MicroStrategy®

Analytics and Mobility

Narrowcast Server Getting Started Guide

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BOOK OVERVIEW AND ADDITIONAL RESOURCES

This *Getting Started Guide* can help you begin using MicroStrategy Narrowcast Server quickly and easily. This guide provides steps for working with the MicroStrategy sample project called Tutorial - Delivery. The MicroStrategy Tutorial - Delivery project contains sample services that demonstrate many of the features of MicroStrategy Narrowcast Server.

⚠️ It is recommended that, if you plan to try the Tutorial - Delivery sample project to learn about Narrowcast Server, you perform the steps in this book before you begin to configure Narrowcast Server for your own environment. Changing the system configuration or subscription information can cause the MicroStrategy Tutorial - Delivery project to stop functioning correctly. It is recommended that you do not change any settings or options using the System Configuration Wizard and the Subscription Book until you understand the purpose of each setting or option.

Use this guide to configure an introductory system with the sample Tutorial project, explore the features and capabilities of the product, and learn how to create services, subscribers, and subscriptions.

Specifically, this guide provides the following information:

- *Chapter 1, About the Narrowcast Server System*, provides a high-level introduction to Narrowcast Server. Descriptions include system components, authentication, security, integrating with existing technologies and custom data sources, clustering, internationalization support, and it introduces you to the sample Tutorial - Delivery project that comes with Narrowcast Server.

- *Chapter 2, Getting Started with Services*, provides all the information you need to install and configure the system.

- *Chapter 3, Sending and Receiving Services*, provides steps to use NCS to deliver sample services for various user roles, and provides details about all of the sample services that are included with MicroStrategy Narrowcast Server.

- *Chapter 4, Subscribing to Report Deliveries*, provides information to subscribe to a service, and acquaints you with the Subscription Portal.

- *Chapter 5, Sending Data To Subscribers*, explains how services work. It describes how an executing service moves through various components and processes to send personalized messages to subscribers.

Technical terms that need more clarification are defined in the glossary of this guide.

Detailed steps for all functionality in the Narrowcast Services system is available in the online help.

About the Narrowcast Server System

Narrowcast Server proactively delivers personalized business insight to email, pagers, and cell phones, extending the reach of business intelligence applications within the enterprise and beyond. Users can specify preferences in the subscription interface, and demand notification based on personalized business rules. This ensures that the information received is relevant and anticipated.

This chapter describes the Narrowcast Server system components. It provides high-level information on authentication, security, integrating with existing technologies and custom data sources, and clustering. It also provides information on internationalization support, and introduces you to the sample Tutorial - Delivery project that comes with Narrowcast Server.

System overview

A MicroStrategy Narrowcast Server system is composed of several components that work together to provide the functionality and performance of Narrowcast Server. Each component serves a distinct purpose, but interacts with the others to ensure high availability, easy maintenance, and efficient processing.

- Integrate with custom data sources, formatting, transmission, and subscriptions

   The MicroStrategy Narrowcast Server architecture is modular, enabling integration with custom data sources, formatting methods, transmission technologies, and subscription book systems. Self-subscription portals can integrate with any Internet, intranet, or extranet site. In addition, a software development kit provides access to all aspects of service development and execution to provide full flexibility.

- Authentication and security

Narrowcast Server offers several features that ensure ease of administration. The product integrates with Microsoft Windows security for authenticating Narrowcast Administrator and Narrowcast Server API users, and for controlling access to the system. Role-based security is available for administrators to control the privileges awarded to each Narrowcast Administrator user.

- Remote monitoring and redundancy

  System administration and monitoring from a remote console are provided. Component-level and system-level redundancy ensure highly available Narrowcast Server applications. In addition, centralized logging facilitates remote troubleshooting, and comprehensive debugging, testing, and monitoring capabilities are available.

- Clustering

  Narrowcast Server incorporates native clustering capabilities and automatic workload distribution to ensure robust, scalable applications. The automatic breakdown of service subscription sets into segments provides consistent, manageable resource consumption and workload distribution. Executing services and subscription set segments are maintained in execution queues, affording maximum efficiency and scalability while protecting against the possibility of system overload. Easy cluster administration provides single-step machine additions and removals.

Internationalizing the system

MicroStrategy Narrowcast Server incorporates several features that enable a single installation and system to support and serve a multinational user community. Rather than maintaining one system for each language or country that you need to support, you can use a

single system to generate content in several languages and for distribution to several countries.

Localized object names

In Narrowcast Administrator, each object can be named and described differently across different locales. This enables an object such as a device to have a name that is easy for an end user to read in a multilanguage user community. Furthermore, Narrowcast Administrator can be configured to show the names and descriptions for a certain locale by default, so that application designers can also work more effectively.

Local time zones

Narrowcast Server further supports multinational user communities through its support of time zones and locales. Time zone differences such as daylight savings changes are supported for the scheduling and delivery window functionality. For example, when daylight savings times are in effect in a particular time zone, Narrowcast Server adjusts the time that services scheduled based on that time zone should be delivered, so that end users receive the services when expected. Time zone awareness is also applied to the user-specified delivery window so that messages are not delivered during blocked delivery windows.

Languages, character sets, and value formatting

Narrowcast Server also supports the generation and delivery of content to multinational user communities through the use of locales. A locale can specify character sets and number, date, and time formats, as well as the selection of which available content is delivered and what language a user observes on the Subscription Portal. An example is a service that includes content available in both

French and Korean. Subscribers' locales ensure that a Paris resident receives French content using the Western character set, while a resident of Seoul receives Korean characters and content. This locale concept is also available through the Subscription Portal, allowing the user to define their language preference and therefore have access to a fully-translated portal in the selected language. A default locale selection for first time users is specified in Narrowcast Administrator.

Narrowcast Server components

Narrowcast Administrator

Narrowcast Administrator provides a graphical environment for configuring servers, developing services, maintaining applications, and administering users. The modular architecture of Narrowcast Server allows custom modules to be integrated directly into the Narrowcast Administrator user interface.

Delivery Engine

The Delivery Engine comprises several components that work together to define and store object definitions, run services, and track service execution. These components include:

- The Distribution Manager (DM), which manages and directs service execution by distributing service workload to available execution engines

- The Execution Engine (EE), which performs the work of gathering service content, formatting it, and delivering it to devices

- The MicroStrategy Logging Server, which provides an event and statistics routing infrastructure

- The Object Repository, which stores the objects used to define a Narrowcast Server system and the services in it

- The Subscription Book Repository, which stores all subscription data, including end users, addresses, personalization, and subscription sets

Additional components contribute to processing information for service execution. These components enable integration with other systems such as MicroStrategy Intelligence Server or email servers. These components include:

- Information sources, which can retrieve personalized information, such as grid and graph reports, from local or remote systems such as a MicroStrategy Intelligence Server.

- Document formatters, which transform raw data provided by information sources into formatted messages. The default configuration for Narrowcast Server supports text, HTML, and Excel output formats.

- Information transmitters, which connect to local or remote systems such as email (SMTP) servers, shared network locations, shared network printers, SMS (messaging) centers, and wireless application servers to deliver formatted content to end users.

Sophisticated message management ensures that the information is presented to end users in an intuitive format. The flexible XML backbone of Narrowcast Server enables message formatting for any mobile device or HTML-based interface. XML enables service content to be transformed into the appropriate markup language, with the best style and rendering tags for each device. XSL stylesheets transform dynamic content into the correct format, and enable complex, custom-defined layout rules and arrangements to be created and used. The Narrowcast system conforms to SMTP, E-SMTP, MIME, and UUEncode standards to ensure support for a wide array of email clients.

Subscription Portal

Each Subscription Portal offers users the ability to subscribe to and view services and service descriptions. Users can also modify subscriptions and create and modify the addresses to which content should be delivered. Users can define preferences to ensure that the information they receive is relevant. Users can use the Subscription Portal to manage their site preferences, specifying default languages, time zones, and currency settings. Access to information sources is controlled at the Subscription Portal where users are prompted to authenticate themselves for appropriate information access.

The Subscription Portal is built on Active Server Page (ASP) technology and depends on Microsoft Internet Information Services (IIS).

SequeLink

SequeLink is a complete solution for configuring and managing data access across any number of data stores, operating systems, and deployment options. SequeLink provides a universal client for ODBC and JDBC, and provides a centralized console for configuring and managing data access from a single point of control. SequeLink creates two NT services: SLAgent 54, which is the Administrator, and SLSocket54, which is the Server.

Sample MicroStrategy Tutorial - Delivery project

The sample MicroStrategy Tutorial - Delivery project includes a pre-configured Tutorial system, a set of instructions, and a set of sample services that illustrate a wide variety of Narrowcast Server features. The sample project makes it easy for first-time users to successfully begin using the product. New users are encouraged to install the Tutorial project and use the sample services.

This guide shows you how to install and set up a sample service using the sample data and objects available in the Tutorial - Delivery project.

GETTING STARTED WITH SERVICES

Installing and Configuring the Sample Project

This chapter provides steps to install and configure the sample Tutorial system. Once you are set up, you can create and deliver a sample service.

About installing and configuring the sample Tutorial system

This section helps you install and configure Narrowcast Server and the sample MicroStrategy Tutorial - Delivery project, so that you can send sample services and learn about Narrowcast functionality.

Before you begin, ensure that you fulfill all prerequisites and complete the required setup tasks described below.

Tutorial project prerequisites

See the MicroStrategy Readme for the latest version information, service pack information, and other requirements.

- Microsoft Windows computer

    ▫ Windows NT or 2000 installed. For specific requirements, see the Installation Prerequisites in the *MicroStrategy Narrowcast Server Installation and Configuration Guide*.

    ▫ Registered with a domain. To interact with your Narrowcast Server system from a remote computer or to use Windows security, ensure that your Narrowcast Server computer is registered with the appropriate domain. See Microsoft Windows documentation for information about Windows domains.

    ▫ IIS installed. The Subscription Portal relies on Microsoft Internet Information Services (IIS).

□ Narrowcast Server is licensed based on CPU number and clock speed. Thus, Narrowcast Server can only be installed on machines with a clock speed that is less than or equal to the licensed clock speed. If you try to install the product on a machine that is faster than your license allows, installation fails.

- A valid Microsoft Windows account in the same domain as the one in which you have registered the Narrowcast Server machine. Your Windows account must also be a valid administrator (part of the Administrators group) on that machine.

  Both Narrowcast Administrator and the Narrowcast Server API determine who you are when you connect to the system by identifying your Windows account. If a system has not been set up to allow access to your Windows account, you cannot connect to the system. When you create a new system, the Windows account you log in with is given full access privileges automatically.

- Relational database

  Narrowcast Server stores all configuration and application objects in a relational database called the Object Repository. The MicroStrategy Tutorial - Delivery sample project includes a Microsoft Access database. The amount of space you need for the Tutorial project is typically in the range of 5 to 10 megabytes. For a list of additional certified and supported relational database platforms, see the MicroStrategy Readme.

- Email account

  Narrowcast Server provides some of the functionality of an email server, except that it does not have any message storage capabilities. To view the messages that Narrowcast Server generates, you must provide a valid email address.

ⓘ As an alternative, you can provide a nonworking email account and choose to save messages to disk instead of transmitting them.

• MicroStrategy Intelligence Server and the MicroStrategy Tutorial - Reporting sample project

Narrowcast Server can operate without MicroStrategy Intelligence Server. However, the services in the Tutorial - Delivery sample project depend on the reports that are installed with the MicroStrategy Tutorial - Reporting sample project. Therefore, the Tutorial- Delivery project requires a Tutorial - Reporting project running on Intelligence Server, either on the local machine or on a networked machine in a trusted domain. Intelligence Server must be running when Narrowcast Administrator is opened the first time for Narrowcast Server to locate this Intelligence Server. The Intelligence Server machine must also have the Tutorial - Reporting project loaded.

If you are installing the Tutorial - Delivery project on the same machine as Intelligence Server, the configuration process automatically finds the Tutorial - Reporting project. If Intelligence Server is running on a different machine, you are asked to specify the name of the machine during the configuration process.

Installing Narrowcast Server

This section provides the basic installation information you need to get the Narrowcast Server Tutorial - Delivery sample project running. For complete steps to install Narrowcast Server, see the *Narrowcast Server Installation and Configuration Guide*.

High-level checklist

The following high-level checklist summarizes the steps that follow in the procedure to install Narrowcast Server.

1   Install Narrowcast Server, including all of its components. (See *To install Narrowcast Server, page 19*.)

2   Create and configure the Tutorial - Delivery system (see *To configure the Tutorial - Delivery system, page 24*). This process includes:

a   Providing email addresses for the sender and sample recipients.

b   Deciding whether to save messages to a file or deliver them via email.

c   Providing a location in which to save messages, if required.

d   If prompted, providing the appropriate Intelligence Server machine name, login, and password. This prompt appears if a running MicroStrategy Intelligence Server with the MicroStrategy Tutorial - Reporting project is not found on the local machine.

At any time during the installation, you can click **Cancel** to quit the installation.

To install Narrowcast Server

1   Insert the MicroStrategy disk into the CD-ROM drive of the computer on which you want to install the product. The Main Menu page opens.

• If the MicroStrategy Main Menu page does not appear, locate and run `Setup.exe` from the disk.

The Welcome page opens for the InstallShield Wizard.

2   Click **Next**.

- If you are presented with messages to stop various services, click **Yes**. This is required to install Narrowcast Server and other MicroStrategy products.

3   Accept the license agreement and type your name, your company name, and your license key to install Narrowcast Server. For details on these fields, see the *Narrowcast Server Installation and Configuration Guide*.

Setup Type

4   Choose **Typical** to use the standard file folder configuration. Then click **Next**.

Choose Destination Location

5   If your machine is configured with the `C:` drive as a hard disk partition, by default the setup utility installs program files onto this drive. Click **Next**.

Select Components

6   By default, all components are selected when you run the MicroStrategy Setup Wizard for the first time. To install Narrowcast Server and its components, including the MicroStrategy Tutorial - Delivery project, ensure that the Narrowcast Server check box is selected. Clear the check boxes next to the products you do not want to install. Click **Next** to accept this configuration.

7   If you are installing Narrowcast Server on a machine where MicroStrategy Web is installed or where Narrowcast Server has previously been installed, a message appears asking whether you want to preserve your existing MicroStrategy Web and/or Narrowcast Server configuration settings.

- If you have already configured the Subscription Portal or Web delivery on this machine and want to preserve the existing configuration, click **Yes**.

- If you are installing for the first time or are installing on a machine where previous product installations have been uninstalled, click **No** to create a new configuration.

> ⚠ Answering this question correctly is important. If you choose an answer that is inappropriate for your situation, your system might not work properly.

8 If prompted, click **Yes** to enable IIS-related services.

Server Activation pages

9 MicroStrategy requires you to activate your server machine by requesting an activation code. The information you provide with this request helps MicroStrategy understand how you plan to use MicroStrategy software. With this information, MicroStrategy can provide better information and technical support for your software configuration.

   Click **Next**.

10 Enter the characteristics of your server installation and click **Next**.

11 Enter contact information for the person who is installing the software. Click **Next**.

12 Select **Yes** to receive an activation code. Click **Next**.

13 The next few pages that are displayed depend on what products you chose to install. (See the *Installation and Configuration Guide* for details to respond to these pages.) For Narrowcast Server, the Subscription Portal page displays.

MicroStrategy Subscription Portal setting

14 The Subscription Portal requires a virtual directory. A virtual directory is a collection of web pages grouped by Microsoft IIS. Accept the default or use a different virtual directory name. The virtual directory is part of the URL that subscribers will use to connect to your Subscription Portal, so you should keep the name short.

⚠️ The virtual directory name must be unique.

MicroStrategy Narrowcast Server setting

15 Type your Windows login account to use for Narrowcast Server Service programs. The account must have Windows Administrator access permissions and privileges. The login should have the format `Domain\User`.

Click **Next**.

16 Additional messages may appear depending on what products you chose to install. (See the *Installation and Configuration Guide* for details on these messages.)

17 The Summary page displays all of the products you chose to install. Click **Install**.

18 The Narrowcast Server system and any other products you chose are installed. Once installation is complete, click **Finish** to restart your machine.

Configuring Narrowcast Server

This configuration process sets up a fully-functional Narrowcast Server system complete with tutorial services, subscriptions, and instructive information. A pre-created system is provided for you, using Microsoft Access as the database platform. In addition, the

Tutorial configuration process configures a default Subscription Portal site.

Sample users are also created, with a unique address and personalization, to demonstrate the powerful personalization capabilities of Narrowcast Server.

Prerequisites for configuration

*   You must install a compatible version of Intelligence Server, MicroStrategy Developer, and Narrowcast Server containing the MicroStrategy Tutorial - Reporting project and the Tutorial - Delivery project, before configuring MicroStrategy Tutorial. Developer should be installed on the same machine as that of Narrowcast Server. The Intelligence Server can be on the same or different machines.

    While it is somewhat easier to configure the Tutorial - Delivery project by installing it on the same machine as Intelligence Server, you observe better system performance if Intelligence Server is installed and configured on a different machine in the same Windows network in a trusted domain.

*   The Tutorial configuration process is launched when Narrowcast Administrator is opened for the first time after the Tutorial - Delivery project is installed. If Intelligence Server is available on the local machine with the Tutorial project loaded, Narrowcast Server automatically uses this Intelligence Server. Otherwise, Narrowcast Server asks you to specify the location of an Intelligence Server with the Tutorial project loaded and running.

Configuring the Tutorial - Delivery sample project

Now that you have installed Narrowcast Server, you are ready to configure the Tutorial - Delivery system.

To run the Tutorial configuration process, you must have selected the MicroStrategy Tutorial - Delivery option when you installed Narrowcast Server. The Evaluation Edition of Narrowcast Server automatically installs the Tutorial - Delivery sample project.

You must have an active Internet connection with email for Narrowcast Server to send services to you via email. If you do not have access to an active email account, you can choose to save the messages as files. This allows you to view the messages in your email application, but you do not need to have network access.

Remote access: It is recommended that the Narrowcast Server System is remotely accessed only through Narrowcast Administrator. Remote access using Terminal Server is not supported or recommended.

If you encounter any errors or problems during the configuration process, check *Troubleshooting the Tutorial installation and configuration, page 27* for steps to understand and resolve any issues.

To configure the Tutorial - Delivery system

1   Begin with one of the following options, depending on your existing system setup:

- Once your machine restarts after installation, the Welcome to MicroStrategy dialog box appears automatically.

- If the Welcome dialog box or the Narrowcast option does not appear, from the **Start** menu choose **Programs**, **MicroStrategy Tools**, and then **Narrowcast Administrator**. The Welcome to MicroStrategy dialog box opens.

- If the MicroStrategy Tutorial - Delivery project is not installed, the first time that Narrowcast Administrator is used on a

machine Narrowcast Server detects that no systems are connected and launches the System Configuration Wizard. Use the steps above to install the Tutorial - Delivery project, or see Narrowcast Server Configuration in the *Narrowcast Server Installation and Configuration Guide* for information to configure the system.

2   In the Welcome to MicroStrategy dialog box, you can provide an email address to deliver email messages to, and then click **OK**.

- If you are offline or do not have an email account, you can save messages to a folder location. Select a folder location where messages should be saved, and note this location so you can find these messages in the future. To see the emails, double-click the .eml files to open the messages in your email application.

You can later edit the delivery options of the Tutorial services by using the System Configuration Wizard. For information about editing the settings of the services, see *To change the Tutorial configuration process, page 26*.

3   If you do not have Intelligence Server running on the local machine, the Select an Available Intelligence Server dialog box opens.

- If you have Intelligence Server installed on the local machine but it is not running, start Intelligence Server and then click **OK**.

- If you do not have Intelligence Server installed on the local machine but intend to do so, click **Cancel**. You can then exit Narrowcast Administrator and install Intelligence Server at any time.

- If you have Intelligence Server installed on a different machine, provide the machine name and the login and password for Intelligence Server.

4 The Summary dialog box opens and indicates that you are ready to start using the Tutorial system.

- If any errors are displayed, click the links to learn how to resolve each problem. For details to resolve specific errors, see *Troubleshooting the Tutorial installation and configuration, page 27*.

    Click **OK**. The Narrowcast Server: Home page opens.

Changing the Tutorial configuration

After you have created a system, if you want to re-configure the system, follow the steps below to re-access the Tutorial configuration process using the System Configuration Wizard. For example, if you had set the delivery options of the service to Email during configuration, and later you want to change the delivery to File, you can edit the option using the System Configuration Wizard.

To change the Tutorial configuration process

1 In Narrowcast Administrator, from the **System** menu, select **Tutorial System**, and then select **Edit System Configuration**. The System Configuration Wizard opens.

2 Click **Information Transmitters**. The Configuration screen appears.

3 Double-click the **Email (SMTP)** Information Transmitter. The Information Transmitter Definition dialog box opens.

4 Select **Message Output** and choose **Save to File**. If you want to have each sample service delivered to email and file, choose **Do Both**.

> If you choose either the **Save to File** or **Do Both** option, specify the folder location in the **Save to folder** field, to save the message files that are generated by Narrowcast Server.

5 Click **OK**.

For more information about using the System Configuration Wizard, see *System Configuration Wizard* in the *Narrowcast Server Installation and Configuration Guide*.

Removing the Tutorial configuration

You can unregister the Tutorial service from Narrowcast Administrator, if the service is not required.

To unregister the Tutorial service

1 In Narrowcast Administrator, from the **System** menu, select **Tutorial System**, and then select **Unregister System** for each system that is registered on your machine. A confirmation message about unregistering the system is displayed.

2 Click **Yes** to proceed. The system is unregistered and the Narrowcast Administrator home page is displayed.

Troubleshooting the Tutorial installation and configuration

During the Tutorial configuration process, certain errors can occur. Each error is described below.

An email address was not provided

If you selected the option to deliver messages via email, you must specify an email address. If you click **Cancel** on the Welcome dialog box, the configuration process continues. However, this error is listed in the Summary dialog box.

This address is used for two purposes:

- Since Narrowcast Server delivers email messages, Narrowcast Server needs to have an email address to use as the sender address.

- Narrowcast Server needs an email address to deliver the Tutorial services to.

To resolve this problem, close and reopen Narrowcast Administrator. You are prompted for this address again and the configuration should proceed without this error. If this error is not resolved, a pre-configured address is used for both the sender address and for the Tutorial service addresses and you do not receive any Tutorial service sample messages via email.

No printer is available

To send a file to a printer using Narrowcast Server, you must specify a printer to use. This information is in the Narrowcast Server print device definition. If the device is set to allow user addresses to override this printer, the recipient's printer as defined in their physical addresses is used.

The Narrowcast Server Tutorial configuration process tries to automatically configure a default printer device for you, using the default printer from your computer. If no default printer can be found, the configuration process prompts you for a printer. If no printer is specified, you can do one of the following:

- Specify a default printer in your computer, and rerun the configuration process.

- Edit the definition of the default printer device, which can be found in Narrowcast Administrator by expanding **Administration** on the left, then expanding **Devices**, then selecting **Printer**. Double-click **Default Printer** to select a printer.

- Create a new print device to point to a printer.

If you do not need print functionality at this time, you can ignore the warning and revisit the print devices at a later time. Other Narrowcast Server functionality is not affected.

The system could not be updated

Before you begin using Narrowcast Server, you must specify an email address. Once you provide an email address, Narrowcast Administrator uses this address for both the sender address when delivering sample email messages and for the recipient address to receive sample Tutorial services. When you update the sender address, Narrowcast Administrator updates the system with this information. If for some reason the system cannot be contacted or the address information cannot be updated, this error results.

To resolve this problem, perform the following steps:

1   Ensure that the Tutorial system database is available in the correct location. The file `TUTORIAL_DELIVERY_7200` must exist in the folder `..\`*`Program_File_Path`*`\Narrowcast Server\Tutorial\Database`, where *`Program_File_Path`* is the file path selected during installation where program files should be installed.

2   Ensure that you have a system data source name on the local machine named "MicroStrategy_Tutorial_Delivery". This data source name must point to the database file described in the previous step. Authentication should not be required.

3   Ensure that this database is not set as read only.

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of the problem.

The Subscription Book could not be accessed

Before you begin using Narrowcast Server, you must specify an email address. Once you provide an email address, Narrowcast Administrator uses this address for both the sender address when delivering sample email messages and for the recipient address to receive the sample Tutorial services. When you update the recipient addresses, Narrowcast Administrator updates the Subscription Book with this information. If for some reason the Subscription Book cannot be contacted or the address information cannot be updated, this error results.

To resolve this problem, perform the following steps:

1   Ensure that the tutorial system database is available in the correct location. The file `TUTORIAL_DELIVERY_7200` must exist under in the folder `..\Program_File_Path\Narrowcast Server\Tutorial\Database`, where `Program_File_Path` is the file path selected during installation where program files should be installed.

2   Ensure that you have a system data source name on the local machine named "MicroStrategy_Tutorial_Delivery". This data source name must point to the database file described in the previous step. Authentication should not be required.

3   Ensure that this database is not set as read only.

4   Ensure that the correct data source name is provided for the Tutorial system Subscription Book. To do this, in Narrowcast Administrator, from the **System** menu, select **Edit System Configuration**. In the Subscription Book section, ensure that the data source name described above is specified. No login, password, or database name is required.

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of this problem.

The Subscription Book does not contain any users

Before you begin using Narrowcast Server, you must specify an email address. Once you provide an email address, Narrowcast Administrator uses this address for both the sender address when sample delivering email messages and for the recipient address to receive sample Tutorial services. To update the Tutorial service recipient addresses, the Subscription Book used by the Tutorial system must contain the Tutorial users. If the Subscription Book is empty, this error results.

To resolve this problem, do one of the following:

• Reinstall the Tutorial - Delivery project and choose to overwrite the Tutorial repository when prompted.

⚠ You lose any changes made to both the Tutorial system and the Subscription Book.

• Manually add a user with an email address to the Subscription Book.

ℹ If you choose the option to manually add a user, the Tutorial services are not delivered when executed, since the users subscribed to these services no longer exist.

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of this problem.

A running Intelligence Server was not provided

The Tutorial project's sample services deliver sample reports. For the Tutorial services to work properly, Narrowcast Server must be able to connect to a running Intelligence Server with the Tutorial - Reporting project available. If you installed both Intelligence Server and Narrowcast Server on the same machine, Narrowcast Server should

locate this Intelligence Server and project automatically and connect to it without prompting you. However, if Narrowcast Server cannot find a running Intelligence Server with the Tutorial project available or cannot connect to it using the default login and password (login: Administrator, password: none), you are prompted to provide the location of this machine and the login and password. If you do not provide the location, login, and password of an Intelligence Server, this error appears.

To correct this problem, ensure the following:

• Intelligence Server is installed on a networked machine in a trusted domain

• The Tutorial - Reporting project is available

• Intelligence Server is running

• The product versions of Narrowcast Server and Intelligence Server are the same

• You can provide the correct login and password when prompted by Narrowcast Server

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of this problem.

Intelligence Server information is invalid

One or more of the following errors has occurred:

• A running Intelligence Server was not found on machine *<machine name>*

• The login/password for the Intelligence Server *<machine name>* are invalid

• The Tutorial - Reporting project is not available on the Intelligence Server *<machine name>*

The Tutorial - Delivery project's sample services deliver sample reports from the MicroStrategy Tutorial - Reporting project. As a result, for the Tutorial - Delivery services to work properly, Narrowcast Server must be able to connect to a running Intelligence Server with the Tutorial - Reporting project available. If you installed both Intelligence Server and Narrowcast Server on the same machine, Narrowcast Server should locate this Intelligence Server and project automatically and connect to it without prompting you. However, if Narrowcast Server cannot find a running Intelligence Server with the Tutorial - Reporting project available or cannot connect to it using the default login and password (login: Administrator, password: none), you are prompted to provide the location of this machine and the login and password. If you do not provide the location, login, and password of a suitable Intelligence Server, this error appears.

To correct this problem, ensure the following:

- Intelligence Server is installed on a networked machine in a trusted domain

- The Tutorial - Reporting project is available

- Intelligence Server is running

- The product versions of Narrowcast Server and Intelligence Server are the same

- You can provide the correct login and password when prompted by Narrowcast Server

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of this problem.

SequeLink is not running on this machine

The Tutorial - Delivery project provides a fully-configured Subscription Portal so that you can subscribe to sample Tutorial

services without customization. For this functionality to work, all Narrowcast Server product components including the Subscription Portal and SequeLink Connectivity Software must be installed on the local machine. You cannot install these components on a separate machine. You can, however, install all product components on the local machine and then configure your Subscription Portal at a later time to use distributed system components.

To resolve this problem, ensure the following:

* You have installed the Subscription Portal and SequeLink Connectivity Software (available as subcomponents under the Narrowcast Server installation option) on the local machine

* You restarted your machine after installation

* The SequeLink Server services are started

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of this problem.

The Subscription Portal is not running on this machine

The Tutorial - Delivery project provides a fully-configured Subscription Portal so that you can subscribe to sample Tutorial services without customization. For this functionality to work, all Narrowcast Server product components including the Subscription Portal and SequeLink Connectivity Software must be installed on the local machine. You cannot install these components on a separate machine. You can, however, install all product components on the local machine and then configure your Subscription Portal at a later time to use distributed system components.

To resolve this problem, ensure the following:

- You have installed the Subscription Portal and SequeLink Connectivity Software (available as subcomponents under the Narrowcast Server installation option) on the local machine

- You restarted your machine after installation

- The SequeLink Server services are started

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of this problem.

This machine is currently in use by system <system name>

The Tutorial - Delivery project provides a fully-configured system so that you can deliver sample Tutorial services. To do this, Narrowcast Server adds the following Narrowcast Server system components to the local machine: a Distribution Manager, an execution engine, and a MicroStrategy Logging Server. However, since any given machine can only be used by one Narrowcast Server system, this step is not completed if the local machine is currently in use by another system as a Distribution Manager, execution engine, or Logging Server. To resolve this problem, reconfigure the system that currently has one or more components on the local machine and remove this machine from the system.

Once you have resolved the underlying problem, close and reopen Narrowcast Administrator to complete the resolution of this problem.

Reviewing the configuration log file

 To learn more about specific errors, review the log file DELogXXX.TXT where XXX is the date and time in Universal Time Coordinates (UTC) or as specified by the user on the Execution tab in System Settings. For more information, refer to the *Narrowcast Server System Administrator Guide*.

3

SENDING AND RECEIVING SERVICES

Evaluating Narrowcast Features

This chapter provides steps to follow the Narrowcast evaluation of features. As part of the evaluation, it describes a Narrowcast service and shows you how to create and deliver a service.

The Narrowcast evaluation has you interact with four of the many sample services provided in the sample Tutorial - Delivery project. This chapter provides details on all of the sample services that come with Narrowcast Server. These sample services are designed to show you all the important functionality that the Narrowcast products provide, so that you can make use of these features in your own services.

About services

A service provides all the information needed for Narrowcast Server to generate and deliver messages to subscribers. For example, one service might be used to deliver a daily email message containing an inventory level, while another service delivers alerts to mobile devices when inventory for a specific item changes significantly.

The information a service needs includes:

- The delivery conditions, such as what address to deliver the file to, what format is required, and so on.

- What content to deliver.

- Any personalization settings.

- Subscription details for sending messages for a particular purpose.

Users can subscribe themselves to a service, or an administrator can subscribe a set of users to a service.

The definition of each service determines:

- When it is sent: This can be time-based (for example, daily) or event-based (for example, after a significant inventory level change).

- To whom it is sent: For example, all subscribers or only those interested in a particular product.

- What is sent: This is the content of the message, such as daily inventory summary or item alert messages.

- How it is formatted: For example, HTML or plain text.

- How it is delivered: For example, via email (SMTP) or SMS.

A service contains the following components:

- Publications, which determine the content of the service.

- Subscription sets, which determine which end users receive the service.

- Schedules, which determine the frequency with which a service is executed.

Services also contain all of the information needed for users to subscribe themselves or other users to that service. This information includes:

- Supported locales, so that a user who reads English does not try to subscribe to a service that delivers only German content.

- Supported devices, so that a user does not create a subscription to his cell phone for a service that sends Microsoft Excel workbooks.

- Content security and preference characteristics, so that a user can choose the information he wishes to receive, within the context of his data access privileges and the information that is pertinent to the service.

About the MicroStrategy Tutorial - Delivery project
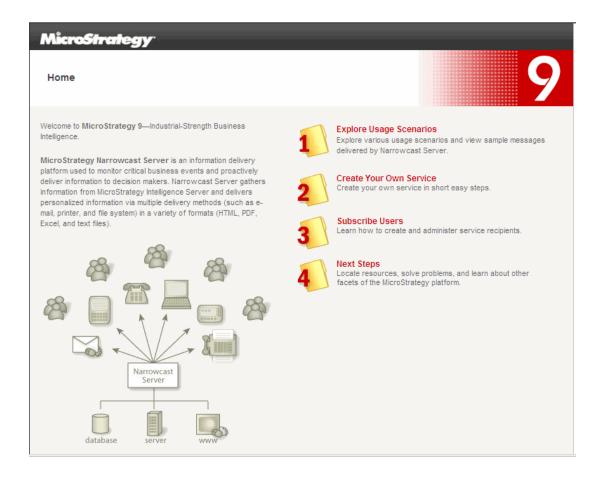
The MicroStrategy Tutorial - Delivery project's sample services are grouped into three business areas: Business Activity Monitoring, Supply Chain Management, and Customer Relationship Management, described below:

- Business Activity Monitoring: These services show how Narrowcast Server can improve information flow within the business itself by proactively delivering information to key decision-makers.

- Supply Chain Management: These services show how Narrowcast Server can improve interactions with external parties such as suppliers by delivering alert-based information when certain events occur.

- Customer Relationship Management: These services demonstrate how businesses can improve relations with customers by segmenting a group of customers into an appropriate audience and then delivering targeted, personalized information.

The steps in this chapter walk you through exploring all of the sample services in the business areas above.

Getting started with the Narrowcast evaluation

The Home page is the starting point for using the Narrowcast evaluation.

Start learning about the feature set by using the sample services that come with Narrowcast Server. The sample services provided are designed to show you how Narrowcast Server proactively delivers information to key decision-makers. Click the title of each service to view a sample message. See *Sending sample services, page 41* for details on each service.

Then continue experiencing fundamental Narrowcast features by creating and sending your own service. Steps are in *Creating a service, page 90*.

Finally, learn how to subscribe users by creating and administering recipients for your new service. You learn how:

•   Reports and documents can be delivered via MicroStrategy Web

- End users can subscribe to services, change their addresses, define preferences, and more using the Subscription Portal

- To create and subscribe users using Narrowcast Administrator

- To integrate user information from an external source with Narrowcast Server

Steps to learn about subscribing users are in *Chapter 4, Subscribing to Report Deliveries*.

Sending sample services

This section walks you through the Narrowcast evaluation. These steps show you how to create and send sample services and teach you about various functionality along the way.

These sample services show how your enterprise can use Narrowcast Server to better leverage its business intelligence by delivering information where and when it is needed.

Prerequisites

Verify that you meet the following requirements and review the important notes before you get started.

- You have installed Narrowcast Server and the MicroStrategy Tutorial - Delivery sample project, and have configured the Tutorial project. For steps to do this, see *About installing and configuring the sample Tutorial system, page 16*.

- Your machine meets the minimum system requirements as noted in the Narrowcast Server Readme file. If your machine does not meet these requirements, you can look at pre-delivered messages that are installed in `..\Program Files\MicroStrategy\Narrowcast`

`Server\Tutorial\SampleMessages.` **Start with** `0_Welcome_ Message.eml.`

ℹ️ Note the following:
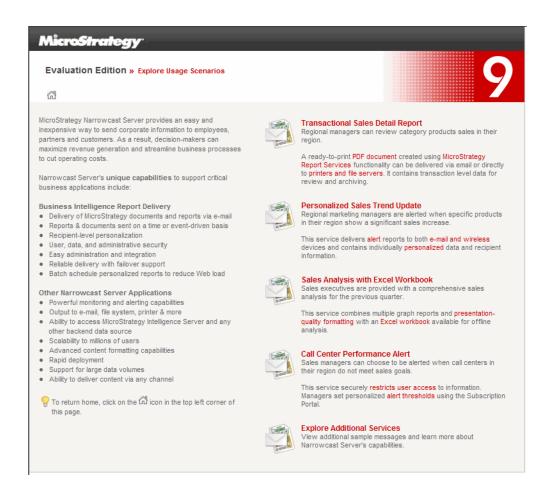
- All reports used by these sample services can be found in MicroStrategy Developer in the MicroStrategy Tutorial - Reporting Project. Go to `Public Objects\Reports\MicroStrategy Platform Capabilities\MicroStrategy Narrowcast Server.`

- If you set up your Narrowcast system to deliver messages to a file storage location, you can view resulting messages at `..\Program Files\MicroStrategy\Narrowcast Server\` `Delivery Engine\SavedMail` by default.

- All services are based on a current date at the end of the fourth quarter.

Transactional Sales Detail Report service
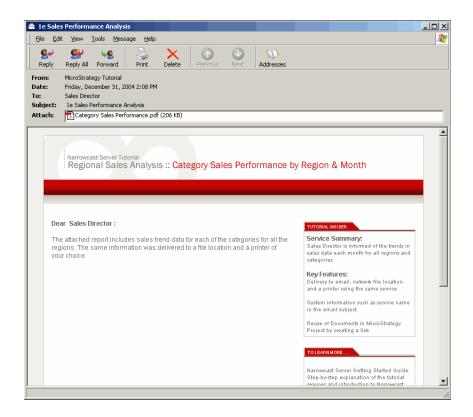
This service sends the Sales Performance Analysis report.

To execute the Transactional Sales Detail service

1 From the Home page, click **Explore Usage Scenarios**. The Explore Usage Scenarios page is shown below:

2   Select the first service, **Transactional Sales Detail Report**.
The email that the service sends is displayed in your email client.

- If you do not see the fully formatted email with graphics, from
  the email client's **View** menu select **Message in HTML**. If
  your email client blocks images, click in the message at the top
  of the email to allow images to be displayed.

3   In the email, double-click the attached **Category Sales Performance** PDF to open it. This PDF shows a Report Services document designed to display sales data. The details of the service and its attached document are described below.

Business purpose

Sales directors are notified at the end of each month about sales in all regions for each of the product categories. Based on this data, any regions that are under-performing can be identified and suitable action can be taken. Managers of regions doing well can be rewarded. The analysis of trends for the current year provides a comprehensive picture of sales performance.

Service overview

A sales director wants an overview of the sales in all the regions for each product category. She also wants additional relevant information

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on cost, profit, and margin for a better understanding of the sales trends. The service provides information for past months in a given year and compares it with previous periods. Previous periods include month, quarter, and year. This comparison highlights any drops or improvements in performance, by region.

This service has a single recipient with multiple addresses and has a static subscription list. The information is simultaneously delivered to an email address, a network location for file storage, and a printer. The information can be shared with other users by sharing the network location or by distributing copies of the printed report. This service delivers a Report Services document in the MicroStrategy metadata, by adding a link in the delivered file to existing MicroStrategy content.

Key features of this service

- Delivery to email, network file location, and a printer using the same service

- System information such as service name in the email subject

- Reuse of Report Services documents in a MicroStrategy project by creating a link

To see how the Sales Director service is defined

1 From Narrowcast Administrator's **View** menu, make sure that **Folder List** is selected.

2 In the Folder List, expand **Applications**, expand **Narrowcast Server Tutorial**, then expand **Business Activity Monitoring**.

3 Select **1e Sales Director - Sales Performance Analysis**.
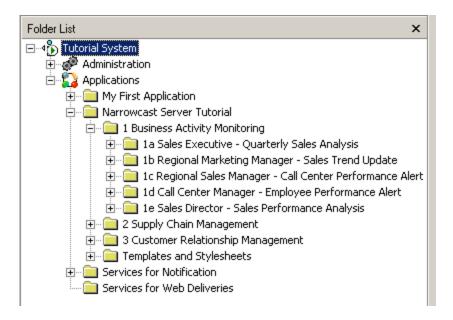
4 On the right side, double-click the **1e Sales Performance Analysis** service. The Narrowcast Service Wizard opens. Click **Next**.

5 On the Delivery Methods page, notice that email, file, and print delivery methods are selected for this service. Click **Next**.

6 To see how the service name is included in the email's subject line, expand **Edit Subject** and double-click **1e Sales Performance Subject**. The service name is included in the email subject line by inserting an information object that provides system information. The information object is represented by a blue "i" icon with a lightning bolt . When you are ready, close the

    Plaintext Document Editor without saving any changes.

7 To see how a document link was included in the email that the service delivers, expand **Define Attachments** and double-click **Category Sales and Profit Performance**. The Report Services document's name is selected on the left, and its dataset (the report, Intelligent Cube, or other set of data that the document draws its data from) and grouping (the structure of the data on the document) are displayed on the right. When you are finished viewing these, click **Cancel**.

8 Click **Next** to see how the file delivery content was created. On the File Content page, you can expand **Define Saved Documents** and double click **Category Sales and Profit Performance** to see how the same Report Services document is identified to be sent to a file storage location. When you are finished viewing, click **Cancel**.

9 Click **Next** to see how the printer delivery content was created. On the Print Content page, you can expand **Define Documents** and double click **Category Sales and Profit Performance** to see how the same Report Services document is identified to be sent to a networked printer. When you are finished viewing, click **Cancel**.

10 When you are finished viewing the parts of the service, close the Service Wizard by clicking the **X** in the top right corner. Click **Yes** to exit the Service Wizard.

By inserting a link to a MicroStrategy document, all the formatting and content created in a MicroStrategy project can be easily reused. This is particularly useful for sending and sharing Report Services documents, which provide pixel-perfect formatting.

To return to the evaluation Home page, in the Folder List on the left click **Tutorial System** at the top of the folder hierarchy, as shown in the image below:

You can close the 1e Sales Performance Analysis email when you are finished viewing it.
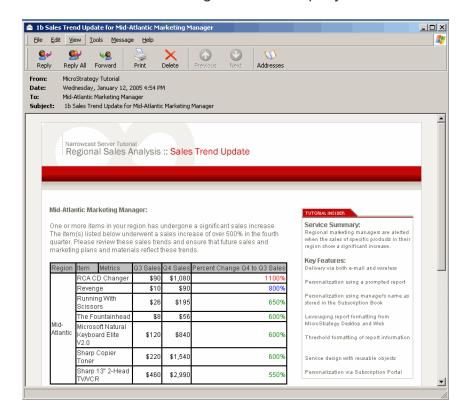
Personalized Sales Trend Update service

This service sends a sales trend update to Mid-Atlantic marketing managers.

To execute the Sales Trend Update service

1 From the Home page, click **Explore Usage Scenarios**.

2   Select the second service, **Personalized Sales Trend Update**. An email opens displaying important information about significant sales increases in the region.

- If you do not see the fully formatted email with graphics, from the email client's **View** menu select **Message in HTML**. If your email client blocks images, click in the message at the top of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Regional marketing managers are alerted when items in their region have a significant sales increase. This allows marketing managers to react quickly to sales trends in their regions and to ensure that future sales and marketing plans and materials reflect these trends.

Service overview

Regional marketing managers are often away from the office. As a result, some prefer to receive sales trend updates via email while others prefer to receive updates via mobile device. This service delivers content for both email and mobile devices.

When you run this service, two messages are delivered:

- One message, to the Mid-Atlantic marketing manager, delivers information via email.

- The second message, to the Northeast marketing manager, delivers information formatted for a mobile device.

Both messages provide the same information: a list of items in their region that have seen a significant sales increase and the percent sales increase for each item.

Key features of this service

- Delivery via both email and mobile devices

- Personalization using a prompted report

- Personalization using manager's name stored in the Subscription Book

- MicroStrategy Developer report formatting leveraged

- Threshold formatting of report information

- Service design with reusable objects

- Personalization via the Subscription Portal

To see how the Regional Marketing Manager service is defined

1 From Narrowcast Administrator's **View** menu, make sure that **Folder List** is selected.

2   In the Folder List, expand **Applications**, expand **Narrowcast Server Tutorial**, then expand **Business Activity Monitoring**.

3   Select **1b Regional Marketing Manager - Sales Trend Update**.

4   On the right side, double-click the **1b Sales Trend Update** service. The Narrowcast Service Wizard opens. Click **Next**.

5   On the Delivery Methods page, notice that two delivery methods are enabled: email and wireless (also called mobile devices). Click **Next**.

6   The content you define is different for each delivery method, since the two delivery methods have different content requirements. (For example, for mobile device messages, a text body is created instead of an HTML body by default.) You can see how this service is set up to send different content depending on what type of device the content is being delivered to:

a   On the Email (SMTP) Content page, expand **Define Message Body (HTML)** and double-click **1b Email Body**.

The HTML Document Editor opens. Use the scrollbar on the right to see what the email body content looks like. Notice the graphic images, logos, and dividing bar in corporate colors.

Close the HTML Document Editor. (If prompted to save changes, click **No**.) Then click **Next**.

b   On the Wireless (SMTP) Content page, expand **Edit Message Body (Text)**. Then double-click **1b Wireless Body**. The Plaintext Document Editor opens.

You can see that simple, graphic-free text content is defined for this delivery method because a mobile device text message is expected to contain simple text and not be loaded with

graphics. The same is not true for the body of an email, which can generally contain more formatting and graphics.

Close the Plaintext Document Editor. (If prompted to save changes, click **No**.)
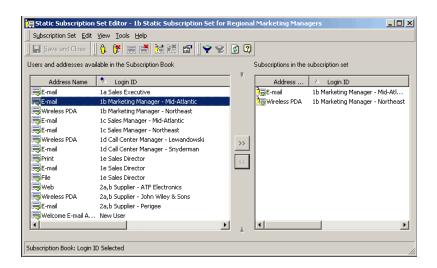
When you are finished viewing the structures of these two different types of content, you can close the Service Wizard.

7 Because regional sales managers need to see information generated specifically for their particular region, their information is personalized using user preferences. This personalization is achieved by including an information object with the service.

a In Narrowcast Administrator, on the right side, double-click the **1b Sales Trend Update (Prompted)** information object. The Information Object Wizard opens.

b Click **Next**. On the wizard's Report page, look at the definition of the selected report on the right side, in the Report Layout pane.

This report contains a prompt to choose a region. This prompt is answered automatically by the information object, with a specific answer for each user. As a result, each user receives only information for their region.

c When you are finished viewing the information object, click **Cancel** to exit and close the Information Object Wizard.

The information object for this service was saved and made available outside of the service. Because this information object was created as an independent object, this allows the information object to be reused in both the email and mobile device message contents. When you have multiple delivery methods in a service, saving personalization information in a separate information object allows users to define preferences

once and receive the appropriate personalized content regardless of their preferred delivery method.

8   Each message is personalized using the regional marketing manager's title. This user-specific information is stored in the Narrowcast Subscription Book. Use the following steps to see how this personalized information is achieved:

a   On the right side, double-click the **1b Sales Trend Update** service again. The Narrowcast Service Wizard opens. Click **Next**.

b   Click **Next** again to get to the Email (SMTP) Content page.

c   Expand **Define Message Body (HTML)** and double-click **1b Email Body**. Use the scrollbar on the right side if necessary to view the top of the email body.

d   The first information object you see (the blue icon with the lightning bolt at the top of the service content) was created by adding the appropriate information object to the email. To see how this was done, from the **Insert** menu, select **User Information**, then point to **First Name**.

e   To find out more about the information objects within a service, for example, to determine which user information has been inserted, from the **View** menu select **Document Element List**. In the Document Elements pane that opens on the left, click **Document Element 1** to display details below it for the first information object. Click **Document Element 2** to display details below it for the second information object.

f   This user information, such as First Name, is then personalized for each user at the end of the service wizard by editing user properties within the subscription set. To see this, close the HTML Document Editor without saving any changes.

g   Click **Next** until you see the Subscriptions and Schedules page. Then double-click **1b Static Subscription Set for Regional Marketing Managers**.

h   In the subscription set for this service, you can see in the right pane two addresses that have been subscribed to this service: an email address for the Mid-Atlantic Marketing Manager and a mobile device address for the Northeast Marketing Manager. In the left pane, double-click these addresses to see the corresponding users:

Be sure to click the matching addresses. The email address is shown selected below. The mobile device address is immediately below the email address.

i   The User Properties Editor opens. By clicking the Addresses tab at the top, you can see that each user has one address defined for the desired delivery method. This controls where the user receives the contents for this service.

j   On the Preference tab, preferences have been defined for the report in this service by answering the prompt by selecting the appropriate region. Click the User Preference, then click **Modify**. In the Define User Preference dialog box, click **Answer**. You are presented with the prompt that is

automatically answered by the information object, and you can provide different or additional answers here. Click **Cancel** twice to return to the User Properties Editor.

k   The user's first name ("Mid-Atlantic Marketing Manager" for the email address in this example) is displayed on the User Information tab. You can type personalized information by simply typing in the **Value** field next to the appropriate User Property. For this service, the typed first name is used to personalize the first name that is added to both the subject and the message body greeting of each email message.

l   Click **Cancel** to close the User Properties Editor. Close the Static Subscription Set Editor to exit. Then close and exit the Service Wizard.

The formatting for the Report Services document is defined in MicroStrategy Developer or MicroStrategy Web, and is leveraged by MicroStrategy Narrowcast Server. The document also includes thresholding, which is content that is specially formatted based on the data values it returns, as defined in MicroStrategy Developer or Web. The preservation of formatting defined in MicroStrategy Developer or Web is an important capability since it enables report and document designers to design and format reports and documents once and then deploy them to end users via multiple channels.

When a user subscribes to this service using the Subscription Portal, the user is prompted to select his region. This allows regional marketing managers to manage their own subscriptions so no central administrator needs to control subscriptions or to assign preferences for this service. To see this functionality, log into the Subscription Portal using the login you created during installation, and subscribe to this service. While subscribing, you are prompted to select a region for which you would like to receive content. For steps to evaluate the sample Subscription Portal, see *Chapter 4, Subscribing to Report Deliveries*.

To return to the evaluation Home page, in the Folder List on the left click **Tutorial System** at the top of the folder hierarchy.
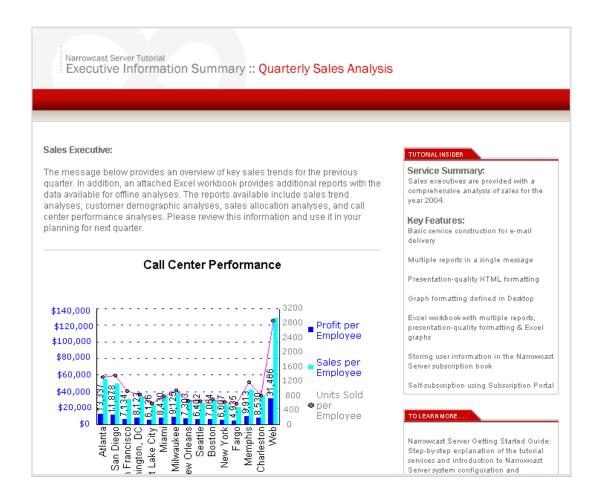
You can close the 1b Sales Trend Update email when you are finished viewing it.

Sales Analysis with Excel Workbook service

Sales executives receive a comprehensive sales analysis for the previous quarter. This service combines multiple graph reports and presentation-quality formatting with an Excel workbook available for off-line analysis.

To execute the Sales Analysis with Excel Workbook service

1   From the Home page, click **Explore Usage Scenarios**.

2   Select the third service, **Sales Analysis with Excel Workbook**. An email opens displaying information about key sales trends for the previous quarter.

   •   If you do not see the fully formatted email with graphics, from the email client's **View** menu select **Message in HTML**. If your email client blocks images, click in the message at the top of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Sales executives commonly review sales information each quarter to ensure that they react to important trends in sales data. In this sample email, the email body contains four graphs that summarize key sales trends, and an attached Excel workbook provides a broader range of reports covering the areas of sales trend analyses, customer demographic analyses, sales allocation analyses, and call center performance analyses. The Excel workbook provides access to the original data so that it is available for additional off-line analysis.

Service overview

This service is an example of a basic service in Narrowcast Server. Specific features of this service include the following:

- Multiple reports have been combined in the same message content and arranged in a presentation-quality HTML format. Narrowcast Server provides the ability to combine multiple reports in the same message and provides control over how the reports are arranged within the HTML content. It is also possible to integrate content from other sources such as from the web, from your Windows file system, or from a database query into this same message.

- The different graphs have coordinated colors and formatting. These graphs are created and formatted in MicroStrategy Developer, and Narrowcast Server ensures that all formatting information is preserved.

- The Excel workbook contains presentation-quality graphs as well as the original data available for offline analysis. This is a powerful advantage because it allows recipients to interact with data without providing end user training on how to use a reporting system and without depending on recipients to run specific reports at a specific time.

- This service stores recipient information in the Subscription Book. The Subscription Book is a set of tables in a relational database that Narrowcast Server uses as its internal storage location for subscription information. This sample service has only one subscription, so only one message is delivered when the service is run.

Key features

- Basic service construction for email delivery

- Aggregation of multiple reports in message content

- Presentation-quality HTML format

- Graph formatting defined in MicroStrategy Developer

- Excel workbook with multiple reports

- User information stored in the Subscription Book

- User self-subscription using the Subscription Portal

To see how the Sales Executive service is defined

1 From Narrowcast Administrator's **View** menu, make sure that **Folder List** is selected.

2 In the Folder List, expand **Applications**, expand **Narrowcast Server Tutorial**, then expand **Business Activity Monitoring**.

3 Select **1a Sales Executive - Quarterly Sales Analysis**.

4 On the right side, double-click the **1a Quarterly Sales Analysis** service. The Narrowcast Service Wizard opens. Click **Next**.

5 On the Delivery Methods page, notice that this service is delivered to all recipients via email. This is because the information is not highly time-critical and all sales executives have access to the corporate email system. Click **Next**.

6 On the Email (SMTP) Content page, you can edit the message body. To do this, click to expand **Define Message Body**. Then double-click **1a Email Body**. The HTML Document Editor opens.

   a In the HTML Document Editor, from the **View** menu, select **Source** to see the source HTML.

   b From the **View** menu, select **Preview** to see the rendered content.

   c From the **View** menu, select **Editor** to edit the HTML as it is rendered.

d   The lightning bolt icons within the service content represent information objects, which are used by Narrowcast Server to gather dynamic content when the service is run. Dynamic content includes such things as the graphs in this service. Right-click one of these icons and select **Edit information object** to see which report from MicroStrategy Developer is represented by this icon, as well as the attribute and metrics on the report, the report's filter definition, and so on. Each information object in the message body contains a different report.

7   Click **Cancel** to exit the Information Object Wizard. Then close the HTML Document Editor without saving any changes.

8   Click **Next**. The Subscriptions and Schedules page opens.

9   Double-click **1a Static Subscription Set for Sales Executives** to see which subscriptions are defined for this service. In the Static Subscription Set Editor, the left pane displays all the users and addresses available in the system, in the Subscription Book. The pane on the right shows the subscription set for the service. For this sample service, a single subscription is displayed and the service is delivered to a single recipient.

a   To subscribe users, select the user on the left and then click the right arrow.

b   To delete subscriptions, select the subscription on the right and then click the left arrow.

c   You can also double-click any address or subscription to view and edit its definition.

10 Close the Static Subscription Set Editor without saving any changes.

11 Edit the schedule by double-clicking it, as shown below:

a   The Schedule Wizard opens. Click **Next**.

b   This schedule is designed not to execute automatically (which is why the year is set to 3000), so you can only receive this service by clicking **Run Immediately**. Click **Next** to see where a schedule is defined.

c   When you are finished viewing the schedule details, click **Finish**.

12 Close and exit the Service Wizard.

To subscribe to the Sales Executive service

Sales executives can use the Subscription Portal to subscribe themselves to receive this service. The ability for sales executives to subscribe themselves to a service like this is important:

•   It allows them to manage their own subscriptions

•   A central administrator does not need to control subscriptions to all services

Before you begin these steps, ensure that you have started the following services within Windows: IIS Admin Service and the World Wide Web Publishing Service.

1　Open the Subscription Portal, using one of the following methods depending on where the Subscription Portal was installed:

- If you accepted the default virtual directory during installation and the Subscription Portal is installed on the local machine, you can open the Subscription Portal using either of the following methods:

  — From your **Start** menu, select **Programs** (or All Programs), select **MicroStrategy Tools**, then select **Subscription Portal**.

  — You can type the following URL into your browser:

  http://localhost/NarrowcastServer/login.asp

- If the Subscription Portal is installed on a different machine, type the following URL into your browser:

  http://*MachineName*/*VirtualDirectoryName*/login.asp

  Where `MachineName` is the name of the machine where the Subscription Portal is installed, and `VirtualDirectoryName` is the name of the virtual directory you selected during the Subscription Portal installation.

2　On the Login page, click **Create a new account**. Type a user name and password, specify an email address, and select the system language. Note the user name and password so you can reference them later. Then click **Create a new account**.

3　When prompted for user information, type a first name and last name and then click **Save**. This information is used to personalize messages.

4　On the Subscription Portal's Welcome page, select the **Tutorial** channel:

> The folder structure in this channel corresponds to the folder structure in Narrowcast Administrator in the MicroStrategy Tutorial - Delivery folder. In Narrowcast Server, one folder is chosen to define a channel and all subfolders become the subfolders for this channel.

5   Select **Sign up for a Service**. Browse to the sample service by selecting **Business Activity Monitoring** and then **1a Sales Executive - Quarterly Sales Analysis**.

6   Select the service, and subscribe your new user to receive this content. Select the only schedule available, leave all options on their default settings, and click **Next**. On the Success page, click **OK**. The Subscriptions page shows that your new user is subscribed to this service for delivery.

Close the Subscription Portal when you are finished.

To return to the evaluation Home page, in the Folder List on the left click **Tutorial System** at the top of the folder hierarchy.

You can close the 1a Quarterly Sales Analysis email when you are finished viewing it.
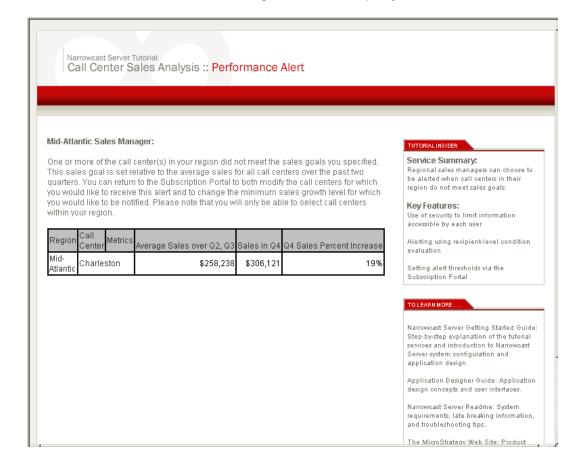
Call Center Performance Alert service

Sales managers can choose to be alerted when call centers in their region do not meet sales goals. This service restricts user access to information securely. Managers can set their own personalized alert thresholds using the Subscription Portal.

To execute the Call Center Performance Alert service

1   From the Home page, click **Explore Usage Scenarios**.

2   Select the fourth service, **Call Center Performance Alert**. An
email opens displaying information about call centers that did not
meet specified sales goals.

- If you do not see the fully formatted email with graphics, from
the email client's **View** menu select **Message in HTML**. If
your email client blocks images, click in the message at the top
of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Each call center has a sales goal that is set relative to the average
sales for all call centers over the past two quarters. Regional sales
managers can be alerted when call centers in their region do not meet
sales goals. Sales managers can choose the call centers within their

region for which they want to receive alerts, and the minimum sales growth level for which they want to be notified. Sales managers are only allowed to select those call centers within their region, so that sensitive sales information in other regions is not accessible.

Service overview

Regional sales managers often like to know quickly if one of the call centers they oversee is not performing well. Personalization for this service works similarly to the personalization used in *Personalized Sales Trend Update service, page 47*, using a prompted report. The report used in this Call Center Performance Alert sample service contains two prompts: one to define the threshold value and one to select a call center.

This service also restricts sales managers from seeing information for call centers in other regions. When regional sales managers select the desired call center, they can only select call centers in their region. In Narrowcast Server, this is enabled through information source security.

Key features

• Use of security to limit information accessible by each user

• Recipient-level condition evaluation alerting

• Alert thresholds set in the Subscription Portal

You can close the 1c Call Center Performance Alert email when you are finished viewing it.

Explore additional services

You can view the remaining sample services from the Tutorial - Delivery sample project, using the steps below to access them. The

Tutorial - Delivery project groups sample services into the following 3 areas:

- Business Activity Monitoring

  These services show how you can improve information flow within the business itself by proactively delivering information to key decision-makers.

- Supply Chain Management

  These services show how you can improve interactions with external parties such as suppliers by delivering alert-based information when certain events occur.

- Customer Relationship Management

  These services demonstrate how businesses can improve relations with customers by segmenting a group of customers into an appropriate audience and then delivering targeted, personalized information.

Employee Performance Alert service

This sample service is designed to alert call center managers when any of their employees performs significantly below the performance of the average employee.

This service integrates with an external database to retrieve recipient addresses, devices, and preferences during execution.

> For this sample service, set the Email (SMTP) and Wireless (SMTP) information transmitters to send messages to file rather than transmitting via email. This can be done in the Narrowcast Server System Configuration Wizard. (In Narrowcast Administrator, from the **System** menu, select **Tutorial System**, select **Edit System Configuration**, select **Information Transmitters** at the top, double-click the **Email (SMTP)** information transmitter, select the

ℹ **Message Output** tab, choose the **Save To File** option, click **OK**, click **Next**, and click **Finish**.)

> This is required because sample services 1d, 3a, and 3b gather nonexistent recipient email addresses from a MicroStrategy project. If these information transmitters are set to deliver these messages via email, these messages are not received. Saving messages to file also allows you to deliver the Tutorial services offline and without accessing an email account.

To execute the Employee Performance Alert service

1   From the Home page, click **Explore Usage Scenarios**.

2   Select **Explore Additional Services**. Then click the first link, **Employee Performance Alert**. An email opens displaying information about employees who performed significantly below standard performance for the month.

   •   If you do not see the fully formatted email with graphics, from the email client's **View** menu select **Message in HTML**. If your email client blocks images, click in the message at the top of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Call center managers are alerted at the end of each month if any of their employees have performed significantly below average employee performance over the previous two months. If one or more employees has sales 65% or more below average sales, the manager receives a message with the employee's name and their performance. The manager is asked to provide training to this employee and to work with this employee to improve his or her performance to prevent employee termination. Managers with no employees meeting the alert criteria do not receive a message.

Service overview

This service is similar to *Call Center Performance Alert service, page 62* since both services implement recipient-level alerting. However, this Employee Performance Alert service differs in two key requirements:

- All call center managers are alerted if one of their employees performs below a company-wide metric. Call center managers do not subscribe themselves to this service, and call center managers do not set a performance threshold for which they want to be alerted.

- Information about each call center manager, such as manager name and email address, is available in a relational database since it is used for another information system within this corporation. For this reason, the administrator does not want to duplicate this user information by creating a redundant set of users in the Subscription Book.

  The administrator creates this service so that it dynamically retrieves the list of recipients and recipient-related information (such as recipient name, email address, and preferred end user device) directly from the database at run time.

  In Narrowcast Server, this functionality is called dynamic subscriptions. Services that use dynamic subscriptions use a dynamic subscription set rather than a static subscription set. Dynamic subscription sets use a subscription information object to gather subscription information from an external source such as a MicroStrategy project, a file, or directly from a database rather than storing users and subscriptions in the Subscription Book. The subscription information object used in this example returns email address, user name, address display name, and preferred end user device.

Key features

- Recipient information gathered from a MicroStrategy project

- End-user devices specified using dynamic subscriptions

- Personalization using dynamic subscriptions

- Efficient report execution for high performance applications

To see how the Employee Performance Alert service is defined

1 From Narrowcast Administrator's **View** menu, make sure that **Folder List** is selected.

2 In the Folder List, expand **Applications**, expand **Narrowcast Server Tutorial**, then expand **Business Activity Monitoring**.

3 Select **1d Call Center Manager - Employee Performance Alert**.

4 On the right, double-click to edit the information object **Manager Subscriptions from Report**. The Information Object Wizard opens. Click **Next** through the wizard to see the various properties of this information object. Key properties are described in the following list:

- This information object maps attribute forms on the page axis of the selected report to subscription properties used by Narrowcast Server when the service is executed.

- Manager (ID) is used to define preferences for the information object used in the content of this report. This mapping is possible because this content information object is executed using personalized page execution, which uses a multipage report to return content for many subscribers in the same report execution. Each user then specifies his preferences by selecting a single page of content, by selecting an attribute value (for example, a manager) from the first attribute (for example, the manager attribute) on the page axis.

- The subscription information object returns the user's preference as a particular manager (for example, Snyderman). The content information object then returns a multipage report where each page can be selected by choosing a particular

manager. Thus, the subscription information object returns the subscription information required for report delivery and returns attribute values that are used to select pages out of a multipage report for each recipient.

5   When you reach the Summary page of the Information Object Wizard, click **Cancel** to close and exit the wizard without saving any changes.

6   In Narrowcast Administrator, double-click the **1d Employee Performance Alert (Dynamic Subscriptions)** service.

7   Click **Next** twice to open the Email (SMTP) Content page. Expand **Define Message Body**, then double-click **1d Email Body**.

8   Select and then right-click the second information object and select **Edit Information Object**. Review the report definition in the Report Layout pane on the right. Key features and properties are as follows:

•   Instead of prompts, this report contains the Manager attribute on the page axis. Click **Advanced Options** and then select the Report Execution tab.

•   This service uses personalized page execution. By contrast, all previous services have used personalized report execution.

9   Click **Cancel** to close the Advanced Properties dialog box. Close and exit the Information Object Wizard and the HTML Document Editor without saving any changes.

10 In the Service Wizard, click **Next** twice to open the Subscriptions and Schedules page.

11 Double-click **Dynamic Subscription Set for Call Center Managers** to edit the subscription set. The Dynamic Subscription Set Wizard opens. Click **Next** through the wizard to see the

various properties of this subscription set. Important key properties are as follows:

- This wizard has selected the subscription information object you viewed previously. When this service is run, several call center managers receive this service.

- Some call center managers receive an email message while other call center managers receive their message on a mobile device. This is because the subscription information object gathers user recipient device IDs from the project in addition to the user name, address display, and physical address. This device ID selection is equivalent to setting the delivery method and device in the Static Subscription Set Editor and thus controls which content the recipient receives and how the content is formatted and delivered.

- Since personalized page execution executes a single report to gather content for multiple subscriptions, this can have significant performance advantages. It is sometimes advantageous to use personalized page execution even when subscription information is stored in the Subscription Book and static subscriptions rather than dynamic subscriptions are used. This functionality is enabled by selecting an attribute value (for example, manager Snyderman) when defining preferences for users in a static subscription set.

12 When you reach the Summary page of the Dynamic Subscription Set Wizard, click **Cancel** to close and exit the wizard without saving any changes. Close and exit the Service Wizard.

13 In Narrowcast Administrator, double-click the **1d Employee Performance Alert (Static Subscriptions)** information object. Click **Next** through the wizard to see the various properties of this information object. Important key properties are as follows:

- The content information object used in the content of this service uses the same report and uses personalized page execution.

- The service does not use automatic segmentation and does not segment the content information object. This important option must be set correctly in the Advanced Options dialog box.

14 When you reach the Summary page of the Information Object Wizard, click **Cancel** to close and exit the wizard without saving any changes.

Instead of using a dynamic subscription set, this service uses a static subscription set and each user defines preferences by selecting a manager. When this service is run, it delivers the same content as when the dynamic subscription version is run. However, fewer messages are sent since only two subscriptions are created.

Users can subscribe to the version of this service that uses static subscriptions, but users cannot subscribe to the version that uses dynamic subscriptions since recipient information is not stored in the Subscription Book. It is possible to create a service using dynamic subscriptions that users can subscribe to using the Subscription Portal; for details, see Advanced Subscription Portal Configuration in the *Narrowcast Server Application Designer Guide*. Administrators must define Subscription Portal sites and channels so that users only have access to services to which they can subscribe.

To return to the evaluation Home page, in the Folder List on the left click **Tutorial System** at the top of the folder hierarchy.

You can close the 1d Employee Performance Alert email when you are finished viewing it.
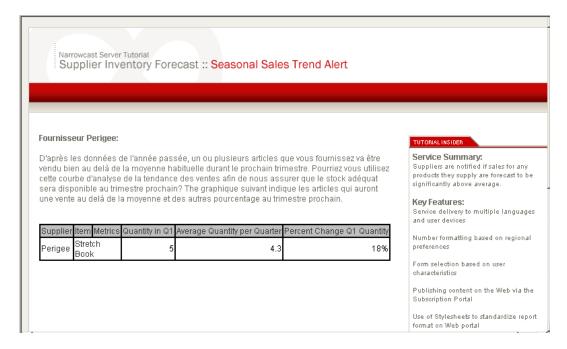
Seasonal Sales Trend Alert service

Suppliers are automatically notified if sales are forecast to be significantly above average for any products they supply. This service

delivers content in multiple languages and controls number formatting based on regional preferences.

To execute the Seasonal Sales Trend Alert service

---

1   From the Home page, click **Explore Usage Scenarios**.

2   Select **Explore Additional Services**. Then click the second link, **Seasonal Sales Trend Alert**. An email opens displaying information about products that are forecasted to be in high demand in the coming quarter.

   •   If you do not see the fully formatted email with graphics, from the email client's **View** menu select **Message in HTML**. If your email client blocks images, click in the message at the top of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Suppliers are automatically notified when historical sales data show that sales for one of the items they supply are forecast to be significantly above average in the coming quarter. This seasonal sales trend analysis helps suppliers react quickly to seasonal trends by ensuring that adequate supplies are on hand. Since suppliers are located worldwide and are often not accessible by email, messages are delivered in multiple languages to multiple end user devices such as email, mobile devices, and on the web.

Service overview

This service demonstrates how a single service can deliver content to users in many different languages and also format content for many end user devices. For example, one supplier, Perigee, is located in France and prefers to receive content via email. As a result, Perigee receives French email alerts when sales data predict an increase in sales for one of the items that they supply. Another supplier, John Wiley & Sons, is located in the United States and is often away from the office. For this reason, John Wiley & Sons receives English alerts on a mobile device. A third supplier, ATF Electronics, is a German supplier that prefers to access content on the web using the Subscription Portal. When you run this service, ATF Electronics does not receive any content since no items they supply meet the alert conditions.

For localization, only static text is changed in this example service, based on language preferences. However, it is possible to retrieve localized text from Intelligence Server so that the item names are delivered in the appropriate language for each recipient. This requires adding localized strings to your data warehouse. For details on setting up MicroStrategy to support internationalization, see the *Supplemental Reference for System Administration*.

Key features

- Service delivery to multiple languages and user devices

- Number formatting based on regional preferences

- Form selection based on user characteristics

- Content publishing on the web using the Subscription Portal

- Standardized report format in portal using stylesheets
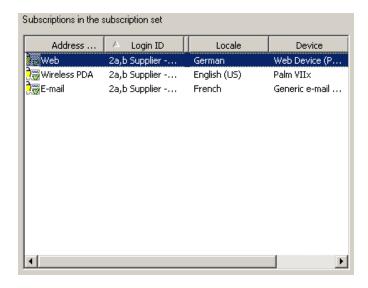
To see how the Seasonal Sales Trend Alert service is defined

---

1 From Narrowcast Administrator's **View** menu, make sure that **Folder List** is selected.

2 In the Folder List, expand **Applications**, expand **Narrowcast Server Tutorial**, then expand **Supply Chain Management**.

3 Select **2a Supplier - Seasonal Sales Trend Alert**.

4 On the right, double-click to edit the service **2a Seasonal Sales Trend Alert**. In the Service Wizard, click **Next**.

5 On the Delivery Methods page, notice that the service contains content for three delivery methods. Click **Next** to go to the page for each delivery method.

6 On the page for each delivery method, click the ![icon] **Specify Devices and Locales** icon. The displayed list shows the devices and the locale (a language plus a geographic location) that this delivery method is designed to support. Each delivery method can support one locale and a subset of the devices provided by the information transmitter for this delivery method.

Subscriptions for this service only receive the content for a particular delivery method if the user for the subscription specifies

the locale supported by this delivery method and if the address specifies a supported device.

7   Click **Cancel** to close the Devices and Locale Support dialog box without saving any changes.

8   In the Service Wizard, click **Next** until you see the Subscriptions and Schedules page.

9   Double-click **2a Static Subscription Set for Suppliers** to edit the subscription set for this service. In the Static Subscription Set Editor, on the right side, you can see the users for service 2a/2b, and you can see the locale for each user. An example is shown below:

Each user subscribed to this service specifies a different locale and device as described above.

By default, all delivery methods and all users created in Narrowcast Administrator support the system locale. Thus, subscriptions are never prevented from receiving a service due to locales unless either the delivery method or the user are modified to not support the system locale. It is important to use care when modifying locales for delivery methods and users.

10 Close and exit the Static Subscription Set Editor, then close and exit the Service Wizard.

To return to the evaluation Home page, in the Folder List on the left click **Tutorial System** at the top of the folder hierarchy.
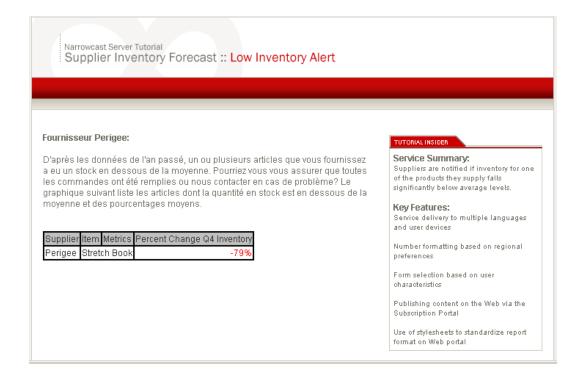
You can close the 2a Seasonal Sales Trend Alert email when you are finished viewing it.

Low Inventory Alert service

Suppliers are automatically notified if inventory for one of the products they supply falls significantly below average levels. This service delivers information to email addresses, mobile devices, and to a web portal. Different stylesheets are used to vary formatting across channels.

To execute the Low Inventory Alert service

1   From the Home page, click **Explore Usage Scenarios**.

2   Select **Explore Additional Services**. Then click the third link, **Low Inventory Alert**. An email opens displaying information about below-average inventory for products for which the supplier is responsible.

   • If you do not see the fully formatted email with graphics, from the email client's **View** menu select **Message in HTML**. If your email client blocks images, click in the message at the top of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Suppliers with products whose current inventory is 75% below the average are automatically notified of the products and their current inventory levels. Suppliers who do not have products that are low on inventory receive no alert.

This inventory analysis helps suppliers react to unexpected sales increases by ensuring that adequate inventories are provided. Since suppliers are located worldwide and are often not accessible by email, messages are delivered in multiple languages to multiple end user devices.

Service overview

This service is similar to the Seasonal Sales Trend Alert service above, except that German content is published to the Subscription Portal for supplier ATF Electronics.

Key features

- Service delivery to multiple languages and user devices

- Number formatting based on regional preferences

- Form selection based on user characteristics

- Content publishing on the web using the Subscription Portal

- Standardized report format in Subscription Portal using stylesheets

Customer Relationship Management

For the next two services (3a Significant Buyer Retention and 3b Repeat Buyer Sales Offer), set the Email (SMTP) and Wireless (SMTP) information transmitters to send messages to file rather than transmitting via email. This can be done in the Narrowcast Server System Configuration Wizard. (In Narrowcast Administrator, from the **System** menu, select **Tutorial System**, select **Edit System Configuration**, select **Information Transmitters** at the top, double-click the **Email (SMTP)** information transmitter, select the **Message Output** tab, choose the **Save To File** option, click **OK**, click **Next**, and click **Finish**.)

This is required because sample services 1d, 3a, and 3b gather nonexistent recipient email addresses from a MicroStrategy project. If these information transmitters are set to deliver these messages via email, these messages are not received. Saving messages to file also allows you to deliver the Tutorial services offline and without accessing an email account.

Service 3a Customer – Significant Buyer Retention

Customers who have made significant purchases are sent coupons to encourage customer loyalty. This service uses analytics to identify

the target audience, and then uses message tracking to identify which messages were read.

To execute the Significant Buyer Retention service

1   From the Home page, click **Explore Usage Scenarios**.

2   Select **Explore Additional Services**. Then click the fourth link, **Significant Buyer Retention**. An email opens thanking the customer for their business and displaying the coupon.

   •   If you do not see the fully formatted email with graphics, from the email client's **View** menu select **Message in HTML**. If your email client blocks images, click in the message at the top of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Customers who make significant purchases in the month of June are sent a coupon for any item in the month of December to encourage customer loyalty. If a customer spends more than $1,500 in the same month, he is sent a coupon for any item in any category. The message is sent six months after the initial purchase to win back customers who may not have returned for some time.

Service overview

This sample Service 3a delivers rewards in the form of coupons to customers who have made significant purchases in the past. This is accomplished by running a report to obtain the target group of customers and then delivering coupons via email to these customers. In both Services 3a and 3b, customer information is stored in a relational database where it is recorded when customers make purchases. Since customer information already exists in one location, the administrator wants to avoid creating duplicate subscription information, so this service uses dynamic subscriptions to retrieve subscription information directly from the data warehouse using a MicroStrategy project.

Two main differences exist between the subscription information objects used for Services 1d and 3a/3b:

- The subscription information object used in Service 1d returns managers instead of customers.

- The customer subscription information object for 3a/3b does not return a customer device but rather uses Outlook Express for all customers since the preferred customer device is not recorded when customers make purchases.

No report data is included in the report content. A static HTML link to a coupon image on a web server is used so all recipients receive the

same coupon (see the next service to see an example where this is not the case). This is accomplished using a stylesheet that returns no data.

Key features

- Customer population segmentation into target audience

- Recipient-level personalization using subscription information

- Read-receipt message tracking using unique message identifiers

To see how the Significant Buyer Retention service is defined

1   From Narrowcast Administrator's **View** menu, make sure that **Folder List** is selected.

2   In the Folder List, expand **Applications**, expand **Narrowcast Server Tutorial**, then expand **Customer Relationship Management**.

3   Select **3a Customer - Significant Buyer Retention**.

4   On the right, double-click to edit the service **3a Significant Buyer Retention**. In the Service Wizard, click **Next** twice to open the Email (SMTP) Content page.

5   To see the features described below, expand **Edit Subject** and double-click **3a Email Subject**, or expand **Define Message Body** (HTML) and double-click **3a Email Body**, depending on what feature is being discussed.

6   This service personalizes each message for recipients by including subscription information returned from the data warehouse using the subscription information object. You can see that the information object used in the subject line provides a customized greeting by using the customer's first name.

This same method could be used to return customer address, preferred device, or any other subscription information.

In this case, the subscription information object returned this information directly using the PIN property for each subscription. The application designer chooses **Subscription Information**, then **PIN** from the **Insert** menu to add this content.

7   If multiple pieces of data or additional analysis are required for the content, you can run additional content information objects and then link the resulting personalized reports to recipients using preferences defined in the subscription information object. This scenario was described in Service 1d and is applied to the customer example in Service 3b, below.

8   Read-receipt message tracking is used in this service to see which recipients opened their messages. When Narrowcast Server delivers a message, each message is assigned a unique ID called a Unique Message Identifier. In this example, the Unique Message Identifier is inserted into a web URL, which points to a zero size image on a web server. The web server can then be configured to log the Unique Message Identifiers used to request content from this web server. (The web server used for this Tutorial is not configured to record this information.)

The Unique Message Identifier is a concatenation of the Service Execution ID and the Subscription ID. This can be joined to the transmission recording tables and then back to both user and application information using this information.

Message tracking information can be recorded to a relational database where it can be joined with information about which messages were delivered successfully to the receiving mail systems. This recipient-level delivery information is enabled in Narrowcast Server using transmission recording. Transmission recording can be enabled from the **System** menu by selecting

Tutorial System, selecting **Set Governing Settings**, and then selecting the **Recording** tab.

9   To see how the link is used to determine which messages were opened, expand **Define Message Body** and double-click **3a Email Body**. Select **Source** from the **View** menu. The following link is displayed:

```
<IMG
SRC="http://www.microstrategy.com/graphics/cdrom/
ncsdemo/spacer.gif?RecipientID=UniqueMessageIdentifi
er" width=0 height=0>
```

10 ASP or Java Server Page (JSP) technology can be used to record which recipients opened messages. For example, an ASP could be written to record which URLs contacted this page and then record the recipient IDs to a database. The following example link shows this:

```
<IMG SRC="http://servername/virtualdirectory/folder/
responsetracking.asp?
RecipientID=fUniqueMessageIdentifier>
```

Once such a link has been added to your HTML document, you construct a simple ASP or JSP to log image requests to a database. The following example provides simple ASP code to achieve this task:

```
<%@ LANGUAGE = VBScript %>
<% Option Explicit

Dim sUniqueMessageIdentifier
Dim adoCon
Dim adoRec
Dim sConStr
Dim sSQL
```

```
Set adoCon = Server.CreateObject
("ADODB.Connection")
Set adoRec = Server.CreateObject ("ADODB.Recordset")

sConStr = "DSN=YOUR_DSN;UID=YOUR_UID;PWD=YOUR_PWD;"
adoCon.Open sConStr

sUniqueMessageIdentifier = Request.QueryString
("sUMI")
sSQL = "INSERT INTO YOUR_TABLE values ('" &
sUniqueMessageIdentifier & "',GETDATE())"

adoRec.Open sSQL, adoCon

'The location of the image to be displayed in the
HTML document
Response.Redirect
("http://servername/virtualdirectory/folder/image.jp
g")

%>
```

This example assumes that the table YOUR_TABLE exists and has two columns, one for the Unique Message Identifier and one for the date. SQL Server is also assumed to be the RDBMS for this example. The last line of code redirects the response to the URL where the image exists.

The post from the HTML document passes the Unique Message Identifier as a parameter, which is captured by the ASP and stored in the database. The response to the post is the actual image, which is displayed within the document body.

This sample code is for illustrative purposes only. It is not intended for use in production systems and does not handle special cases, errors, or any other best practices to ensure its stability and reliability.

11 Since the subscription information objects used for Services 1d and 3a return two groups of users with distinct IDs in the data warehouse, a different information source is used for each. This is because an information source can only be defined to support dynamic subscriptions for one subscription ID. This restriction enables the automatic segmentation of content information objects (and subscription information objects in the case where subscription information defined in the information source definition is used) to use the correct Subscription ID for segmentation.

12 Close any windows without saving changes and exit the Service Wizard.

Whenever creating applications to support dynamic subscriptions, it is good practice to create one information source for each group of users that will be retrieved, and to create all subscription information objects and content information objects using the corresponding information source. This ensures that all information objects are segmented correctly when automatic segmentation is used.

The next sample service builds upon this example and includes targeted service content that is personalized for each recipient.

To return to the evaluation Home page, in the Folder List on the left, click **Tutorial System** at the top of the folder hierarchy.

You can close the 3a Significant Buyer Retention email when you are finished viewing it.

Service 3b Customer – Repeat Buyer Incentive

Customers who repeatedly purchase products in the same category are sent coupons for other products in that category. This service uses analytics to create individually targeted offers and then personalizes message formatting for each recipient.

To execute the Repeat Buyer Incentive service

1   From the Home page, click **Explore Usage Scenarios**.

2   Select **Explore Additional Services**. Then click the fifth link, **Repeat Buyer Sales Offer**. An email opens thanking the customer for their business and displaying the coupon.

- If you do not see the fully formatted email with graphics, from the email client's **View** menu select **Message in HTML**. If your email client blocks images, click in the message at the top of the email to allow images to be displayed.

The details of the service and its content are described below.

Business purpose

Customers who have repeatedly purchased items in the same product category over the last month are sent coupons for any item in this product category, to encourage continued purchases.

Service summary

Service 3a uses a report to identify the target group of customers, but does not deliver personalized content to each customer. Service 3b builds on the customer segmentation example shown in Service 3a above, by delivering a targeted offer to each customer based on his or her purchases over the last month.

Key features

- Creating targeted offers based on customer profiles

- Personalizing message format based on report data

To define the Customer service

1   From Narrowcast Administrator's **View** menu, make sure that **Folder List** is selected.

2   In the Folder List, expand **Applications**, expand **Narrowcast Server Tutorial**, then expand **Customer Relationship Management**.

3   Select **3b Customer - Repeat Buyer Incentive**.

4   On the right, double-click to edit the service **3b Repeat Buyer Incentive (Automatic Segmentation)**. In the Service Wizard, click **Next** twice to open the Email (SMTP) Content page.

5   To see the features described below, expand **Edit Subject** and double-click **3b Email Subject**, or expand **Define Message Body** (HTML) and double-click **3b Email Body**, depending on what feature is being discussed.

6   This service personalizes an image link for each recipient. The link points to one of several images on a corporate web server. This link is dynamically generated for each recipient based on his or her preferred product category. This is done using a stylesheet

that converts personalized data in a report into a personalized web link.

> While this example uses the description of Category to dynamically change the URL, in an actual implementation, the ID form of the attribute should always be used. This ensures that descriptions with spaces do not cause problems.

This is a basic example with a simple report that groups all customers into a handful of product categories. This same strategy can be extended to enable powerful applications by personalizing content at the recipient level to tailor offers to specific individuals. For example, reports can be designed to support product promotion campaigns by determining which customers have purchased correlated items in the last six months. Reports can also be designed to target specific customer groups based on complex analytics applied to customer spending history or other customer attributes.

7 The content information object used to gather personalized content can perform additional, secondary analyses after customer segmentation, based on customer preferences and behaviors. The powerful analytical capabilities of MicroStrategy Intelligence Server can be applied to segment customer populations and then make targeted, individually personalized offers based on customer profiles. This is enabled using subscription information objects to segment the customer population and then using multiple content information objects to provide individually personalized offers.

8 Close any windows without saving changes and exit the Service Wizard.

To return to the evaluation Home page, in the Folder List on the left click **Tutorial System** at the top of the folder hierarchy.

You can close the 3b Customer - Repeat Buyer Incentive email when you are finished viewing it.

Creating a service

You can create a service in two ways: using the Service Wizard or using the Service Editor. The Service Wizard is used in the steps in this chapter to create and send sample services. However, the Service Editor provides a slightly different set of functionality, so it is important to be aware of both of these tools:

- **Service Wizard**: The Service Wizard steps you through creating a new service, including defining the content of the messages sent by the service, creating subscriptions, and defining an execution schedule. The Service Wizard allows you to create different content for each information transmitter defined in your system. For example, mobile devices can be sent short plain text messages while email clients such as Microsoft Outlook can be sent rich, graphical HTML messages with Excel attachments. The steps below use the Service Wizard to walk you through an example of creating and sending a service. For complete details on the Service Wizard, see the *Narrowcast Server Application Designer Guide*.

- **Service Editor**: Use the Service Editor to design a service for more than one locale. For example, a service made available to a multinational user community might include several different publications, each publication containing content in a different language to support the set of users who prefer that language. The Service Editor provides more flexibility than the Service Wizard by allowing you to add as many publications as you need to support your multilanguage user community. For complete details on the Service Editor, see the *Narrowcast Server Application Designer Guide*.

This procedure assumes that you have a working Narrowcast Server system with the sample MicroStrategy Tutorial - Delivery project installed. If necessary, see *About installing and configuring the sample Tutorial system, page 16*.

To create a sample service

1   If you do not already have Narrowcast Administrator open, from the **Start** menu select **Programs**, then **MicroStrategy Tools**, and then **Narrowcast Administrator**. The Narrowcast Administrator Home page opens.

2   Select **Create Your Own Service**.

3   Read the introductory information and click the **Service Wizard** link.

4   On the Welcome page, click **Next**.

On any page of the **Service Wizard**, you can click any of the Help topics on the right to get more information about services.

5   Choose a delivery method. For your first service, accept the default selection of Email (SMTP) and click **Next**.

Use the following steps to specify the content of your service for email subscriptions. What you select here determines what subscribers receive when your service runs.

To specify the subject line

6   On the Email (SMTP) Content page, expand **Edit Subject** and double-click **My Subject** to open the Plaintext Editor.

7   To define the email message subject for your service, select the text **Insert your subject here** and replace it by typing

`Congratulations, you have successfully created a`

`personalized service!` This text appears in the subject line of the email messages generated by this service.

8   Include the subscriber's first name. To do this, use the following steps:

a   Place the cursor after the "s" in Congratulations and before the comma (**,**). Then add a space.

b   From the **Insert** menu, select **User Information, then** select **First Name**. A blue "i" icon appears in the middle of your subject text. This is an information object (dynamic content) that is automatically replaced by the first name of the subscriber when the subscription is sent.

c   When you have finished, click **Return to Service Wizard**.

To define the message body

9   On the Email (SMTP) Content page, expand **Define Message Body**, then double-click **My Message Body**.

10 Replace the existing text by selecting it and typing `Electronics Revenue vs. Forecast:`

11 Apply whatever formatting you wish to this text, such as font, color, size, style, and other HTML formatting.

12 Insert a grid report in the message. To do this, use the following steps:

a   Place the cursor at the end of the line of text that you typed above, just after the colon, and press ENTER to insert a new line after that text in your message.

b   From the **Insert** menu, select **MicroStrategy Tutorial (Manager Subscriptions)**, then select **MicroStrategy Grid Report**.

    c   Navigate to the Electronics Revenue vs. Forecast report in the folder `\\MicroStrategy Tutorial\Public Objects\Reports\Subject Areas\Sales and Profitability Analysis\` and select it. Notice that the report definition appears in the right pane.

    d   Click **Finish** to insert this report into your email service. Then click **Return to Service Wizard**.

To specify subscriptions and schedules

13 On the Email (SMTP) Content page, click **Next**. The Subscriptions and Schedules page is displayed. Specify the subscriptions to your service and define the schedules on which those subscriptions receive messages using the following steps.

    a   All subscriptions are created within a subscription set. (A subscription set groups addresses, making it easy and fast to subscribe multiple users.) To create a subscription set, click **Click here to define subscriptions and preferences.**

    b   For your first service, choose **Static Subscription Set** and click **OK**.

> Dynamic subscription sets should only be used after you have reviewed the *Application Designer Guide*.

    c   To create a subscription, locate the address named Welcome email address. Select it and choose **Subscribe Addresses** from the **Edit** menu.

> If a pop-up message appears, click **OK**.

    The selected address is displayed in the pane on the right.

To set user preferences for a subscription

14 To edit the user, make sure that the Welcome email address is selected on the left, and then from the **Edit** menu choose **Edit**. The User Properties Editor opens.

15 On the **Preference** tab, clear the check box labeled **Only display personalized objects used by this subscription set**. Then, in the User Preference column, highlight the row that contains 1b Sales Trend Update in the Personalized Object column. Click **New**. The Define User Preference page opens.

   a   To specify a preference name, type `Tutorial` for the **User Preference Name**. This name can be used later to choose these same preferences for other subscriptions for this user. Click **Answer** to begin specifying what this user's Tutorial preferences are.

   b   To specify preferences for the report, double-click the regions **Northeast** and **South** on the left. Then click **Finish**. When this user subscribes to this service with his Tutorial preferences, the user receives information about the Northeast and South regions only.

   c   Click **OK** to accept the preferences you have defined for this user. The Define User Preference page closes.

16 To specify user information, in the User Properties Editor click the **User Information** tab. Type your first name in the Value column next to **First Name**.

17 Click **OK** to accept the changes you have made to this user. The changes are saved to the Subscription Book Repository. The User Properties Editor closes.

18 Click **Save and Close** to close the Static Subscription Set Editor and close the Service Wizard.

19 To choose a schedule, on the Subscriptions and Schedules page click **Click here to use an existing schedule.** The Use an Existing Schedule dialog box opens.

20 Choose the **Sunday Morning** schedule, so that this service executes once a week on Sunday mornings. Click **OK**. The Choose Existing Schedule dialog box closes.

21 Click **Next**. The Service Summary window opens. Click **Finish** to save your new service and exit the Service Wizard.

Running your first service

Using the steps above, you defined a service with a report in the message body and the subscriber's first name in the subject. You do not need to wait until Sunday morning for your service to run. You can use Narrowcast Administrator to run any service immediately.

Run your service now by clicking the **Deliver Your Service** link on the Create Your Own Service page.

• If your system is not yet running, you are asked whether to start the server. Click **Yes** to start your system and allow the service to run.

• If your system is not yet activated, you receive a message stating this. Click **OK** in the message. The service runs. (To activate your software, see *Server Activation pages, page 21*. You can perform these steps within MicroStrategy License Manager, available from the **Start** menu, then select **Programs**, then **MicroStrategy Tools**, then **License Manager**.)

Your service may take a minute to execute, depending on the power of your machine and on other software running on your machine. When the service finishes, you have a new email waiting for you either in the inbox of the email account you specified when you

configured the MicroStrategy Tutorial - Delivery project, or in the folder that you designated during installation if you chose to send Tutorial messages to file. You can troubleshoot your service by referring to *Troubleshooting in the Narrowcast Server System Administrator Guide*.

Continue with this evaluation using any of the following options:

- To learn about more detailed functionality for services, see *Sending sample services, page 41* and step through the sample services available in the Narrowcast Server Tutorial - Delivery project.

- To create your own sets of services, see the *Narrowcast Server Application Designer Guide*.

- To learn about creating and maintaining user subscriptions to services, see *Chapter 4, Subscribing to Report Deliveries*.

- To learn how a service works behind the scenes within your Narrowcast system, see *Chapter 5, Sending Data To Subscribers*.

SUBSCRIBING TO REPORT DELIVERIES

Subscription Portal

This chapter provides information to subscribe to a service, and acquaints you with the Subscription Portal.

Once services have been created, you must gather user information so that the services can be personalized, formatted, and delivered. This information includes device addresses and service preferences. This information can be specified by an administrator within the subscription, or it can be provided by individual users in the Subscription Portal.

Users can log in to the Subscription Portal and define preferences and subscribe to the services in which they are interested. An administrator creates the Subscription Portal using the Portal Administrator Wizard. Once the Subscription Portal is created, users can create logins and specify preferences using any web browser.

If you installed the Tutorial - Delivery sample project, a sample Subscription Portal for the reports and documents in this project is already created and available on your MicroStrategy system.

Subscription Portal overview

- **Portal system**: A Subscription Portal system is an installation of the Subscription Portal application, and a Portal Repository database, which contains the definition of one or more sites. A default Subscription Portal system can be created automatically when a new Narrowcast Server system is created.

- **Subscription Portal application**: The Subscription Portal application is a set of web pages that provide the administrative and end user interfaces to Subscription Portal functionality. This application must be installed on a machine on which the Microsoft

Internet Information Services (IIS) service has been installed and properly configured.

- **Portal Repository**: A Portal Repository is a specific set of tables used by a Subscription Portal system, located in a database and identified by a certain table prefix. The tables in each Portal Repository can be given a unique table prefix, so that multiple Portal Repositories can exist in the same physical database instance. Each Portal Repository can store the definitions of one or more sites. Multiple Subscription Portal systems can also share the same set of Portal Repository tables. A default Portal Repository can be created automatically when a new Narrowcast Server system is created using the System Configuration Wizard.

- **Site**: A site identifies a set of services that are made available through a portal for access by end users. A site is defined by a connection to a single Object Repository (and a Subscription Book Repository). In addition, the definition of a site contains a collection of channels and a set of properties that define certain characteristics of the Subscription Portal. Since each site is associated with a single Object Repository, multiple sites need to be created to provide access to services in multiple Object Repositories (and hence in Narrowcast Server systems). The definition of a site and its related channels is stored in a Portal Repository. A site can only be made available to end users through a portal, but multiple portals can provide access to the same site. A default site can be created automatically when a new Narrowcast Server system is created using the System Configuration Wizard.

- **Portal**: A portal defines the web location (URL) through which end users can access Subscription Portal services and subscriptions. A portal is defined by a web server virtual directory and provides access to exactly one site. Two or more portals can, however, provide access to the same site. This is most typically done on

different web servers to provide increased system performance for a high number of concurrent users. The definition of each portal and which site it provides access to are defined and saved in the file system of the machine running the Subscription Portal web server.

- **Channel**: A channel is defined by a folder of services from an Object Repository. Multiple channels can be defined within one site to group different sets of services. Each channel appears as a folder in the Subscription Portal interface. Each user subscription that is created through the Subscription Portal can only be accessed through the channel through which it was created. A site without at least one channel does not provide any functionality to end users.

Evaluating the Subscription Portal

You can evaluate the default Subscription Portal to see the features that subscribers can use to create and modify subscriptions, change addresses, view scheduled reports, and set preferences.

To view the Subscription Portal

1   From the **Start** menu, choose **Programs**, **MicroStrategy Tools**, and then select **Subscription Portal**. The Subscription Portal Login page opens.

2   Type a login ID and password. If you did not change the default login ID and password for the sample Tutorial user, type "New User" for both the login and the password. (Make sure the password includes the capital letters and the space between words.) Then click **Login**.

3 Choose a channel. Channels are groups of services. You can choose which channel you wish to work in by clicking the folder with the name of the channel.

- If you created the sample service in the previous chapter of this guide, click **My First Application** to go to the channel containing the service you just created.

4 Create a subscription. In the Subscription Portal you create a new subscription by selecting **Sign up for a Service** in the desired channel. Choose the service you want to subscribe to.

5 To see all services that you are subscribed to, click the **Subscriptions** tab at the top right.

6 Change an address. Click the **Addresses** tab at the top right to open the Addresses page. Here you can create a new address, modify an existing address, or delete an address.

7 View reports. If you have subscribed to a service that delivers reports to the Subscription Portal, you can view these reports by clicking the **Reports** tab at the top right of the page.

If you have not yet executed any of the services that are created with the MicroStrategy Tutorial - Delivery sample project, you do not have any reports to view at this time. Steps to execute sample services are in *Sending sample services, page 41*.

SENDING DATA TO SUBSCRIBERS

Executing a Service

A service delivers a message and, commonly, an attached report or Report Services document containing your organization's data. For a basic introduction to services, see *About services, page 37*.

When a service is created, it contains all the definitions and components needed to deliver its content to the right users at the right address(es), with any personalization applied. These definitions can include details such as whether the transmitted content should be delivered and in what language, whether login or other authentication should be required, and so on.

This chapter explains how services work. It describes how an executing service passes through various components and processes to send personalized messages to subscribers.

Components and processes of a service execution

The following high-level steps summarize the steps involved in executing a service and the components involved in each process:

1   The Narrowcast Services Delivery Engine receives a request for a service execution. The service execution request can originate from a scheduled event, a request to run a report immediately, or an API call to the Narrowcast Server API.

2   The Delivery Engine evaluates the subscriptions that need to be fulfilled for the request and the personalization characteristics of each subscription.

3   The Delivery Engine then gathers the personalized, dynamic content information needed for each subscription, formats that

content into the appropriate Narrowcast documents, and transmits the resulting messages to the subscribers.

The above steps are explained in detail in the following sections.

Evaluating delivery and recipient information

Typically, a service execution is triggered by a schedule. A service can be set to use more than one schedule, enabling powerful time-of-day/day-of-week scheduling in one service.

The steps taken by the system to evaluate the parts of a service to determine recipients and the personalization requirements of those recipients, are described below.

Evaluating delivery information from schedules

The delivery directions for the service are defined by the user who creates the service. The schedule sets the times or frequencies a service is executed and represents a recurring pattern, not a fixed date, on which a service is executed. To automatically account for daylight savings time, date boundaries, and other time-specific issues, the schedules are defined relative to time zones. A service can use more than one schedule to allow subscribers throughout the world to receive services at specific local times.

For steps to create a schedule, see the *Narrowcast Server Application Designer Guide*.

Evaluating recipient information from subscriptions and subscribers

Every service contains recipient information, designated by the user who creates the service. A subscriber is a person who is subscribed to receive a service. A subscription is created when one of a subscriber's addresses is subscribed to a service, either by adding it

to a subscription set using the Subscription Set Editor or by creating a subscription using the Subscription Portal.

Each individual who receives messages from the Delivery Engine has a login that provides password-controlled access to subscription and preference information for the individual and his delivery addresses. The individual receives messages when one of these addresses is subscribed to a particular service.

For more information about creating subscriptions, see *Chapter 4, Subscribing to Report Deliveries*.

Evaluating information from information sources

When executing a service, the Delivery Engine acquires information such as business data, account credentials, and so on from information sources. Information sources can be a standard MicroStrategy report, a Report Services document, a user account, a system process, and so on. An information source provides dynamic, personalized content that enables the personalization capabilities of the Delivery Engine. Each piece of dynamic content is defined, manipulated, and executed as an information object.

For example, one MicroStrategy information source provides the connection and authentication instructions needed by a MicroStrategy Information Source Module (ISM) to run reports through a specific project on a specific Intelligence Server. Information objects then provide instructions for the information source to return results for a specific report. The results from executing an information object can then be used as content for a message.

Several pre-created ISMs come with MicroStrategy. For more details on ISM, see *Narrowcast Server System Administrator Guide*.

Evaluating personalized content

After Narrowcast Server determines that a service needs to be executed and identifies the recipients to which it will be sent, Narrowcast Server evaluates the personalization. Personalization can come from a user's subscriptions and from the information sources themselves.

Personalization for a user's subscription includes the following:

• The messaging device for the subscribed address

• The locale for the subscribed user

Personalization from information sources includes the following:

• Authentication

• Security objects

• User preferences and locales

These pieces that make up personalization combine to control what content is delivered to fulfill each subscription. Each individual component of personalization is described below.

Personalization based on devices

The device associated with the subscribed address is the device to which the message will be delivered. This device controls certain personalization areas, as follows:

• **Content selection**: When a service is made up of more than one publication, the device associated with the subscription determines which publication, and therefore which content, will be delivered to fulfill a given subscription. For example, if a service has one publication designed to generate message content for mobile devices and another publication designed to generate message content for email clients, the device associated with the

subscription determines which of the two publications will be used to generate content. For more information on how devices can be used to control content selection, see *the Narrowcast Server Application Designer Guide*.

- **Content format and transmission**: A device determines how a publication should be formatted and transmitted to a specific receiver type. For example, a Microsoft Outlook device might specify that a subject line must be plain text and no longer than 128 characters. It might also specify that the message body can be either plain text or HTML, and if it is HTML, image references can be embedded. A device includes specifications for both formatting and transmission. For more information on device transmission parameters, see the *Narrowcast Server System Administrator Guide*.

Personalization based on subscriber's locales

The locale consists of specific language and regional settings such as numeric formats, date formats, and time formats of a user. The locale for the subscribed user controls the following personalization areas of a service:

- **Content selection**: When a service is made up of more than one publication, the subscriber's locale can determine which publication, and therefore which content, will be delivered to fulfill a given subscription. For example, if a service has one publication designed to generate German message content and another publication designed to generate French message content, the locale for each subscriber determines which of the two publications will be used to generate content. For more information on how locales can be used to control content selection, see *Multiple languages and locales* in the *Narrowcast Server Application Designer Guide*.

- **Content generation**: The subscriber's locale control how dynamic content is retrieved from information sources such as MicroStrategy Intelligence Server. Users can view numeric values, dates, and times in the formats with which they are most familiar. For example, decimal values such as one thousand, nine hundred, ninety-three and four-tenths (1,993.4) can be expressed in any of the following ways:

  - 1993.4

  - 1.993,4

  - 1 993,4

  - 1,993.4

  Similarly, date values can be expressed in "mm/dd/yyyy" format or in "dd/mm/yyyy" format. Each subscriber's locale specifies which formatting rules should be applied by information sources when generating dynamic content such as MicroStrategy report results.

- **Character sets**: The subscriber's locale controls the character encoding that is used for the transmission of content. A character set specifies how character code values (such as the value 65) map to character glyphs (such as "A"). While the Unicode character set supports the aggregation of all characters from all languages (including Asian double-byte characters such as the Kanji alphabet), most devices cannot support the Unicode character set. For more information on locales and character set encoding, see *Locales* in the *Narrowcast Server System Administrator Guide*.

Personalization based on information sources

Data can come from various information sources, such as a database, an Excel file, and so on. Each information source can have its own requirements for authentication (in the form of different login

credentials). Additional requirements of a user combine with authentication information to form the personalization for a given user.

For example, consider what happens when you connect to a banking website to determine whether a check has cleared. First, you establish a connection to the web server, which involves providing your account credentials or user authentication, such as a login ID and password. Next, the web server shows you the set of accounts and other bank products that belong to you. Finally, you provide your search criteria, such as the date, check number, and other filtering conditions. The web server then retrieves the results of the requested search and presents them to you providing content, date formats, numeric formats and other information based on the language and regional settings that you prefer.

This example demonstrates four types of information involved in personalization of dynamic content:

* **Authentication objects**: An authentication object stores authentication information for a subscriber, to be used for a specific source of information. It is commonly a login ID and password that Narrowcast Server has cached for a subscriber, so that when Narrowcast Server retrieves information for that subscriber, it can do so using the access capabilities and permissions of the subscriber. An example of an authentication object is the login ID and password that you use to log in to a MicroStrategy project from Developer or Web. Narrowcast Server uses authentication objects to tell information sources to whom each requested piece of dynamic content should be sent.

* **Security objects**: Security objects allow administrators to restrict the information available to a user. An administrator defines a security object for a user by answering an element list prompt. For example, the answer "South" might be a security object for a prompt on the attribute "Region". In the information source

definition, you can specify which prompt objects should be answered by the prompt answers in the security objects of subscribers. This allows you to limit the data a user has access to. For an introduction to prompts, see the *Basic Reporting Guide*. For more information about security objects, see the *Narrowcast Server Administration Guide.*

- **Preferences**: Preferences provide more flexibility to subscribers to choose what they do and do not want to receive when they subscribe to a service. A preference can be anything from a report selection, to prompt answers, to the choice of a page from a result. When a service executes, Narrowcast Server uses preferences to tell information sources what information each subscriber wants to receive.

- **Locales**: Narrowcast Server uses locales to pass information source-specific language and regional settings to an information source module during service execution. The locales tell information sources what language, numeric formats, date formats, and time formats to use when creating each requested piece of dynamic content.

For more information about information source personalization, see *Personalization* in the *Narrowcast Server Application Designer Guide*.

Information acquisition process

The content that Narrowcast Server must generate for each subscription is determined by personalization factors. Because of this, the set of dynamic content requests that Narrowcast Server must make can only be determined as a service is being executed. Narrowcast Server optimizes this set of requests by eliminating duplicate requests where possible.

Narrowcast Server uses information sources and information objects to make requests for dynamic content.

About Narrowcast documents

Narrowcast documents play a role in information acquisition. A Narrowcast document is an object that contains template information (how to lay out and display content) and dynamic content (such as a grid report, a graph, and so on) that will be populated when the service is delivered. Each Narrowcast document has a specific type, such as HTML, plain text, Excel, or derived from an imported file. The document type depends on what type of device the document will be delivered to.

Do not confuse Narrowcast documents (objects that perform a role in the delivery of a Narrowcast service) and Report Services documents. A Report Services document is essentially a collection of reports, formatted to be displayed in a single screen, with presentation quality. A dashboard is a type of Report Services document, and often includes interactive components.
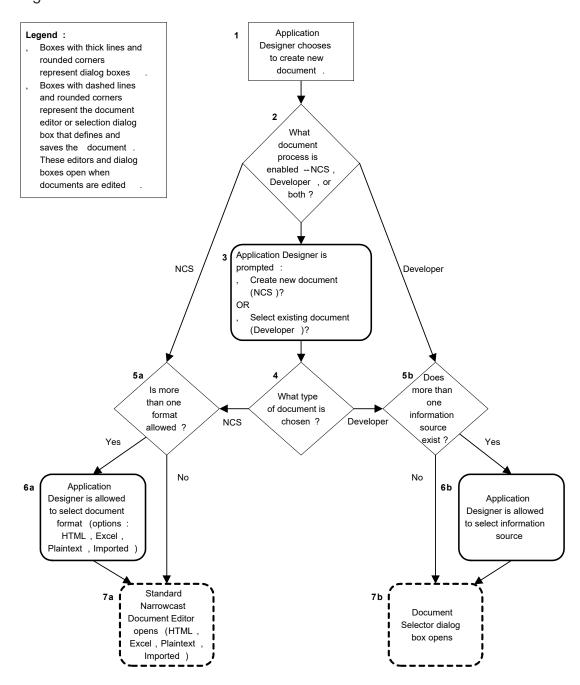
A Report Services document is one of many types of reports that can be part of the dynamic content in a Narrowcast document, to be delivered using Narrowcast Server services.

Information acquisition process diagram

With the ability to create new Narrowcast documents in Narrowcast Server or to link to existing Report Services documents, the information acquisition process has multiple possibilities, depending on which document process the system administrator has enabled and what the application designer chooses during document creation.

The following diagram shows the information acquisition process from when the application designer chooses to create a new document until he begins to construct the document. The diagram shows the choices made and steps taken depending on the document creation

process that is enabled. Each step is described following the diagram.

Legend :
, Boxes with thick lines and rounded corners represent dialog boxes .
, Boxes with dashed lines and rounded corners represent the document editor or selection dialog box that defines and saves the document . These editors and dialog boxes open when documents are edited .

1 Application Designer chooses to create new document .

2 What document process is enabled --NCS , Developer , or both ?

NCS

Developer

3 Application Designer is prompted :
, Create new document (NCS)?
OR
, Select existing document (Developer)?

5a Is more than one format allowed ?

4 What type of document is chosen ?

5b Does more than one information source exist ?

NCS

Developer

Yes

No

No

Yes

6a Application Designer is allowed to select document format (options : HTML , Excel , Plaintext , Imported)

6b Application Designer is allowed to select information source

7a Standard Narrowcast Document Editor opens (HTML , Excel , Plaintext , Imported)

7b Document Selector dialog box opens

1 In Step 1, the application designer chooses to create a new document within Narrowcast Server, either from Narrowcast Administrator, the Publication Wizard, or the Service Wizard.

2 Step 2 identifies the document creation process, based on the options available for document creation, as set by the system administrator. The options are the following:

   a **Always create new Narrowcast Server documents**: This allows you to create new Narrowcast documents from scratch in Narrowcast Server.

   b **Always link to documents created in MicroStrategy Developer**: This allows you to create a link to an existing document in MicroStrategy Developer.

   c **Always prompt**: (This option is selected by default.) This gives you a choice:

      — Create a new Narrowcast Server document and select the document format.

      — Create a link to an existing document in either MicroStrategy Web or Developer, and select the information source.

3 If the system administrator enabled the **Always prompt** option described above, then Step 3 prompts you to select to create either a new Narrowcast document or link to an existing Developer document.

4 If the system administrator enabled the **Always prompt** option described above, then step 4 identifies the type of document chosen: a new document to be created in Narrowcast Server or a link to a Developer document.

5 Steps 5 through 7 vary according to the system setting in step 2. Steps 5a, 6a, and 7a occur when the application designer creates a new Narrowcast Server document. Steps 5b, 6b, and 7b occur when the application designer links to a Developer document.

- Step 5a: Creating a new document in Narrowcast Server. This step identifies whether more than one document format is allowed.

  — Step 6a: If more than one format is allowed, you select the document format (HTML, Excel, Plaintext, or Imported) to use for the new document. Then the appropriate Narrowcast Server document editor opens and you create the new document.

  — Step 7a: If only one format is allowed, the appropriate Narrowcast Server document editor opens automatically and you create the new document.

- Step 5b: Creating a link to a document that exists in Developer or Web. This step identifies whether more than one information source is available.

  — Step 6b: If more than one information source is available, the application designer selects the information source from which to select an existing Developer document.

  — Step 7b: If only one information source is available, the application designer selects the existing Developer document to create the link from Narrowcast Server.

Details on creating specific types of documents and links are included in the *Narrowcast Server Application Designer Guide*.

Retrieving service content from information sources

Services can retrieve and deliver data and other information from many sources. Information sources include standard MicroStrategy reports, Report Services documents, HTML documents, user account information, system process information, and subscription information. Each is described below, in the context of how the information can be used in a service.

MicroStrategy reports as service content

You can use MicroStrategy reports as content in services. Before Narrowcast Server can use a report as service content, it needs to know the server and project in which the report is located. You provide this information when you configure an information source. For more information about configuring an information source, see *Information source modules and information sources* in the *Narrowcast Server System Administrator Guide*.

Once an information source has been configured to point to a MicroStrategy project, you can add MicroStrategy reports from that project to your services. HTML content can support report data in both grid and graph displays, while Excel and plain text content support report data only as a grid display. For more information about using reports in your services, see *Dynamic Content and Personalization* in the *Narrowcast Server Application Designer Guide*.

Report Services documents as service content

A Report Services document is a visually appealing, presentation-quality display of data from multiple reports. Report Services documents use a page layout that is separated into logical sections. A dashboard is a type of Report Services document, usually consisting of only one section and often containing interactive features such as widgets. (For an introduction to Report Services documents and dashboards, as well as images and examples, see the *Report Services Document Creation Guide*.)

Narrowcast Server services can include Report Services documents and dashboards in a service's content. These documents are created in MicroStrategy Developer, MicroStrategy Web, or MicroStrategy Office, and linked to from Narrowcast Administrator, the Service Wizard, or the Publication Wizard. While you cannot modify these documents from within Narrowcast Server, you can add them to

services for standard delivery in the same manner as other Narrowcast Server documents. Report Services documents are supported in PDF, Excel, and Flash formats.

For details to use Report Services documents in your services, see the *Narrowcast Server Application Designer Guide*.

HTML documents as service content

A MicroStrategy HTML document is a container for formatting, displaying, and distributing multiple reports on the same page.

Narrowcast Server services can include HTML documents as content in services. HTML documents are created in Developer and linked to from Narrowcast Administrator, the Service Wizard, or the Publication Wizard. While you cannot modify HTML documents from within Narrowcast Server, you can add them to services for standard delivery, in the same manner as other Narrowcast Server documents. HTML documents are supported in HTML format only.

For steps to create and format an HTML document, see the *MicroStrategy Developer Help*. For more information about using HTML documents in your services, see the *Narrowcast Server Application Designer Guide*.

User information as service content

Narrowcast Server can include user information such as first name, last name, and other user variables in service content. This helps you personalize messages with content such as "Dear Mr. John Q. Smith", or to insert the subscriber's name, address, zip code, country, or other personal information into the service.

User information is stored in the Subscription Book Repository when a subscriber is created. User information to include in a service is designated when the service is created or modified, and is retrieved

when the service is executed. New types of user information can be added as needed.

System information as service content

System information, such as service name, service ID, and execution time and date, can be included in services when the service is created or modified. This service execution information can be used to:

- Track messages using the internal execution ID

- Identify when reports were generated or saved by including the date and time

- Maintain text files containing service names

Subscription information as service content

It can be useful to include subscription information such as the subscriber's physical address in the content of a service (for example, "`JohnQSmith@sample_corp.org`"). Additional subscription information that can be included in a service are user name, address, subscription ID, and other subscription characteristics. The Unique Message Identifier (UMI) can be included in each message to uniquely identify that message at a later date.

Displaying service content

Once all of the dynamic content information required for a given subscription has been retrieved from information sources, that content is formatted and converted into a Narrowcast document.

First, each piece of content (information object) is transformed into a Narrowcast document element.

After every Narrowcast document element has been processed, Narrowcast Server creates a completed Narrowcast document by combining the Narrowcast document template with the document elements. The result is a single Narrowcast document that includes both the static content from the document template (such as page layout for HTML documents or the original Excel workbook for Excel documents) and the dynamic content from report results and other information sources.

For details on creating Narrowcast documents, which include a document template, see the *Narrowcast Server Application Designer Guide*.

Service content container: Narrowcast documents

A Narrowcast document is an object ready to be transmitted by the Delivery Engine. Each Narrowcast document has a specific type, such as HTML, Excel, or an imported file, and contains both static and dynamic content.

Dynamic content is included in the form of information objects, which gather dynamic information from information sources. During service execution, information objects are transformed into Narrowcast document elements and then inserted into document templates. Each document element consists of one or more information objects, plus processing and error handling instructions. The document templates provide the structure and layout for the Narrowcast document.

Like Narrowcast documents, both information objects and document elements have types, such as text, XML, an image, or a custom type from a customized ISM. XML document elements can support more than one XML information object, while text or image document elements can only support an information object of that same type. XML document elements are assigned XSL stylesheets, which convert the XML into other formats such as HTML.

To use more than one report or other XML-based information object in a document element, a custom XSL stylesheet must be created and applied to that document element. The XSL stylesheets that are provided with Narrowcast Server cannot be used in this situation. See the *Narrowcast Server SDK Guide* for details on custom XSL stylesheets.

Processing Narrowcast documents: Document formatters

A Narrowcast document formatter transforms the raw data of the information objects and the structure of the Narrowcast document templates into a formatted and deliverable Narrowcast document. Information objects in each Narrowcast document element definition are processed to produce a rendered document element. The document elements and the document template in the document definition are then integrated to create a rendered document.

Document formatter operations include tasks such as XSL processing and transformation, XML merging, character replacement, and string padding. Formatting rules can account for device characteristics, locale definition, and other recipient-specific formatting information.

Each document formatter supports only one document type. Narrowcast document types include Excel, HTML, plain text, and imported documents.

Transmitting messages

The last step in the subscription fulfillment process is to send the formatted information to the recipients.

Delivering service content: Information transmitters

An information transmitter delivers formatted content to recipient devices. An information transmitter can send email via SMTP or mobile device messages. In general, an information transmitter

supports one type of transmission technology, such as SMTP, FTP, HTTP, SMPP, or ODBC.

Information transmitters depend on information transmission modules (ITM), which are software components designed to support a particular delivery capability. For example, Narrowcast Server provides the following information transmission modules:

- Email (SMTP) ITM for email (SMTP) and wireless (SMTP) transmissions

- File ITM for saving files to networked computers and remote servers using the Windows file system

- Print ITM for printing to shared network printers

- SMS (SMPP v3.3/3.4) ITM for transmitting to an SMS gateway

- Portal ITM for transmitting to the Subscription Portal

The ITM is defined based on the Narrowcast documents and document types it supports, as well as the arrangement of the documents. Each publication can be used with only one specific information transmitter.

To deliver content to end users, the ITM gets instructions from the Delivery Engine on how messages should be packaged and sent. With email, for example, some devices support only UUEncoding to package formatted content, while others support only a specific subset of multi-part MIME encoding. Narrowcast Administrator determines the device characteristics a particular information transmitter supports. Those characteristics are stored in the Object Repository and later retrieved by information transmitters to control packaging and delivery.

For steps to create an information transmitter, see *Information transmission modules and information transmitters* in the *Narrowcast Server System Administrator Guide*.