LISTSERV® Maestro 4.0 What's New Manual

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Version 4.0-14

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Preface

About this Manual

This manual contains information on the new features associated with LISTSERV Maestro 4.0.

The following documentation conventions have been used in this manual:

- Menus, options, icons, fields, and text boxes on the screen will be bold (e.g. the **Mail Job** menu).
- Clickable buttons will be bold and within brackets (e.g. the **[OK]** button).
- Clickable links will be bold and underlined (e.g. the **<u>Edit</u>** link).
- Directory names, commands, and examples of editing program files will appear in `Courier New` font.
- Emphasized words or phrases will be <u>underlined</u>.
- Some screen captures have been cropped and/or edited for emphasis or descriptive purposes.
- Unless otherwise specified, directory paths are for Microsoft Windows installations of LISTSERV Maestro. For Linux or Solaris, substitute the Maestro top-level directory for *\Program Files\L-Soft\Application Server*.

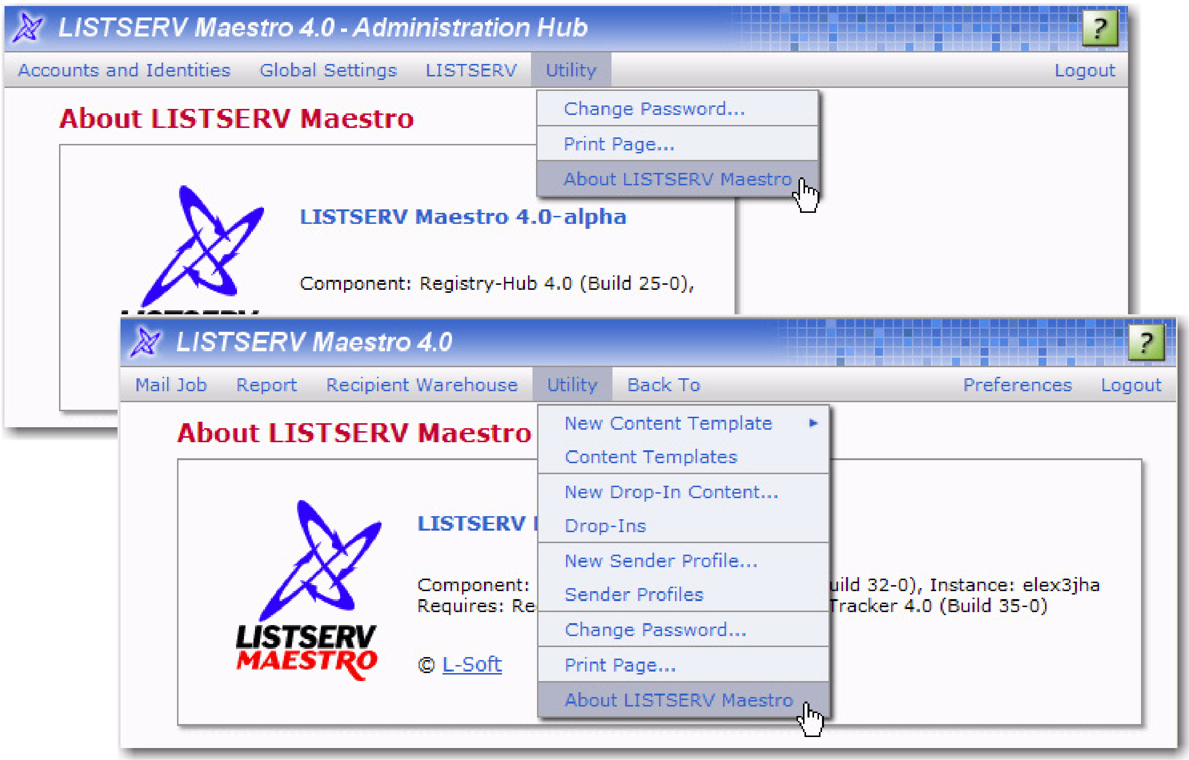
About LISTSERV Maestro 4.0

For information on the current LISTSERV Maestro version and build you are running, simply select the **Utility** menu from the Toolbar and then select **About LISTSERV Maestro**. The About LISTSERV Maestro screen opens, which lists the current build and version of your LISTSERV Maestro.

Figure 3-1 About LISTSERV Maestro Screen

This new **About LISTSERV Maestro** option is availble in both the User Interface and the Adminstration Interface.

Figure 3-2 The About Menu Option



Requirements

LISTSERV Maestro 4.0 requires a valid maintenance LAK.

In addition, it also requires LISTSERV 15.6. The LISTSERV installer that is bundled with the Windows Setup Suite for LISTSERV Maestro 4.0 contains this version of LISTSERV.

Section 1 What's New in the User Interface

Version 4.0 of LISTSERV Maestro has many new features in the User Interface with benefits for every end user, administrator, and data administrator. This section gives you detailed information about the following features:

- The behavior of the **Dataset** menu on the Toolbar has been updated to accommodate those who need to access this menu while working with lists. For details, see Section 1.1 Behavioral Changes to the Toolbar.
- If a user enters a target website through a tracked link in an email job, then LISTSERV Maestro can now track those actions that the user performs on that website. For details, see Section 1.2 Action Tracking.
- The Completed Job Details screen now includes the number of tracked links. For details, see Section 1.3 Viewing the Number of Tracked Links.
- An email job "journal" is now available and contains a log of each activity and who performed those activities. For details, see Section 1.4 Using the Job Journal.
- A new system drop-in gives your recipients the ability to view an HTML message in their browser. For details, see Section 1.5 Viewing an HTML Message in the Recipient's Browser.
- You can now choose to define recipients based on a reaction to a previous job that had its recipients defined from a target group based on a hosted recipient list or a target group based on a dataset. For details, see Section 1.6 Determining Recipients Based on Reaction to a Previous Job.
- New options for defining additonal mail-headers are now available when defining the sender of an email job. For details, see Section 1.7 Advanced Sender Defined Mail-Header Settings.
- The delivery of an email job can now be initiated from outside LISTSERV Maestro. For details, see Section 1.8 Triggering the Delivery of an Email Job.
- For an A/B-split job, it is now possible to define different delivery times for each variant, which gives you the ability to test these times as well. For details, see Section 1.9 Defining Individual Delivery Times for A/B-Split Variants.
- Sending email messages to an entire dataset or to subsets of that dataset, just as you would a list, is now possible. For details, see Section 1.10 Sending Messages to an Entire Dataset.
- The data administrator now has the ability to copy LISTSERV list specific settings to another HLL. For details, see Section 1.11 Copying LISTSERV List Settings.
- A new option to define one or more subsets of a lookup table is now available. For details, see Section 1.12 Defining Subset Values of a Lookup Table.
- You can now have secondary columns in your lookup tables. For details, see Section 1.13 Adding Secondary Columns to a Lookup Table.

- When using two single- or multi-select fields in a dataset or HRL, you can now define these fields so that the options available for the one field depends on the selection made in the other. For detail, see Section 1.14 Filtering Profile Field Drop-Down Menus Based on Previous Selection.
- You can now add descriptions to dataset and hosted list profile fields. For details, see Section 1.15 Adding a Description to a Profile Field.
- A new profile field type makes it possible for you to ask your subscribers for permission to use their data in tracking reports. For details, see Section 1.16 Tracking Permissions.
- A new profile field type makes it possible for you to have a profile field whose value is derived from one or several other profile fields in the same dataset or list. For details, see Section 1.17 Using Derived Profile Fields.
- It is now possible to create a message that asks a subscriber to update specific profile fields. For details, see Section 1.18 Requesting Profile Field Updates.
- When unsubscribing from the last list in a membership area, a subscriber will now be asked if they would like to unregister from the membership area as well. For details, see Section 1.19 Reminding the Subscriber to Unregister from a Membership Area.
- All dataset email messages, such as the welcome or farewell messages, can now be sent as an HTML message with an optional plain text alternative. For details, see Section 1.20 Sending HTML Notification Emails for a Dataset.
- When using formulas, several new functions are now available to you. For details, see Section 1.21 Using the New *{{Calc}} Features.
- The data administrator can now import recipients directly into the Recipient Warehouse from a Database. For details, see Section 1.22 Importing from a Database Directly into the Recipient Warehouse.
- The data administrator can now save predefined "recipient importers" for the Recipient Warehouse. For details, see Section 1.23 Defining Recipient Importers.
- The data administrator can now download dataset members and list subscribers outside of the application. For details, see Section 1.24 Downloading Dataset Members and List Subscribers Externally.
- The data administrator can now run demographic reports for the Recipient Warehouse. For details, see Section 1.25 Viewing Demographic Reports for a Dataset or List.
- Defining a data source for a report is now more streamlined and user-friendly. In addition, including the new Action Events and Forward-to-a-Friend Events is now easily done with just a few clicks. For details, see Section 1.26 Using the New Report Data Source Wizard.
- The Recipient Details Report has been improved and is now more user-friendly. For details, see Section 1.27 Using the Updated Recipient Details Report.

- Several placeholder attributes have been added and updated to accommodate other LISTSERV Maestro 4.0 enhancements. For details, see Section 1.28 Updated Placeholder Attributes.

1.1 Behavioral Changes to the Toolbar

The behavior of the **Dataset** menu on the Toolbar has been updated to accommodate those who may need to access this menu while working with lists. Because of this, there are several changes to the Toolbar:

- As soon as you select a dataset, the **Dataset** menu is displayed. This menu remains visible the entire time the dataset is selected. Therefore, if you select one of the Hosted Recipient List (HRL), Hosted LISTSERV List (HLL), or Linked LISTSERV List (LLL) nodes in the dataset tree, then the **Dataset** menu is still displayed.
- If you select a HRL/HLL node in the dataset tree, then the **Hosted List** menu is displayed in addition to the **Dataset** menu.
- If you select a LLL node in the dataset tree, then the **Linked LISTSERV List** menu is displayed in addition to the **Dataset** menu.
- If you select a category node (folder) in the dataset tree, then, as before, only the **Dataset** menu is visible. However, previously, this **Dataset** menu only showed the category/folder related menu items. This behavior has been changed. If a category is selected, then the **Dataset** menu now continues to show the full set of dataset related menu items, and the category specific items are shown in addition to the other menu items.
- In the **Hosted List** menu, the following menu items have been removed, as they were duplicates of menu items that already exist in the **Dataset** menu (they are no longer required in the **Hosted List** menu because the **Dataset** menu is now always visible):
  - **Dataset Overview**
  - **Tree Structure** (the whole sub-menu has been removed)
- Similarly, in the **Linked LISTSERV List** menu, the following duplicate menu items have been removed:
  - **Dataset Overview**
  - **Refresh and Manage Linked LISTSERV Lists**
  - **Tree Structure** (the whole sub-menu has been removed)

1.2 Action Tracking

Action Tracking is a cookie-based method to track actions and page visits that recipients perform after they have read your email message and followed the links to the target website.

For this to work properly, you need to embed pre-defined “action tags” into the HTML code of your web pages. Whenever a recipient visits one of these pages using a link from your email message, then the corresponding action tracking event is registered by LISTSERV Maestro.

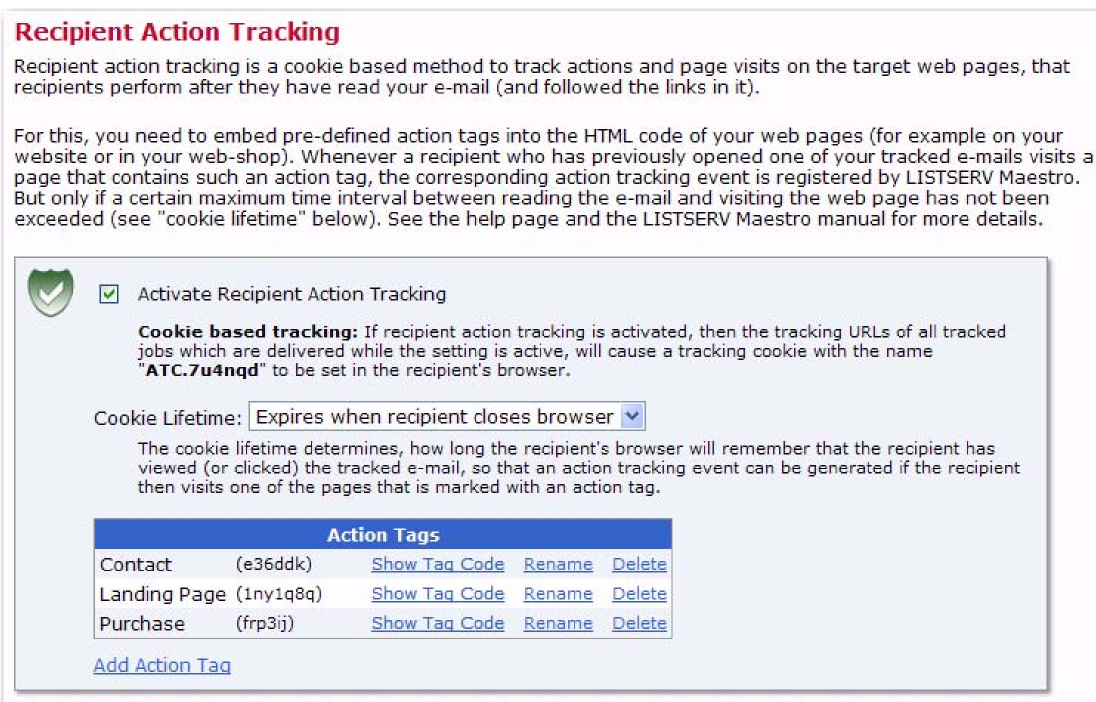
Important: Before you can use this feature in the User Interface, the administrator needs to enable it for you. For details, see Section 2.4 Enabling Action Tracking.

To activate Action Tracking in the User Interface, click on the **Report** menu and then select **Recipient Action Tracking**. The Recipient Action Screen opens. Check the **Activate Recipient Action Tracking** box, and then use the **Cookie Lifetime** drop-down menu to define the cookie's lifetime. The Cookie Lifetime determines how long the recipient's browser will remember that the recipient viewed/clicked on the tracked email. The cookie's lifetime can be defined for up to 30 days. If a marked page is visited at any time while the cookie is still valid, then this visit will be counted as an event even if the page is not revisited by an email link.

Tip: Cookies can be disabled by the recipient so your tracking results will never be 100% accurate; however, this feature can be extremely useful when analyzing trends.

Next, you'll need to define the action tags that will be used to track your recipient's actions. To do so, click on the **Add Action Tag** link, enter the name of the action tag, and then click **[OK]**. Repeat this process until you are finished adding your actions tags. Once you are finished, all action tags will be listed in the **Action Tags** section.

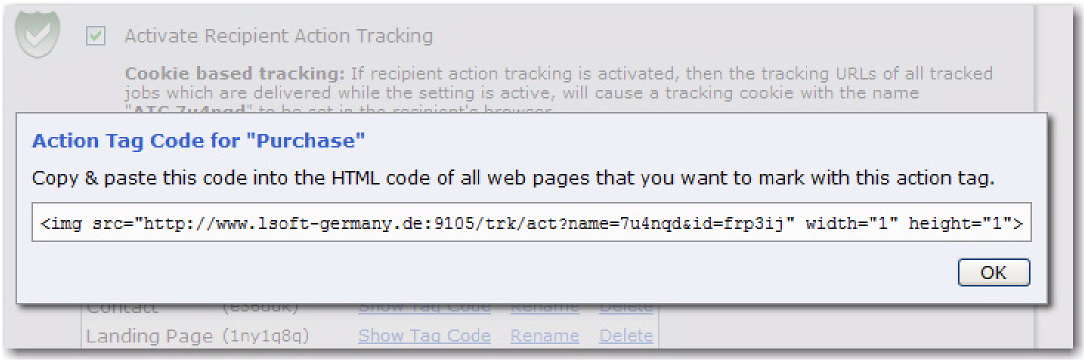
Figure 1-1 The Recipient Action Tracking Screen



To rename or delete the action tag, simply click on the corresponding **Rename** or **Delete** link.

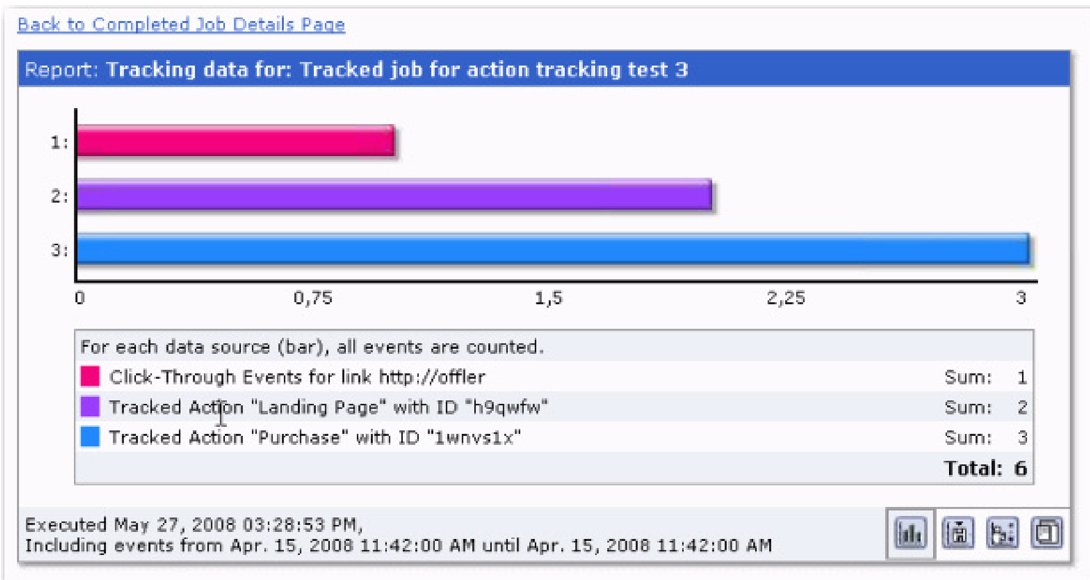
Once you've added your action tags, click on the **Show Tag Code** link for each tag to get the code that needs to be inserted into the HTML code for all web pages that you want to mark with action tags.

Figure 1-2 Action Tag Code



Once these tags are setup on your web pages, then any actions performed by your recipients that relate to these tags will be tracked by LISTSERV Maestro and can be viewed in your reports. In addition, when creating a target group based on a hosted recipient list or dataset, a job based condition node can now be based on action tracking.

Figure 1-3 Action Tracking Data on a Report



1.2.1 Example

Let's say that you have an online catalog that sells various products. In addition, online shoppers can subscribe to your site to receive emails advertising special sales and promotions.

For an upcoming holiday sale, you send out an advertisement mailing that contains tracked links to your product pages.

In addition to this link, you've also applied action tags to specific pages on your site, such as the pages for your sales and your Order Confirmation page.

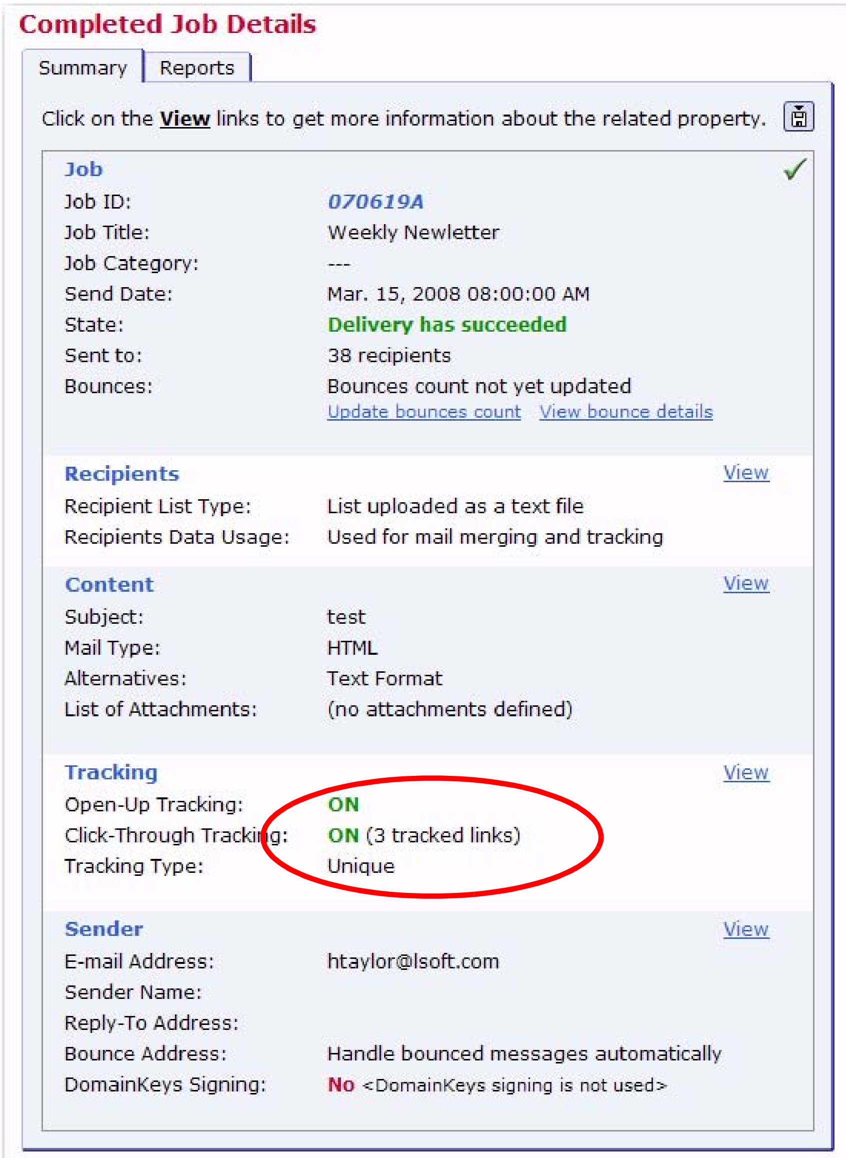
These links and action tags will let you know when a subscriber visits your site, visits specific product pages, and when they purchase products. This will help you keep track of how successful your promotions are and what most interests your subscribers.

1.3 Viewing the Number of Tracked Links

On the Completed Job Details screen, you can now see how many links are being tracked.

To access this screen, click on the **Mail Job** menu and select **Completed Jobs**. From the Completed Jobs screen, click on the job's **ID** that you'd like to view. The Completed Job Details screen opens.

Figure 1-4 Viewing the Number of Tracked Links

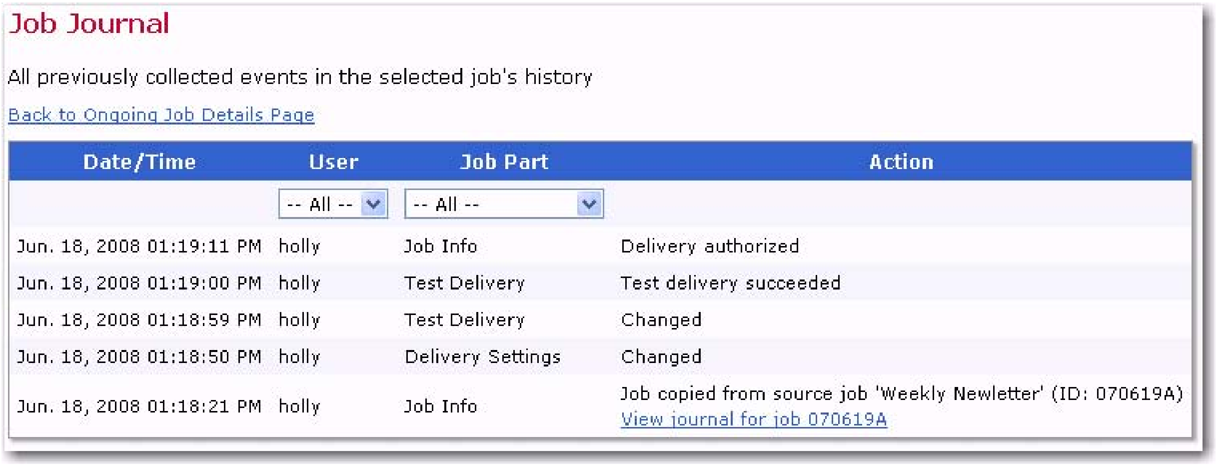


1.4 Using the Job Journal

LISTSERV Maestro now provides you with a Job Journal that lists all previous events in the selected job's history, beginning with the job's creation in the system. All changes to the job are recorded together with information about the user who performed the change and what part of the job was changed. In addition, each record is reported with a timestamp, and the list shows the newest entries first.

The Job Journal can be accessed from any of the Job Details screen (Open, Ongoing, or Completed) by selecting a job, clicking on the **Mail Job** menu, and then selecting **Job Journal**.

Figure 1-5 The Job Journal



Job Journal

All previously collected events in the selected job's history

Back to Ongoing Job Details Page

Date/Time	User	Job Part	Action
	-- All --	-- All --	
Jun. 18, 2008 01:19:11 PM	holly	Job Info	Delivery authorized
Jun. 18, 2008 01:19:00 PM	holly	Test Delivery	Test delivery succeeded
Jun. 18, 2008 01:18:59 PM	holly	Test Delivery	Changed
Jun. 18, 2008 01:18:50 PM	holly	Delivery Settings	Changed
Jun. 18, 2008 01:18:21 PM	holly	Job Info	Job copied from source job 'Weekly Newletter' (ID: 070619A) View journal for job 070619A

If the job began its life as a copy from another job that still exists in the system, then the job creation history entry contains a shortcut link to this job. Click this **View journal for job [JOB_ID]** link to open the journal of the source job.

To restrict the list to events triggered by a certain user and/or changes performed to a certain job part, simply choose the appropriate options from the **User** and **Job Part** drop-down menus at the top of the list.

1.5 Viewing an HTML Message in the Recipient's Browser

When defining the content for an HTML message, you can now use a new system drop-in, `{{*ViewInBrowserURL}}`, that will allow the recipient to view the HTML message in their own browser.

Note: The system drop-in's name is case-sensitive and requires this exact spelling as well as the correct drop-in enclosing tags.

The system drop-in will be replaced with a `http:// URL` that points to a special page that displays the HTML part of your message. This lets the recipient view it in a separate browser window if, for some reason, the recipient can not view the HTML message in their own email client.

In an HTML message that also contains a text alternative part, you can use this system drop-in both in the HTML part and in the text alternative. By including the system drop-in in the text alternative, you will give those recipients that normally only view the text alternative the option of using the URL to display the full HTML message in a separate browser window.

Note: Viewing the message in a browser window will also display the HTML message with the same personalized merge values of the recipient as the original email. These merge values are coded into the URL. Therefore, in a mailing with a very large number of merge values (per recipient) and/or values with a very long text, this mechanism of coding the merge values into the URL may produce URLs that exceed the size limits imposed by the browser software that is in use. Consequently, you should limit the usage of this system drop-in to mailings where the merge field names and their values do not combine to form an excessively long URL.

In addition, viewing the message in a browser window does _not_ change the behavior of the tracked links in the message.

The URL will have roughly the following format (with different individual values, depending on your LISTSERV Maestro installation and the mail job in question):

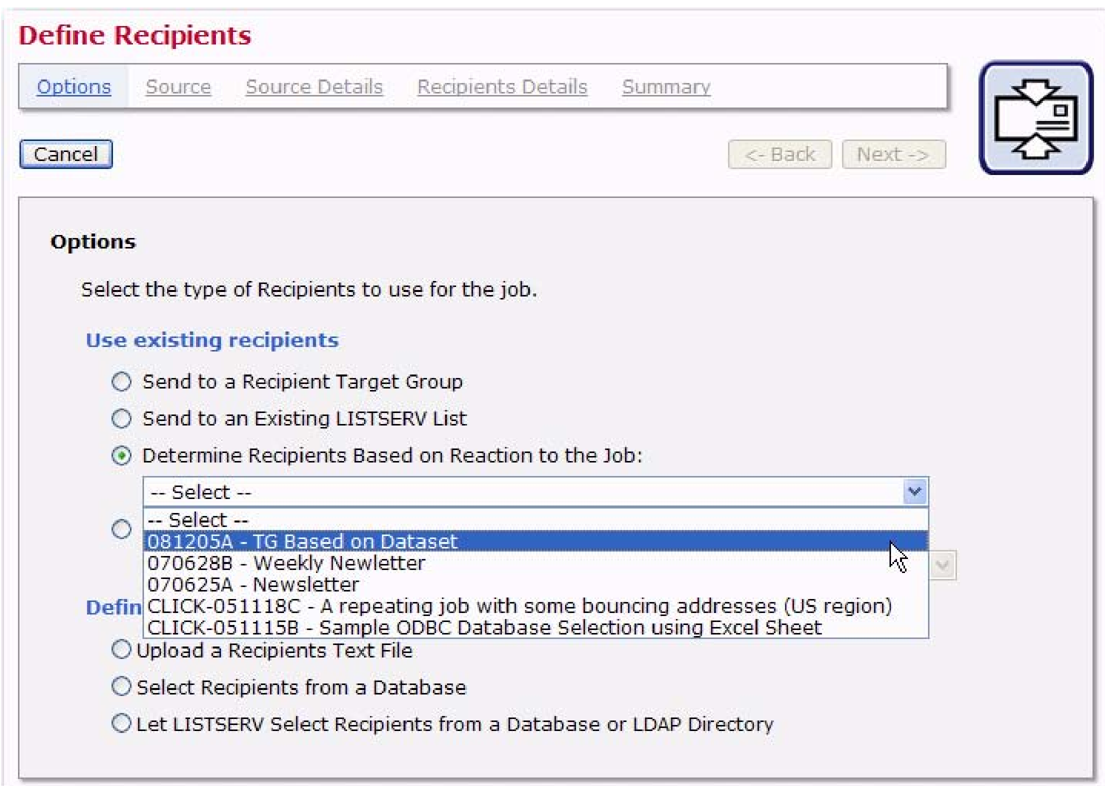
`http://YOUR.SERVER/list/elex3jha/080102A/84c4b3.vib?...`

Note: This system drop-in can not be used in messages that use conditional blocks (of the style `.BB ... .EB`). The only system merge fields (beginning with `&*`) allowed in the message are `&*TO;`, `&*URLENCODE(...);`, and `&*INDEX;`.

1.6 Determining Recipients Based on Reaction to a Previous Job

You can now choose to define recipients based on a reaction to a previous job that had its recipients defined from a target group based on a hosted recipient list or a target group based on a dataset.

Figure 1-6 Determining Recipients Based on Reaction to a Previous Job



Because of this new feature, in order for the **Determine Recipients Based on Reaction to the Job** option to be available on the Options screen of the Define Recipients wizard, all of the following conditions must be met by the previous job:

- Recipients were defined from an uploaded text file, a database selection, a target group based on one of these, a target group based on a hosted recipient list, or a target group based on a dataset.

- Personal tracking was turned on.
- Tracking data has been received by the system.

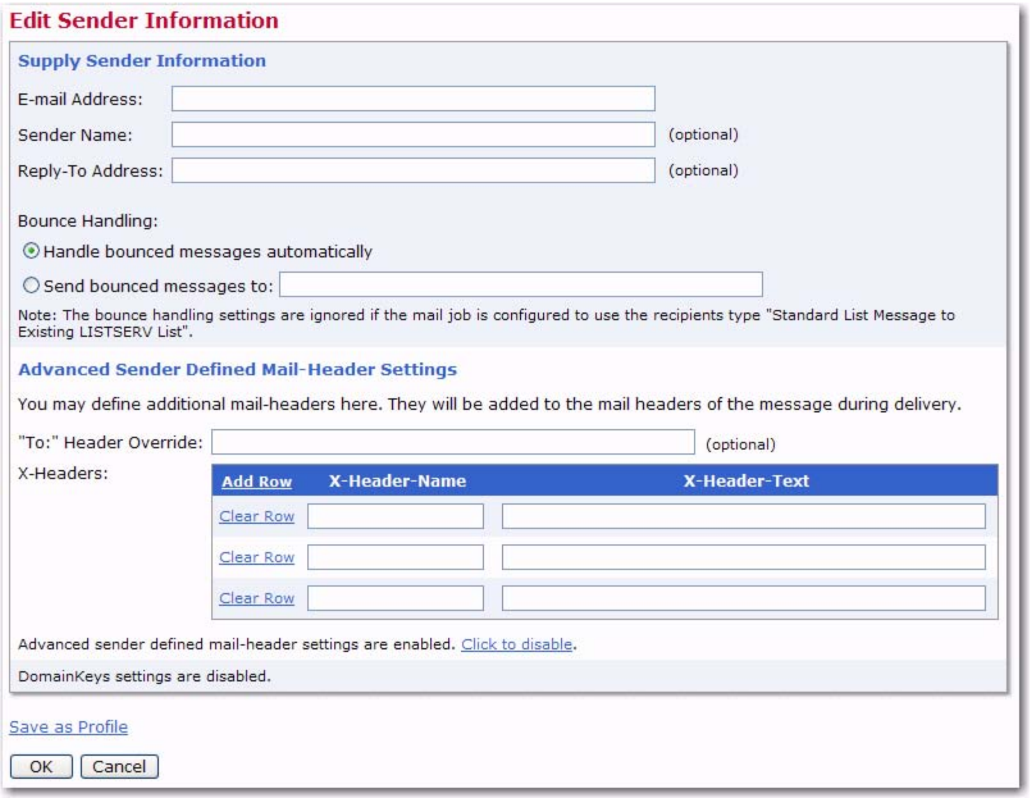
All previous jobs that match these conditions will appear in the drop-down menu associated with this option. If there are no jobs in the menu, then this **Determine Recipients Based on Reaction to the Job** option is not available.

Note: For details on how to create a target group based on a dataset, see Section 1.10 Sending Messages to an Entire Dataset.

1.7 Advanced Sender Defined Mail-Header Settings

The Advanced Sender Defined Mail-Header Settings on the Edit Sender Information screen are disabled by default. To enable, simply click the **Click to enable** link.

Figure 1-7 Edit Sender Information Screen



This section lets you define additional user defined mail headers following the X-Header convention as described in RFC822. These mail-headers will be added to the mail headers of the message during delivery.

- **"To:" Header Override** – This allows you to override the value of the "To:" header for all recipients. Normally, the "To:" header will contain the recipient's address and optionally also his name, so that for each recipients an individual "To:" header is used.

  If a sender override for the "To:" header is defined, the same value will be used for all recipients. The value you specify will be used without any changes, i.e. you have to make sure to provide a value that is valid for the "To:" header (following the MIME header rules).

Note: The "To:" header override is ignored if the recipients type is "Send to an Existing LISTSERV list" of the type "Send job as standard list message to list members".

- **X-Headers** – This allows you to define additional sender defined mail headers following the X-Header convention as described in RFC822.

  Enter the header name (including the leading "X-", which is mandatory) in the **X-Header-Name** column and the text for that header into the **X-Header-Text** column. The additional headers will be added to the end of the header part of the email, just before the actual message content. They will be added in the order you enter them here.

  Rows where both the name and the text columns are empty are ignored; therefore, to remove a certain header, simply click the **Clear Row** link of the corresponding row. If you need more rows than are currently visible, click the **Add Row** link.

1.8 Triggering the Delivery of an Email Job

In some cases, it may be desired that the moment for an email job delivery be determined outside of LISTSERV Maestro. For example, if the message content is defined as a drop-in file that is generated by an external process, then the job should not be delivered until this file has been successfully completed. Because of circumstances like this, you now have the ability to schedule the email job’s delivery for a future time that will be determined after the email job has been approved.

1.8.1 Enabling

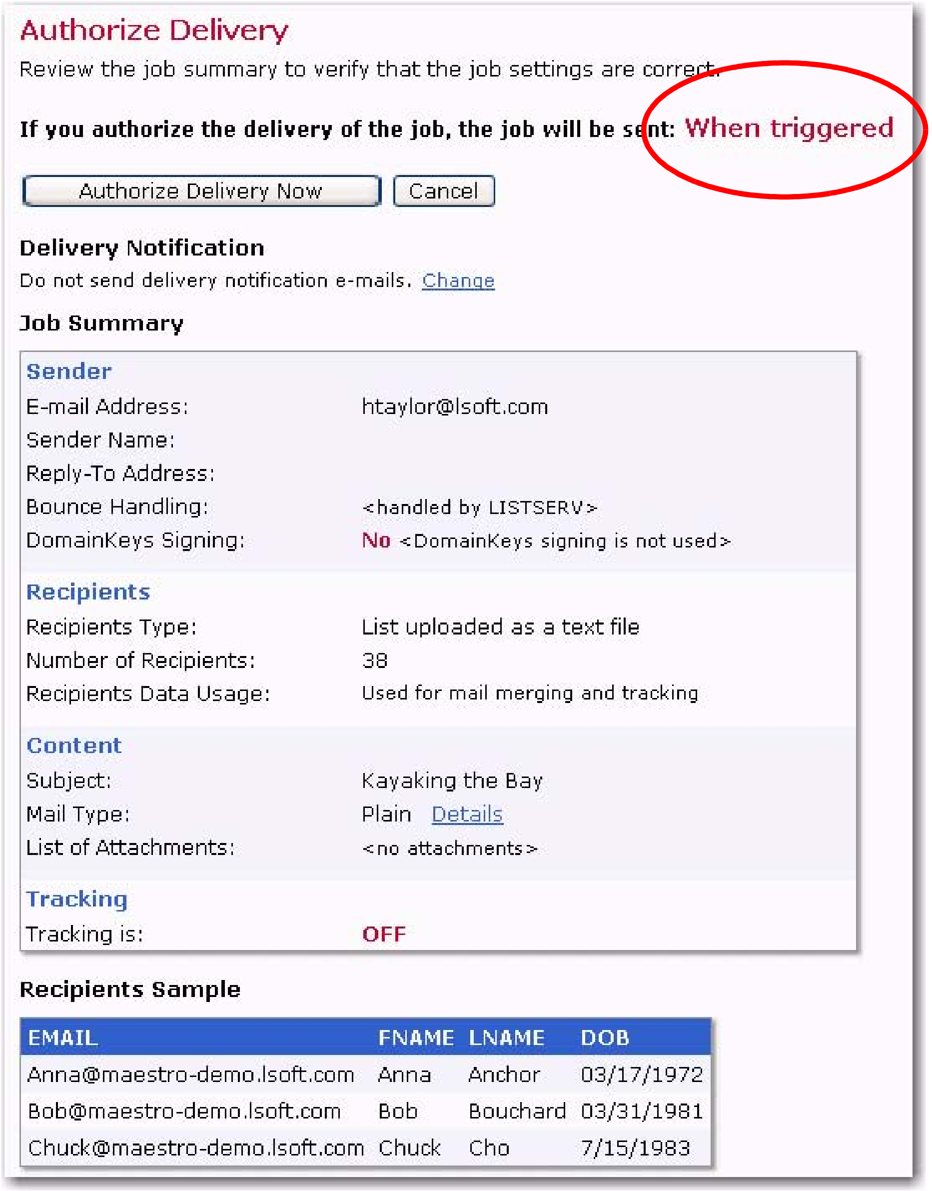
Triggering delivery for an email job is enabled on the Delivery Settings screen. To enable, select the **Wait until mail job delivery is triggered** option.

Figure 1-8 Enabling Triggered Delivery

Once the email job delivery is authorized, the delivery trigger for the mail job is activated.

On the Authorize Delivery screen, click the **[Authorize Delivery Now]** button to authorize delivery. The email job is then placed in the "when triggered" delivery state on the Ongoing Jobs screen. The job will only be delivered once you trigger it.

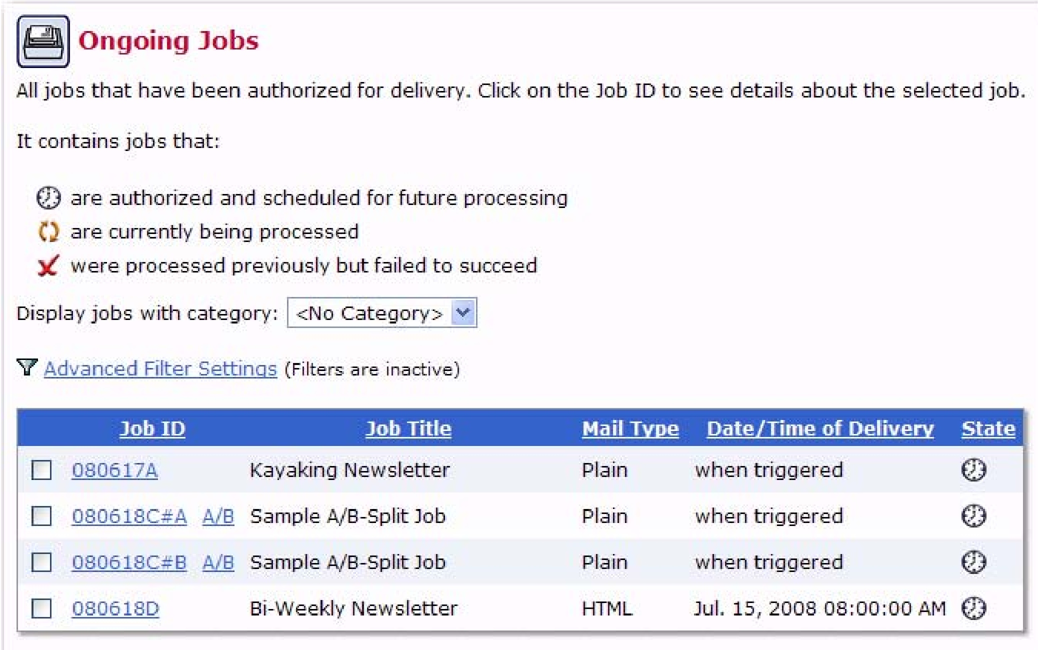
Figure 1-9 Authorizing Delivery Screen



1.8.2 Triggering the Delivery Manually

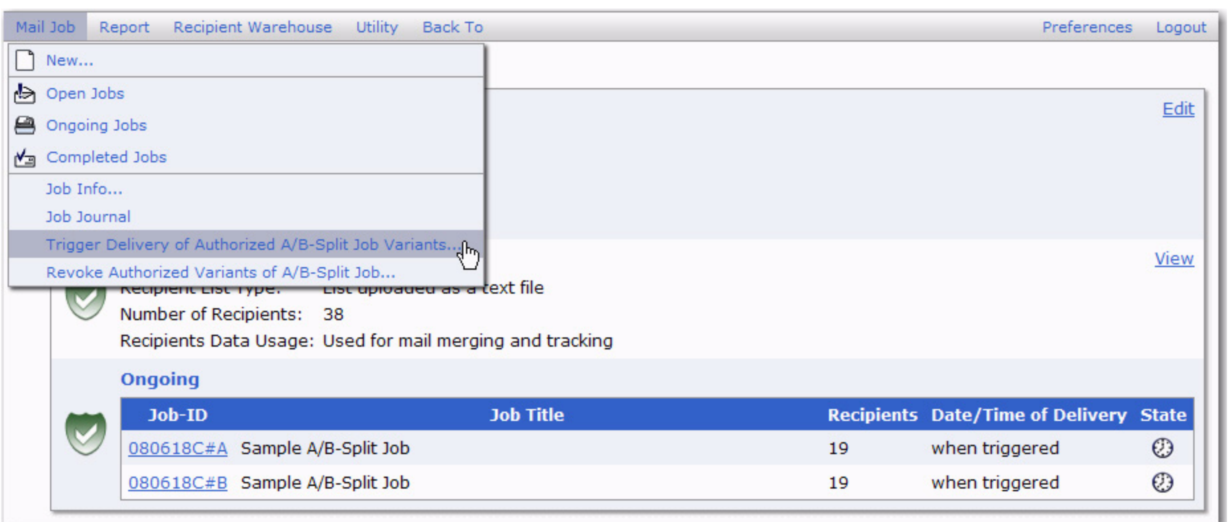
To manually trigger the delivery of an email job, go to the Ongoing Jobs screen and click on the job's **ID**. This opens the Ongoing Job Details screen. From here, click on the **Mail Job** menu and select **Trigger Job Delivery**. Click **[OK]** to confirm the delivery.

Figure 1-10 The Ongoing Jobs Screen with Triggered Jobs



To manually trigger the delivery of an A/B-Split Job, go to the Ongoing Jobs screen and click on the **A/B Job ID**. The A/B-Split Job Details screen opens. From here, click on the **Mail Job** menu and select **Trigger Delivery of Authorized A/B-Split Job Variants**. Click **[OK]** to confirm the delivery.

Figure 1-11 Manually Triggering the Delivery of an A/B-Split Job



1.8.3 Triggering the Delivery Externally

In order to trigger delivery externally, the external process or application has to access the server where the LISTSERV Maestro User Interface (LUI) is running via HTTP (or HTTPS, depending on your setup). In addition, a security token must be obtained.

Note about Security Tokens: Since triggering an email job delivery is a highly privileged operation, LISTSERV Maestro requires that the external process or application delivers a security token for authorization. This security token is assigned internally by LISTSERV Maestro.

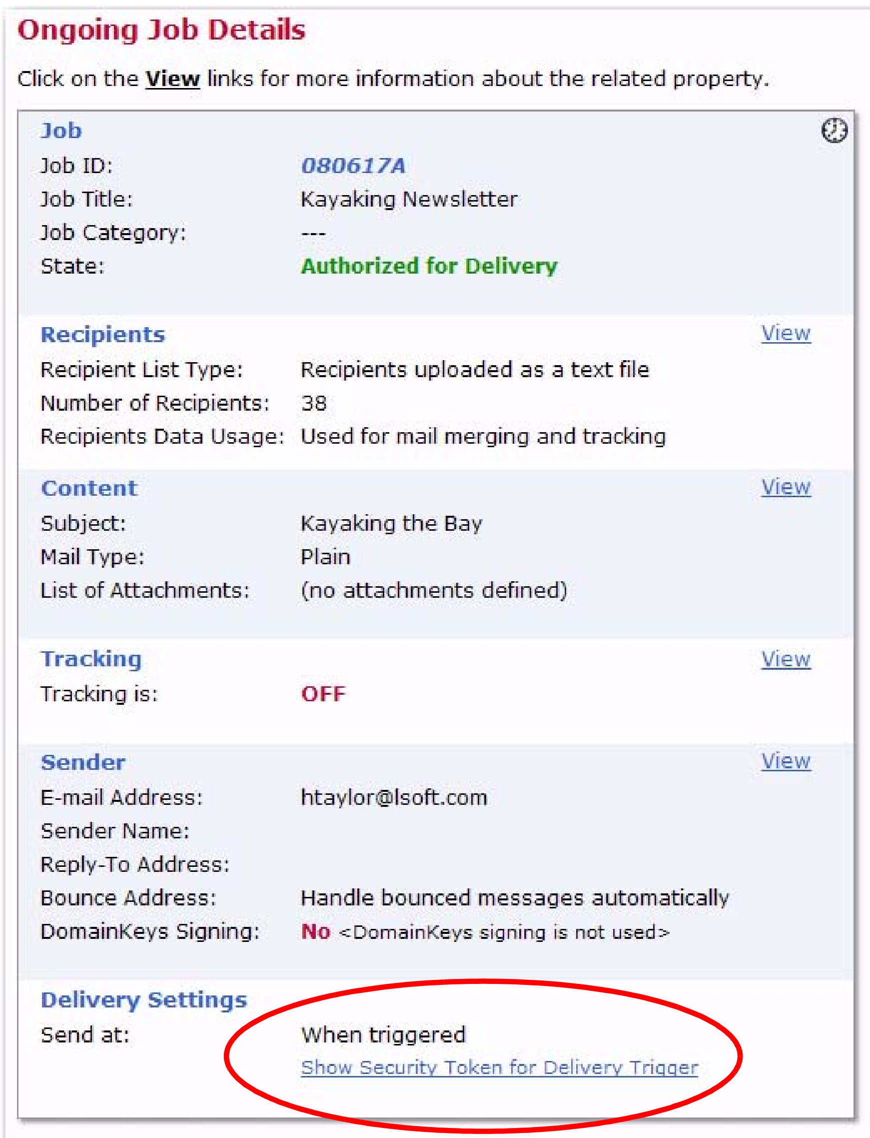
Delivery trigger security tokens are assigned to jobs as follows:

- **Standard Job** – Each standard job has a unique security token, which is found on the job's details page once the job has been authorized.
- **Auto-Repeat Job** – All jobs in an auto-repeat chain have the same security token, which is found on the details page of one of the jobs in the chain (while the job is authorized). Whenever the external process uses the security token to trigger the delivery of the job, the job will be delivered and a new job in the auto-repeat chain will be spawned, which then turn waits in the Ongoing Jobs list until the external process uses the same security token again to trigger this job's delivery. Because of this, the external process can independently determine how often a new job in the auto-repeat chain is to be delivered.
- **A/B-Split Job** – The delivery trigger security token for A/B-split jobs are assigned depending on one of the following four cases:
    - **Standard A/B-Split Job with Common Delivery Settings for All Variants:** The A/B-split job has a common security token that is found on the A/B-split job's details page once the variants have been authorized. If the common security token is used to trigger the action, then this will trigger the delivery of all variants.
    - **Sampling A/B-Split Job with Common Delivery Settings for the Sampling Variants:** The A/B-split job has a common security token that is found on the A/B-split job's details page once the variants have been authorized. Neither the sampling variants nor the main variant have individual security tokens. If the common security token is used to trigger the action, then this will trigger either the delivery of the sampling variants or the delivery of the main variant, depending on which variants are currently authorized for delivery. Because of this, the security token has to be used twice: At first the sampling variants are authorized, then the security token is used to trigger their delivery. Then, the main variant is authorized and the same security token is used to trigger its delivery as well.
    - **Standard A/B-Split Job with Individual Delivery Settings for Variants:** The A/B-split job does not have a common security token. Instead, each variant has an individual security token that is found on the variant job's details page once the variant job has been authorized. Each individual security token must be used to trigger the delivery of each individual variant job. This allows you to trigger the variants at different times. The security tokens of the variant jobs are very similar: Each security token is the same as the security tokens of its sibling variants, except for a unique suffix. The first variant will have the suffix "-A", the second the suffix "-B", and so on. This means that you only need to know the security token for one variant, and how many variants there are, to be able to trigger all variants. This is especially useful when setting up an external

script or process to do this triggering because you only need to tell the process the common part of the security token, plus how many variants there are. The process can then build the complete security token for each variant by extending the common part with the correct suffix for each variant job.

- **Sampling A/B-Split Job with Individual Delivery Settings for Variants:** The A/B-split job does not have a common security token. Instead, each sampling variant and the main variant has an individual security token that is found on the variant job's details page once the variant job has been authorized. Each individual security token must be used to trigger the delivery of each individual variant job. This also allows you to trigger the variants at different times. The same similar security tokens with different suffixes are used for the variants as described above for **Standard A/B-Split Job with Individual Delivery Settings for Variants**.

Figure 1-12 Triggering the Delivery Externally using Security Token



Important: Everyone who is in possession of this security token and who can also access LISTSERV Maestro on its HTTP port (for example, with a normal web browser) will be able to trigger the delivery of the job. Therefore, the security token should be closely guarded and not be given out to unauthorized persons.

The security token is found in the **Delivery Settings** section on any of the Job Details screens. To show the security token, click the **Show Security Token for Delivery Trigger** link. Copy the security token from this box and make sure that the external process or application accesses the URL described below, replacing `[SECURITY_TOKEN]` with the value pasted from the security token popup box.

Note: To create a new security token for a standard job, click the **Create New Security Token** link in the popup box. To create a new security token for an A/B-split job variant, click on the **Create New Security Token for all Variants** link. This will create a new security token for all of the A/B-split job variants. Once a new security token is created, the old token is no longer valid and cannot be used to trigger a job externally.

A trigger URL always has the following form:

```
http[s]://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
```

- where `SERVER_NAME` is replaced with the name of your LISTSERV Maestro server. If a non-standard HTTP port is used, also include the port separated with a colon ":". If access to your LISTSERV Maestro is protected with HTTPS, you need to specify "https://" instead of "http://".
- where `SECURITY_TOKEN` is replaced with the security token for the action that the URL will trigger.

The external delivery trigger is of the **Simple URL Access** type and does not contain any download data in its response. With this type, the action is triggered by accessing the external trigger URL with a HTTP GET-request.

By accessing this URL, a HTTP GET-request is made to LISTSERV Maestro. The server then verifies the given security token and, if it is valid, triggers the corresponding action. The result of the action will be returned in the form of a HTTP response.

If everything went well, a response with the status code "200 - OK" will be returned. In this case, the response body will contain the result of the action.

If there was a problem executing the action, a response with a different status code will be returned; for example, "404 - Not Found" if an invalid security token was specified.

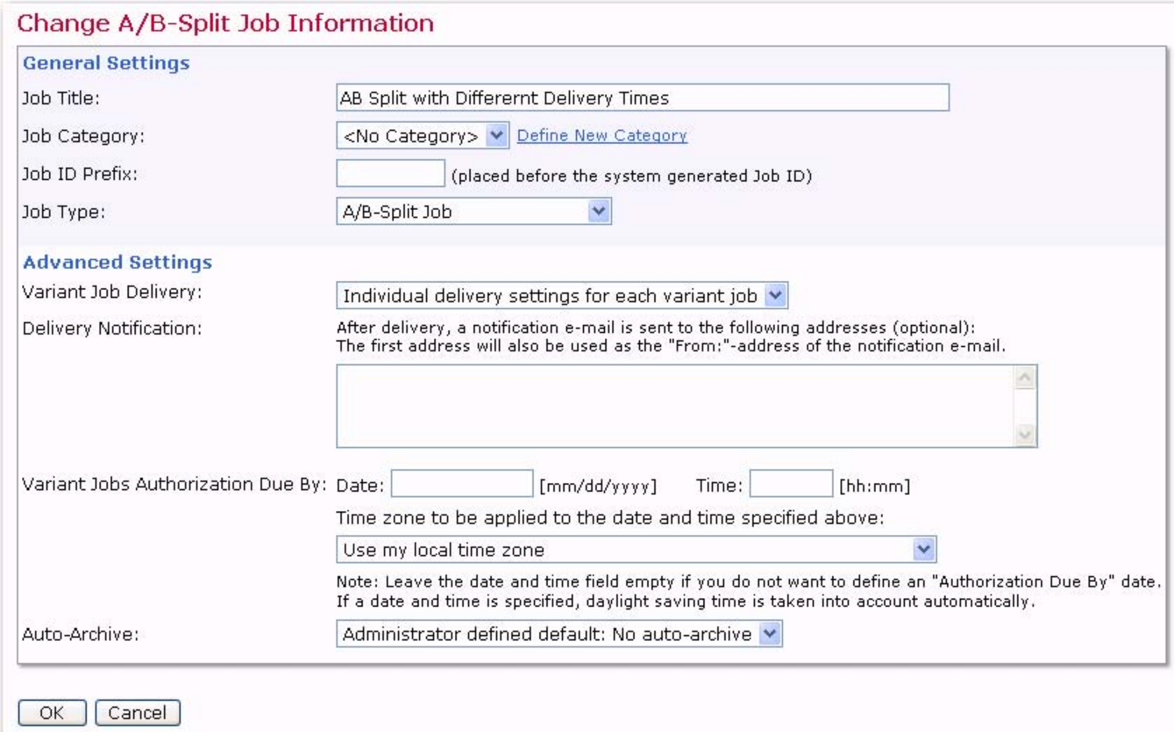
Important: If you type the value manually, then make sure to maintain the exact spelling because security tokens are case sensitive.

1.9 Defining Individual Delivery Times for A/B-Split Variants

When performing A/B-split testing in LISTSERV Maestro, it is now possible to test the delivery time. To define the A/B-split job's variants separately, follow the directions below:

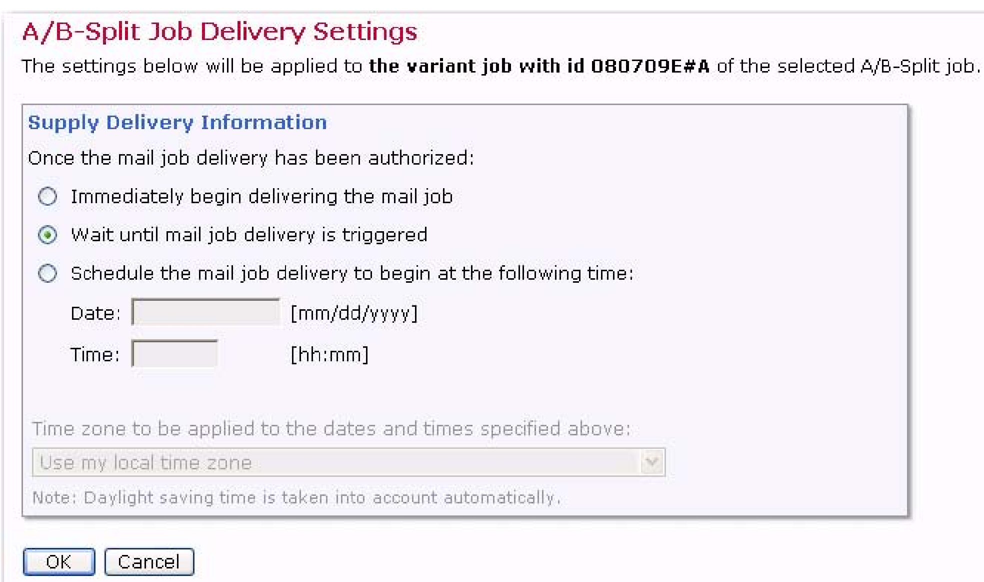
1. From the A/B-Split Job Details screen, click the **Edit** link for the **A/B-Split Job** section. The Change A/B-Split Job Information screen opens.

Figure 1-13 The Change A/B-Split Job Information Screen



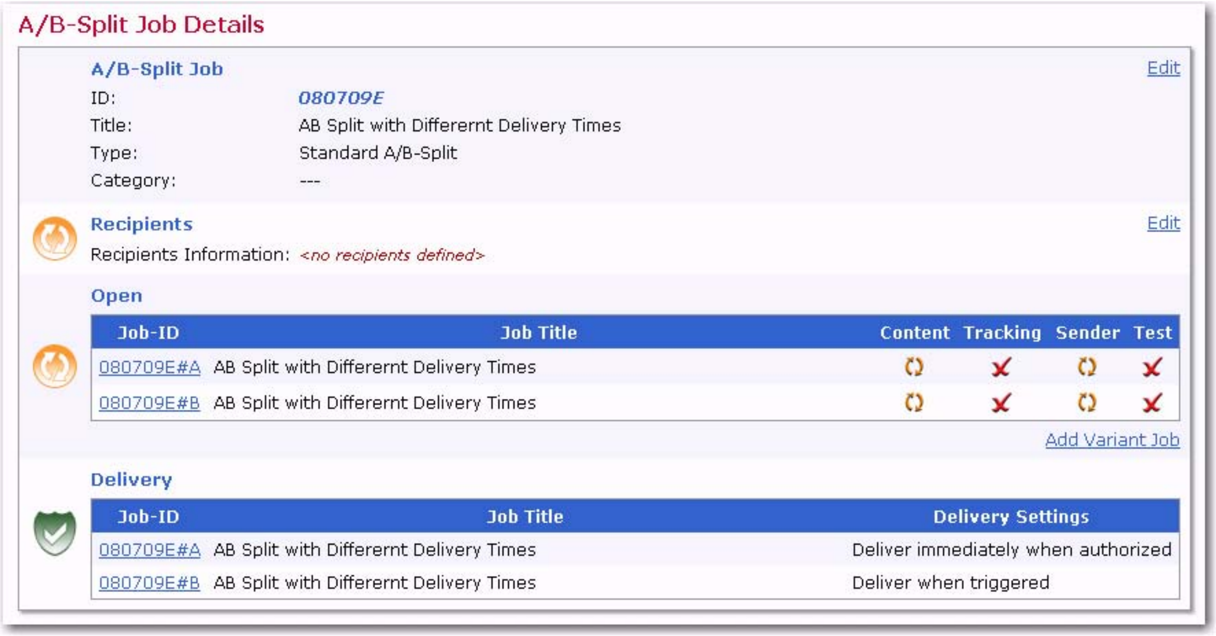
2. Click the **Variant Job Delivery** drop-down menu and select the **Individual delivery setting for each variant job** option.
3. Click **[OK]** to accept your changes and return to the A/B-Split Job Details screen. The **Delivery** section now has each variant job's ID listed.
4. To set each variant's delivery time, click on its **Job ID**. This opens the A/B-Split Job Delivery Settings screen. From here, define the variant's delivery settings and then click **[OK]**.

Figure 1-14 A/B-Split Job Delivery Settings



5. Repeat this process for each variant. The different delivery times will then be shown on the A/B-Split Job Details screen in the **Delivery** section.

Figure 1-15 The A/B-Split Job Details Screen with Different Variant Delivery Settings



When the A/B-Split job is authorized for delivery, each variant's delivery setting will determine when they are delivered.

1.10 Sending Messages to an Entire Dataset

You can now define a target group based on a recipient dataset, which can then be used to define the recipients of an email job.

To create a target group based on a dataset, click on the **Recipient Warehouse** menu, select **New Recipient Target Group**, and then select **Based on Dataset**. The Target Group Definition wizard opens. See the following sections for details on using this wizard.

1.10.1 General

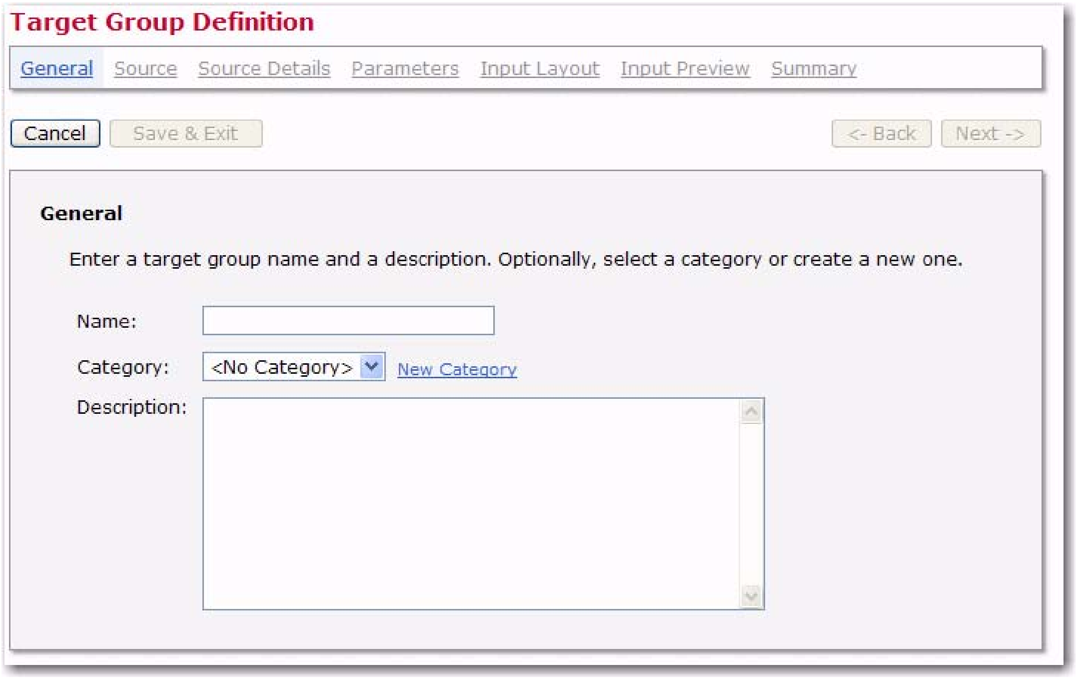
The General screen defines the name, category, and description of the target group.

Both the **Name** and **Description** fields are mandatory. Enter a meaningful name and a good description so the end users who are selecting target groups in the recipients wizard will have all the information they need to decide which target group to use.

Target groups can be clustered in categories, making it easier for the end user to select a target group. A category is meant to contain target groups that are related to each other. The intent of categories is to minimize the time users need to locate a specific target group. By selecting a category first, users do not need to browse through all the available target groups, but only those in the relevant category.

To add a target group to a category, simply choose the category for the target group from the **Category** drop-down menu. To create a new category, click the **New Category** link and define a new category by entering its name into the field. Target group categories are optional. If no category is selected or created, then your target groups will be placed into **<No Category>**.

Figure 1-16 Defining a Target Group Based on a Dataset - General Screen

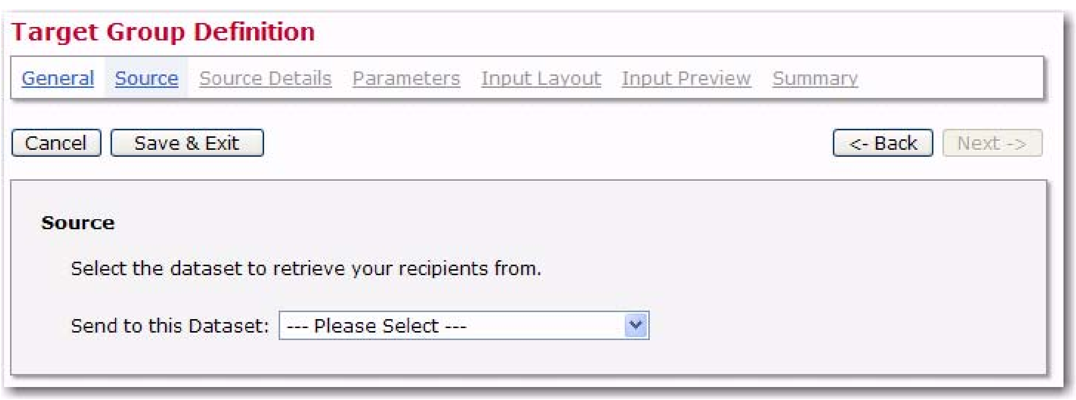


1.10.2 Source

The Source screen defines the recipient dataset that the target group will be based on.

To define, click on the **Send to this Dataset** drop-down menu and then select the desired recipient dataset.

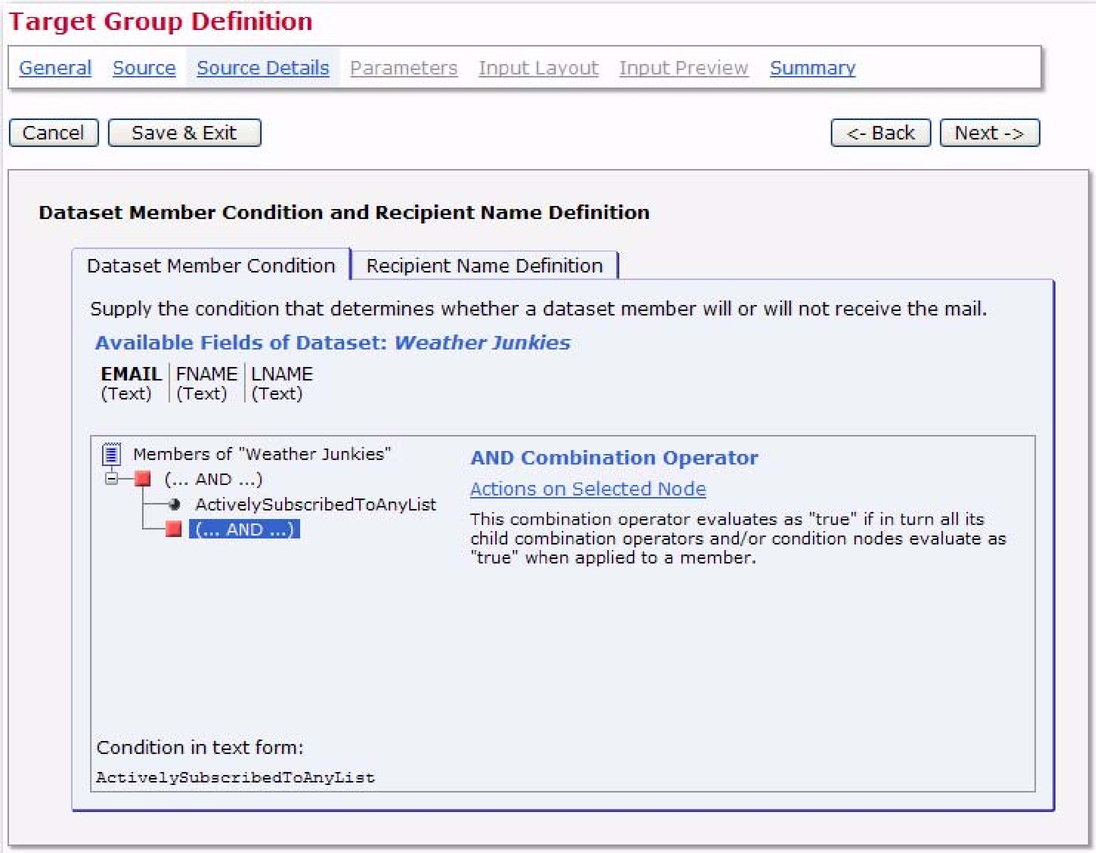
Figure 1-17 Defining a Target Group Based on a Dataset - Source Screen



1.10.3 Source Details

The Source Details screen allows you to define a filtering condition that can be used to select a subset of the subscribers from the dataset on which the target group is based. The only requirement is the "ActivelySubscribedToAnyList" condition, which simply means that the member/subscriber must belong to at least one list in the dataset. For details on defining a filtering condition, please see the online help.

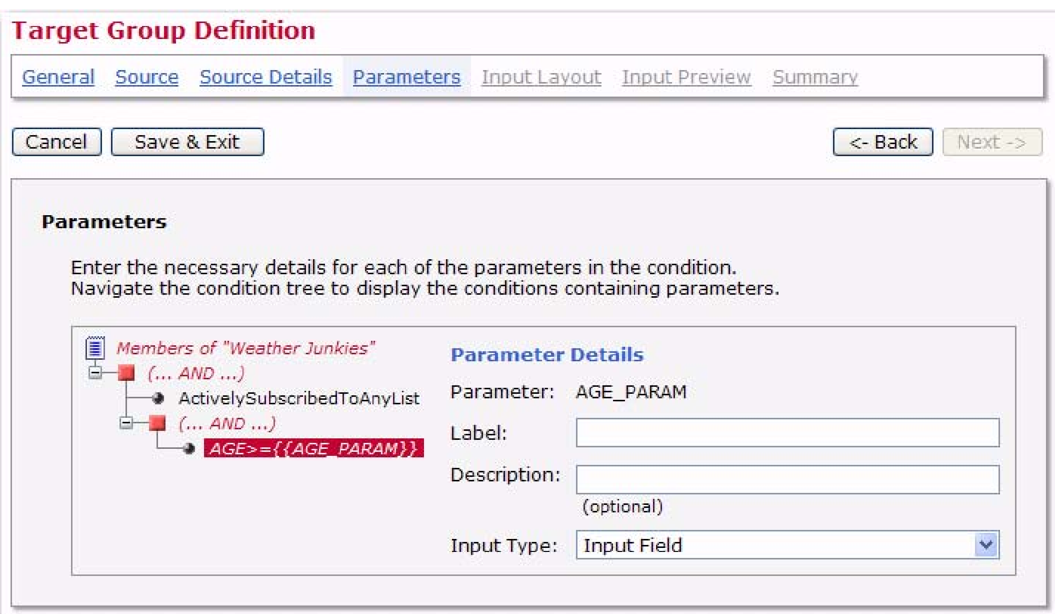
Figure 1-18 Defining a Target Group Based on a Dataset - Source Details



1.10.4 Parameters

The Parameters screen defines how the parameters in the condition tree are treated. For details on defining parameters, please see the online help.

Figure 1-19 Defining a Target Group Based on a Dataset - Parameters Screen



1.10.5 Input Layout

The Input Layout screen defines how the target group parameters will be presented to end users when they use the target group in the Define Recipients wizard.

The parameters will be presented to the end user one below the other, in the order defined here. The selection box shows all parameters. Each parameter is listed with its name and label. Select a parameter and click **Up** or **Down** to change its position in the list.

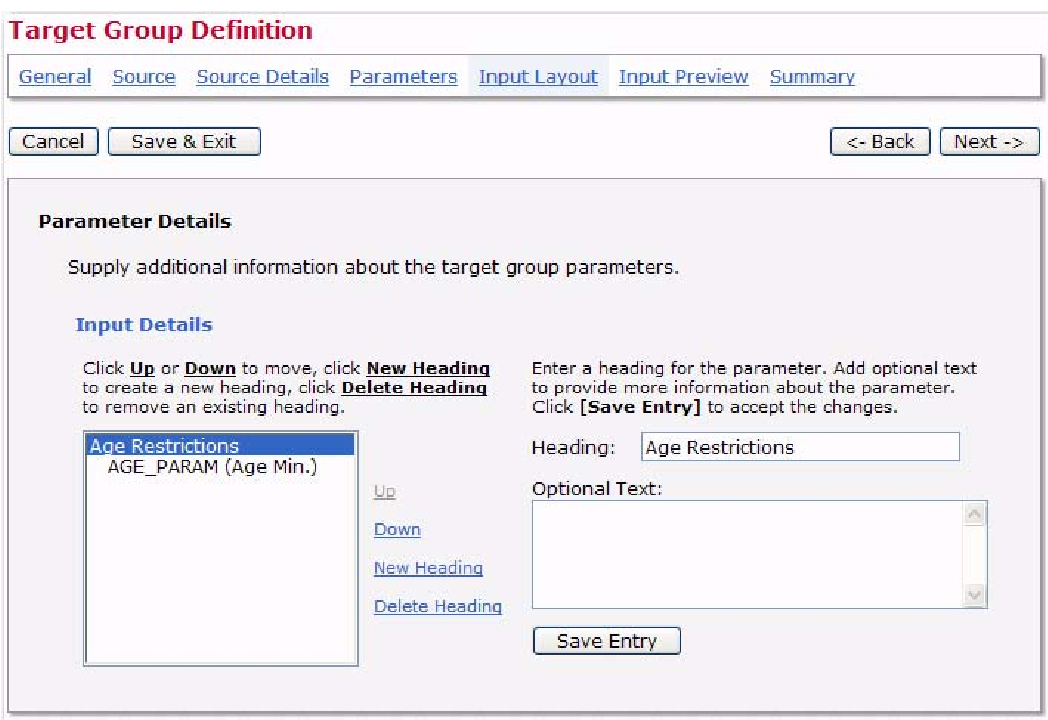
In addition to the parameters themselves, special "headings" may also be defined, which are similar to title rows or section headings. Use headings to add additional explanatory text to the layout and to group parameters together in a way that underlines their semantics. Click on **New Heading** to create a new heading. Each heading consists of the heading text, rendered in an emphasized manner, and an optional text, rendered in a smaller font. Fill out at least the heading text, then click **[Save Entry]**. This will create a new entry in the selection box to the left, which now stands for the heading just defined.

To edit an existing heading, select it in the selection box, then edit its texts in the edit fields to the right. Click **[Save Entry]** again. If **[Save Entry]** is not clicked after editing or creating a heading, the changes will be lost as soon as any other link or button is clicked.

To delete an existing heading, select it in the selection box and click **Delete Heading**.

Headings can be inserted between the existing parameters at any location. A new heading will always be created just before the selection box entry that is currently selected. If no entry is selected it will be created as the first entry. To add a heading just before a given parameter, first select that parameter and then click on **New Heading**. The headings and parameters can be re-ordered at any time with the **Up** and **Down** links.

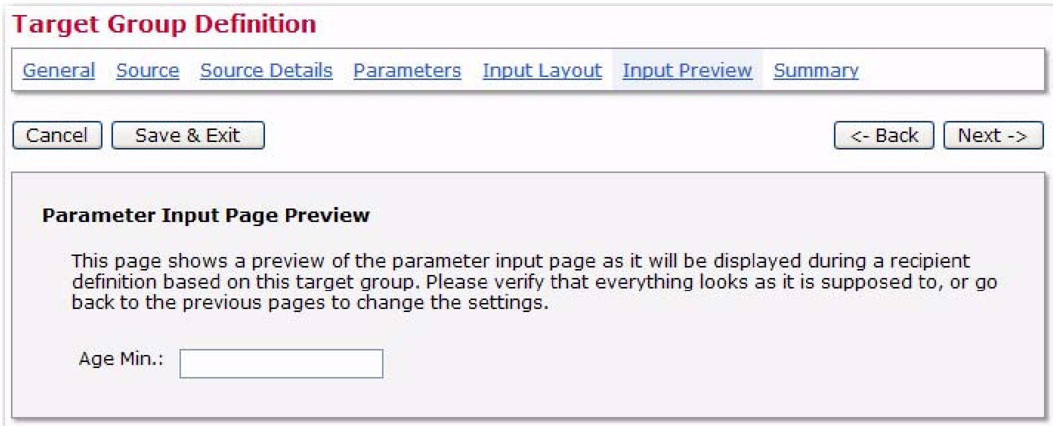
Figure 1-20 Defining a Target Group Based on a Dataset - Input Layout Screen



1.10.6 Input Preview

The Input Preview screen displays the parameters in exactly the same way as they will be displayed to the end user when this target group is used in the recipients wizard. It allows you to verify that the labels, descriptions, parameter types, and values, as well as the parameter ordering and any optional headings that you may have added appear as expected. You can also check that the input validation for integer or floating point numbers is enabled for the input fields where this is required.

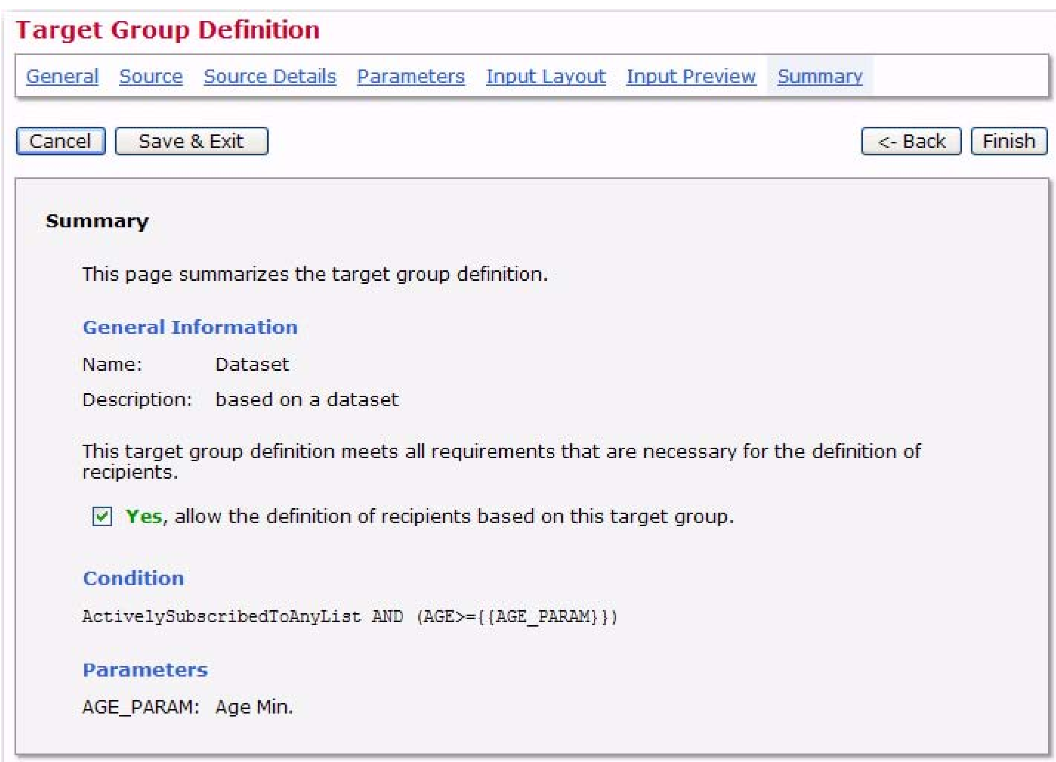
Figure 1-21 Defining a Target Group Based on a Dataset - Input Preview Screen



1.10.7 Summary

On the Summary screen, all important details are displayed for verification.

Figure 1-22 Defining a Target Group Based on a Dataset - Summary Screen



This screen also contains another important feature - enabling the target group for use in the recipients wizard. A target group that has been created is not automatically enabled for use in the recipients wizard. The data administrator must explicitly enable the use of each target group. To do so, check the **Yes, allow the definition of recipients based on this target group** option. Target groups need to be enabled individually, giving the data administrator control over the use of each target group. This way, groups can be created in advance, and only enabled when needed. Similarly, target groups can be disabled, preventing users from accessing them, without permanently deleting them.

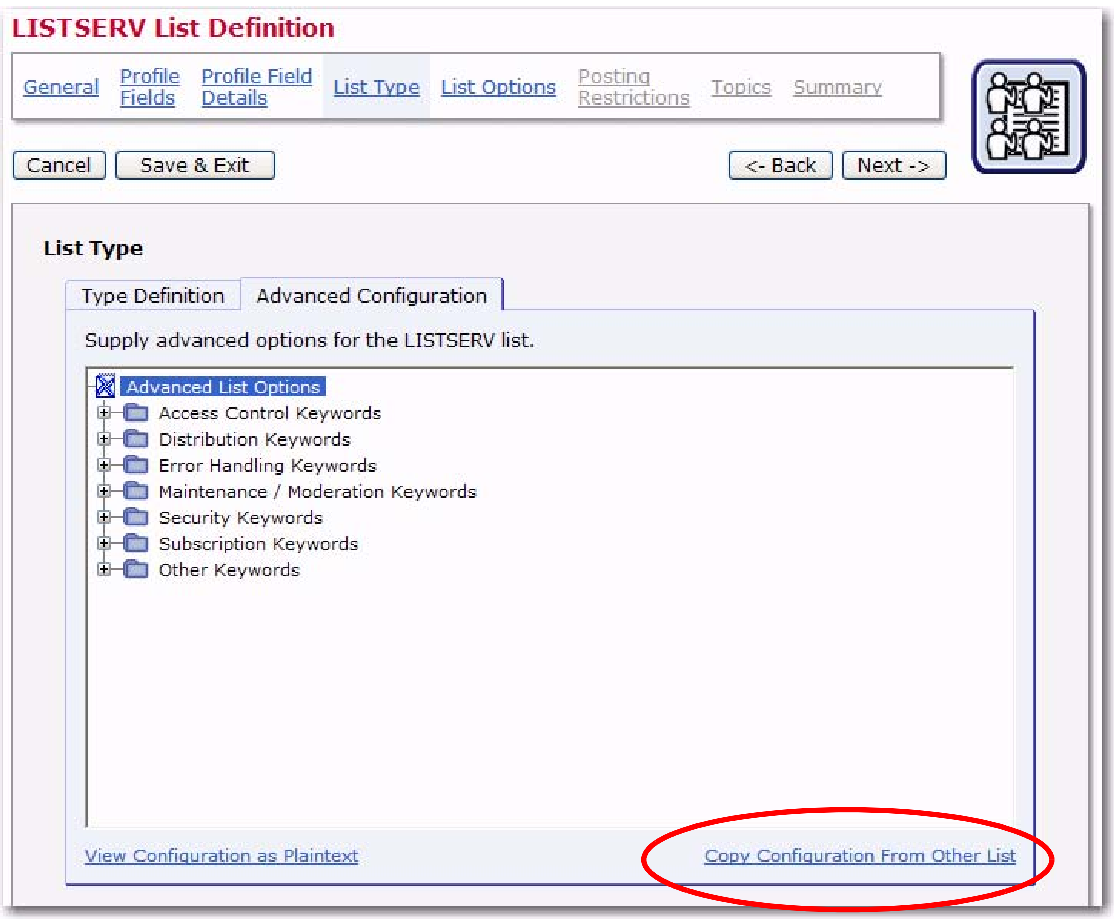
1.11 Copying LISTSERV List Settings

If you have an existing Hosted LISTSERV List (HLL), then you can now copy its LISTSERV settings to create a new HLL.

To copy the settings into a new HLL, follow these steps:

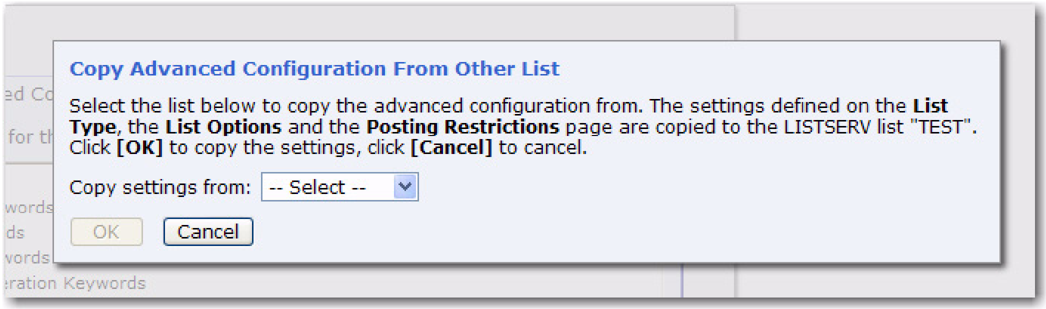
1. Go to the Recipient Dataset Details screen for the dataset you'd like the HLL to belong to, click on the **Dataset** menu, select **Create**, and then select **Create Hosted LISTSERV List**. The LISTSERV List Definition wizard opens.
2. Enter information for the HLL on the General, Profile Fields, and Profile Field Details pages of the wizard, where applicable.
3. On the List Type page, click on the Advanced Configuration tab. At the bottom of this tab, click the **Copy Configuration From Other List** link.

Figure 1-23 Copying HLL Settings



4. The Copy Advanced Configuration From Other List screen opens.

Figure 1-24 The Copy Advanced Configuration From Other List Screen



Click on the **Copy settings from** drop-down menu, select the HLL to copy, and then click **[OK]**. The settings on the List Type, List Options, and Posting Restrictions pages will be automatically filled in with the settings from the selected HLL.

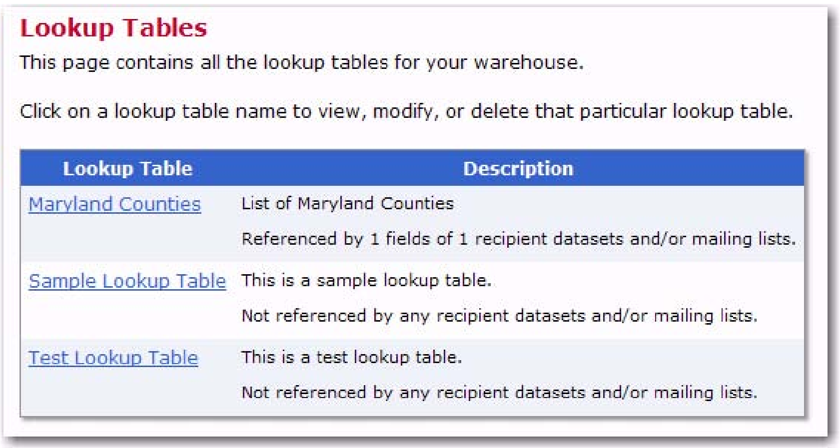
Note: The subscriber information and profile field definitions will not be copied into the new HLL.

1.12 Defining Subset Values of a Lookup Table

You can now further define lookup table entries and create a subset for the lookup table. This gives you the ability to create customized selections for your subscribers. For instance, let’s say that you have a lookup table listing every county in the state of Maryland. You can take this a step further and create subsets that only contain counties that are on the Eastern Shore, that border the Chesapeake Bay, that border the District of Columbia, etc. With lookup table subsets, your ability to create customized entries for your subscribers is endless.

To define a subset for a lookup table, click on the **Recipient Warehouse** menu and select **Lookup Tables**. The Lookup Tables screen opens.

Figure 1-25 The Lookup Tables Screen

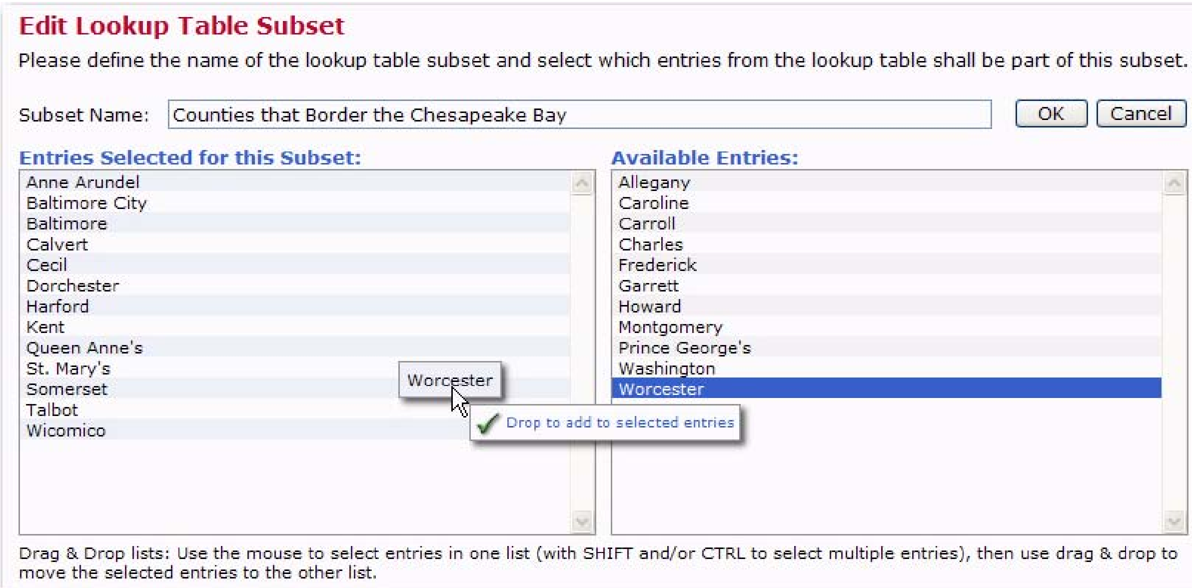


Select the lookup table you’d like to work with. The Edit Lookup Table screen opens.

Figure 1-26 The Edit Lookup Table Screen

Click on the **Lookup Table** menu and select **Define New Subset**. The Edit Lookup Table Subset screen opens. Enter the **Subset Name**, and then drag and drop the entries you'd like to include in the subset from the **Available Entries** box to the **Entries Selected for this Subset** box.

Figure 1-27 Creating a Lookup Table Subset

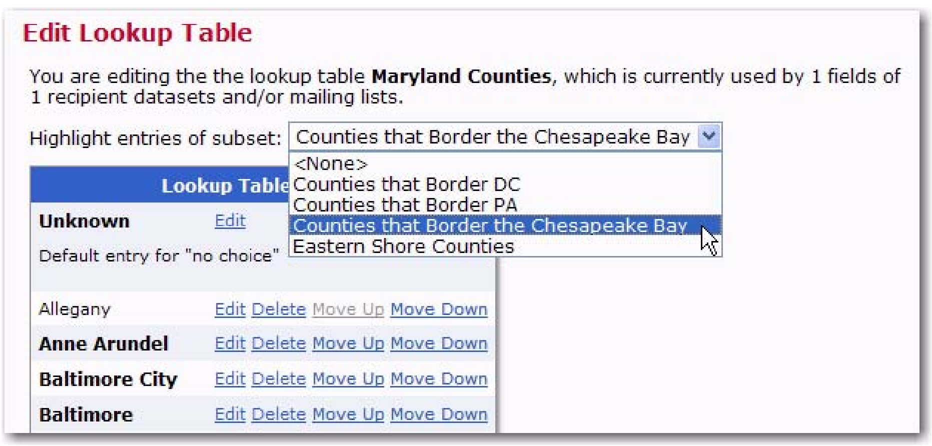


Once you are finished defining the subset, click **[OK]** to return to the Edit Lookup Table. The newly added subset will be highlighted in the list of entries.

Repeat the process and add as many subsets as you need.

If you'd like to view a different subset, click on the **Highlight entries of subset** drop-down menu and select the subset from the menu.

Figure 1-28 Selecting a Subset to View

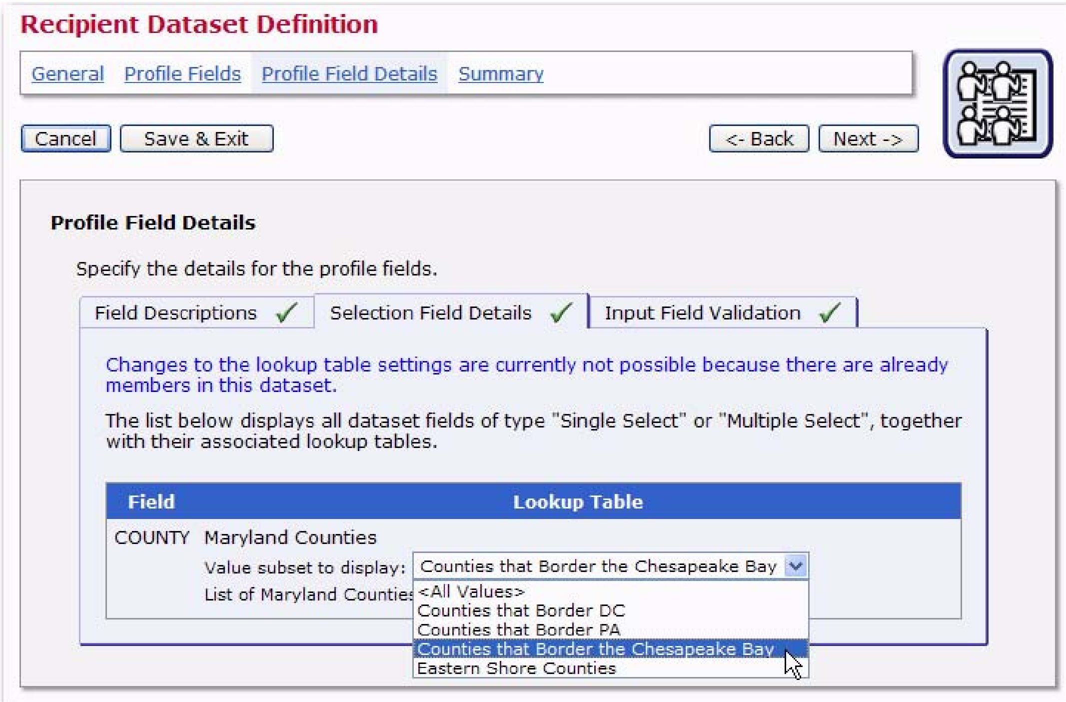


To edit the highlighted subset, click on the **Lookup Table** menu and select **Edit Highlighted Subset**.

To delete the highlighted subset, click on the **Lookup Table** menu and select **Undefine Highlighted Subset**.

Once the subset has been defined, it is now available for use in the Recipient Dataset Definition wizard.

Figure 1-29 Using Lookup Table Subsets in a Dataset



1.13 Adding Secondary Columns to a Lookup Table

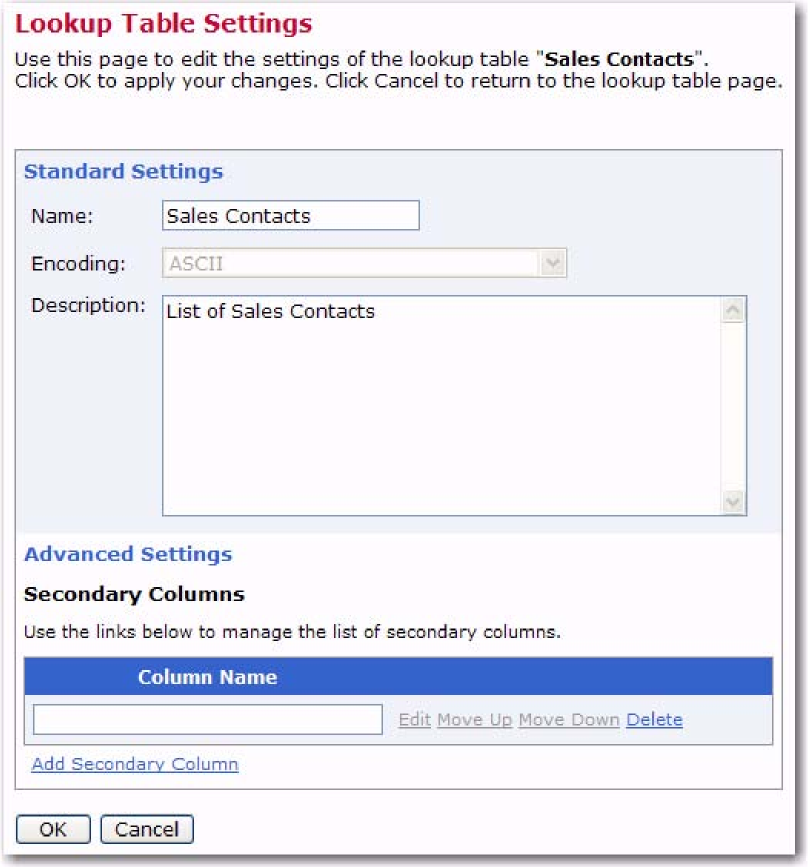
In addition to the standard settings, a lookup table can have additional secondary columns. The standard column of a lookup table holds the lookup table entries' names, which are used to create the entries of a drop-down menu for the user and must therefore be unique. Contrary to this, a secondary column of a lookup table holds entry information that is subordinate to the entry name, such as the sales region code or the sales contact phone number for a lookup table containing sales contact addresses. Uniqueness of secondary column values is not enforced by the system; therefore, the system supports using the same value for several lookup table entries.

Secondary lookup table values are currently accessible via the calculation formula function `SecondaryValue(...)` and in the Demographic Breakdown report for a dataset or hosted mailing list (see Section 1.25 Viewing Demographic Reports for a Dataset or List for details on this report).

Tip: Calculation formulas are usable at various places in LISTSERV Maestro; for the latest details on the calculation formula, see Section 1.21 Using the New *{{Calc}} Features.

To add secondary columns to a specific lookup table, go to the Edit Lookup Table screen for that lookup table, click on the **Lookup Table** menu, and then select **Lookup Table Settings**. The Lookup Table Settings screen opens. Click on the **Show Advanced Settings** link, and then click on the **Add Secondary Column** link. Enter the name of the secondary column and click **[OK]**. To add more than one secondary column, simply click the **Add Secondary Column** link again.

Figure 1-30 Adding Secondary Columns to a Lookup Table



1.13.1 Example

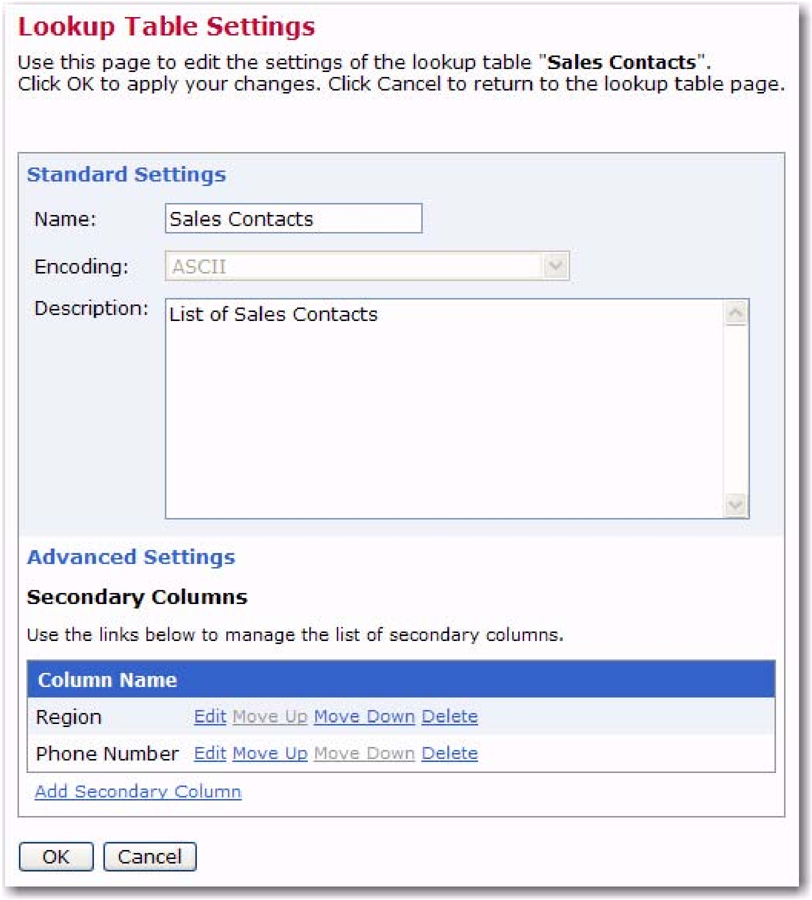
To implement the sales contact lookup table sketched above, you would for example add the secondary columns named **Region** and **Phone Number** to your **Sales Contacts** lookup table. By editing the lookup table entries, you assign one of four different sales region codes and unique phone numbers to each of your twenty sales contact addresses.

Now you add a single select column named **SALES_CONTACT** to your hosted recipient list and select your **Sales Contact** lookup table as basis for this column. Subscribers then choose their sales contact from a drop-down menu that lists each contact by its unique name. Once this is accomplished, the value of the secondary lookup table column **Phone Number** is immediately available for mail merging in the form of the system drop-in `*Calc SecondaryValue(&SALES_CONTACT;,"Phone Number")`, which is replaced with the correct phone number assigned to the sales contact that the subscriber had selected via the sales contact name.

Secondary columns are also available for Demographic Breakdown reporting; and for this purpose, columns like **Region** yield meaningful grouped results due to their non-uniqueness: If you add the **Region** secondary column of the **SALES_CONTACT** list field to the Demographic Breakdown report and remove all other fields, then the report will show four different bars, each corresponding to the count of subscribers who have a sales contact in that region.

Using secondary columns in tracking reports is also supported, but it requires that you first employ a derived field that pre-calculates the secondary value and adds it to the tracking profile data. For details on using derived fields, see Section 1.17 Using Derived Profile Fields.

Figure 1-31 Example of Secondary Columns



1.13.2 Editing of Secondary Column Names

Take extra care when renaming a secondary column that is used in any of the ways described above. Due to the widespread availability of secondary column values, the system does not automatically adjust the name of a secondary column if it is referenced in a calculation formula. If you, for example, rename a secondary column that is referenced from within a calculation formula in the condition tree of a target group based on a dataset or hosted recipient list, then this formula becomes invalid (this invalidity is detected by LISTSERV Maestro and is shown in the form of a delivery error message or an error message when the target group is selected in the Define Recipients wizard).

To repair the invalid formula after you have renamed the secondary column, open the Target Group Definition wizard and review the condition tree. Then open the tree node with the formula in it and edit the formula manually to use the correct secondary column name.

1.13.3 Uploading Behavior of Tables with Secondary Columns

The behavior of uploading lookup table values varies depending on whether or not secondary columns are present in the lookup table.

If the main value from the CSV-file is not present in the lookup table, then a new entry with this main value and its associated secondary values is created.

If the main value from the CSV-file is already present in the lookup table, then the associated secondary values are used to update the already existing secondary values of the existing main value in the lookup table.

If there are no secondary columns in the CSV-file and lookup table, then the upload behavior remains unchanged.

1.14 Filtering Profile Field Drop-Down Menus Based on Previous Selection

Recipient dataset and hosted recipient lists (HRL) now have additional features available when creating and defining profile fields. If there are several single- or multiple-select fields defined on the Profile Fields page, of which at least one is a single-select field; then, when entering the Selection Field Details on the Profile Field Details page, the second drop-down menu will have the additional option of **<Depends on other field>**. This option allows you to dynamically change the lookup table subset that is displayed by the profile field, depending on the user choice in another (single-select) profile field.

For example, imagine a dataset or list that is used to market various online services in the United States, where each subscriber is supposed to be able to individually decide which services they'd like to learn more about. The easiest solution for this would be to set up a lookup table called **Services** with an entry for each available service.

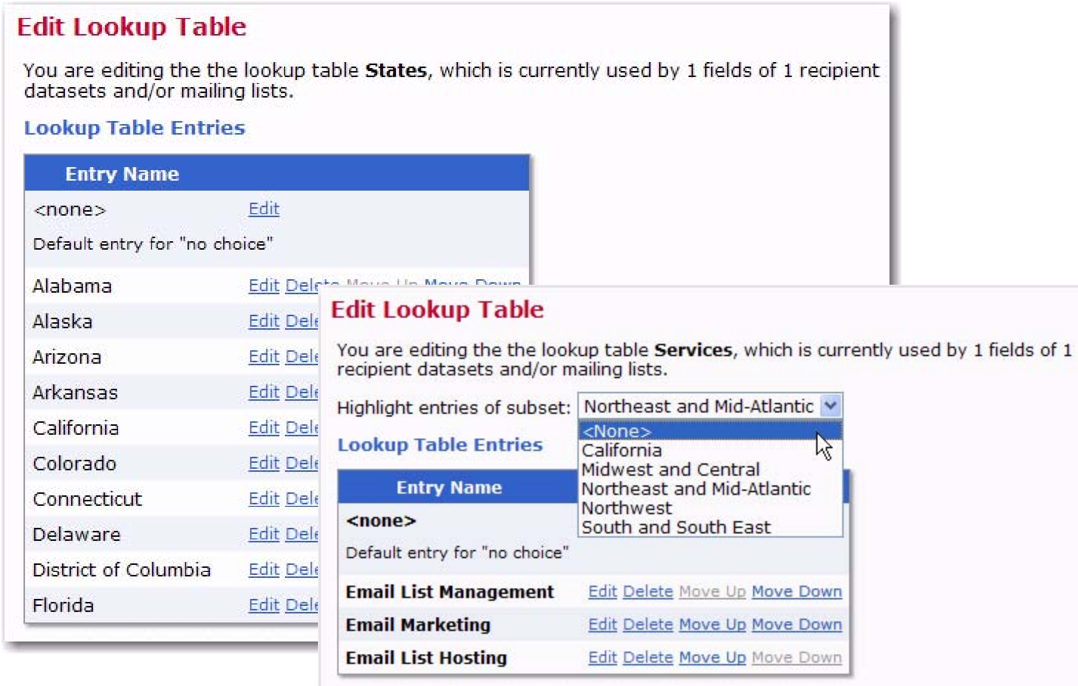
However, assume that for legal reasons some of these services can not be offered in certain states. In the above scenario, all subscribers would still be able to pick from all entries in **Services**, which means that we would potentially send offers about certain services to subscribers that live in a state where these services are not available.

Here lookup table subsets come to the rescue: First, we need a second lookup table called **States**, which lists all states in the USA.

As the next step, we define several subsets in the **Services** lookup table, where each subset groups together the services that are available in certain states. At worst, we would have to define one subset per state (if the available services in all states are different). However, more likely, many states have the same group of available services, so for each of these groups, we create one subset.

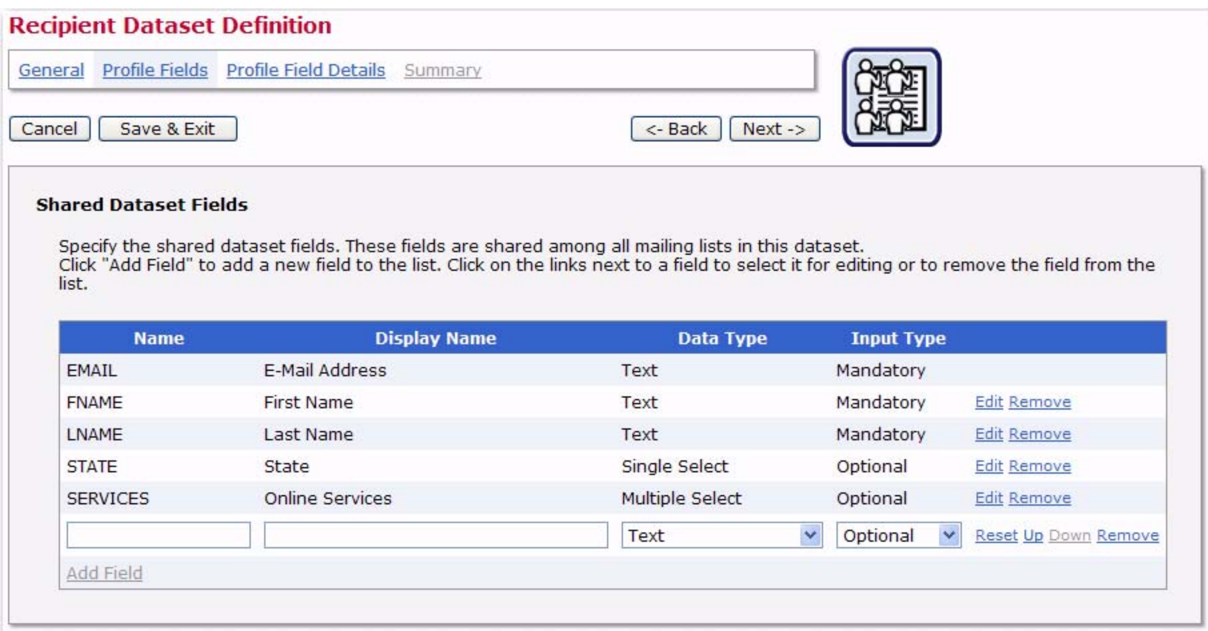
Note: For details on how to define subsets for a lookup table, see Section 1.12 Defining Subset Values of a Lookup Table.

Figure 1-32 Services and States Lookup Tables



Next, we include a multi-select profile field for **Services** and a single select profile field for **State** in the dataset/hosted list.

Figure 1-33 Adding the Services and State Profile Fields

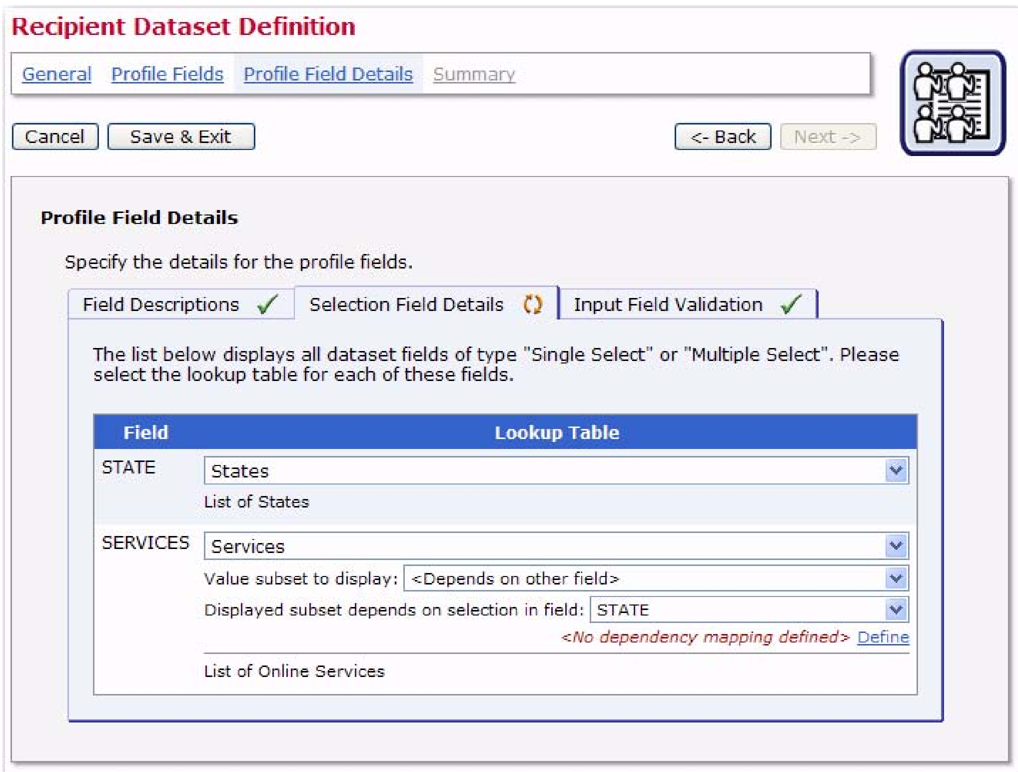


Finally, in the Selection Field Details tab on the Profile Field Details page, we edit the definition of the existing multiple-selection field so that it does not always display all entries from **Services**, but only a subset. And, which subset is displayed depends in turn on the **State** single select field. Because of this, subscribers can first select the state they live in, which then will change the **Services** field so that it only displays the subset of services that are actually available in that state. If setup correctly, this means that a subscriber can never select a service that is not available in his/her state.

To setup, select the **States** lookup table for the **States** profile field. Next, for the **Services** profile field, select the **Services** option from the first drop-down menu, and then the **<Depends on other field>** option from the second drop-down menu. Finally, from the third drop-down menu, select the source field that the subset depends on (this third drop-down menu only appears if the **<Depends on other field>** option in the second drop-down menu is selected). By doing this, you are telling the system that the subset (for the selected lookup table) that is to be used for display may vary depending on the choice in this other field.

And as your last step, you need to tell the system how this dependency will be defined. To do so, click on the **Define** link that appears right below the third drop-down menu once you have selected a source field name. (This will be an **Edit** link if you've previously defined the dependency.)

Figure 1-34 Selection Field Details



This link opens the Dependency Mapping screen where you can define the dependency mapping between the values of the selected source field and the subset that is to be displayed by the profile field for which you are currently defining the settings. The screen shows a table where each possible value in the source field (which is always a single-select field) is displayed in the left column. The right column displays an associated drop-down menu for each value. For any given value, the selection in the drop-down menu defines which lookup table subset shall be displayed by the profile field, if the associated value from the left column is selected in the source field. The available choices are:

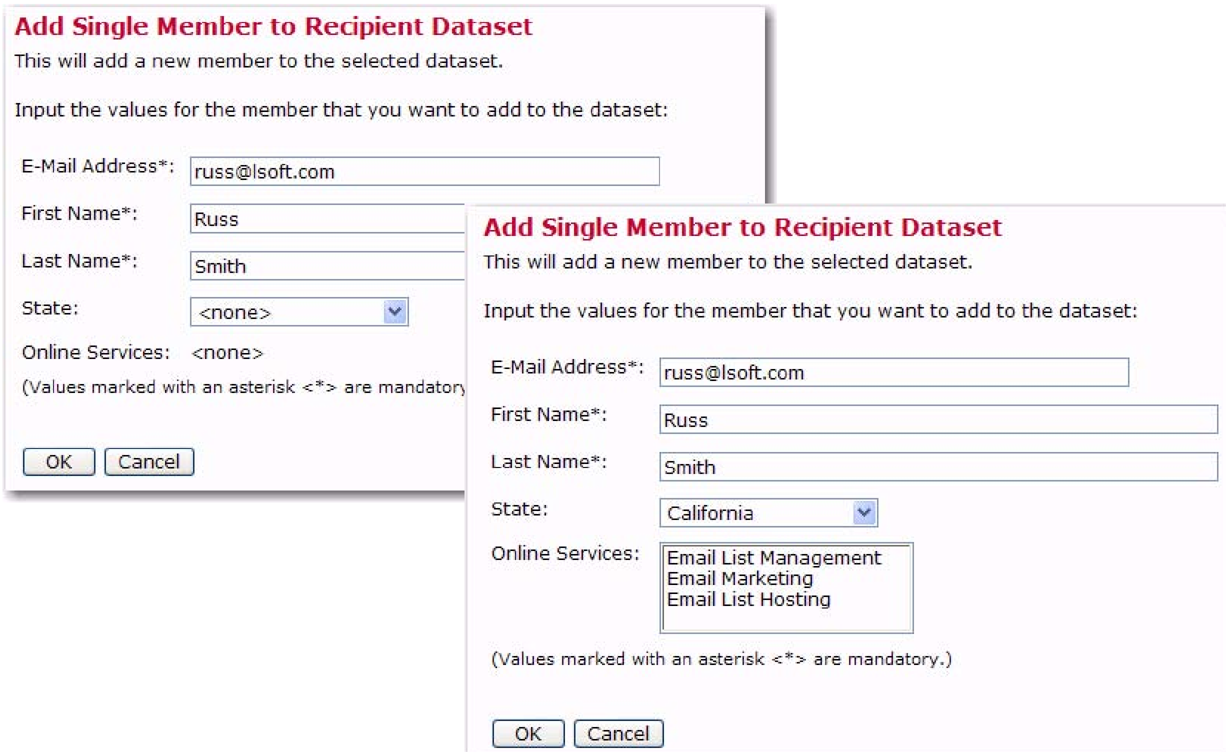
- **<Empty List>** – If selected, then the profile field will display an empty list, if the associated value is selected in the source field.

- **<Full List of Values>** – If selected, then the profile field will display the full list of lookup table values (i.e. no subset, but all values), if the associated value is selected in the source field.
- **Any Subset Name** – If one of the subset names is selected, then the profile field will display only the lookup table values that are elements in this subset, if the associated value is selected in the source field.

Once you have defined the dependency mapping, click **[OK]** to close the screen and save your changes, or click **[Cancel]** to close the screen without saving.

Once you are finished defining the dataset/hosted list, these fields will now be available to your members/subscribers on any one of the add/join member/subscriber screens. For example, if you, as the data administrator, are adding a member to a dataset that has these fields defined, then the screen might look something like this:

Figure 1-35 Add Single Member to Recipient Dataset Screen Before and After Selection

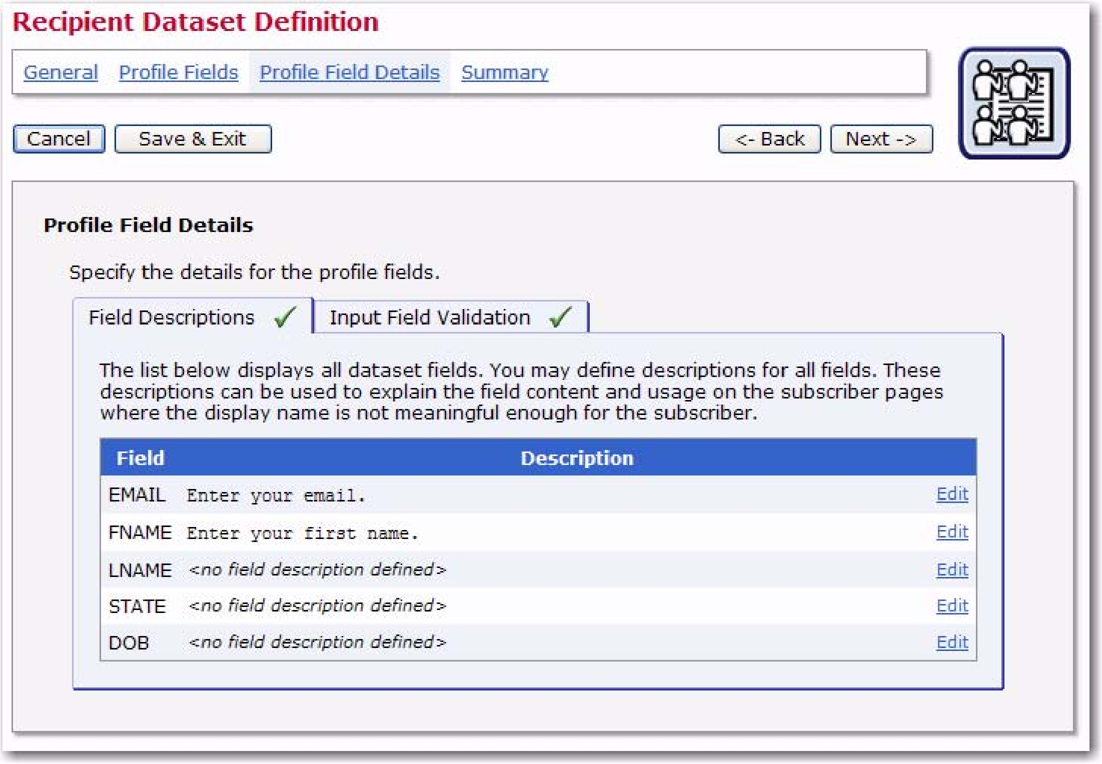


1.15 Adding a Description to a Profile Field

Previously, the profile fields of a dataset and hosted list only had a "display text" attribute. Now, there is a **Description** field where you can enter a longer description of the profile field. This description will appear on the subscriber pages where the display name is not meaningful enough for the subscriber.

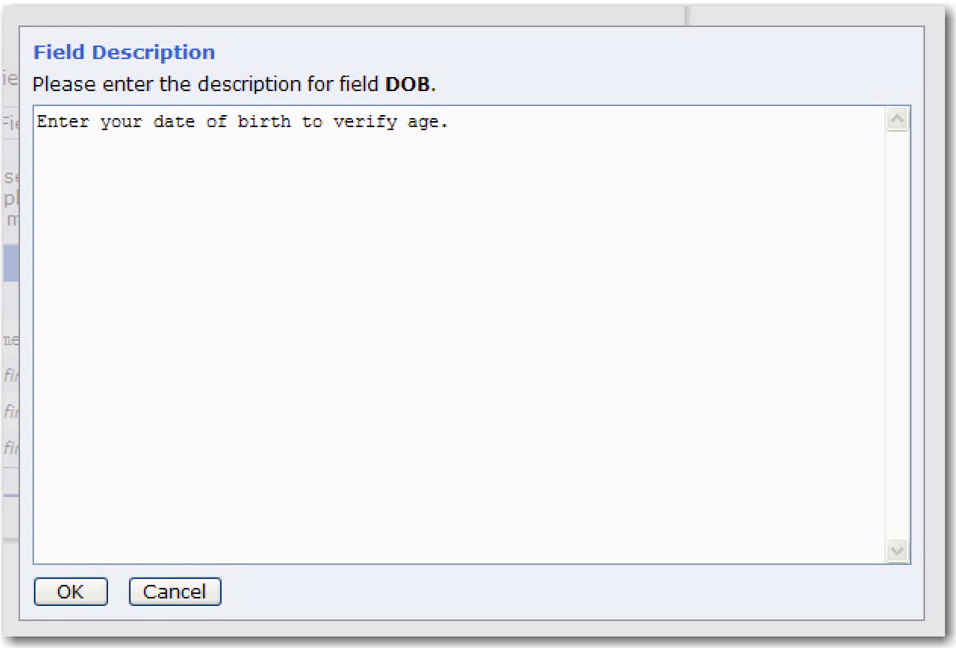
To define, go to the Profile Fields Details page of the Recipient Dataset Definition wizard or the Hosted List Definition wizard, and then click on the Field Descriptions tab. A list of all dataset fields is shown.

Figure 1-36 Profile Fields Details Page - Field Descriptions



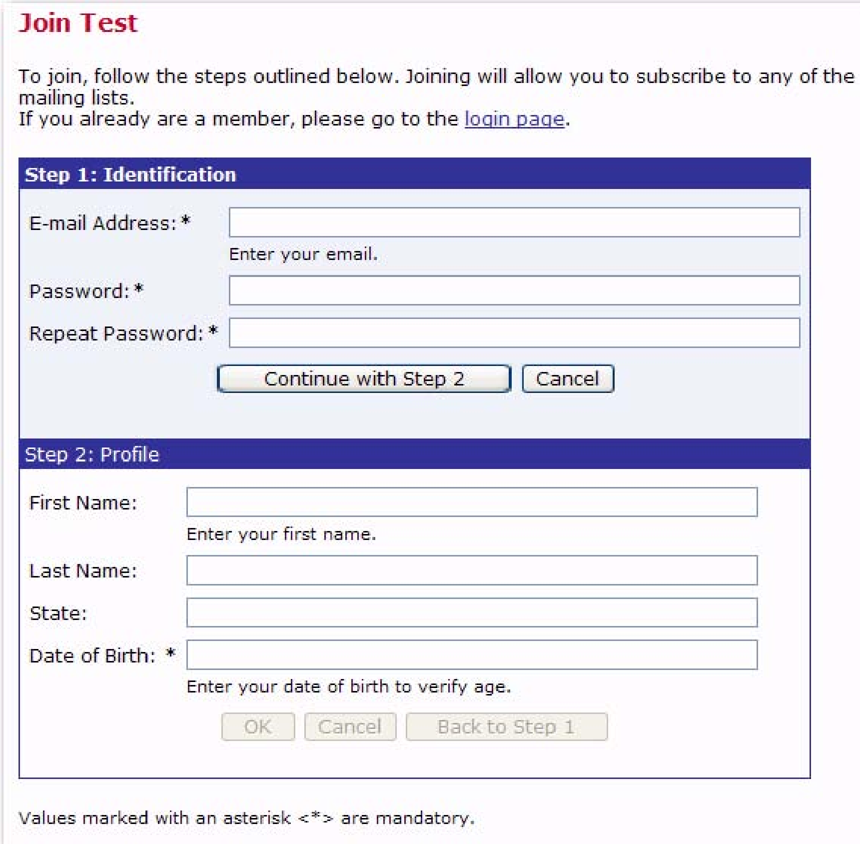
Click the **Edit** link next to the field you'd like to add a description to. The Field Description screen opens. Enter a description for the field, making sure that it explains what the subscriber needs to do to fulfill the field requirements.

Figure 1-37 Defining the Profile Field Description



The descriptions entered here appear on the subscriber pages.

Figure 1-38 Descriptions on the Subscriber Pages



1.16 Tracking Permissions

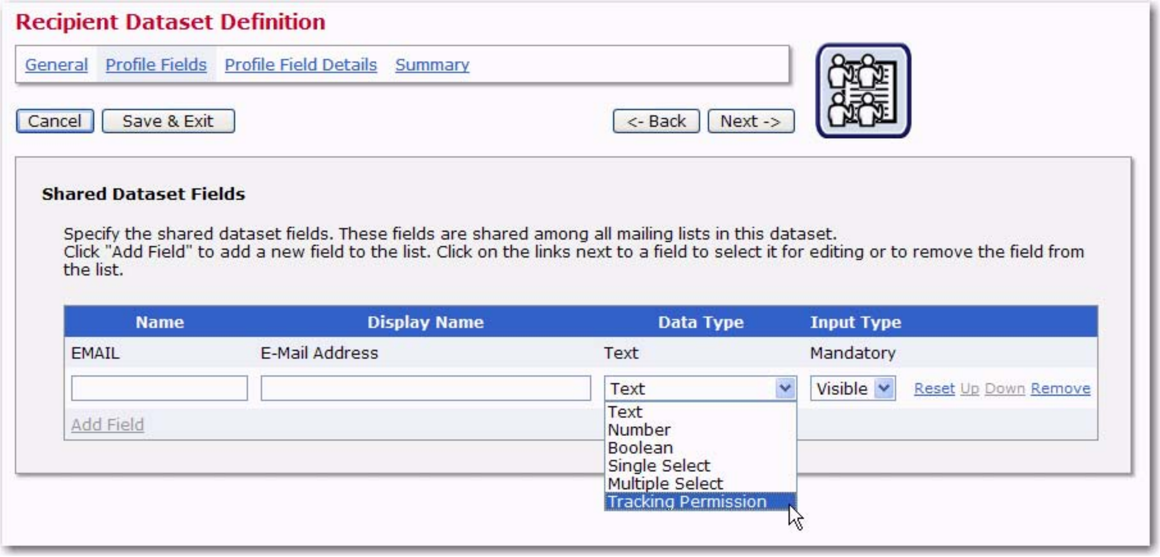
The **Tracking Permissions** data type can now be used when defining the profile fields for a dataset. This data type will let you ask your dataset members and list subscribers whether or not you can use their information for personal tracking.

To define a profile field using this new data type, go to the Profile Fields page of the Recipient Dataset Definition wizard. Enter the field's information, click on the **Data Type** drop-down menu, and then select **Tracking Permission**.

Tip: Use the new **Description** field on the Profile Field Details page to help your members and subscribers know what they are agreeing to. For details, see Section 1.15 Adding a Description to a Profile Field.

Note: The **Tracking Permissions** profile field is not available for the new Demographic Breakdown Report. For details on this report, see Section 1.25 Viewing Demographic Reports for a Dataset or List.

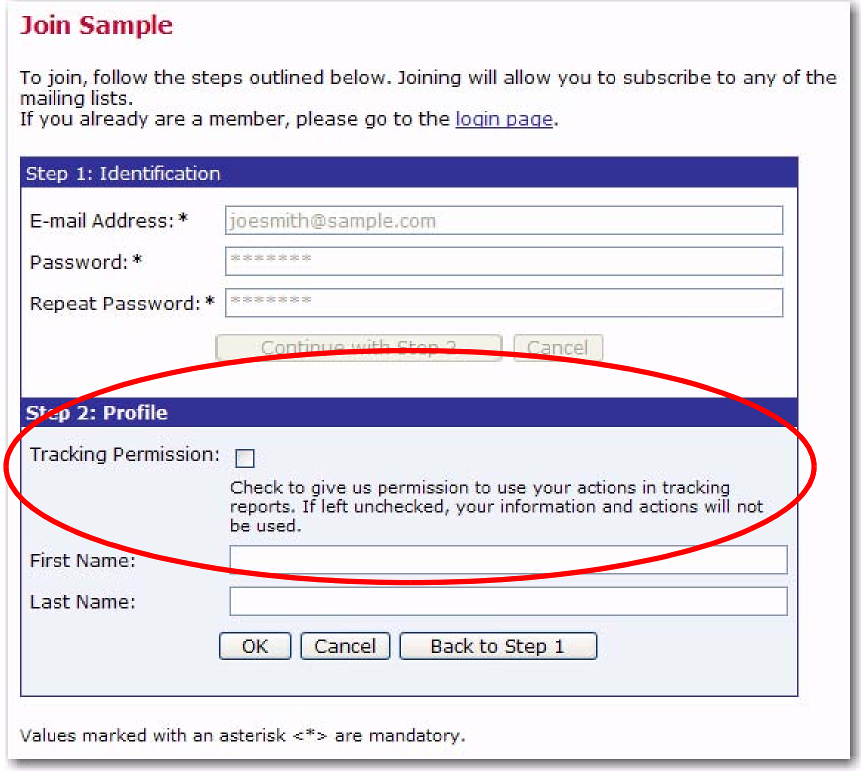
Figure 1-39 Defining a Tracking Permission Data Type Profile Field



Once the dataset definition is finished, this **Tracking Permissions** profile field will be displayed in several areas:

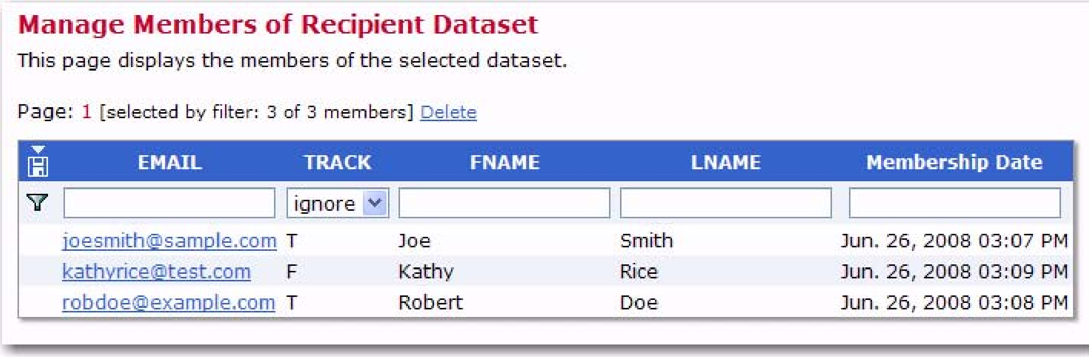
- For a dataset member or list subscriber, it'll be available when joining a membership area/list or when editing a membership area profile.

Figure 1-40 The Tracking Permission Field When Joining a Membership Area



- For the data administrator, the **Tracking Permission** field can be managed on the Manage Members of Recipient Dataset screen.

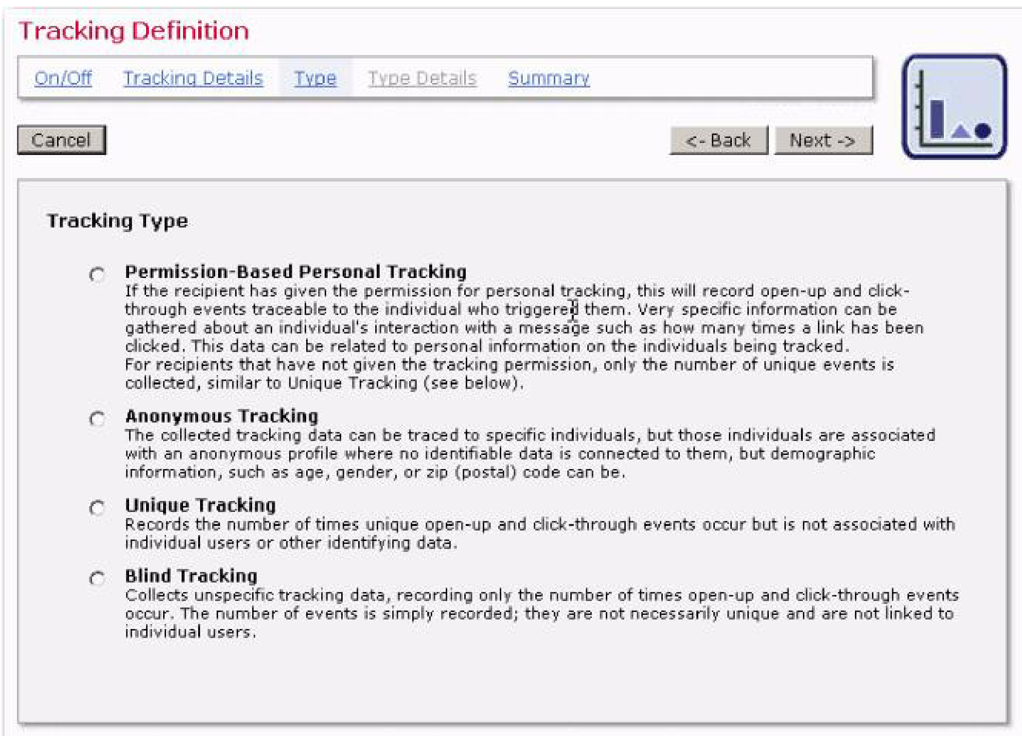
Figure 1-41 The Manage Members of Recipient Dataset Screen



Notes: Clicking on the dataset member's email will open the Edit Member - Dataset Specific Fields screen, which is where you can edit this setting, if necessary. In addition, the data administrator can define this field when adding members/ subscribers to a dataset/list.

Once this field is defined for a dataset, and a target group from that dataset is selected to define recipients for an email job, then the **Personal Tracking** option in the Tracking Definition wizard changes to the **Permission-Based Personal Tracking** option.

Figure 1-42 Permission-Based Personal Tracking



When this option is selected, then:

- Any recipients with a "yes" or "true" value in the **Tracking Permission** column will be tracked with **Personal Tracking**, and the other recipients will be tracked with **Unique Tracking**.
- Any change to the **Tracking Permission** field will be logged in the changelog, if enabled.

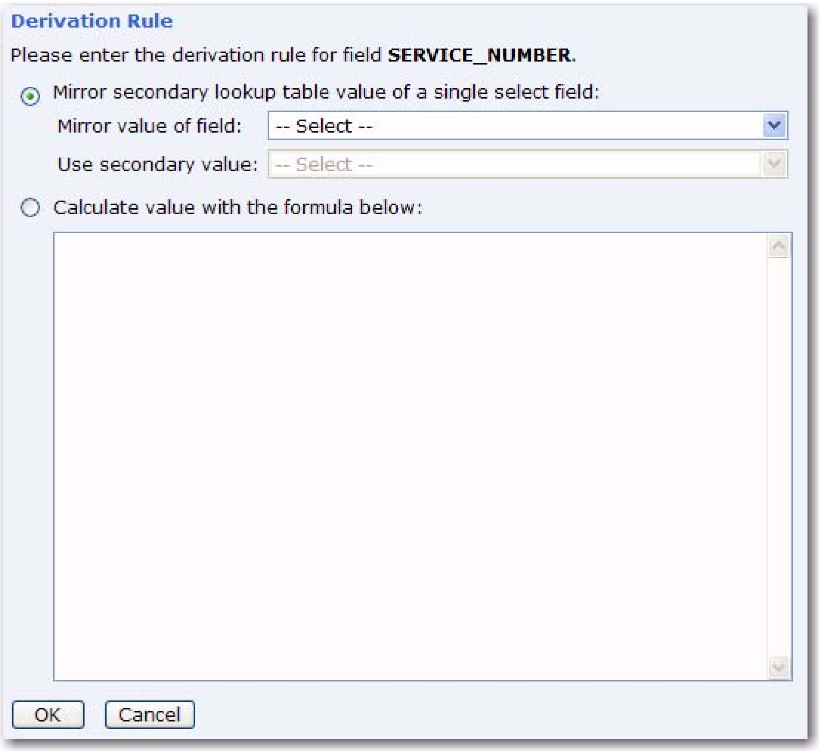
1.17 Using Derived Profile Fields

The data administrator can now set up certain field values to be determined by the user's data entered in other fields by using the new **Derived** profile field data type.

A **Derived** profile field is determined from one or several other profile fields in the same dataset or list (the source fields). This is defined by a special derivation rule. The value of the derived field will be automatically calculated whenever the values of the source fields are changed. In addition, a derived field can only be a "Read Only" or "Hidden" field, which means that its value can not be entered directly.

If a **Derived** profile field is present in a dataset or hosted recipient list, then the Profile Fields Details page will contain a Derivation Rules tab. These rules must be supplied for each derived field and will define how the value for the field is determined. To define, click on the associated **Define** or **Edit** link. This opens the Derivation Rule screen.

Figure 1-43 Defining Derivation Rules



Depending on your profile fields, you may have one or two options available to define the derivation rule. If you have two options, then the dialog will display two radio buttons that allow you to choose between the two options. Once you have selected an option, you can then provide the details for that option.

If you have only one option, then the dialog will only display this single option, without any radio buttons, so you can immediately provide the details for that option.

The possible options are:

- **Mirror secondary lookup table value of a single select field** – This option is only available if there is at least one single-select field among your profile fields; and, the lookup table that is assigned to this field is a table for which secondary columns have been defined. (For details on creating secondary columns, see Section 1.13 Adding Secondary Columns to a Lookup Table.)

The single-select profile field itself will always display the main value from the associated lookup table. However, A derived field can be used to display the values from one of the secondary columns in the lookup table.

In such a situation, the derived column "mirrors" the selection of the single-select field; but, for display, it picks the value from a specific secondary column instead of from the main column (see the example below).

To define, select the name of the single-select field that you want to mirror from the **Mirror value of field** drop-down menu. Once you have made this selection, you can then select the secondary column from which the value names will be used from the **Use secondary value** drop-down menu.

Note: Only the single-select fields that are defined in the same object as the derived profile field are available in the **Mirror value of field** drop-down menu. This means that if the derived field is a dataset field, then it can only reference a single-select field that is also defined in that dataset. If the derived field is a field of a hosted list, then it can only reference a single-select field in the same hosted list. It can not reference a single-select field from the dataset the hosted list resides in.

- **Calculate value with the formula below** – This option is always available. Simply enter the calculation formula that will be evaluated to determine the value for the derived profile field. This can be any kind of formula, using all the formula features that are available.

  The formula can be a constant formula, which would mean that all subscribers will have the same value in this derived profile field. However, a formula as a derivation rule is most useful if it is (at least partially) based on other profile fields, meaning that it is not constant. In such a case, each subscriber will have an individual value in the derived profile field (although not necessarily a unique value), as the formula is individually calculated based on the values of his profile fields.

  For example, the following formula would extract the domain-name part from a dataset member's email address and store it in the derived field:

  ```
  Substring(&EMAIL;, IndexOf(&EMAIL;, "@") + 1)
  ```

  This could, for example, be useful for all kinds of analyses, such as reporting over how many subscribers have their accounts at the various ISPs or organizations.

Note: In the formula, you can only reference other profile fields that are defined in the same object as the derived field itself. This means that a formula of a derived field in a dataset can only reference other fields from the same dataset. It can not reference fields from any lists in the dataset. And, a formula of a derived field in a hosted list can only reference other fields from the same hosted list. It can not reference fields from the dataset the list resides in or fields from other hosted lists. However, a derived field can reference other derived fields as long as this does not create an endless recursion of references (i.e. a chain like "DERIVED1 references DERIVED2 references DERIVED3 etc." is possible; a recursion like "DERIVED1 references DERIVED2 references DERIVED1" is not possible).

Tip: Calculation formulas are usable at various places in LISTSERV Maestro; for the latest details on the calculation formula, see Section 1.21 Using the New *{{Calc}} Features.

When you are finished editing the derivation rule, click **[OK]** to save your changes, or click **[Cancel]** to close the dialog without saving.

1.17.1 Example

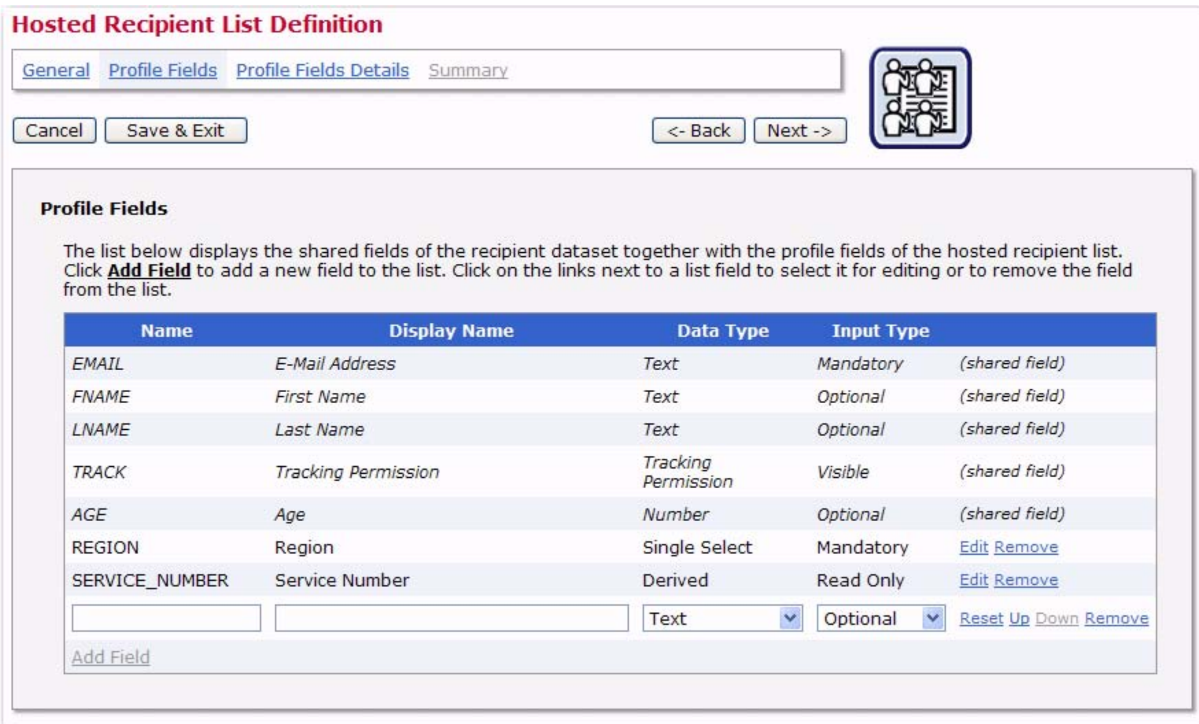
Let's say that you want to create a subscriber profile that will contain a single-select field where the subscribers select the region they live in. And, you want each of these regions to have a specific service phone number, and each subscriber to automatically see the correct service number for their region.

In order for this to work, create a **Region** lookup table with all available regions as the main values; in addition, add a secondary column called **Service Number** to the lookup table. Fill this column with the corresponding service phone numbers for each region.

Tip: Values in the secondary columns do not have to be unique, so it would be no problem if some regions have the same service number.

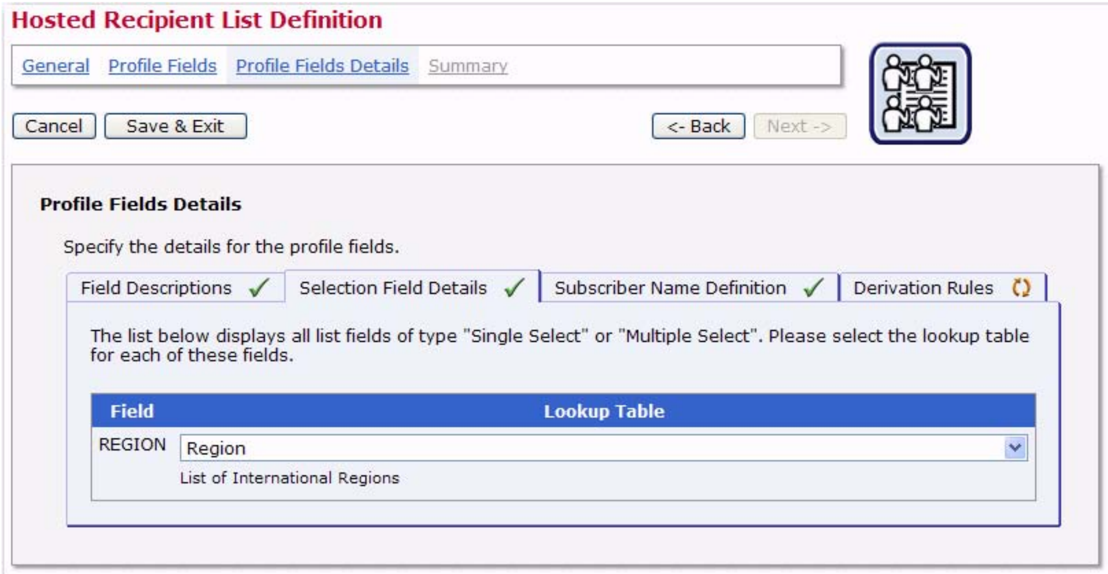
Next, start creating your list. On the Profile Fields page in the Hosted Recipient List Definition wizard, create a single-select field called **REGION** and a read-only derived field called **SERVICE_NUMBER**.

Figure 1-44 Adding Derived Profile Fields



On the Profile Fields Details page, first click on the Selection Field Details tab and assign the **Region** lookup table to the **Region** field. Each subscriber can now select the region he lives in, which will be stored as part of his profile.

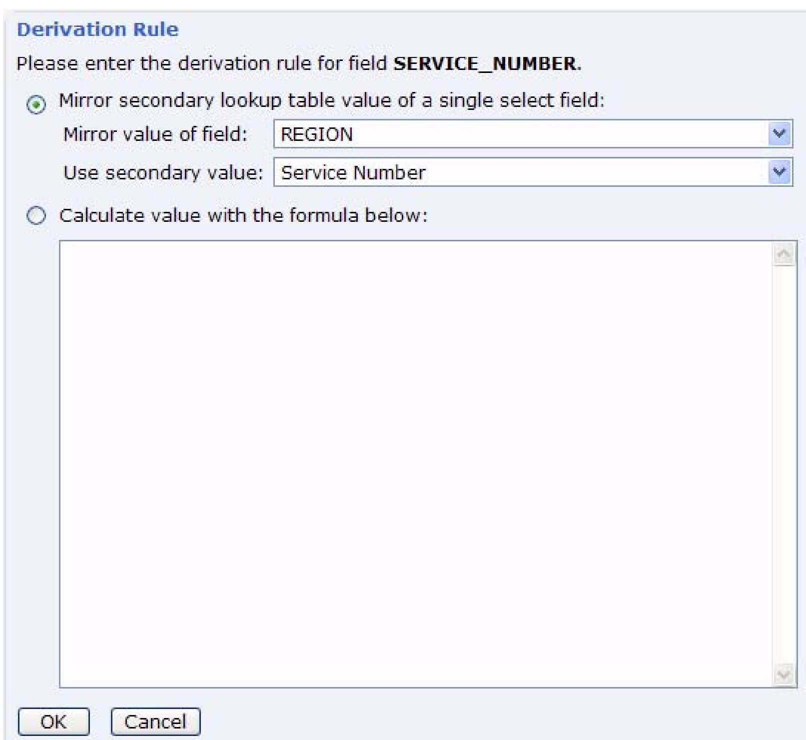
Figure 1-45 Selection Field Details



Next, click on the Derivation Rules tab so you can define the derivation rule associated with the **SERVICE_NUMBER** profile field.

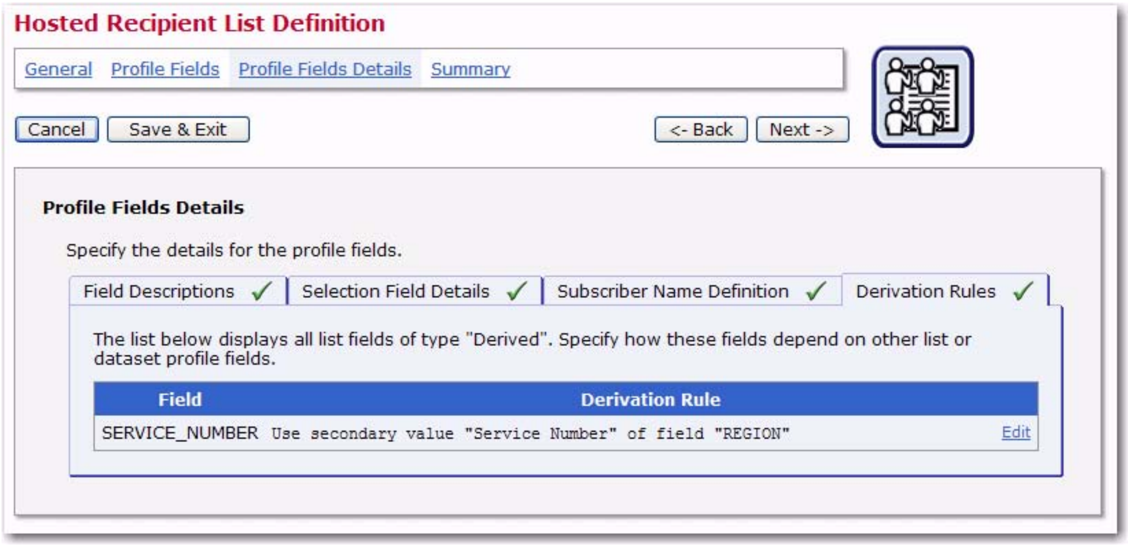
Click the **Define** link to open the Derivation Rule screen. Select the **Mirror secondary lookup table value of a single select field** option. Click the **Mirror value of field** drop-down menu and select **REGION**. Finally, click the **Use secondary value** drop-down menu and select **Service Number**.

Figure 1-46 Defining Derivation Rules



Click **[OK]** to return to the Derivation Rules tab, which now contains the field's derivation rule, which is *Use secondary value "Service Number" of field "Region"*. To edit this rule, simply click on the **Edit** link.

Figure 1-47 Derivation Rules Tab



Now when a subscriber selects his/her region for the **REGION** field, the derived **SERVICE_NUMBER** field will automatically reflect the service phone number for the selected region. And, since this derived field is read-only, it will be displayed to the subscriber in his/her profile so that this information is always available. In addition, should the subscriber change regions, this service phone number will automatically be adjusted accordingly.

Figure 1-48 Viewing Derived Fields in the Subscriber's Profile

1.17.2 When to Use Derived Fields

Derived fields require additional storage space in the system database and additional processing power by the server when their values are calculated. Because of this, a derived field should only be used if there is actually a need for it. Some situations where a derived field seems like a solution can actually be solved without a derived field; in which case, this other solution should be used.

You should also be aware that you can always add an additional derived field to an already existing dataset or hosted list, even if there are already members in the dataset or subscribers on the list. Therefore, you should usually refrain from creating a certain derived field if you have any doubts about whether or not your will actually be using this field. Instead, you should only add it once it turns out that you actually require it.

A derived field is the *correct* solution for the following situations:

- **Include Field in Subscriber Profile** – The value of the derived field will appear as a visible value in the subscriber profile so that the subscriber can view this value on the corresponding profile page in the membership area.

  For example, a derived field that displays the service phone number that matches the country that a subscriber has selected. For this, a "read-only" derived field is the correct choice (in contrast to a "hidden" derived field, which a subscriber will not see in the profile).

- **Include Field in Tracking Reports** – The derived field will be available in the Recipient Details tracking report (for a job with either personal or anonymous tracking).

  For example, a derived field that extracts the domain name from the subscriber's email address would allow a tracking report that can show you how many recipients clicked on a certain link (or opened the email, etc.), broken down by recipient domains. For this, usually a "hidden" derived field is the correct choice (although you can also use a "read-only" field, if you also want to display the value in the subscriber profile, see above).

- **Include Field in Demographic Breakdown Reports** – The derived field will be available in a Demographic report of a dataset or hosted list (see Section1.25 Viewing Demographic Reports for a Dataset or List for details on this report).

  For example, a derived field that extracts the domain name from the subscriber's email address would allow a Demographic Breakdown report that can show you, how many subscribers you have per subscriber domain. For this, usually a "hidden" derived field is the correct choice (although you can also use a "read-only" field, if you also want to display the value in the subscriber profile, see above).

- **Include Field on Browse/Edit Screen** – The derived field will be included in the subscribers list on the Browse/Edit screen, so that you can see the various values there, and also filter the list over these values.

  For example, a derived field that determines the zodiac sign depending on the value in another profile field that contains the subscriber's date of birth. For this, either a "read-only" or "hidden" derived field is the correct choice (depending on if you want this value to also be displayed in the subscriber profile or not, see above).

In contrast, a derived field is usually *not* the correct solution for the following situations:

- **Mail Merging** – A certain derived value will be included as a merge value in the body of a mail message. For this, you should not use a derived field (unless you need the derived field for other situations, see above).

  Instead, simply include a `*Calc` system drop-in in your mail message, with the same calculation formula that you would have used for the derived field.

- **Target Group Condition Tree** – A certain derived value will be used to filter the recipients in the condition tree of a target group. For this, you should not use a derived field (unless you need the derived field for other situations, see above).

Instead, simply use the same calculation formula directly in the condition tree that you would have used for the derived field.

Tip: Calculation formulas are usable at various places in LISTSERV Maestro; for the latest details on the calculation formula, see Section 1.21 Using the New *{{Calc}} Features.

1.18 Requesting Profile Field Updates

When creating the message content for a job, you can now add a special system drop-in that will direct your subscribers to the External Profile Edit Page. This page will let your subscribers update specific profile fields without logging into the Membership Area.

1.18.1 Using the ProfileEditPageURL System Drop-In

This drop-in is called `ProfileEditPageURL` and, if included in the mail body, it is replaced with a URL to the External Profile Edit Page.

The drop-in must be written in a special form because when you write this drop-in into your message you will need to include information about which profile fields will be queried from the subscriber. The syntax is as follows:

```
{{*ProfileEditPageURL FIELDNAME_LIST}}
```

where `FIELDNAME_LIST` must be replaced with a comma-separated list of the names of all profile fields that the External Profile Edit Page will query from the subscriber.

Examples:

- `{{*ProfileEditPageURL HOBBY}}`

  will be replaced with an URL that points to an External Profile Edit Page that asks the subscriber to submit a value for the HOBBY profile field.
- `{{*ProfileEditPageURL STREET,ZIP_CODE,CITY}}`

  will be replaced with an URL that points to an External Profile Edit Page that will ask the subscriber to submit values for the STREET, ZIP_CODE, and CITY profile fields.

1.18.2 Customizing the External Profile Edit Page

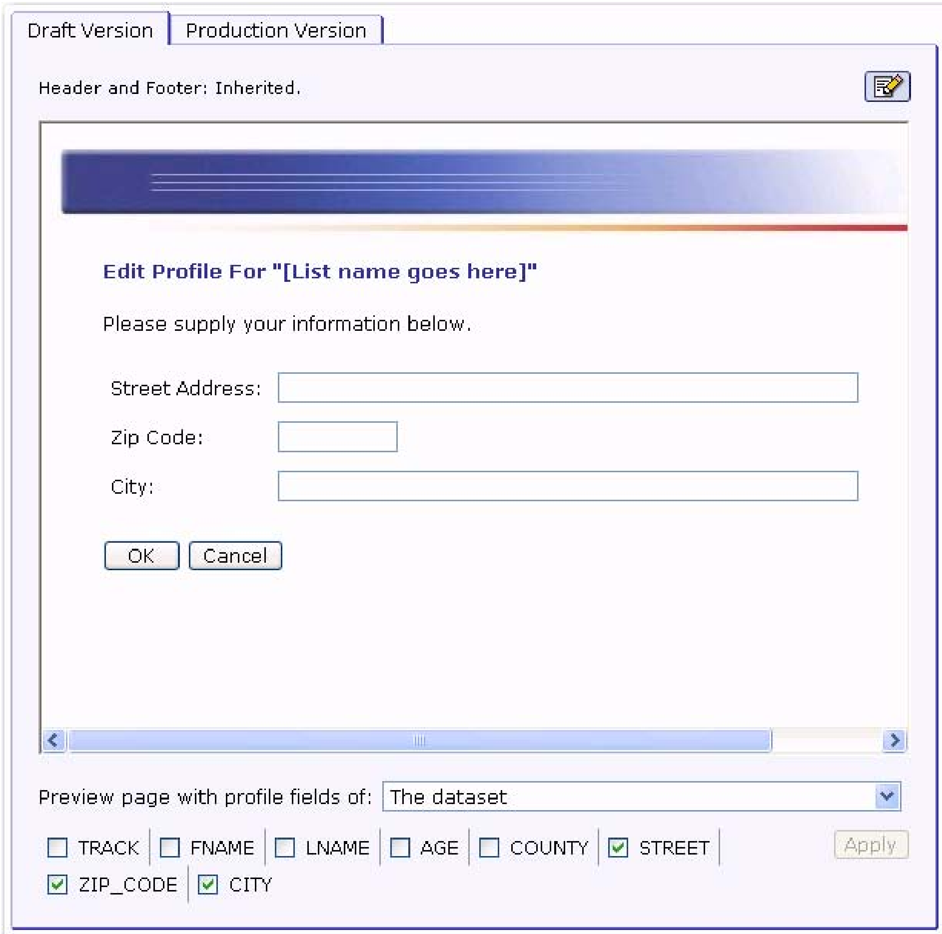
The External Profile Edit Page is a dynamic page that queries certain profile fields from the subscriber. The fields that are queried by the page during a visit depends on the parameters in the URL by which the page was accessed. And, the parameters in the URL in turn are created by the `ProfileEditPageURL` system drop-in depending on the field names that you include in the `FIELDNAME_LIST` of that system drop-in.

Since the External Profile Edit Page is such a dynamic page, there are several features specifically designed for it in the Subscriber Interface:

1. If you select this page for customization, then at the bottom of the screen you see several checkboxes – one checkbox for each available profile field. If you check/uncheck the checkboxes, and then click **[Apply]**, you will then see a preview of this page with exactly these profile fields visible. This lets you simulate the look and feel of this page for each desired profile field combination.

   With the examples of above: If you are planning to use `{{*ProfileEditPageURL STREET,ZIP_CODE,CITY}}` to query the address data of the subscriber, and you first want to check that the page will look correctly if these three profile fields are displayed, then go to the External Profile Edit Page, check the boxes for STREET, ZIP_CODE, and CITY, uncheck all other boxes, and then click **[Apply]**. The preview will then show the page just as it will look to subscribers if you use the system drop-in with STREET, ZIP_CODE, and CITY.

Figure 1-49 Customizing the External Profile Edit Page



2. If the `{{*ProfileEditPageURL FIELDNAME_LIST}}` system drop-in is used in a mailing to a dataset (see Section 1.10 Sending Messages to an Entire Dataset), then `FIELDNAME_LIST` must only contain profile fields that are fields of the dataset. It can not contain any fields that belong to any of the HRLs or HLLs in the dataset.

   However, if the mailing goes to a HRL or HLL, then `FIELDNAME_LIST` may contain all profile fields that are either in the HRL/HLL itself or in the dataset that contains the HRL/HLL.

   The Subscriber Interface for the External Profile Edit Page reflects this: just above the previously mentioned checkboxes, you have a **Preview page with profile fields of** drop-down menu that allows you to select which profile fields you want to see. If you select **The Dataset**, then you will only see checkboxes for the dataset profile fields. This simulates the situation when you use the system drop-in in a mailing to the dataset. If you select **The "LIST"**, then you will see all checkboxes for the list

XYZ plus all of the dataset. This simulates the situation when you use the system drop-in in a mailing to list XYZ where you can use all combined profile fields from the list and dataset in `FIELDNAME_LIST`.

1.19 Reminding the Subscriber to Unregister from a Membership Area

When you unsubscribe from the last list in a Membership Area, a message pops up asking if you would also like to unregister from the entire Membership Area.

You can unsubscribe from a list by:

- going to the Membership Area,
- going to the external unsubscribe page associated with the list, or
- going to the Quick Unsubscribe page that is accessed by clicking on the **Unsubscribe** link in a message sent by the list. (This link is created using the `{{*UnsubscribeURL}}` drop-in when defining the message.)

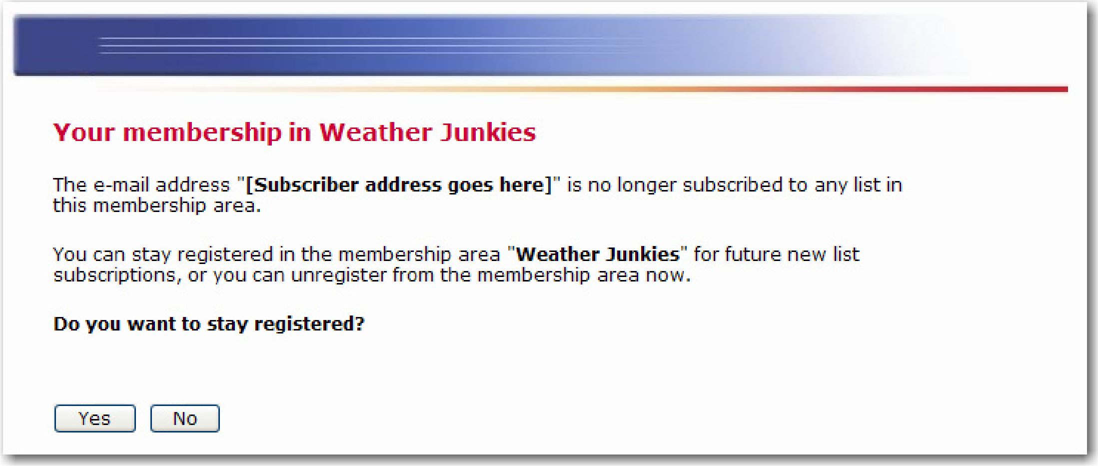
For any of these methods, the following rule applies:

If, after the unsubscribe, you are no longer subscribed to any of the lists in the Membership Area, then you will be asked if you would like to unregister from the Membership Area.

Because of this new feature, there are now several new message pages available for customization. To locate, go to the Recipient Dataset Details screen for the dataset, click on the Membership Area Layout tab, and then click on the **Select a page** link. At the bottom of tab, click on the **Advanced Customization (Message Pages and Input Validation Errors)** link. The message pages are located in the **Yes/No Confirmation** section of the **Message Page Texts** table.

The new message pages are: Unregister Confirmation; Unregister Confirmation (for Restricted Dataset); Stay Registered Confirmation, After Unsubscribe from Last List; and Stay Registered Confirmation, After Unsubscribe from Last List (for Restricted Dataset).

Figure 1-50 Sample of New Message Pages



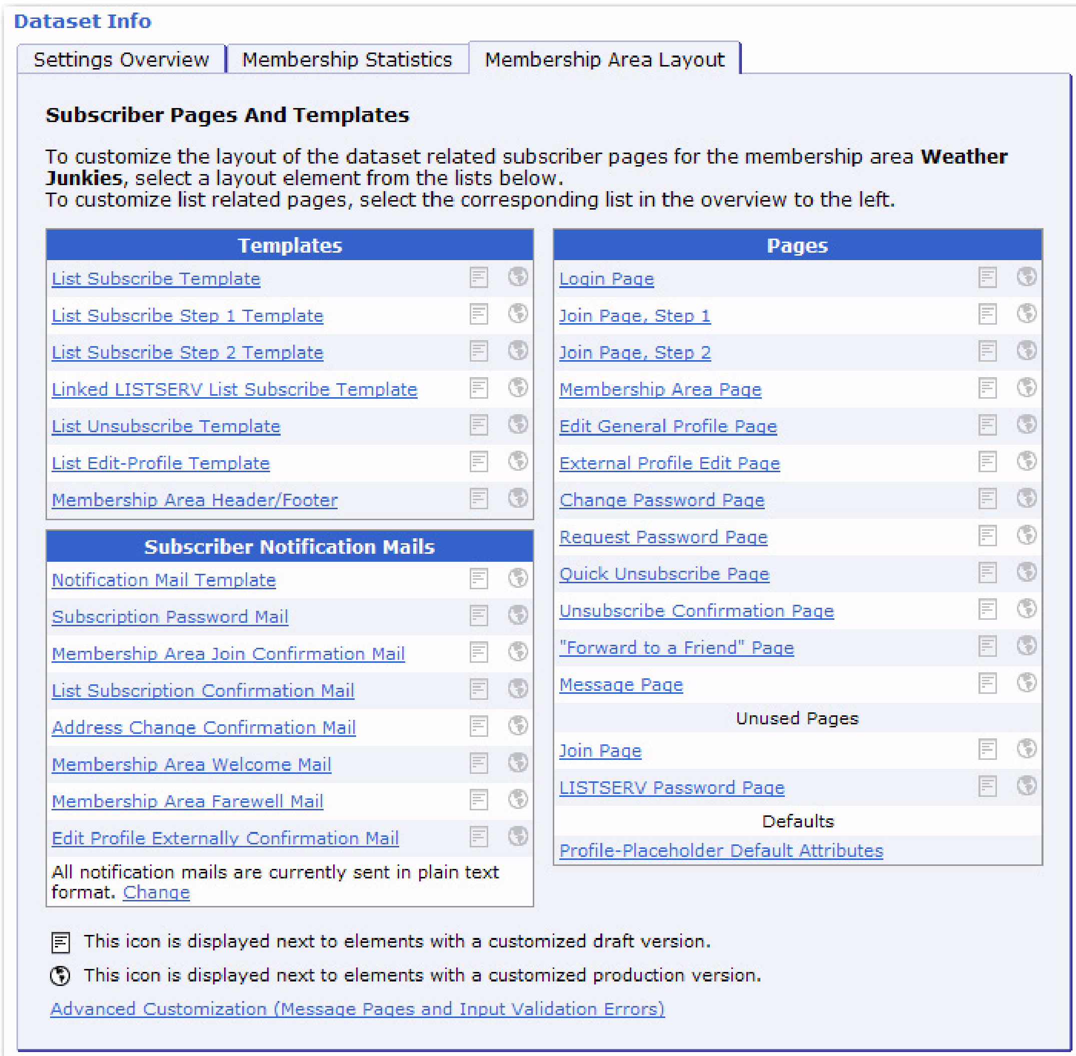
1.20 Sending HTML Notification Emails for a Dataset

All notification email messages for a dataset, such as the welcome or farewell messages, can now be sent as an HTML message with an optional plain text alternative. In addition, these messages can be formatted and customized.

1.20.1 Formatting All Notification Emails for a Dataset

To customize notification emails for a dataset, go to the Recipient Dataset Details screen for the dataset you'd like to work with. Click on the Membership Area Layout tab, and then click on the **Select a page** link. The Subscriber Pages and Templates table is displayed.

Figure 1-51 The Subscriber Pages and Templates Table

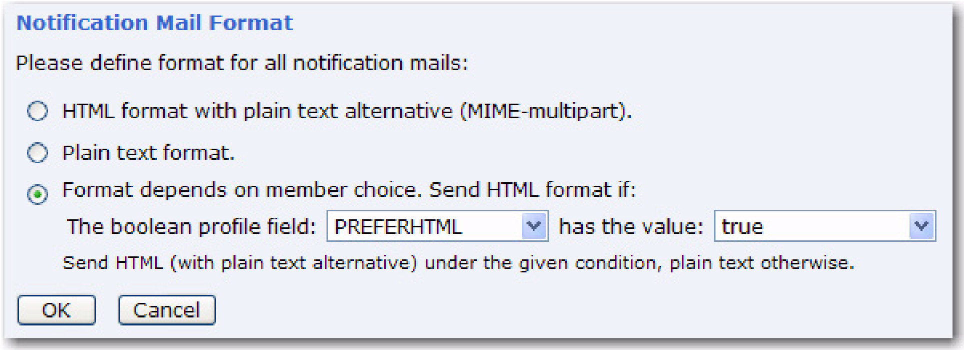


To change the format of all notification emails for this dataset, click on the **Change** link at the bottom of the **Subscriber Notification Mails** section of the table. The Notification Mail Format window pops up. From here, you can choose to:

- **Send all notification mails in HTML format with a plain text alternative part**,
- **Send all notification mails in plain text format**, or

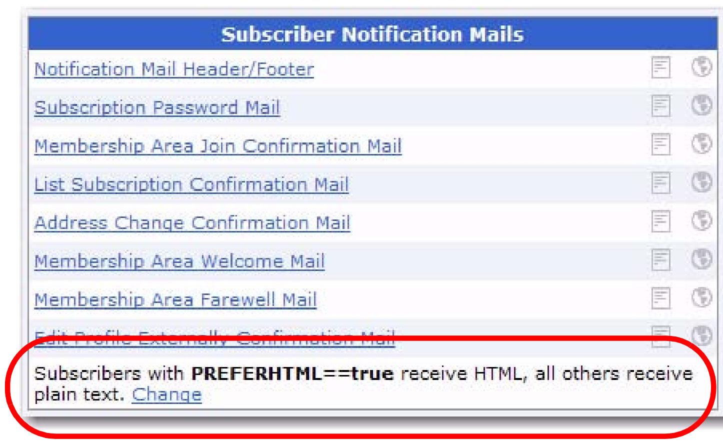
- **Evaluate the following condition to decide if a subscriber receives HTML or plain text**. If this is selected, then select the boolean field and its value from the drop-down menus. When selected, then HTML emails will only be sent to those subscriber that meet the requirements of this condition. Those subscribers who do not meet these requirements will receive a plain text email.

Figure 1-52 Changing the Notification Email Forma



Once you finished, click **[OK]**. The new format status will be displayed at the bottom of the **Subscriber Notification Mails** section of the table next to the **Change** link. This format status will be applied to all notification emails in the dataset.

Figure 1-53 Notification Email Format Status



To customize a specific notification email, see the next section.

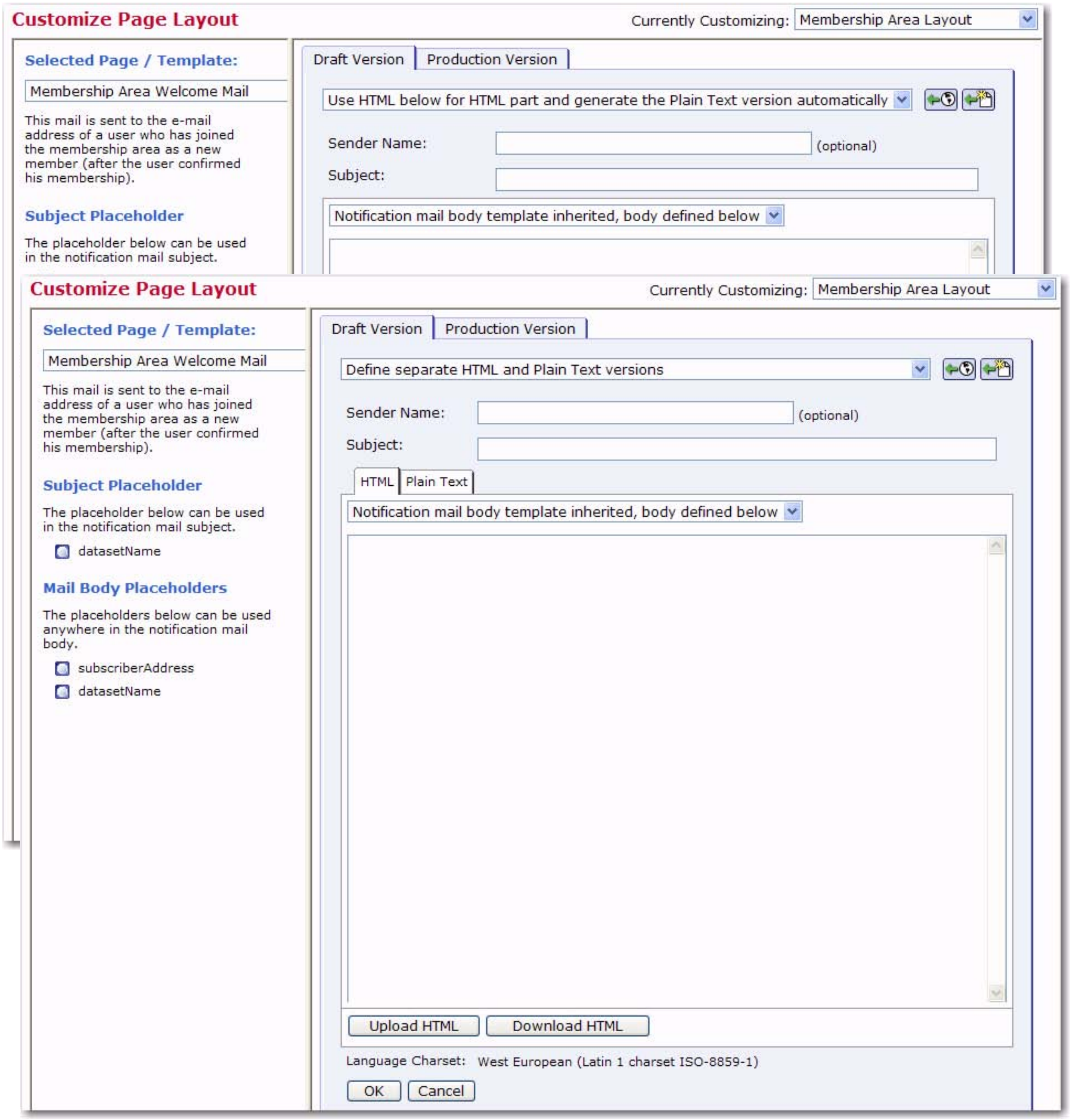
1.20.2 Formatting a Specific Notification Email for a Dataset

To format and customize a specific notification email for a dataset, go to the Recipient Dataset Details screen for the dataset you'd like to work with. Click on the Membership Area Layout tab, and then click on the **Select a page** link. The Subscriber Pages and Templates table is displayed. Click on the name of the notification email. The Customize Page Layout screen opens with the Draft Version tab displayed. Click the **Edit Source** icon. The Draft Version tab refreshes and a new drop-down menu appears at the top of the tab. This option gives you the ability to create an HTML version of the email along with a plain text alternative.

To create an HTML message with the plain text alternative created automatically, click the drop-drown menu and select **Use HTML below for HTML part and generate the Plain Text version automatically**.

To create an HTML message with a separate plain text alternative, click the drop-down menu and select **Define separate HTML and Plain Text version**. When this option is selected, two tabs will appear for defining the body's content.

Figure 1-54 Customizing a Dataset Message



Fill out the rest of the draft accordingly. When defining the email body content, use the drop-down menu to determine what type of content you'll be defining.

- To use the email's body template and provide your own body content, select **Notification mail body template inherited, body define below**.
- To create an all new email (without template), select **All content defined below**.

Note: When defining the HTML and plain text versions of the email separately, then this drop-down menu is available on both the HTML and Plain Text tabs.

To upload HTML into the body of the email, click the **[Upload]** button. Browse to the location of the HTML file and click **[OK]**.

Use the **Language Charset** drop-down menu to select the language encoding used for mail delivery. The charset should match the language that is used in the body of the email.

To submit the changes, click **[OK]**. To cancel editing without submitting any changes, click **[Cancel]**.

1.21 Using the New *{{Calc}} Features

Many changes and updates have been added to the Formula Calculation system drop-in `{{*Calc}}`. The following sections will give you a summary of what has changed.

1.21.1 Data Types

Calculation values can now be one of five different data types (Boolean, Number Set, and Text Set are new):

- **Number** – The value is an integer number in the following range:

  `-9223372036854775808 to 9223372036854775807`

  Note that floating point numbers are not possible in LISTSERV Maestro formulas.
- **Text** – The value is a character string that may contain any sequence of characters, including an empty sequence.
- **Boolean** – The value is a boolean value, either true or false.
- **Number Set** – The value is a set of numbers that is a collection of distinct values of the type number. That is, each number can be contained only once. The set can either have no elements (an empty set), single elements, or any number of elements.
- **Text Set** – The value is a set of text strings. Similar to a number set, a text set is a collection of distinct values of the text type that can have zero, one, or several elements.

1.21.2 Auto Type-Conversion

Operators and functions usually require their operands and arguments to be of a certain type. However, under some circumstances it is possible to supply an expression of a different type as an operand or argument, which will then automatically be converted to the required type.

- **Automatic conversion to Text** – Whenever an operand or argument of type Text is required, an expression either of type Text or of type Number can be supplied. In the latter case, the number will then first be converted into a text before the operator or function is applied. For this conversion, the number-value is simply converted into the corresponding string representation, for example the number 157 becomes the text string "157".

- **Automatic conversion to Number Set** – Whenever an operand or argument of type Number Set is required, an expression either of type Number Set or of type Number can be supplied. In the latter case, the number will then first be converted into a number set with a single element, before the operator or function is applied.
- **Automatic conversion to Text Set** – Whenever an operand or argument of type Text Set is required, an expression either of type Text Set, Number Set, Text or Number can be supplied. In the latter cases, a conversion to Text Set will be performed before the operator or function is applied:
  - A Number Set is converted into a Text Set by converting each single number element into a text element (see "conversion to Text" above).
  - A Text is converted into a Text Set by creating a Text Set with the single text as the only element.
  - A Number is converted into a Text Set by creating a Text Set with the single number as the only element, where the number in turn is first converted into a text.

1.21.3 Expressions

Calculation formulas are now available in the context of the special `*Calc` system drop-in, in the condition tree of target groups of the Dataset or Hosted Recipient List type, and in the derivation rule of a derived profile field in a dataset or hosted recipient list. Because of this, a few of the existing expressions have been updated. See Section 1.20.3.1 Standard Merge Field Expressions and Section 1.21.3.2 Optional Merge Field Expressions for details.

In addition, two new expressions have been added to allow support for the new data types. See Section 1.21.3.3 Constant Boolean Expressions and Section 1.21.3.4 Target Group Parameter Expressions for details.

1.21.3.1 Standard Merge Field Expressions

Restriction: Standard merge field expressions are only allowed if the formula is used in one of the following contexts:

- In the condition tree of a "Dataset" or "Hosted Recipient List" target group
- In the derivation rule of a derived profile field of a dataset or hosted recipients list
- In a `*Calc` system drop-in of a job with the following recipient types:
  - "Uploaded CSV text file"
  - "LISTSERV Maestro selects from a Database"
  - "Target Group" (if the target group is based on either of the two above or on a "Dataset" or "Hosted Recipient List").

If the system drop-in is used in a job with a different recipient type, the formula must not contain any merge field expressions. If it does, an error message will be displayed about this during test delivery.

Type: Standard merge field expressions can be of type Number, Text, Boolean or Text Set, depending on their context and content (see "Type Determination" below for details).

Usage: To include a standard merge field in a formula, type the merge field name enclosed in (&) and (;). Only use merge field names that are actually defined in the recipient list.

Examples:

```
&NAME;
&STATE;
&ACCOUNT_BALANCE;
```

Type Determination: Whenever any such merge field appears in a formula, it will first be replaced with the field value for the current recipient. This occurs before the result of the formula is calculated for that recipient. To be able to do this calculation, the expression's type is determined as follows:

- If the formula is used in the condition tree of a "Dataset" or "Hosted Recipient List" target group or in a `*Calc` system drop-in together with recipients based on such a target group, then the type of each merge field is already defined by the profile field's type, which was defined during creation of the associated dataset or hosted recipient list:

    - Profile fields of type "Number" have the expression type Number.
    - Profile fields of type "Text" have the expression type Text.
    - Profile fields of type "Boolean" have the expression type Boolean.
    - Profile fields of type "Single Selection" have the expression type Text.
    - Profile fields of type "Multiple Selection" have the expression type Text Set.

  This determination of the type is already done during parsing of the formula.

- If the formula is used in a `*Calc` system drop-in with the recipients types "uploaded CSV text file" or "LISTSERV Maestro selects from a database", then the type of the field is determined by the field's content as follows:

  If the field's content can be interpreted as a number, the type Number will be used. If it cannot be interpreted as a number (or is empty), the type Text will be used (which for an empty content will then be an empty text string).

  Consequently, if the merge field appears in a location of the formula where a Number type is expected, you need to ensure that the field's content can be interpreted as a number for all recipients. Otherwise, the field will have the type Text for some recipients, which would usually cause the calculation of the formula and the delivery of the job to fail.

  This determination of the type is done during delivery, when the merge-values of all recipients are known.

Special Note for "Datasets" and "Hosted Recipient Lists": If the formula is used in the condition tree of a "Dataset" or "Hosted Recipient List" target group or in a `*Calc` system drop-in together with recipients based on such a target group, then there are special rules for profile fields of type "Number" or "Text". If such a profile field is defined in the dataset or hosted recipient list as "optional" then this field can not be used in a "standard merge field" expression. Instead, use the "optional merge field" expression instead (see next section.)

1.21.3.2 Optional Merge Field Expressions

Restriction: Optional merge field expressions are only allowed if the formula is used in one of the following contexts:

- In the condition tree of a "Dataset" or "Hosted Recipient List" target group
- In the derivation rule of a derived profile field of a dataset or hosted recipients list
- In a `*Calc` system drop-in of a job with the following recipient types:
    - "Uploaded CSV text file"
    - "LISTSERV Maestro selects from a Database"
    - "Target Group" (if the target group is based on either of the two above or on a "Dataset" or "Hosted Recipient List").

If the system drop-in is used in a job with a different recipients type, the formula must not contain any merge field expressions. If it does, an error message will be displayed about this during test delivery.

Type: Optional merge field expressions can either be of type Number or of type Text, depending on their context and content (see "Type Determination" below for details).

Usage: Optional merge fields are fields that may be undefined (empty) for at least some recipients in the recipient list. If such a field would be used normally in a formula, it would not be possible to calculate the result of the formula for those recipients. Therefore, such "possibly undefined" fields must be included as "optional merge field" expressions, not as "standard merge field" expressions. An optional merge field expression is written in the following way:

```
[&FIELD_NAME; DEFAULT]
```

The whole expression must be enclosed in brackets "[" and "]". Between the brackets the name of the merge field to be addressed appears first, enclosed with (&) and (;), then the default content that will be used for all recipients where the merge field is undefined.

The default that replaces "DEFAULT" as given above must either be a constant number or a constant text literal.

Examples:

```
[&NAME; "no name"]
[&NAME; ""]
[&STATE; "n/a"]
[&ACCOUNT_BALANCE; 0]
```

Note: The second example defines an empty text as the default for `&NAME;`.

Type Determination: Whenever any such merge field appears in a formula, it will first be replaced with the field value for the current recipient, or if that value is undefined or empty, it will be replaced with the given default. Next, the result of the formula is calculated for that recipient. To be able to do this calculation, the expression's type is determined just like for "standard merge field" expressions.

In addition, if the field's value is empty or undefined, the type will be determined by the type of the given default. Therefore, make sure that the type of the default matches the field's type or is at least convertible to that type.

Special Note for "Datasets" and "Hosted Recipient Lists": If the formula is used in the condition tree of a "Dataset" or "Hosted Recipient List" target group or in a `*Calc` system drop-in together with recipients based on such a target group, then only profile fields of type "Number" or "Text" can be used in an "optional merge field" expression, and also only if that field is actually defined as "optional". For fields of other types, or for fields that are defined as "mandatory", use the "standard merge field" expression instead (see previous section.)

1.21.3.3 Constant Boolean Expressions

Restriction: None. Constant boolean expressions can be used in any formula.

Type: Constant boolean expressions are, as the name implies, always of type Boolean.

Usage: To include a constant boolean in a formula, simply type either "true" or "false" (without the quotes).

Examples:

```
true
false
```

1.21.3.4 Target Group Parameter Expressions

Restriction: Target group parameter expressions are only allowed if the formula is used in the condition tree of a "Dataset" or "Hosted Recipient List" target group. They must not be used in a formula of a `*Calc` system drop-in.

Type: Either Number or Text, depending on how the parameter is specified (see below).

Usage: A target group parameter is a parameter that is specified during target group definition, but whose value is not yet known at that time. The parameter will later be "filled out" with content by a user choice made in the recipients wizard, when the target group is used for recipient definition.

To include a target group parameter in a formula, simply type the name of the parameter enclosed in double curly brackets "{{" and "}}". The parameter name must only contain the characters "A" to "Z", "a" to "z", "0" to "9" and the underscore "_".

For the formula it is also important to know the type (either Number or Text) with which the final content of the parameter will be interpreted:

If a parameter is enclosed with quotes (") like a text string, its content is interpreted as Text. If it is not enclosed in quotes, its content is interpreted as Number, so it is important to make sure that all possible parameter values are indeed valid numbers (for type "number").

Notes: If you include the same parameter name several times in the same formula, it will be interpreted as one parameter that simply appears several times. All appearances will have the same content value and must also all appear in the same type context as Number or Text and they must either all be enclosed in quotes to be interpreted as Text parameters, or none of them must be enclosed in quotes (to be interpreted as Number).

Similarly, if a parameter is used with the same name in the same target group but outside of a formula or in a different formula, then all these appearances of the parameter name (in the same target group) will reference the same parameter. All of them will be replaced with the same final content during usage in the recipients wizard.

Examples:

```
{{param}}
{{my_number_param}}
"{{a_text_param}}"
{{Param10}}
```

1.21.4 Operators

All operators have been updated to support the new data types and new calculation formula features.

1.21.4.1 Operators for Number Operands

If both operands are of the Number type, then you can use the following operators:

Table 1-1 Operators for Number Operands

	Operator	Result Type	Result
+	Addition	Number	The sum of both operands.
-	Subtraction (binary operator with two operands)	Number	The difference of both operands.
-	Negative Value (unary operator with one operand)	Number	The negative value of the operand. This operator has only a single operand, at the right side of the operator.
*	Multiplication	Number	The product of both operands.
/	Integer-Division	Number	The integer-quotient of both operands.
%	Modulo	Number	The remainder of integer-division of both operands.
=	Equals-Comparison	Boolean	"True" if the two operands are the same number, "false" otherwise.
<>	Not-Equals-Comparison	Boolean	"True" if the two operands are not the same number, "false" otherwise. This operator can also be written as "^=".
<	Less-Than-Comparison	Boolean	"True" if the first operand number is less than the second operand number.
<=	Less-Or-Equal-Comparison	Boolean	"True" if the first operand number is less than or equal to the second operand number.

Operator		Result Type	Result
>	Greater-Than-Comparison	Boolean	"True" if the first operand number is greater than the second operand number.
>=	Greater-Or-Equal-Comparison	Boolean	"True" if the first operand number is greater than or equal to the second operand number.

Note: In LISTSERV Maestro, division is strictly an integer division; therefore, any decimal places in the result are discarded (not rounded off, but simply ignored).

1.21.4.2 Operators for Text Operands

If one operand is of the Text type and the other is either of the Text or Number type, then you can use the following operators:

Table 1-2 Operators for Text Operands

Operator		Result Type	Result
+	Concatenation	Text	A new text string that is created by appending the second operand text to the first operand text.
=	Equals-Comparison	Boolean	"True" if the two operands are the same text, "false" otherwise.
<>	Not-Equals-Comparison	Boolean	"True" if the two operands are not the same text, "false" otherwise. This operator can also be written as "^=".
<	Less-Than-Comparison	Boolean	"True" if the first operand text is less than the second operand text.
<=	Less-Or-Equal-Comparison	Boolean	"True" if the first operand text is less than or equal to the second operand text.
>	Greater-Than-Comparison	Boolean	"True" if the first operand text is greater than the second operand text.
>=	Greater-Or-Equal-Comparison	Boolean	"True" if the first operand text is greater than or equal to the second operand text.

Notes: If only one operand is of the Text type and the other is of the Number type, then this number operand will automatically be converted into a text before the operator is applied.

Text comparisons are case sensitive, so "this" is not equal to "THIS".

Also the "less-than" and "greater-than" comparisons are based on the character ordering of the Unicode standard, which makes a difference between lowercase and uppercase characters. For example, even though "ABC" < "XYZ" is true, "abc" < "XYZ" is not true, because in Unicode all uppercase characters come before all lowercase characters.

If you need to perform a case insensitive comparison, you should first convert both operands to the same case (either lowercase or uppercase) using the "ToLower(arg)" or "ToUpper(arg)" functions.

1.21.4.3 Operators for Boolean Operands

If both operands are of type Boolean, then you can use the following operators:

Table 1-3 Operators for Boolean Operands

Operator		Result Type	Result
`and`	Boolean “And”	Boolean	“True" if both operands are "true", "false" otherwise.
`or`	Boolean “Or”	Boolean	"True" if one or both operands are "true", "false" otherwise.
`not`	Boolean “Not”	Boolean	"True" if the operand is "false", "false" otherwise. This operator has only a single operand, at the right side of the operator.
=	Equals-Comparison	Boolean	"True" if the two operands are the same boolean value, "false" otherwise.
<>	Not-Equals-Comparison	Boolean	"True" if the two operands have different boolean values, "false" otherwise. This operator can also be written as "^=".

1.21.4.4 Operators for Set Operands

If one of the operands if of type Set, and the other operand is not of type Boolean, then you can use the following operators:

Table 1-4 Operators for Set Operands

Operator		Result Type	Result
+	Union	Set	A set that contains all elements from both operand sets.
-	Relative Completement	Set	A set that contains all elements from the first operand set that are not in the second operand set.
#	Intersection	Set	A set that contains all elements that are present in both operand sets.
=	Equals-Comparison	Boolean	"True" if the two operands are the same set; otherwise, “false”.
<>	Not-Equals-Comparison	Boolean	"True" if the two operands are not the same set; otherwise, “false”. This operator can also be written as “^=”.

	Operator	Result Type	Result
<	Proper-Subset-Comparison	Boolean	"True" if the first operand is a proper (or strict) subset of the second operand set (all values from the first set are also contained in the second set, and the second set has additional other values).
<=	Subset-Comparison	Boolean	"True" if the first operand is a subset of the second operand set (all values from the first set are also contained in the second set, where the two sets may also be the same).
>	Proper-Subset-Comparison	Boolean	"True" if the first operand is a proper (or strict) superset of the second operand set (all values from the second set are also contained in the first set, and the first set has additional other values).
>=	Superset-Comparison	Boolean	"True" if the first operand is a superset of the second operand set (all values from the second set are also contained in the first set, where the two sets may also be the same)

If only one operand is of type Set and the other is of type Text or Number, or if both operands are sets, but one is of type Number Set and the other of type Text Set, then the following conversion will automatically be performed before the operator is applied:

- One operand is of type **Text Set**: Depending on the type of the other operand, one of the following conversions may be performed:
  - **Number** – The number operand is converted into a text set by creating a new set with a text representation of the number as the single element of the set. After this, both operands are of type Text Set and the set operator can be applied to them.
  - **Text** – The text operand is converted into a text set by creating a new set with the text as the single element of the set. After this, both operands are of type Text Set and the set operator can be applied to them.
  - **Number Set** – The number set operand is converted into a text set by creating a new set that contains text representations of all numbers in the number set. After this, both operands are of type Text Set and the set operator can be applied to them.
  - **Text Set** – No conversion necessary. Both operands are of type Text Set and the set operator can be applied to them.
- One operand is of type **Number Set**: If the other operand is of type Text Set, then we are dealing with a case that was already described above. If the other operand is not of type Text Set, then depending on the type of the other operand, one of the following conversions may be performed:
  - **Number** – The number operand is converted into a number set by creating a new set with the number as the single element of the set. After this, both operands are of type Number Set and the set operator can be applied to them.

- **Text** – The text operand is converted into a text set by creating a new set with the text as the single element of the set. In addition, the Number Set argument itself is also converted into a text set by creating a new set that contains text representations of all numbers in the number set. After this, both operands are of type Text Set and the set operator can be applied to them.
- **Number Set** – No conversion necessary. Both operands are of type Number Set and the set operator can be applied to them.

1.21.4.5 Operator Precedence and Parenthesis

Formulas are processed by LISTSERV Maestro following the usual mathematical conventions.

Operators with higher precedence are processed first. If several operators with the same precedence level are encountered, they are processed from left to right. Parenthesis can be set freely to influence precedence where inner parenthesis will be processed before outer parenthesis.

Operator precedence is defined as follows (from highest to lowest, operators on the same row have the same precedence level):

```
not    -    (for unary "minus", i.e. "negative value")
*      /      %      #
+      -    (for binary "minus", i.e. "subtraction")
=      <>      <      <=      >      >=
and
or
```

Examples:

```
15 + 3 * 4 Result: 27
8 * (7 - 3) Result: 32
17 * 22 / 2 % 5 Result: 2
17 * (22 / 2 % 5) Result: 17
17 * (22 / (2 % 5)) Result: 187
```

1.21.5 Formula Functions

LISTSERV Maestro 4.0 contains several new functions that are available for use in formulas.

Number Functions:

- IsNum – Checks if the given argument can be converted into a number.
- ToNum – Converts any non-number data type into a number.

Boolean Functions:

- If – Evaluates a condition and determines one of two possible values as a result.

Set Functions:

- Count – Counts all elements in a set.
- In – Determines if a set contains a certain element.
- SetOf – Builds a set out of a list of elements.
- SetToString – Converts a set into a string by listing all elements in the set.
- SetToStringWithMaxLen – Converts a set into a string (with a maximum length) by listing all elements in the set.

Date/Time Functions:

- IsDate – Checks if a textual date/time representation is valid.
- ToMillis – Converts a textual date/time representation into a milliseconds time value.

Other Functions:

- SecondaryValue – Retrieves the secondary values fro a single/multiple select profile field.

1.21.5.1 IsNum

`IsNum(arg)`

Function: Checks if the given argument can be converted into a number or set of numbers. Returns "true" if the argument can be converted into a number or set of numbers, "false" if not.

This function is a companion function to "`ToNum`": If `IsNum` returns "true" for a given argument, then it is safe to use `ToNum` on the same argument (i.e. `ToNum` will not generate an error when used with the same argument).

Return-Type: Boolean

Arguments:

- `arg` - This argument can be of any type:
  - **Text:** The text is parsed and an attempt is made to convert it into a number. If this is successful, then "true" is returned, otherwise "false".
  - **Text Set:** All elements in the set are parsed and converted into numbers. If this is successful for all elements in the set, then "true" is returned, otherwise "false".
  - **Boolean:** Always results in a return value of "true".
  - **Number or Number Set:** Always results in a return value of "true".

Examples:

```
IsNum("12345")
IsNum(&AGE;)
IsNum(true)
IsNum("123" + "456")
```

1.21.5.2 ToNum

`ToNum(arg)`

Function: Tries to convert the given argument into a number or set of numbers. It generates a runtime error if that is not possible (for example, if the argument is a text that contains characters that are not part of a number representation, like letters). If you are unsure if a certain argument can be converted into a number without an error, and you want to avoid this error, then use the companion function `IsNum` to first check if the argument can be converted at all, together with the function `If`.

This function can, for example, be used to convert a profile field of type Text, which only contains numbers, to the type Number, which can then be used in contexts that require the type Number (such as number operators and functions that require a number argument).

Return-Type: Number or Number Set

Arguments:

- `arg` - This argument can be of any type:
  - **Text:** The text is parsed and an attempt is made to convert it into a number. This is possible if the text contains only digits and optionally a leading minus sign (otherwise an error is generated). A single number is returned.
  - **Text Set:** All elements in the set are parsed and converted into numbers (if possible, otherwise an error is generated). A Number Set that contains all these numbers is returned.
  - **Boolean:** The boolean value "true" is converted into the number "1", the boolean value "false" is converted into the number "0". This number is then returned.
  - **Number or Number Set:** The argument is returned unchanged.

Examples:

```
ToNum("12345")
ToNum(&AGE;)
ToNum(true)
ToNum("123" + "456")
If(IsNum(&TEXTFIELD;), ToNum(&TEXTFIELD;), 0)
```

Notes: The result of the second-to-last example will not be the number 579, but will instead be the number 123456. The string concatenation operator "+" is first applied to the two text strings and then the resulting string is converted into a number.

The last example shows how `ToNum` is used together with `IsNum` and If, to make sure that no runtime error is generated: If the field TEXTFIELD contains a number, then this number is supposed to be used. If not, then instead the default of "zero (0)" is to be used. So the result of this If function is in turn a number: Either the number that was parsed from TEXTFIELD, or the number "0". Thus, the result of the If function can safely be used in a context where a Number type is required, without fearing a runtime error if TEXTFIELD should contain a non-number text.

1.21.5.3 If

`If(condition, value1, value2)`

Function: Evaluates the "condition" and returns either the "value1" (if the condition is "true") or the "value2" (if the condition is "false").

Return-Type: Depends on "value1" and "value2" (see below).

Arguments:

- `condition` - This argument can be of type Boolean, and its the condition to evaluate.
- `value1` - This argument can be of any type (see below), and its the value to return if the condition evaluates to "true".
- `value2` - This argument can be of any type (see below), and its the value to return if the condition evaluates to "false".

Note: Even though "value1" and "value2" can be of any type, the types of these two values must either be the same, or one type must be convertible into the other. If both types are the same, then this is also the return type of the function. If the types are different, but one type can be converted into the other type, then this other type is the return type of the function (even if the value with the first type should be selected by the condition). For details on conversions, see Auto Type-Conversion.

Examples:

```
If(&VALUE; > 15, "greater than 15", "not greater than 15")
If(&VALUE; + 20 = 50, 50, 0)
```

1.21.5.4 Count

`Count(set)`

Function: Counts and returns the number of elements in the given set.

Return-Type: Number

Arguments:

- `set` - This argument can be of type Text Set or Number Set, and its the set to count the elements of.

Examples:

```
Count(SetOf("elem1", "elem2", "elem3"))
Count(SetOf(1, 2, 3, 4, 5))
Count(&MULTI_SELECT_FIELD;)
```

1.21.5.5 In

`In(element, set)`

Function: Checks if the given "element" is contained in the given "set". Returns "true" if the element is found in the set, or "false" if not.

Return-Type: Boolean

Arguments:

- `element` - This argument can be of type Number or Text, and its the element to look for.
- `set` - This argument can be of type Number Set or Text Set, and its the set to search in.

Examples:

```
In("value", &MULTI_SELECT_FIELD;)
```

1.21.5.6 SetOf

`SetOf([arg1, ... , argN])`

Function: Returns a set that contains all arguments. If some arguments are also sets, then the resulting set will contain all elements from these sets individually (i.e. the resulting set will not contain the other sets themselves as its elements, but rather will contain all elements from these other sets). If no argument is given at all, then an empty set is returned.

Return-Type: Number Set or Text Set, depending on the arguments (see below).

Arguments: (All arguments are optional)

- `arg1` - This argument can be of any type, except Boolean. The first element to include in the result set.
- `argN` - This argument can be of any type, except Boolean. The Nth (and last) element to include in the result set.

If any of the arguments is of type Text or Text Set, then the resulting set will also be a Text Set. If all arguments are either of type Number or Number Set, then the resulting set will be a Number Set. Arguments of type Boolean are not allowed.

Examples:

```
SetOf(3, 19882, -4, 3371)
SetOf("abc", "def", "ghi")
SetOf("abc", 15, SetOf("xyz", "qvw"), 28, "def")
SetOf(&VALUE1;, "xyz", &MULTI_SELECT_FIELD;)
```

1.21.5.7 SetToString

`SetToString(set [, default [, separator [, delimiter [, delimitAll [, delimiterEscape]]]]])`

Function: Converts a set into a text string by listing all values in the set (if any), separating them with a specified separator character and optionally also enclosing the values in specified delimiters.

Important: The final result of a formula in a `*Calc` system drop-in must not exceed the maximum length of 900 characters. Similarly, if the formula is used in the derivation rule of a derived profile field (in a dataset or hosted list), then the result must not exceed the maximum length of 100 characters. Using `SetToString` in a formula does increase the danger of exceeding these limits, especially if the result of the function is also used as the direct result of the formula (without further processing by other functions), and if the set contains a large number of values (e.g. this may easily be the case if the set is defined by a multiple-select merge field). In such a situation, the mail job delivery may fail (if used in a `*Calc` system drop-in) or the recalculation of the derived profile field may fail (if used in a derivation rule). If in doubt, it may be better to use the SetToStringWithMaxLen function instead, which allows you to control the output length of the result. If the formula is used in the condition tree of a "Hosted Recipient List" target group, then such a restriction does not apply.

Return-Type: Text

Arguments:

- `set` - This argument can be of type Number Set or Text Set, and its the set that is to be converted into a text.
- `default` - This argument can be of type Text, and it defines the default text that shall be the result of the function if the given set is empty. If not specified, then an empty text string is used as the result for an empty set. This argument is optional.
- `separator` - This argument can be of type Text, and its the separator text that is to appear between two values. The separator will only appear between values, i.e. it will not appear before the first or after the last value. So if the set has less than two elements, the separator will not appear at all. Note, that "separator" may be any text, not only a single character. If not specified, the comma "," is used by default as the separator. This argument is optional but may be supplied if the "default" argument has been supplied too.
- `delimiter` - This argument can be of type Text, and its the delimiter text that is to be used to enclose values. In some situations, it may happen that the values from the set already contain the chosen "separator" as part of their value texts. In such a case, the occurrences of the separator text in the values may be confusing, as such an occurrence may be misinterpreted as an actual separator, after which a new value starts, while it actually is only part of the value. To avoid this, it is possible to enclose the values in delimiters, to better mark the beginning and end of a value (if such a value then contains the separator text, then this does not matter, as the end of the value is no longer marked by the separator, but instead by the delimiter). For this, the "delimiter" argument can be used. If specified, then individual values may be enclosed in the specified delimiter text (depending on the "delimitAll" argument, see below). If a value is enclosed with delimiters, and the value itself also already contains the delimiter text, then this delimiter text is escaped (in a way depending on the "delimiterEscape" argument, see below). Note that "delimiter" may be any text, not only a single character. If not specified, then values are never enclosed with extra delimiters. This argument is optional but may be supplied if the "default" and "separator" arguments have been supplied too.
- `delimitAll` - This argument can be of type Boolean. If set to "true", then all values will be enclosed with the given delimiter text. If set to "false", then only values that actually contain the separator text will be enclosed with delimiters. If not specified, then all values will be enclosed with delimiters (default is "true"). This argument is optional but may be supplied if the "default", "separator" and "delimiter" arguments have been supplied too.

- `delimiterEscape` - This argument can be of type Text, and it defines which text will be used to escape an occurrence of the delimiter text in a value. If a value is enclosed with delimiters, but the value already contains the delimiter text itself, then this contained delimiter text could be confused with the end-delimiter, that ends the value. Therefore, if the delimiter text appears in the value, it needs to be "escaped". The escaping is done by inserting the "delimiterEscape" text just before the delimiter text in the value. If "delimiterEscape" is not specified, then the delimiter text itself will be used for escaping, i.e. this has the effect, that if the delimiter text appears in the value, then it will be escaped by doubling it. For example: If the delimiter text is the standard quote character <">, and the value already contains quotes, like this: <value "contains" quotes>. And if no "delimiterEscape" is specified, so that the default is applied, then the escaped value will contain "doubled" quotes, like this: <value ""contains"" quotes>. If instead for example the backslash is supplied for "delimiterEscape", then the escaped value will look like this: <value \"contains\" quotes>. Note that "delimiterEscape" may be any text, not only a single character. This argument is optional but may be supplied if the "default", "separator", "delimiter" and "delimitAll" arguments have been supplied too.

Examples:

```
SetToString(&MULTI_SELECT_FIELD;)
SetToString(&MULTI_SELECT_FIELD;, "empty")
SetToString(&MULTI_SELECT_FIELD;, "empty", "; ")
SetToString(&MULTI_SELECT_FIELD;, "empty", "; ", "'")
SetToString(&MULTI_SELECT_FIELD;, "", "; ", "'", false)
SetToString(&MULTI_SELECT_FIELD;, "", "; ", "'", true, "\")
```

1.21.5.8 SetToStringWithMaxLen

`SetToStringWithMaxLen(set, maxlen [, omissionText [, default [, separator [, delimiter [, delimitAll [, delimiterEscape]]]]]])`

Function: This is a specialized version of the SetToString function. `SetToStringWithMaxLen` also converts a set into a text string, but observes a given maximum text length, by listing only so many values from the set as may fit into the maximum length. Similarly to `SetToString`, the values are separated with a specified separator character and optionally enclosed in the specified delimiters. If not all values fit the maximum length, then optionally an omission text may be appended.

The `SetToStringWithMaxLen` function is useful if you want to make sure that the final output length of the converted set does not exceed a certain limit. For example the maximum of 900 characters if the formula is used in a `*Calc` system drop-in, or 100 characters if the formula is used in the derivation rule of a derived profile field.

Return-Type: Text

Arguments:

- `set` - This argument can be of type Number Set or Text Set, and its the set that is to be converted into a text.
- `maxlen` - This argument can be of type Number, and its the maximum length for the resulting text. If a positive "maxlen" is supplied, then the returned text will never be longer than this value (although it may be shorter if there are not enough elements in

the set). If "0" or a negative "maxlen" is supplied, the returned text will always be an empty text string.

- `omissionText` - This argument can be of type Text: If at least one of the elements from the set has to be left out from the enumeration because of the specified "maxlen", then this "omissionText" will be appended to the resulting text, to signify that some values have been left out. this argument is optional.

Note: The length of the omission text also counts against the given maximum length. So if an omission text is to be appended (because some values have been left out), but with the omission text the result would then be too long, then even more values will be left out, until there is enough space to fit in the omission text too. If you do not want an omission text to appear at all, then specify an empty text string "" for this argument.

Special Feature: If inside of the omission text you specify the placeholder #COUNT (with this exact spelling, in all UPPERCASE), then this placeholder will be replaced with the number of omitted elements before the omission text is appended. So if you for example specify the text "and #COUNT more", and in the result twelve elements have been omitted, then the omission text in the result will read "and 12 more". If not specified, then "..." is used as the default omission text. The remaining arguments "default", "separator", "delimiter", "delimitAll" and "delimiterEscape" work exactly as with the SetToString function. Please see there for details. These arguments are optional but may be supplied if the "omissionText" argument has been supplied too.

Examples:

```
SetToStringWithMaxLen(&MULTI_SELECT_FIELD;, 100)
SetToStringWithMaxLen(&MULTI_SELECT_FIELD;, 100, " and more...", "empty")
SetToStringWithMaxLen(&MULTI_SELECT_FIELD;, 200, " and #COUNT more...", "empty",
"; ")
SetToStringWithMaxLen(&MULTI_SELECT_FIELD;, 200, "", "empty", "; ", "'")
SetToStringWithMaxLen(&MULTI_SELECT_FIELD;, 200, "", "", "; ", "'", false)
SetToStringWithMaxLen(&MULTI_SELECT_FIELD;, 200, "", "", "; ", "'", true, "\")
```

1.21.5.9 IsDate

`IsDate(datetext, formatpattern [, localename | langcode, countrycode])`

Function: Checks if the given format specifications can be used to correctly parse a numerical date/time value from the given "datetext" text argument. Returns "true" if a date/time value can be correctly parsed from the arguments, "false" if not.

This function is a companion function to ToMillis. If `IsDate` returns "true" for a given set of arguments, then it is safe to use `ToMillis` on the same set of arguments (i.e. `ToMillis` will not generate an error when used with the same arguments).

Please see Date and Time Patterns for details about how to write the format pattern.

Note: For formatting purposes, LISTSERV Maestro will by default use the U.S. locale and the time zone of the server where the LUI component is running. Therefore, locale specific texts, like weekday names, names of months, and so on, will be formatted using the U.S. locale. Similarly, times will be formatted using the server's time zone. If you want to specify a different locale, you can do so with the optional parameter "localename" to choose a predefined locale or with the optional parameters "langcode" and "countrycode" to specify your own locale. See Predefined Locales for details. If you want to specify the time as relative to a different time zone, you can include a time zone value in the date/time text.

Return-Type: Boolean

Arguments:

- `datetext` - This argument can be of type Text, and its the date/time text string to parse. Must contain the desired date/time in a textual format that can be parsed by applying the given format pattern.
- `formatpattern` - This argument can be of type Text, and it specifies the format pattern to use to parse the "datetext".
- `localename` - This argument can be of type Text, and its the name of a predefined locale. If specified, any locale specific text in "datetext" will be expected according to this locale. This argument is optional. Either you supply no further argument at all or you only supply this argument.
- `langcode` - This argument can be of type Text, and its a lowercase two-letter ISO-639 language code specifying the language for the locale. For example, see here http://ftp.ics.uci.edu/pub/ietf/http/related/iso639.txt for one list of the ISO-639 language codes. This argument is optional. Either you supply no further argument at all or you supply both the following this argument and the next.
- `countrycode` - This argument can be of type Text, and its an uppercase two-letter ISO-3166 country code specifying the country for the locale. For example, see here http://www.iso.org/iso/country_codes/iso_3166_code_lists.htm for one list of the ISO-3316 country codes. If "langcode" and "countrycode" are specified, they are used to create a locale for the given language and country, and any locale specific text in "datetext" will be expected according to this locale.

Examples:

```
IsDate("February 22. 2004", "MMMM dd. yyyy")
(parses the given date using the default U.S. locale)
IsDate("Februar 22. 2004", "MMMM dd. yyyy", "Germany")
(parses the given date using the pre-defined locale for Germany)
IsDate("februari 22. 2004", "MMMM dd. yyyy", "de", "AT")
(parses the given date using a custom locale for language "de"
=German and country "AT" =Austria)
```

1.21.5.10 ToMillis

```
ToMillis(datetext, formatpattern [, localename | langcode, countrycode])
```

Function: Returns the numerical value representing the date/time as parsed from the "datetext" argument, where the numerical value specifies the date/time in milliseconds since "Jan. 1st 1970, 00:00:00 GMT" (which can, for example, then be compared to the output of the functions `CurrentMillis` and `SubscribeTimeMillis`, or be used as input to `ToDate`.

It generates a runtime error if there is a parse error. If you are unsure if a certain "datetext" and "formatpattern" can be parsed without an error, and you want to avoid this error, then use the companion function IsDate to first check if the arguments can be parsed at all, together with the function If (see the examples below.)

The format that is used to parse the given date/time text string is specified with the given format argument. Please see Date and Time Patterns for details about how to write the format pattern.

Note: For formatting purposes, LISTSERV Maestro will by default use the U.S. locale and the time zone of the server where the LUI component is running. Therefore, locale specific texts, like weekday names, names of months, and so on, will be formatted using the U.S. locale. Similarly, times will be formatted using the server's time zone. If you want to specify a different locale, you can do so with the optional parameter "localename" to choose a predefined locale or with the optional parameters "langcode" and "countrycode" to specify your own locale. See Predefined Locales for details. If you want to specify the time as relative to a different time zone, you can include a time zone value in the date/time text.

Return-Type: Number

Arguments:

- `datetext` - This argument can be of type Text, and its the date/time text string to parse. Must contain the desired date/time in a textual format that can be parsed by applying the given format pattern.
- `localename` - This argument can be of type Text, and its the name of a predefined locale. If specified, any locale specific text in "datetext" will be expected according to this locale. This argument is optional. Either you supply no further argument at all or you only supply this argument.
- `langcode` - This argument can be of type Text, and its a lowercase two-letter ISO-639 language code specifying the language for the locale. For example, see here http://ftp.ics.uci.edu/pub/ietf/http/related/iso639.txt for one list of the ISO-639 language codes. This argument is optional. Either you supply no further argument at all or you supply both the following this argument and the next.
- `countrycode` - This argument can be of type Text, and its an uppercase two-letter ISO-3166 country code specifying the country for the locale. For example, see here http://www.iso.org/iso/country_codes/iso_3166_code_lists.htm for one list of the ISO-3316 country codes. If "langcode" and "countrycode" are specified, they are used to create a locale for the given language and country, and any locale specific text in "datetext" will be expected according to this locale.

Examples:

```
ToMillis("February 22. 2004", "MMMM dd. yyyy")
(parses the given date using the default U.S. locale)

ToMillis("Februar 22. 2004", "MMMM dd. yyyy", "Germany")
(parses the given date using the pre-defined locale for Germany)

ToMillis("februari 22. 2004", "MMMM dd. yyyy", "de", "AT")
(parses the given date using a custom locale for language "de"
```

```
=German and country "AT" =Austria)

If(IsDate(&FIELD;, "MMMM dd. yyyy"), ToMillis(&FIELD;, "MMMM dd.
yyyy"), 0)
(checks if FIELD contains a date that can be parsed with the given
pattern and the default U.S. locale, and if so, returns the
numerical representation of this date, otherwise returns the
default "zero (0)".)
```

1.21.5.11 SecondaryValue

`SecondaryValue(&MERGE_FIELD;, secondaryColumnName)`

Function: This is an alternative method to retrieve the selected value of a single-select profile field, or the selected values of a multiple-select profile field. If such a profile field is included in the formula as a standard merge field (simply by supplying its merge field name &NAME;), then what you get is the currently selected entry name (for single-select) or a set of the currently selected entry names (for multiple-select). While this is usually the desired behavior, in special cases a different behavior may be required:

If the lookup table on which the profile field is based has secondary columns defined, then you might want to retrieve the matching secondary values instead.

This is what is done with this function: It retrieves the currently selected secondary value as a return value of type Text (for single-select), or the set of currently selected secondary values as a return value of type Text Set (for multiple-select) of the specified single/multiple-select profile field. From which secondary column the values are retrieved is specified with the `secondaryColumnName` argument.

Note: If this function is used to retrieve the secondary values of a multiple-select profile field, then the resulting set may have less elements than there are currently selected values for the profile field. This is because secondary values are not necessarily unique. So two or more of the selections of a certain subscriber could actually have the same secondary value. And since the return value of the function is a set (for multiple-select), and a set contains each element only once, those selections will result in only one entry in the resulting set.

Restriction: Can only be used in the derivation rule formula of a derived profile field, or in a formula in the condition tree of a "Dataset" or "Hosted Recipient List" target group, or in a "*Calc" system drop-in together with recipients based on such a target group. Will not be accepted in formulas for a different recipients type! Also, the specified profile field must be a single or multiple select field. Fields of other types will not be accepted. In addition, the specified `secondaryColumnName` must be the name of a secondary column that is defined in the lookup table on which the profile field is based.

Important: Please remember that the secondary column is referenced in this function by name only. So if you use this function in a formula anywhere, and then later edit the name of the secondary column in the lookup table definition (or delete the secondary column from the lookup table), then this will not automatically change the formula too. The effect will be, that the formula becomes invalid, as it now references a non-existent secondary column. This in turn could for example cause mail job delivery errors (if the function is used in a *Calc formula, or in a target group condition tree), or prevent the re-calculation of a derived profile field value (if the function is used in

the derivation rule formula of a derived field).
Therefore, take care when renaming or deleting secondary lookup table columns and, if necessary, also edit/repair any formulas that make use of such columns.

Return-Type: Text or Text Set

Arguments:

- `&MERGE_FIELD;` - (single or multiple select profile field): This argument must be the name of a merge field (complete with the starting "&" and the closing ";") that corresponds with a single/multiple select profile field in the dataset or hosted recipient list. It can not be a constant value (a number, text, boolean or set).
- `secondaryColumnName` - This argument can be of type Text. It must specify the name of a secondary column in the lookup table that is associated with the specified `&MERGE_FIELD;`.

Examples:

```
SecondaryValue(&FIELD_NAME;, "Phone Number")
```

1.21.6 Multiple Selection Fields

The system drop-in for the multiple selection fields has been deprecated. It is still available for backwards compatibility with existing email jobs. For LISTSERV Maestro 4.0, please use the Formula Calculation system drop-in `{{*Calc}}`, with the "`Count`" and "`SetToStringWithMaxLen`" functions, as well as the "=", "<>", "<", "<=", ">", and ">=" set comparison operators.

Table 1-5 Multiple Selection Field Replacements

Previous Versions	Version 4.0 and higher
Multiple Selection Field Count	use {{*Calc}} with the "Count" function
Multiple Selection Field Enumerated	use {{*Calc}} with the "SetToStringWithMaxLen" function
Multiple Selection Field Advanced Set-Operators	use {{*Calc}} with the "=", "<>", "<", "<=", ">" and ">=" set comparison operators. You can also use the "Count(&FIELD;)=0" function to check for the empty set.

1.21.7 Date and Time Patterns

The format of the date and time patterns must be specified for the functions "`ToDate`" and "`ToMillis`" to convert a numerical date/time value (represented in milliseconds since "Jan. 1st 1970, 00:00:00 GMT") into a formatted output string or vice versa.

The pattern format described here applies to the formatting process, when a numerical date/time value is converted into a formatted text string, and to the parsing process, when a text string is parsed to convert it back into the numerical date/time value.

Important: For date/time formatting and parsing, by default the U.S. locale and the current time zone of the server where the Maestro User Interface (LUI) component is running is used. This means that if locale specific values (names of months, weekdays, era-designators, and the like) are required, they will be given as the U.S. locale values by default. Similarly, if a time is given, it will be formatted (or interpreted) as relative to the time zone of the server (although for parsing a specific time zone can be supplied). If the default U.S. locale is not desired, specify a locale in the "`ToDate`" or "`ToMillis`" function.

1.21.7.1 Date and Time Formats

Date and time formats are specified by pattern strings. Within pattern strings, unquoted letters from 'A' to 'Z' and from 'a' to 'z' are interpreted as pattern letters representing the components of a date or time string (see below for details). Text can be quoted using single quotes <`'`> to avoid interpretation. In a quoted text, the "double" single quote <`''`> represents a single quote. All other characters are not interpreted; they are simply copied into the output string during formatting or matched against the input string during parsing.

The following pattern letters are defined (all other characters from 'A' to 'Z' and from 'a' to 'z' are reserved). The letters are case-sensitive. The same letter has different meanings in its uppercase or lowercase version. Each pattern letter has a specific "presentation" in the created final string (during formatting) or in the parsed string (during parsing). For example, presentation types may be **Text**, **Number**, **Year** or similar. More details about the presentations and their meanings follow below.

Commonly Used Pattern Letters

Letter	Date or Time Component	Presentation	Examples
`y`	Year	Year	1996; 96
`M`	Month in year	Month	July; Jul; 07
`d`	Day in month	Number	10
`E`	Weekday	Text	Tuesday; Tue
`H`	Hour in day (0-23)	Number	0
`h`	Hour in am/pm (1-12)	Number	12
`m`	Minute in hour	Number	30
`s`	Second in minute	Number	55
`S`	Millisecond	Number	978
`a`	Am/pm marker	Text	PM

Special Pattern Letters

Letter	Date or Time Component	Presentation	Examples
`G`	Era designator	Text	AD; BC
`D`	Day in year	Number	189
`w`	Calendar week in year	Number	27
`W`	Calendar week in month	Number	2
`F`	Weekday ordinal in month	Number	2

k	Hour in day (1-24)	Number	24
K	Hour in am/pm (0-11)	Number	0
z	Time zone	General time zone	Pacific Standard Time; PST; GMT-08:00
Z	Time zone	RFC 822 time zone	-0800

Notes: The value of "calendar week in year" and "calendar week in month" depends on the locale that is used. The locale determines the conventions about which weekday is interpreted as the first day of the week (usually "Monday" or "Sunday") and under which circumstances a week that falls partially into one year (or month) and partially into the next, is interpreted as belonging to the one year (or month) or the other. The "weekday ordinal in month" indicates the ordinal number of the weekday of the given date/time in the given month. For the first Monday in a month, the ordinal is "1", as it is for the first Tuesday, Wednesday and so on. For the second Monday in a month, the ordinal is "2", and so on.

1.21.7.2 Presentation Description

Pattern letters are usually repeated, as their number determines the exact presentation:

- **Text**: For formatting, if the number of pattern letters is four or more, the full form is used; otherwise, a short or abbreviated form is used if available.

  For parsing, both forms are accepted, independent of the number of pattern letters.

- **Number**: For formatting, the number of pattern letters is the minimum number of digits, and shorter numbers are zero-padded to this amount.

  For parsing, the number of pattern letters is ignored unless it is needed to separate two adjacent fields.

- **Year**: For formatting, if the number of pattern letters is two, the year is truncated to 2 digits; otherwise it is interpreted as a "Number" (see above).

  For parsing, if the number of pattern letters is more than two, the year is interpreted literally, regardless of the number of digits. So using the pattern "`MM/dd/yyyy`", the text "`01/11/12`" parses to Jan. 11, 12 AD.

  For parsing with the abbreviated year pattern ("`y`" or "`yy`"), LISTSERV Maestro must interpret the abbreviated year relative to some century. It does this by adjusting dates to be within 80 years before and 20 years after the current time. For example, using the pattern "`MM/dd/yy`" on Jan. 1, 1997, the text "`01/11/12`" would be interpreted as Jan. 11, 2012, while the text "`05/04/64`" would be interpreted as May 4, 1964. During parsing, only strings consisting of exactly two digits will be parsed into the default century. Any other numeric string, such as a one digit string, a three or more digit string, or a two digit string that is not all digits (for example "`-1`"), is interpreted literally. Therefore, "`01/02/3`" or "`01/02/003`" are parsed, using the same pattern, as Jan. 2, 3 AD. Likewise, "`01/02/-3`" is parsed as Jan. 2, 4 BC.

  - **Month**: If the number of pattern letters is one or two, the month is interpreted as "Number", if it is 3 or more, it is interpreted as "Text". Therefore, if the month is interpreted as "Number" or "Text", the applicable "Number"/ "Text" interpretation rules apply (see above). For example: 1 letter will be a "Number" that is not padded, 2 letters will be a "Number" that is padded, 3 letters will be a "Text" using the abbreviated form and 4 or more letters will be a "Text" using the long form.

- **General time zone**: For formatting, the time zone is handled as "Text" if it has a name. If not, it is given as a GMT offset value in the format "`GMT[+|-]HH:MM`", where "`HH`" is the hours between 0 and 23 (one or two digits, may be zero-padded to the left) and "`MM`" is the minutes between 00 and 59 (always two digits, zero-padded to the left if necessary). For example, "`GMT+8:00`", "`GMT+08:00`", "`GMT-12:45`".

For parsing, see "Time zone parsing" below.

- **RFC 822 time zone**: For formatting, the RFC 882 4-digit time zone format is used: "`[+|-]HHMM`", where "`HH`" is the hours as two digits, between 00 and 23 (zero-padded to the left if necessary) and "`MM`" is the minutes as two digits, between 00 and 59 (zero-padded to the left if necessary).

  For parsing, see "Time zone parsing" below.

- **Time zone parsing**: For parsing of a time zone, it does not matter if the format pattern specifies a "General time zone" or a "RFC 822 time zone": In both cases, all three types of time zone specifications are accepted:
  - Time zone given as "Text" (if given with a name recognized by LISTSERV Maestro).
  - Time zone given as GMT offset (see "General time zone").
  - Time zone given as RFC 882 4-digit notation (see RFC 822 time zone).

Examples

The following examples show how date and time patterns are interpreted in the default U.S. locale with the "U.S. Pacific Time" time zone. The given date and time are "`2001-07-04 12:08:56`" local time in that time zone.

Date and Time Pattern	Result
`"yyyy.MM.dd G 'at' HH:mm:ss z"`	`2001.07.04 AD at 12:08:56 PDT`
`"EEE, MMM d, ''yy"`	`Wed, Jul 4, '01`
`"h:mm a"`	`12:08 PM`
`"hh 'o''clock' a, zzzz"`	`12 o'clock PM, Pacific Daylight Time`
`"K:mm a, z"`	`0:08 PM, PDT`
`"yyyyy.MMMMM.dd GGG hh:mm aaa"`	`02001.July.04 AD 12:08 PM`
`"EEE, d MMM yyyy HH:mm:ss Z"`	`Wed, 4 Jul 2001, 12:08:56 -0700`
`"yyMMddHHmmssZ"`	`010704120856-0700`

1.21.7.3 Predefined Locales

When specifying a locale to be used for date/time formatting in "ToDate" or for parsing in `ToMillis`, you can either specify the specific ISO codes of the desired country and language (see "ToDate" and "ToMillis"), or you can simply specify one of the following predefined locale names, which stands as a shortcut for the given language and country combination..

Locale Name	Language	Country
CANADA	English (en)	Canada (CA)
CANADA_FRENCH	French (fr)	Canada (CA)
CHINA	Chinese (zh)	China (CN)
FRANCE	French (fr)	France (FR)
GERMANY	German (de)	Germany (DE)
ITALY	Italian (it)	Italy (IT)
JAPAN	Japanese (jp)	Japan (JP)
KOREA	Korean (ko)	Korea (KR)
SPAIN	Spanish (es)	Spain (ES)
SWEDEN	Swedish (sv)	Sweden (SE)
TAIWAN	Chinese (zh)	Taiwan (TW)
UK	English (en)	Great Britain (GB)
US	English (en)	United State of America (US)

1.22 Importing from a Database Directly into the Recipient Warehouse

The Upload wizard that LISTSERV Maestro uses to assist the data administrator with modifying the data in an existing dataset or list has changed. The wizard is now considered an Import Members or Import Subscribers wizard and allows the data administrator to import recipients from a database directly into the Recipient Warehouse without having to first export the data into an CSV-file. Now all the data administrator has to do is specify a user database connection and a select statement to directly pull the recipients from that database.

Note: Before using this feature, please make sure the administrator has defined the settings associated with it. For details, see Section 2.5 Defining the Hosted Data Import Restrictions.

Because of this new feature, three things have been updated:

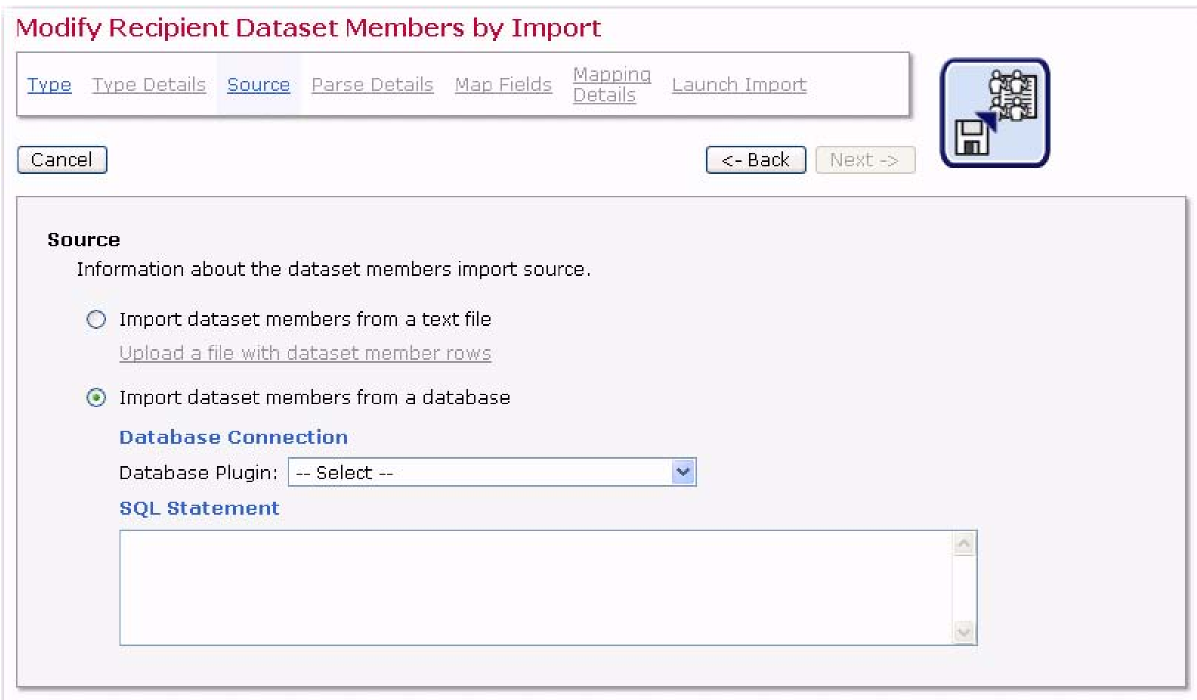
1. As stated above, the Upload wizard is now called the Import Members wizard or the Import Subscribers wizard.
2. To access the Upload Members wizard from the Recipient Wizard for a dataset, click on the **Dataset** menu, select **Member Import**, and then select **Import Members Now**.

To access the Upload Subscribers wizard from the Recipient Wizard for a list, click on the **Hosted List** menu, select **Subscriber Import**, and then select **Import Subscribers Now**.

3. The Source screen for the Import Members/Subscribers wizard now contains an option to **Import dataset members from a database** and enter a **SQL Statement**.

   When the option is selected, click the **Database Plugin** drop-down menu to select the database you'd like to import recipients from. Once you've selected the database, the Source screen refreshes and contains fields for your database information, such as **Database Name**, **SQL Server User Name**, **Password**, **Database Host Name**, and **TCP/IP Port or Instance Name**.

Figure 1-55 The New Import Members Wizard - Source Screen



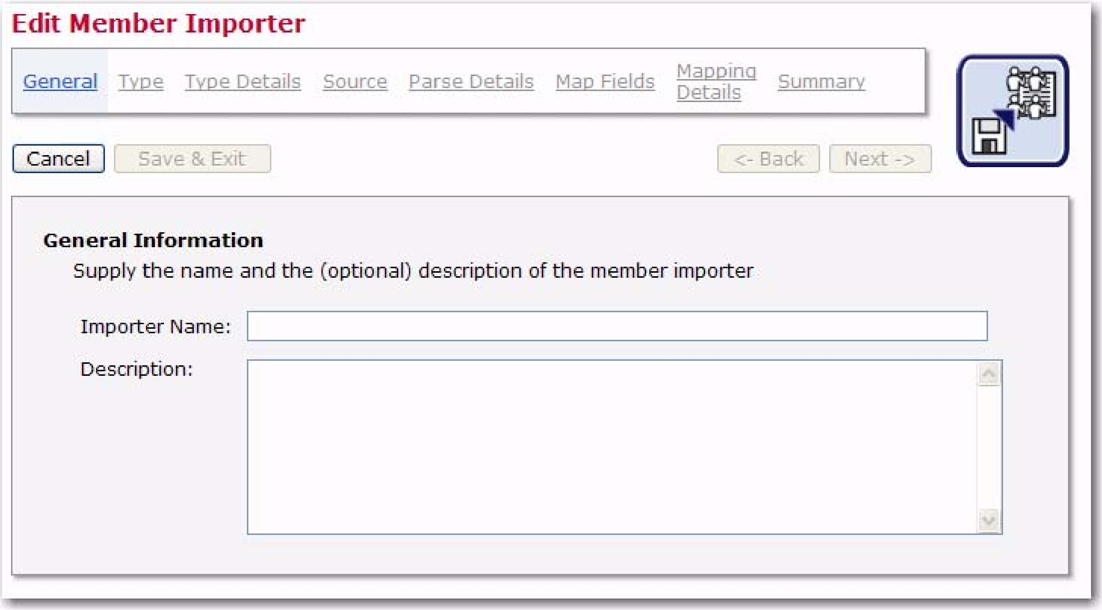
1.23 Defining Recipient Importers

For those occasions where you'd like to manage your dataset members or list subscribers on a regular basis, LISTSERV Maestro 4.0 now contains a feature that allows you to define these member or subscriber imports once. This lets you store these settings and run the import whenever necessary.

Note: Before using this feature, please make sure the administrator has defined the settings associated with it. For details, see Section 2.5 Defining the Hosted Data Import Restrictions.

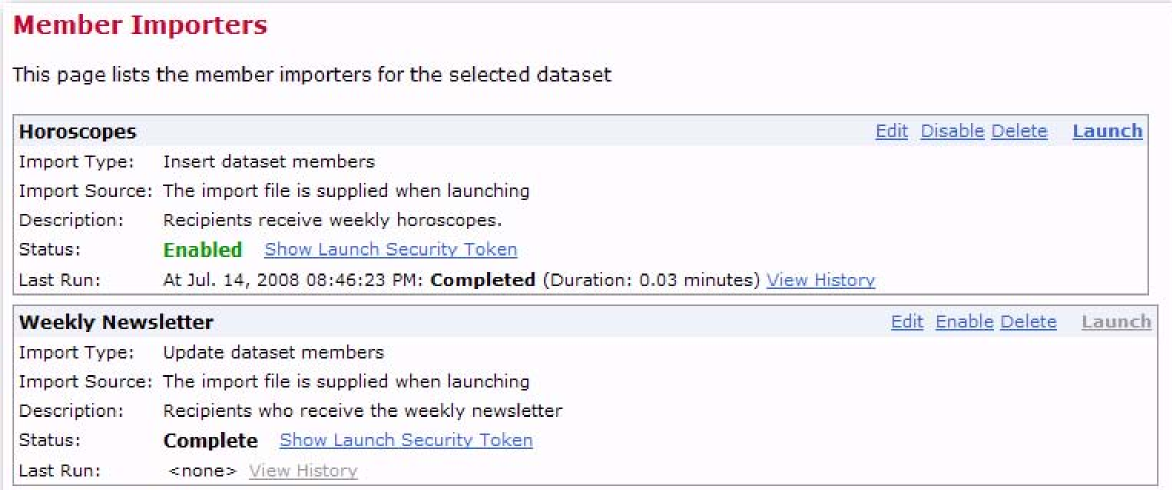
To define a Recipient Import for a dataset, go to the Recipient Warehouse, click on the dataset you'd like to work with, click on the **Dataset** menu, select **Member Importer**, and then select **New Member Importer**. The Edit Member Importer wizard open. This wizard mirrors the Import Members wizard. Define each page as you would the Import Members wizard (see Section 1.22 Importing from a Database Directly into the Recipient Warehouse for details).

Figure 1-56 The Edit Member Importer Wizard



Once you're finished defining the Member Importer, it will be listed on the Member Importers screen. To access this screen, click on the **Dataset** menu, click on **Member Importer**, and then select **Member Importers**.

Figure 1-57 The Member Importers Screen

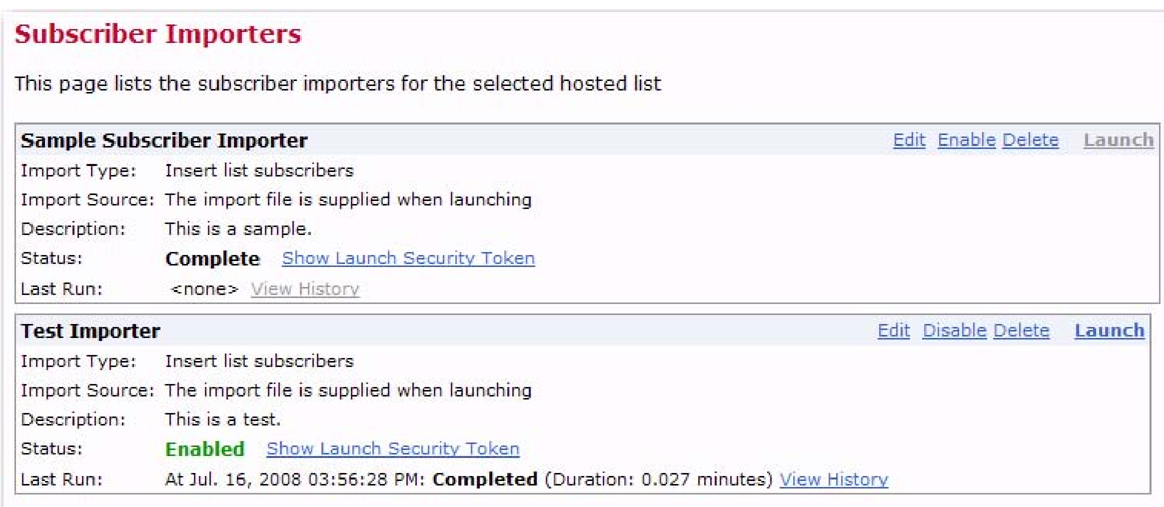


To define a Recipient Import for a list, go to the Recipient Warehouse, and then click on the dataset that contains the list you'd like to work with. From the Recipient Dataset Details screen, click on the list name, click on the **Hosted List** menu, select **Subscriber Importer**, and then select **New Subscriber Importer**. The Edit Subscriber Importer wizard open. This wizard mirrors the Import Subscribers wizard. Define each page as you would the Import Subscribers wizard (see Section 1.22 Importing from a Database Directly into the Recipient Warehouse for details).

Figure 1-58 The Edit Subscriber Importer Wizard

Once you're finished defining the Subscriber Importer, it will be listed on the Subscriber Importers screen. To access this screen, click on the **Hosted List** menu, click on **Subscriber Importer**, and then select **Subscriber Importers**.

Figure 1-59 The Subscribers Importers Screen



Before the Recipient Importer can be used, it needs to be enabled. To enable, click the **Enable** link. If you no longer want the importer available for use, but you don't want to permanently delete it, then click the **Disable** link. The Recipient Importer will remain on the Member Importer/Subscriber Importer screen.

To edit a Recipient Importer, click the **Edit** link associated with that importer. The Edit Member Importer/Edit Subscriber Importer wizard opens.

To delete a Recipient Importer, click the **Delete** link associated with that importer.

1.23.1 Launching a Recipient Importer

To run a Recipient Importer, click the **Launch** link associated with that importer. The Import Member/Import Subscriber wizard runs automatically according to the settings you defined for the Recipient Importer.

1.23.2 Launching a Recipient Importer Externally

In order to trigger the launch externally, the external process or application has to access the server where the LISTSERV Maestro User Interface (LUI) is running via HTTP (or HTTPS, depending on your setup). In addition, a security token must be obtained.

Note about Security Tokens: Since triggering a launch externally is a highly privileged operation, LISTSERV Maestro requires that the external process or application delivers a security token for authorization. This security token is assigned internally by LISTSERV Maestro.

To obtain the security token, simply click the **Show Launch Security Token** link to open a popup box. Copy the security token from this box and make sure that the external process or application accesses the URL described above, replacing `[SECURITY_TOKEN]` with the value pasted value from the popup box.

Note: To create a new security token, click the **Create New Launch Security Token** link in the popup box. Once a new security token is created, the old token is no longer valid and cannot be used to trigger a job externally.

Once you know the security token, the following URL must be accessed. A trigger URL always has the following form:

```
http[s]://[SERVER_NAME]/lui/externalAction.do?token=[SECURITY_TOKEN]
```

where `SERVER_NAME` is replaced with the name of your LISTSERV Maestro server. If a non-standard HTTP port is used, also include the port separated with a colon ":". If access to your LISTSERV Maestro is protected with HTTPS, you need to specify "https://" instead of "http://".

and where `SECURITY_TOKEN` is replaced with the security token for the action that the URL will trigger.

External triggers come in two variants:

- **Simple URL Access** – The action is triggered by accessing the external trigger URL with a HTTP GET-request.

  By accessing this URL, a HTTP GET-request is made to LISTSERV Maestro. The server then verifies the given security token and, if it is valid, triggers the corresponding action. The result of the action will be returned in the form of a HTTP response.

  If everything went well, a response with the status code "200 - OK" will be returned. In this case, the response body will contain the result of the action. Most actions will simply return a simple "OK" text in the result, but some actions may also return more data in the result; for example, if the purpose of the action was to download certain data from LISTSERV Maestro.

If there was a problem executing the action, a response with a different status code will be returned; for example, "404 - Not Found" if an invalid security token was specified.

- **URL Access with Additional Data** – The action is triggered by accessing the external trigger URL with a HTTP POST-request.

  In contrast to the "simple URL access" of above, the trigger URL must be accessed with a HTTP POST-request, and the additional data that is necessary for the action must be included as part of the request body. The data that is required depends on the action in question. Please see the description of the action for this information.

  The result of the action will be returned in the form of a HTTP response, just like for the "simple URL access" (see above for details).

Important: If you type the value manually, then make sure to maintain the exact spelling because security tokens are case sensitive.

1.23.3 Viewing a Recipient Importer's History

To view the usage history for the Recipient Importer, click on the **View History** link. The Importer Launch History screen opens.

To download error records, click on the **Download** link next to the error description. The data will be downloaded as a ZIP-file that contains the data in the form of a text file with comma separated values (a CSV-file). This CSV-data can then be imported into 3rd party tools (for example Excel) for further analysis.

Figure 1-60 Viewing the Member Importer's History

To delete entries from the Launch History screen, click on the **Scissor** icon above the entries you'd like to delete. The entries below this marker will be removed.

1.24 Downloading Dataset Members and List Subscribers Externally

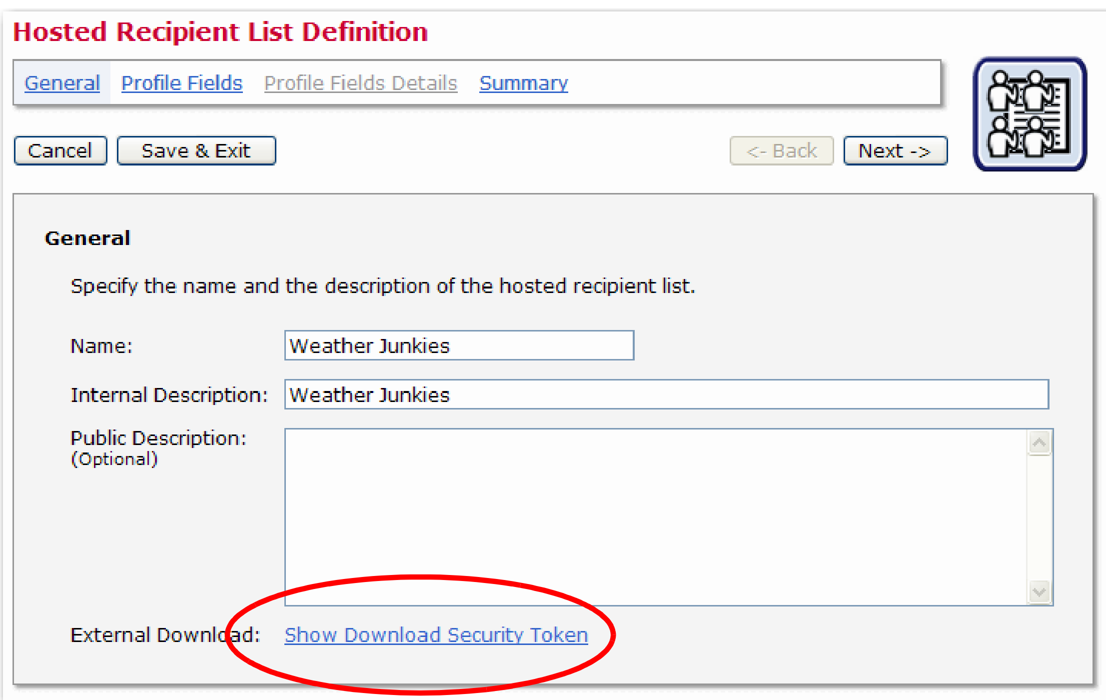
LISTSERV Maestro 4.0 now gives you the ability to download dataset members and/or list subscribers externally. For this to work, the external process or application has to access the server where the LISTSERV Maestro User Interface (LUI) is running via HTTP (or HTTPS, depending on your setup). In addition, a security token must be obtained.

Note about Security Tokens: Since downloading dataset members and list subscribers is a highly privileged operation, LISTSERV Maestro requires that the external process or application delivers a security token for authorization. This security token is assigned internally by LISTSERV Maestro.

To obtain the security token for a dataset, open the Recipient Dataset Details screen, click on the **Dataset** menu, and then select **Edit Dataset Settings**. The Recipient Dataset Definition wizard opens. On the General screen, the **External Download** field will contain a **Show Download Security Token** link. Click this link to open a pop-up box that contains the security token. Copy the security token and make sure that the external process or application accesses the URL described above, replacing `[SECURITY_TOKEN]` with the value from the popup box.

To obtain the security token for a list, open the Recipient Dataset Details screen, select the list, click on the **Hosted List** menu, and then select **Edit List Details**. The Hosted List Definition wizard opens. On the General screen, the **External Download** field will contain a **Show Download Security Token** link. Click this link to open a pop-up box that contains the security token. Copy the security token and make sure that the external process or application accesses the URL described above, replacing `[SECURITY_TOKEN]` with the value from the popup box.

Figure 1-61 Downloading Subscribers Externally



Note: To create a new security token, click the **Create New Download Security Token** link in the popup box. Once a new security token is created, the old token is no longer valid and cannot be used to trigger a job externally.

Once you know the security token, the following URL must be accessed. A trigger URL always has the following form:

```
http[s]://[SERVER_NAME]/lui/externalAction.do?token=[SECURITY_TOKEN]
```

where `SERVER_NAME` is replaced with the name of your LISTSERV Maestro server. If a non-standard HTTP port is used, also include the port separated with a colon ":". If access to your LISTSERV Maestro is protected with HTTPS, you need to specify "https://" instead of "http://".

and where `SECURITY_TOKEN` is replaced with the security token for the action that the URL will trigger.

External triggers come in two variants:

- **Simple URL Access** – The action is triggered by accessing the external trigger URL with a HTTP GET-request.

  By accessing this URL, a HTTP GET-request is made to LISTSERV Maestro. The server then verifies the given security token and, if it is valid, triggers the corresponding action. The result of the action will be returned in the form of a HTTP response.

  If everything went well, a response with the status code "200 - OK" will be returned. In this case, the response body will contain the result of the action. Most actions will simply return a simple "OK" text in the result, but some actions may also return more data in the result; for example, if the purpose of the action was to download certain data from LISTSERV Maestro.

  If there was a problem executing the action, a response with a different status code will be returned; for example, "404 - Not Found" if an invalid security token was specified.

- **URL Access with Additional Data** – The action is triggered by accessing the external trigger URL with a HTTP POST-request.

  In contrast to the "simple URL access" of above, the trigger URL must be accessed with a HTTP POST-request, and the additional data that is necessary for the action must be included as part of the request body. The data that is required depends on the action in question. Please see the description of the action for this information.

  The result of the action will be returned in the form of a HTTP response, just like for the "simple URL access" (see above for details).

Important: If you type the value manually, then make sure to maintain the exact spelling because security tokens are case sensitive.

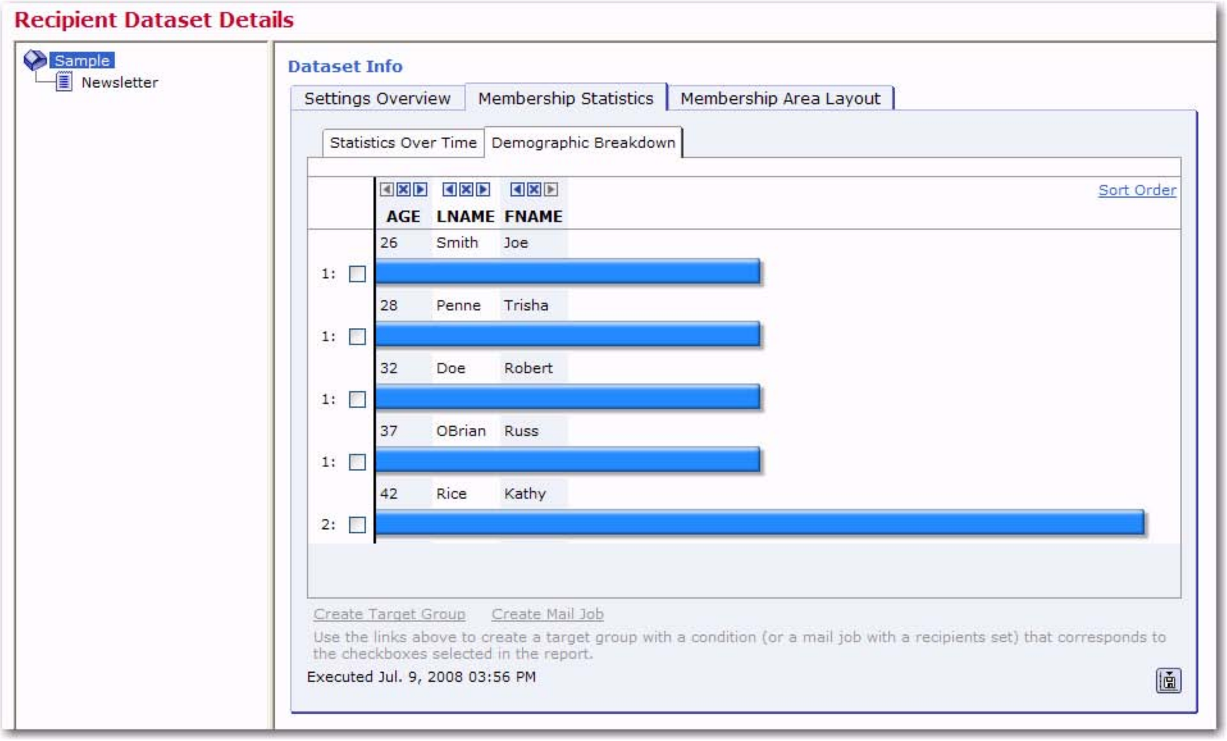
1.25 Viewing Demographic Reports for a Dataset or List

You can now view a Demographic Breakdown report on the members of the selected dataset or on the subscribers of the selected list.

To view the Demographic Breakdown report for a dataset, go to the Recipient Dataset Details screen for that dataset, click the Membership Statistics tab, and then click on the Demographic Breakdown sub-tab.

To view the Demographic Breakdown report for a list, go to the Recipient Dataset Details screen for the dataset that the list belongs to, click on the list name, click on the Subscriber Statistics tab, and then click on the Demographic Breakdown sub-tab.

Figure 1-62 Demographic Breakdown Report for a Dataset



By default, the report shows each individual profile with all available profile fields selected as report header columns. Up to 100 profiles are shown in the list.

The Demographic Breakdown report is most useful if profile fields with only a few different values are shown (fields that contain larger geographic regions or product groups are good candidates). Each profile values group is shown with its numeric count to the left and a bar whose length corresponds to this count.

To rearrange the order of the columns, use the left and right arrows associated with each column. To remove a column, simply click the **[x]** box. When you're finished rearranging the columns, click **[Apply]**.

To add a previously removed column to the report, click the **More Columns** link. This opens a drop-down menu with the previously removed columns; select the desired column to once again add it to the report header columns.

Note: You can add, remove, or reorder the report columns several times all at once. When you are satisfied with your report header columns, click the **[Apply]** button.

Important: The email and tracking permissions column types are never part of the Demographic Breakdown report. For more information, see the online help.

Use the **Sort Order** link to modify the ordering of the report result bars.

Below the report, information about when the report was executed is displayed.

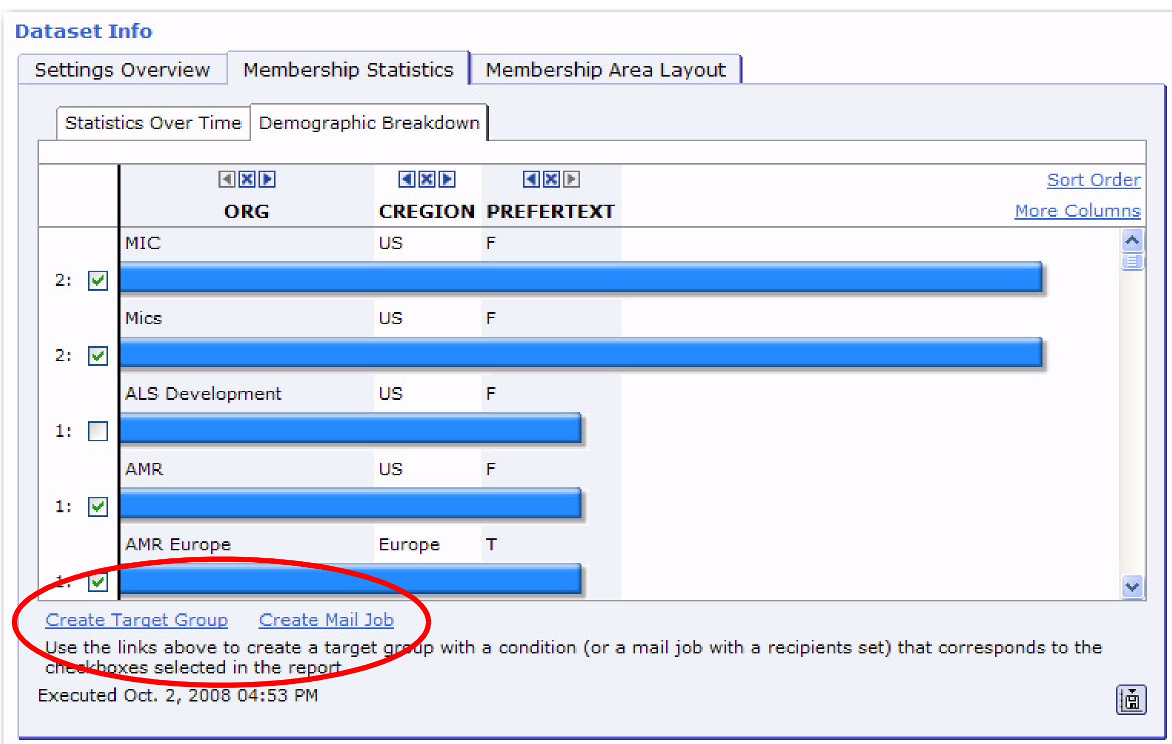
This message bar also contains the **Download** icon for the report at the very right. Click on the icon to open a popup menu that lets you chose between two different download formats:

- **Download as PDF** – The report will be downloaded in the form of a PDF file, for easy distribution or printing.
- **Download as Text File (CSV)** – The report will be downloaded in the form of a ZIP-file that contains the current report in the form of a text file with comma separated values (a CSV-file), plus an additional readme.txt file with details about the report. This CSV-data can be imported into 3rd party tools (such as Excel) for further analysis.

1.25.1 Sending Messages to Specific Demographics

LISTSERV Maestro 4.0 has made it easier than ever to send a message to a specific demographic in your dataset or list. Each bar in the report describes one particular demographic of the subscriber base. This gives you the chance to use the Demographic Breakdown report as a visual means to define the recipients set for either a target group or a mail job

Figure 1-63 Creating a Mail Job or Target Group Based on Demographics



To send a message to a specific subscriber base and immediately create a new mail job, go through the report and place a check next to each subscriber group you'd like to include in the mailing. Once this is done, click the **Create Mail Job** link. This opens the Start New Job screen. Enter the email jobs information and click **[OK]**. You'll be taken to the Workflow Diagram with the **Define Recipients** section completed for you. From here, finish creating your email job and authorize it for delivery. Only the selected subscribers will receive this message.

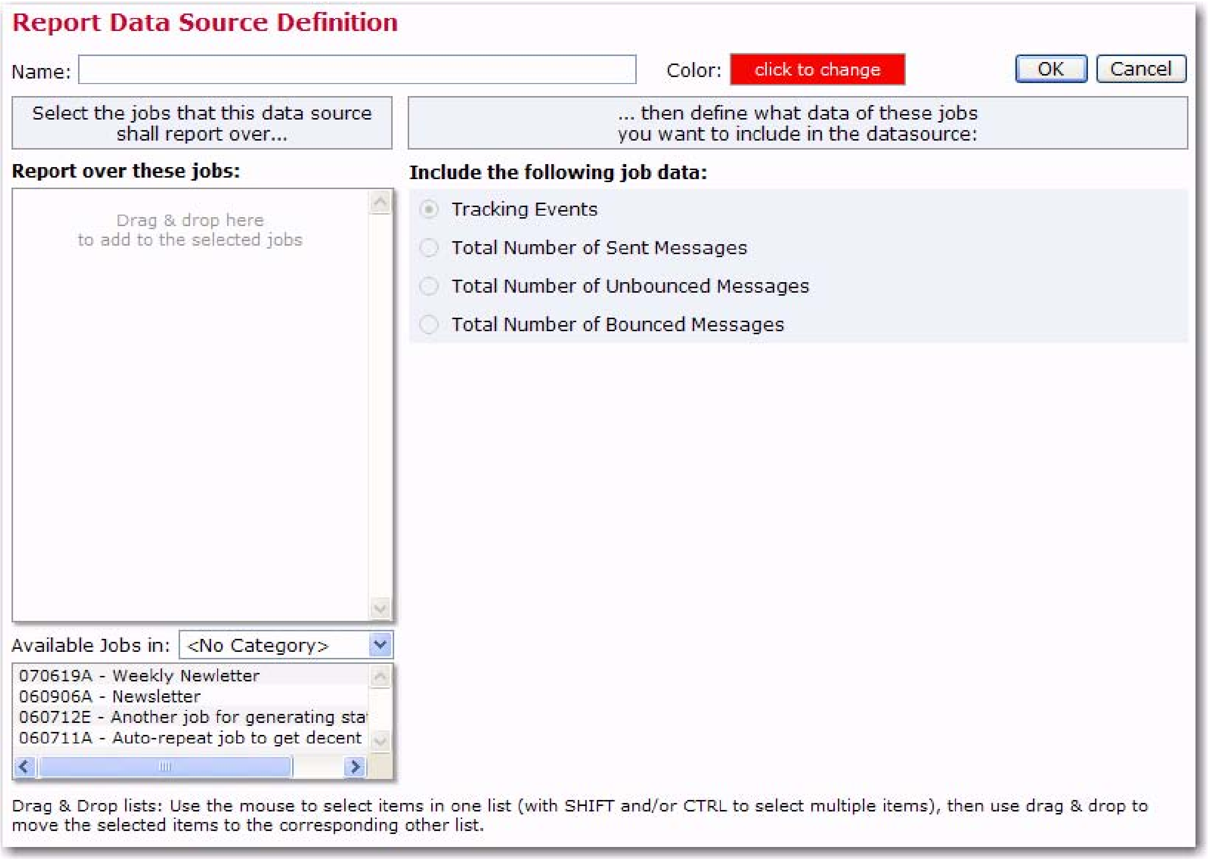
To reuse the subscriber base for several mail jobs, go through the report and place a check next to each subscriber group you'd like to include in future mailings. Once this is done, click the **Create Target Group** link. This opens the Target Group Definition wizard with settings that match the recipients selection defined by your selected checkboxes on the report. Use the Target Group Definition wizard to further refine the target group settings and to store the target group under a name of your choice for later use.

1.26 Using the New Report Data Source Wizard

Previously, when you defined a data source for a report, LISTSERV Maestro would guide you through a wizard. Now, with LISTSERV Maestro 4.0, the multi-paged wizard has become the sleek and user-friendly Report Data Source Definition screen.

To access this new screen, go to the Define Report screen, click on the Data Source tab, and then click the **[Add Data Source]** button.

Figure 1-64 The New Report Data Source Definition Screen



In the **Name** field, enter the name for the data source.

To change the color, click on the color swatch in the **Color** field and select the color from the color palette that appears.

To add jobs to the report, click on a job in the **Available Jobs** box and drag it to the **Report over these jobs** box. Click **[Apply]** when you are finished.

To remove a job from the **Report over these jobs** box, simply drag and drop it in the **Available Jobs** box. Click **[Apply]** when you are finished.

Figure 1-65 Dragging and Dropping Available Jobs

To include specific job data in the report, click on one of the following options in the **Include the following job data** section:

- **Tracking Events** – This requires additional information to be defined. See below for details.
- **Total Number of Sent Messages** – This includes all sent messages, regardless of whether the mail bounced or not.
- **Total Number of Unbounced Messages** – This includes the number of sent messages, minus the number of messages that were detected as bounces at the time the report is executed.
- **Total Number of Bounced Messages** – This includes the number of messages that were detected as bounces at the time the report is executed.

When the **Tracking Events** option is selected, additional information becomes available, letting you choose what tracking events will be included in the report:

- You can decide which type of events you'd like to track – **Open-Up Events**, **Click Events**, or **Action Events**, if available.

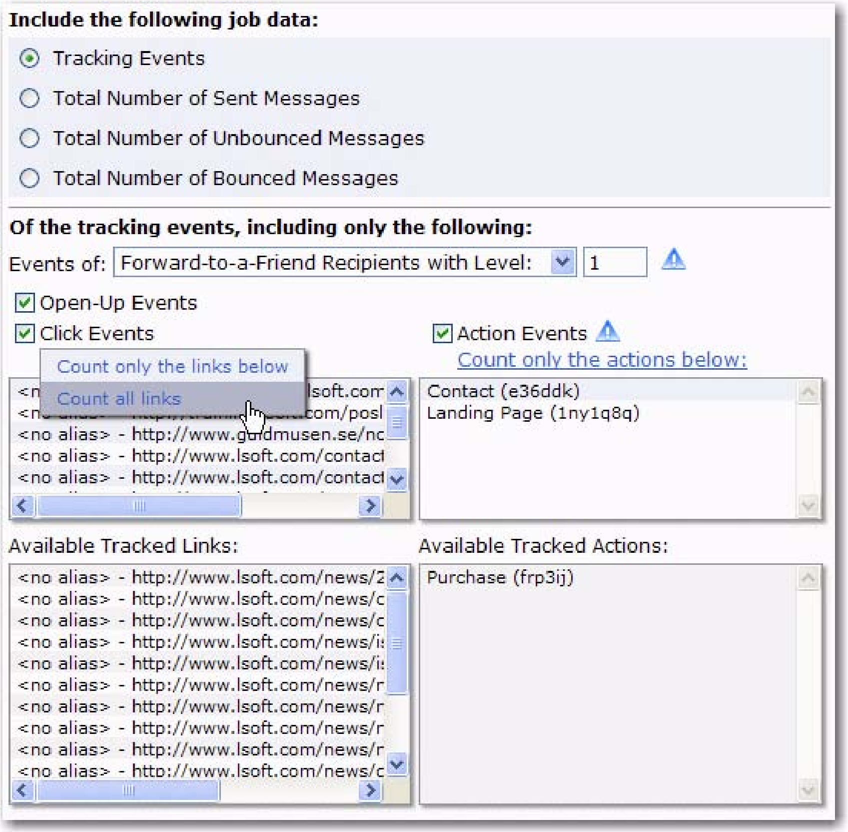
Note: Action Events are part of the new Action Tracking feature. For details see Section 1.2 Action Tracking.

- If you've selected any of the above events, then you can define which links and actions you'd like to track.

  For example, if **Click Events** is selected, then you can select the links you'd like tracked in the report. To do so, simply drag and drop the links from the **Available Tracked Links** box to the **Count only the links below** box. If you want to track all of the links, click on the **Count only the links below** link and select **Count all links**.

  Similarly, if **Action Events** is selected, then you can drag and drop the links from the **Available Tracked Actions** box to the **Count only the actions below** box. If you want to track all of the actions, click on the **Count only the actions below** link and select **Count all actions**.

Figure 1-66 Defining Tracking Events

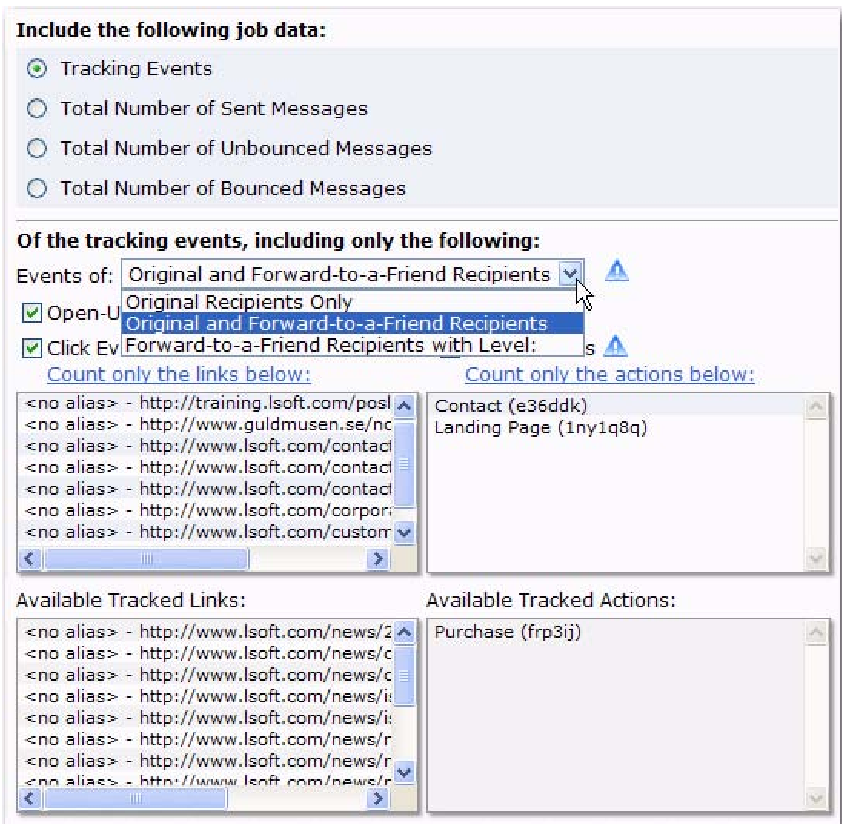


- If the Forward-to-a-Friend feature is used for any of the email jobs you're using in the report, then you can decide whether or not to track events performed by your original recipients or by both (original and friend-recipients). To define, click on the **Events of** drop-down and select one of the following options:
  - **Original Recipients Only** – If selected, then the report will only use events that were triggered by the original recipients of the email (there will be no

events triggered by friend-recipients). This is the same behavior that was present in earlier versions of LISTSERV Maestro (that is, before the 4.0 release). In addition, this is the same behavior found in Quick Reports.

- **Original and Forward-to-a-Friend Recipients** – If selected, then the report will use all events, both those triggered by original recipients and those triggered by any friend-recipients.
- **Forward-to-a-Friend Recipients with Level** – If selected, then an additional field becomes available. In this field, enter a number greater than or equal to 1. This number defines the forward-level you are interested in. The report will not include the events of the original recipients, but only of the friend-recipients of the given level. If you enter "1", then only events for friend-recipients of the 1st level will be included (i.e. only those friends that got the emails forwarded by the original recipients). If you enter "2", then only events for friend-recipients of the 2nd level will be included (i.e. only those friends who received the email forwarded by other friends from the 1st level), and so on...

Figure 1-67 Defining Job Data and Tracking Events



When you're finished defining the data source, click the **[OK]** button to return to the Define Report screen. Once you are finished defining the remaining report settings, click the **[Save & Execute]** button. The report is generated and displayed for viewing.

Figure 1-68 Example of a Report with Forward-to-a-Friend Events

1.27 Using the Updated Recipient Details Report

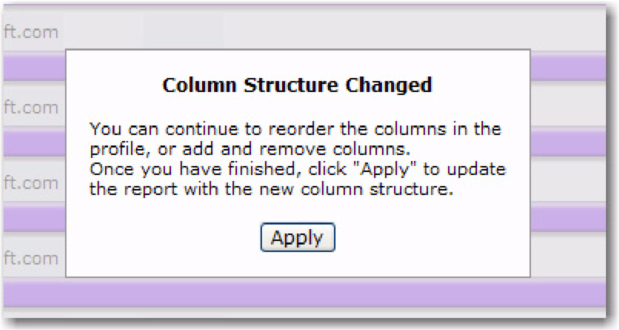
The Recipient Details report has been updated and is now more informative and user-friendly.

On the Reports tab of the Completed Job Details screen, the options for defining the Recipient Details report has been streamlined. When you select the **Recipient details** option, the **Include Data Sources For** section will contain the **Open-Up Events** and **Click-Through Events** options. When **Click-Through Events** is selected, you can select to **Separate data sources per link** or **Bundle all links in one data source**.

Once you are finished defining the report, click **[OK]**. The Recipient Details Report is displayed. The usability features for the report have changed.

To rearrange the order of the columns, you can use the left and right arrows associated with each column. In addition, to remove a column, simply click the **[x]** box. When you're finished rearranging the columns, click **[Apply]**.

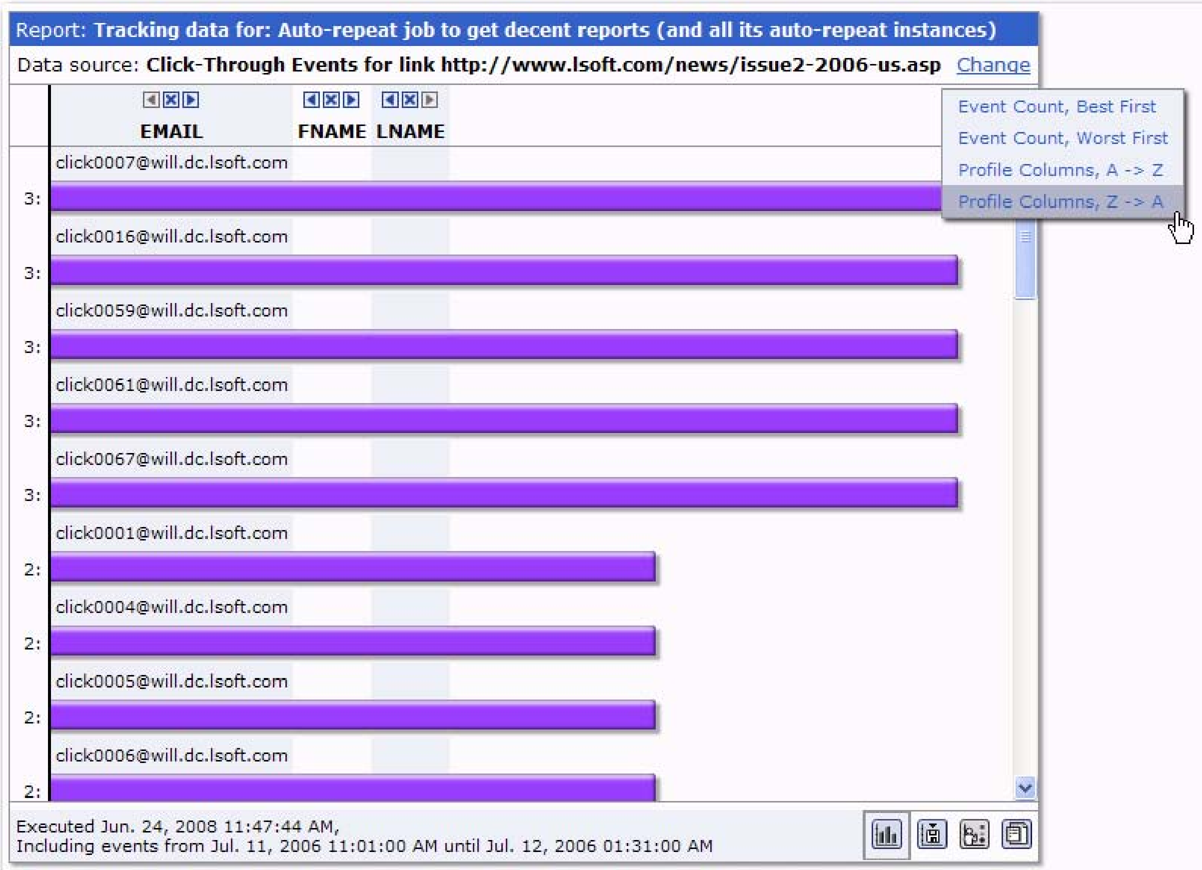
Figure 1-69 Applying Column Changes to the Recipient Details Report



If there are additional columns that are not shown on the report, then the **More Columns** link appears. Use this link to add columns to the report.

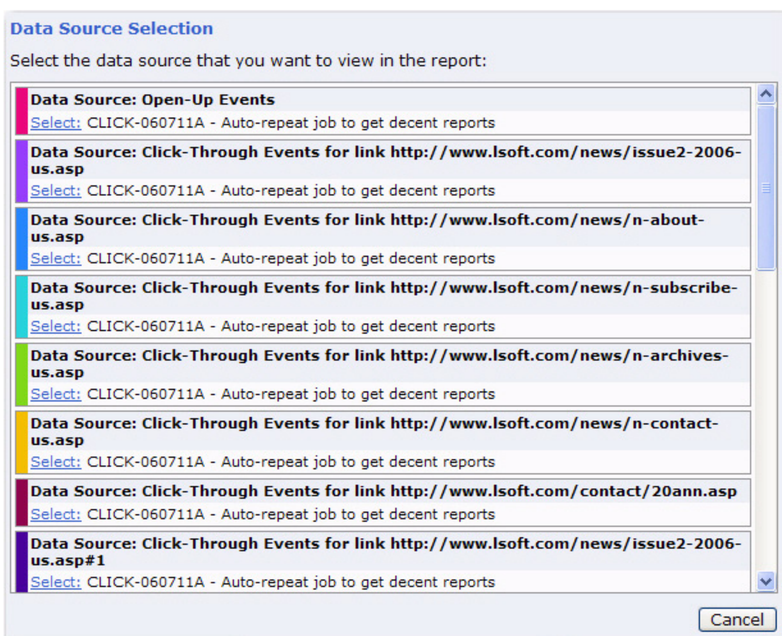
Another way to change the order of the data is to click on the **Sort Order** link and select a sort option from the pop-up menu.

Figure 1-70 Changing the Order of the Report Data



To change the data source for the report, click on the **Change** link. The Data Source Selection screen opens.

Figure 1-71 Changing the Data Source for the Recipient Details Report



From here, click on the **Select** link that is associated with the data source you'd like to use. The report will be refreshed using this new data source.

1.28 Updated Placeholder Attributes

The following placeholder attributes have been added or updated to accommodate other LISTSERV Maestro 4.0 enhancements. See the sections below for details.

1.28.1 Quick Login Option Profile Field Placeholders

This table lists the attributes that may be used with quick login option profile field placeholders.

Table 1-6 Quick Login Option Profile Field Placeholder Attributes

Attribute Name	Mandatory	Attribute Description
`styleclass`	No	Defines the name of the CSS style class (or classes) that will be assigned to the checkbox. Default: No style class.

1.28.2 Hide Subscription Option Profile Field Placeholders

This table lists the attributes that may be used with quick login option profile field placeholders. These placeholders are only available for Hosted LISTSERV Lists.

Table 1-7 Hide Subscription Option Profile Field Placeholder Attributes

Attribute Name	Mandatory	Attribute Description
`styleclass`	No	Defines the name of the CSS style class (or classes) that will be assigned to the checkbox. Default: No style class.

1.28.3 LISTSERV List Topic Profile Field Placeholders

This table lists the attributes that may be used with quick login option profile field placeholders. These placeholders are only available for Hosted LISTSERV Lists.

Table 1-8 LISTSERV List Topic Profile Field Placeholder Attributes

Attribute Name	Mandatory	Attribute Description
`styleclass`	No	Defines the name of the CSS style class (or classes) that will be assigned to the checkbox. Default: No style class.

1.28.4 Boolean or Tracking Permission Profile Field Placeholders

This table lists the attributes that may be used with Boolean profile field placeholder.

Table 1-9 Boolean Profile Field Placeholder Attributes

Attribute Name	Mandatory	Attribute Description
`type`	No	Defines how the boolean field will be rendered. Possible types are: checkbox (rendered as a checkbox), dropdown (rendered as a dropdown list with two choices), or radiogrid (rendered as a pair of radio buttons). Default: checkbox
Only for the `dropdown` or `radiogrid` types:		
`yes`	Yes	Defines the text of the dropdown list choices or the radio button that corresponds to the boolean `true` value.
`no`	Yes	Defines the text of the dropdown list choices or the radio button that corresponds to the boolean `false` value.
`order`	No	Defines the ordering of the two dropdown list choices or radio buttons. Possible order values are: `noyes` (the choice that corresponds to the boolean `false` value comes first, followed by the `true` choice) or `yesno` (the choice that corresponds to the boolean `true` value comes first, followed by the `false` choice). Default: `noyes`
Only for the `dropdown` type:		
`select`	No	Defines the text of a third choice that will always appear as the first choice of the dropdown list and which acts as a "reminder" choice. The user will not be allowed to submit the page while this choice is still selected. This choice is therefore only meant to remind the user to select one of the other two choices. Normally you would supply a text like "--Please Select--" or similar for this reminder choice. Defining the reminder choice is optional. Depending on if it is defined or not, the dropdown list will show the following behavior: If the boolean profile field does not yet have an associated value, and the reminder choice is defined, then when the page is displayed, the reminder choice will initially be selected. If however the reminder choice is not defined, then whichever of the other two choices is the first choice will initially be selected (see `order` above). If the profile field however already has a value, then the matching "yes" or "no" choice is initially selected, no matter if the reminder choice is present or not. **Note:** On pages where the profile field already has an associated value (and where the reminder choice would never be the initially selected choice anyway), this "select" attribute is not available as an attribute of the placeholder. On such pages, the dropdown list can only be defined with the two standard values. Default: No third choice will be available, only the two standard choices for `true` and `false` are shown.
Only for the `radiogrid` type:		

Attribute Name	Mandatory	Attribute Description
`align`	No	Defines how the two radio buttons will be aligned in respect to each other. Possible alignment values are: `horizontal` (the two radio buttons will appear in one horizontal row next to each other or `vertical` (the two radio buttons will appear stacked in one vertical column). Default: `horizontal`
If the placeholder is defined in a context where the enabled/disabled state of the field is the same under all circumstances, then:		
`styleclass`	No	Defines the name of the CSS style class(es) assigned to the checkbox. Default: no style class
If the placeholder is defined in a context where the enabled/disabled state of the field differs according to the circumstances, then:		
`enabledclass`	No	Defines the name of the CSS style class(es) assigned to the checkbox if the field appears in a disabled context. Default: no style class
`disabledclass`	No	Defines the name of the CSS style class(es) assigned to the checkbox if the field appears in a disabled context. Default: no style class

Section 2 What's New in the Administration Interface

Version 4.0 of LISTSERV Maestro has several new features in the Administration Interface that benefit the system administrator. This section gives you detailed information about the following new features:

- A new single sign-on feature is now available for the administrator, allowing one-click access to both the HUB and LUI. For details, see Section 2.1 Switching Between Interfaces.
- The Administration HUB now has a new look and feel that makes it easy to perform administration tasks. For details, see Section 2.2 New Look and Feel.
- LISTSERV Maestro now monitors your system metrics, which gives you access to status reports and helps you monitor the amount of free disk space on the installation disk. For details, see Section 2.3 Monitoring Your System Metrics.
- LISTSERV Maestro can now track actions that a user performs on a "target" website. For details on enabling this for the User Interface, see Section 2.4 Enabling Action Tracking.
- The data administrator can now save predefined "recipient importers" and import recipients directly into the Recipient Warehouse. Because of this, the Hosted Data settings have been updated. For details, see Section 2.5 Defining the Hosted Data Import Restrictions.
- SSL ciphers are now supported by LISTSERV Maestro. For details, see Section 2.6 SSL Cipher Support.
- The Tracking URL screen has been replaced by the URL Settings screen, which is where you define the various URLs used by the User Interface. Because of this new screen, several other settings have changed as well. For details, see Section 2.7 URL Settings and Other Hosted Data Changes.
- If the administrator can not login to the Administration HUB using the normal LUI login page because of a problem that stems from an incorrect configuration in the HUB, then the administrator can now have direct login access to the HUB in order to fix it. For details, see Section 2.8 Emergency Admin HUB Access.
- It is now possible to secure some users/groups with SSL (using https://) while other users/groups are not secured (using http://). For details, see Section 2.9 Mixing SSL and Non-SSL Access on One Server (Mixed Mode).
- You can now export the data of a delivered job, including tracking events, into an XML file. For details, see Section 2.10 Exporting LISTSERV Maestro Job Data to an XML File.
- You can now configure LISTSERV Maestro to bind to different ports on different IP addresses, if necessary. For details, see Section 2.11 Configuring LISTSERV Maestro to Bind to Different HTTP Ports on Different IP Addresses.

- You can now configure LISTSERV Maestro to act as a backend server behind IIS. For details, see Section 2.12 Sharing a Server with IIS.
- You can now configure aliases for the access URLs in the Administrative HUB. For details, see Section 2.13 Configuring Aliases for the Access URLs.

2.1 Switching Between Interfaces

With the new Single Sign-On feature, the LISTSERV Maestro Administrator can now switch back and forth between the Administration HUB and User Interface with one click. No more hassle, no more logging in and out, just one simple click is all it takes.

To access LISTSERV Maestro, open a web browser and access the URL:

```
http://<YOUR_MAESTRO_USER_INTERFACE_HOST>/lui
```

In the URL above, you need to replace "<YOUR_USER_INTERFACE_HOST>" with the hostname of the server running the Maestro User Interface component (LUI). In addition, if the server uses a different HTTP-port than the standard port "`80`", then you need to include this different port with the host name, separated with a colon "`:`", like this: "`http://HOSTNAME:PORT/lui`".

This URL provides access both to the Maestro User Interface (for normal users and the administrator) and to the Administration Interface (for the administrator only); in addition, the URL redirects you to the new login area.

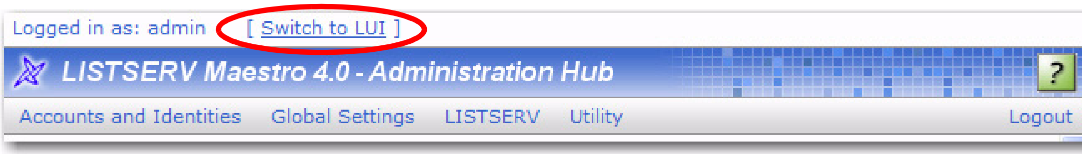
From here, click on the **Start LISTSERV Maestro Session** link to open the Login Screen.

Figure 2-1 LISTSERV Maestro Login Screen

Enter the Administrator's user name and password (the user name is admin and the password is established during installation). Click the **[Login]** button to enter the Administration HUB.

To switch to the LISTSERV Maestro User Interface, simply click the **Switch to LUI** link at the top of the HUB screen. To switch back to the HUB, click **Switch to HUB**.

Figure 2-2 Switching Between Interfaces



Note: If you switch to the User Interface and then logout from there, the next time you (as the administrator) login, you will taken directly to the User Interface. Similarly, if you logout of the HUB, the next time you login, you will be taken directly to the HUB.

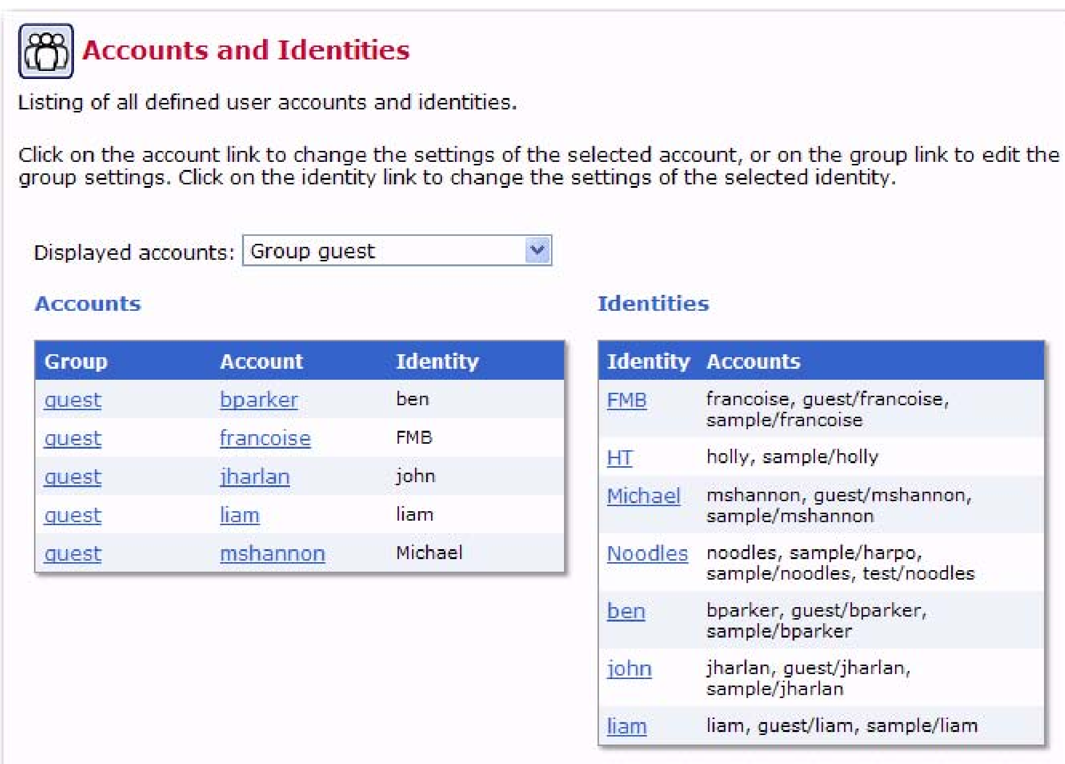
2.2 New Look and Feel

The Administration HUB has now been streamlined for easier use and accessibility.

2.2.1 The Home Page

The Accounts and Identities screen is now the opening screen of the LISTSERV Maestro Administration HUB. This screen gives you quick and immediate access to one of the most important administrative duties – managing user accounts.

Figure 2-3 New Administration HUB Home Page



2.2.2 The Toolbar

The Toolbar contains menus and icons that give you quick access to the different functions in LISTSERV Maestro, letting you easily navigate from one area to another. It appears on each LISTSERV Maestro page and displays the currently available options.

Note: There are quite a few different sub-menus and options that may appear in the various parts of the main menu. However, not all of these options and sub-menus are always visible. The main menu and its sub-menus only show those options and menus that are currently available according to the context of the page you are on.

Figure 2-4 The Toolbar

The **Accounts and Identities** menu contains options for the creation and administration of user accounts and identities. The possible options are:

- **Accounts and Identities Overview** – Display the Accounts and Identities screen.
- **New Account** – Create a new user account.
- **New Identity** – Create a new identity.

The **User Account** menu is only available when a user is selected. It contains options to administer the currently selected user account. The possible options are:

- **Edit** – Edit the account name, group, identity, and/or password, and define if the account is allowed to change its password or not.
- **Delete** – Delete the user account.
- **User Right Settings** – Define the user rights for the selected account.
- **LISTSERV Connection** – Define the LISTSERV connection settings for the selected account.
- In addition, if the selected account is a single (non-group) user account, then all of these options are also available:
  - **URL Settings** – Define the settings for various URLs used by LUI for the selected account.
  - **Size Limits** – Define the message size limit for the selected account.
  - **Job ID Prefix** – Define the job-ID prefix for the selected account.
  - **Lite Mode Restrictions** – Define the lite mode restrictions for the selected account.
  - **Content Restrictions** – Define the content restrictions for the selected account.
  - **Recipients Restrictions** – Define the recipients restrictions for the selected account.
  - **Tracking Restrictions** – Define the tracking restrictions for the selected account.

- **Hosted Data Settings** – Define the hosted data settings for the selected account.
- **DomainKeys Settings** – Define the DomainKeys settings for the selected account.
- **Auto-Archive Settings** – Define the auto-archive settings for the selected account.

The **Group** menu is only available when a group is selected. It contains options to administer the currently selected group. The possible options are:

- **Delete** – Delete the selected group and all accounts in it.
- **LISTSERV Connection** – Define the LISTSERV connection settings for the selected group.
- **URL Settings** – Define the settings for various URLs used by LUI for the selected group.
- **Size Limits** – Define the message size limit for the selected group.
- **Job ID Prefix** – Define the job-ID prefix for the selected group.
- **Lite Mode Restrictions** – Define the lite mode restrictions for the selected group.
- **Content Restrictions** – Define the content restrictions for the selected group.
- **Recipients Restrictions** – Define the recipients restrictions for the selected group.
- **Tracking Restrictions** – Define the tracking restrictions for the selected group.
- **Hosted Data Settings** – Define the hosted data settings for the selected group.
- **DomainKeys Settings** – Define the DomainKeys settings for the selected group.
- **Auto-Archive Settings** – Define the auto-archive settings for the selected group.

The **Global Settings** menu contains options to administer the global configuration settings. The possible options are:

- **Administration Hub** – Define the global configuration settings for the Administration Hub component. The sub-menu may contain the following options:
  - **General Administration** – Configure general Administration Hub related settings.
  - **Administrative E-mail Notifications** – Configure the email notification settings (for all components).
- **Maestro User Interface** – Define the global configuration settings for the Maestro User Interface component. The sub-menu may contain the following options:
  - **General Administration** – Configure general Maestro User Interface related settings.
  - **Database Plugins** – Configure the available database plugins.
  - **System Database Connection** – Configure the system database connection.
  - **User Rights** – Configure the Maestro User Interface specific user rights of all user accounts.

- **LISTSERV Web Interface Access** – Define the configuration for direct access to the LISTSERV Web Interface (WA) from the LISTSERV Maestro Interface (and vice versa). The sub-menu may contain the following options:
  - **LISTSERV Web Interface Links** – Configure links between the LISTSERV Maestro User Interface and one or several LISTSERV Web Interfaces (WAs).
  - **LISTSERV Web Interface Account Mappings** – Configure mappings between LISTSERV Maestro accounts and LISTSERV Web Interface (WA) accounts, to allow a user to move between the two interfaces without having to login again.
- **Default URL Settings** – Define the default settings for various URLs used by LUI.
- **Default LISTSERV Connection** – Define the default LISTSERV connection settings.
- **Default Tracking URL** – Define the default tracking URL.
- **Default Size Limits** – Define the default message size and file upload size limits.
- **Default Lite Mode Restrictions** – Define the default lite mode restrictions.
- **Default Content Restrictions** – Define the default content restrictions.
- **Default Recipients Restrictions** – Define the default recipients restrictions.
- **Default Tracking Restrictions** – Define the default tracking restrictions.
- **Default Hosted Data Settings** – Define the default hosted data settings.
- **Default DomainKeys Settings** – Define the default DomainKeys settings.
- **Default Auto-Archive Settings** – Define the default auto-archive settings.

- **Maestro Tracker** –Sub-menu for global configuration settings for the Maestro Tracker component. The sub-menu may contain the following options:
  - **General Administration** – Configure general Maestro Tracker related settings.

The **Utility** menu contains general administer options. The possible options are:

- **Change Password** – Change the password of the administrator account.
- **Print Page** – Print the current page/screen.
- **About LISTSERV Maestro** – Show LISTSERV Maestro version information.

The **Logout** option allows you to log out from LISTSERV Maestro (after first confirming that you really want to log out).

The **Help** icon is used to access the help associated with the current screen.

2.3 Monitoring Your System Metrics

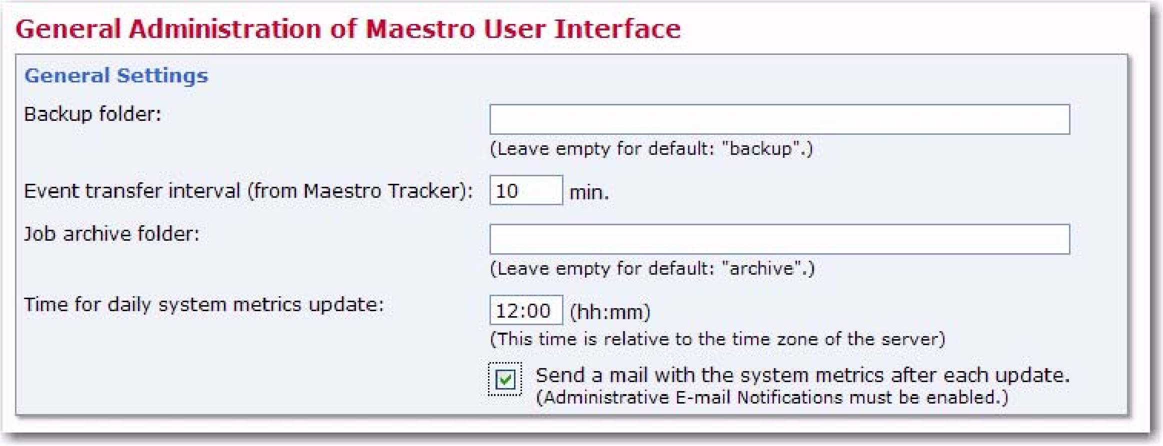
The administrator can now access and monitor system metrics in the User Interface.

2.3.1 Setting the System Metrics Options

To set/change the time for your daily system metrics to update, go to the Administration HUB, click on the **Global Settings** menu, select **Maestro User Interface**, and then select **General Administration**. At the top of the General Administration of Maestro User Interface screen, enter a time in the **Time for daily system metrics update** field. The default is 12:00.

To enable email messages to show you how much disk space is being used, check **Send a mail with the system metrics after each update**.

Figure 2-5 System Metrics Options in the HUB



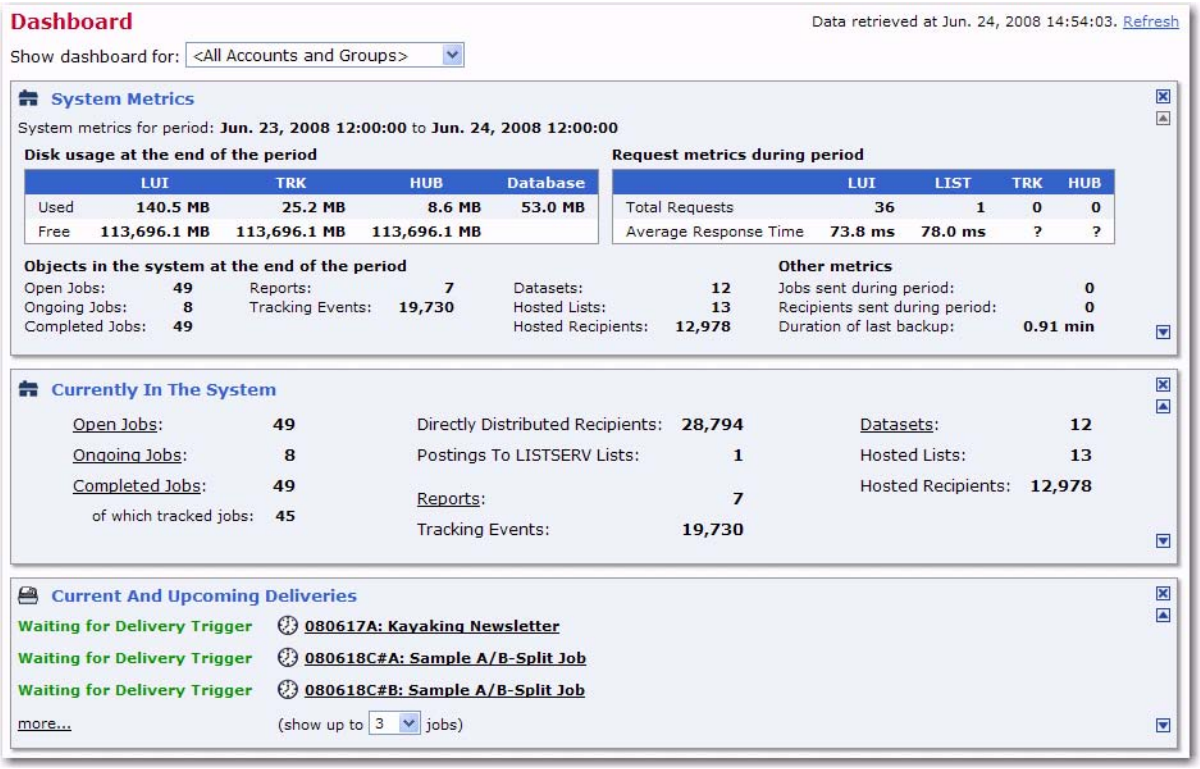
2.3.2 The Dashboard

For the administrator, the Dashboard in the User Interface now contains a new section called **System Metrics**.

This new section gives you a complete overview of every group and account for a specific period of time. You can view:

- How much space the User Interface, the HUB, the Maestro Tracker, and your database are using, as well as how much space is free.
- How many objects are in the system, such as open, ongoing, and completed jobs; reports; tracking events; datasets; hosted lists; and recipients.
- How many jobs were sent and how many recipients these jobs were sent to.
- How long the last backup took.

Figure 2-6 System Metrics on the Dashboard

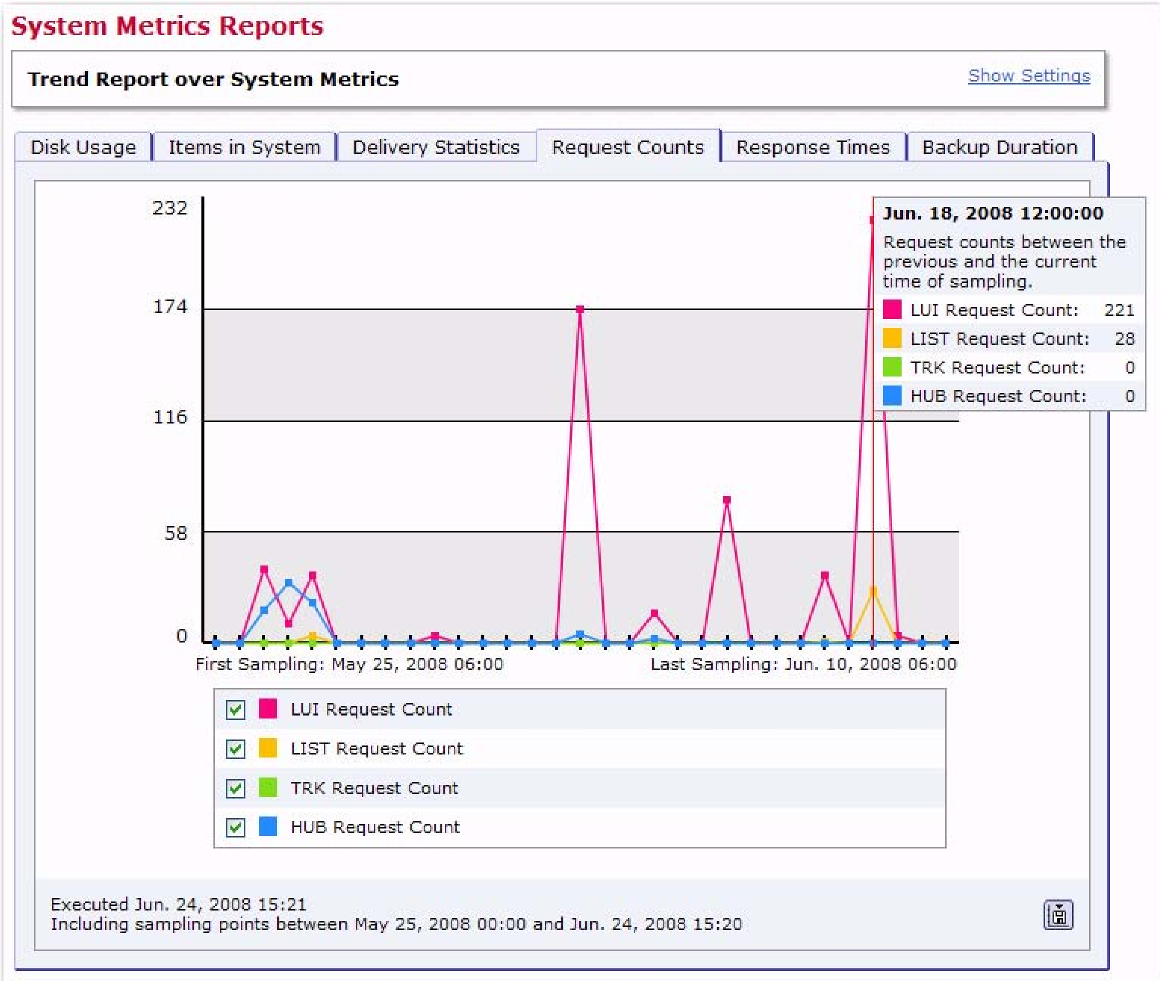


2.3.3 System Metrics Reports

Your system metrics can also be shown in a set of reports that show trends in how your system is running. Similar to other LISTSERV Maestro reports, you can drill-down into specific events on these reports to see detailed information, and you can also run them for the immediate past or for a fixed period of time.

To run a system metrics report, click on the **Reports** menu and select **System Metrics**. The System Metrics report opens with several tabs. Each tab contains a different report pertaining to a specific type of data.

Figure 2-7 The System Metrics Report - Request Counts Tab



2.3.3.1 Adding to the Dashboard

To add a specific System Metrics report to the Dashboard, click on the **Report** menu and select **Add Report to Dashboard**. This will only add the report that was being viewed (e.g. the report on the Request Counts tab); it does not add the entire set of reports. You can add up to 20 reports on the Dashboard; therefore, if you’d like to add other System Metric reports, simply click on their tab and then add it to the Dashboard.

If you click on the report on the Dashboard, the entire set of System Metrics reports will open. If you make any changes to the report that was on the Dashboard, then the **Apply Settings to Report on Dashboard** option will be available on the **Report** menu. However, if you go to the System Metrics report by selecting it from the **Report** menu, and click on the tab to view that same report, then this option will not appear since this is a different version than the one on the Dashboard. If you’d like to add another version of that report to the Dashboard, then simply add it to the Dashboard using the **Add Report to Dashboard** option.

Note: The **Apply Settings to Report on Dashboard** option will only appear for that specific report that was on the Dashboard. For instance, if you added the Request

Counts report to the Dashboard, then that is the only report/tab in the set of System Metrics reports that will have this option available.

2.3.3.2 Downloading

You can download the entire set of System Metrics reports or just a single report.

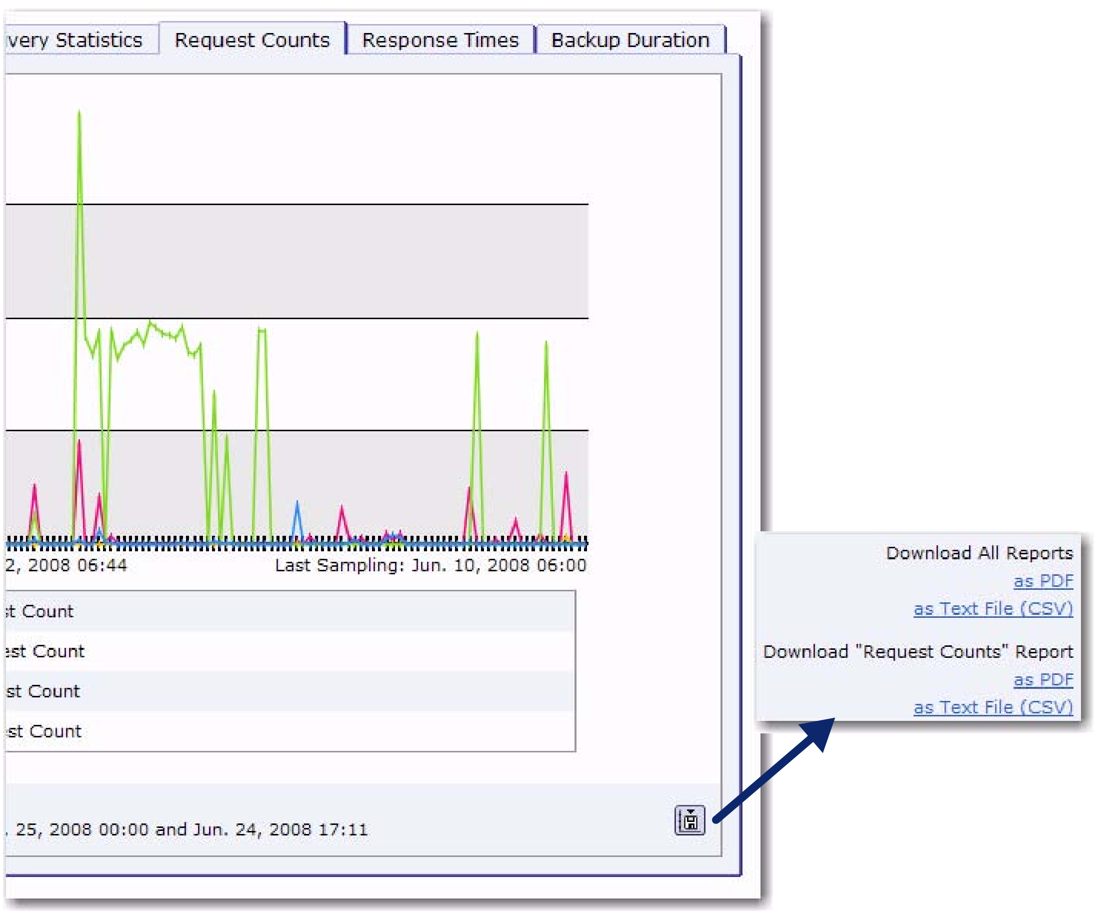
To download the entire set of reports, simply click on the **Download** icon from any tab. A pop-up menu appears with options to download all reports **as PDF** or **as Text File (CSV)**.

To download a specific report, go to that tab, and then click on the **Download** icon. A pop-up menu appears with an option to download that specific report **as PDF** or **as Text File (CSV)**.

Tips on Download Formats:

- **Download as PDF** – The report will be downloaded in the form of a PDF file for easy distribution or printing.
- **Download as Text File (CSV)** – The report will downloaded in the form of a ZIP-file that contains the current report in the form of a text file with comma separated values (a CSV-file), plus an additional readme.txt file with details about the report. This CSV-data can be imported into 3rd party tools (such as Excel) for analysis.

Figure 2-8 Downloading the System Metrics Report



2.4 Enabling Action Tracking

Action Tracking is a cookie-based method to track actions and page visits that recipients perform after they have read your email message and followed the links to the target website. For this to be available for users in the LISTSERV Maestro User Interface, the administrator must enable it first.

To enable Action Tracking for the entire User Interface, click on the **Global Settings** menu, select **Maestro User Interface**, and then select **Default Tracking Restrictions**. The Tracking Restrictions screen opens. From here, select **Enable Action Tracking**.

To enable for a specific user that is not in a group, click on the account name on the Accounts and Identities screen. This opens the User Account Overview screen. From here, click on the **User Account** menu and select **Tracking Restrictions**. The Tracking Restrictions screen opens. From here, select **Enable Action Tracking**.

To enable for a specific group, click on the group name on the Accounts and Identities screen. This opens the Group Overview screen. From here, select the **Group** menu and select **Tracking Restrictions**. The Tracking Restrictions screen opens. From here, select **Enable Action Tracking**.

Figure 2-9 Enabling Action Tracking for the User Interface

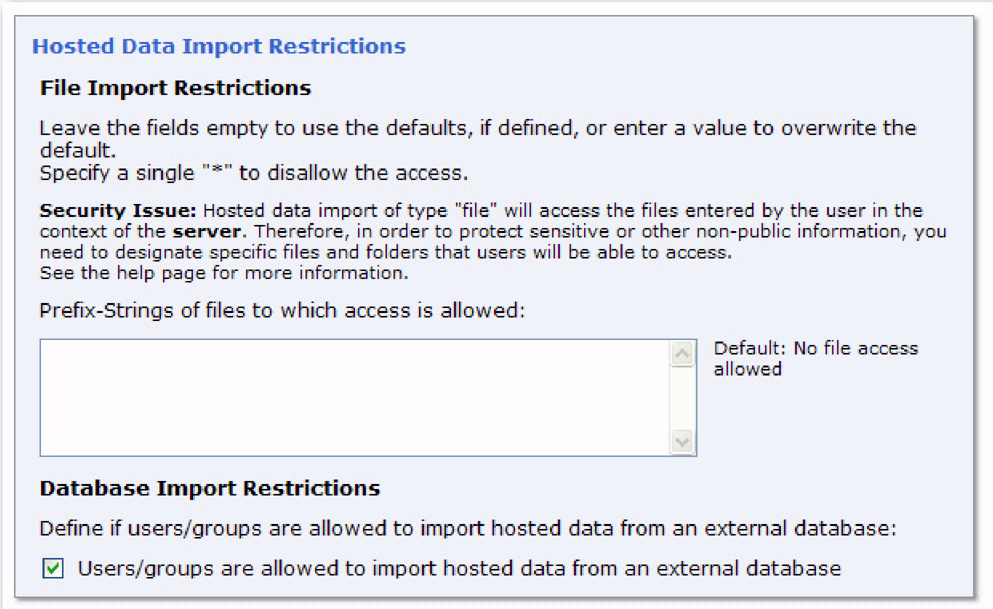
2.5 Defining the Hosted Data Import Restrictions

A Recipient Importer can either pull data from a database or read it from a file. In the latter case, the file can either be provided by the user at the moment the Recipient Importer is launched, or it can be read from a pre-defined location on the server (defined during importer definition). In addition, a Recipient Importer can be launched manually (from inside User Interface) or externally (with an external trigger, via a URL). Depending on the importer type and the method that is used for launching it, the following will happen:

1. The Recipient Importer reads from a database and is then launched manually. As soon as the importer is launched, it reads the current data from the external database and imports it into the hosted object.
2. The Recipient Importer reads from a database and is then launched with an external trigger. As soon as the importer is launched, it reads the current data from the external database and imports it into the hosted object. (The request to the trigger URL does not contain any additional data, as the data is read from the database.)
3. The Recipient Importer reads from a file that is provided by the user during launch, and then the importer is launched manually. When the importer is launched, the system first asks the user to select a file to upload. This is the file that the importer is supposed to process. Once the file is uploaded (from the user's local system), the importer processes it.
4. The Recipient Importer reads from a file that is provided by the user during launch, and then the importer is launched with an external trigger. The request to the external trigger URL must be a special POST-request that already contains the file data that the importer will process. (That is, the POST-request to the trigger URL is two things at once – it is the actual trigger that starts the importer, and it is also the upload that provides the data for the importer.)
5. The Recipient Importer reads from a file at a pre-defined server location, and then the importer is launched manually. When the importer is launched, it reads the file from the pre-defined location at the server and processes it. The location was pre-defined when the importer was initially created (in the Member/Subscriber Importer wizard).
6. The Recipient Importer reads from a file at a pre-defined server location, and then the importer is launched with an external trigger. When the importer is launched, it reads the file from the pre-defined location at the server and processes it. The location was pre-defined when the importer was initially created (in the Member/Subscriber Importer wizard). (The request to the trigger URL does not contain any additional data, as the data is read from the file on the server.)

For the last two cases, #5 and #6, additional settings will need to be defined. To do so for the entire User Interface, click on the **Global Settings** menu, select **Maestro User Interface**, and then select **Default Hosted Data Settings**. The Hosted Data Settings screen opens. In the **Hosted Data Import Restrictions** section, define the file import restrictions and prefix strings for the files that access is allowed for. Access to the server files is restricted and only files that start with one of the prefixes defined here are allowed.

Figure 2-10 The Hosted Data Import Restrictions Section on the Hosted Data Settings Screen



Important: The option to import the data from a text file is only available in the Member/Subscriber Importer wizard if there is at least one such prefix defined. Similarly, the option to define an importer that reads from an external database is only available if the **Users/groups are allowed to import hosted data from an external database** option is checked. These settings can also be set on a group or single user basis.

2.6 SSL Cipher Support

The following table lists the SSL ciphers that are supported by LISTSERV Maestro. It also shows which ciphers are enabled as allowed ciphers by default, if the SSLCiphers setting in the tomcat.ini is not defined. If you want to define a different set of allowed SSL ciphers, add the SSLCiphers setting to the tomcat.ini and specify the cipher-names in a comma separated list as the value of the setting.

Table 2-1 Supported SSL Ciphers

Name	Allowed by Default
SSL_RSA_WITH_RC4_128_MD5	Yes
SSL_RSA_WITH_RC4_128_SHA	Yes
TLS_RSA_WITH_AES_128_CBC_SHA	Yes
TLS_DHE_RSA_WITH_AES_128_CBC_SHA	Yes
TLS_DHE_DSS_WITH_AES_128_CBC_SHA	Yes
SSL_RSA_WITH_3DES_EDE_CBC_SHA	Yes
SSL_DHE_RSA_WITH_3DES_EDE_CBC_SHA	Yes
SSL_DHE_DSS_WITH_3DES_EDE_CBC_SHA	Yes

Name	Allowed by Default
SSL_RSA_WITH_DES_CBC_SHA	Yes
SSL_DHE_RSA_WITH_DES_CBC_SHA	Yes
SSL_DHE_DSS_WITH_DES_CBC_SHA	Yes
SSL_RSA_EXPORT_WITH_RC4_40_MD5	Yes
SSL_RSA_EXPORT_WITH_DES40_CBC_SHA	Yes
SSL_DHE_RSA_EXPORT_WITH_DES40_CBC_SHA	Yes
SSL_DHE_DSS_EXPORT_WITH_DES40_CBC_SHA	Yes
SSL_RSA_WITH_NULL_MD5	
SSL_RSA_WITH_NULL_SHA	
SSL_DH_anon_WITH_RC4_128_MD5	
TLS_DH_anon_WITH_AES_128_CBC_SHA	
SSL_DH_anon_WITH_3DES_EDE_CBC_SHA	
SSL_DH_anon_WITH_DES_CBC_SHA	
SSL_DH_anon_EXPORT_WITH_RC4_40_MD5	
SSL_DH_anon_EXPORT_WITH_DES40_CBC_SHA	
TLS_KRB5_WITH_RC4_128_SHA	
TLS_KRB5_WITH_RC4_128_MD5	
TLS_KRB5_WITH_3DES_EDE_CBC_SHA	
TLS_KRB5_WITH_3DES_EDE_CBC_MD5	
TLS_KRB5_WITH_DES_CBC_SHA	
TLS_KRB5_WITH_DES_CBC_MD5	
TLS_KRB5_EXPORT_WITH_RC4_40_SHA	
TLS_KRB5_EXPORT_WITH_RC4_40_MD5	
TLS_KRB5_EXPORT_WITH_DES_CBC_40_SHA	
TLS_KRB5_EXPORT_WITH_DES_CBC_40_MD5	

2.7 URL Settings and Other Hosted Data Changes

The Tracking URL screen has been replaced by the URL Settings screen, which is where you define the various URLs used by the User Interface. Because of this new screen, please note the following changes as well:

- To define the subscriber pages URL, instead of using the Hosted Data Settings screen, you will now use the new URL Settings screen.

- Previously, when you wanted to define the login restrictions host name you would use the Login Restrictions screen. This screen has been removed, and any login restrictions are now defined on the new URL Settings screen.

The URL Settings screen defines the settings for the various URLs used by LUI.

If defined on the application level, then these settings will be used as defaults for all accounts that do not have individual settings on the group or user level.

- **LUI Access URL** – The LUI access URL is used by the LUI users and the admin, to access the LUI user interface. For some LUI interface pages, the system needs to include this access URL on the page itself (for example to create a link). The URL that the system uses for this is generated using the settings supplied here. If a setting is not supplied, the displayed default value will be used.

  Specify the **Host Name**, **HTTP Port**, and **Protocol** (either HTTP or HTTPS) that is to be used to generate the LUI access URL.

  Only on user/group level: If a LUI server has several host names assigned, then normally a user can use any of these host names to access LUI. If you want to restrict the user to only be able to login when he uses the host name as specified here, check the User must use this host name for login option. If checked, then a login by the user to which this setting applies will only be successful, if the user has used the same host name in his access URL as is specified here. If the user uses a different host name in his access URL, the system will behave as if the user account does not exist.

- **Hosted Subscriber Pages Access URL** (only available on user/group level) – The hosted subscriber pages access URL is used by subscribers to access the subscriber pages (the pages of the membership area of a dataset). There are various situations in which LUI needs to generate this URL, for example to include an unsubscribe link, login link or forward-to-a-friend link in an e-mail message. The URL that the system uses for this is generated using the settings supplied here. By default, the system will simply use the same settings as are supplied for the LUI access URL (see above). You only need to specify separate values for the subscriber pages access URL if this URL is actually supposed to be different than the LUI access URL.

  If necessary, specify the Host Name, HTTP Port and Protocol (either HTTP or HTTPS) that is to be used to generate the subscriber pages access URL.

- **HUB Access URL** – The HUB access URL is used behind the scenes to allow the system to display the password change page for normal users, and to allow the admin to switch seamlessly between the LUI and the HUB interfaces. To enable this functionality, the system needs to be able to generate a URL that correctly points to the HUB user interface. The URL that the system uses for this is generated using the settings supplied here. If a settings is not supplied, the displayed default value will be used.

  Specify the **Host Name**, **HTTP Port**, and **Protocol** (either HTTP or HTTPS) that is to be used to generate the HUB access URL.

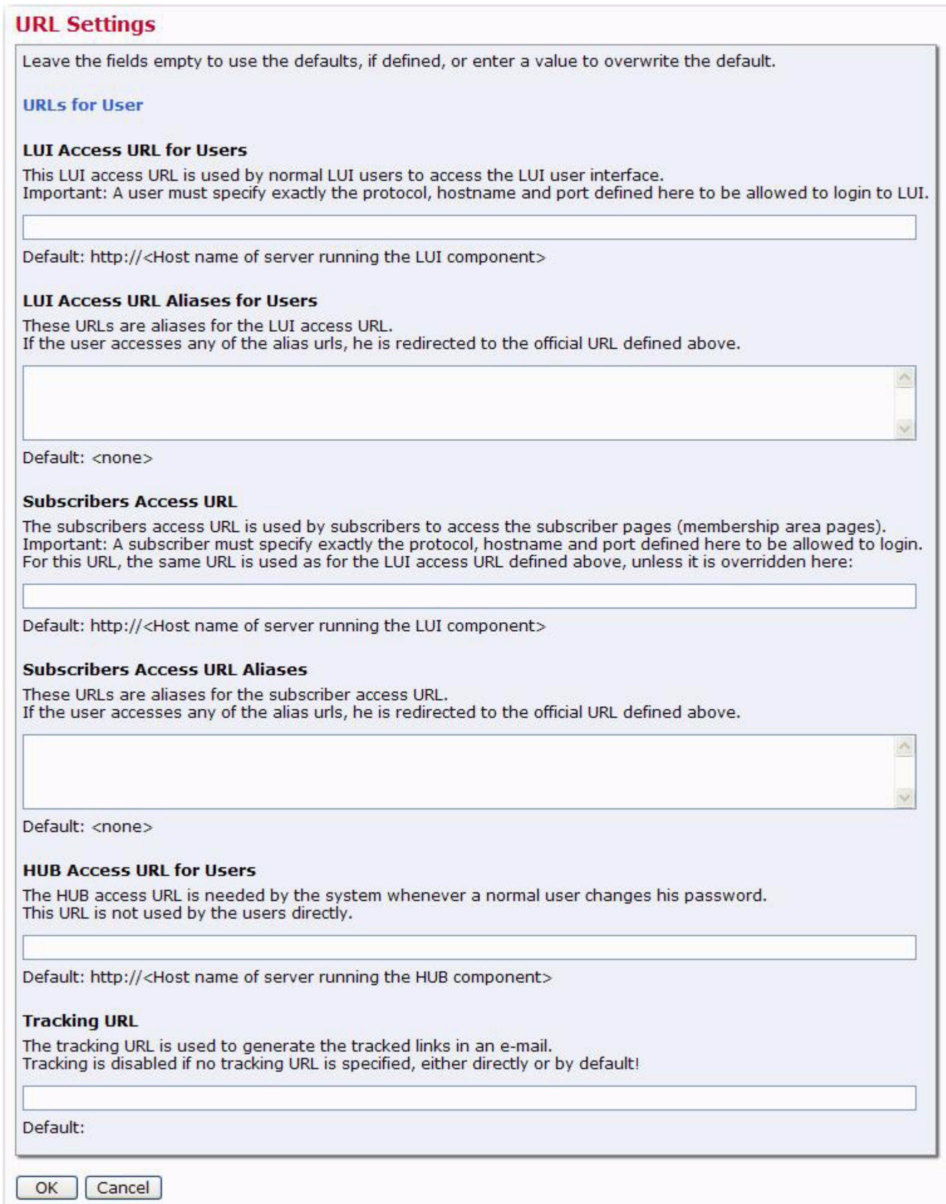
- **Tracking URL** – The tracking URL is used to generate the tracked links in e-mail messages for which tracking has been enabled. The URL that the system uses for this is generated using the settings supplied here. If a settings is not supplied, the displayed default value will be used.

  Specify the **Host Name**, **HTTP Port** ,and **Protocol** (either HTTP or HTTPS) that is to be used to generate the tracking URL.

Important: There is no default for the tracking URL host name. Therefore, as long as no such hostname is defined, tracking is disabled because a tracking URL can not be generated.

Click **[OK]** to submit and save any changes, or **[Cancel]** to leave the page without saving your changes.

Figure 2-11 URL Settings


URL Settings

Leave the fields empty to use the defaults, if defined, or enter a value to overwrite the default.

URLs for User

LUI Access URL for Users

This LUI access URL is used by normal LUI users to access the LUI user interface.
Important: A user must specify exactly the protocol, hostname and port defined here to be allowed to login to LUI.

Default: http://<Host name of server running the LUI component>

LUI Access URL Aliases for Users

These URLs are aliases for the LUI access URL.
If the user accesses any of the alias urls, he is redirected to the official URL defined above.

Default: <none>

Subscribers Access URL

The subscribers access URL is used by subscribers to access the subscriber pages (membership area pages).
Important: A subscriber must specify exactly the protocol, hostname and port defined here to be allowed to login.
For this URL, the same URL is used as for the LUI access URL defined above, unless it is overridden here:

Default: http://<Host name of server running the LUI component>

Subscribers Access URL Aliases

These URLs are aliases for the subscriber access URL.
If the user accesses any of the alias urls, he is redirected to the official URL defined above.

Default: <none>

HUB Access URL for Users

The HUB access URL is needed by the system whenever a normal user changes his password.
This URL is not used by the users directly.

Default: http://<Host name of server running the HUB component>

Tracking URL

The tracking URL is used to generate the tracked links in an e-mail.
Tracking is disabled if no tracking URL is specified, either directly or by default!

Default:

OK Cancel

2.8 Emergency Admin HUB Access

Login of the admin to the Administration Hub normally happens via the Maestro User Interface (LUI) login page. Under some circumstances, it may however happen that login to LUI is not possible so that the admin can not login either. This means that the admin also does not have access to the HUB. Now, if the reason for this problem is some sort of incorrect configuration in the HUB, for which the admin needs to login to the HUB to be able to fix the problem, then there is a catch-22 situation: The admin can not login to the HUB because of the problem, but to be able to fix it, he needs to login to the HUB.

For such a situation, there is an emergency login access directly to the HUB, via the HUB login page (instead of the LUI login page that is normally used). Normally, the HUB login page would not allow the admin to login but would instead redirect him to the LUI login page.

However, the HUB login page can be forced to allow a direct login, circumventing any problems with the LUI login. To force such a direct login, access the HUB login page with the following URL:

```
http://HOSTNAME/hub?loginOverride
```

(where you replace "HOSTNAME" accordingly).

Then submit the admin password to login. You will now be logged in to the HUB, however without the option of switching over to the LUI interface.

2.9 Mixing SSL and Non-SSL Access on One Server (Mixed Mode)

It is now possible to secure some users/groups with SSL (using https://) while other users/groups are not secured (using http://). To facilitate this new feature, several changes had to made to the previous admin settings and configurations. Because of this, please review the LISTSERV Maestro 4.0 Administrator's Manual in it's entirety if you are configuring a Maestro instance.

2.10 Exporting LISTSERV Maestro Job Data to an XML File

You can now export the data of a delivered job, including tracking events, into an XML file.

2.10.1 Enabling the Job Data Export Feature

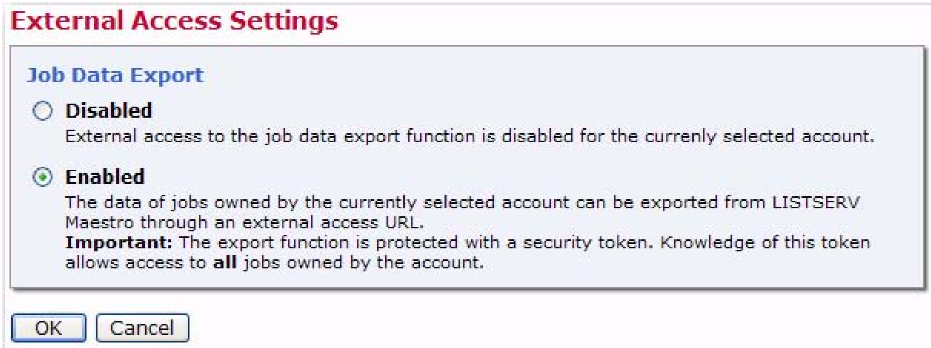
The Job Data Export feature is disabled by default. Therefore, before you can export job data, you need to enable this feature. To enable, you must enable it for the group or non-group user account that is the owner of the job(s) that you want to export.

To enable the Job Data Export feature, log in to the HUB with the admin account.

For a group: From the Accounts and Identities screen, select the group to enable. The Group Overview screen opens. From here, select **Group > External Access** from the Toolbar. The External Access Settings screen opens.

For a non-group user account: From the Accounts and Identities screen, select the user account to enable. The User Account Overview screen opens. From here, select **User Account > External Access** from the Toolbar. The External Access Settings screen opens.

Figure 2-12 External Access Settings

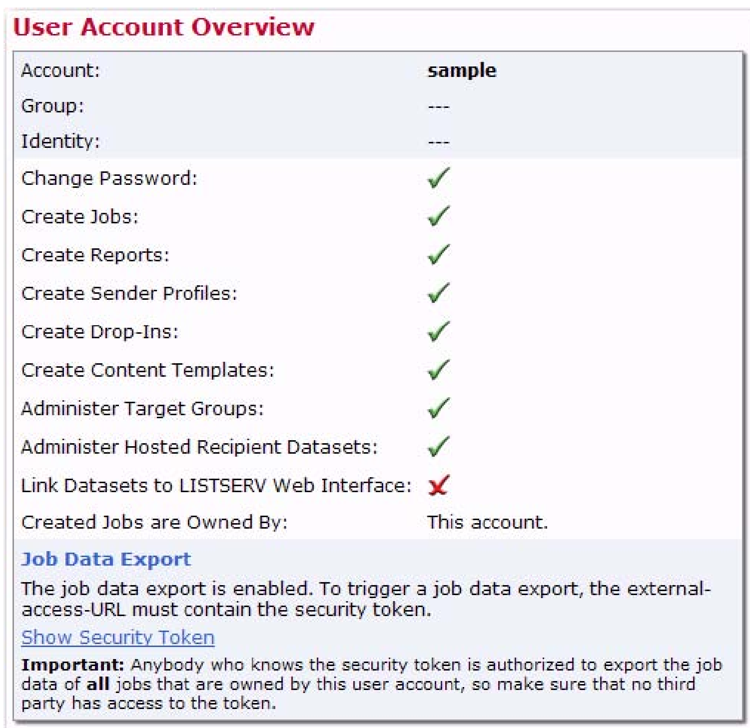


Select the **Enabled** option and click **[OK]**. The Job Data Export feature is now enabled for the specific account or group you selected.

2.10.2 Accessing the Security Token

To protect against unauthorized access during the export process, the export request must include a secret security token. Every group, and every non-group account, has its own security token. The token is displayed on the Group/User Account Overview screen, once the job data export feature is enabled.

Figure 2-13 Viewing the Security Token



To display the security token, click on the **Show Security Token** link. Make note of the security token and keep it secure; you will need it for the export process.

Once displayed, you can also generate a new token if the old security token has been compromised. To do this, simply click on the **Create New Security Token** link.

Important: Knowledge of this security token gives access to all jobs that are owned by the account or group. This also means that any team collaboration settings in a group that define who is and who is not allowed to access a given job are ignored. Therefore, it is important to make sure that the security token does not get into the wrong hands. If there is a possibility that the token has been compromised, you should generate a new token, which automatically invalidates the old token.

2.10.3 Exporting Data to an XML File

Once the Job Data Export feature is enabled, then it is possible to export a specific job, or a range of jobs, depending on the access parameters. The export is triggered by making a request to an external access URL, with the corresponding parameters. The result is an export file in XML format (optionally zipped).

The access URL for a job data export has the following form:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN&more_parameters...
```

- where `SERVER_NAME` is replaced with the name of your LISTSERV Maestro server. (If a non-standard HTTP port is used, also include the port, separated with a colon ":". If access to your LISTSERV Maestro is protected with HTTPS, you need to specify "https://" instead of "http://".)
- where `SECURITY_TOKEN` is replaced with the security token for the job data export.
- where `more_parameters...` is replaced with further request parameters, specifying the type of the report and other details, see below.

To specify which jobs will be included in the export, you need to supply additional parameters. You can:

- **Export a Specific Job** – This exports a specific job, with a known job-ID.

  Specify the additional request parameters `type=single` and `jobid=JOB_ID`, where you replace `JOB_ID` with the ID of the job you want to export (only the bare ID, without any id-prefix). The ID that is specified must be the ID of a normal "completed" job. The referenced job must not be an "ongoing" or "open" job, and also not an A/B-split parent job. However, it can be one of the variants of an A/B-split job, if you want to export this variant specifically. See the next item for an option to export A/B-split jobs.

  Example:

  ```
  http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
  &type=single&jobid=100817A
  ```

- **Export a Specific A/B-Split Job** – This exports a specific A/B-split job, with a known job-ID. The export will contain all "completed" variants of this A/B-split job ("ongoing" or "open" variants are not included).

  Specify the additional request parameters `type=absplit` and `jobid=JOB_ID`, where you replace `JOB_ID` with the ID of the A/B-split job you want to export (only the bare ID, without any id-prefix). The ID must be the ID of the A/B-split parent job, not of one of its variants.

Example:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
&type=absplit&jobid=100912C
```

- **Export a Specific Auto-Repeat Chain** – This exports all "completed" jobs in a specific chain of auto-repeat jobs.

  Specify the additional request parameters `type=chain` and `jobid=JOB_ID`, where you replace `JOB_ID` with the ID of any of the jobs in the auto-repeat chain. The result will contain all jobs from the same auto-repeat chain that are in the "completed" state.

  Example:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
&type=chain&jobid=101004D
```

- **Export All Jobs from a Specific Time Period** – This exports all "completed" jobs with a delivery date/time that falls into the given time period.

  Specify the additional request parameter `type=period` and specify the period with the parameters `from=FROM_DATE_TIME` and `to=TO_DATE_TIME`, where you replace `FROM_DATE_TIME` with the start date/time of the period, and `TO_DATE_TIME` with the end date/time of the period. For both, you must use the following format: `YYYY-MM-DD-hh-mm`.

Note: These date and time values are interpreted relative to the default time zone settings of the server where the LUI component of LISTSERV Maestro is running.

Example:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
&type=period&from=2010-08-01-00-00&to=2010-08-07-23-59
```

- **Export All Jobs from the Most Recent Days** – This exports all "completed" jobs with a delivery date/time during one of the most recent days, where the number of days is configurable.

  Specify the additional request parameter `type=period` and specify the period with the parameter `recentdays=DAYS`, where you replace `DAYS` with the number of full days in the past that shall define the period. The period is defined as follows: It begins at 00:00h of the day that is `DAYS` many days in the past, where "1" means "1 day in the past", i.e. "yesterday", so "2" means "the day before yesterday", etc. And the period always ends at 24:00h yesterday, i.e. jobs from today are never included in the export.

  For example, if you specify recentdays=1, then you will get all jobs that were delivered yesterday (between 00:00h and 24:00h).

  A value of "7" means "7 day in the past". So if you specify recentdays=7, then you will get all jobs that were delivered during the last 7 days (but not today). If for example the current day is a Saturday, then the period specified by this will begin at 00:00h on the previous Saturday and will end at 24:00h yesterday (Friday).

Note: When determining the beginning and end of the relevant days, the system uses the default time zone settings of the server where the LUI component of LISTSERV Maestro is running.

Example:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
&type=period&recentdays=3
```

- **Combination of Auto-Repeat Chain and Specific Period** – It is possible to combine the parameters to select a specific auto-repeat chain and a specific time period. As a result, the report will contain not all "completed" jobs from the selected auto-repeat chain, but only those that were delivered during the specified period.

  The period can be specified by both methods explained above: Either as a specific time period with given "from" and "to" date/time values, or as a relative time period with a given number of "recent days".

  Example 1:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
&type=chain&jobid=100917E&from=2010-08-01-00-00&to=2010-08-07-23-59
```

  Example 2:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
&type=chain&jobid=100722B&recentdays=3
```

By default, the result is returned as an UTF-8 encoded XML file (content type "text/xml").

Optionally, you can also request that the result is returned as a ZIP file. To do so, simply include the parameter zip as part of the access URL. For example:

```
http://SERVER_NAME/lui/externalAction.do?token=SECURITY_TOKEN
&type=single&jobid=100817A&zip
```

This zip parameter can be combined with any of the parameters described above. If specified, then the downloaded file will be a ZIP archive file that contains one single "inner" file. The inner file is called "export.xml" and contains the same UTF-8 encoded XML data that you would also get directly if you do not specify the zip parameter.

Tip: For more details, including an example of job data exported into an XML file format, see the *Exporting LISTSERV Maestro Job Data to an XML File* white paper.

2.11 Configuring LISTSERV Maestro to Bind to Different HTTP Ports on Different IP Addresses

By default, LISTSERV Maestro binds the HTTP-port on all IP-addresses of the server it is running on, and it binds the same HTTP-port on all these addresses. I.e., if the server has several addresses, then a client will be able to access the Maestro User Interface, the Administration Hub and Maestro Tracker (depending on which components are installed) on the same HTTP-port by using any of the server's addresses.

If this default behavior is satisfactory, then no changes to the LISTSERV Maestro configuration need to be made.

However, if for some reasons it is required that LISTSERV Maestro binds only to some of the available IP-addresses on the server, and/or if you want LISTSERV Maestro to bind different ports on different IP-addresses, you need to edit the “BindAddress” entry in the file:

```
[maestro_install_folder]/conf/tomcat.ini
```

Specify one or several comma-separated IP-addresses, optionally with ports. LISTSERV Maestro will then bind only to the specified addresses, using the specified ports. If for an address no port is specified, then the default http port (as configured by the Port setting in the tomcat.ini) will be bound on that address.

Examples:

- Bind only one address, using the default port:

```
BindAddress=192.168.1.1
```

- Bind three different addresses, using the default port on each:

```
BindAddress=192.168.1.15,192.168.1.16,192.168.1.24
```

- Bind three different addresses, using the default port on the first, but different ports on the other two:

```
BindAddress=192.168.1.15,192.168.1.16:8081,192.168.1.24:8082
```

Note: If you have several LISTSERV Maestro components installed on the same server, then all of them will be affected by this change. E.g., it is not possible to use different bindings for each of the components, if the components are installed on the same server. However, if the components are installed on different servers, they can use different bindings.

Important: This change will only be effective after a restart of the component in question.

2.12 Sharing a Server with IIS

If you want to install LISTSERV Maestro on a server where an IIS web server is already running, then most likely the default HTTP port 80 is already in use by this web server. Therefor, you need to configure LISTSERV Maestro to use a different HTTP port. For details on configuring LISTSERV Maestro to use a different HTTP Port, see Section 14.2.1 of the LISTSERV Maestro 4.0 Administrator's Manual.

The unfortunate side-effect of this is that users of LISTSERV Maestro will be unable to access Maestro with a nice "clean" URL, like http://myhost.domain.com/lui. Instead, they would have to include the non-standard HTTP port in the URL, like http://myhost.domain.com:8080/lui.

While this may be acceptable in many cases, in some cases it is not. In these cases, it is possible to "share" the standard port 80 with IIS or Apache.

Or more precisely: IIS acts as a reverse-proxy in such a way that the requests from the clients are made to IIS (on the default port), and IIS then dispatches the requests to LISTSERV Maestro as the backend server. LISTSERV Maestro's response is then passed back to IIS, which forwards it to the client. To the client this looks, as if it is communicating directly with LISTSERV Maestro on the standard port, when, in reality, it is communicating with IIS. However, this does not process the requests itself, but passes them on to LISTSERV Maestro and then passes the responses back to the client.

The following sections describe how to configure LISTSERV Maestro and IIS for such a scenario.

Important: The web site that is to be used for the proxying must not have any root folders with the names "lui", "hub", "list" or "trk", i.e. before configuring the web site as described below, make sure that the following URLs are **not** in use (and also not any sub-URLs that start with these URLs):

```
http://YOURSERVER/lui
http://YOURSERVER/hub
http://YOURSERVER/list
http://YOURSERVER/trk
```

2.12.1 Configuring LISTSERV Maestro

1. Edit the file `[install_folder]/conf/tomcat.ini` and add the following entry:

   `AJPConnector=IP_ADDRESS:PORT`

   where you replace `IP_ADDRESS` with one of the IP-addresses of the server (usually the main address) and `PORT` with a free port that is not used by any other application (for example, `8009`).

   Example:

   `AJPConnector=192.168.1.1:8009`

2. Create a folder on the server, in a suitable location, with a suitable name. The account under which the web server is running must have "read and write" access to this folder. In the following steps, we will use `[connector_folder]` to depict this folder.
3. Create a text file with the following name:

   `[connector_folder]/workers.properties`

4. Edit this file with a text editor and set its content to the following four lines:

   ```
   worker.list=maestro
   worker.maestro.type=ajp13
   worker.maestro.host=HOSTNAME
   worker.maestro.port=PORT
   ```

   where you replace `HOSTNAME` and `PORT` according to the values that you used for the AJPConnector setting in the `tomcat.ini`. The `HOSTNAME` must be a host name that maps to the IP-address that you used for the AJPConnector, and the `PORT` must be the same port as in the AJPConnector.

5. Create a text file with the following name:

   `[connector_folder]/uriworkermap.properties`

6. Edit this file with a text editor and set its content to the following four lines:

   ```
   /lui|/*=maestro
   /hub|/*=maestro
   ```

`/trk/*=maestro`

`/list/*=maestro`

2.12.2 Configuring IIS

1. Download the latest stable version of the ISAPI Redirect DLL:

   For 32-bit Windows:

   `http://apache.copahost.com//tomcat/tomcat-connectors/jk/binaries/win32/`

   For 64-bit Windows:

   `http://apache.copahost.com//tomcat/tomcat-connectors/jk/binaries/win64/`

   You only need to download the actual DLL from the release folder. It has a name like `isapi_redirect-VERSION.dll`. At the time of writing, the latest stable release was 1.2.31, so the filename was `isapi_redirect-1.2.31.dll`.

   Download this file and then rename it to remove the version number from the name, so that it then has the name `isapi_redirect.dll`.

   Put this file into the `[connector_folder]`.

2. Create a text file with the following name:

   `[connector_folder]/isapi_redirect.properties`

3. Edit this file with a text editor and set its content to the following five lines:

```
extension_uri=/jakarta/isapi_redirect.dll
log_file=[maestro_install_folder]\logs\isapi_redirect.log
log_level=info
worker_file=[connector_folder]\workers.properties
worker_mount_file=[connector_folder]\uriworkermap.properties
```

   where you replace `[maestro_install_folder]` and `[connector_folder]` (two occurrences of the latter) with the correct values for your system.

2.12.2.1 Configuring IIS 6

1. Open the IIS Manager.
2. In the Manager, open the node for the local computer.
3. Right-click on the **Web Service Extension** node.
4. Select **Add a new Web service Extension** from the popup menu. In the dialog that opens:
   a. Enter a meaningful name for the extension (for example "LISTSERV Maestro").
   b. Add one required file: Click the **[Add]** button, then the **[Browse]** button, then select the file `[connector_folder]\isapi_redirect.dll`
   c. Check the **Set extension status to Allowed** checkbox.
   d. Click **[OK]**.

5. Still in the Manager, open the **Web Sites** node.
6. Determine the web site that you want to use to act as a "proxy" for LISTSERV Maestro.
7. Right click on the node for this web site.
8. Select **New** > **Virtual Directory** from the popup menu. In the wizard, create a new virtual directory with the following settings:

   Alias: Must be "jakarta" (without the quotes).

   Path: Select the [connector_folder]

   Permissions: Grant both "Read" and "Execute".
9. Again, in the Manager, right click on the node for this web site.
10. Select **Properties** from the popup menu. In the properties dialog:
    a. Go to the **ISAPI Filters** tab.
    b. Click **[Add]**.
    c. Enter a meaningful filter name (for example "LISTSERV Maestro").
    d. Click **[Browse]** to select the executable. Select the file `[connector_folder]\isapi_redirect.dll`

2.12.2.2 Configuring IIS 7

Note: At this time, we have not been able to test the following procedure ourselves, so it is described to the best of our knowledge.

In the Server Manager:

1. Both "ISAP Filters" and "ISAPI Extensions" must be installed as role services.
2. Determine the web site that you want to use to act as a "proxy" for LISTSERV Maestro.
3. Right click on the node for this web site.
4. Select **Add Application** from the popup menu. In the dialog, enter the following settings:

   Alias: Must be "jakarta" (without the quotes).

   Physical path: Select the `[connector_folder]`.
5. Select the web site node again, then in the right pane, double click the "ISAPI Filters" symbol, then right click in the right pane.
6. Select **[Add]** from the popup menu. In the dialog:
    a. Give the filter a meaningful name (for example "LISTSERV Maestro").
    b. For the executable, select the file `[connector_folder]\isapi_redirect.dll`
7. Select the web site node again, then in the right pane, double click the "Handler Mappings" symbol, then right click in the right pane.
8. Select **Add Module Mapping** from the popup menu. In the dialog:
    a. **Request path:** Must be "*.dll" (without the quotes).

b. **Module:** IsapiModule

c. **Executable:** Select the file
`[connector_folder]\isapi_redirect.dll`

d. **Name:** Specify a meaningful name (for example "LISTSERV Maestro").

e. After you click **[OK]** in the dialog, you are asked if you want to allow this ISAPI extension. You must answer with **Yes**.

2.12.3 Completing the Configuration

After the configuration steps above have been completed, you must restart LISTSERV Maestro and IIS to activate the changes you made.

If everything is configured correctly, you should then be able to access LISTSREV Maestro through IIS. For example, if the web site for which you configured the proxying above is called "www.mycorp.com", then you can now access LISTSERV Maestro with the following URL:

```
http://www.mycorp.com/lui
```

As a last step, you should now log in to the Administration Hub and configure the access URLs to reflect that access to LISTSERV Maestro is now via the default port, i.e. the access URLs must no longer include the port element.

For example, if your LISTSERV Maestro is running on port 8080, then before you performed the above proxy configuration, your access URLs will look something like "http://SERVERNAME:8080". You now need to change these to plain URLs without a port element, like "http://SERVERNAME".

If you are configuring a fresh installation of LISTSERV Maestro, then that is all you need to do. But if you are configuring a LISTSERV Maestro instance that has already been in use for a while with the non-standard port (for example, 8080), then people might already have bookmarks to the LISTSERV Maestro access pages with this non-standard port.

After you have now changed the access URLs to no longer contain the non-standard port, users will no longer be allowed to log in to LISTSERV Maestro if they access it via these bookmarks. You should therefore set the old access URLs (the ones with the non-standard port) as access URL aliases. With such an alias, if a user accesses LISTSERV Maestro with the old URL (through an old bookmark), then they will still be allowed to login, and after login, they are automatically redirected to the new URL (with the standard port).

2.13 Configuring Aliases for the Access URLs

2.13.1 Setting LUI Access URL Aliases for Users

On the URL Settings screen, you can now configure an alias for the LUI access URL. This can be done as a default, for a group, or for a single user account.

To access the Default URL Settings screen in the Administrative HUB, click on **Global Settings > Maestro User Interface > Default URL Settings**.

In the **Default LUI Access URL Aliases for Users** section, enter the URLs that will be the aliases for the LUI Access URL. If a user accesses LUI with any of the alias urls, then their login is accepted, and after login, they will be automatically redirected to the official

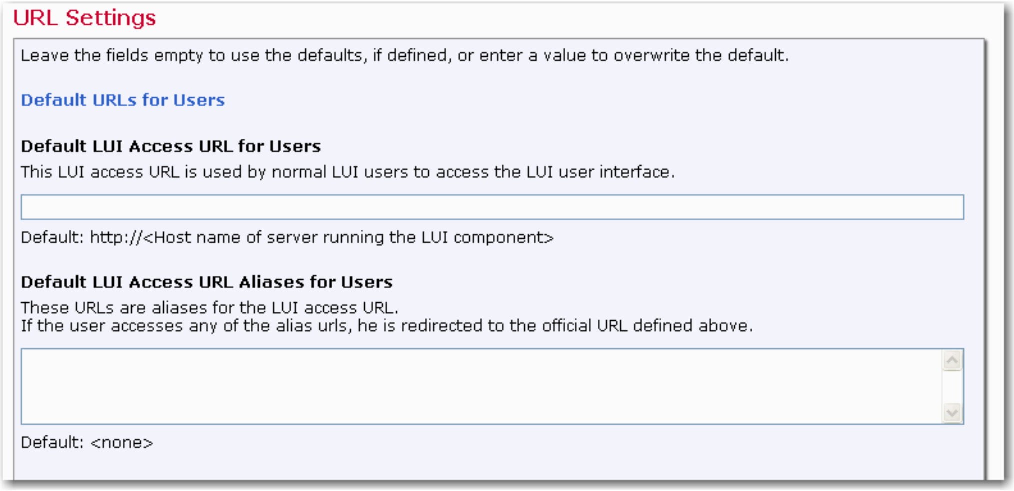
LUI Access URL. Make sure to specify a list of alias URLs (one per row), each with the full protocol and hostname, optionally followed by the port. For example,

`http://luihostalias.domain.com`

or

`https://secureluihostalias.domain.com:1443`

Figure 2-14 Default URL Settings Screen



To access the URL Settings screen for a particular user account or group, go to the Acounts and Identities Overview screen, and then select the account/group by clicking on the account/group name. From the User Account Overview/Group Overview screen, click on **User Account > URL Settings** or **Group > URL Settings**.

In the **LUI Access URL Aliases for Users** section, enter the URLs that will be the aliases for the LUI Access URL. If a user accesses LUI with any of the alias urls, then their login is accepted, and after login, they will be automatically redirected to the official LUI Access URL. Make sure to specify a list of alias URLs (one per row), each with the full protocol and hostname, optionally followed by the port. For example,

`http://luihostalias.domain.com`

or

`https://secureluihostalias.domain.com:1443`

2.13.2 Setting Subscriber Access URL Aliases

On the URL Settings screen, you can now configure an alias for the subscriber access URL. This setting is only available on user/group level.

To access the URL Settings screen for a particular user account or group, go to the Acounts and Identities Overview screen, and then select the account/group by clicking on the account/group name. From the User Account Overview/Group Overview screen, click on **User Account > URL Settings** or **Group > URL Settings**.

In the **Subscriber Access URL Aliases** section, enter the URLs that will be the aliases for the Subscriber Access URL. If the subscriber accesses any of the alias urls, then they are automatically redirected to the official Subscriber Access URL. By default, the system will simply use the same alias URLs that are supplied for the LUI access URL (see above). You only need to specify separate alias URLs for the subscriber pages if these aliases are actually supposed to be different than the LUI access aliases. Make sure to specify a list of alias URLs (one per row), each with the full protocol and hostname, optionally followed by the port. For example,

`http://subscriberhostalias.domain.com`

or

`https://securesubscriberhostalias.domain.com:1443`

Figure 2-15 URL Setting Screen

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