

# Tamino

## Tamino Manager User Documentation

Version 9.7

April 2015

This document applies to Tamino Version 9.7.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

Copyright © 1999-2015 Software AG, Darmstadt, Germany and/or Software AG USA, Inc., Reston, VA, USA, and/or its subsidiaries and/or its affiliates and/or their licensors.

The name Software AG and all Software AG product names are either trademarks or registered trademarks of Software AG and/or Software AG USA, Inc. and/or its subsidiaries and/or its affiliates and/or their licensors. Other company and product names mentioned herein may be trademarks of their respective owners.

Detailed information on trademarks and patents owned by Software AG and/or its subsidiaries is located at <http://softwareag.com/licenses>.

Use of this software is subject to adherence to Software AG's licensing conditions and terms. These terms are part of the product documentation, located at <http://softwareag.com/licenses/> and/or in the root installation directory of the licensed product(s).

This software may include portions of third-party products. For third-party copyright notices, license terms, additional rights or restrictions, please refer to "License Texts, Copyright Notices and Disclaimers of Third-Party Products". For certain specific third-party license restrictions, please refer to section E of the Legal Notices available under "License Terms and Conditions for Use of Software AG Products / Copyright and Trademark Notices of Software AG Products". These documents are part of the product documentation, located at <http://softwareag.com/licenses> and/or in the root installation directory of the licensed product(s).

Use, reproduction, transfer, publication or disclosure is prohibited except as specifically provided for in your License Agreement with Software AG.

**Document ID: INS-MANAGER-97-20160318**

## Table of Contents

Tamino Manager .....	vii
I .....	1
1 Introduction to the Tamino Manager .....	3
General Overview .....	4
Graphical User Interface Concepts .....	5
2 Using the Tamino Manager .....	11
3 Administration of Database Locations .....	13
Display Available Database Locations .....	14
Protecting Database Locations (Windows) .....	14
Add a new Database Location .....	16
Rename a Database Location .....	17
Delete Database Location .....	18
Information about a Database Location .....	19
Move a Database Location .....	19
Define a Default Location .....	21
Define a Default Backup Location .....	21
Modify Location Settings .....	22
II Database Administration Functions .....	25
4 Create a Database .....	27
5 Display Information about a Database .....	35
Database Status .....	36
Database Activity .....	37
Space Usage .....	39
Current Requests .....	40
6 Start a Database .....	41
7 Stop a Database .....	43
8 Delete a Database .....	45
9 Rename a Database .....	47
10 Set the Version of a Database .....	49
11 Check and Repair a Database .....	51
12 Prepare a Database for CD .....	53
13 Register a CD Database .....	55
14 Unregister a CD Database .....	57
15 Set the Range of Port Numbers .....	59
16 Replicate a Database .....	63
Creating a Replication Database .....	64
Adding/removing a Replication Database Name .....	64
Setting a Replication Database .....	65
Resetting a Replication Database .....	66
Replication Management .....	67
17 Add Database Space .....	69
18 Move Database Space .....	71
19 Expand a Database Space .....	73

20 Delete a Database Space .....	75
21 Modify the Journal Space .....	77
22 View the Log Spaces .....	79
23 Switch the Log Space .....	81
24 Back up a Database .....	83
Backing up a Database to Disk or Tape .....	85
Backing up a Database using an External Backup Environment .....	88
Using Backup Generations .....	89
25 Define an External Backup Method .....	91
Adding and deleting a Backup Method .....	92
Modifying Parameters and adding Configurations .....	94
26 Restore a Database from a Backup .....	99
General Procedure .....	100
Considerations for Restoring a Database .....	102
27 Delete Backup .....	103
General Procedure .....	104
Considerations for Deleting a Backup .....	104
28 Display Information about a Backup File .....	105
29 Create a Database from a Backup .....	107
30 Display/Modify Database Properties .....	117
Server Properties .....	118
XML Properties .....	122
Port Properties .....	126
X-Tension Properties .....	128
Displaying and Modifying Database Properties .....	128
31 Assign/Delete Web Server Settings .....	131
III .....	133
32 Job Monitoring Functions .....	135
The Job Log .....	136
Displaying Job Monitor Information .....	137
Confirming Pending Alerts .....	137
Deleting Job Records .....	138
33 Administration of Collections .....	139
34 Tamino Security .....	141
Tamino Authentication .....	142
Tamino Authorization .....	147
Security Manager .....	155
Instance-based Security .....	172
35 Version/License Management .....	179
36 Web Server Management .....	181
Displaying Known Web Servers .....	182
Add Web Server .....	182
Modify Web Server .....	183
Delete Web Server .....	184
Rename Web Server .....	185

37 Administration Considerations .....	187
Space Management .....	188
Problem Reporting .....	189
38 ARGBATCH - The System Management Hub Batch Interface .....	191
Starting ARGBATCH .....	192
Argbatch Documentation .....	192
Setting the Environment .....	193
Command Example .....	194
List of Available Commands .....	194
39 Usage Hints .....	199
Remote Administration .....	200
Index .....	201

---

---

# Tamino Manager

---

Welcome to the documentation for the Tamino Manager, the administration component for the Tamino XML Server. This document is intended for database administrators and for application developers.

This documentation contains the following sections:

- Introduction to the Tamino Manager** A general overview of the Tamino Manager, together with information about its architecture. This section also provides you with information about using special features of the graphical user interface.
- Using the Tamino Manager** A description of how to use the functions available from the graphical user interface. Informs you about database administration, Tamino security, version/license management, web server management, job monitoring, the batch interface and other administrative issues.

---

# I

---

■ 1 Introduction to the Tamino Manager .....	3
■ 2 Using the Tamino Manager .....	11
■ 3 Administration of Database Locations .....	13



# 1 Introduction to the Tamino Manager

---

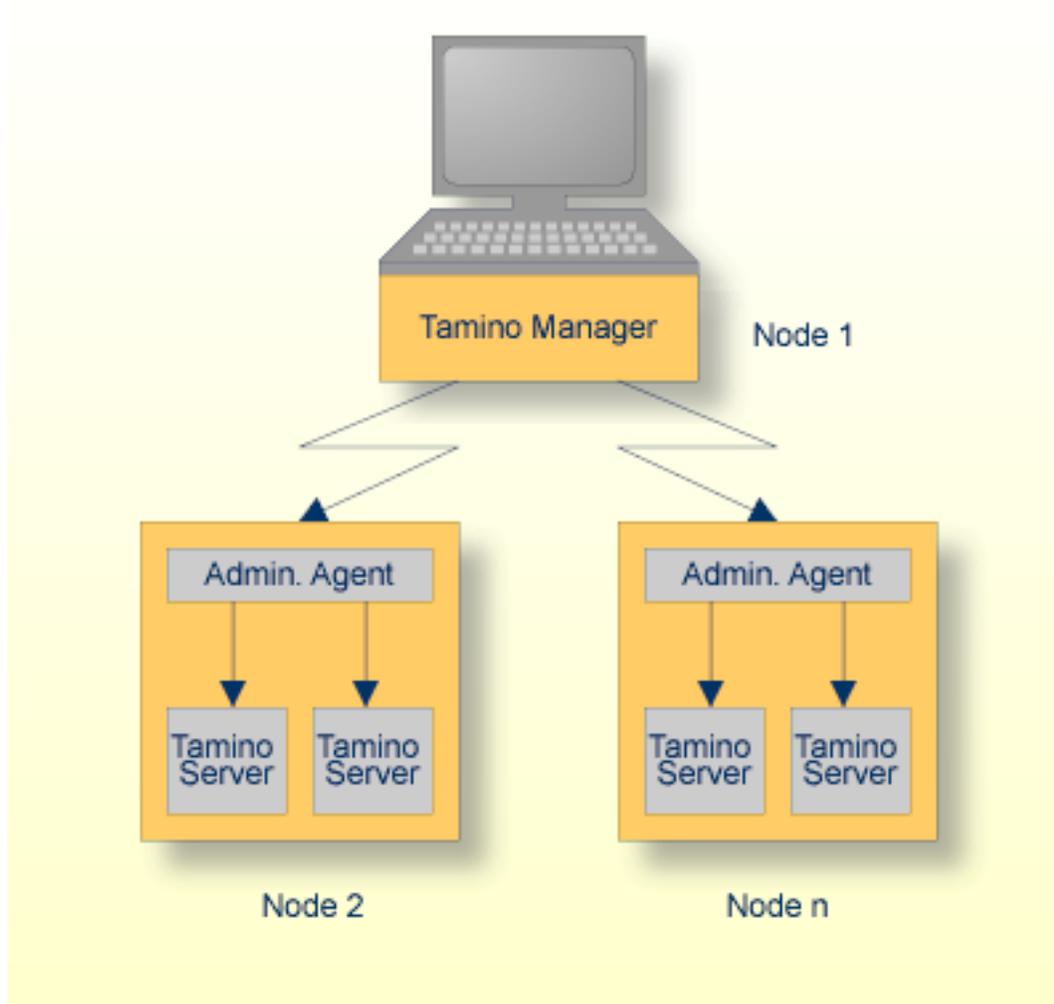
- General Overview ..... 4
- Graphical User Interface Concepts ..... 5

This section provides an introduction to the main features of the Tamino Manager. The topics covered are:

## General Overview

---

Tamino provides an administration tool that is implemented as a client-server application. The Tamino Manager is the point of central administration, and it runs in the System Management Hub, the standard, GUI-based, central point of administration for Software AG's products. The System Management Hub itself runs in a standard web browser. Please refer to the System Management Hub documentation for further information. For basic administration functions (create database, start/stop database, backup/restore database), the Tamino Manager uses the administration agent component installed on the node where the Tamino Server to be administered runs.



 **Note:** If you close the browser window in which the System Management Hub is running or switch to another URL, you will also terminate the Tamino Manager.

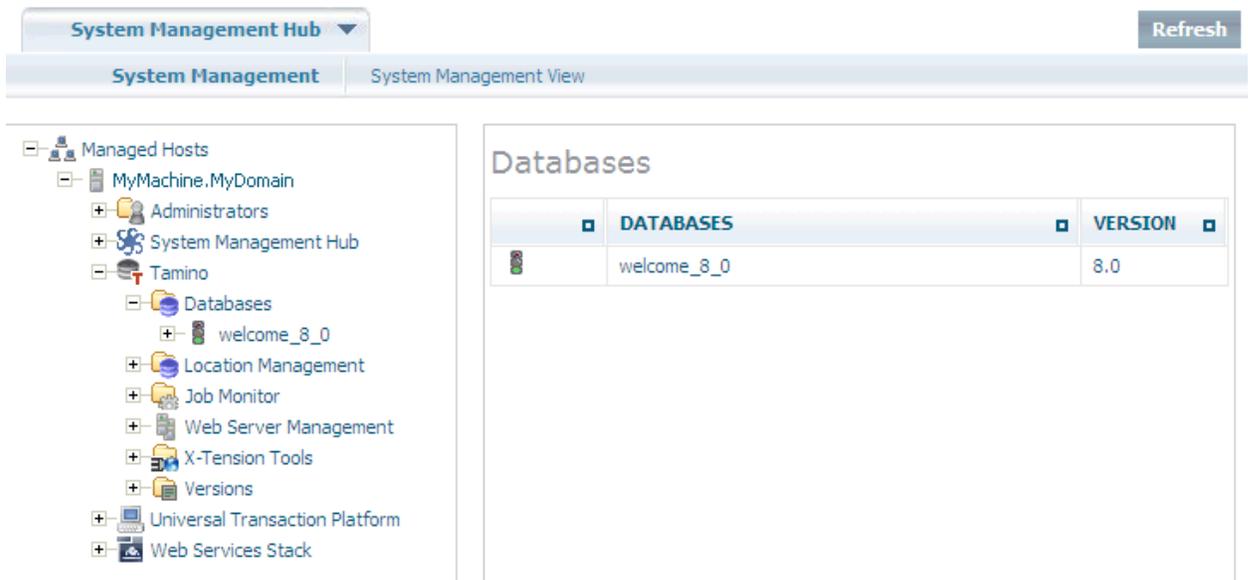
## Graphical User Interface Concepts

This section describes the following points:

- The System Management Hub window
- Tamino documentation
- Tree views
- Alerts
- The database traffic light

### The System Management Hub Window

The **System Management Hub window** is divided into two parts: a navigation/tree-view frame (left) and a display/detail-view frame (right) that is used to display details of selected objects or to accept user input. The following image shows an example of the **System Management Hub window** with the Tamino Manager running.



The screenshot shows the System Management Hub interface. At the top, there is a header bar with "System Management Hub" on the left and a "Refresh" button on the right. Below the header, there are two tabs: "System Management" (selected) and "System Management View".

The main area is split into two panes. The left pane shows a tree view under "Managed Hosts" with the following structure:

- Managed Hosts
  - MyMachine.MyDomain
    - Administrators
    - System Management Hub
    - Tamino
      - Databases
        - welcome\_8\_0
      - Location Management
      - Job Monitor
      - Web Server Management
      - X-Tension Tools
      - Versions
    - Universal Transaction Platform
    - Web Services Stack

The right pane is titled "Databases" and contains a table with the following data:

	DATABASES	VERSION
	welcome_8_0	8.0

To change the size of either of the parts, move the mouse pointer over the border separating the parts until the pointer changes, showing two arrows that point in opposite directions. Then drag the border using the mouse until the parts have the required sizes.

Commands can be issued using the context menu. The availability of commands depends on the object you select from the tree frame and on the current status of that object. Only those commands that are available for the selected object are displayed. If you select another object, the contents of the context menu will be refreshed accordingly.

Tables that are displayed in the display/detail-view frame can be sorted using the small triangles in the table header. If you select the upper triangle, you will get an ascending sort order (numerically or alphabetically); if you select the lower triangle, you will get a descending sort order in the table display. (Note that this feature is not available if you use Mozilla as your standard browser.)



**Notes:**

1. When you logon to the Tamino Manager, you must use the user ID and password combination that is allowed as Tamino Administrator. The user ID can take the form domain/userID (Windows: domain\userID), where domain is the domain name within your local network and userID is your user ID.
2. The Tamino Manager shares the System Management Hub with other Software AG products, some of which may be installed together with Tamino or which may already be installed on your system. These products have their own documentation.

### **Keyboard Navigation in the System Management Hub Window**

You can use some of the keys on your keyboard to navigate within and between the two frames of the System Management Hub.

- Use the **TAB** key to move from one frame to another.
- Use the following keys to navigate within a tree:
  - **Cursor up** key: move up to the next object.
  - **Cursor down** key: move down to the next object.
  - **Cursor right** key: open a sublevel in the tree.
  - **Cursor left** key: close a sublevel in the tree.
- In the detail frame, use the **TAB** key to move from one input field or command button to the next input field or command button.

## Tree Views

In the tree-view frame, you can expand or collapse the tree structure by clicking on the plus (+) or minus (-) sign in front of an object. You can single-click on an object to select it - in this case, details about this object are displayed in the detail-view frame, but the object is not expanded (on the other hand, expanding an object does not select it).

### ➤ To refresh the display

- Choose **Refresh** from the context menu to refresh the contents of the tree-view frame. The **Refresh** command updates the selected node or object in the tree-view. Depending on the selected object, the parent and child nodes are also updated. To refresh the detail view frame, click on the selected tree-view object again. The **Refresh** command is always available.



**Caution:** you must not use the browser's **Refresh** button to refresh the display - this will close your session.

## Alerts

Alerts are issued if errors or other events are encountered while processing a job. There are four levels of severity:

Icon	Severity
	Warning
	Error
	Fatal
	Information only

Alerts are acknowledged using the Job Monitor. Please refer to the section [Confirming Pending Alerts](#) for further information.

## Database Traffic Light

The status of the database is indicated by a traffic light icon. The traffic light can take one of the following states:

Color	Meaning
Red 	The database is stopped (inactive).
Yellow 	The database is in standby mode (active, but no user transactions accepted), or it is an active replication database.
Green 	The database is running (active).

### Tamino Icons

The following table shows the icons that are used in the Tamino Manager, together with their meaning. For convenience, the icons are grouped according to where they occur.

Icon	Meaning
<b>Tamino Root</b>	
	Tamino root node
<b>Tamino Databases</b>	
	Folder for Tamino databases
	Active Tamino database
	Inactive Tamino database
	Standby Tamino database or an active replication database
<b>Collections/Schemata</b>	
	Folder for collections
	Single schema
	Folder for schemata
	Folder for TSD2 collections
	Folder for TSD3 collections
	Single TSD2 schema
	Single TSD3 schema
	Doctype of schema
<b>Job Monitor</b>	
	Folder for jobs
	Folder for completed jobs
	Single completed job
	Folder for running jobs
	Single running job
	Folder for suspended jobs

Icon	Meaning
	Single suspended job
	Folder for pending alerts
	Single pending alert
<b>Database Properties</b>	
	Database properties
	Database server properties
	Database XML properties
	Database port properties
<b>Database Locations</b>	
	Folder for database locations
	Database log locations
	Database log archive locations
	Database temporary working locations
	Database reserved locations
	Database backup locations
	Tape or pipe
	Default tape or pipe
	Backup tape or pipe
	Default backup tape or pipe
	Disk
	Default disk
	Backup disk
	Default backup disk
<b>Server Extensions</b>	
	Folder for server extensions
	Server extension consisting of several objects
	Server extension containing several parameters
	Parameter of a server extension
	Function which cannot be used as a server extension function
	Event handling of a server extension
	Map in of a document
	Map out of a document

Icon	Meaning
	Deletion of a document
	Query function
<b>Database Spaces</b>	
	Folder for database spaces
<b>Database Information</b>	
	Database information
	Database activity
	Database space usage
	Database log usage
<b>Database Backup</b>	
	Folder for backups
	Single backup
	Incremental backup
<b>Collections</b>	
	Collections
<b>Web Servers</b>	
	Folder for web servers
	Single web server
<b>Tamino Security Manager</b>	
	Tamino security manager
	Folder of Tamino security users
	Folder of Tamino security user groups
	Folder of Tamino security access control lists
	Single Tamino security user
	Single Tamino security group
	Single Tamino security access control list
<b>Replication Management</b>	
	Replication management

## 2 Using the Tamino Manager

---

This section describes the administration of the Tamino environment using the Tamino Manager and provides an overview of the functions you can perform. These functions are divided into the following categories:

- **Administration of database locations**
- **Database administration functions**
- **Job monitoring functions**
- **Collections administration**
- **Tamino security**
- **Version/license management**
- **Web server management**
- **Administration considerations**
- **ARGBATC - The System Management Hub Batch Interface**
- **Usage Hints**



# 3 Administration of Database Locations

---

- Display Available Database Locations ..... 14
- Protecting Database Locations (Windows) ..... 14
- Add a new Database Location ..... 16
- Rename a Database Location ..... 17
- Delete Database Location ..... 18
- Information about a Database Location ..... 19
- Move a Database Location ..... 19
- Define a Default Location ..... 21
- Define a Default Backup Location ..... 21
- Modify Location Settings ..... 22

In order to specify physical storage on a node, the Tamino Manager uses the concept of database locations. Database locations define where the Tamino database spaces are stored. The Tamino Manager maps these database locations (which can also be thought of as logical names) to physical location paths.

Let us suppose that a database administrator has a directory called *C:\Tamino Database Locations\Backups\mydbbackup*, in which he plans to store backup copies of his database *mydb*. Using the **Locations** object, he can assign the database location name of *mydbBackup* to this directory. Once this has been done, he can administrate the files via the location name without having to remember where they are physically located.

The Tamino Manager also uses a default location: this is the location in which database spaces will automatically be created if you do not specify other locations when creating a new database. The initial setting uses a location as default location which is created during installation.

The Tamino Manager provides you with the following functions to administer and manage database locations:

## Display Available Database Locations

---

### » To display available database locations

- Select the **Location Management** object. A table with information about the available database locations is listed in the detail-view frame.

**Location Name** shows the name of the location, and **Location Path** where it resides in the file system. **Location Size** shows the size which is used by Tamino database spaces on this location. Other files may reside in this location (external to Tamino or files that are not database spaces). **Location Free** shows the total amount of space that is free on the physical volume (shared by locations). If, however, there is more than one location on the same disk, more free space might be shown than really exists.

## Protecting Database Locations (Windows)

---



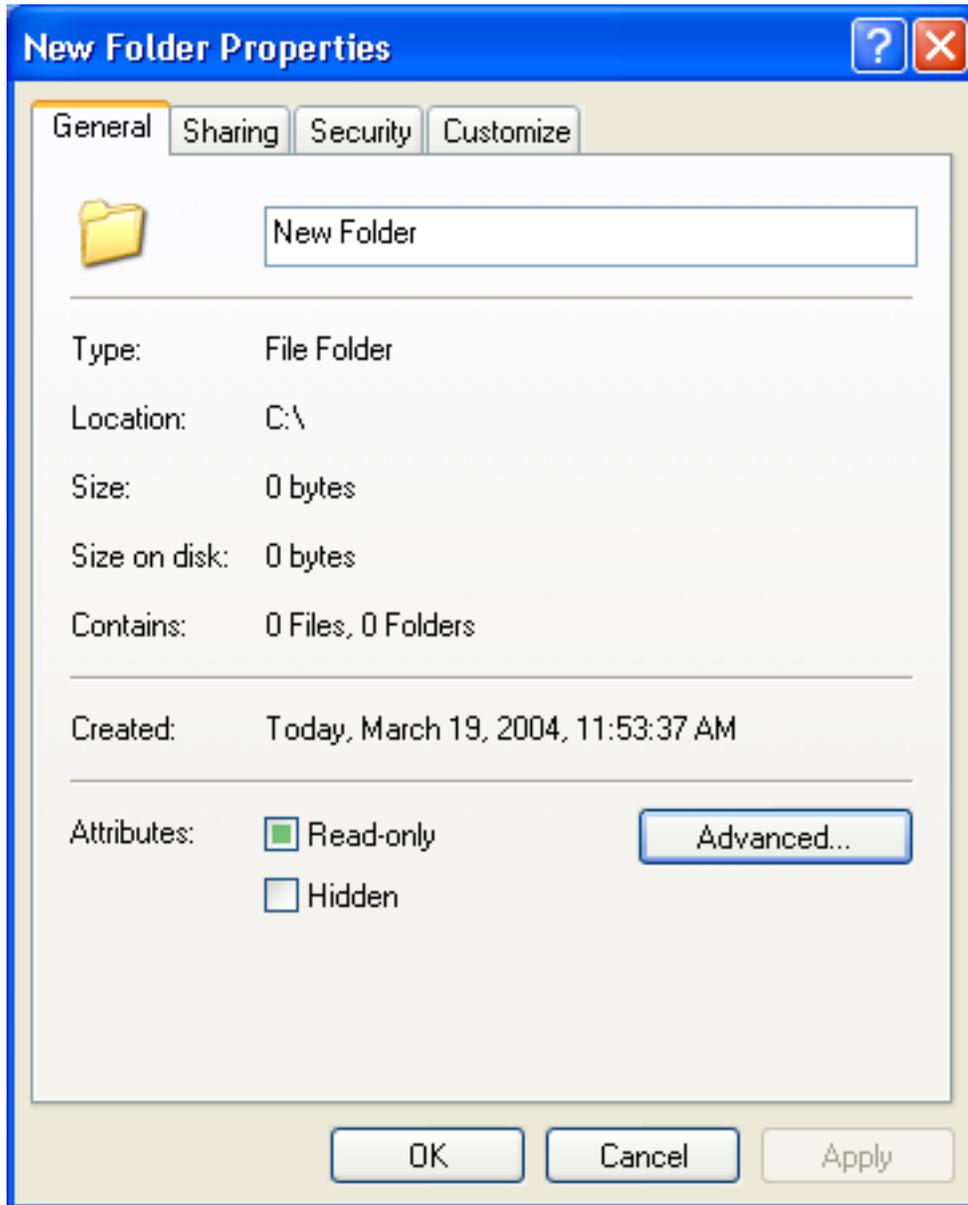
**Note:** The following functionality is only available on Windows systems.

You can protect your database locations with the help of the Windows file system. The recommended procedure is to create a folder in the NTFS file system and switch encryption on, then base new database locations on the encrypted folder.

➤ To switch encryption of a folder on

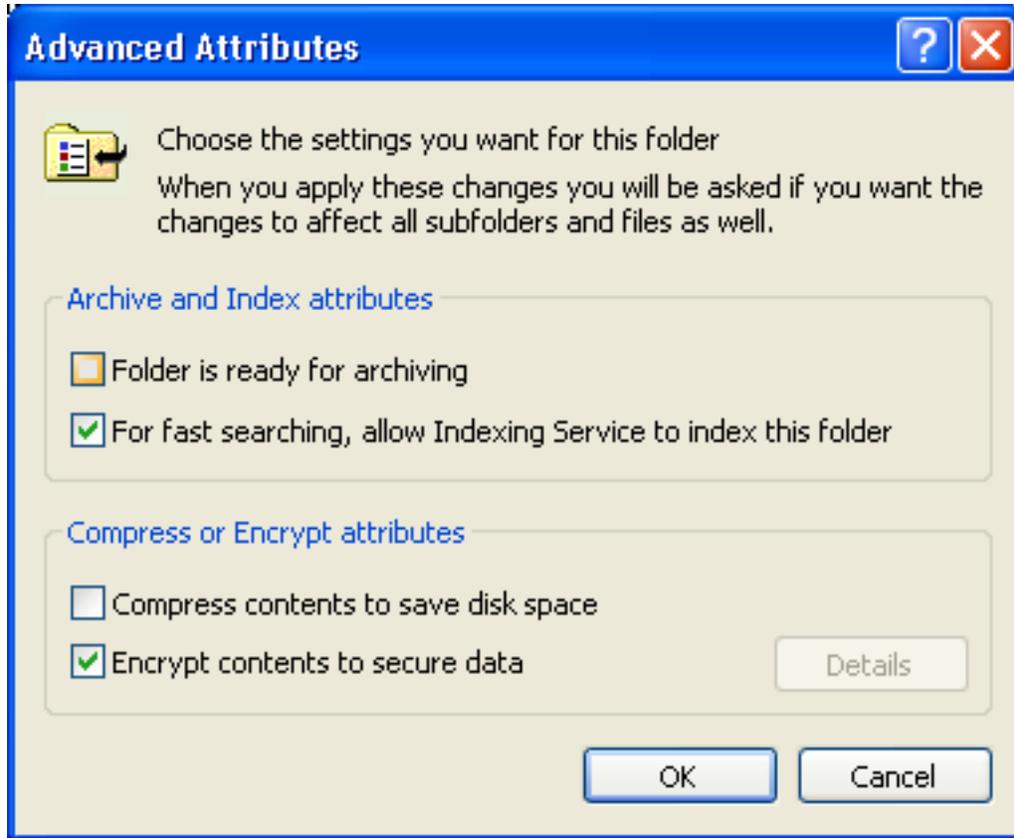
- 1 Create a folder and choose **File > Properties** (alternatively right-click on the folder and choose **Properties** from the context menu) in the Windows Explorer.

A dialog box showing the properties of the folder is displayed:



- 2 Choose the **Advanced** button.

The **Advanced Properties** dialog box is displayed:



- 3 Select the **Encrypt contents to secure data** option and choose **OK**.
- 4 Next, create a Tamino location as described in the section [Add a new Database Location](#), based on the folder you have created. When creating new databases, you can place the data, journal or index spaces to be protected in this location. You can also move database spaces from existing databases to this encrypted location, using the Tamino Manager ( see section [Move a Database Location](#)).

## Add a new Database Location

---

### ➤ To add a new database location

- 1 Select **Location Management** and choose **Add** from the context menu. The **Add Location** page appears.

- 2 Select the type for the new database location from the **Location Type** drop-down list box. Available location types are the file system, tapes, or - depending on your system - named pipes and raw devices. Network drives are defined in the System Management Hub. For detailed information about network drives in the System Management Hub, see the description of Network Drives in the section *Control Panel Package* of the System Management Hub documentation.
- 3 Choose **Browse** to display/select the available devices and directories on which the new location can be created, or enter the full path name of the new location in the **Location Path** dialog box. If the specified path does not exist, it will be created.
- 4 Enter the name of the new database location in the **Location Name** text box.
- 5 Choose **OK** to create the new database location.



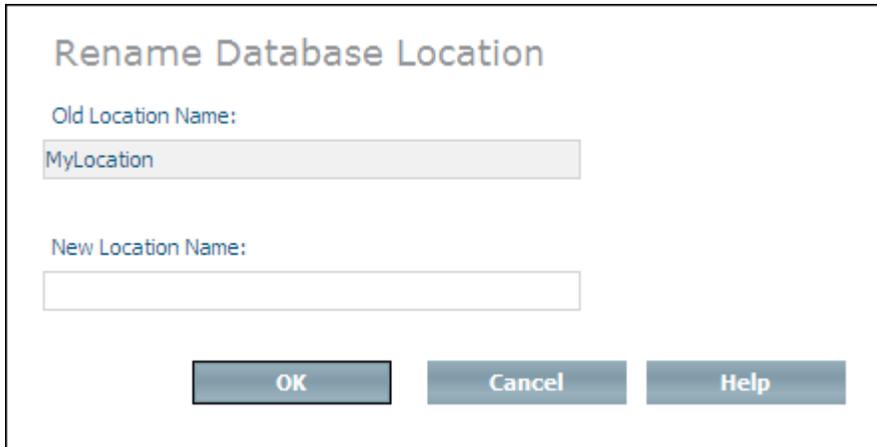
**Note:** Database locations cannot be allocated in folders which have the Windows compressed attribute set.

## Rename a Database Location

---

### ➤ To rename a database location

- 1 Expand the node **Location Management**.
- 2 Select the database location that you want to rename and choose **Rename** from the context menu. The **Rename Database Location** page appears.



**Rename Database Location**

Old Location Name:  
MyLocation

New Location Name:

OK Cancel Help

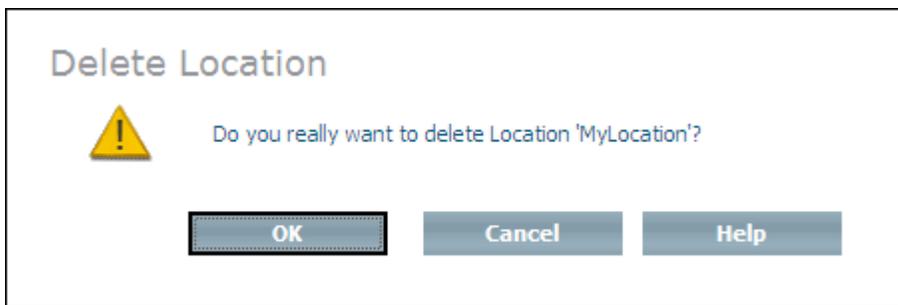
- 3 Enter the new name in the text field **New Location Name** and choose **OK** to rename the database location.

## Delete Database Location

---

➤ **To delete a database location**

- 1 Expand the node **Location Management**.
- 2 Select the database location that you want to delete and choose **Delete** from the context menu. The **Delete Location** page appears.



**Delete Location**

! Do you really want to delete Location 'MyLocation'?

OK Cancel Help

- 3 Choose **OK** to delete the database location.



**Note:** A database location can only be deleted if it is empty. A database location is empty if no database spaces are displayed in its detail view, and if it is no longer used in any database-specific location settings (e.g. log location). Deleting a database location does not delete its directory or any files in that directory that are not associated with Tamino.

## Information about a Database Location

### ➤ To display information about a database location

- 1 Expand the node **Location Management**.
- 2 Select the database location for which you want information to be displayed.

The information displayed includes for each space that resides on this location the database name, the space name, and - if applicable - the timestamp information, the session number, and the size of the space.

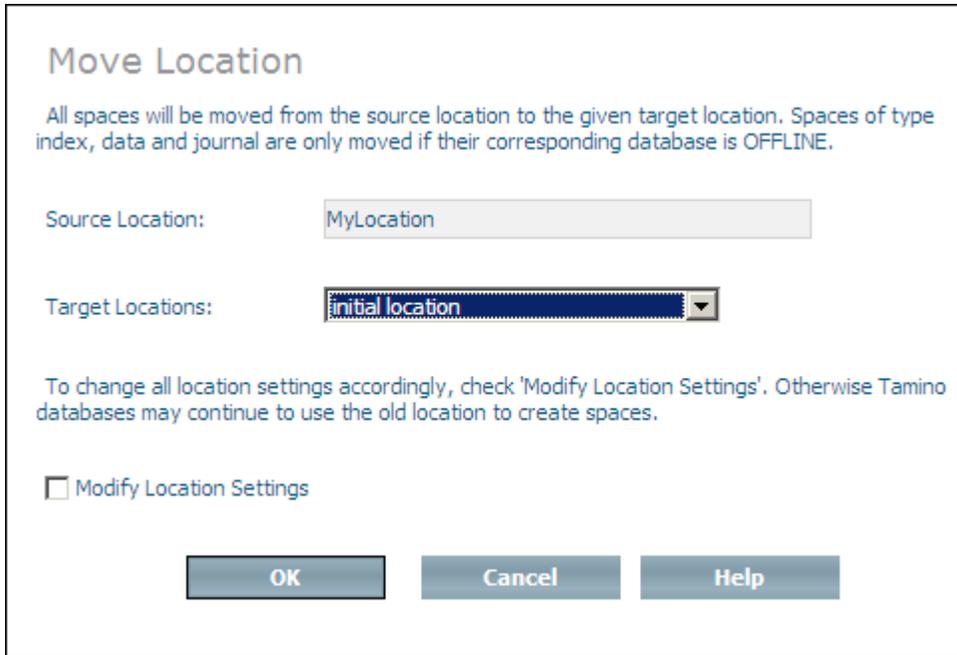
Location Details					
□	DATABASE NAME □	SPACE NAME □	SAVEPOINT □	SESSION □	SIZE □
	welcome_8_0	index space 1	-	-	8.89 MB
	welcome_8_0	data space 1	-	-	10.00 MB
	welcome_8_0	journal space 1	-	-	10.00 MB
	welcome_8_0	temporary working space 1	-	-	9.00 MB
	welcome_8_0	log space 1	Initial	2	315.77 KB
	welcome_8_0	log space 1	Initial	3	5.10 KB
	welcome_8_0	log space 1	Initial	4	0.27 KB

## Move a Database Location

Moving a database location moves all of the spaces from the selected location to another defined database location. Data, index and journal spaces can only be moved if the associated database is offline. The location will continue to exist after moving.

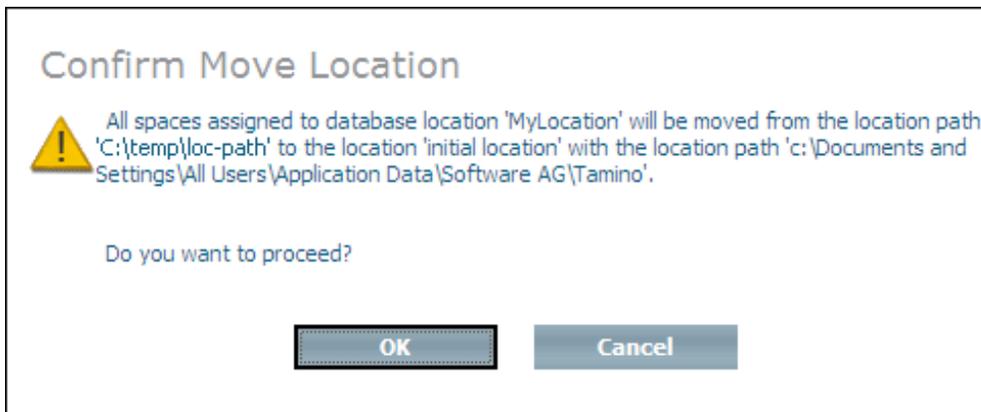
### ➤ To move a database location

- 1 Expand the node **Location Management**.
- 2 Select the database location that you want to move and choose **Move** from the context menu. The **Move Location** page appears.



- 3 Select the location that you want to move the spaces to from the **Target Location** drop-down list box.
- 4 If you check the **Modify Location Settings** check box, the location settings of databases that point to the source location are modified to point to the new target location.

You are asked to confirm the move by choosing **OK** on the **Confirm Move Location** page. This saves you having to modify the location settings for each database individually with the **Modify** command.



- 5 Choose **OK** to move the location.

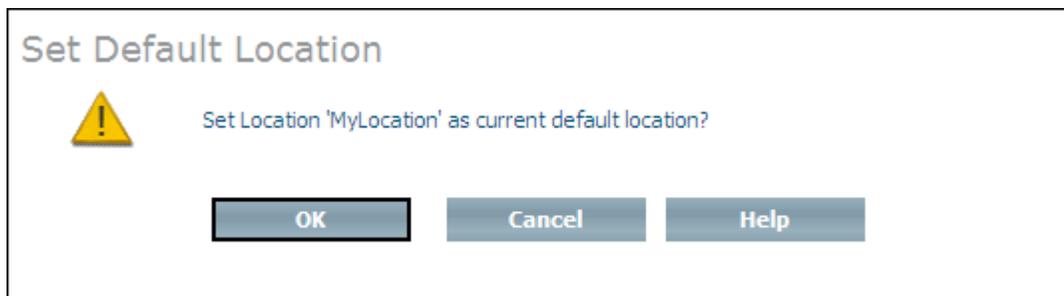
## Define a Default Location

---

By default, Tamino creates database spaces in the default location specified during the installation. You can, however, define an existing location to be the default location in which new databases will automatically be created if you do not specify other locations when you create a new database.

### ➤ To define a default location

- 1 Select the database location that you want to use as the default location and choose **Set Default** from the context menu. The **Set Default Location** page appears.



- 2 Choose **OK** to define the new default location.

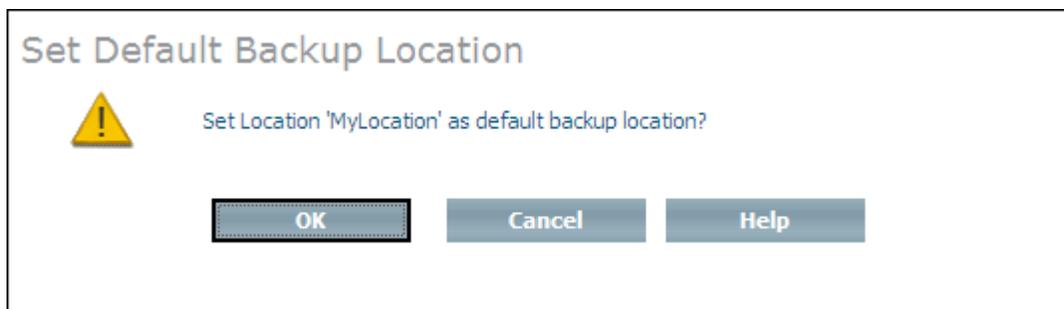
## Define a Default Backup Location

---

You can use the Tamino Manager to define a location in which backup files will be stored. This definition is used as default for the backup location when you create a database.

### ➤ To define a default backup location

- 1 Select the database location that you want to use as the default backup location and choose **Set Default Backup** from the context menu. The **Set Default Backup Location** page appears.



- 2 Choose **OK** to define the new default backup location.

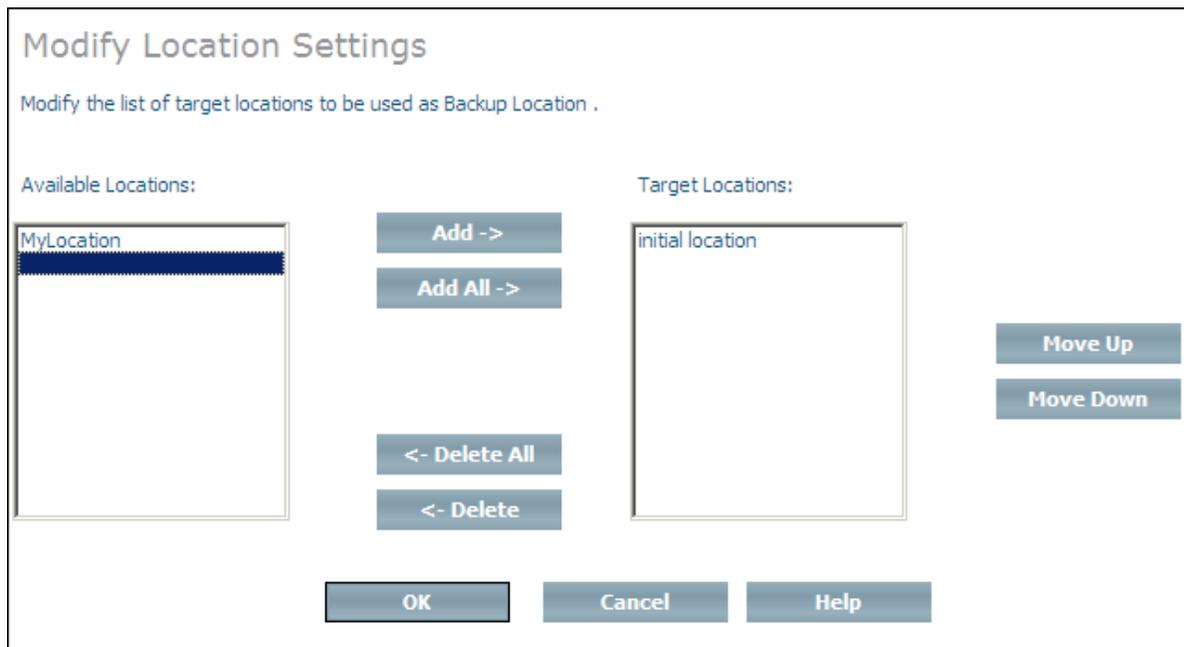
## Modify Location Settings

The Modify command can be used to change the location settings of a database. The database can be either active or inactive.

This command may be useful if you create a database without specifying any given locations, or if you have not defined any database locations before creating the database - in this case, the default locations will be used.

### » To modify location settings

- 1 Expand the database whose location settings you want to modify.
- 2 Expand the object **Locations** and select the location you want modify. The current setting is shown in the display frame.
- 3 Choose **Modify** from the context menu. The **Modify Location Settings** page appears.



- 4 Select a new database location from the list of available locations and choose **Add** to add it to the list of target locations, or choose **Add All** to add all available database locations to the list of target locations. If you add more than one location, they will be used in the same order as in the list. If you add a database location to the list of target locations by mistake, you can remove it from the list by selecting it and choosing **Delete**, or choose **Delete All** to remove

all target locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

- 5 Choose **OK** to modify the location settings.



# II Database Administration Functions

---

The following database administration functions are available:

- Create a database
- Display information about a database
- Start a database
- Stop a database
- Delete a database
- Rename a database
- Set the version of a database
- Check and repair a database
- Prepare a database for copying to CD
- Register a CD database
- Unregister a CD database
- Set the range of port numbers
- Replicate a database
- Add database space
- Move database space
- Expand a database space
- Delete a database space
- Modify the journal space
- View the log spaces
- Switch the log space
- Back up a database
- Define an external backup method
- Restore a database from a backup
- Delete a database backup space
- Display information about a backup file

[Create a database from a backup](#)

[Display/Modify database properties](#)

[Assign/delete web server settings](#)

# 4 Create a Database

---

## ➤ To create a database

- 1 Select **Databases** and choose **Create Database** from the context menu. If you have more than one version of Tamino installed, you must first select from the drop-down list box the version of Tamino to use for creating the new database. Choose **OK**. The page **Define Database Name** of the **Create Database** dialog appears.

Page1

### Define Database Name

Define Database Name:

 \*

This name will identify the database in Tamino.

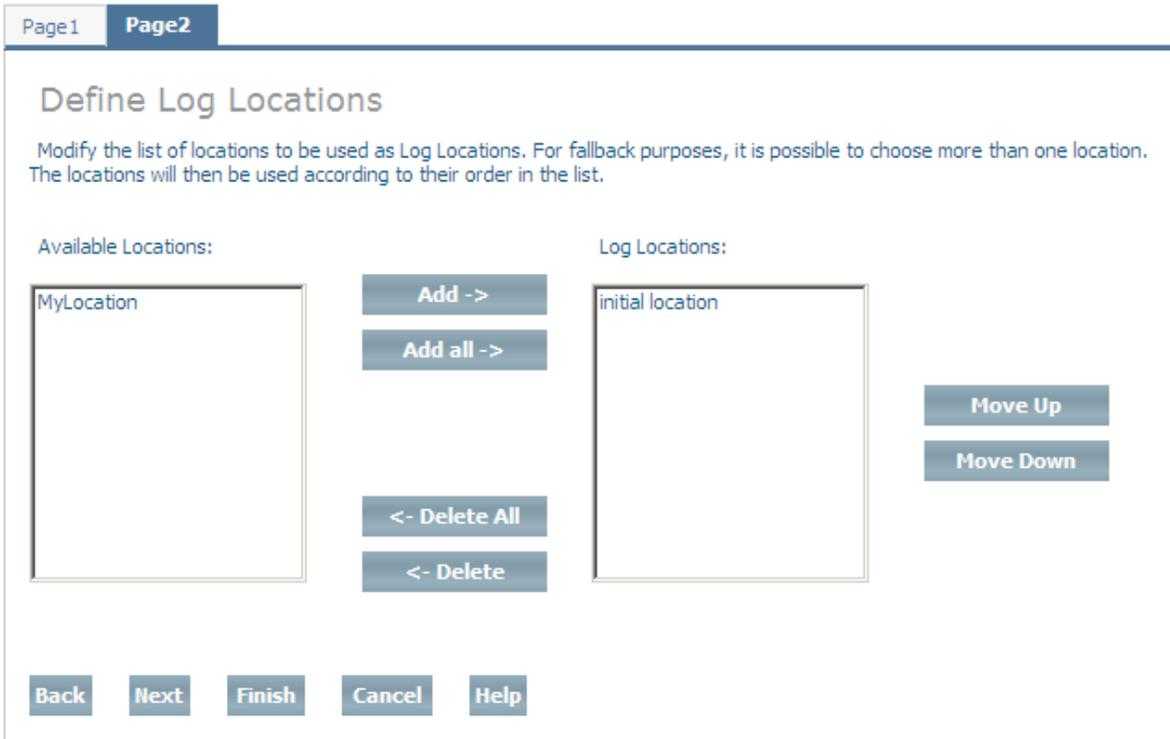
Next Finish Cancel Help

- 2 Enter the name for the database in the **Define Database Name** text field. This will be the name under which the database is known in the Tamino Manager. The database name can be up to a maximum of 32 characters in length.

 **Note:** The following characters may not be used: SPACE , ; ! \ = # . [ ] " % ' / ^ ` ? \*

 **Note:** You can choose **Finish** at any time while defining a database. If you do this, any settings you have already defined will be used, and all other settings will have their respective default values.

Choose **Next** to continue to the page **Define Log Locations**.



- 3 Define one or more log locations for the database. A log location is used to store the database log spaces. Multiple selections are possible. If you define more than one location, they will be used in the same order as in the list. In contrast to data and other locations, where the second location will only be used when the first location cannot be written to, Tamino will use the log locations alternately within a session when a log space switch occurs. When a new session is started, the first available location is used.

Select an available database location and choose **Add** to add it to the list of log locations, or choose **Add All** to add all available database locations to the list of log locations. If you add a database location to the list of log locations by mistake, you can remove it from the list by selecting it and choosing **Delete**; or choose **Delete All** to remove all log locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

Please refer to the section [Location Management](#) for further information about database locations.

When you have defined all of the log locations that you want, choose **Next** to continue to the page **Define Log Archive Locations**.

Page1 Page2 **Page3**

## Define Log Archive Locations

Modify the list of locations to be used as Log Archive Locations. For fallback purposes, it is possible to choose more than one location. The locations will then be used according to their order in the list.

Available Locations:

MyLocation

Log Archive Locations:

Add ->

Add all ->

<- Delete All

<- Delete

Move Up

Move Down

Back Next Finish Cancel Help

- Define one or more log archive locations for the database. The database log spaces are moved to the log archive location when they are closed. Multiple selections are possible. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of log archive locations, or choose **Add All** to add all available database locations to the list of log archive locations. If you add a database location to the list of log archive locations by mistake, you can remove it from the list by selecting it and choosing **Delete**; or choose **Delete All** to remove all log archive locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

Please refer to the section [Location Management](#) for further information about database locations. If no log archive location is defined, the log spaces will remain in their log location after closing.

When you have defined all of the log archive locations that you want, choose **Next** to continue to the page **Define Temporary Working Locations**.

Page1 Page2 Page3 **Page4**

## Define Temporary Working Locations

Modify the list of locations to be used as Temporary Working Locations. For fallback purposes, it is possible to choose more than one location. The locations will then be used according to their order in the list.

Available Locations:

MyLocation

Temporary Working Locations:

Initial location

Add ->

Add all ->

<- Delete All

<- Delete

Move Up

Move Down

Back Next Finish Cancel Help

- 5 Define one or more temporary working locations for the database. Tamino uses the space in these locations to store temporary work spaces. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of temporary working locations, or choose **Add All** to add all available database locations to the list of temporary working locations. If you add a database location to the list of temporary working locations by mistake, you can remove it from the list by selecting it and choosing **Delete**; or choose **Delete All** to remove all temporary working locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

When you have defined all of the temporary working locations that you want, choose **Next** to continue to the page **Define Reserve Locations**. Please refer to the section [Location Management](#) for further information about database locations.

Page1 Page2 Page3 Page4 **Page5**

## Define Reserve Locations

Modify the list of locations to be used as Reserve Locations. For fallback purposes, it is possible to choose more than one location. The locations will then be used according to their order in the list.

Available Locations: Reserve Locations:

MyLocation

Add ->

Add all ->

initial location

Move Up

Move Down

<- Delete All

<- Delete

Back

Next

Finish

Cancel

Help

- 6 Define one or more reserved locations for the database. Reserved locations are used to store the database spaces if the assigned locations become full. In addition, information that can be used to analyze error situations is also written to the reserved location. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of reserve locations, or choose **Add All** to add all available database locations to the list of reserve locations. If you add a database location to the list of reserve locations by mistake, you can remove it from the list by selecting it and choosing **Delete**; or choose **Delete All** to remove all reserve locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

When you have defined all of the reserve locations that you want, choose **Next** to continue to the page **Define Backup Locations**. Please refer to the section [Location Management](#) for further information about database locations.

- 7 Define one or more backup locations for the database. Backup locations are used to store the backup spaces. If you define more than one location, they will be used in the same order as in the list (this does not apply to parallel backups). Select an available database location and choose **Add** to add it to the list of backup locations, or choose **Add All** to add all available database locations to the list of backup locations. If you add a database location to the list of backup locations by mistake, you can remove it from the list by selecting it and choosing **Delete**; or choose **Delete All** to remove all backup locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move** and **Move Down** buttons.

When you have defined all of the backup locations that you want, choose **Next** to continue to the page **Database Profile**. Please refer to the section [Location Management](#) for further information about database locations.

Page1 Page2 Page3 Page4 Page5 Page6 **Page7**

### Define Database Spaces

SPACE TYPE	SPACE SIZE (MB)	LOCATION
Index Space	10	initial location ▼
Data Space	20	initial location ▼
Journal Spaces	50	initial location ▼

**Back** **Finish** **Cancel** **Help**

- 8 Define the initial space size for the data, index and journal space, and the location where each space is created. The proposed location is the location that has been selected as the default location in the location management. Further index, journal and data spaces can be added after the database has been created.

When you have made all the changes (if any) that you want to make, choose Finish to create the new database.

To set database properties after creating the database please refer to [Modify Database Properties](#).



# 5 Display Information about a Database

---

- Database Status ..... 36
- Database Activity ..... 37
- Space Usage ..... 39
- Current Requests ..... 40

Having access to data about the status of a database is important for a number of reasons. These include:

- Monitoring for certain events (shortage of disk space or alerted jobs)
- Database tuning
- General overview of database status at any given moment in time

The Tamino Manager can display the following information about a database:

## Database Status

---

This displays general information about the database, including whether the database is online or offline, the settings of the most important switches, the usage levels of the important database spaces, time stamp information, the current session number and, where appropriate, the number of alerts pending for the database in question.

### ➤ To display database status information

- Expand the **Databases** object and select the database for which status information is to be displayed. The **Status of Database** page appears.

Status of Database 'welcome\_8\_0'

 ONLINE	Version 8.0		
--	-------------	--	--

Switches:

authentication:	web server	auto expand:	yes
X-Tension direct usage:	yes	autostart:	yes
X-Tension Java usage:	yes	read only:	no
X-Tension COM usage:	yes	Database on CD:	no

Usage Level:

Index Space:		8.21 MB of total 8.89 MB
Data Space:		7.94 MB of total 10.00 MB
Log Space:		0.34 MB of total 1215.05 MB
Temporary Working Space:		9.00 MB of total 1223.70 MB

Timestamps:

Created at:	Jul 10, 2008 8:40:53 AM	by:
Last Startup at:	Jul 21, 2008 9:40:20 AM	
Last Backup at:	Jul 11, 2008 1:53:45 PM	

Database Session No: 13 refreshed at: Jul 21, 2008 11:10:40 AM  
 Pending Alerts: 0

## Database Activity

This display includes information about buffer pool size and usage, the various numbers of blocks currently in use, the number of I/Os made in the current session, and buffer pool data (hit rates and flush limit).

All values shown in the display refer to the current database session.

➤ **To display database activity information**

- 1 Expand the database for which information is to be displayed.
- 2 Expand the **Information** object and select the **Database Activity** object. The **Database Activity Information** page is displayed.

The properties displayed have the following meaning:

■ **Buffer Pool Size**

The size of the internal memory cache that is used for reading and writing database blocks.

■ **Current Used Buffer Pool Size**

The amount of the buffer pool currently in use.

■ **Current Number of Index Blocks**

The number of the database's Index container blocks currently in the buffer pool.

■ **Current Number of Data Blocks**

The number of the database's Data container blocks currently in the buffer pool.

■ **Current Number of Temp Blocks**

The number of the database's Temp container blocks currently in the buffer pool.

■ **Number of Buffer Flushes**

The number of times that a buffer flush has occurred. During a buffer flush, all of the modified database blocks are written from the buffer pool back into the database's physical store. If the number of modified blocks is large, the buffer flush operation can result in a significant I/O load while it is running.

■ **Logical Reads**

The total number of database blocks that have been read from the buffer pool.

If a read request is issued for a block that is not in the buffer pool, a physical read is performed automatically to retrieve the block from the physical store. Once the block is in the buffer pool, the logical read operation can be completed, and the number of logical reads will be incremented by 1.

■ **Physical Reads**

The total number of database blocks that have been read from the physical database store. A block is only read from the physical store when it is not already in the buffer pool.

■ **Physical Writes**

The total number of database blocks that have been written to the database's physical store during the session's buffer flushes.

■ **Buffer Pool Hit Rate**

The success rate of retrieving database blocks from the buffer pool without having to perform a read from the physical store. The figure displayed is given by  $100 * (\text{logical reads} - \text{physical reads}) / (\text{logical reads})$ .

■ **Current Buffer Pool Hit Rate**

As for Buffer Pool Hit Rate, but limited to the time period between the previous and current activations of the Database Activity display in the Tamino Manager.

The first time the display is activated in the current session, the value for Current Buffer Pool Hit Rate is the same as for Buffer Pool Hit Rate.

- **Flush Limit**

The maximum allowed size of the modified database blocks in the buffer pool. When this size is reached, a buffer flush is started automatically.

- **Modified Pages in Buffer Pool**

This shows the percentage of blocks in the buffer pool that have been modified.

- **Dynamic Pool Size**

The size of the dynamic pool. The dynamic pool is a separate cache area, not part of the main buffer pool, and is used as a work area for certain operations such as sort and search operations. The dynamic pool is shared across all users of the system.

- **Current Used Dynamic Pool Size**

The amount of the dynamic pool currently in use.

- **Maximum Pool Usage**

The high-water mark of dynamic pool usage during the current session.

- **Current Number of Space Waiters**

The number of users/applications that are currently waiting for space allocation in the dynamic pool.

- **Total Number of Space Waiters**

The total number of users/applications that have waited for space allocation in the dynamic pool during the current session.

See the section [Display/Modify Database Properties](#) for information about how to change property settings

## Space Usage

---

This display includes the following information about the database spaces:

**Space Count**

The number of spaces that physically exist

**Total Size**

The sum of all allocated space of all physical spaces of a given space category

**Free Space Size**

The amount of unused space for the Index, Data and Journal spaces

**Free Location Size**

The sum of all free space of all locations assigned to a given space category

➤ **To display space usage information**

- 1 Expand the database for which information is to be displayed.

- 2 Expand the **Information** object and select the **Space Usage** object. The **Space Usage Information** page is displayed.

## Current Requests

---

The Current Request function shows the requests that are currently running against Tamino, and it allows you to stop one or all requests. The display includes the known current requests with the name of the collection, the start time, and information about the command. Select the request to be stopped, or choose the **Select All** button to select all requests. To cancel the selected request(s), choose the **Stop Selected Requests** button.

# 6 Start a Database

---

## ➤ To start a database

- Select the database you want to start and choose **Start Database** from the context menu.

The color of the traffic light next to the selected database changes from red to green when the database has been successfully started. If the database cannot be started successfully, you can find out why by looking at the job log in the Job Monitor under the category “Pending Alerts”.



**Note:** In general, you can only start a Tamino CD database on the platform on which it was created; for example, you cannot start a Tamino CD database on Solaris if the CD database was created with Tamino on Windows. This is because the format of data written to CDs generally differs from one operating system to another.

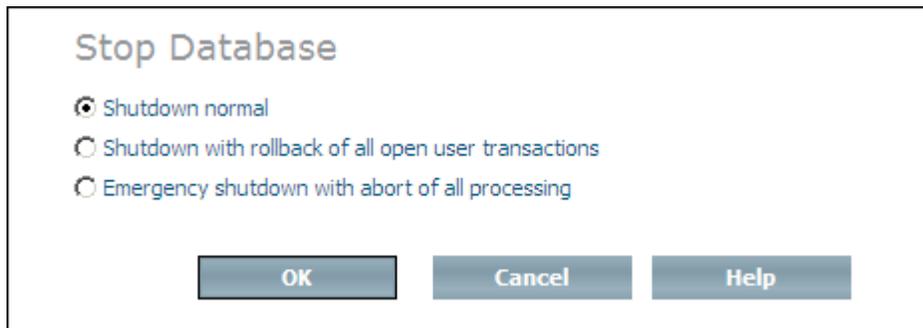


# 7 Stop a Database

---

## » To stop a database

- 1 Expand the **Databases** object.
- 2 Select the running database that you want to stop and choose **Stop Database** from the context menu. The **Stop Database** page appears.



- 3 Use the option buttons to select the termination mode for the database.

Termination Mode	Description
Shutdown normal	This option terminates the database session normally and waits for currently active user transactions to finish. The waiting time in seconds can be set with the server property Maximum Transaction Duration (see <a href="#">Server Properties</a> ).
Shutdown with rollback of all open transactions	This option terminates the database immediately. User transactions that have not finished processing are rolled back.
Emergency shutdown with abort of all open transactions	This option terminates the database session immediately. All processing is stopped immediately. Crash dump files will be written. This method will cause an autorepair the next time the database is started, and should only be used as a last resort.

- 4 Choose **OK** to stop the database. The color of the traffic light next to the selected database changes from green to red when the database has been successfully stopped.

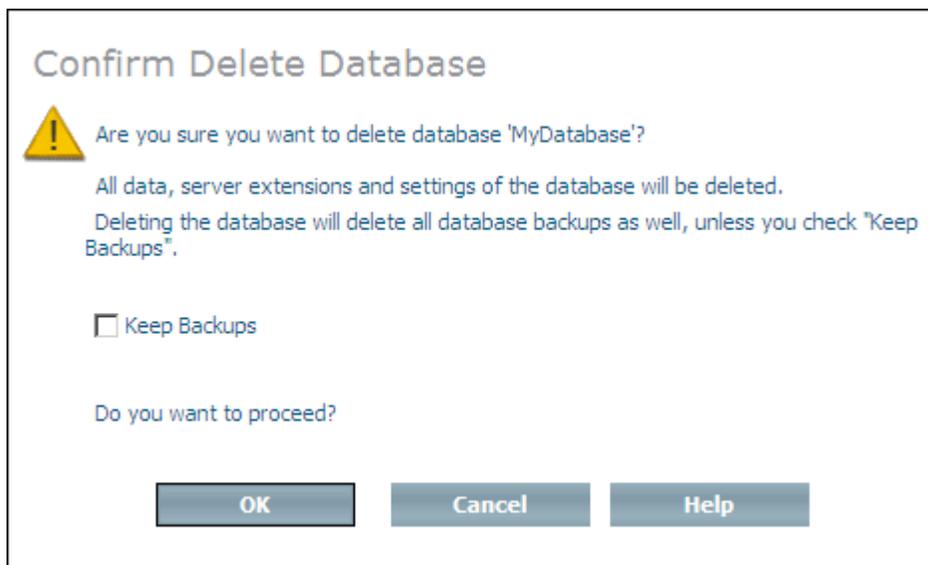
## 8 Delete a Database

---

Deleting a database consists of deleting the data, any server extensions that are installed and the settings associated with the database. A database can only be deleted if it is inactive (stopped).

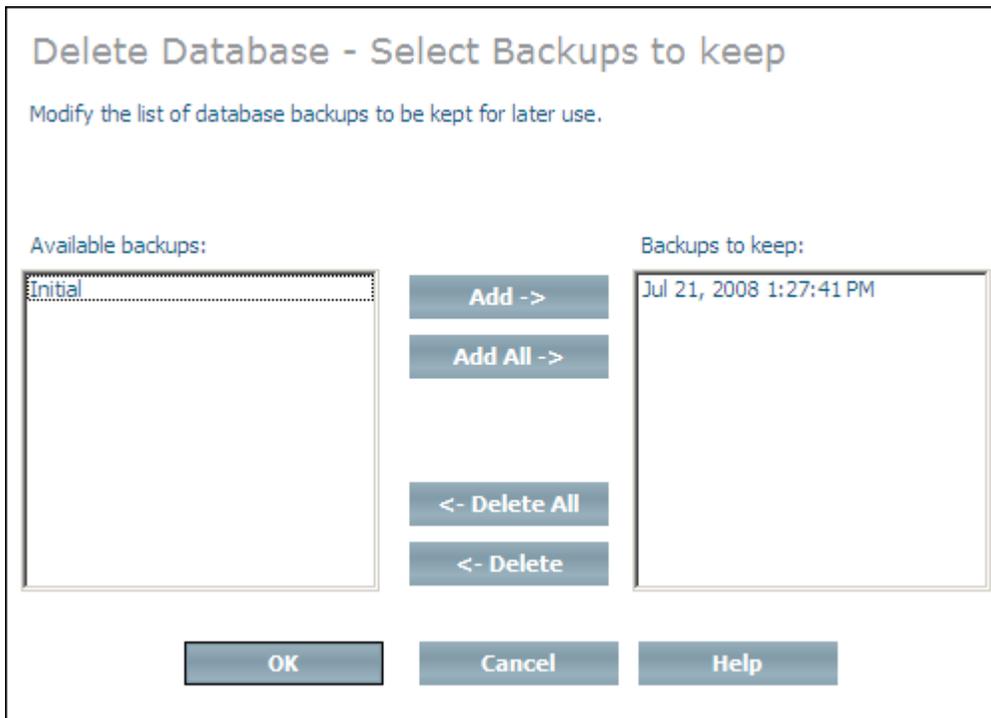
### ➤ To delete a database

- 1 Expand the **Databases** object.
- 2 Select the database that you want to delete and choose **Delete Database** from the context menu. The **Confirm Delete Database** page appears.



- 3 Choose **OK** to delete the database (if you want to delete the backups associated with the database as well), or check the **Keep Backups** checkbox if you want to keep old backup copies of the database (these backups can then be used later as input for the function **Create Database**

from Backup). In this case, choosing **OK** will display the **Delete Database - Select Backups to keep** page.



- 4 By default, the last backup made is displayed in the list of backups to keep. Add backups from the list of available backups by selecting them and choosing **Add**. Choose **Add All** to add all available backups to the list of backups to keep. Delete backups from the list of backups to keep by selecting them and choosing **Delete**. Choose **Delete All** to delete all backups from the list of backups to keep. When you have selected all of the backups that you want to keep, choose **OK**.
- 5 Choose **OK** to delete the database.



**Note:** Deleting a database does not delete any database locations.

# 9

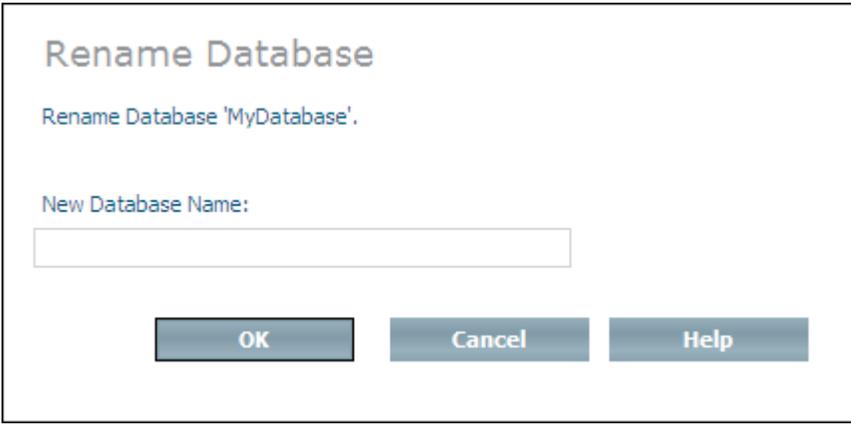
## Rename a Database

---

The Rename command is used to assign a new name to a database. The database to be renamed must be inactive (stopped).

➤ **To rename a database**

- 1 Expand the **Databases** object.
- 2 Select the database to be renamed and choose **Rename Database** from the context menu. The **Rename Database** page appears.



Rename Database

Rename Database 'MyDatabase'.

New Database Name:

OK Cancel Help

- 3 Enter the new name for the database in the **New Database Name** text field. The maximum length is 32 characters. Choose **OK** to rename the database.



**Note:** When you rename a database, the default group for security (which is usually the same as the database name) is not renamed.



# 10

## Set the Version of a Database

---

You can use the Tamino Manager to change the version of a database when you upgrade/downgrade from one version of Tamino to another. This means that databases created with earlier versions of Tamino can still be used with subsequent versions.

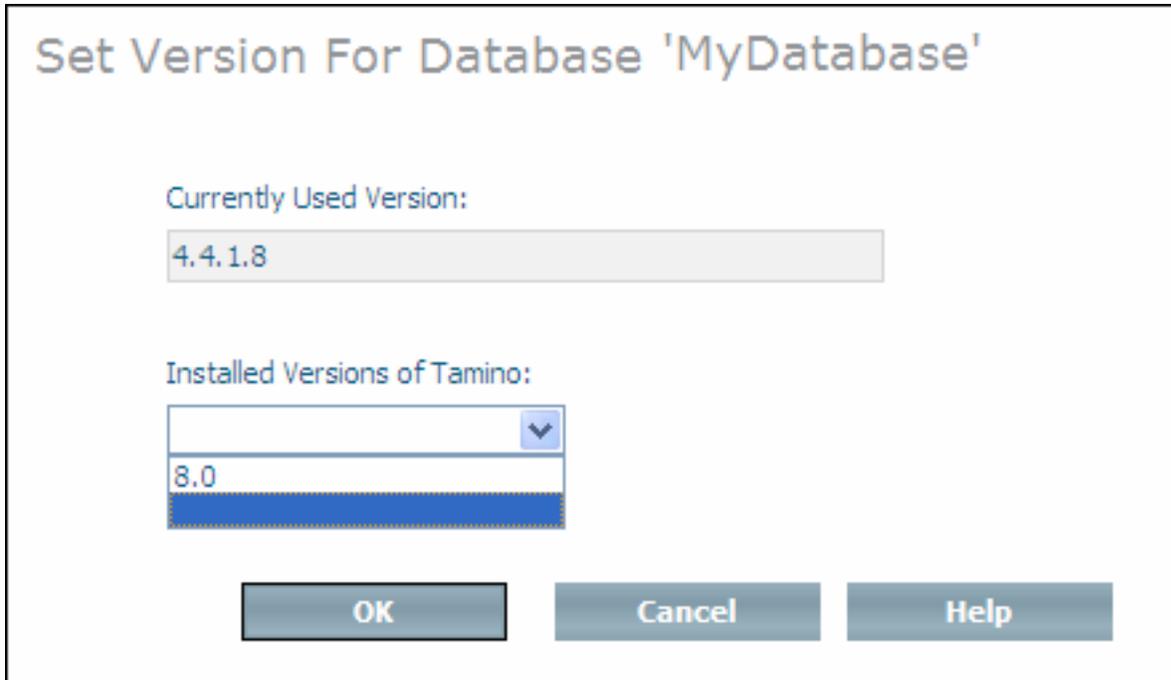
It is highly recommended only to use the **Set Version** function when the database is stopped and no other administration actions are in progress (for example, recovery). The database should generally be started immediately after **Set Version**, so that standard automatic re-initialization steps can be carried out. It is also recommended to back up a database after a successful downgrade, otherwise a complete restore/repair will no longer be possible.



**Note:** The authentication mode of the database needs to be set to "none" before a database can be upgraded via `Set Version`. For more information see section *Authentication Modes*.

### ➤ To set the version of a database

- 1 Select the database for which you want to change the version and choose **Set Version** from the context menu. The **Set Version For Database** page appears.



- 2 Open the drop-down list box **Installed Versions of Tamino**, select the version of Tamino that you want to change to and choose **OK**.

# 11 Check and Repair a Database

---

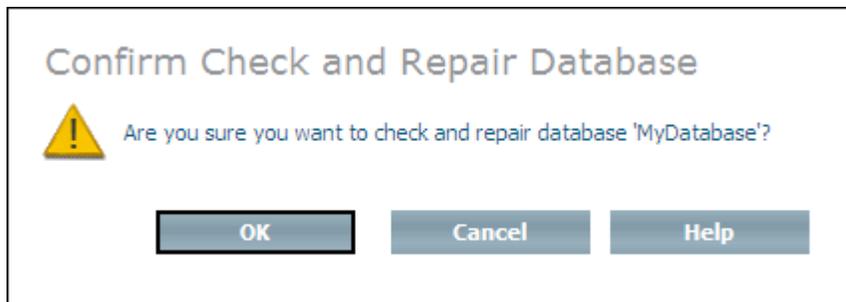
You need to check the consistency of a database only if you receive messages informing you that a database index has been disabled. The check procedure rebuilds the disabled index and deletes the old disabled copy. The database to be checked must be active (running).



**Note:** You can check the consistency of a database at any time - the check procedure does not make any changes to a valid and consistent database.

## › To check and repair a database

- 1 Expand the **Databases** object.
- 2 Select the database that you want to check and choose **Check and Repair** from the context menu. The **Confirm Check and Repair Database** page appears.



- 3 Choose **OK** to check and repair the database.



# 12 Prepare a Database for CD

---

The Prepare For CD command is used to create an image of an existing database, which can subsequently be copied to a CD-ROM for duplication and distribution to multiple recipients. The database spaces of the source database are copied to a target directory. Where appropriate, the property settings of the read-only copy of the database are the same as for the source database. The database to be prepared must be inactive (stopped).

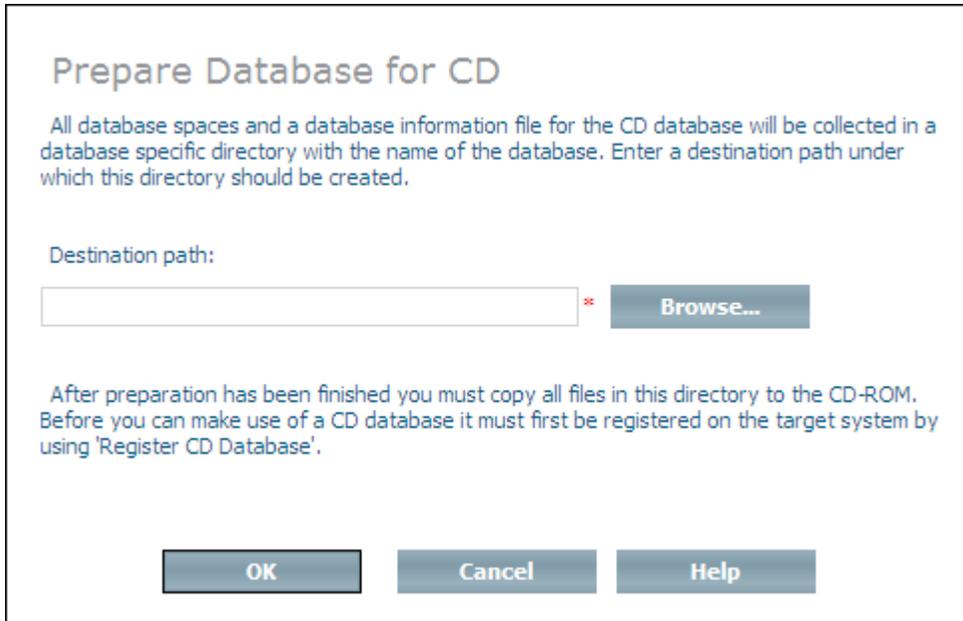


## Notes:

1. A CD database that is created on a Windows version of Tamino cannot be read by a UNIX-based version of Tamino.
2. Preparing a database may take some time and can also be space-consuming.
3. The files produced must fit onto one single CD.
4. Before creating the CD, the previous server session must have been terminated normally to guarantee database consistency.

## » To prepare a database for a CD

- 1 Expand the **Databases** object.
- 2 Select the database that you want to prepare and choose **Prepare for CD** from the context menu. The **Prepare Database for CD** page appears.



- 3 Enter the destination path name for the database container files and information file in the **Destination path** text box.

Or:

Choose **Browse** to select a drive and a directory for the destination path. Choose **OK** to return to the previous page.

- 4 Choose **OK** to prepare the database for a CD.

# 13

## Register a CD Database

---

Once a CD database has been created, it must be registered before it can be used.

➤ **To register a CD database**

- 1 Select the **Databases** object.
- 2 Choose **Register CD Database** from the context menu. The **Register CD Database** page appears.

**Register CD Database**

Register a database provided on CD-ROM for use on this system. Configuration information will be taken from the database information file (\*.1R0) stored on CD.

Enter full path of the database information file:

 \* 

Enter a path where the database can store temporary information.

Path for temporary files:

 \* 

Provide a database name under which the CD-ROM database will be registered on this system.

New Database Name

 \*

- 3 Enter the full path name of the information file \*.1R0 (including the file name).

Or:

Choose **Browse** to select the drive, the directory and the information file. Choose **OK** to return to the previous page.

- 4 Enter the full path name of a directory that will be used to store any temporary files that the CD database may require.

Or:

Choose **Browse** to select the drive and directory. Choose **OK** to return to the previous page.

- 5 Enter the name of the new database. Choose **OK** to register the CD database.



**Note:** In general, you can only start a Tamino CD database on the platform on which it was created; for example, you cannot start a Tamino CD database on Solaris if the CD database was created with Tamino on Windows. This is because the format of data written to CDs generally differs from one operating system to another.

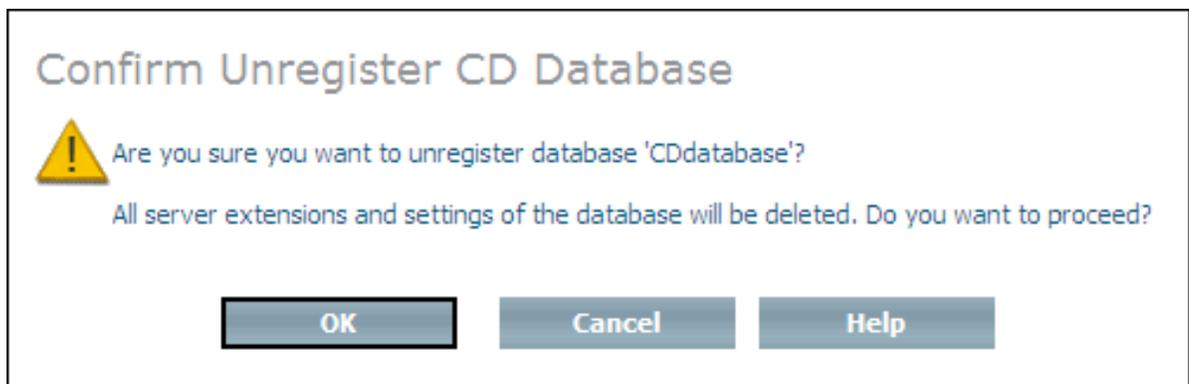
# 14 Unregister a CD Database

---

If a database is stored on a CD-ROM, it cannot be deleted in the conventional sense, but rather has to be unregistered. A CD database should always be unregistered before removing/disconnecting the storage medium it is on.

## » To unregister a CD database

- 1 Select the CD database that you want to unregister and choose **Unregister CD Database** from the context menu. The **Confirm Unregister CD Database** page appears.



- 2 Choose **OK** to unregister the CD database.



# 15

## Set the Range of Port Numbers

---

Tamino currently uses four different ports (see [Port Properties](#)):

- replication port
- administration port
- XML port
- XML XTS port
- HTTP port

Ports are either dynamically allocated by Tamino when a database is started (dynamic ports), or they can be explicitly defined (static ports) at database creation time, allowing ports outside the defined range. Ports can also be set using the Tamino Manager Database Properties before a database is started.

### Dynamic Port Allocation

To avoid port collisions, Tamino uses dynamic port allocation for the communication methods XTS, SSL, XTS and TCP/IP, or SSL and TCP/IP (see section [Server Parameters](#) for details). Dynamic port allocation means that XTS assigns the XML XTS port, the replication port and the administration port at server start up, choosing unused ports from the dynamic port range. Dynamic port allocation for the ports is used if the port number assigned to a port at database creation time is 0 (port number assignment can also be done via the Modify Property function). There is, however, no dynamic port allocation for the XML port, which handles communication via TCP/IP. XTS allocates the first free port it can find in the specified port range when the server is started, thus avoiding port collisions. Dynamic port allocation is the default for Tamino. The XML port, however, has to be explicitly defined or is allocated automatically from the static port range at database creation (or startup) time, if TCP/IP as communication method is used. Dynamic ports can differ for each database session.

### Static Port Allocation

You can also define specific ports for Tamino, using port numbers equal to or greater than 1024 and lower than 65535. Specific ports are normally expected to be assigned from the static port range defined during installation or with the **Port Range** function of the Tamino Manager, but can also be chosen from outside this range. In this case, ports from the dynamic port range are not allowed. If communication via TCP/IP is used (for the XML port) or communication method HTTP/HTTPS (for the HTTP port) and no port number is specified, a free port from the static port range is allocated automatically. Static ports remain unchanged between sessions, once they are defined.

### Dynamic and Static Port Ranges

The Tamino Manager offers the possibility to define a range of port numbers, from which Tamino chooses a port number when a database is created or started. You can set, display and modify the current range of port numbers, using **Port Range**. A port range must have at least 20 port numbers.

#### » How to set the range of port numbers

- 1 Select the **Databases** object.
- 2 Choose **Port Range** from the context menu. The **Port Range of Tamino Databases** page appears (this displays the current maximum and minimum port numbers for static and dynamic ports):

The screenshot shows a dialog box titled "Port Range of Tamino Databases". It contains two rows of input fields. The first row is for "STATIC" ports, with "STATIC MIN PORT" set to 3200 and "STATIC MAX PORT" set to 3300. The second row is for "DYNAMIC" ports, with "DYNAMIC MIN PORT" set to 3100 and "DYNAMIC MAX PORT" set to 3199. Below these fields is a checkbox labeled "Force Set Range" which is currently unchecked. At the bottom of the dialog are two buttons: "OK" and "Cancel".

Option	Installation Value	Range of Values	Description
Static Min Port	3100	1024 - 65535	The minimum number for the static port range.
Static Max Port	3166	1024 - 65535	The maximum number for the static port range.
Dynamic Min Port	3167	1024 - 65535	The minimum number for the dynamic port range.
Dynamic Max Port	3300	1024 - 65535	The maximum number for the dynamic port range.
Force Set Range	(not selected)		If the dynamic port range includes the static ports already allocated by existing databases, this options forces the dynamic range to be set, although it is possible that the existing databases, using ports from the entered dynamic range, may not be able to start.



**Note:** Port numbers from 1 - 1023 are standardized, so it is not possible to enter a range including ports smaller than 1024.

- 3 Enter the new lower limit (Min Port) and upper limit (Max Port) for the range(s) of port numbers. Choose **OK** to change the range(s) of port numbers.



# 16 Replicate a Database

---

- Creating a Replication Database ..... 64
- Adding/removing a Replication Database Name ..... 64
- Setting a Replication Database ..... 65
- Resetting a Replication Database ..... 66
- Replication Management ..... 67

The Tamino Manager contains commands that you can use to create and manage replication databases. For further information about database replication and when to use it, please refer to the chapter *Replication Guide*.

## Creating a Replication Database

---

The first step in creating a replication database is to create an exact copy (slave) of the database to be replicated (master) from the most recent backup of that database. To do so, you first have to create a database from a (non-initial) backup of your current database. For further information about creating a database from a backup, please refer to the section [Create a Database From a Backup](#).

 **Caution:** Do not start a replication database before you have performed the step [Setting a Replication Database](#)

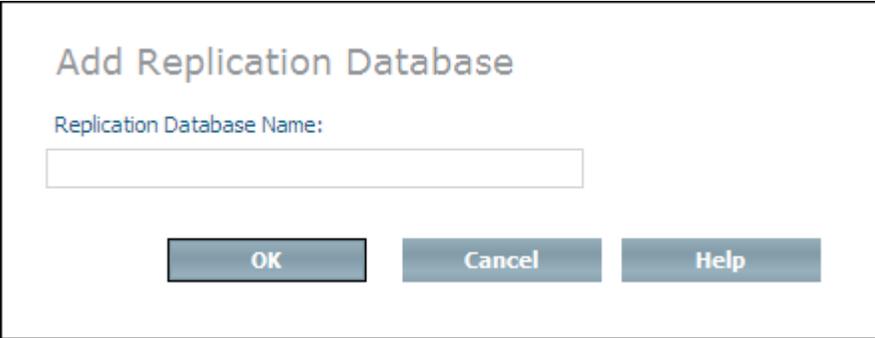
## Adding/removing a Replication Database Name

---

Once the database has been created from backup, its name has to be added to the list of permitted replication databases for the master database. A master database can have one or more replication databases. The database to which the replication database name is to be added must be active (running).

### ➤ To add/remove a replication database name

- 1 Expand the database object to which you want to add a replication database name.
- 2 Select the object **Replication Management** and choose **Add Replication Database** from the context menu. The **Add Replication Database** page appears.



The screenshot shows a dialog box titled "Add Replication Database". Inside the dialog, there is a label "Replication Database Name:" followed by a text input field. Below the input field, there are three buttons: "OK", "Cancel", and "Help".

- 3 Enter the name of a slave database in the **Replication Database Name** text box (the one you have created from backup) and choose **OK**. It is possible to enter the name of a replication

database that has not yet been created from backup, but will be in the future. Thus, you can create a “pool” of replication database names to be used at a later point in time, so that you do not have to repeat this step each time a new replication database is to be created.



**Note:** The first time you add an entry to the list it is not necessary to restart the master database.

- If you want to remove the name of a database from the list of permitted replication databases, select the object **Replication Management** for the master database - the **Permitted Replication Databases** page appears.

DATABASE NAME	SIMULTANEOUS QUERY	ACTION
MyReplicatedDatabase	No	Remove
Replication001	No	Remove
Replication002	No	Remove

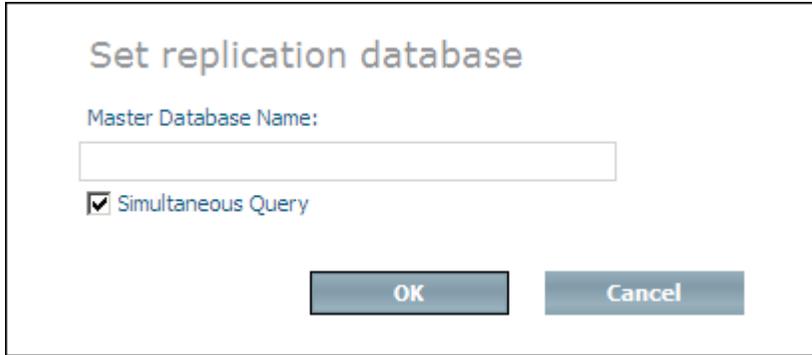
Choose **Remove** to remove the database name from the list.

## Setting a Replication Database

Once the name of the replication database has been added to the master database, the replication database must be set as a replication database. This is done by specifying the name of the master database that is to be replicated. The replication database must be inactive (stopped).

### ➤ To set a replication database

- Expand the database object that has been defined as the replication database (the one you have created from backup), select **Replication Management** and choose **Set Type to Replication** from the context menu. The **Set replication database** page appears.



- 2 Enter the name of the master database in the **Master Database Name** text field. If you want to enable queries to this database while replication is in progress, select the **Simultaneous Query** checkbox. and choose **OK**.

 **Note:** Once a database has been set to a replication database, the subtree under the database object in question changes and contains only the child objects **Information**, **Replication Management**, **Database Spaces**, **Locations**, **Properties** and **Web Servers**. Also, the only commands that can be performed on a replication database are Start Database, Stop Database and Delete Database. You can view the replication status of a database by selecting the object **Replication Management**.

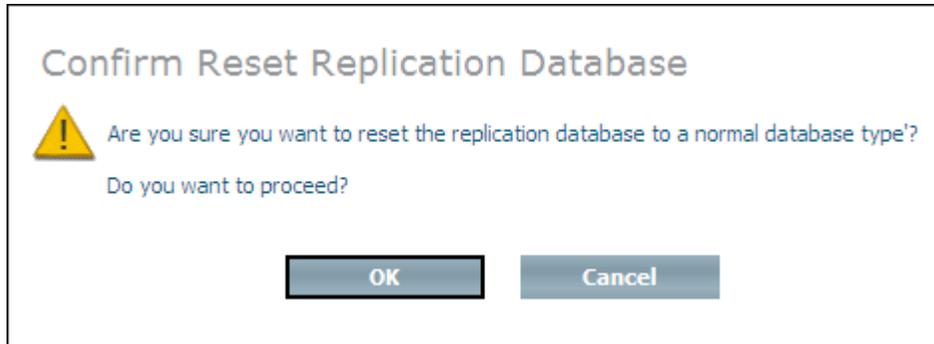
## Resetting a Replication Database

---

If, for any reason, the master database is lost, you can reset the replication database to a normal database, which can then be used as a substitute for the lost master. The replication database to be reset must be inactive (stopped).

### ➤ To reset a replication database

- 1 Expand the database object of the replication database, select **Replication Management** and choose **Set Type to Normal Database** from the context menu . The **Confirm Reset Replication Database** page appears.



- 2 Choose **OK** to reset the replication database to a normal database.

 **Note:** Once you have reset a replication database, replication cannot be continued.

## Replication Management

Depending on whether you work with a normal database or with a replication database, the options that are available with Replication Management differ.

### Replication Management for a Replication Database

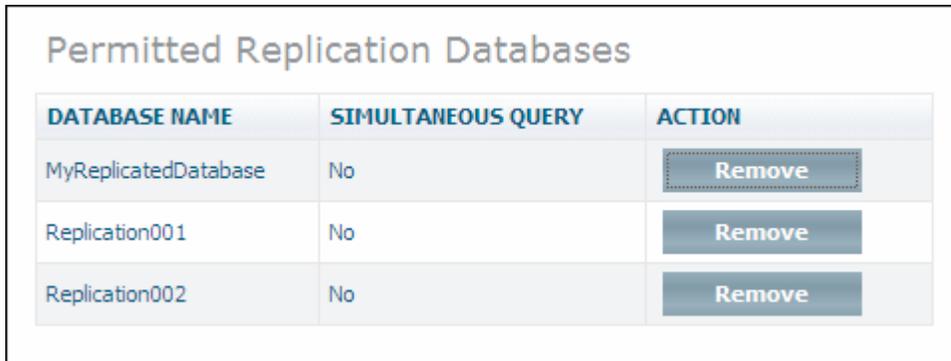
If you select the object **Replication Management** for a *replication* database, information similar to the following is displayed:

Replication Management		
REPLICATION TIMESTAMP	SIMULTANEOUS QUERY	MASTER DATABASE
Mon Jul 28 10:15:30 2008	Yes	MyDatabase

The window shows the name of the replication database's master database, the timestamp when the replication database was created, and if simultaneous query is enabled. The command **Add Replication Database** is not available.

## Replication Management for a Normal Database

If you select the object **Replication Management** for a *normal* (master) database, information similar to the following is displayed:



The screenshot shows a window titled "Permitted Replication Databases" containing a table with three columns: "DATABASE NAME", "SIMULTANEOUS QUERY", and "ACTION". The table lists three databases: "MyReplicatedDatabase", "Replication001", and "Replication002". Each row has a "Remove" button in the "ACTION" column. The "Remove" button for "MyReplicatedDatabase" is highlighted with a dashed border.

DATABASE NAME	SIMULTANEOUS QUERY	ACTION
MyReplicatedDatabase	No	Remove
Replication001	No	Remove
Replication002	No	Remove

The window lists the names of the replication databases that are allowed for the master database. It also shows if simultaneous query is enabled. The buttons **Set Type to Replication** and **Set Type to Normal Database** are not available.

# 17

## Add Database Space

---

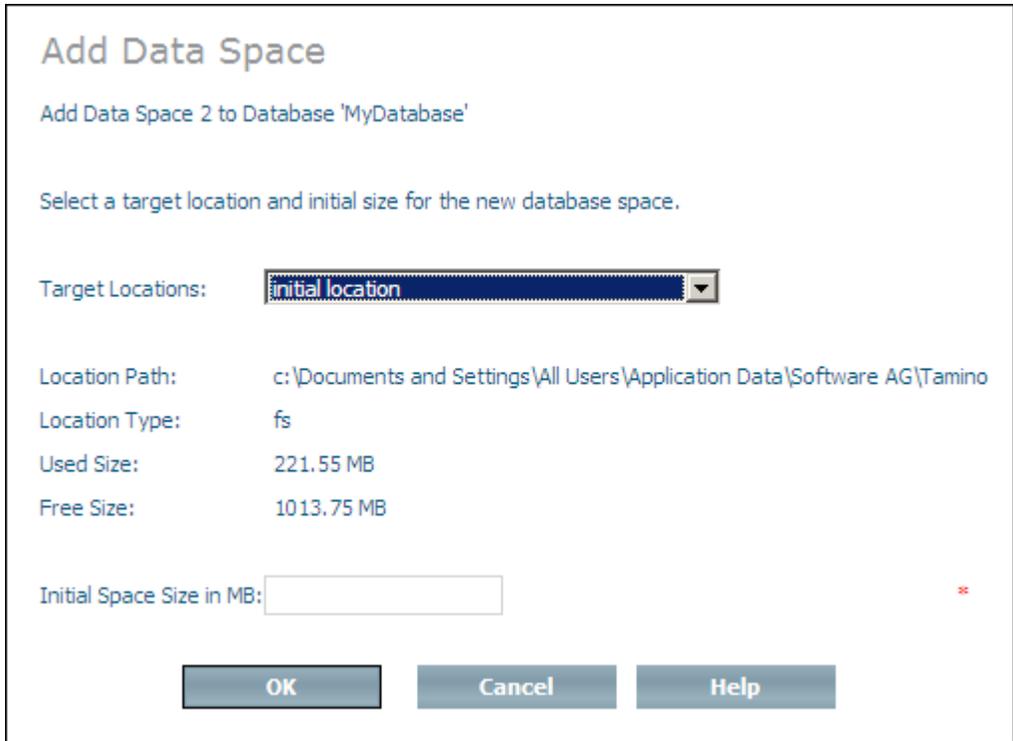
You can add new database spaces of the types index, data and journal to an existing database in order to allow for database growth. The database to which the new database space is to be added can be either active (running) or inactive (stopped).



**Note:** If the property `autoexpand` is enabled, Tamino allocates the needed database spaces by itself.

### » To add a space to a database

- 1 Expand the database object to which you want to add a database space.
- 2 Expand the object **Database Spaces**, select the type of database space that you want to add (data, index or journal) and then choose **Add** from the context menu. The page for adding spaces appears, depending on which database space you want to add, for example **Add Data Space**.



- 3 Select a target location for the new space from the **Target Location** drop-down list box. The following information about the selected location is displayed:
  - the location path
  - the location type
  - the amount of size used
  - the amount of size free
- 4 Enter the amount of space you want to add (in MB) in the **Initial Space Size** text box.
- 5 Choose **OK** to add the space to the database.

# 18

## Move Database Space

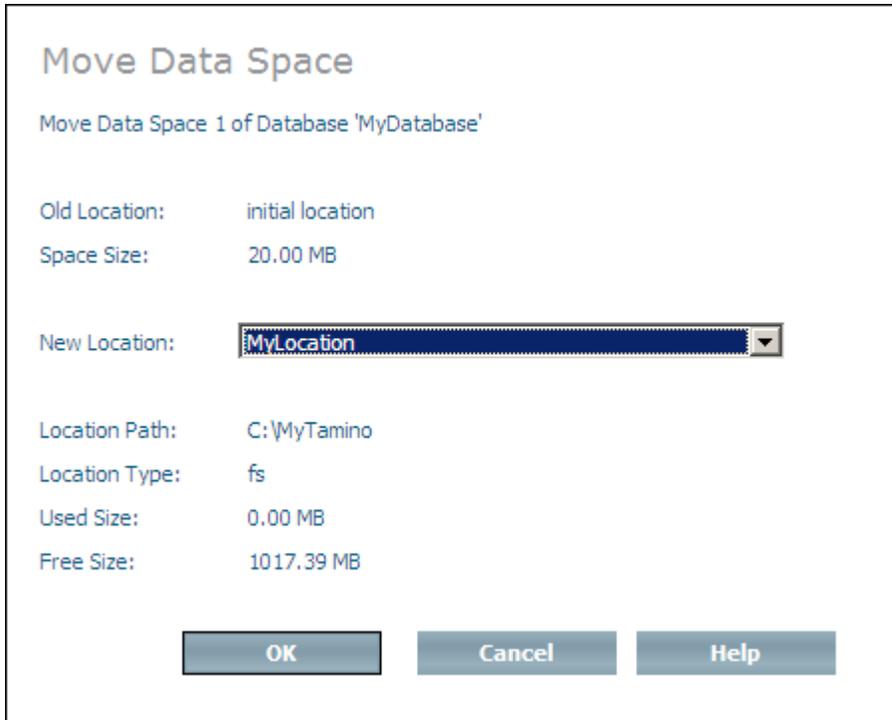
---

The Move command is used to move a database space (data, index, journal or journal overflow) to a new physical location. The database that contains the space to be moved must be inactive (stopped).

For Journal Overflow Space, this is the only command that is available. Journal overflow is automatically created or extended if it is necessary, and it will also be automatically removed or decreased during server shutdown. Hence no administration is necessary.

### » To move a database space

- 1 Expand the database object that contains the space that you want to move.
- 2 Expand the object **Database Spaces** and the type of space that you want to move (for example, data space). Then select the space that you want to move and choose **Move** from the context menu. The **Move Data Space** page appears.



- 3 Select the new location where the space is to be moved to from the **New Location** drop-down list box. The following information about the new location is displayed:
  - the location path
  - the location type
  - the amount of size used
  - the amount of size free
- 4 Choose **OK** to move the space.

# 19 Expand a Database Space

---

The Expand command is used to increase the size of the last index, journal or data space by a given amount. The space is expanded within the current location. The database that contains the space to be expanded can be either active (running) or inactive (stopped). If the database parameter `autoexpand` is set to yes, Tamino will automatically expand database spaces when necessary.

## ➤ To expand a database space

- 1 Expand the database object that contains the space type that is to be expanded.
- 2 Expand the object **Database Spaces**, select the type of database space that you want to expand (data, index or journal) and then choose **Expand** from the context menu. The **Expand Space** page appears, for example for data space:

**Expand Data Space**

Expand Data Space of Database 'MyDatabase'

Location: initial location

Used Size: 212.56 MB

Free Size: 1017.28 MB

Current Space Size: 20.00 MB

Additional Space Size in MB:

OK Cancel Help

- 3 Enter the amount of space (in MB) to be added to the space in the **Additional Space Size** text box.
- 4 Choose **OK** to expand the space.

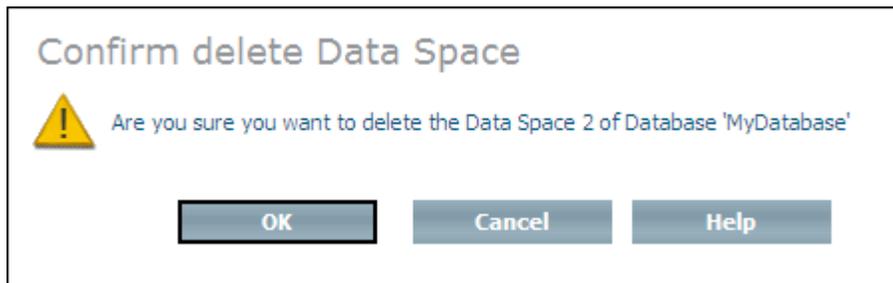
# 20 Delete a Database Space

---

The Delete command is used to delete the most recently-added index, data or journal space from a database. The database that contains the space to be deleted must be inactive (stopped).

➤ **To delete a database space**

- 1 Expand the database object that contains the space type that you want to delete.
- 2 Expand the object **Database Spaces**, select the type of database space that you want to delete (data, index or journal) and then choose **Delete** from the context menu. The **Confirm delete Space** page appears, for example for data space:



- 3 Choose **OK** to delete the database space.



# 21 Modify the Journal Space

---

The Modify command is used to change the size of a journal space and to reorganize it. If more than one journal space exists, the first journal space is increased or decreased to the specified size, and all other journal spaces are deleted. The database must be inactive (stopped).

» **To modify the journal space**

- 1 Expand the database object that contains the journal space that you want to modify.
- 2 Expand the object **Database Spaces** and choose **Journal Spaces**. Then choose **Modify** from the context menu. The **Modify Journal Space** page appears.

**Modify Journal Space**

Modify Journal Space of Database 'MyDatabase'

Location:	initial location
Used Size:	222.56 MB
Free Size:	1006.83 MB
Current Space Size:	50.00 MB
New Space Size in MB:	<input type="text"/>

OK Cancel Help

- 3 The amount of space currently assigned to the journal space is displayed, together with the remaining free space. Enter the new size for the journal space in the **New Space Size** text box.

- 4 Choose **OK** to modify the journal space.

# 22 View the Log Spaces

➤ To view the Log Spaces:

- Expand the database for which you want to display the log spaces, then expand **Database Spaces**. One of the menu items is called **Log Spaces**. If you select it, information about the log spaces is displayed in the window on the right.

Log Space of Database 'MyDatabase'

SPACE NAME	SAVEPOINT	SESSION	SIZE	LOCATION NAME
Log Space 1	Initial	2	0.27 KB	initial location
Log Space 1	Jul 21, 2008 1:27:41 PM	3	0.37 KB	initial location
Log Space 1	Jul 21, 2008 1:27:41 PM	4	5.97 KB	initial location
Log Space 1	Jul 21, 2008 1:27:41 PM	5	3.85 KB	initial location
Log Space 1	Jul 21, 2008 1:27:41 PM	6	0.64 KB	initial location
Log Space 1	Jul 21, 2008 1:27:41 PM	7	2.61 KB	initial location
Log Space 1	Jul 21, 2008 1:27:41 PM	8	3.74 KB	initial location



# 23

## Switch the Log Space

---

The Switch to New Log Space command is used to switch from the current to a new log space extent. The session number remains unchanged. The previous extent of the log space will be moved to the log archive location, if the log archive location is defined and is different from the location of the log space extent.

➤ **To switch the log space**

- 1 Ensure that the database is online.
- 2 Select the object **Log Spaces** from the expanded **Database Spaces** object for the database in question, and choose **Switch to New Log Space** from the context menu.



# 24

## Back up a Database

---

- Backing up a Database to Disk or Tape ..... 85
- Backing up a Database using an External Backup Environment ..... 88
- Using Backup Generations ..... 89

An important part of database administration is to make regular backups of your database. Database Backup and Restore functions are available from the Tamino Manager. The Backup function makes a copy of the database. The Restore function restores the database to the state it was in when you made the backup. Restore is generally executed together with a Recover process, in which all changes that were made to the database after the backup are re-applied. For this process, log files (log spaces) are used as input files. In this way, all data up to the most recently completed transaction can be restored.

The Backup function is used to make a backup copy of a database. You can make either Tamino (internal) backups to disk or tape, or back up the database to an external backup system.



**Caution:** If more than one backup is written to a tape, the existing backup will be overwritten. The savepoint of each backup will be offered in the Restore menu, but only the latest backup will be available. No warning will be issued. You should, therefore, not put more than one backup on one tape.

You can make incremental backups of a database. The first incremental backup after a full backup stores the database changes that were made since the full backup. If there are several incremental backups since the most recent full backup, each incremental backup after the first one stores the changes since the preceding incremental backup. Since in general an incremental backup is much smaller than a full backup, the time required to make an incremental backup can be considerably less than the time required to make a full backup.

Incremental backups provide a useful extension to Tamino's backup capabilities. If you decide to include incremental backups in your backup strategy, you should keep a sensible balance between incremental backups and full backups. Regular full backups should still be the central part of your strategy, and the incremental backups can be considered as a quick and safe way of protecting against data loss in the intervals between the full backups.

The following general restrictions apply for backups:

- While the Tamino Data Loader utility is running, it is not possible to do a backup.
- Data that has been mapped via Server Extensions will not be backed up, unless it is mapped to the same database (that is being backed up).

For further information about backup and restore policies, please refer to the Backup Guide.

## Backing up a Database to Disk or Tape

This section describes how to back up a database internally, i.e. to disk or tape.

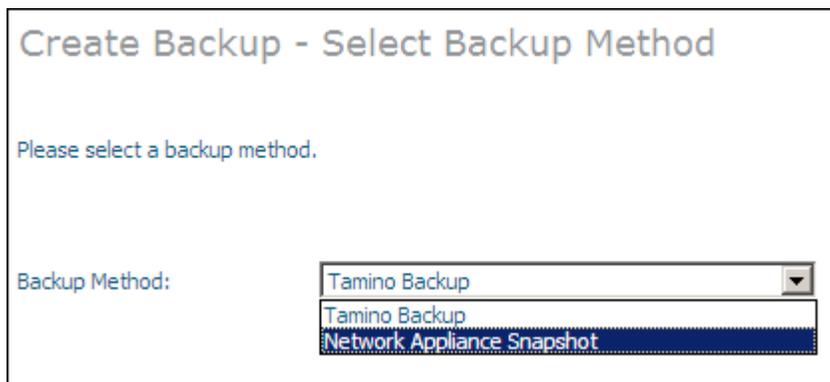
- [General Procedure](#)
- [Considerations for Incremental Backup](#)

### General Procedure

#### ➤ To back up a database to disk or tape

- 1 Expand the database object that you want to back up.
- 2 Ensure that the database you want to back up is started. Refer to the section [Start a Database](#) for details.
- 3 Select the object **Backups** and choose **Backup** from the context menu.
- 4 The dialog you now see depends on whether you have defined an external backup method.

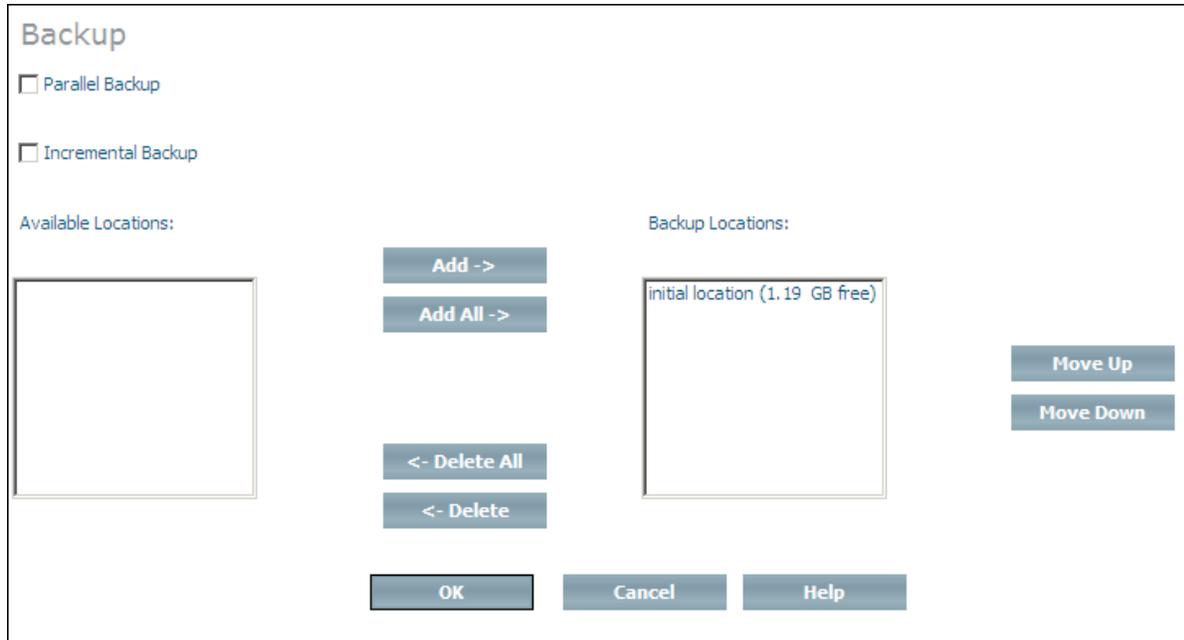
If you have defined an external backup method, the dialog **Select Backup Method** appears:



In the drop-down box **Backup Method**, choose the menu entry **Tamino Backup** to perform a standard backup, or choose one of the available external methods. If you choose an external method, see the section [Backing up a Database using an External Backup Environment](#) for a description of how to proceed.

If you have not defined an external backup method, proceed to the next step directly.

- 5 The **Backup** page appears.



The checkbox for **Incremental Backup** is visible if you have activated this option for the database (see the section [Considerations for Incremental Backup](#)).

- 6 Select one or more locations where the backup will be stored. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of backup locations, or choose **Add All** to add all available database locations to the list of backup locations. If you add a database location to the list of backup locations by mistake, you can remove it from the list by selecting it and choosing **Delete**, or choose **Delete All** to remove all backup locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

 **Note:** Although not recommended, it is possible to select combined file system/tape locations. The file system should be added first. If the file system is full, the backup continues to the tape. However, you should avoid specifying a file system location after a tape location because once the tape is full, you will be prompted to enter another tape.

- 7 If you select more than one backup location (which is most effective if the locations are on physically different hard disks), they will be normally filled/written to sequentially. If the associated backup devices are relatively slow (tape drives, for example) you can speed up the backup process by performing parallel I/Os to the specified backup spaces.

 **Notes:**

1. If you perform a parallel backup to a given number of drives/devices, you will require the same number of drives/devices for the corresponding restore procedure.
  2. The parallel backup feature is currently only available for UNIX platforms. If you select it on a Windows platform, the backup will be performed sequentially, and a warning message will be issued.
  3. The parallel backup feature is not available for making incremental backups.
- 8 Choose **OK** to back up the database.

The backup process is started. The page **Job Monitor** appears, informing you of the progress of the operation. The database is backed up when you see the message like this:

```
Backup of database 'my-database' successfully completed.
```

If you now expand the **Backups** Option in the upper left window, the backup is listed with time and date information.

### Considerations for Incremental Backup

The incremental backup feature is selectable for each database individually, i.e. you can activate it for one database and deactivate it for another. When you use the Tamino Manager to activate or deactivate the feature for a particular database, the change takes effect the next time the database server is restarted.

To specify that a database can be used for making incremental backups, do the following:

#### ➤ To specify that a database can be used for making incremental backups

- 1 In the Tamino Manager, select the node of the database.
- 2 Expand the tree of the node.
- 3 Expand the **Properties** node.
- 4 In the context menu of the **Server** node, select **Modify**.
- 5 Set the value of the property `incremental backup` to "yes" and choose **OK**.

The following restrictions apply for incremental backups:

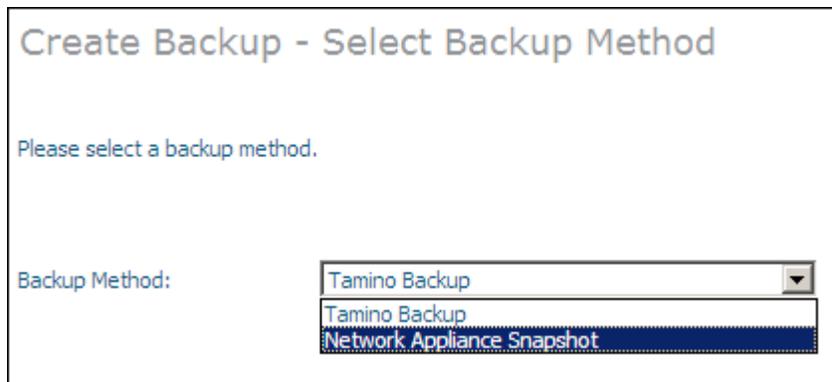
- Incremental backup is not available for external backup environments (see the section [Backing up a Database using an External Backup Environment](#) for a description of external backup environments).
- The parallel backup feature is not available for incremental backups.
- Incremental backups are not available for read-only databases.

## Backing up a Database using an External Backup Environment

This section describes how to back up a database to an external environment. The external environment must first be defined, as described in the section [Define an External Backup Method](#).

### ➤ To back up a database using an external backup environment

- 1 Expand the database object that you want to back up.
- 2 Select the object **Backups** and choose **Backup** from the context menu. The **Create Backup - Select Backup Method** page appears.



- 3 Select a backup method from the **Backup Method** drop-down list box and choose **Next**.

If you select the method **Tamino Backup**, the **Backup** page appears, and you continue as described in the section [To back up a database with no external backup environment defined](#).

If you select an external backup method (Network Appliance Filer Snapshot, Network Appliance Filer Mirror or EMC TimeFinder), then choose **Next**, the **Create Backup - Select Backup Configuration** page appears.

- 4 Select an appropriate configuration from the **Backup Configuration** drop-down list box and choose **Finish** to start the backup (in the case of Network Appliance Snapshot, you have to enter a descriptive backup configuration name for the backup in a corresponding text box before you start the backup procedure).

## Using Backup Generations

Make sure to develop a backup strategy that gives you maximum protection for your data. If you have many update operations per day, it is recommended that you also back up the database at least daily. The number of backup generations to be retained can be defined using the backup parameter **Number of Backup Generations**. If you maintain for example seven backup generations, you have one backup for each day of the week. When you create the 8th backup, the first one will be deleted.



**Note:** Backup generations apply to full backups only, not to incremental backups.

### » To define the number of backup generations:

- 1 Expand the database object, expand **Properties** and choose **Server**.

A page with information about the database appears. One of the items is **Number of backup generations**.

- 2 Choose **Modify** from the context menu of the **Server** object.

The modifiable properties are displayed. You can change the value of **Number of backup generations** by overwriting the existing value with a new value and clicking on **OK**.

### Server Properties of Database 'MyDatabase'

PROPERTY NAME	DETAILS	EFFECTIVE VALUE	CONFIGURED VALUE	UNIT
buffer pool size	?	60	<input type="text" value="60"/>	* MB
dynamic pool size	?	512	<input type="text" value="512"/>	* KB
maximum transaction duration	?	300	<input type="text" value="300"/>	* seconds
non-activity timeout	?	900	<input type="text" value="900"/>	* seconds
replication delay	?	5	<input type="text" value="5"/>	* seconds
flush group size	?	0	<input type="text" value="0"/>	*
number of backup generations	?	5	<input type="text" value="7"/>	*

Refer also to the section Internal Backup and Restore in Tamino in the *Backup Guide* for more issues concerning backup generations.



# 25 Define an External Backup Method

---

- Adding and deleting a Backup Method ..... 92
- Modifying Parameters and adding Configurations ..... 94

You can use the Tamino Manager to back up a Tamino database to an external backup system. The following systems are currently supported:

- Network Appliance Filer (Mirror and Snapshot)
- EMC TimeFinder

Before the respective external backup methods can be used, they must first be added to the external backup environment and subsequently configured as described below. It is possible to define and configure more than one external backup method. Also, they must be enabled in the Tamino license file.

Once an external backup method has been added and configured, it is available to be used to back up a database as described in the section [Back up a Database](#).

This documentation implies that the administrator has a good working knowledge of the specific hardware/software combinations used to make the external backups, and also that the administrator knows how to correctly configure the hardware and software involved.

-  **Caution:** If external backup systems are to be used, the log location(s) and the log archive location(s) must be on different volumes/devices than the database in question. Furthermore, it is strongly recommended that you only have one database residing on a given volume or device group.
-  **Caution:** This warning applies to Network Appliance Snapshot: it is possible to have more than one snapshot of a database on a given volume - if the database is restored using a snapshot other than the most recent one, all snapshots made after the one used to restore the database will no longer be available. All snapshots also get lost if the whole volume is restored.

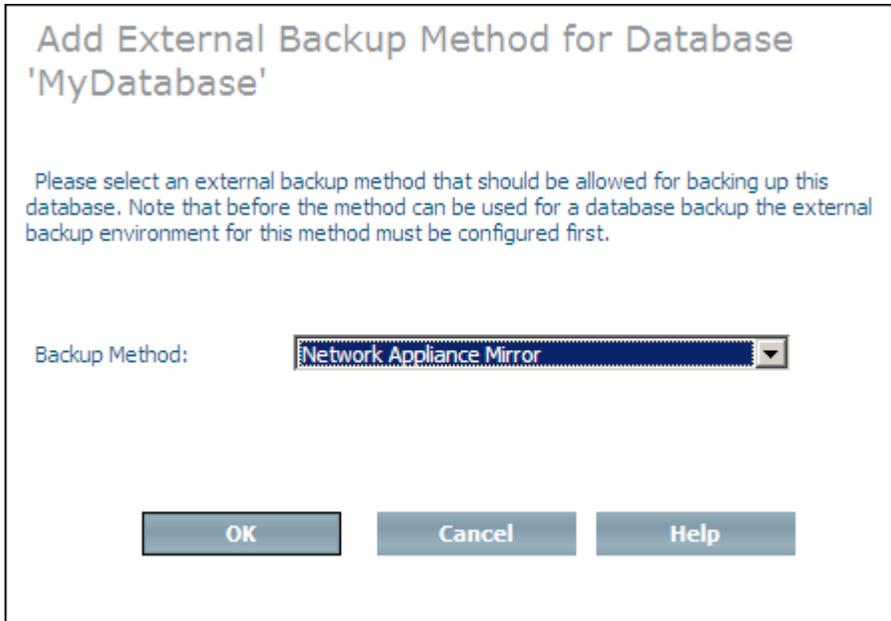
## Adding and deleting a Backup Method

---

External backup methods must first be added to the External Backup Environment before they can be configured and used. Methods that have already been added are listed in the display frame when the object **External Backup Environment** is selected. External backup methods that are no longer required can be deleted from the **External Backup Environment** object.

### ➤ To add a backup method

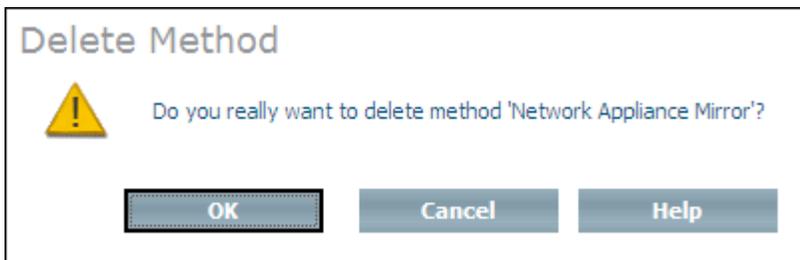
- 1 Expand the database to which the backup method is to be added, select the object **External Backup Environment** and choose **Add Backup Method** from the context menu. The **Add External Backup Method for Database** page appears.



- 2 Select the backup method to be added from the **Backup Method** drop-down list box and choose **OK**.

➤ **To delete a backup method**

- 1 Expand the **External Backup Environment** object and select the backup method to be deleted.
- 2 From the context menu, choose **Delete Method**. The **Delete Method** page appears.



- 3 Choose **OK** to delete the method.

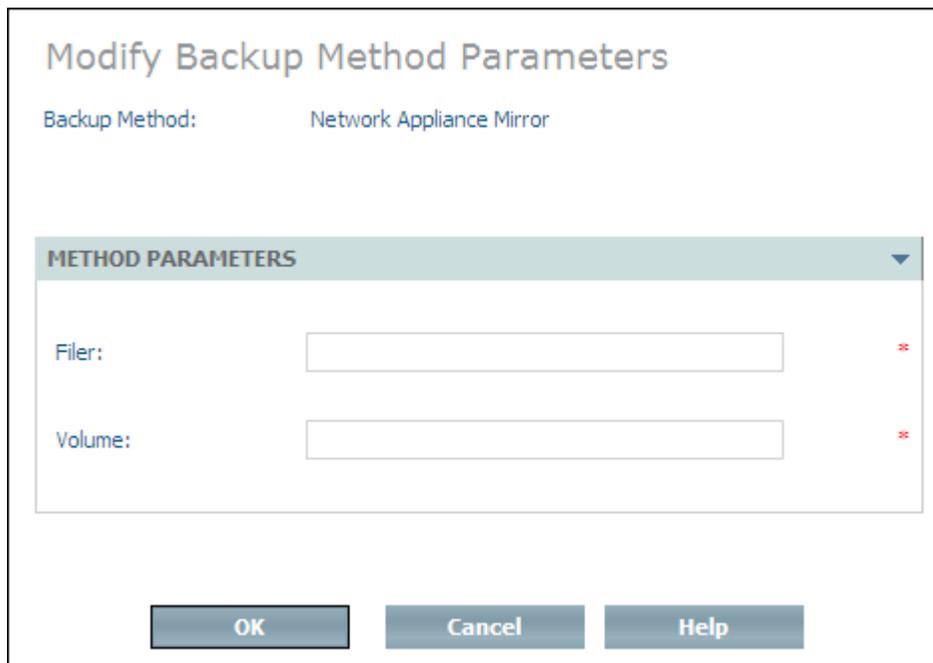
## Modifying Parameters and adding Configurations

---

Once a backup method has been added, you must first modify its parameters (applies to all methods) and add configuration information (only applies to EMC TimeFinder and Network Appliance Mirror) before it can be used to back up a Tamino database. Method parameters and configuration information can be changed at any time after a method has been added.

### ➤ To modify the parameters of the Network Appliance Snapshot and Mirror methods

- 1 Select the Network Appliance Snapshot or Mirror method from the expanded **External Backup Environment** object and choose **Set Method Parameters** from the context menu. The **Modify Backup Method Parameters** page appears.



The screenshot shows a dialog box titled "Modify Backup Method Parameters". At the top, it indicates "Backup Method: Network Appliance Mirror". Below this is a section titled "METHOD PARAMETERS" with a dropdown arrow. Inside this section, there are two text input fields: "Filer:" and "Volume:". Each field has a red asterisk to its right, indicating that these fields are required. At the bottom of the dialog, there are three buttons: "OK", "Cancel", and "Help".

- 2 Enter the name of the filer and the volume on which the database resides in the corresponding text boxes and choose **OK**.

### ➤ To modify the parameters of the EMC TimeFinder method

- 1 Select the **EMC TimeFinder** method from the expanded **External Backup Environment** object and choose **Set Method Parameters** from the context menu. The **Modify Backup Method Parameters** page appears.

The screenshot shows a dialog box titled "Modify Backup Method Parameters". At the top, it indicates the "Backup Method" is "EMC TimeFinder". Below this is a section titled "METHOD PARAMETERS" which contains several input fields and buttons:

- Target:** A text input field with a red asterisk (\*) to its right, indicating it is a required field.
- Devices:** A text input field with two buttons below it: "Add to List" and "Remove from List". Below these buttons is a rectangular list area that is currently empty.
- Library path:** A text input field with a "Browse..." button to its right.

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

- 2 Enter the name of the Symmetrix device where the database is located in the **Target** text field. This name can be either the Symmetrix ID (SymmId) or the physical device name (e.g. */dev/rdisk... ..*). If the SymmId is used, it can be abbreviated (from right to left) until it is unique for the host in question, but it must be at least 4 digits long.
- 3 One at a time, enter the names of the devices on which the database locations reside in the **Devices** text box. Once you have entered a name, use **Add to List** to add it to the list of devices (use **Remove from List** to remove devices that were added by mistake or misspelled). The names can be either Symmetrix devices names (3-hexdigit values) or physical device names (e.g. */dev/rdisk... ..*).

The devices for all Index and Data locations must be covered, as must the Reserved Location because the database may have open container files there. Journal and Temp locations do not necessarily have to be covered (this means that these files can be in the same locations as Index and Data, but the backup/restore processes will run faster if the Journal is located somewhere else). The Log location and the Log Archive location must be on a different location that is not a part of the external backup processing environment.

- 4 Enter the full path name of the library that contains the file *symapi.dll* in the **Library** path text box. This is required in order to connect to EMC's SYMAPI software component.
- 5 Choose **OK** to modify the method parameters.

➤ **To add a configuration for Network Appliance Mirror**

- 1 Select the **Network Appliance Mirror** object from the expanded **External Backup Environment** and choose **Add Configuration** from the context menu. The **Add External Backup Configuration** page appears.

The screenshot shows a dialog box titled "Add External Backup Configuration". It contains the following elements:

- Backup Method:** A dropdown menu currently showing "Network Appliance Mirror".
- Configuration Name:** An empty text input field with a red asterisk indicating it is a required field.
- CONFIGURATION PARAMETERS:** A section header with a dropdown arrow, containing two fields:
  - Mirror Filer:** An empty text input field with a red asterisk.
  - Mirror Volume:** An empty text input field with a red asterisk.
- Buttons:** Three buttons at the bottom: "Add", "Cancel", and "Help".

- 2 Enter a configuration name in the **Configuration Name** text box. This name is used to identify the configuration within the External Backup Environment, as well as to select the configuration in question when performing an external backup.
- 3 Enter the name of the filer and the volume to which the backups are to be made in the corresponding text boxes.

There must be one mirror volume (which has to be initialized by the filer administrator) for each mirror of the database that is made. The mirror volume does not necessarily have to be on the same filer as the database, but it must have exactly the same sizes as the database volume.

- 4 Choose **Add** to add the configuration to the **Network Appliance Mirror** object.

➤ To add a configuration for EMC TimeFinder

- 1 Select the **EMC TimeFinder** object from the expanded **External Backup Environment** and choose **Add Configuration** from the context menu. The **Add External Backup Configuration** page appears.

The screenshot shows the 'Add External Backup Configuration' dialog box. It features a title bar and several input fields. The 'Backup Method' is set to 'EMC TimeFinder'. The 'Configuration Name' field is empty and marked with a red asterisk. Below this is a section titled 'CONFIGURATION PARAMETERS' which contains a 'Target' field (also empty and marked with a red asterisk) and a 'Devices' field. Under the 'Devices' field are two buttons: 'Add to List' and 'Remove from List'. At the bottom of the dialog are three buttons: 'Add', 'Cancel', and 'Help'.

- 2 Enter a configuration name in the **Configuration Name** text box. This name is used to identify the configuration within the External Backup Environment, as well as to select the configuration in question when performing an external backup.
- 3 Enter the name of the target Symmetrix where the backup is to be made in the **Target** text field. This name can be either the Symmetrix ID (SymmId) or the physical device name (e.g. /dev/rdsk... ..). If the SymmId is used, it can be abbreviated (from right to left) until it is unique for the host in question, but it must be at least 4 digits long.

It is also possible to define a remote Business Continuance Volume (see BCV in step below). In this case, the ID of the corresponding Symmetrix should be entered in the Target text field. It is only possible to define one BCV set in such a case.

- 4 One at a time, enter the names of the devices to which the database backup is to be made in the Devices text box. Once you have entered a name, use **Add to List** to add it to the list of devices (use **Remove from List** to remove devices that were added by mistake or misspelled). The names can be either Symmetrix device names (3-hexdigit values) or physical device names (e.g. /dev/rdisk... ..).

Each device name points to a Business Continuance Volume (BCV). The number and size of BCV devices defined must be the same as for the database itself.

- 5 Choose **Add** to add the configuration to the **EMC TimeFinder** object.

➤ **To remove a backup configuration (EMC TimeFinder or Network Appliance Mirror)**

- 1 Select the configuration you want to remove from the expanded **EMC TimeFinder** object or from the expanded **Network Appliance Mirror** object and choose **Remove Configuration** from the context menu. The **Remove Configuration** page appears.
- 2 Choose **OK** to remove the configuration.

# 26

## Restore a Database from a Backup

---

- General Procedure ..... 100
- Considerations for Restoring a Database ..... 102

This section describes how to restore a database from a backup.

### General Procedure

---

The process of regenerating your data from a backup is done in two steps: First, the restore step, which is the reverse procedure of a backup. As input, you use the backup copy of the database, which automatically restores your data back into the database. The second step, the recover step, repeats database changes since that last backup. A restore is always done for the whole database, not for parts of the database, e.g. for single collections.

A restore is always done for the whole database, not for parts of the database, e.g. for single collections. When you restore from a full backup, the database contents are returned to their exact state at the time the full backup was made. If you restore from an incremental backup, Tamino first restores the most recent full backup that was made before the incremental backup, then restores any other incremental backups that were made after the full backup but before the selected incremental backup, then finally restores the selected incremental backup.

As soon as the restore step successfully finishes, the database is automatically started in standby mode (indicated by a yellow traffic light). Then the recover step is started. During the recover step, all of the completed database transactions that were made since the specified backup are recovered. The input for the recover step are the log spaces; each server session creates a log space that records all completed database transactions that are made during the session. By using the **Recover Until** option, you can restrict the recovery until a certain date and time.

Finally, the database is shut down again.

If you restore from a full backup, the subsequent automatic recover step uses only the session logs, even if there are incremental backups available that were made after the full backup.

If you restore from an incremental backup, then Tamino restores first the corresponding full backup and then all incremental backups up to and including the selected incremental backup. The subsequent automatic recover step uses the session logs that were created after the selected incremental backup. Incremental backups that were made after the selected incremental backup are not used in the restore or recover phase.

Tamino processes incremental backups faster than session logs. Therefore, if you have made a full backup and one or more subsequent incremental backups, then you should select the most recent incremental backup for doing the restore instead of selecting the full backup.

In all cases, the database to be restored must be stopped (offline).

#### ➤ To restore and recover a database

- 1 Ensure that the database is stopped.

- 2 Expand the database that you want to restore.
- 3 Expand the object **Backups**, then select the backup copy that you want to use as input for the restore process. You can choose either a full backup or an incremental backup. See the section [Considerations for Restoring a Database](#) for information about restoring from an incremental backup.

Choose **Restore** from the context menu. The **Restore Data** page appears.

- 4 Select the recovery option that you want to use. The following options are available:

Option	Action
Recover All	The completed database transactions that were stored in the session logs created since the selected backup are re-applied to the restored database.
Don't Recover	The database is restored from the backup, but none of the completed database transactions stored in the session logs are recovered.
Recover Until	The completed database transactions from all session logs created up to the specified time and date are recovered. The completed database transactions from session logs created after the specified time are not recovered.

- 5 Choose **OK** to restore the database.



**Note:** During the Restore/Recover step the database is in standby mode, which means that it is not possible to work with it. Hence before and after changing large amounts of data at one point in time, it is recommended to back up the database. Otherwise, the Restore/Recover step might take very long, and the database is not available for that period of time.

## Considerations for Restoring a Database

---

If you restore a database from a backup that is not the most recent backup, all of the more recent backups are set to the INVALID state. This means that they cannot be used for subsequent restore operations.

If you select an incremental backup in the Restore dialog for restore/regenerate for a particular database, the following will be done:

1. The most recent full backup before the selected incremental backup will be restored.
2. All incremental backups created after the full backup will be restored, up to and including the selected incremental backup.
3. All log spaces that were created after the selected incremental backup are processed.

# 27 Delete Backup

---

- General Procedure ..... 104
- Considerations for Deleting a Backup ..... 104

This section describes how to delete a database backup.

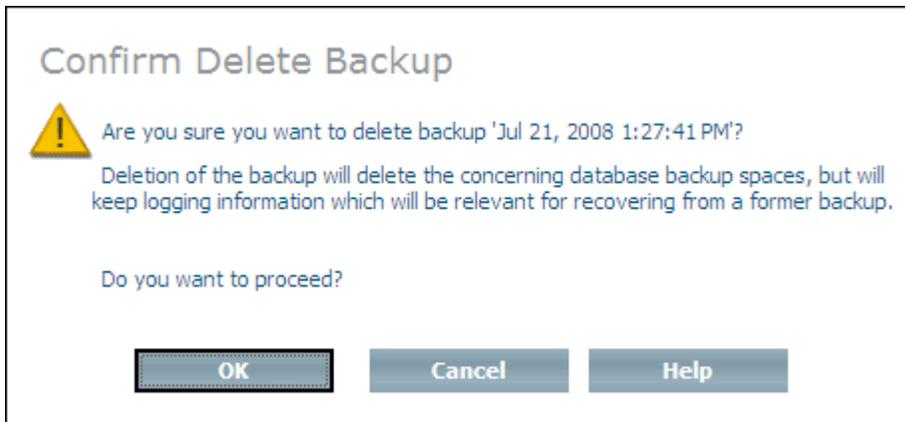
## General Procedure

---

In addition to the automatic deletion of backups via Tamino's backup generation feature (defined by the property `number of backup generations` in the server properties), you can also delete single backups that are no longer required with the Delete command. Deleting a backup removes all of the backup spaces that are associated with it, but the associated log information is not removed, since it may subsequently be required if the database has to be recovered.

### > To delete a backup space

- 1 Expand the database for which you want to delete the backup.
- 2 Expand the object **Backups**, select the backup that you want to delete and choose **Delete** from the context menu. The **Confirm Delete Backup** page appears.



- 3 Choose **OK** to delete the backup and backup space.

## Considerations for Deleting a Backup

---

If you are using incremental backups, the following restrictions apply:

- If you delete a full backup, Tamino automatically also deletes all subsequent incremental backups that are based on this full backup.
- You cannot select an incremental backup for deletion.

# 28

## Display Information about a Backup File

---

The command Backup File Info is used to display information about a backup file. This information may be required, for example, if you intend to create a new database from a backup of an existing database.

The following information is displayed for internal backups:

- the extent (one line for each extent)
- the path
- the file name
- the size of the file (in MB)

The following information is displayed for external backups:

- the time stamp (date and time when the backup was made)
- the backup name
- the backup method
- a list of parameter names and their values

### ➤ To display information about a backup file

- Expand the **Backups** object from the database you are using, and select the backup for which you want to display information. Choose **Display Backup Info** from the context menu. The **Backup File Info** page is displayed.

Backup File Info

NO	PATH	FILENAME	BACKUP TYPE	BACKUP NO.	SIZE IN MB
1	c:\Documents and Settings\All Users\Application Data\Software AG\Tamino	AAC00001001216643261.1B0			2.9

# 29

## Create a Database from a Backup

---

The command `Create Database From Backup` can be used to create an exact copy (at a given status) of an existing database, for example on another machine or when performing a database restore operation. The following types of backups are supported as input for this command:

- File system from 1 to n extents
- Tape backups
- Parallel backups on a file system or tapes
- Mixed media backups on a file system and tapes
- Named pipes

A database can only be created from a backup on the hardware architecture/operating system on which the backup was made.

When you create a database using the `Create Database From Backup` command, Tamino creates the database in such a way that any fragmentation that might have been present in the original database is removed. The defragmentation can improve the efficiency of the database's internal indexing mechanism and also reduce the overall physical disk requirements of the database spaces.

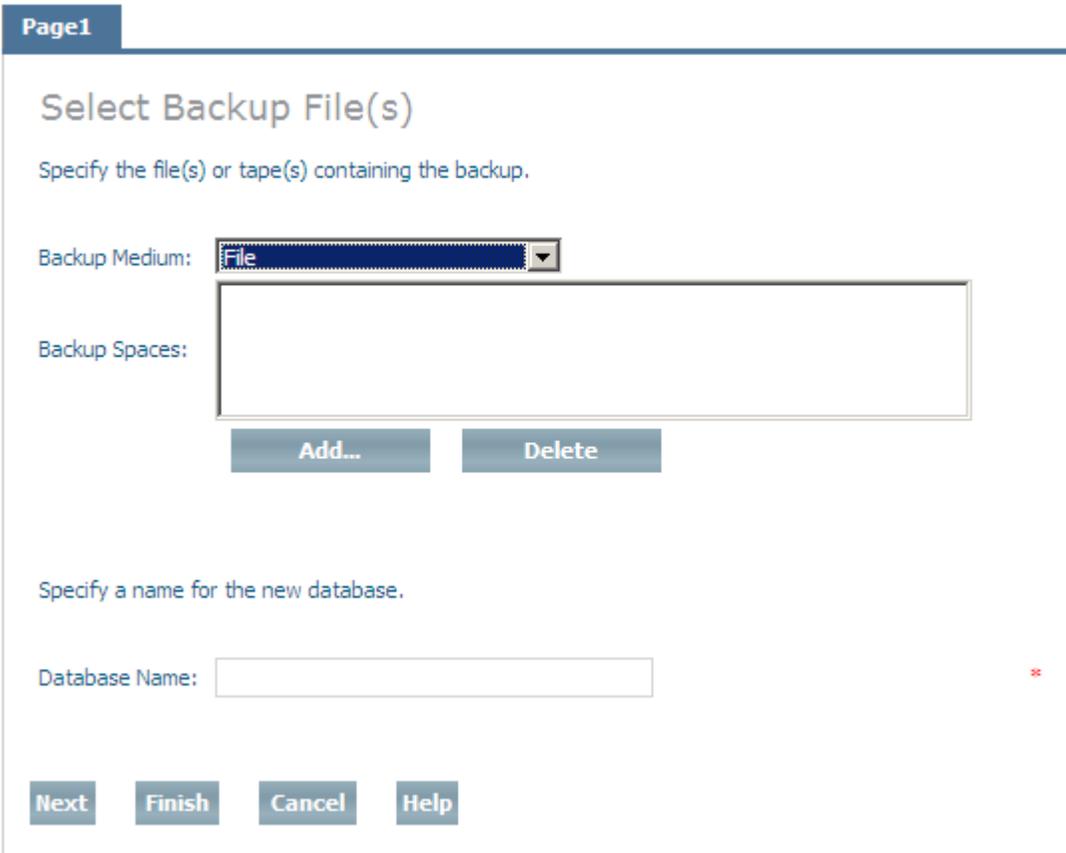


### Notes:

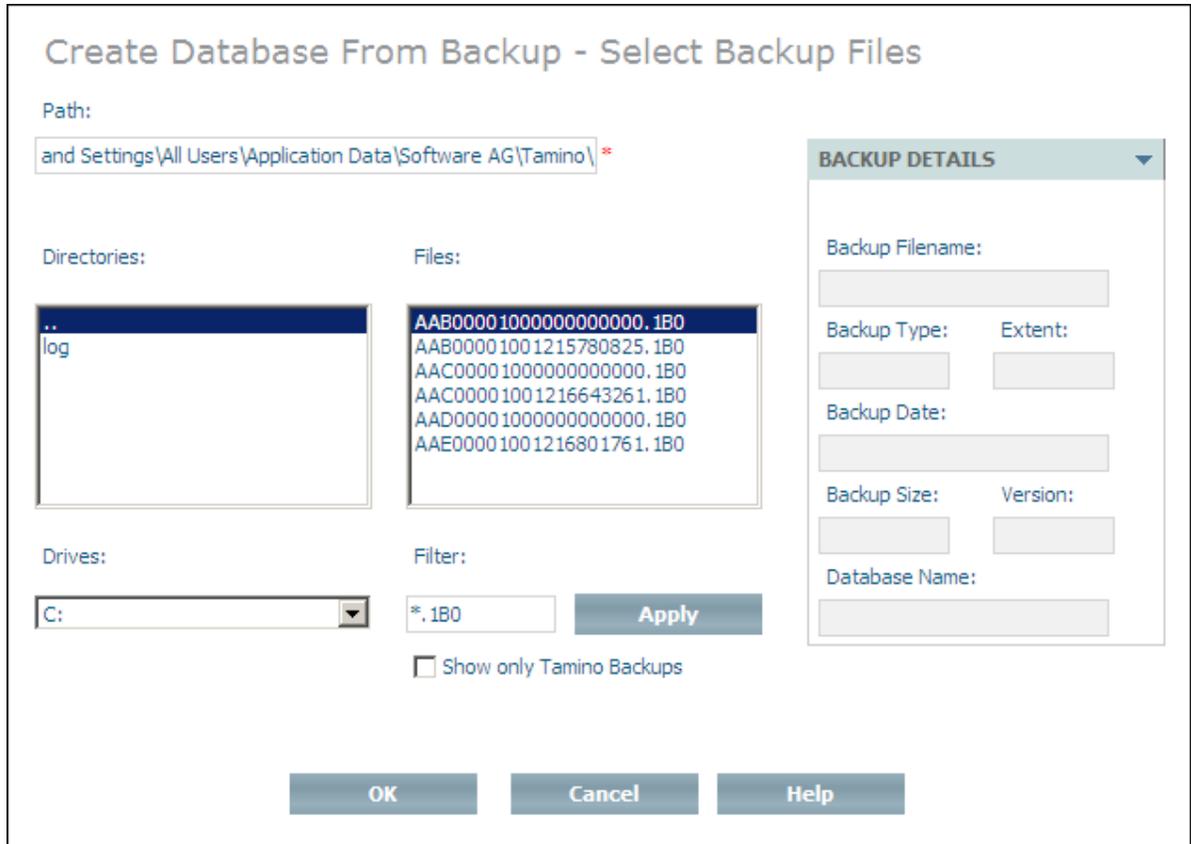
1. The default location will be used for the creation of the database, and the database spaces (data space, index space, journal space) of the created database will have the same sizes as the original database. If you wish to change the sizes or locations of the database spaces of the created database, use the standard features of the Tamino Manager to change these values after you have created the database from the backup.
2. Backups made to external backup systems cannot be used as input for this command.
3. Incremental backups cannot be used as input for this command.

➤ **To create a database from a backup**

- 1 Select **Databases** and choose **Create Database From Backup** from the context menu. The **Select Backup File(s)** page of the **Create Database from Backup** dialog appears.



- 2 The list in the **Backup Spaces** list box is initially empty. Select the backup medium from the **Backup Medium** drop-down list box. Choose **Add...** to add a file to the list. If you have chosen File as the backup media, the **Create Database from Backup - Select Backup Files** page appears (to delete a file from the list, select it and choose **Delete**).



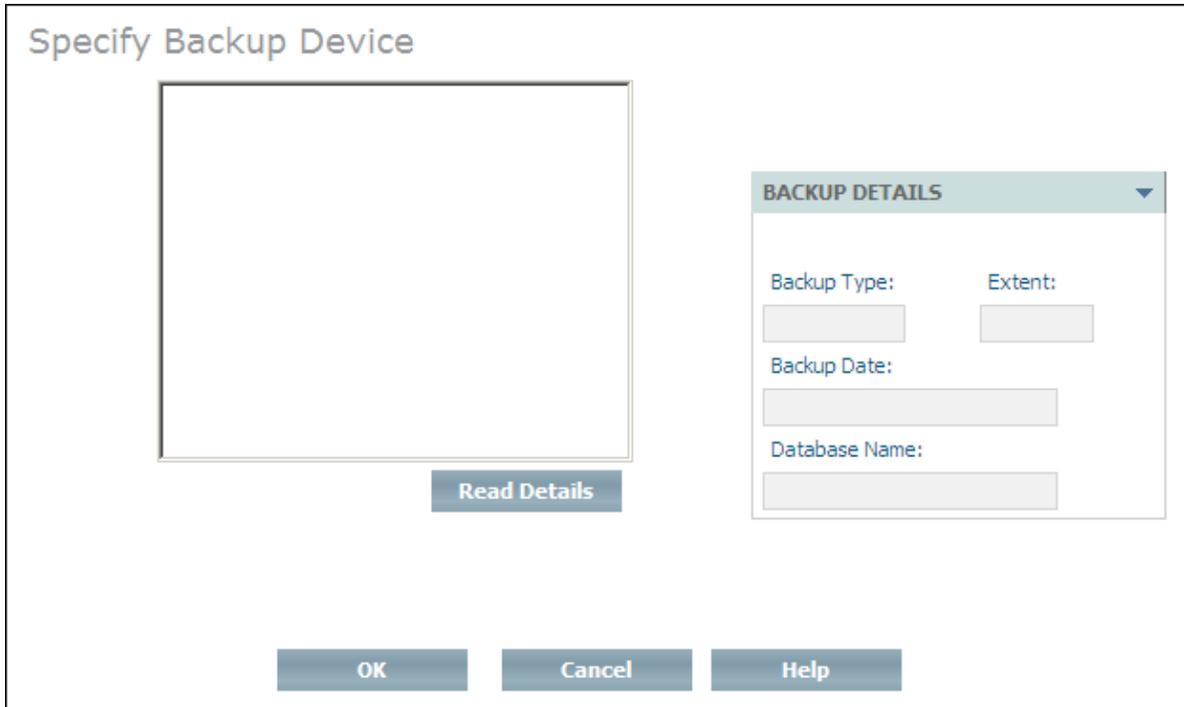
- 3 By default, the contents of the default backup location are displayed. Files that match the search criterion specified by the filter (\*.1B0 by default) are displayed in the Files list box. Select a file from the list box to display details about it (file name, backup extent, date and size, name of the database from which the backup was made) and choose **OK** (at any time) to add it to the list in the **Select Backup Files** dialog (choosing **OK** returns you to this dialog).

Select a drive from the **Drives** drop-down list box (and navigate to the corresponding directory in the **Directories** box) if you want to search for backups in a location other than the default backup location. You can specify an alternative filter (default value is \*.1B0) to reduce the number of files found in a given directory - choose **Apply** to activate the new filter. Check the **Show only Tamino Backups** check box to scan files in the directory to see whether they contain backup information (in conjunction with the filter function, this option is useful if the backup files have been renamed and do not comply with Tamino file naming conventions). Depending on the number of backup files in the directory and the combination of filter information and scan options used, it may take a while for the list of files to be generated.



**Note:** If you need to select more than one input file, you must repeat this step for each backup file to be selected.

- 4 If you chose Tape as the backup medium from the **Select Backup Files** page, the **Specify Backup Device** page appears (this applies only on Windows platforms).



Choose **Read Details** to read and display backup information from the tape. Select a file from the list box to display details about it (extent number, date and size, name of the database from which the backup was made and the database version) and choose **OK** (at any time) to add it to the list in the **Select Backup Files** dialog (choosing **OK** returns you to this dialog).

- 5 If you want to change to name of the database being created (which will be the case if a database with the same name already exists on the local machine), enter the new name in the field **Database Name**.

 **Note:** If it is available, you can choose **Finish** at any time after this point while defining a database. If you do this, any settings you have already defined will be used, and all other settings (location settings, default backup) will have their respective default values. The values for the data, index and journal space are taken from the former database, as well as the properties

Choose **Next** to proceed to the next page of the dialog.

- 6

Page1 **Page2**

## Create Database From Backup - Define Log Locations

Modify the list of locations to be used as Log Locations. For fallback purposes, it is possible to choose more than one location. The locations will then be used according to their order in the list.

Available Locations: Log Locations:

MyLocation

Add ->

Add all ->

<- Delete All

<- Delete

initial location

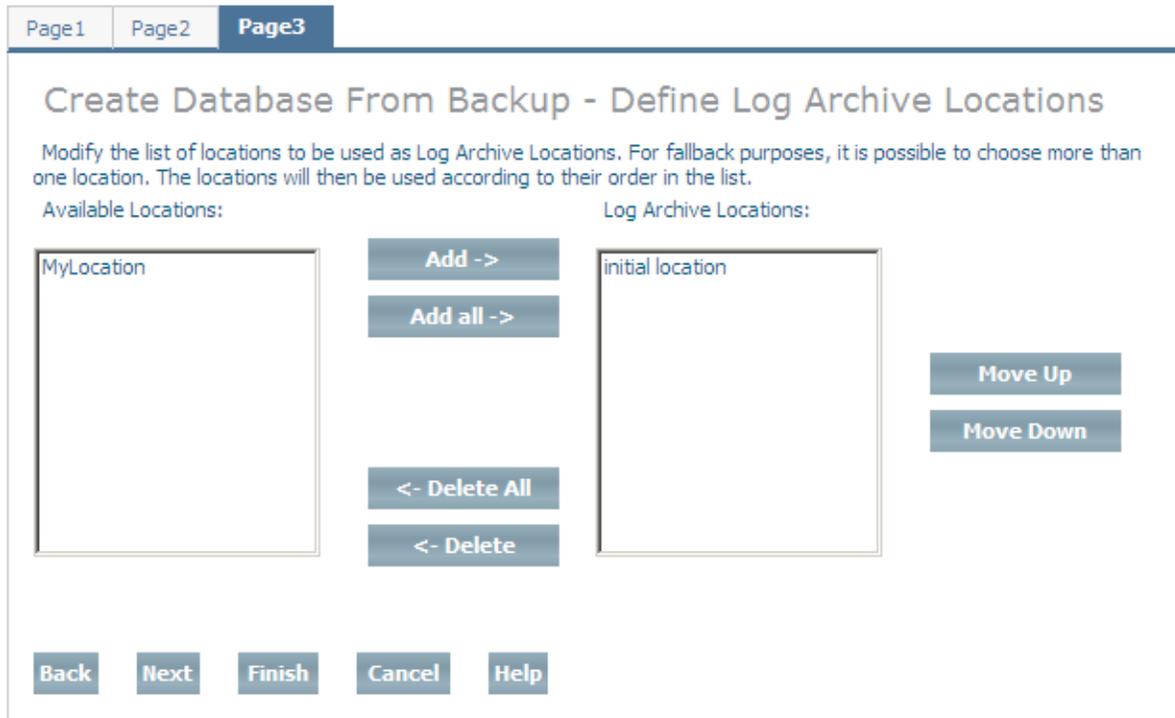
Move Up

Move Down

Back Next Finish Cancel Help

Define one or more log locations for the database. A log location is used to store the database log spaces. Multiple selections are possible. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of log locations, or choose **Add All** to add all available database locations to the list of log locations. If you add a database location to the list of log locations by mistake, you can remove it from the list by selecting it and choosing **Delete**, or choose **Delete All** to remove all log locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

When you have defined all of the log locations that you want, choose **Next** to continue to the next page of the dialog. Please refer to the section [Location Management](#) for further information about database locations.



Define one or more log archive locations for the database. The database log spaces are moved to the log archive location when they are closed. Multiple selections are possible. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of log archive locations, or choose **Add All** to add all available database locations to the list of log archive locations. If you add a database location to the list of log archive locations by mistake, you can remove it from the list by selecting it and choosing **Delete**, or choose **Delete All** to remove all log archive locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

When you have defined all of the log archive locations that you want, choose **Next** to continue to the page **Define Temporary Working Locations**. Please refer to the section [Location Management](#) for further information about database locations.

Page1 Page2 Page3 **Page4**

## Create Database From Backup - Define Temporary Working Locations

Modify the list of locations to be used as Temporary Working Locations. for fallback purposes, it is possible to choose more than one location. The locations will then be used according to their order in the list.

Available Locations: Temporary Working Locations:

MyLocation

Add ->

Add all ->

initial location

Move Up

Move Down

<- Delete All

<- Delete

Back

Next

Finish

Cancel

Help

Define one or more temporary working locations for the database. Tamino uses the space in these locations to store temporary work spaces. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of temporary working locations, or choose **Add All** to add all available database locations to the list of temporary working locations. If you add a database location to the list of temporary working locations by mistake, you can remove it from the list by selecting it and choosing **Delete**, or choose **Delete All** to remove all temporary working locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

When you have defined all of the temporary working locations that you want, choose **Next** to continue to the page Define Reserve Locations. Please refer to the section [Location Management](#) for further information about database locations.

Page1 Page2 Page3 Page4 **Page5**

### Create Database From Backup - Define Reserve Locations

Modify the list of locations to be used as Reserve Locations. For fallback purposes, it is possible to choose more than one location. The locations will then be used according to their order in the list.

Available Locations: Reserve Locations:

MyLocation	<b>Add -&gt;</b>	initial location	<b>Move Up</b>
	<b>Add all -&gt;</b>		<b>Move Down</b>
	<b>&lt;- Delete All</b>		
	<b>&lt;- Delete</b>		

**Back** **Next** **Finish** **Cancel** **Help**

Define one or more reserved locations for the database. Reserved locations are used to store the database spaces if the assigned locations become full. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of reserve locations, or choose **Add All** to add all available database locations to the list of reserve locations. If you add a database location to the list of reserve locations by mistake, you can remove it from the list by selecting it and choosing **Delete**, or choose **Delete All** to remove all reserve locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

When you have defined all of the reserve locations that you want, choose **Next** to continue to the page **Define Backup Locations**. Please refer to the section [Location Management](#) for further information about database locations.

Page1 Page2 Page3 Page4 Page5 **Page6**

## Create Database From Backup - Define Backup Locations

Modify the list of locations to be used as Backup Locations. for fallback purposes, it is possible to choose more than one location. The locations will then be used according to their order in the list.

Available Locations: Backup Locations:

MyLocation

initial location

Add ->

Add all ->

<- Delete All

<- Delete

Move Up

Move Down

Back

Finish

Cancel

Help

Define one or more backup locations for the database. Backup locations are used to store the backup spaces. If you define more than one location, they will be used in the same order as in the list. Select an available database location and choose **Add** to add it to the list of backup locations, or choose **Add All** to add all available database locations to the list of backup locations. If you add a database location to the list of backup locations by mistake, you can remove it from the list by selecting it and choosing **Delete**, or choose **Delete All** to remove all backup locations from the list (locations that are deleted from the list are returned to the list of available locations). You can change the order of the locations in the list by selecting a location and using the **Move Up** and **Move Down** buttons.

When you have defined all of the backup locations that you want, choose **Finish** to create the new database from the backup.



# 30

## Display/Modify Database Properties

---

- Server Properties ..... 118
- XML Properties ..... 122
- Port Properties ..... 126
- X-Tension Properties ..... 128
- Displaying and Modifying Database Properties ..... 128

You can use the Tamino Manager to display information about and modify database properties. These properties are divided into 4 groups:

- Server properties
- XML properties
- Port properties
- X-Tension

The following sections provide information about the properties in each group and give instructions on how to display and modify.

 **Note:** The word “yes” in the column “Dynamic” in the following tables indicates that changes to the property value become effective immediately, even if the Tamino server is active. The word “no” indicates a non-dynamic property, which means that the changes only become effective if you stop and restart the database. After changing a non-dynamic property and if the database is online, a confirmation screen with the option to stop and restart the database is displayed. If you choose the **Restart** button on this screen, the database will be stopped and restarted immediately for the changed property to become effective.

## Server Properties

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
auto expand	yes	yes, no	yes	This switch controls whether the Tamino server is allowed to allocate or extend database spaces (data, journal or index) on its own.	<ul style="list-style-type: none"> <li>■ Tamino first tries to expand an existing space. If this fails, new space will be allocated in the defined reserved location</li> <li>■ If no free space is available, an error will be returned, depending on the operation performed</li> </ul>
autostart	no	yes, no	no	If this switch is set to "yes", the database will be started automatically when the computer starts as well as after its creation.	
buffer pool size	no	5 - 65536	Computed on the basis of the	This is the size of the buffer pool of the Tamino server in MB. The maximum value that you can specify for this property is 65536 MB). However, in practice, the	<ul style="list-style-type: none"> <li>■ Recommendation: as big as the biggest index</li> <li>■ Should not be bigger than the physical memory in order to avoid swapping</li> </ul>

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
			database profile	usable buffer pool size reduces to a lower amount, depending on the machine configuration and the Tamino version used.	
flush limit	yes	0 - 45875	0	The size in MB of the modified buffer pool space that triggers a flush (disk write) of the modifications present in the buffer pool.	Minimum for flush limit is 1 MB. Setting the flush limit to 0 is also allowed: If this value is set to 0, Tamino will adjust the flush limit itself. If a value higher than 70 % of the buffer pool size is configured, the server will internally recalculate the flush limit to 70 % of the buffer pool size, and a warning will be issued during each server startup.
dynamic pool size	no	500 - 61440	500	This is the size in KB of the Tamino server's internal dynamic working pool.	<ul style="list-style-type: none"> <li>■ Keeps result sets</li> <li>■ Support for sorting</li> <li>■ If this value is too small, swapping will occur which leads to increased I/O</li> </ul>
maximum transaction duration	yes	20 - 2592000	300	This is the maximum transaction duration in seconds.	This time includes the time for all command processing, including query. Tamino will terminate and roll back transactions that last longer.
non-activity timeout	yes	20 - 2592000	900	The maximum timespan (in seconds) that a user is allowed to be inactive before the Tamino server rolls back pending user transactions.	The non-activity timeout is also used as a communications timeout to the Tamino client. For this purpose, the timeout value used is never greater than 600 seconds.
replication delay	yes	1 - 65535	5	The interval (in seconds) at which the replication databases defined for a master database are updated. The property is set for the master database and applies to all replication databases that are	Decreasing the value of this property increases the processing overheads associated with more frequent calls for log space data by the replication databases.

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
				defined for that master database.	
flush group size	yes	0 - 5000	0	This property specifies the number of I/Os issued in parallel in a buffer flush. If 0 is specified, the system default is used.	
number of backup generations	yes	1 - (2 <sup>32</sup> -1)	5	The number of full backups that Tamino will keep in parallel. When this number is exceeded, the oldest backup and the corresponding log spaces will be deleted.  Backup generations refer to full backups only, not incremental backups.	
read only	no	yes, no	no	The database is read only. No insert, update or delete operations are possible.	Database cannot be deleted when this property is set to "yes".
tolerate autorepair errors	no	yes, no	yes	If this is set to yes, errors that occur during the autorepair of the Tamino server after an abnormal termination will be tolerated rather than leading to a refusal to start. The indexes or doctypes concerned will be disabled.	A disabled index can be fixed using the Check and Repair command in the Tamino Manager
server host name	no		none	This defines the host name part for the Tamino Server's registration with XTS.	<ul style="list-style-type: none"> <li>■ The Tamino server cannot be contacted from other nodes via XTS. Instead, applications on other nodes will look for the server on their node.</li> <li>■ This setting can be used on portable devices to ensure that an interruption of network connections does not cause any problems with administrating and communicating with the Tamino server.</li> <li>■ Max. length=255</li> </ul>

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
communication method	no	SSL and TCP/IP, SSL, XTS and TCP/IP, XTS, TCP/IP, HTTP, HTTPS	XTS and TCP/IP	This defines which standard method Tamino uses for communication.	<p>If TCP/IP is used in combination with XTS or SSL, XML requests can be sent to the server via XTS and TCP/IP. (Note that using SSL requires a special certificate)</p> <p>If XTS or SSL are used, the XML port is not allocated and XML requests can only be sent via XTS.</p> <p>If TCP/IP is used, the XML XTS port is not allocated and XML requests can only be sent via TCP/IP.</p> <p>If HTTP or HTTPS is used, property HTTP port must be set.</p>
SSL certificate file	no	max. length 1023	none	Specifies the file name of the server's certificate.	
SSL key file	no	max. length 1023	none	Specifies the file name of the server's key.	Optional. The key can also be included in the certificate file.
SSL password	no	max. length 1023	none	Holds the pass phrase of the server's SSL key.	Optional. Used to decrypt the file specified in SSL key file, if this file is encrypted.
SSL CA file	no	max. length 1023	none	Specifies the file name of the trust file	To be used for certificate base authentication and encryption
SSL certificate chain verification depth	no	1023	1	Specifies the maximum depth of chained certificate evaluation	
SSL verify_client	no	yes, no	no	Indicates whether the client is to be authenticated by the Tamino server via SSL	
deprecated features	yes	tolerate, log, log and reject	log	Specifies how Tamino reacts to the usage of deprecated features. It can react by executing the request and writing an error to the	

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
				session's job log (log), by additionally rejecting the request which uses the deprecated feature (log and reject), or by silently executing the request (tolerate).	
unbuffered	no	none, all, database, journal	none	This property specifies which parts of a Tamino database are handled with unbuffered I/O. The property usually increases I/O times but removes the need for synchronization on devices.	value database: means data spaces and index spaces in this context
overwrite XTS registration	no	yes, no	no	This switch controls whether the Tamino server should remove existing XTS directory service entries for the server and create new entries during startup.	Before setting this value to "yes", check that no database with the same name is active on another node, using the same XTS directory server. You would disable any client communication with such a database.
incremental backup	yes	yes, no	no	This switch controls whether an incremental backup can be made for the database.	

## XML Properties

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
XQuery document cache size	yes		20	Specifies the capacity of the document cache that is used for XQuery processing.	Document caching improves the performance of certain queries like join queries where the sorting is done via an index. Also certain XQuery update statements can benefit from a big document cache. The capacity of the

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
					XQuery document cache is specified in MB.
word fragment index	no	yes, no	no	If this is set to yes, a word fragment index is maintained.	Maintaining a word fragment index can be very time- and resource-intensive, but will increase performance for certain query types.  For read-only databases (e.g. replication databases), the word fragment index parameter is displayed, but cannot be modified.
XML maximum sessions	no	0 - 100000	100	The maximum number of XML sessions that can be open at the same time.	A sessionless request counts as a session for the execution time.
XML max simultaneous requests	no	150 - 10000	0	Specifies the size of the queue of free XML request entries and therefore limits the maximum numbers of simultaneous requests that can be accepted by the Tamino Server.	The default value (0) means that the actual value of the property is computed by Tamino at startup time. The value for a database with default settings is 157 (100 + XML work threads + XML dynamic work threads + 2).
XML work threads	no	1 - 1024	5	The number of threads used to process XML commands.	Requests are queued if there are no XML work threads available.
X-Node default encoding	no	supported encoding	ISO-8859-1	The encoding that external data sources which are accessed by Tamino use for their data.	Can be overwritten within the schema definition where the mapping is specified.

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
X-Node default password	no	Character string (max. 128 characters)	guest	The password used for ODBC connections if no other password is specified.	Can be overwritten within the schema definition where the mapping is specified.
X-Node default user	no	Character string (max. 128 characters)	guest	The user-ID used for ODBC connections if no other user ID is specified.	Can be overwritten within the schema definition where the mapping is specified.
default tokenizer	no	white space-separated, Japanese	white space-separated	Specifies the component that is used to break strings into words.	
default encoding	no	Encoding names (see list box)specified in the <a href="#">IANA registry</a>	ISO-8859-1	Specifies the encoding used for responses from Tamino if no explicit encoding is requested.	
XML document default encoding	no	UTF-8 and ISO-8859-1	UTF-8	Specifies the encoding that is assumed for a received document if the encoding is not specified otherwise.	
stemming index	no	yes, no	no	Specifies whether or not a stemming index is maintained. A stemming index speeds up text retrieval operations that use stemming functionality.	For read-only databases, the stemming index parameter is displayed, but cannot be modified.
markup as delimiter	no	yes, no, mixed	no	Specifies how markup is treated. If set to "yes", markup is treated as a delimiter for text (i.e. markup is handled like white space). If set to "mixed", markup is not treated as a delimiter in mixed-content elements.	If you change this property, it is necessary to recreate all text indexes.
authentication	no	web server, tamino, none	web server	Specifies whether authentication is performed by the web server, by Tamino, or not at all.	Please refer to the section <a href="#">Tamino Authentication</a> for further information about this property.

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
XML maximum request duration	yes	20 - 2592000	300	The maximum duration of each request is limited to the specified number of seconds.	After this period, the request terminates with an error, but the transaction is not rolled back.
queue next request	yes	yes, no	yes	Specifies whether a subsequent request in a session is allowed even if the result of the previous request has not been completely processed. If set to "yes", a subsequent request in a session is allowed while the previous request is still active. If set to "no", a subsequent request in a session is not allowed if the previous request is still active.	
reject xsi:type	no	yes, no	yes	Rejects xsi:type attribute in element validation.	
text index word length	no	32-250	64	Specifies the maximum length for text index entries.	
XML text index type	no	single word, double word	double word	Specifies if a text query may contain one or two words (single-word index or double-word index).	Usage of three or more word queries cannot be an indexed search, thus resulting in low performance.
request log folder	no	-	-	This is the folder/directory where XML request log files are stored.	The default folder for the request log is the reserved location, if no request log folder is specified.
request log	yes	off, full, requests	off	This property specifies whether requests to Tamino are logged to a file. Logging can be restricted to the pure request (requests), or the requests with all data sent to Tamino (full). The	

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
				default is that no logging is performed (off).	
request log file count	no	0 - 999	2	This is the maximum number of XML request log files written. If 0 is specified, XML request logging is turned off.	
request log file maximum size	no	0 - 2997152	1	This is the maximum size of an XML request log file (in MB). If this size is reached, Tamino switches to a new request log file. If the last log file is full, Tamino switches to the first one.	

## Port Properties

Port numbers should only be changed if there is a special reason to do so. Otherwise, it is recommended to take the default, as Tamino handles port allocation dynamically. For further information, see section [Set the Range of Port Numbers](#).

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
replication port	no	0 or 1024 - 65535	0 (dynamic allocation)	The number of the port used for access to the Tamino server for replication databases	<p>Only used by replication databases.</p> <p>A value of 0 means that the port number is allocated dynamically at database startup. If you do not use the value 0, the number</p> <ul style="list-style-type: none"> <li>■ should be taken from the range of static port numbers defined during installation or with the <b>Port Range</b> option</li> <li>■ should be changed if there are conflicts with other applications</li> </ul>
XML port	no	0 or 1024 - 65535	default from static port range	The number of the port used for XML access to the Tamino server via pure TCP/IP	A value of 0 means that the port number is allocated automatically. If you do not use the value 0, the number

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
					<ul style="list-style-type: none"> <li>■ should be taken from the range of static port numbers defined during installation or with the <b>Port Range</b> option</li> <li>■ should be changed if there are conflicts with other applications</li> </ul>
administration port	no	0 or 1024 - 65535	0 (dynamic allocation)	The number of the port used for access to the Tamino server for all administration actions	<p>A value of 0 means that the port number is allocated dynamically at database startup. If you do not use the value 0, the number</p> <ul style="list-style-type: none"> <li>■ should be taken from the range of static port numbers defined during installation or with the <b>Port Range</b> option</li> <li>■ should be changed if there are conflicts with other applications</li> </ul>
XML XTS port	no	0 or 1024 - 65535	0 (dynamic allocation)	The number of the port used for XML access to the Tamino server when using Software AG's extended transport service for XML access, including encrypted communication via SSL.	<p>A value of 0 means that the port number is allocated dynamically at database startup. If you do not use the value 0, the number</p> <ul style="list-style-type: none"> <li>■ should be taken from the range of static port numbers defined during installation or with the <b>Port Range</b> option</li> <li>■ should be changed if there are conflicts with other applications</li> </ul>
HTTP port	no	0 or 1024 - 65535	default from static port range	The number of the port used for XML access to the Tamino server when using native HTTP or HTTPS communication.	<p>A value of 0 means that the port number is allocated automatically. If you do not use the value 0, the number</p> <ul style="list-style-type: none"> <li>■ • should be taken from the range of static port numbers defined during installation or with the <b>Port Range</b> option</li> <li>■ • should be changed if there are conflicts with other applications</li> </ul>

## X-Tension Properties

Name	Dynamic	Allowed Values	Default Value	Description	Additional Information
X-Tension Java Options	no	Character string (max. 255 characters)	none	This is used to specify optional properties for the JVM that is started when X-Tension Java usage is turned on.	The syntax of the string is as follows: The first character of the string serves as the delimiter for the options that follow. For example: ?opt1?opt2?opt3 results in the options opt1, opt2 and opt3.
X-Tension Java usage	no	yes, no	yes	If this switch is set to yes, the X-Tension Java infrastructure is enabled. If this switch is set to no, Java-based X-Tensions cannot be installed, modified, upgraded or executed, even if they were installed before the switch was set to no.	
X-Tension COM usage	no	yes, no	yes	If this switch is set to yes, the X-Tension COM infrastructure is enabled. If this switch is set to no, COM X-Tensions cannot be installed, modified, upgraded or executed, even if they were installed before the switch was set to no.	
X-Tension direct usage	no	yes, no	yes	If this switch is set to yes, the X-Tension Direct infrastructure is enabled. If this switch is set to no, Direct X-Tensions cannot be installed, modified, upgraded or executed, even if they were installed before the switch was set to no.	

## Displaying and Modifying Database Properties

### ➤ To display/modify database properties

- 1 Expand the database for which you want to display/modify the properties.
- 2 Select the **Properties** object to display information about all of the database properties, or expand the **Properties** object and select a group (Server, X-Tension, XML or Ports) to display specific information.

The information displayed includes (where appropriate) the property name, the effective value, the configured value, units, high water mark and the time it occurred (useful for database tuning), and information about whether a property is dynamic or not. A property is dynamic if the new value becomes immediately effective when the database is running. New values for non-dynamic properties become effective after the next restart of the database. If the value displayed under high water marks approaches the maximum configured value for a property, it may be advisable to specify a new maximum value to ensure continued good performance.

- 3 Select a group and choose **Modify** from the group's context menu. A page containing the group properties appears.

### XML Properties of Database 'MyDatabase'

PROPERTY NAME	DETAILS	EFFECTIVE VALUE	CONFIGURED VALUE	UNIT	DYNAMIC
XQuery document cache size	?	-	20	* MB	yes
XML work threads	?	-	10	*	no
XML maximum sessions	?	-	100	*	no
text index word length	?	-	64	*	no
XML maximum request duration	?	-	300	* seconds	yes
request log file count	?	-	2	*	no
request log file maximum size	?	-	1	* MB	no

- 4 Enter new values for properties you want to change in the **Configured Value** column or select settings from the drop-down list boxes. Placing the cursor over the question mark icon in the **Details** column displays a tool tip that includes a brief description of the property together with its minimum, maximum and default values. If you choose **All Defaults**, all of the properties are reset to their default values/settings.
- 5 Choose **OK** to apply the changes.
- 6 If you have changed a non-dynamic property, a confirmation screen with the option to stop and restart the database is displayed. You can either choose **Restart** to change the property and initiate the stop and restart, or choose **Do not Restart** to skip the stop and restart process.



# 31

## Assign/Delete Web Server Settings

---

Adding a web server with the Assign/Delete command authorizes the web server in question to access the selected database. Before assigning a web server, you first have to define it with the help of the Web Server Management. If no web server is assigned, all web servers are allowed to access the database.

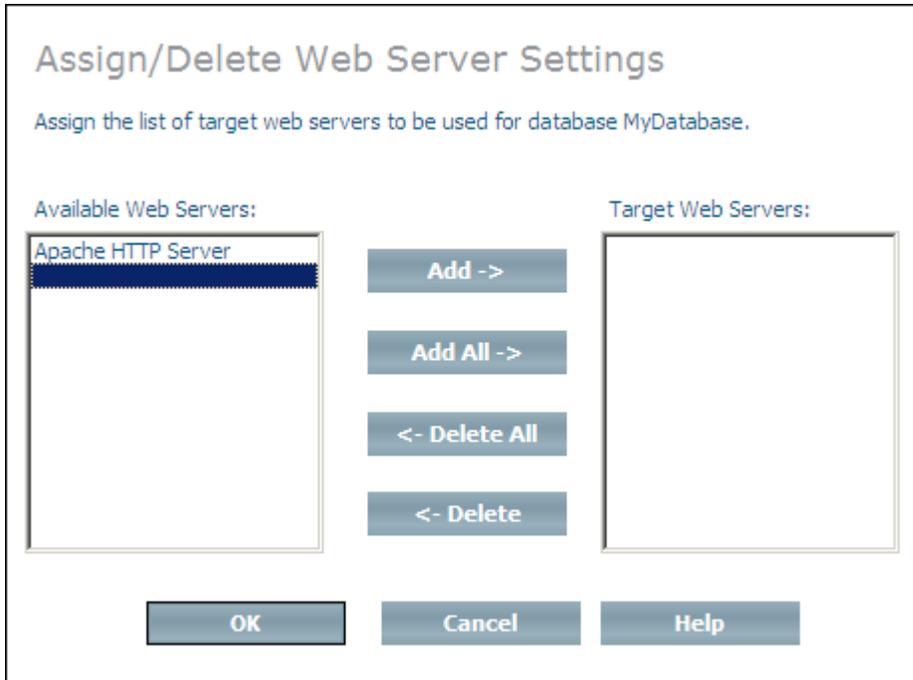
Please refer to the section [Web Server Management](#) for information about adding, modifying and deleting web servers that can be used by Tamino.



**Note:** When you assign or delete a web server, the changes only become effective after re-starting the database to which these web servers assigned.

### » To assign/delete a web server

- 1 Expand the **Databases** object. In the list of databases displayed, expand the database whose list of web servers you wish to modify.
- 2 Select the object **Web Servers** and choose **Assign/Delete** from the context menu. The **Assign/Delete Web Server Settings** page appears.



- 3 Select an available web server and choose **Add** to add it to the target list of web servers, or choose **Add All** to add all available web servers to the target list of web servers. You can remove a web server from the target list by selecting it and choosing **Delete**, or choose **Delete All** to remove all web servers from the target list (web servers that are deleted from the target list are returned to the list of available web servers). You can change the order of the web servers in the list by selecting a web server and using the **Move Up** and **Move Down** buttons.

When you have assigned/deleted all of the web servers that you want, choose **OK** to assign/delete the web server(s).

Please refer to the section [Web Server Management](#) for further information about adding, modifying and deleting web servers that can be used by Tamino.

# III

---

■ 32 Job Monitoring Functions .....	135
■ 33 Administration of Collections .....	139
■ 34 Tamino Security .....	141
■ 35 Version/License Management .....	179
■ 36 Web Server Management .....	181
■ 37 Administration Considerations .....	187
■ 38 ARGBATCH - The System Management Hub Batch Interface .....	191
■ 39 Usage Hints .....	199



# 32

## Job Monitoring Functions

---

- The Job Log ..... 136
- Displaying Job Monitor Information ..... 137
- Confirming Pending Alerts ..... 137
- Deleting Job Records ..... 138

The Tamino Manager monitors all jobs that you start. You can use the Job Monitor to display information from the following categories:

**Pending Alerts**

Jobs in this category have unconfirmed alerts. Each job in this category is also listed in one of the other categories (running, completed, suspended jobs). The Pending Alerts category allows you quick access to potential problems without the need to search through all other categories. You can acknowledge all alerts in one action or acknowledge each alerted job separately, when you display the information about it.

These are alerts that were produced while jobs were processing and which have not been acknowledged yet. You can acknowledge the alerts when you display the information about them.

**Running Jobs**

These are jobs that are currently being processed.

**Completed Jobs**

These are jobs that have finished processing, even if they produced alerts (in this case, the jobs are displayed in both the Pending Alerts and the Completed Jobs).

**Suspended Jobs**

These are jobs that have been suspended.

This section contains information about the following:

- [The job log](#)
- [Displaying job monitor information](#)
- [Confirming pending alerts](#)
- [Deleting job records](#)

## The Job Log

---

The following information is displayed for each job:

- The job status. This is represented by one of the following icons:

Icon	Job status
	job running
	job completed
	job suspended

- The count of warnings (🚨), errors (🚫) and fatal errors (💣) that occurred while the job was running.
- Messages produced during the job, listed in chronological order. Each message is accompanied by its severity, message ID, message text and the data and time it was produced. Clicking on a message ID additionally displays the full text of the message, together with an explanation and a user action, in a separate browser window.

---

## Displaying Job Monitor Information

---

### ➤ To display job monitor information

- 1 Expand the root **Tamino** object.
- 2 Expand the **Job Monitor** object under the root **Tamino** object.
- 3 Select the job type you want. The relevant jobs are displayed together with their names.
- 4 For detailed information about a specific job, expand the job type object, and select the job for which you want to display the detailed monitor information.

Once you have selected a specific job from an object, you can also display a list of related jobs. The information displayed in the list includes a description of the job together with the job status, starting and ending times and any alerts that may have been issued. It is also possible to display detailed information about specific jobs contained in this list of related jobs.

### ➤ To show related jobs

- 1 Select a job from the expanded job type object and choose **Show Related Jobs** from the context menu. The **Show Related Jobs - Query** dialog box appears:
- 2 Select a relation criterion from the list box and choose **OK**. The list of related jobs is displayed.
- 3 Choose **Job Details...** to display detailed information about a job in the resulting list of related jobs.

---

## Confirming Pending Alerts

---

The object **Pending Alerts** is a list of the jobs that contain alerts waiting to be acknowledged. They can be acknowledged when the list is displayed. You can either confirm all of the pending alerts in all of the jobs in the list, or confirm the alerts in individual jobs.

➤ **To confirm pending alerts**

- 1 Expand the **Job Monitor**.
- 2 Select **Pending Alerts** and choose **Confirm Alerts**. This confirms all pending alerts in all jobs.

Or:

Select a job from the list of pending alerts and choose **Confirm Alerts and Delete Jobs**. This confirms all of the alerts in the selected job and then deletes it from the list.

## Deleting Job Records

---

In order to prevent the job log from becoming too large, the Tamino Manager provides you with functions to delete job records. Job records that contain unconfirmed alerts and running jobs cannot be deleted. There are two ways in which a job record can be deleted:

- Tamino deletes it automatically, based on the status and age of the job record.
- The DBA deletes it

➤ **To delete a job record manually**

- 1 Expand the **Job Monitor** and select **Completed Jobs**.
- 2 Choose **Delete All Completed Jobs** to delete all of the job records.
- 3 Expand the **Completed Jobs** object, select the job you want to delete and choose **Confirm And Delete Job**.

➤ **To configure automatic deletion of a job record**

- 1 Expand the **System Management Hub** object (located under the object that represents your host machine).
- 2 Select the **Events and Job Monitor** object, and from the context menu choose **Change Settings**.
- 3 Change the time interval for the message cleanup as required.
- 4 Choose **OK**.

The default interval for automatic deletion of job records is as follows:

- The record of a job that only contains informational messages is deleted after 30 days.
- The record of a job that contains confirmed warnings is deleted after 30 days.
- The record of a job that contains confirmed errors is deleted after 30 days.
- The record of a job that contains confirmed fatal errors is deleted after 30 days.

# 33 Administration of Collections

---

Expanding the **Collections** object lists the collections in the database and their associated doctypes. You can also access the Data Loader to load and unload data into a doctype by expanding the object **Collections > (name of collection) > (name of schema) > (name of doctype)**, then selecting the **Load** option from the context menu of the doctype object. Please refer to the documentation about the Tamino Data Loader for further information about how to use this utility.

---

# 34 Tamino Security

---

- Tamino Authentication ..... 142
- Tamino Authorization ..... 147
- Security Manager ..... 155
- Instance-based Security ..... 172

This chapter contains information about Tamino authentication, the Tamino authorization concept and the Security Manager, which is integrated in the Tamino Manager tree of each database and can be used to implement Tamino authorization and authentication. The following topics are covered:

## Tamino Authentication

---

Tamino supports an authentication mechanism that uses an external web server or information that is stored in the database. When a web server is used to perform authentication, other mechanisms (in addition to the HTTP basic authentication mechanism) that are supported by that web server can also be used. When Tamino is used to perform the authentication, only the basic authentication mechanism is supported.

### Authentication Modes

There are 3 possible authentication modes. The authentication mode is defined per database with the XML property `Authentication`. Please refer to [Display/Modify Database Properties](#) for further information about how to set and modify the authentication mode.

The following authentication modes are available:

#### **web server**

In this mode, Tamino receives the userid from the web server module and relies on the web server to authenticate the user. If this mode is set and the web server is not configured to perform authentication, a blank userid will be used in Tamino which will be assigned to the permissions of the default group. If a request is authenticated successfully and passed to Tamino, the userid (and the domain) specified in the HTTP basic authentication scheme is used.

This is the default mode that is set when a new database is created. If this method is used, the web servers that are allowed to communicate with Tamino should be carefully restricted (see [Web Server Management](#)).

#### **tamino**

This mode specifies that authentication is performed directly by Tamino. All requests sent to Tamino are authenticated against the users known to Tamino. These users are either stored directly in Tamino in the collection `ino:security` or are stored in an external authentication service which Tamino can query (see section [External Authentication](#) in this chapter). Each request sent to Tamino must include a userid and a password; if these are not provided or if authentication fails, Tamino will return an HTTP response code 401.

#### **none**

In this mode, Tamino will use the userid provided for authorization, but it will not be authenticated. The userid can be sent in either the HTTP basic authentication header field or in the special header field `X-INO-Authorization`.



**Note:** There is an additional mode “tamino no challenge”. This mode is equivalent to “tamino”, but provides some additional internal functionality which is used by certain Software AG products. If your installation of Tamino is preset to “tamino no challenge”, do not change that mode.

## Passwords

If a user is to be authenticated by Tamino, there must be a password stored inside Tamino for that user. Passwords are not stored as plain text, but rather as hash values that are computed using a one-way hash function. In order to store a password, the plaintext password has to be put into the attribute `ino:unencryptedpassword`. The value in this attribute is then hashed, and the resulting value is stored in the attribute `ino:password`. If the password was retrieved as a hash value, it can be stored back into Tamino directly using the attribute `ino:password`.

A user can change his own password with the special administration function `ino:ChangeUserPassword`. This function changes the password of the user that issues the command, and will only work when the authentication mode is set to `Tamino`. The function has only one parameter, which is the new password in plaintext:

### Example

```
_admin=ino:ChangeUserPassword("new_password")
```

The current request will be executed using the old password, but the next request for the user in question will have to be executed using the new password. Executing this function also sets the attribute `ino:passwordlastchanged` to the current system time.



**Note:** In order to avoid plaintext passwords from being stored in web server access logs, this admin command should always be sent using an HTTP POST request.

## External Authentication

When using the authentication mode `tamino`, it is possible to have Tamino check the user credentials against a local operating system or against an LDAP Server. In order to use this feature, users must be grouped into domains, where each domain is associated with an authentication service.

Domains are defined in the doctype `ino:domain` of the collection `ino:security`. A domain defines a unique name and the type of authentication service and possibly some additional parameters to describe the authentication service. The following example shows the definition of a domain `mydomain`, which uses the local operating system to authenticate the users:

```
<ino:domain ino:domainid="mydomain" ino:domaintype="os"
xmlns:ino="http://namespaces.softwareag.com/tamino/response2" />
```

The following attributes can be set for a domain:

**ino:domainid (required)**

Specifies the unique name of the domain - this unique name must be specified as part of the user names in order to uniquely assign a user to a domain.

**ino:domaintype (optional - default=tamino)**

Specifies the type of authentication service. Possible values are:

- tamino: authenticate against users whose passwords are defined in Tamino
- os: authenticate against the local operating system
- ldap: authenticate against an external LDAP server

**ino:expire (optional - default = 0)**

The number of seconds that a user should be cached in Tamino before being reauthenticated against the external service. A value of 0 means that the user is reauthenticated with every request sent to Tamino. When using a local operating system, this value should be set fairly low and when using an external service which is connected via a network, this value should be set higher, in order to avoid unnecessary network accesses.

**ino:acceptusers (optional - default = defined)**

This option specifies whether to allow access of any user that is correctly authenticated by the authentication service (value `all`) or whether to only allow access by users that are explicitly defined in the `ino:user` doctype (value `defined`).

**ino:usegroups (optional - default = false)**

This option specifies whether to use the external group information from domains – for example the groups in an Active Directory Server or in an LDAP server. When this attribute is set to true, the external groups will be visible and will be preceded by the domain name and a backslash. Note that this option can only be set by directly storing the XML configuration files into Tamino. The Security Manager in the System Management Hub and Argbatch do not support this feature yet.

**ino:default (optional - default = false)**

This option specifies whether the domain should be used as default authentication domain. Setting this option will result in users being authenticated against this domain, even when no domain name is given with the userid. If a user exists which is defined locally in Tamino and also in the default domain, the local user will be used for authentication. Note that this option can only be set by directly storing the XML configuration files into Tamino. The Security Manager in the System Management Hub and Argbatch do not support this feature yet.

When specifying the domain type `ldap`, some additional parameters need to be set, to describe the location and configuration of the LDAP server. For this purpose, key-value-pairs can be specified as contents of the `ino:domain` element in the following format:

```
<ino:param ino:name=".." ino:content=".." />
```

The following parameters need to be specified for an LDAP:

host	IP number of the host where the LDAP server is running
port	Port on which the LDAP server is listening
ldap_person_dn	The distinguished name of the person entries
ldap_person_object	The class hierarchy for person entries from the top to the bottom, separated by colon (e.g. top,person)
ldap_group_dn	The distinguished name of the group entries
ldap_group_object	The class hierarchy for group entries from the top to the bottom, separated by colon
ldap_password_field	The attribute names containing the password (separated by colon)
ldap_user_field	(optional - default=cn) The prefix for the unique userid

For more information about these parameters, see section [LDAP Configuration](#)

Once a domain is defined in Tamino, any user accessing Tamino that has a username starting with the domain ID, followed by a backslash, will be authenticated against the authentication service specified by the domain. For example, if we have the following defined in *ino:security*:

```
<ino:domain xmlns:ino="http://namespaces.softwareag.com/tamino/response2"
ino:domainid="mydomain" ino:domaintype="os" />
<ino:user xmlns:ino="http://namespaces.softwareag.com/tamino/response2"
ino:userid="mydomain\user">OS-User</ino:user>
<ino:user xmlns:ino="http://namespaces.softwareag.com/tamino/response2"
ino:userid="user" ino:unencryptedpassword="xx">Tamino-User</ino:user>
```

We can now access Tamino by specifying the username `user` without a domain, in which case the user will be authenticated against the password `xx`, which is stored directly in Tamino, or by specifying the username `user` and the domain `mydomain`, in which case the user will be authenticated against the local operating system.

Since the Tamino architecture requires the authentication information to be passed to the server in the HTTP header field for authentication, and since this field is restricted to a userid and password, the domain is represented as part of the userid separated by a backslash (“\”). Any userid which does not contain any domain information is automatically assigned to the default domain, which is the local Tamino authentication service, relying only on user information stored in *ino:user*.

## LDAP Configuration

To configure an external LDAP service, some special parameters need to be set, depending on the type of LDAP being used. This section gives a short description for some common LDAP configurations.

### iPlanet Directory Server

The iPlanet Directory Server is preconfigured to store users in a special way. When using this preconfigured mechanism, the following parameters should be used (besides the host and port parameters):

```
<ino:param ino:name="ldap_person_dn"
  ino:content="ou=People,dc=my,dc=server,dc=com" />
<ino:param ino:name="ldap_person_object"
  ino:content="top,person,organizationalPerson,inetorgperson" />
```

where the value "ou=People,dc=my,dc=server,dc=com" needs to be replaced by your specific DN.

If you have added users with the uid field filled, the users will not be uniquely identified using the cn prefix, but rather the uid prefix, which will require that the following parameter is also added:

```
<ino:param ino:name="ldap_user_field" ino:content="uid" />
```

### Active Directory Service

When using an MS Active Directory Service, the following parameters need to be set (besides the host and port parameters):

```
<ino:param ino:name="ldap_person_dn"
  ino:content="CN=Users,DC=my,DC=server,DC=com" />
<ino:param ino:name="ldap_person_object"
  ino:content="top,person,organizationalPerson,user" />
```

where the value "CN=Users,DC=my,DC=server,DC=com" needs to be replaced by your specific DN.

## OpenLDAP

An OpenLDAP server can be configured in various ways - the administrator of the LDAP will know which fields contain the user information, and should be able to provide the correct values for the fields `ldap_person_dn`, `ldap_person_object`, `ldap_password_field`, and possibly also the `ldap_user_field`.

## Tamino Authorization

---

Tamino provides an authorization check to grant or deny access to XML nodes (elements and attributes) and functions.

Access control is currently available on the structural level, that is, each node can be protected individually, or based on its position in a subtree, rather than based on the content or value of a node.

This section describes how authorization checking is implemented in Tamino under the following headings:

- [Authorization Concept](#)
- [Protecting `ino:security`](#)
- [Security Objects: XML Schemas](#)
- [Special Cases](#)

### Authorization Concept

#### Security Objects

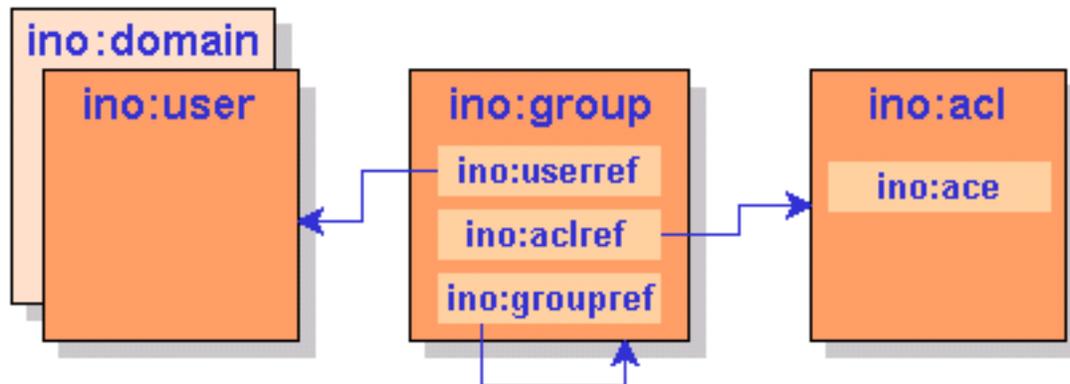
Tamino is delivered with a Collection `ino:security` that contains Doctypes `ino:user`, `ino:group` and `ino:acl` (acl=Access Control List).



**Note:** The Collection `ino:timeframe` is intended for future use and does not have special functions in the current version.

You can implement access control by defining instances of Tamino Doctypes `ino:user`, `ino:group` and `ino:acl` to the Tamino Collection `ino:security` as illustrated in the following figure:

## Doctypes in Collection ino:security



An Access Control List (ACL) contains Access Control Elements (ACEs) which identify nodes and function names. The access level is specified in an attribute of the ACE. A group refers to users and ACLs, thus authorizing those users for the ACEs contained in the ACLs.

The authorization concept for nodes is based on the following principles:

- Each node to be protected must be XML content stored in Tamino. Nodes that are implicitly created due to mappings to external sources cannot be protected.
- Each node and its descendants can be protected individually, but if a given node cannot be accessed as a result of its access restrictions, then none of the descendants of that node can be accessed either, even if access permissions are defined for these descendants.
- If a node is not defined in an ACE, there is no access control, that is, it is generally accessible, unless there are restrictions defined for one of the node's ancestors.

The authorization concept for functions is based on the following principle:

- An absolute function name that is not preceded by any path names must be specified. The function name must finish with the characters `()`.
- The attribute `ino:access` for functions may only contain the values `no` (function may not be executed) or `full` (function may be executed).

The following general principles also apply:

- All undefined users are automatically members of the default group that has the same name as the database.
- Each instance of user, group, and ACL must be unique within a Tamino database.
- The authorization feature does not guarantee referential integrity. That is, if a node is deleted, the authorization information is retained, and restrictions can be defined for nodes before they exist.

- During document composition, protected nodes are not returned to an unauthorized user.
- During document processing, if the construct to be updated in Tamino contains protected nodes, the update is rejected for the whole document.
- During delete operations, if the construct to be deleted in Tamino contains protected nodes, the delete operation is rejected for the whole document, and also for multiple documents if more than one document is to be deleted.
- The order of precedence in which access restrictions are processed is such that less restrictive permissions override more restrictive ones if more than one restriction is explicitly defined for one node.

### Authorization Levels

The authorization level is specified in an attribute of the ACE. Authorization levels are:

#### Level Meaning

- no Access to this node or function is denied.
- read Read access is granted.
- change Update access is granted.
- full Define and undefine access is granted. Function may be executed.



**Note:** The access attributes are case-sensitive and must all be written in lower-case letters.

The following authorization levels are required on the Node for X-Machine commands:

Command	Minimum authorization level
_xql	read, change or full for node, and full for function
_process	change or full
_delete	change or full
_define	full
_undefine	full
_admin	full for function
_xquery (reading)	read, change or full
_xquery (updating)	change or full

## Protecting `ino:security`

All authorization information in Tamino is stored in the Collection `ino:security`. When Tamino is initially installed, no access restrictions are set for this Collection, which means that any user authenticated by the web server to access Tamino can modify the data in `ino:security` and hence grant and revoke access rights to any part of the database. When implementing security on Tamino, you should first define a user that has access to `ino:security`, and define `ino:security` as being inaccessible to all other users.

The following XML document is an example of how to set up security for the Tamino database `mydb`, with only the user `secadmin` having access to `ino:security`.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<ino:user ino:userid="secadmin"
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">Security
Administrator</ino:user>
<ino:group ino:groupname="secgroup"
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:userref>secadmin</ino:userref>
  <ino:aclref>secacl</ino:aclref>
</ino:group>
<ino:acl ino:aclname="secacl"
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:ace ino:access="full">ino:security</ino:ace>
</ino:acl>
<ino:group ino:groupname="mydb"
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:aclref>defaultacl</ino:aclref>
</ino:group>
<ino:acl ino:aclname="defaultacl"
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:ace ino:access="no">ino:security</ino:ace>
</ino:acl>
```



**Note:** Please be aware that the user who is used to access the System Management Hub and who is to be used to administer the security configuration via the Security Manager, needs to be a valid user in the Tamino Server with the required privileges – otherwise it will not be possible to modify the user definitions. So the user who is defined as administrator in the System Management Hub should also be defined in the Tamino Security.

## Security Objects: XML Schemas

All security objects are stored in the Collection *ino:security*. Security objects are instances of Doctypes *ino:user*, *ino:group*, *ino:acl* or *ino:domain*. Please refer to the collection *ino:collection*, for the complete schemas.

### Doctype *ino:user*

The attribute *ino:userid* is checked for uniqueness during insertion of an instance of Doctype *ino:user*. The contents of the *ino:user* element is freely definable and has no relevance to the operation of Tamino security.

### Example *ino:user* Instances

The following examples illustrate an instance of a general user:

```
<ino:user ino:userid="saguser1" ino:password="xxx" ↵
xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
User name, general user</ino:user>
```

### Doctype *ino:group*

The Doctype *ino:group* has only one attribute: *ino:groupname*. The group name is checked for uniqueness during insertion of an instance of Doctype *ino:group*.

The child element *ino:userref* establishes the relation between an instance of *ino:group* and an instance of *ino:user* by using the value of the user ID as content.

On the other hand, there is no referential integrity between *ino:user* and *ino:group* based on the contents of the *ino:userref* element.

The child element *ino:aclref* establishes the relation between an instance of *ino:group* and an instance of *ino:acl* by using the name of the ACL as content. All users referenced in the group have access to all ACLs referenced by the same group. Again, there is no referential integrity between *ino:group* and *ino:acl* based on the contents of the *ino:aclref* element.

Using the *ino:groupref* element, it is possible to reference other groups. The references are resolved similar to an `include` statement.

Please note that the *ino:groupref* element can only be set by directly storing the XML configuration files into Tamino – the Security Manager in the System Management Hub and Argbatch do not support this feature yet.

The following example demonstrates how the *ino:groupref* can be used to separate the groups of users and groups of privileges (roles). The *adminusers* group is used to group some users together and the group *adminprivileges* groups some ACLs. Via the *ino:groupref* from *adminusers* to *adminprivileges*, the users in group *adminusers* are assigned the ACLs from *adminprivileges*.

```
<ino:group ino:groupname="adminusers"
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:userref>saguser1</ino:userref>
  <ino:userref>saguser2</ino:userref>
  <ino:groupref>adminprivilege</ino:groupref>
</ino:group>

<ino:group ino:groupname="adminprivilege"
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:aclref>acldbadmin</ino:aclref>
  <ino:aclref>aclsecadmin</ino:aclref>
</ino:group>
```

## Special Groups

If there is a group defined to the system, which has a group name identical to the name of the Tamino database in question, all defined and undefined users are regarded as members of this group.

Besides the default group, there is also a predefined administrator group with the name *ino:admin*. Any user assigned to this group has full access to all nodes and to all functions.

## Example ino:group instances

The following example instances illustrate a group for general users:

```
<ino:group ino:groupname="general" ↵
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:userref>saguser1</ino:userref>
  <ino:aclref>aclgeneral</ino:aclref>
</ino:group>
```

The following example instances illustrate a group for administrators:

```
<ino:group ino:groupname="admin" ↵
  xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:userref>sagdba</ino:userref>
  <ino:aclref>acladmin</ino:aclref>
</ino:group>
```

The following example instances illustrate a default group for a database that is called mydb:

```
<ino:group ino:groupname="mydb" ↵
xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:aclref>aclall</ino:aclref>
</ino:group>
```

The group definition *mydb* will automatically incorporate all users of the Tamino database, because it carries the name of the Tamino server itself (in this example *mydb*), thus granting the access rights contained in the ACLs referenced in *ino:aclref* to all users.



**Note:** This group has to be created to act as default to prevent any user getting full database access.

### Doctype ino:acl

The *ino:acl* element has only one attribute: *ino:aclname*. The ACL name is checked for uniqueness during the insertion of an instance of Doctype *ino:acl*. The child elements *ino:ace* contain the access authorization definitions for each node and function in the Tamino repository as values of the attribute *ino:access*.

The content of an *ino:ace* element is the absolute path to the node or the absolute function name for which access rights are to be defined. The path must be explicitly defined, it must not contain any generic definitions such as // or \*. Also, the names between the slashes may only consist of characters that are valid for XML element and attribute names.

There are currently four possible values for the attribute *ino:access*: no, read, change, full. Any other value supplied will be rejected by the validation. Note that these values are case-sensitive.

### Example Instances of ino:acl

This example grants read access to instances of doctype1 in collection coll1.

```
<ino:acl ino:aclname="aclall" ↵
xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:ace ino:access="read">coll1/doctype1</ino:ace>
</ino:acl>
```

This example grants full access to instances of "doctype1" in Collection "coll1"

```
<ino:acl ino:aclname="acluser" ↵
xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:ace ino:access="full">coll1/doctype1</ino:ace>
</ino:acl>
```

This example grants full access to the Collection *ino:security* (for administrators):

```
<ino:acl ino:aclname="acladmin" ↵  
xmlns:ino="http://namespaces.softwareag.com/tamino/response2">  
  <ino:ace ino:access="full">ino:security</ino:ace>  
</ino:acl>
```

This example grants execution access to the function *ino:Info*:

```
<ino:acl ino:aclname="acladmin" ↵  
xmlns:ino="http://namespaces.softwareag.com/tamino/response2">  
<ino:ace ino:access="full">  
  ino:Info()</ino:ace>  
</ino:acl>
```

## Doctype ino:domain

### Example Instances of ino:domain

This example defines a domain *mydomain*, for which all users will be authenticated against the local operating system:

```
<ino:domain xmlns:ino="http://namespaces.softwareag.com/tamino/response2"  
ino:domainid="mydomain" ino:domaintype="os"/>
```

## Special Cases

This section describes the behavior of Tamino Security in some special situations.

### **\_process**

In order to insert data using the `_process` command, the permissions `full` or `change` are required for all nodes into which data will be inserted. If data is to be stored in a Collection in which a restriction of `no` or `read` has been defined on a required node for a user, the store process will fail even if no data is to be stored in the node that is non-accessible. This is because of the validation, which will not accept the document as it doesn't conform to the schema definition.

### **\_delete**

In order to delete a document, a user must have at least `change` permission on all of the nodes that are to be deleted. If more than one document is to be deleted in a single request and at least one document cannot be deleted because of access restrictions, then the entire delete request will fail.

### Restricting required nodes

When setting access restrictions on nodes, care should be taken when restrictions are set on nodes that are not optional. When data is read from such documents, the inaccessible nodes are not returned in the result set. However, it is not possible to load new data into these Doctypes because the validation will not accept data that does not conform to the schema definition, and data conforming to the schema definition will be rejected by security because inaccessible nodes are involved.

## Error messages

Tamino does not issue error messages that provide detailed insight into the exact cause of access violations. This is done with the intention of providing potential hackers with as little information as possible. When a user attempts to read data to which she/he has no access, security normally returns the same information that it would as if the protected data did not exist. When attempts are made to delete or modify protected data, Tamino issues a general access violation message in most cases, but does not provide any information about the exact cause of the violation.

## Mass loading data

If you mass load data into the collection *ino:security*, it is strongly recommended that you use the option `concurrentWrite`. If this option is not used, the collection *ino:security* will be exclusively locked by the mass loader, and no other incoming requests will be authenticated or authorized until the mass load process is finished.

## WebDAV

Note that with the introduction of WebDAV as a built-in component of the Tamino XML Server, a new type of security is also available in the WebDAV perspective. While the Tamino Security mainly addresses the security of parts of XML documents based on their structure, the WebDAV ACL Specification (RFC 3744) addresses protecting operations on whole documents only. For details, refer to the WebDAV documentation.

## Security Manager

---

You can use the Security Manager to create, display, delete and update users, domains, user groups and access control lists for the selected database. The database selected must be running. The following Security Manager functions are available:

- Create User
- Display User
- Modify User
- Delete User
- Create Domain
- Display Domain
- Modify Domain
- Delete Domain
- Create User Group
- Display User Group
- Modify User Group
- Delete User Group
- Create Access Control List
- Display Access Control List

- [Modify Access Control List](#)
- [Delete Access Control List](#)
- [Add Access Control Element](#)



**Notes:**

1. For the names of users, groups, ACLs and ACEs, the full UTF-8 character set is supported for names.
2. Depending on the length of the names used, if the sum of users, groups, and ACLs is more than about 200 - 250, the following commands cannot be executed: Modify User, Modify Group, Create User, Create Group and Create ACL.

### **Create User**

The Create User command is used to create (define) an instance of the Doctype *ino:user*. If groups already exist, the new user can be added to a group either in the **Create User** dialog, or at a later stage by using the **Modify Group** command. A user can be a member of one or more groups.

#### **> To create a user**

- 1 Expand the object **Security Manager** from the database that you want to work with and select **Users**.
- 2 Choose **Create User** from the context menu. The **Create User** page is displayed.

**Create User**

User ID:  
User1

Domain:  
-

Password: [masked] Confirm Password: [masked]

Description:  
This is a description of User1.

Not Member of:  
Group1  
Group2

Member of:

Add ->

<- Delete

OK Cancel Help

- 3 Enter the user ID and a description of the user to be created in the **UserId** and **Description** text fields. The description could, for example, be the full name of the user.
- 4 Choose a domain for the user to be created from the drop-down list.

For information about domains, see the section [Create Domain](#).

- 5 Enter and confirm the password for the user to be created. If you only enter the password once, or if the two passwords are not identical, you will receive an error message when you try to create the user.
- 6 Choose **OK** to create the user.

Or:

You can add a new user to existing user groups when the user is created. The user groups that are available are listed in the **Not member of** list box. Select a group and choose **Add** to add it to the **Member of** list. If you add a group to the **Member of** list by mistake, you can

remove it by selecting it and choosing **Delete** (groups that are deleted from the **Member of** list box are returned to the **Not member of** list box). Once you have finished adding the user to groups, choose **OK** to create the user and add it to the groups you selected.

### Display User

Once you have created a new user, it is listed in the tree view of the Security Manager. To display a list of users, choose the object **Users** in the Security Manager. A list of users is displayed, showing the User ID, domain and description:

Users			
<input type="checkbox"/>	USER NAME <input type="checkbox"/>	DOMAIN <input type="checkbox"/>	DESCRIPTION <input type="checkbox"/>
	User1		This is the description of User 1.
	User3		This is the description of User3
	User5		This is a description of User5
	User6		This is a description of User6.
	User2	domain1	This is the description of the user
	User4	domain1	This is a description of User4.

If you select one of the users from the list in the tree view, information about this user is displayed:

### User User1

Domain:

Description: This is the description of User 1.

**MEMBER OF**

Group2

## Modify User

The Modify User command is used to update the definition of a user (instance of Doctype *ino:user*). The user ID, password and the user description can be updated. The user can also be added to and deleted from user groups.

### ➤ To modify a user

- 1 Select the user to be modified from the expanded **Users** object and choose **Modify User** from the context menu. The **Modify User** page is displayed.

The screenshot shows a dialog box titled "Modify User User1". It contains the following fields and controls:

- User ID:** A text box containing "User1".
- Domain:** A dropdown menu currently showing "-".
- Password:** An empty text box.
- Confirm Password:** An empty text box.
- Description:** A text box containing "This is the description of User1."
- Not Member of:** A list box containing "Group1".
- Member of:** A list box containing "Group2".
- Buttons:** "Add ->", "<- Delete", "OK", "Cancel", and "Help".

- 2 Change the user ID, domain, password and description as desired - if you change the password, you must enter the identical password twice, otherwise you will receive an error message. Add the user to new user groups by selecting the groups from the **Not member of** list box and then choosing **Add**. Delete the user from user groups by selecting the groups from the **Member of** list box and choosing **Delete**.

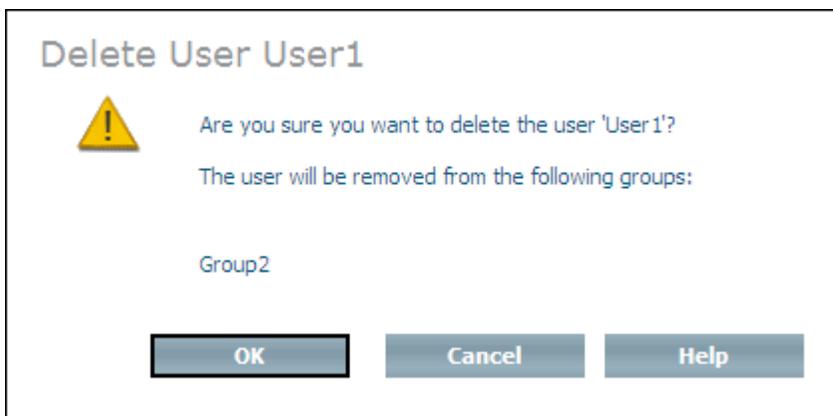
- 3 When you have made all of the changes you want, choose **OK** to modify the user.

### Delete User

The Delete User command removes a selected user (instance of Doctype *ino:user*) from all of the groups in which it is a member. If you only want to remove a user from specified groups, you should use the Modify User or Modify Group commands.

#### › To delete a user

- 1 Select the user to be deleted from the expanded **Users** object and choose **Delete User** from the context menu. The **Delete User** page is displayed.



- 2 Choose **OK** to delete the user.

### Create Domain

The Create Domain command is used to create a new domain (a new instance of the Doctype *ino:domain*). For information about domains in Tamino, see section [External Authentication](#).

#### › To create a domain

- 1 Expand the object **Security Manager** from the database you want to work with and select **Domains**.
- 2 Choose **Create Domain** from the context menu. The page **Create Domain - General Parameters (Page 1 of 2)** is displayed:

**Create Domain - General Parameters (Page 1 of 2)**

Name:

Domain Type:

< Back    Next >    Finish    Cancel    Help

- 3 Enter a name for the new domain, for example *domain1* and choose a domain type from the **Domain Type** list box.
- 4 Choose **Next** to display the page **Create Domain - Specific Parameters (Page 2 of 2)**:

**Create Domain - Specific Parameters (Page 2 of 2)**

Name:

Domain Type:

PARAMETER NAME	PARAMETER VALUE
Remember authentication (seconds):	<input type="text"/>
Accept Users	<input type="text"/>

< Back    Next >    Finish    Cancel    Help

Note that depending on which domain type you have chosen, other parameter values may be displayed. The domain type "ldap", for example, requires authentication against an external LDAP server, which needs additional parameter specifications (see [External Authentication](#) parameter **ino:domaintype** for detailed information).

Enter values for **Remember authentication** and **Accept Users**. For information about the possible values for these fields, see the description of the domain attributes `ino:expire` and `ino:acceptusers` in the section [External Authentication](#).

- 5 Choose **Finish**.

A message is displayed, stating that the domain is created. After successful completion, a new page is displayed, listing the available domain(s) with the domain type.

### Display Domain

Once you have created domains, they are listed in the tree view of the Security Manager. To display this list of domains, expand the object **Domains** in the Security Manager. If you select one of the domains from the list, information about the domain is displayed, for example:

**Domain domain1**

Domain Name: domain1  
 Domain Type: tamino

PARAMETER NAME	PARAMETER VALUE
Remember authentication (seconds)	300
Accept Users	defined

### Modify Domain

The Modify Domain command is used to update the definition of a domain. All parameters can be changed, with the exception of the domain type.

#### ➤ To modify a domain

- 1 Select the domain to be modified from the expanded **Domains** object and choose **Modify Domain** from the context menu. The **Modify Domain** page is displayed (note that the display of parameters depends on the domain type):

Modify Domain domain1

Name:  \*

Domain Type:

PARAMETER NAME	PARAMETER VALUE
Remember authentication (seconds):	<input type="text" value="300"/>
Accept Users	<input type="text" value=""/>

OK Cancel Help

- 2 Change the domain name and parameters as desired.
- 3 When you have made all of the changes, choose **OK** to modify the domain.

### Delete Domain

The Delete Domain command deletes a domain (instance of Doctype *ino:domain*).

#### ➤ To delete a domain

- 1 Select the domain to be deleted from the expanded **Domains** object and choose **Delete Domain** from the context menu. The **Delete Domain** page is displayed:

Delete Domain domain1

 Are you sure you want to delete the domain 'domain1'?

OK Cancel Help

- 2 Choose **OK** to delete the domain. A message confirms successful deletion of the domain.

## Create User Group

The Create Group command is used to create a new user group (instance of Doctype *ino:group*). If users and access control lists already exist, they can be added to the new group either in the Create Group dialog, or at a later stage by using the Modify Group command.

### ➤ To create a group

- 1 Expand the object **Security Manager** from the database that you want to work with and select **User Groups**.
- 2 Choose **Create User Group** from the context menu. The **Create User Group** page is displayed.

- 3 Enter the name of the group in the **Group Name** text field.
- 4 Choose **OK** to create the group.

Or:

You can add users and access control lists to the new group when it is created. The users that can be added to the group are listed in the **Available Users** list box. Select a user and choose the first **Add** button to add it to the **Members** list box. If you add a user to the **Members** list box by mistake, you can remove it by selecting it and choosing the first **Delete** button (users that are deleted from the **Members** list box are returned to the **Available Members** list box). The ACLs that can be added are listed in the **Available Access Control Lists** list box. Select an ACL and choose the second **Add** button to add it to the **Assigned Access Control Lists** list box. If you add an ACL to the **Assigned Access Control Lists** list box by mistake, you can remove it by selecting it and choosing the second **Delete** button (ACLs that are deleted from the **Assigned Access Control Lists** list box are returned to the **Available Access Control Lists** list box). Once you have finished adding users and ACLs to the group, choose **OK** to create the group and add the users and ACLs you selected.

### Display User Group

Once you have created a new user group, it is listed in the tree view of the Security Manager. To display a list of users groups, choose the object **User Groups** in the Security Manager. A list of available user groups is displayed:



If you select one of the user groups from the list in the tree view, information about this user group is displayed, showing members and the Access Control Lists:



## Modify User Group

The Modify Group command is used to update the definition of a user group (instance of Doctype *ino:group*). The name of the group can be changed, and users and access control lists can be added to and deleted from the group.

### ➤ To modify a group

- 1 Select the group to be modified from the expanded **User Groups** object and choose **Modify User Group** from the context menu. The **Modify User Group** page is displayed.

The screenshot shows a dialog box titled "Modify User Group Group2". At the top, there is a "Group Name:" label and a text input field containing "Group2". Below this, the dialog is organized into two columns. The left column contains two list boxes: "Available Users" and "Available Access Control Lists". The right column contains two list boxes: "Members" and "Assigned Access Control Lists". Between the "Available Users" and "Members" list boxes, and between the "Available Access Control Lists" and "Assigned Access Control Lists" list boxes, there are two buttons: "Add ->" and "<- Delete". At the bottom of the dialog, there are three buttons: "OK", "Cancel", and "Help".

- 2 Change the name of the group as desired. Add users to the group by selecting them from the **Available Users** list box and then choosing the first **Add** button. Delete users from the group by selecting them from the **Members** list box and choosing the first **Delete** button. Add ACLs to the group by selecting them from the **Available Access Control Lists** list box and then

choosing the second **Add** button. Delete ACLs from the group by selecting them from the **Assigned Access Control Lists** list box and choosing the second **Delete** button.

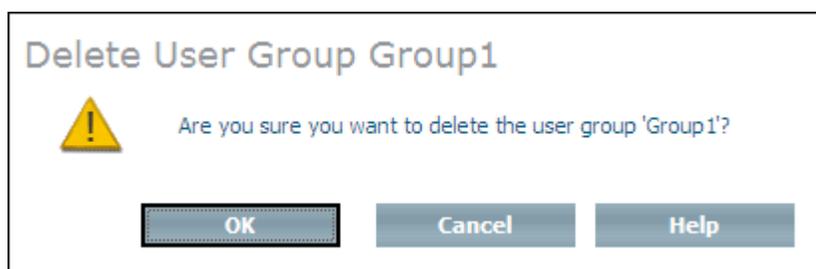
- 3 When you have made all of the changes you want, choose **OK** to modify the group.

### Delete User Group

The Delete User Group command deletes a user group (instance of Doctype *ino:group*). However, the users and ACLs that are members of that group are not deleted.

#### › To delete a group

- 1 Select the group to be deleted from the expanded **User Groups** object and choose **Delete User Group** from the context menu. The **Delete User Group** page is displayed.



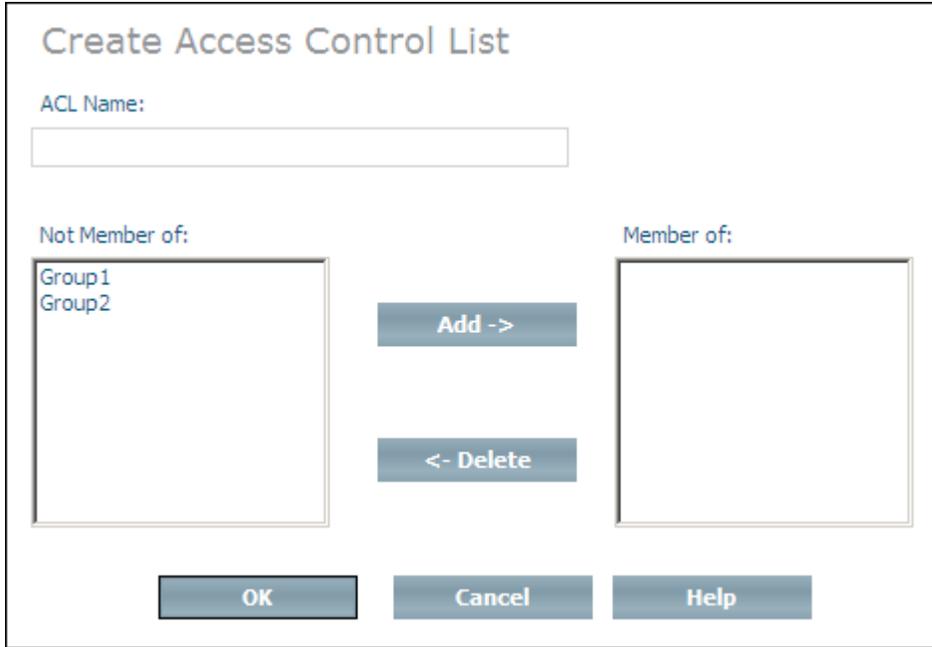
- 2 Choose **OK** to delete the group.

### Create Access Control List

The Create Access Control List command is used to create an instance of the Doctype *ino:acl*. If groups already exist, the new ACL can be added to a group either in the Create Access Control List dialog, or at a later stage by using the Modify ACL command. An ACL can be a member of one or more groups.

#### › To create an access control list

- 1 Expand the object **Security Manager** from the database that you want to work with and select Access Control Lists.
- 2 Choose **Create Access Control List** from the context menu. The **Create Access Control List** page is displayed.



- 3 Enter the name of the ACL to be created in the **ACL Name** text field.
- 4 Choose **OK** to create the ACL.

Or:

You can add a new ACL to existing user groups when the ACL is created. The user groups that are available are listed in the **Not member of** list box. Select a group and choose **Add** to add it to the **Member of** list box. If you add a group to the **Member of** list box by mistake, you can remove it by selecting it and choosing **Delete** (groups that are deleted from the **Member of** list box are returned to the **Not member of** list box). Once you have finished adding the ACL to groups, choose **OK** to create the ACL and add it to the groups you selected.

### Display Access Control List

Once you have created a new access control list, it is listed in the tree view of the Security Manager. To display the available access control lists, choose the object **Access Control Lists** in the **Security Manager**:

Access Control Lists	
	ACL NAME
	ACL1
	ACL2
	ACL3

If you select one of the lists in the tree view, information about this list is displayed, showing the node, permission and the user group to which it applies:

ACL ACL1	
NODE	PERMISSION
Hospital/patient	full
TO APPLY TO USER GROUP	
 Group2	

### Modify Access Control List

The Modify Access Control List is used to update the definition of an access control list (instance of Doctype *ino:acl*). The name of the ACL can be changed, the ACL can be added to and deleted from groups, and access control elements can be deleted or have the associated authorization level modified.

#### ➤ To modify an access control list

- 1 Select the access control list to be modified from the expanded **Access Control Lists** object and choose **Modify Access Control List** from the context menu. The **Modify Access Control List** page is displayed.

**Modify Access Control List ACL1**

ACL Name:

Not Member of:

NODE	PERMISSION	ACTION
Hospital/patient	full	<input checked="" type="checkbox"/> Delete

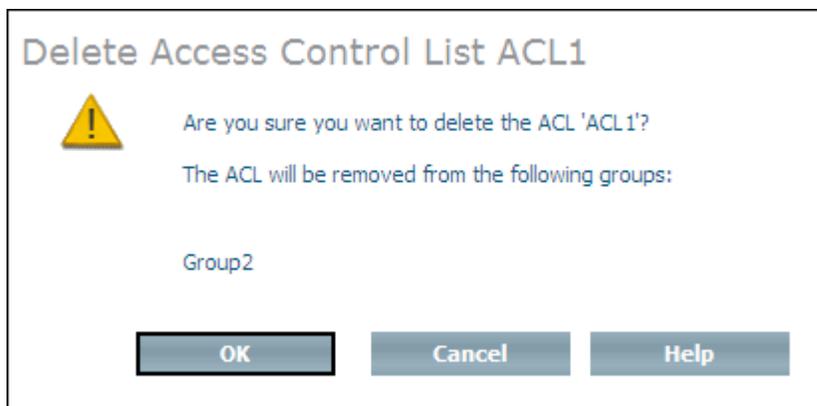
- 2 Change the name of the ACL as desired. Add the ACL to new groups by selecting them from the **Not member of** list box and then choosing **Add**. Delete the ACL from groups by selecting them from the **Member of** list box and choosing **Delete**. Modify the authorization level of an access control elements by opening the drop-down list boxes next to their names and selecting the new permissions. Delete access control elements by checking the **Delete** check boxes next to their names.
- 3 When you have made all of the changes you want, choose **OK** to modify the access control list.

### Delete Access Control List

The Delete Access Control List command deletes a selected access control list and removes references to it from the groups in which it was contained. If you only want to remove an ACL from specified groups, you should use the Modify Group command.

#### > To delete an access control list

- 1 Select the access control list to be deleted from the expanded **Access Control Lists** object and choose **Delete Access Control List** from the context menu. The **Delete Access Control List** page is displayed.



- 2 Choose **OK** to delete the access control list.

### Add Access Control Element

The Add Access Control Element command is used to define the access rights to nodes in the Tamino repository. The definitions are stored in the child elements *ino:ace* of the Doctype *ino:acl*. The access control element is added to the access control list that is to be given access rights to the node specified.

#### ➤ To add an access control element

- 1 Select the access control list to which you want to add the access control element from the expanded **Access Control Lists** object and choose **Add Access Control Element** from the context menu. Page 1 of the **Add Access Control Element** page is displayed.

- 2 Enter the repository path (collection/doctype etc.) to the node for which access rights are to be defined in the **Node** text box.
- 3 Select the authorization level to be assigned from the **Permission** drop-down list box. The following levels are available:

**Level    Meaning**

- no        Access to this node is denied.
- read     Read access is granted.
- change   Update access is granted.
- full      Define and undefine access is granted.

Choose **Next** to continue to page 2 of the **Add Access Control Element** dialog.

- 4 If no namespace declarations are required, choose **Finish** to add the ACE, otherwise you must enter the URL of the namespace in the **Namespace URL** text field before you can choose **Finish**.



**Notes:**

1. When using the Security Manager, the user who is logged into the System Management Hub must have the privileges to make changes to *ino:security*. This means that an administrator must be defined in Tamino before the Authentication mode is switched to `tamino`.
2. The feature of using the local operating system for authentication cannot currently be configured using the Security Manager. This means the *ino:domain* definitions have to be stored directly into Tamino using other interfaces (e.g. with the Tamino Interactive Interface).

## Instance-based Security

---

Tamino provides not only type-based access control but also instance-based access control. With instance-based access control, it is also possible to define access control for each document, thereby enabling Tamino as a directly accessible document repository in a multi-user environment.

The following description gives an overview of the privileges defined for the instance-based access control and shows how the ACLs are defined and read.

### Access Control Lists

Since WebDAV ACL defines an XML structure for access control lists and since Tamino also supports WebDAV ACL for the WebDAV resources stored in Tamino, this ACL structure was also chosen for regular Tamino documents.

An access control list consists of one or more ACEs (access control elements) which each define a set of privileges to be granted or denied to a certain principal. Per ACE there can be multiple privileges defined, but they must be either all granted or all denied.

The following gives an example of an ACL granting the user *tamino* read access to a document:

```

<acl xmlns="DAV:">
  <ace>
    <principal>
      <href>ino:user/tamino</href>
    </principal>
    <grant>
      <privilege>
        <read />
      </privilege>
    </grant>
  </ace>
</acl>

```

## Principals

Principals can be basically any users and groups known to the Tamino database. When addressing a certain user or group the href element needs to be specified and the content of that element denotes the principal by specifying the name preceded by the string "ino:user/" for users and "ino:group/" for groups.

Besides the explicit definition of users and groups there is also the possibility to use the special principal all to apply to all users. The following ACL gives an example which would grant the user tamino read access to a document and deny the read access to all other users:

```

<acl xmlns="DAV:">
  <ace>
    <principal>
      <href>ino:user/tamino</href>
    </principal>
    <grant>
      <privilege>
        <read />
      </privilege>
    </grant>
  </ace>
  <ace>
    <principal>
      <all />
    </principal>
    <deny>
      <privilege>
        <read />
      </privilege>
    </deny>
  </ace>
</acl>

```

## Privileges

The WebDAV ACL standard defines a set of privileges to control the access to certain operations on the content and properties of documents. The most commonly used are:

- **write-content**  
Controls whether a user is allowed to modify the content of a document.
- **read**  
Controls whether a user is allowed to read a document.

According to the WebDAV ACL standard the privileges can also be aggregated. One predefined aggregation is the privilege all which contains all other privileges. The following ACL grants read and write-content access to the user tamino and denies everything for all other users:

```
<acl xmlns="DAV:">
  <ace>
    <principal>
      <href>ino:user/tamino</href>
    </principal>
    <grant>
      <privilege>
        <read />
      </privilege>
      <privilege>
        <write-content />
      </privilege>
    </grant>
  </ace>
  <ace>
    <principal>
      <all />
    </principal>
    <deny>
      <privilege>
        <all />
      </privilege>
    </deny>
  </ace>
</acl>
```

Besides the predefined privileges, an ACL may also contain user-defined privileges which don't have any semantics for Tamino but might be used by external applications to control access to certain operations on the documents.

## Evaluation of ACLs

The ordering of the ACEs in an ACL is important, since the ACLs are evaluated from top to bottom. When the access level to a document is determined, the Tamino server will search for an ACE entry which matches the current request principal (either the user itself or a group to which the user belongs) and which also matches the required privilege. So if a user wishes to read a document, the ACL is scanned for an ACE which matches the principal and contains the privilege read. If that privilege is granted, the operation will be executed. If the privilege is denied, the execution of the operation will be rejected. If the whole ACL does not contain any ACE matching the principal and the required privilege, a grant of the privilege will be applied and the operation will be executed – this means that a good ACL will typically end in a deny all for everyone.

## Defining an Access Control List

An ACL is provided as an XML document and can be applied to a Tamino document in two ways: either via a PROCESS where the ACL is wrapped with a special element defining the document to apply this ACL to or via XQuery when creating a new document.

### Defining an ACL via the PROCESS command

To apply an ACL to a document, this document has to be uniquely identified. An ACL can be wrapped by an `ino:request` and `ino:object` element and a reference to the document to which this ACL should apply can be set via the special attribute `ino:aclref`. The reference is a path of the following structure:

```
collection name + '/' + doctype name + '/@' + ino:id
```

So to define an ACL for the document with `ino:id 1` in the collection `ino:etc` and in the doctype with name `unbind`, the following document would be stored via a PROCESS command:

```

<ino:request xmlns:ino="http://namespaces.softwareag.com/tamino/response2">
  <ino:object ino:acref="ino:etc/unbind/@1">
    <acl xmlns="DAV:">
      <ace>
        <principal>
          <href>ino:user/tamino</href>
        </principal>
        <grant>
          <privilege>
            <read />
          </privilege>
          <privilege>
            <write-content />
          </privilege>
        </grant>
      </ace>
      <ace>
        <principal>
          <all />
        </principal>
        <deny>
          <privilege>
            <all />
          </privilege>
        </deny>
      </ace>
    </acl>
  </ino:object>
</ino:request>

```

The document needs to be sent to the collection *ino:security*. The ACL will not be physically stored in the collection *ino:security*, but will rather be attached directly to the document to which the ACL applies.

### Defining an ACL via XQuery

Another mechanism for setting an ACL for a document is to directly attach the ACL to a newly created document via XQuery. The XQuery function `tf:document` allows you to create a new document and append an ACL to the document. When this document is then stored to Tamino via the `fn:put` function, the ACL will be directly applied to the document. The following example shows how a document with root element `Person` is created and saved into the collection `addresses` while being assigned an ACL that denies the read privilege to everyone:

```
update
fn:put(tf:document(<Person PersonId="4"><Name><FirstName>Joe</FirstName>
  <LastName>Storner</LastName></Name></Person>, (),
  <acl xmlns="DAV:"><ace><principal><all /></principal>
  <deny><privilege><read /></privilege></deny></ace></acl>), "addresses")
```

### Instance-based vs. structure-based Access Control

When both instance-based and structure-based access control are defined for documents, the privileges for both types of access control need to be granted in order for the operation to be allowed. The combination of the two types of control can be quite useful – for example it allows you to set the access level for a certain group of users to read permissions for a whole collection via structure-level access control and restrict the access even more to make some of the objects not readable at all for this group of users.

The special group *ino:admin*, which allows full access to all data, also applies to the instance-based access control. So if a certain privilege is denied for everyone in an instance-based ACL, the members of the *ino:admin* group will still get full access to the document.



# 35

## Version/License Management

---

This section contains information about displaying version/license information, and about how to switch to a different license file. You will need to switch the license file when an existing license file expires, or when you install and enable optional components.

### ➤ To display license information

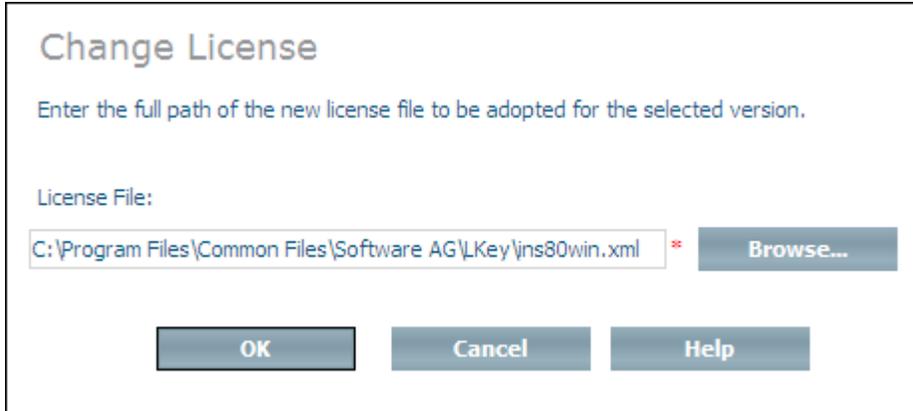
- Expand the **Versions** object, select the version and choose **License Information**. Information about the current license file is displayed in the detailed view frame. The information displayed includes the customer name and ID, installed components, license keys and expiration dates.

### ➤ To display version information

- Select the version about which you want to display information from the expanded **Versions** object and choose **Detailed Version Information**. Product-specific information about installed dynamic link libraries and executables is displayed in the detailed view frame. The information displayed includes a description of the dll or exe files, the version number of each file, and the installation directory.

### ➤ To change the license file

- 1 Select the version for which you want to change the license file from the expanded **Versions** object and choose **Change License**. The **Change License** page appears.



- 2 Enter the full path of the new license file (including the file name) in the **License File** text box, or choose **Browse**.
- 3 Choose **OK** to change to the new license file.



**Notes:**

1. When you change the license file, the new version is copied to `<sysdrive>\Program Files\Common Files\Software AG\LKey\inoxxx.xml`. The old version is saved as `<sysdrive>\Program Files\Common Files\Software AG\LKey\inoxxx.xml.old`.
2. Any database that is running when the license file is changed must be stopped and restarted in order to enable the new license file for it.

# 36

## Web Server Management

---

- Displaying Known Web Servers ..... 182
- Add Web Server ..... 182
- Modify Web Server ..... 183
- Delete Web Server ..... 184
- Rename Web Server ..... 185

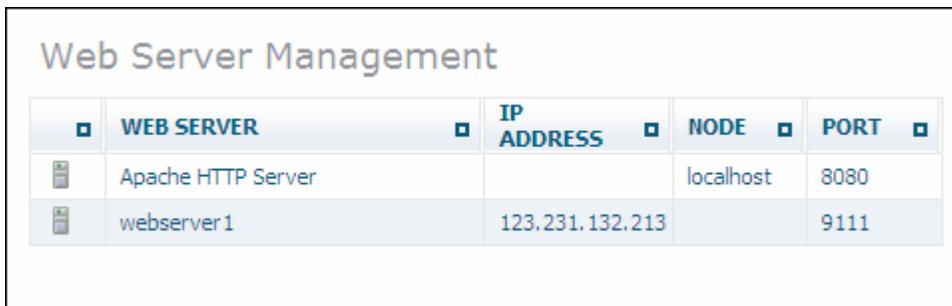
This chapter contains information about managing web servers. Web servers can be added, deleted, renamed and modified. The following topics are covered:

## Displaying Known Web Servers

---

➤ To display known web servers

- Select the object **Web Server Management** from the tree-view frame. The list of known web servers appears in the display frame. Each web server is displayed together with its associated IP address, node and port number.



The screenshot shows a window titled "Web Server Management" containing a table with the following data:

WEB SERVER	IP ADDRESS	NODE	PORT
Apache HTTP Server		localhost	8080
webserver1	123.231.132.213		9111

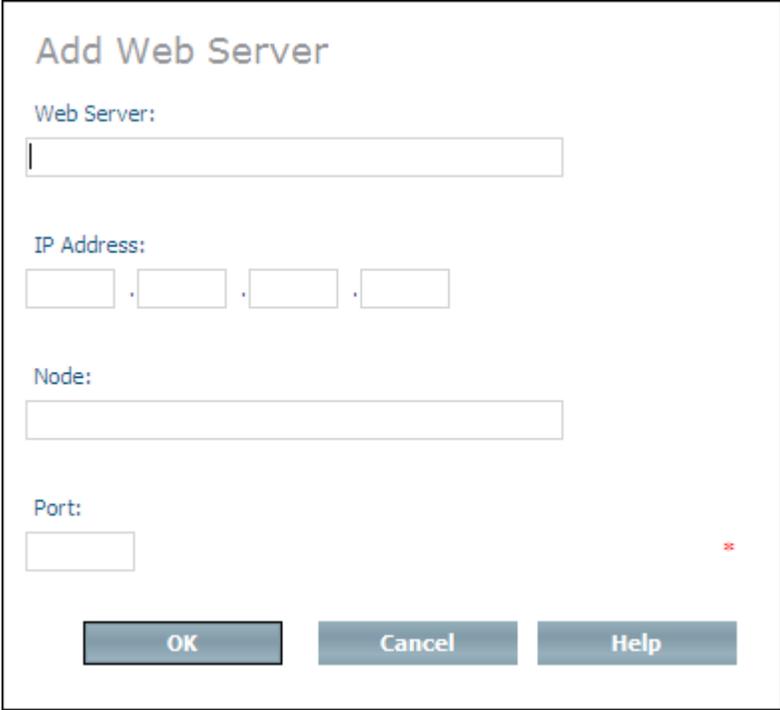
## Add Web Server

---

When the **Web Server Management** object is selected, you can add web servers to the object, which can then be subsequently authorized to access specific databases.

➤ To add a web server

- 1 Select the object **Web Server Management** and choose **Add** from the context menu. The **Add Web Server** page is displayed.



**Add Web Server**

Web Server:

IP Address:  
 .  .  .

Node:

Port:  
 \*

**OK** **Cancel** **Help**

- 2 In the **Web Server** text box, enter the name by which the web server is to be known (the maximum length is 100 characters). In the **IP address** text boxes, enter the IP address of the web server. In the **Node** text box, enter the node name. In the **Port** text box, enter the port number of the web server. You can either fill in the Node field or the IP Address field. If you fill in both, make sure that the data is consistent (i.e. the node is exactly known under the given IP Address. If you fill in only the Node field, the IP Address is automatically retrieved from the system
- 3 Choose **OK** to add the new web server.

## Modify Web Server

You can modify (change) the IP address and port number of a known web server.

### » To modify a web server

- 1 Select the web server that you want to modify from the expanded object **Web Server Management** and choose **Modify** from the context menu. The **Modify Web Server** page is displayed.



The screenshot shows a dialog box titled "Modify Web Server 'webserver1'". It contains three input fields: "IP Address" with four separate boxes containing "123", ".231", ".132", and ".213"; "Node" with a single empty text box; and "Port" with a box containing "9111". At the bottom, there are three buttons: "OK", "Cancel", and "Help".

- 2 In the **IP address** text boxes and in the **Node** and **Port** text box, make the required changes.
- 3 Choose **OK** to modify the web server.

## Delete Web Server

---

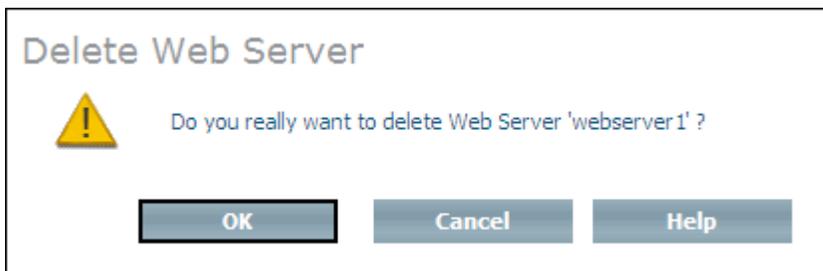
You can use the Delete command to remove a web server from the list of known web servers.



**Note:** You can only delete a web server if it is not assigned to a database.

### » To delete a web server

- 1 Select the web server to be deleted from the expanded object **Web Server Management** and choose **Delete** from the context menu. The **Delete Web Server** page is displayed.



The screenshot shows a confirmation dialog box titled "Delete Web Server". It features a yellow warning triangle icon on the left. The text reads "Do you really want to delete Web Server 'webserver1' ?". At the bottom, there are three buttons: "OK", "Cancel", and "Help".

- 2 Choose **OK** to delete the web server.

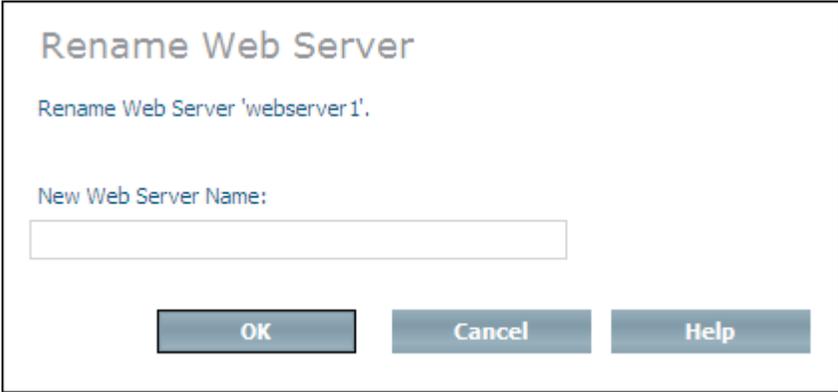
## Rename Web Server

---

You can use the Rename command to change the current web server name to another one.

➤ **To rename a web server**

- 1 Select the web server to be renamed from the expanded object **Web Server Management** and choose **Rename** from the context menu. The **Rename Web Server** page is displayed.



**Rename Web Server**

Rename Web Server 'webservice1'.

New Web Server Name:

**OK** **Cancel** **Help**

- 2 In the **New Web Server Name** text box, enter the new name of the web server.
- 3 Choose **OK** to rename the web server.



# 37 Administration Considerations

---

- Space Management ..... 188
- Problem Reporting ..... 189

This section provides general information about the following topics:

- [Space management](#)
- [Problem reporting](#)

## Space Management

---

### Database Locations

In order to use the physical storage on a node, the Tamino Manager uses the concept of database locations. Database locations are where the Tamino database spaces are stored. The Tamino Manager maps these database locations (which can also be thought of as logical names) to physical location paths.

Let us suppose that a database administrator has a directory called C:\Myfiles\Tamino\mydb-backup, in which she/he plans to store backup copies of his database mydb. Using the Database Location Manager, she/he can assign the database location name of mydbBackup to this directory. Once this has been done, she/he can administrate the files via the location name without having to remember where they are physically located.

### Database Spaces

Database spaces are the physical components that comprise the database. They are stored in and administrated via database locations.

#### Types of database spaces

The following types of database spaces exist for each database:

Space Type	File Extension	Purpose
Index Space	1I0	Contains the database's meta data, e.g. indexes
Data Space	1D0	Contains the database's data
Log Space	1L0	Contains the information required to recover updates after restoring a database
Backup Space	1B0	Contains database backups
Tamino CD Database Info File	1R0	Contains the information required to register a CD database with the Tamino Manager
Journal Space	1J0	Contains the information required for transaction rollback
Journal Overflow Space	1O0	Journal overflow spaces are used to save pending global transactions and the logging records of long running transactions. Journal overflow is automatically created or

Space Type	File Extension	Purpose
		extended if it is necessary, and it will also be automatically removed or decreased during server shutdown.
Temporary Sort Space	1S0, 1T0, 1F0, 1W0	Contains temporary data
Utility Recovery Space	1C0, 1C1	Contains log information from calls to the Data Loader
Tamino dump file	0M0, 1M0	Contains information for error analysis by Software AG support



**Note:** Do not directly manipulate these files, but use the Tamino Manager for all operations. These files are deleted when a database is deleted, with the exception of the dump files. Dump files can be deleted manually if they are no longer needed for error analysis by Software AG support. Backup files can be kept with a corresponding option in the **Delete Database** dialog box.

## Problem Reporting

### How to prepare Problem Information

If a problem occurs at a customer's site, Software AG's support team will attempt to provide a solution as fast as possible (in some cases, software is also distributed via partners, who are responsible for support themselves). To minimize the time required to analyze a problem and deliver a solution, the support team requires detailed information about the problem.

The problem information should contain:

- Problem description:
  - Tamino component or function used
  - Error messages (message IDs) and texts
  - A short description of the problem
- Environment description:
  - Tamino version
  - Operating system version
  - Hardware environment (CPU type, disk device types, etc.)
- Can the problem be reproduced?
  - What are the steps to reproduce it
  - Which data is needed to reproduce it (schemas, XML instances, queries)

If the problem is not reproducible, the problem information should contain additionally:

- Where does the problem occur?
  - On all databases, or on a single database only
  - On databases within a specific environment only
  - Environments where the problem does or does not occur
- When does the problem occur?
  - Always or only sporadically
  - In parallel with other events
  - Periods of time when the problem does not occur
  - When the problem first occurred
  - Changes of the environment around this date
  - Last changes of the environment before this date

If Tamino creates crash dumps that are associated with a problem, they can also be sent to the support team. The files in question have the suffix 0M0 or 1M0 and can be found in the database's reserve location. The files should be compressed using a ZIP utility before sending them in order to save space.

# 38 ARGBATCH - The System Management Hub Batch

## Interface

---

▪ Starting ARGBATCH .....	192
▪ Argbatch Documentation .....	192
▪ Setting the Environment .....	193
▪ Command Example .....	194
▪ List of Available Commands .....	194

The System Management Hub supports a batch interface called ARGBATCH, which can be used to create and run Tamino-specific routine jobs, for example to create databases and back them up at regular intervals. In the following, you will find a short introduction to the command line interface to get you started:

### Starting ARGBATCH

---

On Windows, the `argbatch` command line interface can be started as follows:

#### » To start `argbatch`

- 1 Open a Windows command prompt.
- 2 Set the working directory to the location of the `argbatch.exe` executable, for example:

```
cd C:\Program Files\Software AG\System Management Hub\bin
```

- 3 Start the `argbatch.exe` executable.

On UNIX, run the shell script `sagenv.new`. It is located in the Tamino installation directory. In the Bourne Shell, enter the following command:

```
. <installation directory>/sagenv.new
```

where `<installation directory>` is the root directory of the Tamino installation.

### Argbatch Documentation

---

The batch interface offers online help that is displayed automatically when you start the executable. Please refer also to the description of the batch interface in the documentation set of the System Management Hub for further information. The documentation is available under the installation directory of the System Management Hub, for example `C:\Program Files\Software AG\System Management Hub\documentation\en\overview.htm`.

## Setting the Environment

---

Most of the `argbatch` commands require that you provide your username and password. To avoid typing in username and password for each command, it is recommended to first use the `set environment` command to set your username and password. Settings exceed session lifetime and are valid for the current user until they are overwritten with new values in a new `set environment` command, or until they are cleaned with the `clear environment` command.

To set the environment, enter the following:

```
argbatch set environment user=myusername password=mypassword
```

Replace *myusername* and *mypassword* with your own name and password.

Furthermore, you should also define the product for your `argbatch` session. It is also possible to set the product version for the `argbatch` session, but this should be handled with care and only by done exceptionally:

- Product version should not be set if only one version of the product is installed. In this case, the version is used by default.
- Product version should not be set if more than one version is installed and the mainly used version is the newest version (default).
- If `argbatch` commands are used for older database versions, the correct version will be retrieved based on the given database name, if specified. This means, that even in this case the version should not be set in the environment.
- One good reason to set the version in the environment is if you have two or more product versions installed and the mainly used version is not the newest version. Then, it is helpful to set the version to the mainly used version.

To define the product and - if necessary - the product version, display a list of available products and versions by entering the following two command:

```
argbatch show products
```

A list of available products is displayed, among them the product `Tamino`.

```
argbatch show versions product=Tamino
```

All installed versions of `Tamino` are displayed.

Now set the environment to the product `Tamino` and the version you are using, e.g. version `8.1.1`:

```
argbatch set environment product=Tamino version=8.1.1
```

Alternatively, you can also use the environment variables `ARGBATC_USER` and `ARGBATC_PASSWORD` to specify your username and password. If these two environment variables have been defined, their values will be taken. Specifying user and password directly as parameters in the batch command will override these values.

## Command Example

---

To display a list of available Tamino `argbatch` commands, use `argbatch show commands`. If you have set the environment as described in section [Setting the Environment](#), a list of all commands that are available for the installed Tamino version is displayed.

If, for example, you want to stop a database with an `argbatch` command, use the command `argbatch show databases` to display a list of databases that are currently defined in Tamino. Then use `stop database` in the following way to stop one of the databases:

```
argbatch stop database database=mydatabase
```

where *mydatabase* is the name of the database you want to stop. If you need detailed information on the `stop database` command, enter `argbatch stop database help long`. (The parameter `help long` shows detailed information, whereas the parameter `help` only gives the parameter options.)

Note that list parameters for `argbatch` commands must be given in the right sequence. For details, see the `argbatch` online help.

## List of Available Commands

---

The following `argbatch` commands are available for Tamino. Use `argbatch commandname help long` to display detailed online information about how to use the command:



**Note:** The order of available parameters for the commands is not arbitrary. Refer to the online help of the individual commands for additional information.

Commands
clear environment
set environment
show environment
show commands
show products
show requests

<b>Commands</b>
show versions
show targetnodes
add commonadmin
confirm alertedjobs
confirm job
delete commonadmin
delete completedjobs
delete job
show alerts
show commonadmin
show commonadmins
show completedjobs
show job
show jobs
show runningjobs
show suspendedjobs
add ace
add administrator
add databasespace
add location
add replication
add webserver
assign webserver
backup database
check database
create acl
create database
create dbfrombackup
create domain
create group
create user
delete acl
delete administrator
delete backup
delete database
delete databasespace

<b>Commands</b>
delete domain
delete group
delete location
delete user
delete webserver
delete webserverassignment
expand databasespace
get replicationlist
install extension
list acls
list groups
list users
modify acl
modify domain
modify executionmode
modify externalname
modify group
modify journalspace
modify locationsettings
modify parameter
modify privatepath
modify property
modify publicpath
modify user
modify webserver
move databasespace
move location
prepare cddatabase
register cddatabase
remove replication
rename database
rename location
rename webserver
reset replication
restore database
set databaseversion

<b>Commands</b>
set defaultbackuplocation
set defaultlocation
set portrange
set replication
show acesofacl
show acls
show aclsofgroup
show administrators
show backupfiles
show backups
show backupstructure
show databases
show databasespaces
show databasestatus
show descriptionofuser
show detailsofdomain
show domains
show extensiondetails
show extensions
show extensiontracestate
show groups
show groupsofACL
show groupsofuser
show information
show locations
show locationsettings
show permissionsofACL
show properties
show publicpath
show taminversions
show users
show usersofgroup
show versioninformation
show webservers
start database
stop database

<b>Commands</b>
stop requests
switch extensiontraceoff
switch extensiontraceon
switch logspace
uninstall extension
unregister cddatabase

# 39 Usage Hints

---

- Remote Administration ..... 200

This section contains miscellaneous hints on usage of the Tamino Manager. The topics covered are:

## Remote Administration

---

Because the Tamino Manager (and the System Management Hub upon which it is based) is browser-based, you can easily administrate Tamino remotely. Simply start the System Management Hub on your local machine, and note the startup URL, which will be similar to `http://<node>:<port>/smh/login.htm`. Then start the browser on the remote machine and supply this URL in the browser's address line. If `<node>` is displayed as `localhost`, you must replace this by the real node name or IP address where the System Management Hub is located.

# Index

---

## A

- access control element
  - add, 171
  - in ino:security, 148
- access control list
  - create, 167
  - delete, 170
  - display, 168
  - in ino:security, 148
- Active Requests, 40
- add
  - access control element, 171
- administration
  - remote, 200
- administration port
  - port property, 127
- alert
  - confirm pending, 137
  - level of, 7
- ARGBATCH, 191
- authentication
  - external, 143
  - general description, 142
  - password, 143
  - XML property, 124
- authentication modes, 142
- authorization
  - general information, 147
- authorization levels, 149
- auto expand
  - server property, 118
- autostart
  - server property, 118

## B

- backup
  - create external, 88
  - create internal, 85
  - delete, 103
  - external, 91
- backup method
  - add configurations, 94
  - add/delete, 92
  - modify parameters, 94
- backup space
  - purpose, 188
- batch, 191

- batch command, 191
  - example, 194
  - list, 194
  - setting the environment, 193
- buffer pool size
  - server property, 118

## C

- CD database
  - create, 53
  - register, 55
  - unregister, 57
- check
  - database, 51
- collection
  - administration from Tamino Manager, 139
- command line interface, 191
- communication method
  - server property, 121
- create
  - access control list, 167
  - CD database, 53
  - database from backup, 107
  - domain, 160
  - user, 156
  - user group, 164

## D

- data space
  - purpose, 188
- database
  - backup, 83
  - check and repair, 51
  - create, 27
  - create from backup, 107
  - delete, 45
  - display information about, 35
  - prepare for CD, 53
  - rename, 47
  - restore from backup, 99
  - set version, 49
  - start, 41
  - stop, 43
- database activity, 37
- database backup
  - delete, 103
- database backup space
  - display information, 105

- database location
  - add new, 16
  - define default backup location, 21
  - define default location, 21
  - delete, 18
  - display available, 14
  - display information about, 19
  - general description, 13
  - modify settings, 22
  - move, 19
  - rename, 17
- database locations
  - general information, 188
- database properties
  - display, 117
  - modify, 117
  - port properties, 126
  - server properties, 118
  - X-Tension properties, 128
  - XML properties, 122
- database space
  - add, 69
  - delete, 75
  - expand, 73
  - move, 71
- database spaces
  - general information, 188
- database status, 36
- database traffic light, 7
- default backup location, 21
- default encoding
  - XML property, 124
- default location, 21
- default tokenizer
  - XML property, 124
- delete
  - access control list, 170
  - backup, 103
  - domain, 163
  - user, 160
  - user group, 167
- display
  - access control list, 168
  - domain, 162
  - user, 158
  - user group, 165
- domain, 143
  - create, 160
  - delete, 163
  - display, 162
  - modify, 162
- dynamic pool size
  - server property, 119

## E

- external authentication, 143

## F

- file extension, 189
  - 0M0, 189
  - 1B0, 188
  - 1C0, 189

- 1C1, 189
- 1D0, 188
- 1F0, 189
- 1I0, 188
- 1J0, 188
- 1L0, 188
- 1M0, 189
- 1O0, 188
- 1R0, 188
- 1S0, 189
- 1T0, 189
- 1W0, 189
- flush group size, 120
- flush limit
  - server property, 119

## G

- group
  - in ino:security, 148

## I

- icons
  - meaning of, 8
- incremental backup
  - server property, 122
- index space
  - purpose, 188
- ino:acl, 147
- ino:group, 147
- ino:security, 147
- ino:user, 147

## J

- job log, 136
- Job Monitor, 135
- job monitor
  - display information, 137
- job record
  - delete, 138
- Journal Overflow Space, 188
- journal space
  - modify, 77
  - purpose, 188

## L

- LDAP
  - configuration, 146
- LDAP Server, 143
- license management
  - from Tamino Manager, 179
- list of batch commands, 194
- log space, 79
  - purpose, 188
  - switch, 81

## M

- manage
  - collection, 139

- markup as delimiter
  - XML property, 124
- maximum transaction duration
  - server property, 119
- modify
  - access control list, 169
  - domain, 162
  - user, 159
  - user group, 166

## N

- non-activity timeout
  - server property, 119
- number of backup generations
  - server property, 120

## O

- overwrite XTS registration
  - server property, 122

## P

- port numbers
  - set range, 59
- problem
  - how to report, 189

## R

- read only
  - server property, 120
- repair
  - database, 51
- replication database
  - create, 64
  - reset, 66
  - set, 65
- replication database name
  - add/remove, 64
- replication delay
  - server property, 119
- replication port, 126

## S

- security, 141
- Security Manager
  - general information, 155
- security object, 147
  - ino:acl, 147
  - ino:group, 147
  - ino:security, 147
  - ino:user, 147
- server host name
  - server property, 120
- server parameter
  - text index word length, 125
  - XML text index type, 125
- server property, 120, 122
  - queue next request, 125
  - reject xsi:type, 125

- request log, 125
- request log file count, 126
- request log file maximum, 126
- request log folder, 125
- SSL certificate file, 121
- SSL key file, 121
- SSL password, 121
- XML max simultaneous requests, 123

- service
  - LDAP, 146
- space management
  - general information, 188
- space usage, 39
- stemming index
  - XML property, 124
- System Management Hub
  - general description, 5
  - keyboard navigation, 6

## T

- Tamino CD database info file
  - purpose, 188
- Tamino dump file
  - purpose, 189
- Tamino Manager
  - general description, 3
  - graphical user interface, 5
- Tamino security, 141
  - special cases, 154
- temporary sort space
  - purpose, 189
- tolerate autorepair errors
  - server property, 120

## U

- unbuffered, 122
- user
  - create, 156
  - delete, 160
  - display, 158
  - in ino:security, 148
  - modify, 159
- user group
  - create, 164
  - delete, 167
  - display, 165
  - modify, 166
- utility recovery space
  - purpose, 189

## V

- version management
  - from Tamino Manager, 179

## W

- web server
  - add, 182
  - delete, 184
  - display known, 182
  - managing, 181

- modify, 183
- rename, 185
- web server settings
  - assign/delete, 131
- word fragment index
  - XML property, 123

## X

- X-Node default encoding
  - XML property, 123
- X-Node default password
  - XML property, 124
- X-Node default user
  - XML property, 124
- X-Tension COM usage
  - X-Tension property, 128
- X-Tension direct usage
  - X-Tension property, 128
- X-Tension Java options
  - X-Tension property, 128
- X-Tension Java usage
  - X-Tension property, 128
- XML document default encoding, 124
- XML maximum request duration
  - XML property, 125
- XML maximum sessions
  - XML property, 123
- XML port
  - port property, 126
- XML property, 122
- XML work threads
  - XML property, 123
- XML XTS port
  - port property, 127
- XQuery document cache size, 122