Event Logging" on page 6.
- After these tasks are completed, go to "Installing and Configuring Storage Management Analysis" on page 6.

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## Installing Tivoli Decision Support

Refer to the *Tivoli Decision Support Installation Guide* listed in "Prerequisite and Related Documents" on page 21.

**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 **O.K.**

## Installing Cognos

Refer to the *Tivoli Decision Support Installation Guide* listed in "Prerequisite and Related Documents" on page 21.

## Installing the ODBC Drivers

**ATTENTION: The ODBC drivers shipped on the Tivoli Decision Support CD-ROM 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 these drivers from the vendor's Web site.**

Storage Management Analysis supports three databases:

- DB2 Version 5.2 or higher
- Microsoft SQL Server Version 7.0 or higher
- Oracle Version 8.1.5 or higher

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.

## 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 system (the local system) or on the network. If you installed TDS in stand-alone mode, your source files are 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:** Ensure that your network administrator provides you with read only access for network permissions of these folders and files.

### Enabling Event Logging

On the Tivoli Storage Manager server or servers, 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*.

## 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:

- "Installing Storage Management Analysis" on page 6
- "Importing Storage Management Analysis" on page 6
- "Configuring Storage Management Analysis" on page 7

### Installing Storage Management Analysis

From the Tivoli Decision Support for Storage Management Analysis CD-ROM, install Storage Management Analysis on the TDS server:

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 Management.
4. When the Read me dialog appears, click Accept.
5. Click on **Next** and then **Finish** to complete the installation. The click **Exit**.

The online documentation is installed in this directory:

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

The README file is installed in this directory:

```
TDS 2.1\Docs\Readme.txt
```

### Importing Storage Management Analysis

To import Storage Management Analysis from the Tivoli Discovery Administrator console, perform the following steps:

1. If a discovery guide has not been imported to TDS on your system, you are prompted to import an installed discovery guide, and to connect to a data source. Click **Yes**.

**Note:** See "Running the Tivoli Discovery Administrator for the First Time" in the *Tivoli Decision Support Administrator Guide*

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 "Assigning and Verifying a Data Source" on page 7 for the procedure.

## Configuring Storage Management Analysis

To configure Storage Management Analysis, perform the following tasks:

1. "Assigning and Verifying a Data Source" on page 7
2. "Setting the Date Range Parameter in the Cube" on page 7
3. "Building the Cubes" on page 8
4. "Scheduling the Cube Build Task" on page 8

### Assigning and Verifying a Data Source

Assign and verify a data source for each **Tivoli Storage Manager** cube. Do the following from the Tivoli Discovery Administrator console after you responded **Yes** when prompted to assign one or more data sources.

1. From the **Data Source** dropdown list, select the data source.
2. Click on **Select All**, and click **OK**.
3. Click the **Data Sources** folder.
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**, and then verify the data source definition, userid, password, and qualifier.

### Setting the Date Range Parameter in the Cube

Each Storage Management Analysis cube contains 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:** The Tivoli Storage Manager Client Information and Client Filespaces cubes do not have a Date Range parameter. Therefore, a cube build will contain all values for those queries contained by the TDS server. If you want a smaller dataset, you should do TDS RDBMS pruning with the Tivoli Storage Management Decision Support Loader.

## 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.
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.
4. Review the processing messages for any errors. If an error generates an error dialog box, review the error, and then click **OK**.
5. Click **Close**.

Repeat the previous steps for each cube. You should build all cubes before you start the Discovery Interface. Then complete the task for all cubes by performing these steps:

1. Start the Tivoli Discovery Interface
2. Use Storage Management Analysis to review the views for each topic (a topic is presented as a question).

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 described in "Prerequisite and Related Documents" on page 21.

**Note:** Microsoft SQL - 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 ""

## 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 job runs because this job must finish in order to have updated data for the cubes.

The following procedure use the Tivoli Discovery Administrator to create a cube building schedule and to determine the schedule TaskID. You can use any of the following applications to schedule cube builds:

- Cognos Scheduler
- Tivoli Decision Support Process Scheduler
- Tivoli Storage Manager Scheduler

- NT Scheduler

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

## Enabling DB2 Crystal Reports

The factory defaults enable a full set of Crystal Reports for Microsoft SQL and Oracle. A separate set of reports are included for DB2. In order to enable DB2 reports, use Windows Explorer to open the *Util\Tivoli Decision Support for Storage Management Analysis* directory under the *TDS* directory and execute the batch file *swaprpts.bat*. The batch file copies the report from that directory to the Reports directory. The MS SQL and Oracle reports are copied back to the current directory with an *rpt\_db2* extension.

## 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 and parameters 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**.

## Preparing Crystal Reports

Preparing Crystal Reports includes:

"Setting Up Crystal Reports" on page 9

For information on ensuring Year 2000 (Y2K) compliance of the Crystal Reports program, see "Ensuring Year 2000 (Y2K) Compliance" on page 12.

## Setting Up Crystal Reports

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

1. Start the Tivoli Discovery Interface.
2. Select a Crystal report.
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. Enter the parameters to delimit the Crustal Reports query, and click on **Finish**.

## 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. If you choose to enter the Date parameter, do so as a string in one of the following formats:

For a type of DATE/TIME the format varies by database:

**DB2:** YYYY-MM-DD \*

**Microsoft SQL:** MMM DD, YYYY \*

**Oracle:**DD-MMM-YY \*

Some reports may use a special date field that use the following format for all databases:

YYYY-MM-DD \*

In the Discovery Interface, a hint is included in each Crystal Reports to indicate which format to use.

**Note:** The dates in the Crystal Reports will not necessarily be displayed in the same format in which you have entered them.

## Troubleshooting

This section describes troubleshooting tips for the following areas:

- "Solving Cube Building Problems" on page 10
- "Solving Report Problems" on page 11
- "Ensuring Year 2000 (Y2K) Compliance" on page 12

### 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 TDS 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 TDS 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 TDS 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 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 *TDS Administrator Guide*

## 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 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 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.

## Ensuring Year 2000 (Y2K) Compliance

This information does not constitute a certification or warranty, express or implied, of any kind.

Compliance information is provided for your database product and for Seagate products such as Crystal Reports.

### Tivoli Storage Manager Database

To ensure that TDS continues to select data correctly after January 1, 2000, the database used to store historical data must be Y2K certified. Contact your systems administrator and your database vendor if you have any questions concerning the Y2K compliance of your database.

### Seagate Crystal Reports

Seagate Crystal Reports version 6 is Y2K ready if you have downloaded and installed the required patches from Seagate. Seagate Software considers a product to be Y2K 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 (hardware, software, and firmware) used with the product properly exchange accurate date data with the Seagate product.

For more information regarding the Y2K readiness of Seagate Crystal Reports, refer to the Seagate website at:

<http://www.seagatesoftware.com>

## 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 Tivoli Storage Management Decision Support Loader task aggregates 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 Tivoli Storage Management 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 nine cubes:

- "Tivoli Storage Manager Client Message Cube" on page 13
- "Tivoli Storage Manager Server Message Cube" on page 14
- "Tivoli Storage Manager Client Activity Cube" on page 14
- "Tivoli Storage Manager Server Activity Cube" on page 15
- "Tivoli Storage Manager Client Bytes Processed Cube" on page 15
- "Tivoli Storage Manager Server Bytes Processed Cube" on page 16
- "Tivoli Storage Manager Client Information Cube" on page 16
- "Tivoli Storage Manager Client Filespace Cube" on page 16

Each cube consists of queries and parameter settings. Each query creates a .csv data file for the Cognos Transformer, and the resulting .csv files are used to build the Cognos model and powercube. The queries extract data from the relational database through an ODBC driver.

Each cube described below contains the following information:

- Parameters** The parameters are used to control what information is included in the cube.
- Queries** SQL queries of the database table are used to create the cube. This section describes those queries and lists the SQL Columns SELECT statement, along with the Calculated Columns used by the query. To view the functions for the calculated columns (along with SQL Columns and Calculated Columns) from the Tivoli Discovery Administrator console, open the cube. Then double-click on Queries, and double-click on an individual query to display a tabbed dialog that lets you view query information.
- Dimensions** After cubes are defined in the Tivoli Discovery Administrator, a model can be created for each cube in Cognos Transformer. The model for each cube consists of dimensions and measures. A dimension is a grouping of descriptive data about a major aspect of a business. Each dimension includes categories in one or more drill-down paths and an optional set of special categories.
- Measures** The measures in the Transformer model are the quantitative values. These values change according to the dimensions you are looking at.

## Tivoli Storage Manager Client Message Cube

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

### Parameters

The date range, message level, and TSM parameters are used to control what information is included in the cube. The error thresholds are used to categorize TSM clients.

The following table lists the parameter settings:

**Table 1: TSM Client Message Cube Parameters**

Parameter Name	Type	Default Values
Date range	Range	Date range to include in cube (default is 7 days) Start Date End Dates

**Table 1: TSM Client Message Cube Parameters**

Severity	Terminology	W: Warning I: Information E: Error S: Severe D: Diagnostic
Day or night	Categorization	Day - 7am to 5pm Evening - 5pm to Midnight 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 2: Parameters for TSM Server Message Cube**

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

## 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.

### Parameters

The table below lists the parameter settings.

The date range are used to control what information is included in the cube. The performance and error thresholds are used to categorize Tivoli Storage Manager clients.

**Table 3: Parameters for Building TSM Client Activity Cube**

Parameter Name	Type	Default Values
Date range	Range	Date range to include in cube (default is last month + MTD) Start Date End Dates
Day or night	Categorization	Day - 7am to 5pm Evening - 5pm to Midnight Overnight - Midnight to 7am

**Table 3: Parameters for Building TSM Client Activity Cube**

Parameter Name	Type	Default Values
Performance threshold (KB/sec)	Categorization	Good (throughput >=xx kb/sec) Average (throughput <xx kb/sec && >=yy kb/sec) Slow (throughput <yy kb/sec)
Filesize threshold (KB)	Categorization	Small (filesize<= 10KB) Medium (filesize> 10KB and less than 256000KB) Large (filesize>256000KB)

## 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 processing.

### Parameters

The following table lists the parameter settings:

**Table 4: Parameters for TSM Server Activity Cube**

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

## 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. The date range, message level, and Tivoli Storage Manager parameters are used to control what information is included in the cube. The performance are used to categorize Tivoli Storage Manager clients based on performance.

**Table 5: Parameters for TSM Client Bytes Processed Cube**

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

## 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. The date range, message level, and Tivoli Storage Manager parameters are used to control what information is included in the cube. The performance are used to categorize Tivoli Storage Manager clients based on performance.

**Table 6: Parameters for TSM Server Bytes Cube**

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

## 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 7: Parameters for TSM Client Information Cube**

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

## Tivoli Storage Manager Client Filespace Cube

The Tivoli Storage Manager Client Filespace multidimensional cube contains client information information related to Tivoli Storage Manager clients.

### Parameters

The following table lists the parameter settings. The date range, message level, and Tivoli Storage Manager parameters are used to control what information is included in the cube. The performance are used to categorize Tivoli Storage Manager clients based on performance.

**Table 8: Parameters for Client Filespace Cube**

Parameter Name	Type	Default Values
Last client backup date threshold	Range	<b>OK:</b> Filespaces that have been backed up within the last day <b>Warning:</b> Filespaces that have been backed up between 1 and 7 days <b>Critical:</b> Filespaces that have not been backed up for more than 7days

## Topics and Views for Event Analysis

Under topics and views for event analysis, 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.clients. This information is used to identify Tivoli Storage Manager client problems that require attention. Both summary information and specific error information is provided

**Table 9: Daily Exception Reports**

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

### 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 10: Important Messages**

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

### 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 11: Improving Storage Health**

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

## When Do I Find the Most Problems?

**Hints:** This topic will help you detect patterns in error activity that is 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 12: When Do I See the Most Problems?**

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

## Trends in Client Operations

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

**Table 13: Trends in Client Operations**

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

## 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 14: Trends in Server Operations**

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

## 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 15: What Does my Environment Look Like?**

View Title	Report Title	Data Source (cube)
How many clients are registered with each server?	TSM_c li003.ppr	Client Information
Which software levels do clients use?	TSM_c li004.ppr	Client Information
Which platforms do clients use?	TSM_c li005.ppr	Client Information

## Topics and Views for Performance Analysis

Under topics and views for performance analysis, Storage Management Analysis provides the following 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 16: How Are My Clients Performing?**

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

## 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 17: How Are My Servers Performing?**

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

## 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 18: How Does File Size Affect My Performance?**

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

## 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 19: How Does Time of Day and Week Affect My Performance?**

View Title	Report Title	Data Source (cube)
What is the average daily throughput for client operations?	TSM_clb002.ppr	Client Bytes Processed
What is the average hourly throughput for client operations?	TSM_clb003.ppr	Client Bytes Processed
What is the average hourly throughput for server operations?	TSM_srvb001.ppr	Server Bytes Processed
How does time of day affect client session activity?	TSM_clb004.ppr	Client Bytes Processed

## Prerequisite and Related Documents

Refer to the following TDS 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 TDS 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).