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What’s New in SAS 9.4 Publishing Framework

General Enhancements

SAS 9.4 Publishing Framework provides the following general enhancements:

- If you are publishing to SharePoint or WebDAV, SSL setup can be done using TKESSL. For more information, see *Encryption in SAS*.
- Support has been added for circular integrity constraints.
- Support has been added for extended attributes. For more information about extended attributes, see *SAS Language Reference: Concepts*.
- Event publishing is obsolete, and the event publishing documentation has been removed. Instead, use PROC HTTP to issue HTTP requests and receives responses from an HTTP server. See the PROC HTTP documentation in the *Base SAS Procedures Guide*. 
What Is SAS Publishing Framework?

The SAS Publishing Framework feature of SAS Integration Technologies provides a complete and robust publishing environment for enterprise-wide information delivery. The Publishing Framework consists of SAS CALL routines, application programming interfaces (APIs), and graphical user interfaces that enable both users and applications to publish SAS files (including data sets, catalogs, and database views), and other digital content to a variety of destinations including the following:

- e-mail addresses
- message queues
- publication channels and subscribers
- WebDAV-compliant servers
- archive locations
- SharePoint servers

SAS Publishing Framework also provides tools that enable both users and applications to receive and process published information. For example, users can receive packages with content, such as charts and graphs, that is ready for viewing. SAS programs can receive packages with SAS data sets that might in turn trigger additional analyses on that data.

The functions of the Publishing Framework include channel definition, subscription management, package publishing, package retrieval, and package viewing.
Channel Definition and Subscription Management

SAS Publishing Framework enables you to define SAS publication channels, which are conduits for publishing particular categories of information. You can set up a channel for a particular topic, organizational group, user audience, or any other category. Once publication channels have been defined, authorized users can subscribe to them and automatically receive information whenever it is published to those channels.

For more information about defining channels and managing subscriptions, refer to the Help for the Publishing Framework plug-in for SAS Management Console.

The SAS Information Delivery Portal also enables users to manage their subscriptions. The portal enables users to select channels to subscribe to, specify the desired delivery transport (such as an e-mail address or message queue), and specify filters that indicate which information is to be included or excluded.

Package Publishing

SAS Publishing Framework enables you to create packages that contain one or more information entities, including SAS data sets, SAS catalogs, SAS databases, and almost any other type of digital content. You can also define viewers that make the information entities easier to display.

After creating a package, you can publish the package and its associated viewers to one or more channels. This causes the information to be delivered to each user who has subscribed to those channels, if the package and its contents meet the subscriber's filtering criteria. In addition to channels, you can publish packages directly to one or more e-mail addresses, message queues, WebDAV-compliant servers, archive locations, and SharePoint servers.

To create and publish packages, you can use either of the following methods:

- Use the publish CALL routines to create packages and publish them from within a SAS program.
- Use the Java APIs that are provided with SAS Integration Technologies to create packages and publish them from within a third-party application.

You can also use SAS Enterprise Guide or SAS Information Delivery Portal to create and publish packages via SAS Publishing Framework.
Package Retrieval and Viewing

SAS Publishing Framework provides the SAS Package Retriever, which is a graphical user interface to enable users to extract and save information from packages that have been published through SAS Publishing Framework. The SAS Package Reader user interface enables users to display the contents of packages. Users can also view published information from the SAS Information Delivery Portal.

In addition, you can use CALL routines to extract and process published information from within SAS programs. APIs are provided to enable third-party programs to extract and process published information.
What Is a Package?

Definition of Package

A package is a container for information, or digital content, that is generated or collected for delivery to a consumer.

Knowledge takes the form of package entries, which can be either of two types:

- SAS results
- unstructured content

SAS Results

A category of package entry type is SAS results, which can take the form of any of the following:

- SAS catalog
- SAS data set
- SAS database (such as MDDB)
- SAS SQL view
Unstructured Content

Unstructured content is any package entry that is created external to SAS. Supported unstructured content types include the following:

- binary file (such as Excel, GIF, JPG, PDF, PowerPoint, and Word)
- HTML file (including ODS output)
- reference string (such as URL)
- text file (such as a SAS program)
- viewer file (such as an HTML or plain text template that formats SAS file items for viewing in e-mail)

Filename Extensions for Package Entry Types

Each entry in a package is implicitly contained in a file whose filename extension reflects the entry type. Knowing filename extensions might be useful when retrieving packages from the archive, WebDAV, and SharePoint transports.

Default filename extensions are as follows:

- .csv - Comma-separated values
- .ref - Reference
- .sac - SAS catalog (for archive and WebDAV transports)
- .sad - SAS data set (for archive and WebDAV transports)
- .sam - SAS MDDB
- .sav - SAS SQL View
- .spk - Archive package
- .stc - SAS catalog or SAS data set (for SharePoint transport)

Rendering a Package

When determining how to render packages, the publisher should consider the following:

- the company's business requirements
- the configuration of the business enterprise (for example, hardware, software, business processes, and communications protocols)
- the package content (structured and unstructured data)
- the transport (such as archive, channel, e-mail, message queue, or web) that is used to deliver the package

The following scenarios depict business factors that might affect how a package is rendered:
Table 2.1  Package Rendering to Meet Consumer Needs

<table>
<thead>
<tr>
<th>Consumer Need</th>
<th>Publisher Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to packages, but have limited system storage resources</td>
<td>Render the package as an archive.</td>
</tr>
<tr>
<td>Access to package without having SAS software installed</td>
<td>Render the package as an archive and attach the archive to e-mail for access by using SAS Package Reader.</td>
</tr>
<tr>
<td>Only executive-level summaries (for example, text reports, graphics, and web links)</td>
<td>Render the package as unstructured content to known consumers via e-mail or to unknown consumers via subscription-based channels.</td>
</tr>
<tr>
<td>Access to SAS results, but do not want to access the package for continued processing</td>
<td>Apply a template to the SAS data package entry for viewing in e-mail and on the web.</td>
</tr>
<tr>
<td>Access to SAS results, but do not have web access or do not use HTML</td>
<td>Apply a template in plain-text format to the SAS results for viewing in e-mail.</td>
</tr>
<tr>
<td>Direct access to SAS results for continued data processing</td>
<td>Deliver SAS results package entries to message queues or archives to enable programmatic access to SAS data.</td>
</tr>
<tr>
<td>To span a broad professional range (executive, manager, programmer, and knowledge worker)</td>
<td>Apply name/value metadata to the package and package entries to enable consumers to filter packages or package entries for relevancy.</td>
</tr>
</tbody>
</table>

Before the publisher can begin the publishing process, the administrator must first configure the publishing environment, which might include archives, channels, subscribers, and subscriptions.

Package Transports

Overview of Package Transports

The destination (or transport) for delivering a package is defined programmatically in a SAS application by using CALL PACKAGE_PUBLISH routines.

Transports are as follows:

archive
a single binary collection of all the items in a package, which is compressed and saved to a directory file. The archive contains the contents of a package and...
metadata that is necessary for extracting the contents. An archived package is also referred to as an SPK file, which is short for SAS Package.

channel
a conduit through which the defined transport (either e-mail or message queue) delivers package items to the subscribers of the channel. The subscriber defines the preferred transport by using personal subscription properties. Whereas publishing to e-mail is identity-centered (the publisher delivers packages to recipients whose identities are known), publishing to channels is subject-centered, allowing both the publisher and the consumer to concentrate on the subject of the package rather than on the recipients for the package.

e-mail
mechanism for delivering selected package items to identified recipients.

message queue
in application messaging, a place where the publisher can send a message (or a package) that can be retrieved by another program for continued processing.

SharePoint
Microsoft product that enables users to share files, collaborate, and publish to the web. Publishing to SharePoint is similar to publishing to WebDAV in that it facilitates concurrent access to and update of package data on the internet.

WebDAV-compliant server
an acronym for Web Distributed Authoring and Versioning. Whereas the traditional transports (archive, channel, e-mail, and message queue) are repositories for published package data that can be retrieved and reprocessed in a synchronous fashion, a WebDAV-compliant server facilitates concurrent access to and update of package data on the internet.

WebDAV is not only a delivery mechanism, but also a core technology that extends the HTTP network protocol, enabling distributed web authoring tools to be broadly interoperable. WebDAV extends the capability of the web from that of a primarily read-only service, to a writable, collaborative medium.

Persisted Packages

Publishing a package to an archive or to a WebDAV server provides the following advantages:

- You conserve disk resources.
- The package stays in a static location, allowing consumers or programs to retrieve the package at their convenience.
- The SAS data package entries are available to consumers who do not have SAS software installed on their systems.

After the administrator has configured channels with archive paths or base paths, the publisher can publish packages directly to an archive or WebDAV server. The publisher can use the following methods to publish to a persistent store (an archive or a WebDAV server):

- publishing programmatically by using SAS
- using a third-party client application

The consumer can use the stand-alone product SAS Package Reader subsequently to uncompress, or unzip, and use an archived package. SAS Package Retriever can
be used to access the package from the persisted location and to store the package elsewhere. The RETRIEVE SCL application, CALL routines, and SAS Information Delivery Portal can also be used to retrieve persisted packages.

Subscription Channels

Creating Channels
The administrator uses SAS Management Console to create a channel object with the attributes that are specified in the SAS Metadata Repository. The administrator must create a channel for each distinct topic or audience. For example, users of a particular application might want a channel for discussion and data exchange, while the programmers of that application might want another channel to discuss technical problems and future enhancements. Although the topic is the same application, the discussion about the topic is different. Therefore, two separate channels might best serve the needs of the two groups of users.

Creating Subscribers
The administrator must create a subscriber for each potential user of a channel. Subscribers must be defined before subscriptions to channels can be created.

Creating Subscriptions
The association of a subscriber to a channel is a subscription. A subscription enables the information that is published to a channel to be delivered to the interested (subscribed) subscribers.

Subscriptions can be created by either the administrator or the subscriber. The administrator can create subscriptions when a publishing environment is initially configured. Individual subscribers can create personal subscriptions after the publishing environment has been configured.
Retrieving Packages and URLs

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Retrieving Packages from Different Transports

After a package is created, the transport, or destination, and other properties control how the package is delivered to the consumer.

Packages can be retrieved from the following destinations:

- archive
- e-mail
- message queue
- WebDAV-compliant server
- SharePoint

For archives, you can use the stand-alone product SAS Package Reader to uncompress, or unzip, and use SPK files. SAS Package Reader can be used to read packages, regardless of whether the consumer has SAS installed.

Depending on your needs and on whether you have SAS installed, you can choose from the following products to access a package on an archive, message queue, or WebDAV-compliant server:
The consumer can use SAS Package Retriever to access a package and to store it elsewhere for continued use. SAS must be installed in order to use the SAS Package Retriever.

If SAS is installed, then you can use the Publish Package CALL routines in order to write SAS programs, including stored processes, that create, populate, publish, and retrieve packages. You can also use the Publish Package CALL routines to publish and retrieve packages to and from SharePoint.

If SAS is not installed, then you can use third-party client software in order to write a third-party client application that uses SAS Integration Technologies to access Integrated Object Model (IOM) servers. The Integrated Object Model provides distributed object interfaces for conventional SAS features. This enables you to develop component-based applications that integrate SAS features into the enterprise application.

You can also use SAS Information Delivery Portal to retrieve packages from archives or WebDAV-compliant servers. For more information, see the product Help.

For more information about configuring and publishing to an archive, see “Persisted Packages” on page 8.

When the publisher publishes a package via e-mail, the package is delivered to a list of recipients. Choosing e-mail gives the publisher authority over who receives the package. The recipient, however, requires no knowledge about the publishing environment from which the package was sent, nor must the recipient subscribe to a delivery channel. Also, recipients do not have to be SAS users. If the e-mail has a package file attachment, or if the e-mail contains a link to the persisted WebDAV package, then SAS is not needed to consume the package. The recipient can use SAS Package Reader or a web browser in order to read the package.

Note: There are two methods for using e-mail to publish packages. The method described in this section refers to publishing packages explicitly to e-mail addresses. The other method is to publish a package to a channel, which can have e-mail subscribers. In that case, the recipient must be subscribed to a delivery channel.

Although e-mail is suitable for delivering reports and views of data to a limited audience, a message queue is best used for collecting package data entries for continued processing and publishing in time-critical environments. Publishing to a queue, and retrieval from a queue, are entirely independent activities. The publishing software (programmatic software) and the retrieval software (SAS Package Retriever or programmatic software) communicate asynchronously without any knowledge of the location of the other software, or even whether the other software is running.

Whereas the traditional transports (archive, channel, e-mail, and message queue) are repositories for published package data that can be retrieved and reprocessed in a synchronous fashion, package delivery to SharePoint or to a WebDAV-compliant server facilitates concurrent access to and update of package data on the internet.
SAS Package Retriever

Overview

SAS Package Retriever is an SCL application that enables you to retrieve package data from a transport—archive, message queue, or WebDAV-compliant server—to an appropriate storage location on your SAS system or an external file location. After you designate a storage location for the entry (for example, at a libref, fileref, or a file location), you can reference the entry for inclusion in a SAS program for continued package publishing in the business enterprise.

Examples of package data include SAS data (such as a SAS data set, SAS catalog, or a SAS database) and external data (such as an HTML file, binary file, text file, or viewer file).

Underlying the functions of SAS Package Retriever is a subset of the Publish Package CALL routines that relate explicitly to retrieving packages, which you can use directly for programmatic package retrieval.

To invoke SAS Package Retriever, enter the following command on the SAS command line:

```
retrievepackage
```

Use the Select Transport field in the SAS Package Retriever window to specify an archive, queue, or WebDAV as the transport for retrieving package entries.

For the archive transport, specify the Archive Name, which is the name of the file that you want to retrieve. Specify the full path and name of the archive file, including the .spk extension. You can also use the arrow button next to the field to browse and select your package. For information about setting advanced properties for your archived package, see “Advanced Archive Properties Window” on page 14.

For the queue transport, specify the Queue Name in one of the following formats:

- `MSMQ://machineName\queueName`
- `MQSERIES://queueManager:queueName`
- `MQSERIES-C://queueManager:queueName`

For example,

```
MQSERIES://MYPC:LocalQ
MSMQ://mypc\localq
```

For information about setting advanced properties for retrieving your package from a queue, see “Advanced Queue Properties Window” on page 15.

For the WebDAV transport, enter the URL location of the package in the Package URL field. For information about setting advanced properties for your WebDAV package, see “Advanced WebDAV Properties Window” on page 15.
Advanced Archive Properties Window

You set advanced properties only if you specify the archive name as an LDAP URL, and the LDAP server is running secured.

To specify advanced properties for retrieving your archived package, click the Advanced Properties button in the SAS Package Retriever window to open the Advanced Archive Properties window. In this window, you can set values for the LDAP Bind Distinguished Name and the LDAP Bind Password fields.

LDAP (Lightweight Directory Access Protocol) is the emerging client-access standard for enterprises that are implementing a common repository for user, resource, and security data. LDAP lets enterprises to administer this information in one place using one interface. The LDAP Bind Distinguished Name and the LDAP Bind Password properties can be specified to provide the information that is needed to bind to the LDAP server. The Advanced Archive Properties Window contains the following fields:

LDAP Bind Distinguished Name
specifies a character string that indicates the distinguished name that is used to bind to the LDAP server.

LDAP Bind Password
specifies a character string that indicates the password that is used to bind to the LDAP server.

FTP User
specifies a character string that identifies the user ID of the user who is retrieving from the remote host.

If the FTP protocol is specified as the archive path and the server does not accept anonymous user access, then you must specify an FTP user ID. If you specify an FTP user ID, then you must also specify an FTP password.

FTP Password
specifies the user's password that is needed to retrieve from the remote host.

If the FTP protocol is specified as the archive path and the server does not accept anonymous user access, then you must specify an FTP password. If you specify an FTP password, then you must also specify an FTP user ID.

HTTP User
specifies a character string that identifies the user ID of the user who binds to the web server when retrieving a package.

Note: Supplying an HTTP user ID is necessary only if the remote host where the archive is located runs secured.

HTTP Password
specifies a character string that identifies the password of the user who binds to the web server when retrieving a package.

Note: Supplying an HTTP password is necessary only if the remote host where the archive is located runs secured.
HTTP Proxy URL
specifies a character string that identifies the URL of the proxy server.

Advanced Queue Properties Window
You might need to specify advanced properties for retrieving your package from a queue. Click Advanced Properties in the SAS Package Retriever window to open the Advanced Queue Properties window.

In this window, you can set values for the Correlation Identifier and Timeout fields.

Correlation Identifier
specifies a binary character string that identifies a package. If specified, only packages that have a header message with the specified correlation identifier will be retrieved. This is useful if you want to retrieve only certain packages that have the same correlation identifier.

Timeout
specifies a numeric string that identifies the number of seconds for the operation time-out. By default, the retrieve operation immediately returns output that lists the number of packages that are found in the queue. To override this default, specify this property so that the retrieve operation continues to search for packages until at least one package is found in the queue or until the time-out occurs.

Advanced WebDAV Properties Window
In addition to specifying the URL location of the package, you might need to set advanced properties for retrieving the package from WebDAV.

HTTP User
specifies a character string that identifies the user ID of the user who binds to the web server when retrieving a package. Supplying an HTTP user ID is necessary only if the WebDAV-compliant server runs secured.

HTTP Password
specifies a character string that identifies the password of the user who binds to the Web server when retrieving a package. Supplying an HTTP password is necessary only if the WebDAV-compliant server runs secured.

HTTP Proxy URL
specifies a character string that identifies the URL of the proxy server.

Retrieving a Catalog, MDDB, or SQLView Entry
When you select a catalog, MDDB, or SQLView entry to retrieve from the Result Package Tree View, the Specify Output Library Name and Member Name Window prompts you to specify values for certain fields. In the Library Name field, enter the library where you want the entry to be placed after it is retrieved. You can also click
the arrow beside the **Library Name** field to browse possible library selections. In the **Member Name** field, enter the name for the member.

---

**Retrieving a Data Set**

When you select a SAS data set to retrieve from the Result Package Tree View window, the Specify Output Library Name and Member Name window prompts you to specify values for certain fields. In the **Library Name** field, enter the library where you want the data set to be placed after it is retrieved. You can also click the arrow beside the **Library Name** field to browse possible library selections. In the **Member Name** field, enter the name for the data set.

You can also specify data set options in this window as a text string in the following form:

`option1=value option2=value ...`

For example,

`pw='born2run' keep=empno`

Surround string values, such as a password, with single quotation marks.

Examples of typical data set options, with definitions, follow:

**SORTEDBY=**
- specifies how the data set is currently sorted.

**PW=**
- assigns a read, write, or alter password to a SAS file and enables access to a password-protected SAS file.

**READ=**
- assigns a read password to a SAS file and enables access to a read-protected SAS file.

**WRITE=**
- assigns a write password to a SAS file and enables access to a write-protected SAS file.

**ALTER=**
- assigns an alternative password to a SAS file and enables access to a password-protected SAS file.

**FIRSTOBS=**
- causes processing to begin at a specified observation.

**OBS=**
- causes processing to end with the $n$th observation.

**WHERE=**
- selects observations that meet the specified condition.

**IDXNAME=**
- directs SAS to use a specific index to satisfy the conditions of a WHERE expression.

**IDXWHERE=**
- overrides the SAS decision about whether to use an index in order to satisfy the conditions of a WHERE expression.
DROP= excludes variables from processing or from outputting to SAS data sets.

KEEP= specifies variables for processing or for writing to output SAS data sets.

RENAMED changes the name of a variable.

For a complete list of data set options, see the SAS Data Set Options: Reference.

---

Retrieving a Binary File Entry

When you select a binary file entry to retrieve from the Result Package Tree View window, the Specify Output Filename or Fileref window prompts you to specify values for certain fields. Under the Select Type option, select either File Name or Fileref. In the following field, specify the location of the filename or the fileref where you want the binary file entry to be placed when it is retrieved. You can also click the arrow beside the field to browse possible filename or fileref selections.

**Filename**
- specifies the name of the external file where you want the retrieved entry placed in the directory structure of your operating environment.

**Fileref**
- specifies an existing SAS fileref to associate with the retrieved entry.

---

Retrieving a Binary Entry of File Type CSV

When you select a binary entry that is of CSV (Comma Separated Value) file type to retrieve from the Result Package Tree View window, the Specify Output Filename or Fileref window prompts you to specify values for certain fields. Under the Select Type option, select either Filename or Fileref. In the following field, specify the location of the filename or the fileref where you want the binary file entry to be stored after it is retrieved. You can also click the arrow beside the field to browse possible filename or fileref selections.

**Filename**
- specifies the name of the external file where you want the retrieved entry placed in the directory structure of your operating environment.

**Fileref**
- specifies an existing SAS fileref to associate with the retrieved entry.

You can also select whether you want the CSV file to be retrieved as a SAS data set.

If you retrieve the CSV file as a SAS data set, you are prompted for the Library and Member names. Enter the library where you want the data set to be placed after it is retrieved. In the Member Name field, enter the name for the data set.
Retrieving a Companion File

A companion file is an HTML file that is referenced for inclusion in another HTML file package entry that is ODS-generated. Therefore, one or more HTML files serve as companions to the ODS-generated HTML file that is being retrieved.

If the HTML package entry that you are retrieving includes any companion files, you are prompted about whether to select them. If you click Yes, you are prompted to enter the storage location for the files. A message is displayed to indicate that the file retrieval was successful.

For details about retrieving HTML file package entries, see “Retrieving an HTML Entry” on page 18.

Retrieving an HTML Entry

When you select an HTML entry to retrieve from the Result Package Tree View window, the Specify Output Path window prompts you to specify the storage location for the file. Enter the location where you want the HTML file to be stored after it is retrieved. You can specify this path in the Path field in the Specify Output Path window. You can also use the arrow button next to the Path field to browse and select your location.

To specify a character set encoding property for the HTML file that is retrieved, click Advanced Properties. For more information about specifying advanced properties, see “HTML and Viewer Encoding Property” on page 19.

If the HTML file package entry contains any companion files, you are prompted about whether to retrieve them. For details about companion files, see “Retrieving a Companion File” on page 18.

Retrieving a Text File Entry

When you select a text file entry to retrieve from the Result Package Tree View window, the Specify Output Filename or Fileref window prompts you to specify values for certain fields. Under the Select Type option, select either Filename or Fileref. In the following field, specify the location of the filename or the fileref where you want the text file entry to be placed when it is retrieved. You can also click the arrow beside the field to browse possible filename or fileref selections.

Filename
specifies the name of the external file where you want the retrieved entry placed in the directory structure of your operating environment.

Fileref
specifies an existing SAS fileref to associate with the retrieved entry.
Retrieving a Viewer Entry

When you select a viewer entry to retrieve from the Result Package Tree View window, the Specify Output Filename or Fileref window prompts you to specify values for certain fields. HTML and text viewers are supported. Under the Select Type option, select either Filename or Fileref. In the following field, specify the location of the filename or the fileref where you want the viewer entry placed when it is retrieved. You can also click the arrow beside the field to browse possible filename or fileref selections.

Filename
specifies the name of the external file where you want the retrieved entry placed in the directory structure of your operating environment.

Fileref
specifies an existing SAS fileref to associate with the retrieved entry.

To specify a character set encoding property for the viewer file that is retrieved, click the Advanced Properties button. For more information about specifying advanced properties, see “HTML and Viewer Encoding Property” on page 19.

HTML and Viewer Encoding Property

Character set encoding refers to how an operating environment internally represents character data. Operating environments that share common architectures represent character data identically. For example, UNIX operating environments internally represent character data in ASCII-ISO format, z/OS operating environments in EBCDIC format, and Windows operating environments in ASCII-ANSI format.

By default, no translation occurs when HTML files or viewer files are retrieved; they are written as binary data. However, if necessary, when you retrieve the files, you can override the character set encoding that is published with the files by specifying an alternative character set encoding that is appropriate to the retrieving host.

Note: The encoding property does not apply to a viewer file in text format. Encoding applies only to a viewer file in HTML format.

SAS Package Reader

The SAS Package Reader application enables you to retrieve the contents of a SAS package as an archive file from an archival location or from an e-mail attachment without having to run SAS. An archive is denoted by a .spk file extension, which is an abbreviation for SAS Package.

A read-only tool, SAS Package Reader is useful for viewing individual package entries and saving them to local files. SAS Package Reader launches an appropriate viewer to enable you to see the content of the package entry. For SAS
data sets, it starts a built-in data set viewer; for all other viewable data, it starts the web browser that is already configured on your system.

**Note:** Some entry types cannot be viewed. Examples include viewer files, SAS catalogs, and SAS databases (MDDB and DMDB files). If the selected entry type is not viewable, then the View icon does not appear in the toolbar. In addition, if you try to view a SAS data set that is password-protected, a message is displayed saying that the data set cannot be accessed.

What you do with a package corresponds to the type of consumer that you are and the type of information that is contained in the package. Packages are created for specific target consumers for definite purposes.

Because you do not need SAS running in order to use SAS Package Reader, you do not need additional SAS software licensed in order to retrieve packages.

For more information about SAS Package Reader, see the product Help.

---

**Retrieving URLs**

When a package is published to a channel that is defined with a WebDAV persistent store, then e-mail subscribers receive e-mail with a link to the persisted location. Here is an example of an e-mail message in which the URL reference is identified:

Weekly sales

Published on 24MAR2000:20:14:19 GMT

The package contains graphs, ticket sales data, and an executive summary.

**URL:**

http://www.AlphaliteAirways/weeklysales/031200

Clicking the link automatically invokes the consumer's configured web browser and the URL package entry is presented for viewing in the web browser window.
Overview of Viewers

SAS Integration Technologies provides a viewer facility that combines the robust text rendering capabilities of HTML and plain text with the efficiency of e-mail delivery. This facility enables you to create and apply a viewer, which is a template that contains formatting directives for rendering a specific view to an entire package or to selected package entries.

The viewer facility consists of a set of tagging extensions to HTML, which you can use to create a unique template according to the specific package data that is being rendered. For example, you can write formatting directives to stream package entries (such as a text file or a URL reference) or to extract SAS data file entries for presentation in e-mail. A viewer creates a presentation quality look and feel to package data entries for distribution to a view-only audience.

A primary benefit of applying viewers to packages is that e-mail recipients can now view package entries that otherwise would not be viewable. For example, an archive that contains a SAS data set can be attached to e-mail, but is not viewable in e-mail.
unless a viewer is applied. The viewer renders the SAS data set as a populated table.

Furthermore, a viewer facilitates publishing in the traditional sense using, for example, an electronic newsletter. An electronic newsletter template that is coded in HTML or plain text format can dynamically build your content, which can consist of links to websites for up-to-date information about topics of interest to its readers.

When to Use a Viewer

A viewer is useful under the following conditions:

Publishing to the E-mail Transport
You want to publish a package that contains a data set, for delivery to consumers who use a view-only transport (such as e-mail). Because a SAS data set is not viewable in e-mail, an HTML or text viewer is needed to format the SAS data for a view-only presentation.

Publishing to Channel Subscribers
If you are publishing to a channel, the transports that are used by subscribers are unknown to you. Therefore, you might decide to format the entire package with the aid of a viewer to ensure maximum viewability for the broadest consumer audience. The viewer is applied to a package that is published to subscribers who use e-mail delivery, WebDAV subscribers, or channels that have a WebDAV persistent store. The viewer is not applied to a package that is published to subscribers who specify delivery to message queues.

Extracting and Formatting SAS Data
With a viewer, you can extract specific package items and variables from a SAS data set entry and distribute to subscribers who use e-mail. Subscribers who use e-mail receive the package entries that the viewer extracts and formats. Subscribers who use queues receive the full package.

Formatting an Entire Package
Besides formatting a SAS data set package entry, you can also use a viewer to format other entries in the package (such as another HTML file, a text file, a binary file, or a reference) as input streams. Applying a viewer to the entire package provides a comprehensive presentation for viewing purposes only.

Publishing an Electronic Newsletter
A popular form of package output is an electronic newsletter. The basic template that imposes the look and feel of the document can contain static text or HTML coding. However, you can code the dynamic information (in the form of news articles or SAS data) as links to websites whose source data is continuously refreshed.

Publishing an Executive Level Summary
Delivery of SAS result sets and other text and graphical information via e-mail has the greatest value for an executive level consumer. The executive might have a requirement to view the data (for example, in the form of summary tables) and to read text but might not necessarily need access to the raw data for continued processing, extraction, and delivery throughout the enterprise.
How to Create a Viewer

The Sample Package

The publisher (or the person who creates the viewer template) must have a thorough understanding of the contents of the package in order to successfully create the template. You choose the appropriate viewer tags in order to design a template that formats the rendered view of the package.

This sample package contains four entries, in the following order:

1. SAS data set
2. text file
3. reference URL
4. HTML file

This package also contains the following description:

AlphaliteAirways Sales Force Briefing

SAS Data Set

Here is an example of a SAS data set that contains six observations, each containing four variables: FNAME, LNAME, YEARS, and TERRITORY.

<table>
<thead>
<tr>
<th>Name</th>
<th>Surname</th>
<th>Years</th>
<th>Territory</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>Smith</td>
<td>32</td>
<td>NE</td>
</tr>
<tr>
<td>Gary</td>
<td>DeStephano</td>
<td>20</td>
<td>SE</td>
</tr>
<tr>
<td>Arthur</td>
<td>Allen</td>
<td>40</td>
<td>MW</td>
</tr>
<tr>
<td>Jean</td>
<td>Forest</td>
<td>3</td>
<td>NW</td>
</tr>
<tr>
<td>Tony</td>
<td>Votta</td>
<td>30</td>
<td>SW</td>
</tr>
<tr>
<td>Dakota</td>
<td>Smith</td>
<td>3</td>
<td>HA</td>
</tr>
</tbody>
</table>

Basic Viewer

Overview of Basic Viewer

The file that contains the viewer template contains code that is surrounded by tags `<SASINSERT>` open tag and end with the `</SASINSERT>` closing tag.

The viewer contains sections that format each package entry by using the appropriate technique.
extracting and formatting a variable from a SAS data set into a list
extracting and formatting a SAS data set into a table
streaming a text file and a reference URL
filtering package entries

For a single, comprehensive viewer that contains all of the preceding examples, see "Example 3: Sample HTML Viewer" on page 39.

Extracting and Formatting a Variable from a SAS Data Set into a List

Delivery of a single variable from all observations in a SAS data set is suitable for an unordered list.

Here is the first section from the sample template that formats a single variable from a SAS data set into a list.

<!--Section 1: Formatting a Data Set Variable in an HTML List-->
<SASINSERT>
<h2>Congratulations!</h2>
$(entry=1 attribute=description)
<ul>
<SASTABLE ENTRY=1>
<li>$(VARIABLE=fname)</li>
</SASTABLE>
</ul>
</SASINSERT>

The ENTRY=1 attribute identifies the SAS data set as the first entry in the package. The description attribute extracts the description of the package.

The <UL> HTML tag specifies an unordered list after which the <SASTABLE> tag with the ENTRY=1 option are necessary to identify the SAS data set as the first entry in the package. The <LI> HTML tag is used with variable substitution syntax to identify that the variable fname is to be extracted from the SAS data file and formatted as a list entry in the rendered view. Implicit in the <SASTABLE> construct is looping. Each observation in the data set is read and formatted until the end of file is reached.

The following SAS HTML tags are used in this example:

- <SASINSERT> tag
- Substitution syntax
- <SASTABLE> tag

This section of the template is rendered for viewing in e-mail as follows:

```
Congratulations!
AlphaliteAirways Sales Force Briefing
John
Gary
Arthur
Jean
Tony
Dakota
```
Extracting and Formatting a SAS Data Set into a Table

Delivery of multiple variables or all variables from the observations in a SAS data set is suitable for a tabular presentation. Here is an example of a template that extracts three of four variables from a SAS data set into a table.

<!--Section 2: Formatting a SAS Data Set into a Table-->
<SASINSERT>
<h2>Record Sales from these Salespeople</h2>
<table border cellspacing=0 cellpadding=5 rules=groups>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Territory</th>
</tr>
</thead>
<tbody>
<SASTABLE ENTRY=1>
<tr>
<td> $(Variable=fname)</td>
<td> $(Variable=lname)</td>
<td> $(Variable=territory)</td>
</tr>
</tbody>
</SASTABLE>
</table>
</SASINSERT>

The ENTRY=1 attribute identifies the SAS data set as the first entry in the package. The description attribute extracts the description of the entry from the package. Standard HTML table tags set up the tabular framework that defines a row with three columns of header text and accompanying tabular data. The <TD> tag is used with the variable substitution syntax to identify the following variables for extraction and insertion into the table: fname, lname, and territory. Implicit in the <SASTABLE> construct is looping. Each observation in the data set is read and formatted until the end of file is reached.

The following SAS HTML tags are used in this example:
- <SASINSERT> tag
- Substitution syntax
- <SASTABLE> tag

This section of the template is rendered for viewing in e-mail as follows:

Record Sales from These Salespeople
Table 4.1  AlphaliteAirways Sales Force Briefing

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Territory</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>Smith</td>
<td>NE</td>
</tr>
<tr>
<td>Gary</td>
<td>DeStephano</td>
<td>SE</td>
</tr>
<tr>
<td>Arthur</td>
<td>Allen</td>
<td>MW</td>
</tr>
<tr>
<td>Jean</td>
<td>Forest</td>
<td>NW</td>
</tr>
<tr>
<td>Tony</td>
<td>Votta</td>
<td>SW</td>
</tr>
<tr>
<td>Dakota</td>
<td>Smith</td>
<td>HA</td>
</tr>
</tbody>
</table>

Streaming a Text File and a Reference URL

The viewer template might also include the entire contents of a text file, another HTML file, a reference URL, or a binary file.

Here is the third section from the sample template that inserts a text file and a reference URL into the viewer.

<!--Section 3: Inserting a Text File and a Reference URL-->

<SASINSERT>
<h2>Letter of Congratulations</h2>
<p>Below is a copy of the letter that was sent to each recipient of the top sales award.</p>
$(entry=2 attribute=stream)
<p>See <a href="$(entry=3 attribute=stream)">for detailed sales figures.</a></p>
</SASINSERT>

The <H2> tag defines a descriptive heading for the text document and the reference URL. The ENTRY=2 attribute identifies the entry (a text document) to be substituted as an input stream to the HTML output. The ENTRY=3 attribute identifies the reference URL.

The following SAS HTML tags are used in this example:

- <SASINSERT> tag
- Substitution syntax

This section of the template is rendered for viewing in e-mail as follows:
Letter of Congratulations

Below is a copy of the letter that was sent to each recipient of the top sales award.

December 30, 2000

International Sales
AlphaliteAirways Headquarters

Dear AlphaliteAirways Salesperson,

Congratulations on your much deserved recognition as outstanding salesperson for AlphaliteAirways for 2000.

To express our gratitude for your excellent contribution, we wish to present you with 25 stock options in AlphaliteAirways.

Wishing you continued success in your career with AlphaliteAirways.

Sincerely,

Alvin O. Taft, Jr.
Director-in-Chief


Filtering Package Entries

Another method for locating package entries for inclusion in the viewer is name/value filtering. You can filter package entries that are assigned an optional name/value pair when they are created according to specified criteria. Entries that match are included in the rendered view. Filtering is especially powerful for searching large, nested packages.

In our example, we filter for all entries that have a name/value pair of type=report and include the matching entries in the viewer. In our fictitious package, one HTML entry matches the name/value pair, so it is filtered for inclusion in the viewer.

Here is the fourth section from the sample template that inserts an HTML file (according to matched criterion) into the viewer.

<!--Section 4: Filtering an Entry-->
<SASINSERT>
<h2>Message from the President</h2>
<SASREPEAT>
$(entry="(type=report)" attribute=stream)
</SASREPEAT>
</SASINSERT>

The ENTRY="(type=report)" attribute filters all package entries that contain a name/value pair of type=report. The <SASREPEAT> open tag and the </SASREPEAT> closing tag surround the search string in order to perform a repetitive search for the name/value pair. Without this tag, the search would end after the first match. In this example, only one HTML entry is matched. This entry is substituted as an input stream to the HTML output.

The following SAS HTML tags are used in this example:
Message from the President

AlphaliteAirways delivers service. AlphaliteAirways is the recognized industry leader according to its safety record, volume of passengers served, and number of routes serviced.

How are we able to live up to such high expectations consistently? First and foremost, we do it through the abilities of our top salespeople. We owe a huge debt to these hard-working individuals who actively pursue revenue for this company.

Using the Publish Package Interface to Apply a Viewer

After you create a viewer template for a package, the publisher can apply it when publishing the package to e-mail by using the Publish Package Interface. For the e-mail, channel subscriber, and WebDAV delivery types only, you specify a viewer as a property to the CALL PACKAGE_PUBLISH routine.

You specify the VIEWER_NAME property and assign to it a viewer in the form of either an external filename or a SAS fileref.

For example, the following code shows the application of an HTML viewer to a package that is published to e-mail:

```plaintext
publishType = "TO_EMAIL";
properties = "VIEWER_NAME";
viewerFile = "filename:c:\dept\saletemp.html";
emailAddress = "JohnDoe@alphalite.com";
CALL PACKAGE_PUBLISH(packageId, publishType, rc,
    properties, viewerFile, emailAddress);
```

The following code shows the application of a text viewer to a package that is published to e-mail:

```plaintext
publishType = "TO_EMAIL";
properties = "TEXT_VIEWER_NAME";
viewerFile = "filename:c:\dept\saletemp.txt";
emailAddress = "JohnDoe@alphalite.com";
CALL PACKAGE_PUBLISH(packageId, publishType, rc,
    properties, viewerFile, emailAddress);
```

The following code publishes the package (to which an HTML viewer is applied) to all subscribers of the HR channel. The subject property is specified so that all e-mail subscribers will receive the message with the specified subject.
publishType = "TO_SUBSCRIBERS";
storeInfo = "SAS-OMA://alpair02.sys.com:8561";
viewerFile = "filename:c:\dept\saletemp.html";
channel = 'HR';
subject = "Weekly HR Updates:";
user = "myUserName";
password = "myPassword";
props = "VIEWER_NAME, SUBJECT, CHANNEL_STORE, METAUSER, METAPASS";
CALL PACKAGE_PUBLISH(packageId, "TO_SUBSCRIBERS", rc, props, viewerFile, subject, storeInfo, user, password, channel);

For complete details about how to programmatically specify a viewer when you publish to the e-mail and the channel subscriber types, see "CALL PACKAGE_PUBLISH Routine: Publish Package to E-mail" on page 83 and "CALL PACKAGE_PUBLISH Routine: Publish Package to Subscribers" on page 104.

The following code publishes the package (to which an HTML viewer is applied) to a WebDAV-compliant server:

rc = 0;
publishType = "TO_WEBDAV";
properties = "VIEWER_NAME, COLLECTION_URL";
viewerFile = "filename:c:\dept\saletemp.html";
cUrl = "http://www.alpair.web/NightlyMaintReport";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, viewerFile, cUrl);

The following code publishes the package (to which an HTML viewer is applied) to SharePoint:

rc = 0;
publishType = 'TO_SHAREPOINT';
properties = 'COLLECTION_URL, HTTP_USER, HTTP_PASSWORD, TEXT_VIEWER_NAME, TARGET_VIEWER_NAME, TARGET_VIEWER_MIMETYPE, APPLIED_TEXT_VIEWER_NAME';
collectionUrl = http://www.alpair.web/NightlyMaintReport;
username = 'user_name';
password = 'password';
viewerFileTemplate = 'FILENAME:C:\dept\saletemp.html';
viewerFileName = 'packageIndex.html';
viewerMimetype = 'application/html';
viewerAppliedOutput = 'FILENAME:C:\dept\saletemp.output.html';
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, collectionUrl, username, password, viewerFileTemplate, viewerFileName, viewerMimetype, viewerAppliedOutput);

Dictionary

<SASINSERT> Tag

Marks a section of the viewer file for viewer processing.
Details

All viewer processing occurs within the opening <SASINSERT> tag and the closing </SASINSERT> tag. SAS tags and substitution statements are recognized only when they appear within the <SASINSERT> and </SASINSERT> tags.

The data that is inserted into the rendered view comes from a specified package entry. The data that is extracted from the entry can be any of the following:

- value of a SAS variable
- description of the entry or package
- entire entry, which is to be streamed into the HTML file
- reference to the entry
- package or nested package abstract

See “Example 1: Sample: Using the <SASINSERT> and <SASTABLE> Tags to Build a List” on page 38 and “Example 2: Sample: Using the <SASINSERT> and <SASTABLE> Tags to Build a Table” on page 39.

Viewer HTML Tag: Substitution Syntax

A substitution statement within the <SASINSERT> opening tag and the </SASINSERT> closing tag inserts data from the specified package entry into a viewer file for delivery as HTML or text output.

Syntax

<SASINSERT> $(nested=z entry=x attribute=value) </SASINSERT>

Required Arguments

$(
  indicates the start of substitution mode using the dollar sign ($) followed by the open parenthesis. The close parenthesis indicates the end of substitution mode.

nested=z
  identifies the nested package within the main package that is to be involved in the substitution. If the NESTED attribute is not specified, then only the entries in the main package are involved in the substitution. For information about the syntax of the z value, see “Specifying Values for the NESTED and ENTRY Attributes” on page 32.

entry=x
  identifies the entry within the specified package that is to be targeted for the substitution. For information about the syntax of the x value, see “Specifying Values for the NESTED and ENTRY Attributes” on page 32.
name=someName

Identifies a name of a name/value pair. The value of this name/value pair will be substituted. The name= and attribute= keywords cannot be specified on the same substitution string.

If entry= is specified along with name=, the entry's name/value specification will be used to make the substitution. For example, the following substitution takes the first entry in the package and determines the value of the name "title". This value is inserted into the HTML or text output:

$(entry=1 name="title")

This example evaluates the name/value that is specified at the main package level. The value for the name "title" is substituted:

{$name="title"}

attribute=value

Identifies the attributes of the specified entry that are to be inserted into the HTML or text output. The value that is associated with this attribute can be any of the following:

description

Inserts the description of the specified entry. For example, the following substitution inserts the description of the specified entry into the HTML or text output:

$(entry=1 attribute=description)

stream

Streams the specified entry into the HTML or text output. The streamed entry must be one of the following entry types:

- reference string (added to the package with the CALL INSERT_REFERENCE routine)
- text file (added with INSERT_FILE routine)
- binary file (added with INSERT_FILE routine)
- HTML file (added with INSERT_HTML routine).

For example:

$(entry=1 attribute=stream)

reference

Inserts a reference by substituting the entry's filename into the rendered view. For example, the following substitution inserts the filename of the first entry:

$(entry=1 attribute=reference)

abstract

Inserts the package abstract at this location. If the NESTED attribute is not specified, the abstract of the main package is inserted in the HTML or text output. If the NESTED attribute is specified, then the abstract of the nested package is inserted in the HTML or text output. The ENTRY attribute is not valid when the abstract attribute is specified. For example, the following substitution inserts the main package abstract into the HTML or text output:

$(attribute=abstract)
Details

Specifying Values for the NESTED and ENTRY Attributes

The NESTED and ENTRY attributes are used in substitution syntax within the `<SASINSERT>` tag and as attributes on the `<SASTABLE>` tag. The examples that appear in this section apply to substitution syntax within the `<SASINSERT>` tag, but all of the syntax rules also apply to the use of the NESTED and ENTRY attributes in the `<SASTABLE>` tag.

You can specify the values of the NESTED and ENTRY attributes in two forms, numeric or name/value.

---

Note: Variable substitution is another type of substitution. It must be specified within the `<SASTABLE>` tag.

---

Identifying an Entry by Its Order in the Package

You use the entry's numerical order in the package to identify which entry is to be involved in a substitution operation.

An example of package entry order follows:

1. SAS data set
2. binary file
3. reference string
4. HTML file

The SAS data set is the first entry, the binary file is the second entry, and so on.

For the NESTED attribute, a numeric value identifies the package that is involved in the substitution based on order of nesting into the package. For example, nested=3 specifies the third package that is nested in the main package. To accommodate packages with multiple levels of nesting, a period (.) differentiates levels of nesting. For example, nested=2.5 specifies the fifth package that is nested in the second package that is nested in the main package.

For the ENTRY attribute, a numeric value identifies the entry that is to be used in the substitution that is based on the order of insertion into the package. For example, $(entry=2) specifies the second entry in the package.

If the NESTED attribute is not specified, then the specified entry in the main package is used for the substitution.

Identifying an Entry By Filtering the Package

Name/value pairs are used in the NESTED and ENTRY attributes to specify filters that determine which nested packages and entries are to be involved in a substitution operation. You must quote the name/value pair and contain it within parentheses. For example,

\[$(nested="(type=report)" entry="(a=b)")\]

When the name/value pair is specified outside the `<SASREPEAT>` tags, only the first entry that matches the filter is substituted. When the name/value pair is used inside the `<SASREPEAT>` tags, all entries that match the filter are substituted into the HTML or text output.
To limit the search for an entry to the main package only, omit the NESTED attribute. For example, \( $(entry=(type=report)) \) specifies that the entry that is to be involved in the substitution operation is the first entry in the main package that has a name/value pair of type=report.

Entries in the main package are always candidates for name/value substitution, even when the NESTED attribute is specified. In the following example, the entry that is involved in the substitution is either the first entry in the main package that matches the a=b name/value pair or it is the first entry that matches a=b in the first nested package with the type=report name/value pair.

\( $(nested=(type=report) entry=(a=b)) \)

To substitute all entries that match the name/value pairs, enclose the substitution within the \(<SASREPEAT>\) tag. If the preceding example were enclosed in \(<SASREPEAT>\) tags, the entries that are involved in the substitution would be all those in the main package and the nested packages that match the a=b name/value pair.

The name/value syntax also supports the asterisk (*) wildcard on the NESTED attribute. The asterisk indicates "all levels below." For example, to substitute "all entries in all nested packages beneath this level," use a period (.) and an asterisk (*) in the NESTED attribute, as follows:

\( $(nested=(type=report).* entry=(a=b)) \)

The preceding example identifies for the substitution all entries that match the a=b name/value pair in the following packages:

- the main package
- the first nested package that contains a match of the type=report name/value pair, regardless of the nesting level of that package
- any package, regardless of name/value pair, that is nested beneath the first nested package

To substitute all matching entries in the main package and in all nested packages, use an asterisk in the NESTED attribute, as shown in the following example:

\( $(nested="*" entry=(a=b)) \)

The preceding example substitutes all entries in the main package and in all nested packages at any level that match the name/value pair a=b.

Example: Using Substitution Syntax

\( $(entry=1 attribute=description) \) indicates that the description for package entry 1 is to be substituted at this location.

\( $(nested=1 entry=4 attribute=stream) \) indicates that the fourth entry within the first nested package should be streamed at this location. The entry must be either a reference, a text file, a binary file, or an HTML file.

\( $(nested=1.2 entry=2 attribute=stream) \) identifies for streaming the second entry in the second package that is nested in the first package that is nested in the main package.

\( $(nested="*" entry="(type=report)" attribute=description) \) indicates that the description of the first entry within the main package, or any nested packages, that matches the type=report name/value pair is to be
substituted into the HTML or text output. If the substitution is contained within
<SASREPEAT> tags, then all entries in the main and nested packages that
match the type=report name/value pair are substituted into the HTML or text
output.

$(nested="(type=report)" attribute=abstract)
indicates that the abstract from the nested package within the main package that
matches the type=report name/value pair is to be substituted into the HTML or
text output. If this substitution were specified within <SASREPEAT> tags, then
the abstracts of all matching nested package entries in the main package are
inserted into the HTML or text output.

$(name=title entry=1)
indicates that the first entry in the package is used for the substitution. Because
name= is specified, a name/value substitution occurs. Name= identifies the
name of a name/value pair. Therefore, in this case, it indicates a name of title. If
the first entry's name/value specification contains a name of title, its value is
substituted.

$(name=Definition entry="(type=report)")
indicates that the substitution occurs for the first entry within the main package
that has the type=report name/value pair. The name= syntax indicates that a
name/value substitution occurs. If the entry that matches the type=report filter
has a name/value pair with the name of Definition, then its value is substituted. If
this substitution is contained in a <SASREPEAT> tag, then the name/value
substitution will occur for all entries in the main package that match the
type=report filter.

$(name=title)
indicates that because entry= is not used in this substitution string, the name/
value for the main package is used for the substitution. Name= identifies the
name of a name/value pair, so in this case it indicates a name of title. If the
package's name/value specification contains a name of title, then its value is
substituted.

---

<SASTABLE> Tag
Populates HTML or text tables and lists.

Syntax

<SASTABLE nested=z entry=x attribute=value> /* insert HTML tags or static text
as needed here */

/* $\langle variable=variableName \rangle */ /* insert HTML tags or static text as needed here */

</SASTABLE>

Required Arguments

nested=z
identifies an optional nested package within the main package that is to be used
to build the table or list. If the NESTED attribute is not specified, then only the
main package is used to build the table or list. The numerical and name/value
syntax options that are available for the z value are defined in “Specifying Values
for the NESTED and ENTRY Attributes” on page 32.
entry=x
identifies the entry within the specified package that is to be used to build the

first=a
specifies an optional numeric that designates the first row that is to be inserted

last=b
specifies the last row of optional numeric data that is to be inserted into the table

n=c
specifies the total number of optional rows that are to be inserted into the table

Note that the LAST attribute and the N attribute are mutually exclusive. If both
are specified, the last one is used.

Note that the LAST attribute and the N attribute are mutually exclusive. If both
are specified, then the last one is used.

Details
Overview
Within the <SASINSERT> tags, the <SASTABLE> tag supports the development of
HTML lists and tables. The <SASTABLE> tag populates tables and lists by
repetitively inserting HTML tags or static text and specified data into HTML or text
output. The insertion repeats for each row of data that has been specified for
insertion. The location of the data and the rows of data to be inserted are
determined by the attributes of the <SASTABLE> tag.

Variable Substitution
Variable substitution is valid within the <SASTABLE> open tag and the </
SASTABLE> closing tag. The variable substitution syntax is as follows:

$\{\text{VARIABLE=variableName}\}$

The variable substitution syntax specifies that the value of the VARIABLE attribute in
the data set is to be substituted into the tables and lists in either HTML or plain text
format. This attribute is valid only within the <SASTABLE> tag. The entry that is
named in the <SASTABLE> tag must be a valid SAS data set. Any number of
variable substitutions can be specified within the <SASTABLE> tag as long as each
one references a valid variable in the SAS data set.

Examples:

Example 1: Using <SASINSERT> and <SASTABLE> to Build a List
The following example uses the <SASINSERT> and <SASTABLE> tags to build a
list. The SAS data set that is used is the second entry that is added to the main
package. The value of the fileName variable is substituted on each repetition.

<p>
<SASINSERT>
Example 2: Using <SASINSERT> and <SASTABLE> to Build a Table

The following example uses the <SASINSERT> and <SASTABLE> tags to build a table. The SAS data set entry is the first entry in the main package. The value of the variables fname, lname, state, and homepage are used to create the table. The newly created table will contain one row for each row in the main package.

```
<?xml version='1.0' encoding='utf-8'?>
<example>
  <SASINSERT>
    <h1>Table Example using SASTABLE</h1>
    <table border cellspacing=0 cellpadding=5
      rules=groups>
      <thead>
        <tr><th>First Name</th>
        <th>Last Name</th>
        <th>State</th>
        <th>HomePage</th></tr>
      </thead>
      <tbody>
        <SASTABLE ENTRY=1>
        <tr> <td> $(VARIABLE=fname)</td>
        <td> $(VARIABLE=lname)</td>
        <td> $(VARIABLE=state)</td>
        <td> <a href=$(VARIABLE=homepage)>$(VARIABLE=homepage)</a></td>
        </tr>
        </SASTABLE>
      </tbody>
    </table>
  </SASINSERT>
</example>
```

### <SASREPEAT> Tag

Repeats a substitution for all entries that match given criteria.

**Syntax**

```
<SASREPEAT> </SASREPEAT>
```

**Details**

The <SASREPEAT> tag causes a substitution that is enclosed within the tag to repeat for all entries that match the specified name/value pair, as described in “Specifying Name/Value Pairs” on page 55. Without the <SASREPEAT> tag, the substitution stops after matching the first entry.

Any HTML tags or static text that are included in the <SASREPEAT> tag are inserted into the output along with the substitution data, and those tags are repeatedly inserted each time a new entry matches the name/value pair.
The `<SASREPEAT>` tag is recognized only within the `<SASINSERT>` tag and is relevant only when it is used with name/value pair substitutions.

Examples:

Example 1: Using `<SASREPEAT>` to Build a List of Reports

The following example uses the `<SASREPEAT>` tag to build a list of reports. The substitutions and the HTML tag within the `<SASREPEAT>` tag are repeated for each entry that matches the type=report name/value pair.

```sas
<SASINSERT>
Available reports include the following:
<ul>
  <SASREPEAT>
  <li> $(entry="(type=report)"
    attribute=description)</li>
  </SASREPEAT>
</ul>
</SASINSERT>
```

An example of the rendered view follows:

```
Available reports include the following:
  President’s State of the Union address
  AlphaliteAirways Annual Report
  Sales Quotas for Midwest Territory
```

Example 2: Using `<SASREPEAT>` to Build a Table

The next example uses the `<SASREPEAT>` tag to build a table. The substitutions and the HTML tags within the `<SASREPEAT>` tag are repeated for each entry in the main package that matches the type=report name/value pair.

```sas
<table border="1" cellspacing="0" cellpadding="3">
  <SASINSERT>
  <SASREPEAT>
  <tr><td> $(entry="(type=report)"
    attribute=description)</td></tr>
  </SASREPEAT>
</SASINSERT>
</table>
```

An example of the rendered view follows:

```
Table 4.2  Table Built Using `<SASREPEAT>` Tag

<table>
<thead>
<tr>
<th>President's State of the Union Address</th>
<th>AlphaliteAirways Annual Report</th>
<th>Sales Quotas for Midwest Territory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```
<SASECHO> Tag
Stores a text string to send to the SAS Log.

Syntax
<SASECHO text="text"/>

Details
The <SASECHO> tag aids in the diagnosis of viewer parsing and processing problems by printing a message to the SAS Log window as the viewer file is processed.

The <SASECHO> tag is recognized only within the <SASINSERT> tags. If the text value contains embedded punctuation and spaces, enclose the text in quotation marks. The <SASECHO> open tag has no corresponding closing tag.

Example: Using <SASECHO>
<SASECHO text="Correctly executed first segment."/>

Examples:

Example 1: Sample: Using the <SASINSERT> and <SASTABLE> Tags to Build a List
The following example uses the <SASINSERT> and <SASTABLE> tags to build a list. The SAS data set that is used is the second entry that is added to the main package. The value of the fileName variable is substituted on each repetition. To see formatted output from <SASINSERT> and <SASTABLE> examples, see "Example 5: Sample Viewer Template" on page 42.

<p>
<SASINSERT>
<ul>
<SASTABLE ENTRY=2>
<li>$\{\text{fileName}\}</li>
</SASTABLE>
</ul>
</SASINSERT>
Example 2: Sample: Using the <SASINSERT> and <SASTABLE> Tags to Build a Table

The following example uses the <SASINSERT> and <SASTABLE> tags to build a table. The SAS data set entry is the first entry in the main package. The value of the variables fname, lname, state, and homepage are used to create the table. The newly created table will contain one row for each row in the main package. To see formatted output from <SASINSERT> and <SASTABLE> examples, see “Example 5: Sample Viewer Template” on page 42.

```sas
<SASINSERT>
<h1>Table Example Using SASTABLE</h1>
<table border cellspacing=0 cellpadding=5 rules=groups>
<thead>
<tr><th>First Name</th>
<th>Last Name</th>
<th>State</th>
<th>HomePage</th>
</tr>
</thead>
<tbody>
<SASTABLE ENTRY=1>
<tr>
<td> $(Variable=fname)</td>
<td> $(Variable=lname)</td>
<td> $(Variable=state)</td>
<td> <a href=$(Variable=homepage)>$(variable=homepage)</a></td>
</tr>
</SASTABLE>
<tr><td colspan=4 align=center>
Note: Simple table example.</td></tr>
</tbody>
</table>
</SASTABLE>
```

Example 3: Sample HTML Viewer

This sample HTML viewer example is a collection of viewer coding sections. To see the e-mail output, see the output from the viewer coding sections that are described in “How to Create a Viewer” on page 23. The e-mail output from this sample HTML viewer is a collection of the output from these sections.

```sas
<!--Section 1: Formatting a Data Set
Variable in an HTML List-->
<SASINSERT>
<h2>Congratulations!</h2>
$(entry=1 attribute=description)
<p>
<ul>
<SASTABLE ENTRY=2>
<li>$(VARIABLE=fname)
</SASTABLE>
</ul>
</p>
</SASINSERT>

<!--Section 2: Formatting a SAS Data Set
in a Table-->
<h2>Record Sales from these Salespeople</h2>
$(entry=1 attribute=description)
<table border cellspacing=0 cellpadding=5
```
Example 4: Sample SAS Program with an HTML Viewer

The following SAS program example includes two parts:

- SAS code that creates two SAS data sets
- package publishing CALL routines that create a package, insert package entries, and publish the package to e-mail with the aid of a viewer file

The CALL PACKAGE_PUBLISH routine applies a viewer that is named realview.html to the package that is rendered in e-mail. The following code shows the viewer properties and attributes. To look at the content of the viewer template, see "Example 5: Sample Viewer Template" on page 42. To look at a rendered view of the package that is delivered to e-mail, see the output from the viewer coding sections that are described in "How to Create a Viewer" on page 23. The e-mail output from this sample HTML viewer is a collection of the output from these sections.

data empInfo;
  length homePage $256;
  input fname $ lname $ ages state $ siblings homePage $;
datalines;
Example 4: Sample SAS Program with an HTML Viewer

```sas
John Smith 32 NY 4 http://alphaliteairways.com/~jsmith
Gary DeStephano 20 NY 2 http://alphaliteairways.com/~gdest
Arthur Allen 40 CA 2 http://alphaliteairways.com/~aallen
Jean Forest 3 CA 1 http://alphaliteairways.com/~jforest
Tony Votta 30 NC 2 http://www.pizza.com/~tova
Dakota Smith 3 NC 1 http://alphaliteairways.com/~dakota
;
run;
quit;

data fileInfo;
length fileName $256;
input fileName $;
datalines;
Sales
Marketing
R&D
;
run;
quit;

data _null_;
rc=0; packageId = 0;
CALL PACKAGE_BEGIN(packageId,"Daily Orders Report.","",rc);
if (rc eq 0) then put 'Package begin successful.';
else do;
  msg = sysmsg();
  put msg;
end;

CALL INSERT_REF(packageId, "HTML",
  "http://www.alphaliteairways.com",
  "Check out the Alphalite Airways web site
   for more information." , "", rc);
if (rc eq 0) then put 'Insert Reference successful.';
else do;
  msg = sysmsg();
  put msg;
end;

CALL INSERT_DATASET(packageId, "work", "empInfo",
  "Data Set empInfo" , "", rc);
if (rc eq 0) then put 'Insert Data Set successful.';
else do;
  msg = sysmsg();
  put msg;
end;

CALL INSERT_DATASET(packageId, "work", "fileInfo",
  "Data Set fileInfo" , "", rc);
if (rc eq 0) then put 'Insert Data Set successful.';
else do;
  msg = sysmsg();
  put msg;
end;
```
A SAS program creates a package and applies a viewer template that is named realview.html. During package publishing, viewer tag processing renders a view of the package for delivery via e-mail.

```sas
viewerName='filename:realview.html';
prop='VIEWER_NAME';
address="John.Smith@alphaliteairways.com";
CALL PACKAGE_PUBLISH(packageId, "TO_EMAIL", rc, 
    prop, viewerName, address);
if rc ne 0 then do;
    msg = sysmsg();
    put msg;
end;
else
    put 'Publish successful';

CALL PACKAGE_END(packageId,rc);
if rc ne 0 then do;
    msg = sysmsg();
    put msg;
end;
else
    put 'Package termination successful';

run;
```

Example 5: Sample Viewer Template

A SAS program creates a package and applies a viewer template that is named realview.html. During package publishing, viewer tag processing renders a view of the package for delivery via e-mail.

```html
<html>
<HEAD>
<META HTTP-EQUIV="Content-Type CONTENT="text/html; charset=ISO-8859-1">
<TITLE>Daily Purchase Summary</TITLE>
</HEAD>
<BODY>
<p>

<SASINSERT>
<h1>Table Example Using SASTABLE</h1>
<table border cellspacing=0 cellpadding=5
    rules=groups>
<thead>
<tr><th>First Name</th>
<th>Last Name</th>
<th>State</th>
<th>HomePage</th></tr>
</thead>
<tbody>
<tr><td> $(VARIABLE=fname)</td>
<td> $(VARIABLE=lname)</td>
<td> $(VARIABLE=state)</td>
<td> <a href="$(VARIABLE=homepage)" >$(VARIABLE=homepage)</a></td>
</tr> 
</tbody>
</table>

</SASINSERT>
</p>
</BODY>
</html>
```
Simulated Rendered View of the Package in E-mail

The following table is an example of the information that might be displayed by the preceding viewer template:

Table 4.3  Table Example Using SASTABLE

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>State</th>
<th>HomePage</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>Smith</td>
<td>NY</td>
<td><a href="http://alphaliteairways.com/~jsmith">http://alphaliteairways.com/~jsmith</a></td>
</tr>
<tr>
<td>Gary</td>
<td>DeStephano</td>
<td>NY</td>
<td><a href="http://alphaliteairways.com/~gdest">http://alphaliteairways.com/~gdest</a></td>
</tr>
<tr>
<td>Arthur</td>
<td>Allen</td>
<td>CA</td>
<td><a href="http://alphaliteairways.com/~aallen">http://alphaliteairways.com/~aallen</a></td>
</tr>
<tr>
<td>Jean</td>
<td>Forest</td>
<td>CA</td>
<td><a href="http://alphaliteairways.com/~jforest">http://alphaliteairways.com/~jforest</a></td>
</tr>
<tr>
<td>Tony</td>
<td>Votta</td>
<td>NC</td>
<td><a href="http://pizza.com/~tova">http://pizza.com/~tova</a></td>
</tr>
<tr>
<td>Dakota</td>
<td>Smith</td>
<td>NC</td>
<td><a href="http://alphaliteairways.com/~dakota">http://alphaliteairways.com/~dakota</a></td>
</tr>
</tbody>
</table>
Example Using Stream

http://alphaliteairways.com
Package Publishing

The following activities are performed in order to publish a package:

1. Entries are inserted into the package.
2. The transport for delivering the package to the consumer is defined.
3. Other properties that are specific to the transport or the rendering of the package are defined.
4. The package is published.

The following scenarios depict how the package publishing method can depend on your role in the business enterprise or your experience as a programmer:

Table 5.1 Package Publishing Methods for Different Publishers

<table>
<thead>
<tr>
<th>Type of Publisher</th>
<th>Package Publishing Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novice user or someone who prefers to use a GUI</td>
<td>Publish by using SAS Enterprise Guide or SAS Information Delivery Portal. For more information, see the product Help.</td>
</tr>
<tr>
<td>SAS programmer</td>
<td>Publish programmatically by using the Publish Package CALL routines. See &quot;Using the Publish Package Interface&quot; on page 47.</td>
</tr>
<tr>
<td>Programmer who uses a language other than SAS</td>
<td>Publish by writing a third-party client application. See &quot;Using a Third-Party Client Application&quot; on page 47.</td>
</tr>
</tbody>
</table>
Using a Third-Party Client Application

The publisher can write a third-party client application that uses SAS Integration Technologies to access Integrated Object Model (IOM) servers.

The IOM provides distributed object interfaces for conventional SAS features. The distributed object interfaces enable the publisher to develop component-based applications that integrate SAS features into the enterprise application.

Client development in the Java environment enables the publisher to write applets, stand-alone applications, servlets, and even Enterprise JavaBeans that interact with IOM servers. By supporting industry standards (such as Java Database Connectivity [JDBC] and CORBA), the SAS Integration Technologies software enables the publisher to take advantage of existing programming skills and toolsets for writing client applications. For more information, see the SAS Integration Technologies: Java Client Developer’s Guide.

Client development in the Windows environment is based on the Microsoft Component Object Model (COM). Because COM support is built into the operating system and in all the leading programming language products, the publisher can integrate SAS (and existing SAS programs) into client applications. SAS Integration Technologies software provides the type libraries that are necessary to use the IOM server with Visual Basic and Visual C++. For more information, see the SAS Integration Technologies: Windows Client Developer’s Guide.

Using the Publish Package Interface

The Publish Package Interface consists of SAS CALL routines that enable you to write SAS programs, including stored processes, that create, populate, publish, and retrieve collections of information known as packages.

The process of publishing a package follows:

1. A package is created by using the CALL PACKAGE_BEGIN routine. For example,

   ```
   CALL PACKAGE_BEGIN(packageId, desc, nameValue, rc);
   ```

   This CALL routine assigns a name to the package and any optional name/value pairs that are associated with it. Name/value pairs are used to assign metadata to a package or individual package entries. This metadata enables you to create filters that aid in information retrieval. The filters can be used both by subscribers to channels and by programs that search the package archive.

2. A package is populated by adding package entries by using the CALL INSERT_* routines. An entry can be a SAS file (for example, data set, catalog, or SAS MDDB), or almost any other type of file, including HTML and images. CALL routines fall into two categories of item types:

   - SAS results:
CALL INSERT_CATALOG routine
CALL INSERT_DATASET routine
CALL INSERT_MDBB routine
CALL INSERT_PACKAGE routine
CALL INSERT_SQLVIEW routine

unstructured content:
CALL INSERT_FILE routine
CALL INSERT_HTML routine
CALL INSERT_REF routine
CALL INSERT_VIEWER routine

For example,
CALL INSERT_DATASET(packageId, libref, memname, description, nameValue, rc);

You can also nest packages by including a package as an entry in another package. Entries are referenced in the order in which they were added to the package.

Note: If inserting HTML file entries, see “Publish and Retrieve Encoding Behavior” on page 49.

A package is published to a delivery transport by using the CALL PACKAGE_PUBLISH routine. Supported transports are archives, e-mail addresses, message queues, SharePoint, subscribers to a pre-defined channel, and WebDAV-Compliant servers. CALL routines for supported transports are as follows:

TO_ARCHIVE
TO_EMAIL
TO_QUEUE
TO_SHAREPOINT
TO_SUBSCRIBERS
TO_WEBDAV

For example,
publishType = "TO_ARCHIVE"
.
.
.
CALL PACKAGE_PUBLISH (packageId, publishType, rc, properties, archivePath, archiveName);

The end of the published package is defined by using the CALL PACKAGE_END routine. For example,
CALL PACKAGE_END(packageId, rc);

A package is retrieved from a delivery transport by using the following CALL routines:

CALL COMPANION_NEXT routine
Publish and Retrieve Encoding Behavior

Default Publish and Retrieve Behavior

All HTML files are published with a file encoding that indicates the character set of the HTML file. This encoding is either automatically generated or user-specified. All published files are read as binary data.

When retrieved, all HTML files are written as binary data. By default, no translation occurs. However, translation does occur when a file encoding is specified in the retrieve CALL routine (such as RETRIEVE_PACKAGE, for example).

Rules for Determining File Encoding

You can specify an encoding on the INSERT_HTML CALL routine to indicate the file’s character set. The encoding values of ASCII, EBCDIC_R15, and EBCDIC_R25 are treated as special cases in the following encoding rules. The file encoding that is published with each HTML file is determined by the following rules:

1. The HTML file is searched for `charset=` within the META tags. The following rules govern the search:
The search covers only the META tags found within the HEAD portion of the document.

- META tags within comments are ignored.
- By default, the search uses the encoding of the native session. If a special encoding is specified (ASCII, EBCDIC_RS25, or EBCDIC_RS15), the search uses that encoding rather than the native session encoding.
- The encoding specified within the META tag always takes precedence over user-specified encodings on the CALL INSERT_HTML routine.

2. If the encoding value is found within the HTML file, then that value is published as the encoding value.

3. If the encoding value is not found within the HTML, and if a user-specified encoding value was not provided on the CALL INSERT_HTML routine, then the native session encoding is published as the encoding value.

4. If the encoding value is not found within the HTML, and if the user-specified encoding is not a special case (not ASCII, EBCDIC_RS25, or EBCDIC_RS15), then the user-specified encoding value is published as the encoding value.

5. If the encoding value is not found within the HTML file, and if a special encoding value of ASCII was specified, then the following rules apply:
   - If running on an ASCII host at publish time, then an attempt is made to use the current locale information to determine the flavor of ASCII encoding. If the locale information is unavailable, then the native session encoding is used.
   - If running on an EBCDIC host at publish time, then an attempt is made to use the current locale information to determine the transport format. If set, then the transport format is the encoding that is used. If not set, then the default becomes ISO-8859-1.

6. If the encoding value is not found within the HTML file, and if a special encoding value of EBCDIC_RS15 is specified, then an encoding value of OPEN_ED-1047 is used, regardless of the host operating environment.

7. If the encoding value is not found within the HTML file, and if a special encoding value of EBCDIC_RS25 is specified, then an encoding value of EBCDIC1047 is used, regardless of the host operating environment.

---

**Specifying an Encoding on the Retrieve**

By default, no translation occurs when HTML files are retrieved; the files are written as binary data. To override the default at retrieve time, supply an encoding property. This property indicates that the HTML files should be translated into the specified character set encoding. The encoding that is published with the file is used as the source encoding, and the user-specified encoding is used as the destination encoding.
Filtering Packages and Package Entries

Overview of Filtering

A filter is a property of a subscriber that enables that subscriber to receive only content that meets certain criteria. Filters can be used to exclude content that the subscriber is not interested in, or that the subscriber's computing resources cannot handle. Filters can be defined based on the entry type, MIME type, or one or more name/value pairs that are defined for the content. A filter can be an include filter, which means that the subscriber receives all content that meets the filter criteria, or an exclude filter, which means that the subscriber receives all content that does not meet the filter criteria.

When packages are published to channels, name/value filters can be used to limit the packages that are published to individual subscribers. Subscriber-specified name/value filters are compared to the name/value pairs in the published packages. If the filters match the package, then the package is published to the subscriber.

Subscribers use the Publishing Framework plug-in for SAS Management Console to define subscribers. If a subscriber specifies a delivery transport of queue, then that subscriber can specify additional filters to limit the package entries that are included in the packages that are published to that subscriber. Package entry or MIME type filters are compared to the entry type or MIME type of each package entry. If the package entry type or MIME type matches the subscriber's entry type or MIME type filters, then that package entry is included in the package that is published to that queue subscriber.

Note: For each type of filter (entry type, MIME type, or name/value pair), you can define either inclusion or exclusion filters (but not both). If you have previously defined exclusion name/value filters, for example, and then specify an inclusion filter, then all of the previously defined exclusion filters are deleted from the repository.

Enabling Filtering When Publishing Packages

During package development, user-defined name/value pairs are added to packages in the CALL PACKAGE_BEGIN routine. Entry types are added to package entries automatically in the various CALL INSERT* routines. User-defined MIME types are added to package entries in the CALL INSERT_FILE routine.

At publish time, filtering takes place when a package is published with the CALL PACKAGE_PUBLISH routine with a publish type of TO_SUBSCRIBERS.
Implementing MIME-Type Filters

MIME types provide details about the information that is being published. For example, specifying the MIME type `audio/basic` indicates that the file is an audio file and requires software that can interpret such content.

You can define a filter that determines the type of information the subscriber receives. For example, a subscriber who is connecting with a modem might not want to receive some data types that might be large or unwieldy, such as movies or audio. By excluding those MIME types, the subscriber never encounters those types of information.

The MIME type filters are case-insensitive filters. Like name/value pairs, MIME types are user-defined and as such need to be maintained globally to ensure consistent filtering. See the `CALL INSERT_FILE` routine on page 62 for a list of suggested MIME types.

Implementing Entry-Type Filters

Each published package contains one or more entries. Each entry is one of several possible types. You can create a filter to include or exclude one or more entry types. Entry types are specified automatically in the various `INSERT CALL` routines. For a list of available package entry types, see the syntax description of the `CALL ENTRY_FIRST` routine on page 124.

Implementing Name/Value Filters

Publishers can specify name/value pairs that describe the package that is being published. Knowledge of name/value pairs enables you to define filters for a subscriber that determine the packages that are received. If an inclusion name/value filter is defined for a subscriber, then the subscriber receives only those packages that match the name/value filter.

To implement name/value filters across your enterprise, the name/value pairs applied to packages must agree with the name/value pairs that appear in subscriber filters. Maintaining a global list of agreed-upon name/value pairs and including definitions and usage information for each name/value pair enables accurate package description and subscriber filtering in your enterprise.

The name/value filters used in your enterprise depend on the types of packages that you publish and on the types of subscribers that receive those packages. For example, you could define a channel called Maintenance that includes e-mail subscribers and an archive subscriber named MaintReports. You could add a name/value filter to the subscriber definition for the MaintReports archive subscriber that would refuse to accept packages that contain a name/value pair of `noarchive`. For this filter to be effective, packages published to the Maintenance channel would need to include the `noarchive` name/value pair in the appropriate way in order to keep unwanted packages out of the MaintReports archive. A global list of name/value pairs would help ensure that the filters and the packages both used the `noarchive` name/value pair appropriately.
A wide variety of syntax options for name/value filters gives subscribers many filtering options, including filtering based on logical relationships between multiple name/value pairs.

A name/value pair is expressed as either a name or a relationship between a name and a value in the following form:

\[
\text{name} < \text{operator} \text{ value}
\]

where

- **name** is a variable to which a value can be assigned. **name** is not case sensitive.
- **operator** relates the variable to the value.
- **value** is a character string or numeric value. **value** is case sensitive.

The following table lists commonly used operators:

<table>
<thead>
<tr>
<th>Comparison Operators</th>
<th>Logical Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>= (equals)</td>
<td>&amp; (AND)</td>
</tr>
<tr>
<td>!= (not equal)</td>
<td></td>
</tr>
<tr>
<td>? (contains)</td>
<td></td>
</tr>
</tbody>
</table>

The following is an example of a package description that uses name/value pairs that a publisher has assigned to a published package:

\[
\text{market=(Mexico, US) type=report Quarter4 sales _priority_=low}
\]

Subscribers can write meaningful filters if they know the conventions that a publisher uses to describe packages. The following examples illustrate filter strings that determine whether the preceding example entity would be selected by the filter. If the package meets the filter conditions, then the package is delivered to the subscriber.

\[
\text{market=(US, Asia, Europe)}
\]

No match. Because the equals operator (=) is used, the subscriber values and the publisher values that are assigned to the variable name MARKET must match exactly. In this example, the subscriber filters for US, Asia, and Europe, whereas the publisher assigns a value of Mexico and US. The conditions for selection are not met. Therefore, the package is not delivered to the subscriber.

\[
\text{market=(mexico, us)}
\]

No match. Because the equals operator (=) is used, the subscriber values and the publisher values that are assigned to the variable name MARKET must match exactly. In this example, the subscriber values do not match the publisher values because of case differences.

\[
\text{market=US | market=Asia | market=Mexico}
\]

No match. Because the equals operator (=) is used, the subscriber values and the publisher values that are assigned to the variable name MARKET must match exactly. In this example, although the OR operator (|) might seem to cause a matching condition, the equals operator (=) requires that each name/value pair that is separated by an OR operator (|) match the publisher name/value pair entirely. A match would result if the subscriber values were written as...
follows: market=Mexico, US | market=Asia | market=Mexico The first name/value pair in the series would match.

market=(Mexico, US)
Match. Because the equals operator (=) is used, the subscriber values and the publisher values that are assigned to the variable name MARKET must match exactly. In this example, the value set does match.

market=(US, Mexico)
Match. Because the equals operator (=) is used, the subscriber values and the publisher values that are assigned to the variable name MARKET must match exactly. In this example, the value set matches, regardless of the order of values within the value set.

No match. The conditions that are specified in the subscriber name/value pair read: Variable name MARKET must contain the values US and Asia and Mexico. The contains comparison operator (?) identifies the eligible values for consideration. In this example, although the publisher variable MARKET contains US and Mexico, it does not also contain Asia. Because the logical AND operator (&) is used, its condition is not satisfied.

market?US | market?Asia | market?Mexico
Match. The conditions that are specified in the subscriber name/value pair read: Variable name MARKET must contain the values US or Asia or Mexico. The contains comparison operator (?) identifies the eligible values for consideration. In this example, the publisher variable MARKET contains US, and the logical OR operator (|) condition is satisfied.

Quarter4=sales
No match. Because the equals operator (=) is used, the subscriber values and the publisher values that are assigned to the variable name QUARTER4 must match exactly. In this example, because the publisher variable name QUARTER4 does not contain a value and the subscriber variable name QUARTER4 does contain a value of sales, the value sets do not match.

Quarter4
Match. Variable names are not required to have values. In this example, because the publisher variable name QUARTER4 does not have an assigned value and the subscriber variable name QUARTER4 does not have an assigned value, the value sets match.

type=report & forecast
No match. Two conditions must be met. The equals operator (=) requires that the subscriber values and the publisher values that are assigned to variable name TYPE match. In this example, the first condition is met because both the publisher and the subscriber assign the value report to variable TYPE. However, the AND logical operator (&) requires that the variable name TYPE also be assigned the value forecast. Because the publisher variable name TYPE is not assigned a value of forecast, the final condition is not met.

type=report & sales
Match. Two conditions must be met. The equals operator (=) requires that the subscriber value and the publisher value that are assigned to variable name TYPE match. In this example, the values match. Both assign the value report to the variable name TYPE. The AND logical operator (&) also requires that the variable name SALES match. Because both the publisher and the subscriber identify a variable name sales with no assigned value, the final condition is also met.
For more information about name/value pairs, see “Specifying Name/Value Pairs” on page 55.

Specifying Name/Value Pairs

Overview of Name/Value Pairs

Publishers can specify name/value pairs that describe the contents of the entire package and of individual package items. With these descriptors, SAS channel subscribers can use the Publishing Framework plug-in for SAS Management Console to construct filters. For determining the packages that are delivered to them in their entirety, see “Filtering Packages and Package Entries” on page 51. Although subscribers can filter at the package item level for the message queue only, a developer can write retrieval programs that filter at both the package level and the package item level for all transports.

The publisher can specify one or more space-separated name/value pairs for a package item or for an entire package in the following forms:

- name
- name=value
- name="value"
- name="single value with spaces"
- name=(value)
- name=("value")
- name=(value-1, "value 2", ...).

Specifying Name/Value Pairs for a Package Item

Here is an example of specifying a single name/value pair for a package item:

```plaintext
type=dataset
```

The publisher identifies the item in the package as a data set.

To describe the package item with finer granularity, the publisher can specify multiple name/value pairs. A space separates each name/value pair. Here is an example of specifying multiple name/value pairs for a package item:

```plaintext
type=dataset  hub=RDU
```

The publisher identifies the item in the package as a data set, which is relevant only to the RDU hub.

Although a subscriber can filter at the package item level for a message queue only, a developer can write a retrieval program that filters at the package item level for all transports.
The publisher can specify name/value pairs when publishing a package item using the Publish Package Interface. When creating a package entry, you assign name/value pairs to the name-value property in the CALL INSERT_entry-type routine, where values for entry-type are as follows:

- CATALOG
- DATASET
- FILE
- HTML
- MDDB
- REF
- SQLVIEW
- VIEWER

The following code shows the assignment of name/value pairs to a data set package entry.

```plaintext
libref = "HR";
memname = "capacityHistory";
description = "Flight Capacity History (Data)";
nameValue = "type=dataset hub=RDU";
CALL INSERT_DATASET(packageId, libref, memname, description, nameValue, rc);
```

This name-value property specifies a data set whose data is relevant only to the RDU hub.

For complete details about programmatically specifying name/value pairs, see CALL PACKAGE_BEGIN routine syntax on page 77.

---

### Specifying Name/Value Pairs for an Entire Package

Here is an example of specifying a single name/value pair for an entire package:

```plaintext
market=US
```

The publisher identifies the entire package as relevant only to a US market.

To describe the contents of an entire package with finer granularity, the publisher can specify multiple name/value pairs. A space separates each name/value pair. Here is another example of specifying multiple name/value pairs for an entire package:

```plaintext
market=US type=report content=ticketsales Quarter4 priority=high
```

This high-priority package contains one or more reports about fourth-quarter ticket sales that is relevant only to a US market.

When both subscribers and developers of package-retrieval applications know about package name/value pairs, they can construct and apply filters that control package delivery. See “Filtering Packages and Package Entries” on page 51.

The publisher can specify name/value pairs when publishing the package by using the Publish Package Interface. For the archive, message queue, and SAS channel...
subscriber delivery types only, you assign name/value pairs to the name-value property in the CALL PACKAGE_BEGIN routine.

The following code shows the assignment of name/value pairs to an entire package:

```plaintext
packageId=0;
rc=0;
desc = "Nightly run.";
nameValue = "market=US type=report content=ticketsales Quarter4 priority=high";
CALL PACKAGE_BEGIN(packageId, desc, nameValue, rc);
```

This name-value property specifies a high-priority package that contains one or more reports about fourth-quarter ticket sales that are relevant only to a US market.

For complete details about programatically specifying name/value pairs for an entire package, see CALL PACKAGE_BEGIN routine syntax on page 77.

---

Dictionary

**CALL INSERT_CATALOG Routine**

Inserts a SAS catalog into a package.

**Syntax**

```plaintext
CALL INSERT_CATALOG(package-ID, libref, member-name, description, name-value, rc);
```

**Required Arguments**

- `package-ID`
  - identifies the package into which the catalog will be inserted.
  - Type: Numeric, Input

- `libref`
  - names the library that contains the catalog.
  - Type: Numeric, Input

- `member-name`
  - specifies the name of the catalog.
  - Type: Character, Input

- `description`
  - describes the catalog.
  - Type: Character, Input
**name-value**

identifies a list of one or more space-separated name/value pairs, each in one of the following forms:

- `name`
- `name=value`
- `name="value"`
- `name="single value with spaces"
- `name=(value)`
- `name=("value")`
- `name=(value-1, "value 2", ...)`

Name/value pairs are site-specific; they are used for the purpose of filtering.

**rc**

receives a return code.

**Example: Using INSERT_CATALOG**

The following example inserts the catalog ALPHELP.PUBSUB into the PACKAGEID package.

```sas
libname = 'alphelp';
memname = 'pubsub';
desc = 'Publication's catalog';
nameValue='';
CALL INSERT_CATALOG(packageId, libname, memname, desc, nameValue, rc);
```

---

**CALL INSERT_DATASET Routine**

Inserts a SAS data set into a package.

**Syntax**

```sas
CALL INSERT_DATASET(package-ID, libref, member-name, description, name-value, rc
<, properties, property-value-1, property-value-2, ...>);
```

**Required Arguments**

**package-ID**

identifies the package.

**Type** Numeric, Input
**libref**
names the library that contains the data set.

*Type* Character, Input

**member-name**
names the data set.

*Type* Character, Input

**description**
describes the data set.

*Type* Character, Input

**name-value**
identifies a list of one or more space-separated name/value pairs, each in one of the following forms:

- `name`
- `name=value`
- `name="value"`
- `name="single value with spaces"`
- `name=(value)`
- `name=("value")`
- `name=(value-1, "value 2",...)`

Name/value pairs are site-specific; they are used for the purpose of filtering.

*Type* Character, Input

**rc**
receives a return code.

*Type* Numeric, Output

Optional Arguments

**properties**
identifies a comma-separated list of optional property names. Valid property names are as follows:

- `ALLOW_READ_PROTECTED_MEMBER`
- `DATASET_OPTIONS`
- `TRANSFORMATION_TYPE`
- `CSV_SEPARATOR`
- `CSV_FLAG`

*Type* Character, Input

**property-value-1, property-value-2, ...**
specifies one value for each specified property. The order of the values matches the order of the property names in the properties parameter. Valid property values are defined as follows:
ALLOW_READ_PROTECTED_MEMBER specifies a value of "YES". It is important to note that the password and encryption attributes are not preserved in the intermediate published format (whether on a queue or in an archive). Because of this exposure, take care when publishing data sets that are password protected, encrypted or both. The ALLOW_READ_PROTECTED_MEMBER property must be asserted on read-protected data sets in order to be published. This property ensures that the publisher realizes that this is a read-protected data set, and that the Read password and encryption attributes are not preserved when stored in the intermediate format. If this property is not applied, then the publish operation fails when trying to publish the read-protected data set.

DATASET_OPTIONS specifies data set options. For a complete list of data set options, see the SAS Data Set Options topic in the SAS Help.

TRANSFORMATION_TYPE indicates that the data set should be transformed to the specified type when published. At this time, the only supported value for this property is CSV, for Comma-Separated-Value.

CSV_SEPARATOR indicates the separator to use when creating the CSV file. The default separator is a comma (,).

CSV_FLAG indicates a CSV override flag. Supported values include NO_VARIABLES, NO_LABELS, and EXTENDED. By default, when writing numeric variable values into the CSV file, BEST is used to format numerics that have no format associated with them. To override this default, specify the property value EXTENDED on the CSV_FLAG property. This extends the number of digits used as the precision level. By default, if the data set is transformed into a CSV file, then the file's first line contains all of the specified variables. The second line contains all of the specified labels. To override this default behavior, specify flags with values "NO_VARIABLES" or "NO_LABELS". To specify both values, a CSV_FLAG property must be specified for each.

Type Character or Numeric, Input
Details

When the data set is published, data set attributes are cloned so that when it is retrieved back into SAS, the created data set will have similar attributes. Attributes that are cloned include encryption, passwords, data set label, data set type, indexes, and integrity constraints. It is important to know that the password and encryption attributes are not preserved in the intermediate format (whether on a queue or in an archive). Because of this exposure, take care when publishing data sets that are password-protected, encrypted, or both.

Examples:

Example 1: Transforming Data into a CSV File and Publishing

The following example specifies a transformation type of CSV and two CSV_FLAG properties. The data set is transformed into a CSV file and published in CSV format.

```sas
prop='TRANSFORMATION_TYPE,CSV_SEPARATOR,CSV_FLAG,CSV_FLAG';
ttype='CSV';
separator='/';
flag1 = 'NO_VARIABLES';
flag2 = 'NO_LABELS';
CALL INSERT_DATASET(packageId, libname, memname, desc,
   nameValue, rc, prop, ttype, separator, flag1, flag2);
```

Example 2: Publishing a SAS Data Set in a Package

The following example inserts the SAS data set FINANCE.PAYROLL into a package.

```sas
libname = 'finance';
memname = 'payroll';
desc = 'Monthly payroll data.';
nameValue='';
CALL INSERT_DATASET(packageId, libname,
   memname, desc, nameValue, rc);
```

Example 3: Publishing a SAS Data Set and Applying a Password

The following example uses the DATASET_OPTIONS property to apply a password for Read access and to apply a subsetting WHERE statement to the data set when publishing the package. Because the data set is read-protected, you must specify the ALLOW_READ_PROTECTED_MEMBER property. Package publishing fails without this property.

```sas
libname = 'hr';
memname = 'employee';
desc = 'Employee database.';
nameValue='';
properties="DATASET_OPTIONS, ALLOW_READ_PROTECTED_MEMBER";
opt="READ=abc Where=(x<10)";
allow="yes";
CALL INSERT_DATASET(packageId, libname, memname,
   desc, nameValue, rc, properties, opt, allow);
```
Example 4: Using INSERT_DATASET with the TRANSFORMATION_TYPE Property

The following example uses the TRANSFORMATION_TYPE property to publish a data set in CSV format.

```sas
libname = 'hr';
memname = 'employee';
desc = 'Employee database.';
nameValue='';
ttype = 'CSV';
prop = "TRANSFORMATION_TYPE";
CALL INSERT_DATASET(packageId, libname, memname, desc, nameValue, rc, prop, ttype);
```

---

**CALL INSERT_FILE Routine**

Inserts a file into a package.

**Syntax**

```sas
CALL INSERT_FILE(
package-ID, filename, file-type, mime-type, description, name-value, rc
<, properties, property-value-1, property-value-2, ...>);
```

**Required Arguments**

- **package-ID** identifies the package.
  - Type: Numeric, Input

- **filename** names the file, using the following syntax:
  - FILENAME: external_filename
  - FILEREF: sas_fileref
  - Type: Character, Input

- **file-type** specifies the file type, which must be TEXT or BINARY.
  - Type: Character, Input

- **mime-type** specifies the MIME type, the value of which is determined by the user. Subscribers can filter packages based on MIME type. See “Filtering Packages and Package Entries” on page 51. For suggested values, see the Details section.
  - Type: Character, Input
**description**

describes the file.

**name-value**

identifies a list of one or more space-separated name/value pairs, each in one of the following forms:

- `name`
- `name=value`
- `name="value"`
- `name="single value with spaces"
- `name=(value)`
- `name=("value")`
- `name=(value-1,"value 2",...)`

Name/value pairs are site-specific; they are used for the purpose of filtering.

**rc**

receives a return code.

**Optional Arguments**

**properties**

identifies a comma-separated list of optional property names. Valid property names are as follows:

- DESTINATION_FILENAME
- PATH

**property-value-1, property-value-2, ...**

specifies one value for each specified property name. The order of the property values must match the order of the property names in the `properties` parameter. Valid property values are defined as follows:

- **DESTINATION_FILENAME** specifies a valid filename that will be the destination of the file being inserted into the package. The filename should not contain any path information. This property is supported by the archive, WebDAV, and SharePoint transports.

- **PATH** indicates the relative path information for this file. The relative path is included as the name of the file when defined in the ZIP file. The specified path should not contain a drive or device letter, or a leading slash. All slashes should be forward slashes '/' as opposed to
backslashes '\'. This property is recognized only by the archive transport. It is ignored by all other transports.

| Type       | Character, Input |

Details

The `mime-type` parameter is a user-specified MIME type that specifies the type of binary file or text file that is being published. Users might choose to document the supported values in order for publishers to use them or to use their own content strings.

Suggested MIME types include the following:

- application/msword
- application/octet-stream
- application/pdf
- application/postscript
- application/zip
- audio/basic
- image/jpeg
- image/gif
- image/tiff
- model/vrml
- text/html
- text/plain
- text/richtext
- video/mpeg
- video/quicktime

Example: Using INSERT_FILE

The following example supplies a content string of `Image/gif` to provide more information about the type of binary file that is being inserted.

```plaintext
filename = 'filename:/tmp/Report.gif';
fileType = 'binary';
desc = 'Report information';
nameValue = '';
mimeType = 'Image/gif';
CALL INSERT_FILE(packageId, filename, fileType, mimeType, desc, nameValue, rc);
```

CALL INSERT_HTML Routine

Inserts HTML files into a package.
Syntax

CALL INSERT_HTML(package-ID, body, body-URL, frame, frame-URL, contents, contents-URL, page, page-URL, description, name-value, rc<, properties, property-value-1, property-value-2, ...>);

Required Arguments

**package-ID**
identifies the package.
Type Numeric, Input

**body**
names the HTML body file, using the following syntax:
- FILEREF: SAS_fileref
- FILENAME: external_filename
For information about inserting multiple body files, see the Details section.
Type Character, Input

**body-URL**
specifies the URL to be used for the body file.
Type Character, Input

**frame**
names the HTML frame file, using the following syntax:
- FILEREF: SAS_fileref
- FILENAME: external_filename
Type Character, Input

**frame-URL**
specifies the URL to be used for the frame file.
Type Character, Input

**contents**
names the HTML contents file, using the following syntax:
- FILEREF: SAS_fileref
- FILENAME: external_filename
Type Character, Input

**contents-URL**
specifies the URL to be used for the contents file.
Type Character, Input
**Page**

names the HTML page file, using the following syntax:

- FILEREF: SAS_filerref
- FILENAME: external_filename

*Type*  Character, Input

**Page-URL**

specifies the URL to be used for the page file.

*Type*  Character, Input

**Description**

describes the inserted HTML package entry.

*Type*  Character, Input

**Name-value**

identifies a list of one or more space-separated name/value pairs, each in the form of *name=value*. Name/value pairs are site-specific; they are used for the purpose of filtering.

*Type*  Character, Input

**Rc**

receives a return code.

*Type*  Numeric, Output

Optional Arguments

**Properties**

identifies a comma-separated list of optional property names. Valid property names are as follows:

- ENCODING
- COMPANION_FILE
- COMPANION_MIMETYPE
- COMPANION_URL
- GPATH
- GPATH_URL
- NESTED_NAME

*Type*  Character, Input

**Property-value-1, property-value-2, ...**

specifies one value for each specified property name. The order of the property values must match the order of the property names in the *properties* parameter. Valid property values are defined as follows:

**ENCODING**  indicates the character set of the HTML files, such as ISO-8859-1. The default encoding is assumed from the native session.
<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPANION_FILE</td>
<td>indicates the name of an additional HTML file that is to be added to this set of HTML files. Multiple COMPANION_FILE properties and values can be specified. Name the companion files, using either FILEREF: SAS_fileref or FILENAME: external_filename.</td>
</tr>
<tr>
<td>COMPANION_MIMETYPE</td>
<td>indicates the MIME type of the companion file that is to be added to the inserted HTML entry. If specified, then this property must be preceded by the COMPANION_FILE property.</td>
</tr>
<tr>
<td>COMPANION_URL</td>
<td>indicates the URL of an HTML file that is to be added to the inserted HTML entry. If specified, then this property must be preceded by the COMPANION_FILE property.</td>
</tr>
<tr>
<td>GPATH</td>
<td>indicates the name of a single directory that contains the ODS-generated graphical files for inclusion as companion files to the HTML file set. Note that all files in the specified directory are included as companion files.</td>
</tr>
<tr>
<td>GPATH_URL</td>
<td>indicates the URL of the directory that contains the ODS-generated graphical files. An example of a URL might be ~ods-output/images. Alternatively, you can specify &quot;NONE&quot; as the GPATH_URL property value. If the value of &quot;NONE&quot; is specified, then only the filename is used as the URL. Note that if GPATH_URL is specified, then you must also specify the GPATH property.</td>
</tr>
<tr>
<td>NESTED_NAME</td>
<td>indicates the name of the nested directory to create for the storage of the set of HTML files. If you do not specify a value for this property, then a name is generated automatically. Note that the NESTED_NAME property is valid only when publishing to the WebDAV-compliant server transport.</td>
</tr>
</tbody>
</table>

**Details**

The files that can be inserted include the body, frame, contents, and page files.

When the NEWFILE= option is specified in the ODS HTML statement, ODS might generate multiple body files. When ODS generates multiple body files, it uses a numeric file naming sequence of the general form: `bodyfilenameNumber`, as in body1.html, body2.html, body3.html. To insert an entire sequence of body files, use the following syntax:

FILENAME: `bodyFilename*.extension`

When an asterisk is specified in the `body` parameter, an asterisk should also be specified in the `body-URL` parameter. For further information about ODS, see SAS Output Delivery System: User's Guide.
Note: As a best practice, it is suggested that a MIME type be provided for any companion files inserted into the HTML entry. The MIME type is useful for applications that will later consume or display the published package.

Examples:

Example 1: Using INSERT_HTML
The following example generates ODS files and inserts those files into a package.

Desc='HTML output for payroll processing';
nameValue = '';
filename f '/users/f.html';
filename c '/users/c.html';
filename b '/users/b.html';
filename p '/users/p.html';
ods html frame=f contents=c(url='c.html')
   body=b(url='b.html') page=p(url='p.html');

/* insert SAS statements here to generate ODS output */
ods html close;

CALL INSERT_HTML(packageId, 'fileref:b', "b.html",
   'fileref:f', "f.html", 'fileref:c', "c.html",
   'fileref:p', "p.html", desc, nameValue, rc);

Example 2: Using INSERT_HTML with the ENCODING Property
The following example replaces the CALL INSERT_HTML routine in the example above with another version of the CALL routine that inserts ODS files by using the ENCODING property. In this case, the ENCODING property specifies the ISO-Latin-1 character set.

Desc='HTML output for payroll processing';
nameValue = '';
CALL INSERT_HTML(packageId, 'fileref:b', "b.html",
   'fileref:f', "f.html", 'fileref:c', "c.html",
   'fileref:p', "p.html", desc, nameValue, rc,
   "encoding", "ISO-8859-1");

Example 3: Using INSERT_HTML with a Specified Character Set Encoding
The following example specifies a character set encoding and adds two HTML files to the original set of inserted files.

Desc='HTML output for payroll processing';
nameValue = '';
properties='encoding, companion_file, companion_file';
encodingV = "ISO-88591-1";
file1 = "filename: report.html";
file2 = "filename: dept.html";
CALL INSERT_HTML(packageId, 'fileref:b', "b.html", 
   'fileref:f', "f.html", 'fileref:c', "c.html",
   'fileref:p', "p.html", desc, nameValue, rc,
   "encoding", "ISO-88591-1");
Example 4: Using an Asterisk (*) to Specify a Set of Files

The following example uses an asterisk (*) to specify that all body files are to be included in the set of inserted HTML files. The naming sequence used is the same as the naming sequence used in ODS. So the files body.html, body1.html, body2.html, and so on (for all files found in this sequence), will be published. For further information about the ODS naming sequence used in conjunction with the NEWLINE= option, see the SAS Language Reference: Concepts.

```
Desc='HTML output for payroll processing';
nameValue = '';
CALL INSERT_HTML(packageId,
   'filename:/users/jsmith/body*.html', "body*.html",
   'fileref:f', "f.html", 'fileref:c', "c.html",
   'fileref:p', "p.html", desc, nameValue, rc,
   properties, encodingV, file1, file2);
```

CALL INSERT_MDDB Routine

Inserts a SAS multidimensional database into a package.

**Syntax**

```
CALL INSERT_MDDB(package-ID, libref, member-name, description, name-value, rc);
```

**Required Arguments**

- **package-ID**
  - identifies the package.
  - Type: Numeric, Input

- **libref**
  - names the library that contains the MDDB.
  - Type: Character, Input

- **member-name**
  - names the MDDB.
  - Type: Character, Input

- **description**
  - describes the MDDB.
  - Type: Character, Input
**name-value**

Identifies a list of one or more space-separated name/value pairs, each in one of the following forms:

- `name`
- `name=value`
- `name="value"`
- `name="single value with spaces"`
- `name=(value)`
- `name=("value")`
- `name=(value-1, "value 2", ...)`

Name/value pairs are site-specific; they are used for the purpose of filtering.

**rc**

Receives a return code.

**Details**

An MDDB is a multidimensional database (not a data set) offered by SAS. It is a specialized storage facility where data can be pulled from a data warehouse or other data sources and stored in a matrix-like format for fast and easy access by tools such as multidimensional data viewers.

**Example: Using INSERT_MDDB**

The following example inserts the MDDB FINANCE.PAYROLL into the package returned in `package-id`.

```plaintext
libname = 'finance';
memname = 'payroll';
desc = 'Monthly payroll data.';
nameValue='';
CALL INSERT_MDDB(packageId, libname, memname, desc, nameValue, rc);
```

**CALL INSERT_PACKAGE Routine**

Inserts a package into another package.

**Syntax**

```plaintext
CALL INSERT_PACKAGE(package-ID, insert-package-ID, rc <, properties, property-value-1, property-value-2, ...>);
```
Required Arguments

**package-ID**
identifies the package.

*Type* Numeric, Input

**insert-package-ID**
identifies the package that will be nested in the package identified by *package-ID*.

*Type* Numeric, Input

**rc**
receives a return code.

*Type* Numeric, Output

Optional Arguments

**properties**
identifies a comma-separated list of optional property names. At present, only one property is supported:

- **NESTED_NAME**

*Type* Character, Input

**property-value-1, property-value-2, …**
specifies one value for each specified property name. The order of the property values must match the order of the property names in the *properties* parameter. Valid property values are defined as follows:

- **NESTED_NAME** indicates the name of the nested directory to create for the storage of the nested package. If you do not specify a value for this property, then a name is generated automatically. Note that the NESTED_NAME property is valid only when publishing to the WebDAV-compliant server transport.

*Type* Character, Input

Details

Description and name/value parameters are not allowed on this CALL routine. Instead, this CALL routine uses the description and name/value parameters that are specified in the **CALL PACKAGE_BEGIN routine**.

Example: Using INSERT_PACKAGE

The following example initializes two packages (PACKAGEID and DSPID). All data sets are inserted into the package that is identified by DSPID. The package that is identified by DSPID is nested within the main package that is identified by PACKAGEID.

```call
CALL PACKAGE_BEGIN(packageId,
        "Main package", '', '', rc);
```
CALL PACKAGE_BEGIN(dsPid, "Package of just data sets.", '', '', rc);

libname = 'sasuser';
memname = 'payroll';
desc = 'Monthly payroll data.';
CALL INSERT_DATASET(dsPid, libname, memname, desc, '', rc);

libname = 'sasuser';
memname = 'employees';
desc = 'Employee data.';
CALL INSERT_DATASET(dsPid, libname, memname, desc, '', rc);

/* nest data set package in main package */
CALL INSERT_PACKAGE(packageId, dsPid, rc);

CALL INSERT_REF Routine

Inserts a reference into a package.

Syntax

CALL INSERT_REF(package-ID, reference-type, reference, description, name-value, rc);

Required Arguments

package-ID
identifies the package.
Type Numeric, Input

reference-type
specifies the type of the reference. Specify HTML or URL.
Type Character, Input

reference
specifies the reference that is to be inserted.
Type Character, Input

description
describes the reference.
Type Character, Input

name-value
identifies a list of one or more space-separated name/value pairs, each in one of the following forms:
CALL INSERT_REF Routine

- name
- name=value
- name="value"
- name="single value with spaces"
- name=(value)
- name=("value")
- name=(value-1,"value 2",...)

Name/value pairs are site-specific; they are used for the purpose of filtering. See the section about filtering for more information.

**Type**  Character, Input

**rc**  receives a return code.

**Type**  Numeric, Output

Example: Using INSERT_REF

The following example inserts links to newly created HTML files. The package is sent by using the EMAIL transport so that subscribers receive embedded links within their e-mail messages.

```sas
filename myfram ftp 'odsftpf.htm';
filename mybody ftp 'odsftpb.htm';
filename mypage ftp 'odsftpp.htm';
filename mycont ftp 'odsftpc.htm';
ods listing close;
ods html frame=myfram body=mybody
   page=mypage contents=mycont;
/* insert SAS statements here to develop ODS output*/
ods html close;

desc="The SORT procedure creates a variety of ODS generated html output." || "An example can be viewed at ":
CALL INSERT_REF(packageId, "HTML",
   "http://alpair01.sys.com/odsftpf.htm", desc, ",", rc);
if rc ne 0 then do;
   msg = sysmsg();
   put msg;
end;
else
   put 'Insert reference OK';

For another example, see "Example 3: Example: Publishing with the FTP Access Method" on page 159."
CALL INSERT_SQLVIEW Routine

Inserts a PROC SQL view into a package.

Syntax

CALL INSERT_SQLVIEW(package-ID, libref, member-name, description, name-value, rc);

Required Arguments

package-ID
    identifies the package.
    Type      Numeric, Input

libref
    names the library that contains the PROC SQL view.
    Type      Character, Input

member-name
    names the PROC SQL view.
    Type      Character, Input

description
    describes the PROC SQL view.
    Type      Character, Input

name-value
    identifies a list of one or more space-separated name/value pairs, each in one of the following forms:
    name
    name=value
    name="value"
    name="single value with spaces"
    name=(value)
    name=("value")
    name=(value-1, "value 2",...)
    Name/value pairs are site-specific; they are used for the purpose of filtering.
    Type      Character, Input

rc
    receives a return code.
Example: Using INSERT_SQLVIEW

The following example inserts the PROC SQL view FINANCE.PAYROLL into the package that is returned in $\text{packageId}$.

```sas
libname = 'finance';
memname = 'payroll';
desc = 'Monthly payroll data.';
nameValue='';
CALL INSERT_SQLVIEW(packageId, libname, memname, desc, nameValue, rc);
```

CALL INSERT_VIEWER Routine

Inserts a viewer into a package.

Syntax

```sas
CALL INSERT_VIEWER(package-ID, filename, mime-type, description, name-value, rc
<, properties, property-value-1, property-value-2, ...> );
```

Required Arguments

- **package-ID**
  - identifies the package.
  - Type: Numeric, Input

- **filename**
  - names the viewer, using the following syntax:
    - `FILENAME: external_filename`
    - `FILEREF: sas_fileref`
  - Type: Character, Input

- **mime-type**
  - specifies the MIME type, the value of which is determined by the user. Subscribers can filter packages based on MIME type. For suggested values, see the Details section for CALL INSERT_FILE Routine on page 62.
  - Type: Character, Input

- **description**
  - describes the viewer.
  - Type: Character, Input
**name-value**
identifies a list of one or more space-separated name/value pairs, each in one of the following forms:

- `name`
- `name=value`
- `name=“value”`
- `name=“single value with spaces”`
- `name=(value)`
- `name=(“value”)`
- `name=(value-1, “value 2”,…)`

Name/value pairs are site-specific; they are used for the purpose of filtering.

**rc**
receives a return code.

**Optional Arguments**

**properties**
identifies a comma-separated list of optional property names. Valid property names are as follows:

- ENCODING
- VIEWER_TYPE

**property-value-1, property-value-2, …**
specifies one value for each specified property. The order of the values matches the order of the property names in the properties parameter. Valid property values are defined as follows:

- **ENCODING** indicates the character set of the viewer file, such as ISO-8859-1.
- **VIEWER_TYPE** indicates the type of the viewer. Valid values are HTML and TEXT. The default value is HTML.

**Example: Using INSERT_VIEWER**
The following example inserts the external file HVIEWER.HTML into the package that is specified by packageId.

```plaintext
filename = 'filename:/tmp/hviewer.html';
desc = 'HTML viewer';
nameValue = '';
mimeType = 'text/html';
CALL INSERT_VIEWER(packageId, filename,
```
CALL PACKAGE_BEGIN Routine

Initializes a package and returns a unique package identifier.

Syntax

```call package_begin(package-ID, description, name-value, rc 
<, properties, property-value-1, property-value-2, ... > );```

Required Arguments

- **package-ID**
  - identifies the new package.
  - Type: Numeric, Output

- **description**
  - describes the package.
  - Type: Character, Input

- **name-value**
  - identifies a list of one or more space-separated name/value pairs, each in one of the following forms:
    - `name`
    - `name=value`
    - `name="value"`
    - `name="single value with spaces"`
    - `name=(value)`
    - `name=("value")`
    - `name=(value-1, "value 2", ...)`
  - Name/value pairs are site-specific; they are used for the purpose of filtering.
  - Type: Character, Input

- **rc**
  - receives a return code.
  - Type: Numeric, Output

Optional Arguments

- **properties**
  - identifies a comma-separated list of optional property names. Valid property names are as follows:
    - ABSTRACT
EXPIRATION_DATETIME

NAMESPACES

**property-value-1, property-value-2, ...**

specifies one value for each specified property name. The order of the property values must match the order of the property names in the `properties` parameter.

Valid property values are defined as follows:

**ABSTRACT**
provides an abstract (short summary) of the inserted package.

**EXPIRATION_DATETIME**
numeric SAS datetime value. This value should be specified in GMT format.

**NAMESPACES**
specifies unique names that associate published packages with specific contexts on a WebDAV-compliant server. The association of a namespace with a package organizes package data on a server according to meaningful criteria or contexts. A namespace is an additional scoping criterion for a name/value description of a package or package entry. When you publish a package to WebDAV, the name/value descriptors are stored with the package or its entries to the specified WebDAV namespaces. For example, a package might be described as containing first quarter profits that were generated by the Houston office. The specified description and scope uniquely define the package so that consumers can filter name/value pairs on packages or entries unambiguously. An example of a namespace definition that you enter in the Namespaces field follows: HOUSTON='http://www.AlphaliteAirways.com/revenue/final'.

A namespace specification is case sensitive with single quotation marks surrounding embedded values. To specify multiple namespaces, separate each namespace definition with a space.

**Type**
Character or Numeric, Input

**Details**
The package identifier returned by this CALL routine is used in subsequent CALL INSERT and CALL PACKAGE routines.
Examples:

Example 1: Using PACKAGE_BEGIN

The following example initializes a package and returns the package identifier in `packageId`.

```plaintext
packageId=0;
rc=0;
desc = "Nightly run.";
nameValue='';
CALL PACKAGE_BEGIN(packageId, desc, nameValue, rc);
```

Example 2: Using PACKAGE_BEGIN and Setting an Expiration Date

The following example initializes a package with an expiration date and returns the package identifier in `packageId`.

```plaintext
packageId=0;
rc=0;
desc = "Nightly run.";
nameValue='';
dtValue = '20apr2010:08:30:00'dt;
CALL PACKAGE_BEGIN(packageId, desc, nameValue, rc, "EXPIRATION_DATETIME", dtValue);
```

Example 3: Using PACKAGE_BEGIN and Specifying an Abstract

The following example initializes a package with an expiration date and an abstract character string and returns the package identifier in `packageId`.

```plaintext
packageId=0;
rc=0;
desc = "Nightly run.";
nameValue='';
dtValue = '20apr2010:08:30:00'dt;
abstract = "This package contains company confidential information.";
properties="EXPIRATION_DATETIME, ABSTRACT";
CALL PACKAGE_BEGIN(packageId, desc, nameValue, rc, properties, dtValue, abstract);
```

Example 4: Using PACKAGE_BEGIN and Specifying Namespaces

The following example initializes a package with two namespaces and returns the package identifier in `packageId`.

```plaintext
packageId=0;
rc=0;
desc = "Nightly run.";
nameValue='';
CALL PACKAGE_BEGIN(packageId, desc, nameValue, rc, "NAMESPACES", namespaces);
```
CALL PACKAGE_END Routine
Frees the resources that are associated with a package.

Syntax
CALL PACKAGE_END(package-ID, rc);

Required Arguments
  package-ID  identifies the package.
    Type    Numeric, Input
  rc  receives a return code.
    Type    Numeric, Output

Details
This CALL should be made after the completion of package publishing.

Example: Using PACKAGE_END
The following example frees the resources that are associated with the package.

CALL PACKAGE_END(packageId, rc);

CALL PACKAGE_PUBLISH Routine: Publish Package to Archive
Publishes a package to an archive.

Syntax
CALL PACKAGE_PUBLISH(package-ID, publish-type, rc, properties, < property-value-1, property-value-2, ... > );

Required Arguments
  package-ID  identifies the package that is to be published.
**publish-type**
indicates how to publish the package. To publish the package by using the archive transport, specify TO_ARCHIVE.

**rc**
receives a return code.

**properties**
identifies a comma-separated list of optional property names. Specify any of the following property names, or specify " to indicate that no properties are to be applied:
- ARCHIVE_FULLPATH
- ARCHIVE_NAME
- ARCHIVE_PATH
- FTP_PASSWORD
- FTP_USER
- GENERATED_NAME
- HTTP_PASSWORD
- HTTP_PROXY_URL
- HTTP_USER

**Optional Argument**

**property-value-1, property-value-2, ...**
specifies a value for each specified property name. The order of the property values must match the order of the property names in the properties parameter. Valid property values are defined as follows:

**ARCHIVE_FULLPATH** returns the complete URL path of the published archive on the server. The URL path includes the name of the archive, as specified by ARCHIVE_NAME or the generated name if ARCHIVE_NAME is not specified. This output property is returned only if ARCHIVE_PATH is specified.

**ARCHIVE_NAME** specifies a character string that indicates the name of the archive file.

**ARCHIVE_PATH** specifies a character string that indicates the path where the archive should be created.

**FTP_PASSWORD** indicates the password that is needed to log on to the remote host at which the archive will be stored.
FTP_USER indicates the user ID that is needed to log on to the remote host at which the archive will be stored. Specify this property only when the remote host is secured.

GENERATED_NAME returns the name of the package, whether this value was generated by SAS or specified by another property. This property is an output property. If the package is published with a PARENT_URL, and ARCHIVE_PATH is not specified, then the package is published as a folder that contains the contents of the package and not as a .spk file. In this case, the return value for GENERATED_NAME will not be the name of the archive but the name of the package. For SharePoint, this is a folder name.

HTTP_PASSWORD indicates the password that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.

HTTP_PROXY_URL indicates the URL of the proxy server.

HTTP_USER indicates the user ID that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.

Details

The ARCHIVE_NAME property identifies the name of the archive file to create. If this property is omitted, then the archive transport generates a unique name by default.

The ARCHIVE_PATH property identifies where the archive is created. This property can be a physical pathname, an FTP URL, or an HTTP URL. If ARCHIVE_PATH is an HTTP URL on a secured server, you must specify the HTTP_USER and HTTP_PASSWORD properties. Specifying the HTTP_PROXY_URL property is optional. If ARCHIVE_PATH is an FTP URL on a secured host, then you must specify the FTP_USER and FTP_PASSWORD properties.

Note: In the z/OS operating environment, an archive can be published only to UNIX System Services directories.

Example: Publishing a Package to an Archive

```
publishType = "TO_ARCHIVE";
properties='archive_path, archive_name';
path = '/u/users';
name = 'results';
CALL PACKAGE_PUBLISH(packageId, publishType,
```
CALL PACKAGE_PUBLISH Routine: Publish Package to E-mail

Publishes a package using the e-mail transport.

Syntax

```call
CALL PACKAGE_PUBLISH(package-ID, publish-type, rc, properties,
< property-value-1, property-value-2, ...>, address-1<, address-2, ...>);
```

Required Arguments

- **package-ID**
  identifies the package that is to be published.
  
  **Type** Numeric, Input

- **publish-type**
  indicates how to publish the package. To publish the package by using the e-mail transport, specify TO_EMAIL.
  
  **Type** Character, Input

- **rc**
  specifies a return code.
  
  **Type** Numeric, Output

- **properties**
  identifies a comma-separated list of optional property names. Specify any of the following property names, or specify " to indicate that no properties are to be applied:
  
  - ADDRESSLIST_DATASET_LIBNAME
  - ADDRESSLIST_DATASET_MEMNAME
  - ADDRESSLIST_VARIABLE_NAME
  - APPLIED_TEXT_VIEWER_NAME
  - APPLIED_VIEWER_NAME
  - ARCHIVE_NAME
  - ARCHIVE_PATH
  - COLLECTION_URL
  - DATASET_OPTIONS
  - ENCODING
  - FROM
  - FTP_PASSWORD
FTP_USER
HTTP_PASSWORD
HTTP_PROXY_URL
HTTP_USER
IF_EXISTS
PARENT_URL
PROCESS_VIEWER
REPLYTO
SENDER
SUBJECT
TARGET_VIEW_MIMETYPE
TARGET_VIEW_NAME
TARGET_VIEWER_MIMETYPE
TARGET_VIEWER_NAME
TEXT_VIEWER_NAME
VIEWER_NAME

Type Character, Input

`address-1<, address-2, ...>`
specifies one or more e-mail addresses to use when publishing the package.

Type Character, Input

Optional Argument

`property-value-1, property-value-2, ...`
specifies a value for each specified property name. The order of the property values must match the order of the property names in the properties parameter. Valid property values are defined as follows:

ADDRESSLIST_DATASET_LIBNAME an alternative to specifying explicit e-mail addresses, specifies a character string that indicates the name of the SAS library in which resides the data set from which an e-mail list can be extracted.

ADDRESSLIST_DATASET_MEMNAME an alternative to specifying explicit e-mail addresses, specifies a character string that indicates the name of the SAS member in which resides the data set from which an e-mail list can be extracted. The data set is fully specified by library.member.

ADDRESSLIST_VARIABLE_NAME specifies a character string that indicates the name of the variable
APPLIED_TEXT_VIEWER_NAME specifies a character string that names the rendered package view, which results from the application of the text viewer template to the package for viewing in e-mail. To specify the name of the rendered package view, use either
FILEREF: SAS_fileref or
FILENAME: external_filename.
This property is valid only when the TEXT_VIEWER_NAME property is also specified. By default, the rendered view is created as a temporary file. This property overrides the default, causing the rendered view to be saved permanently to a file.

APPLIED_VIEWER_NAME specifies a character string that indicates the name of the rendered package view, which results from the application of the HTML viewer template to the package for viewing in e-mail. To specify the name of the rendered package view, use either
FILEREF: SAS_fileref or
FILENAME: external_filename.
This property is valid only when the VIEWER_NAME property is also specified. By default, the rendered view is created as a temporary file. This property overrides the default, causing the rendered view to be saved permanently to a file.

ARCHIVE_NAME specifies a character string that indicates the name of the archive file.

ARCHIVE_PATH specifies a character string that indicates the path where the archive should be created.

COLLECTION_URL specifies a character string that indicates the URL in which the WebDAV collection is placed. You assign an explicit filename to the collection. Note that when you use COLLECTION_URL, the default behavior is to replace the existing collection at that location.
<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORRELATIONID</td>
<td>specifies a binary character string correlator that is used on the package header message.</td>
</tr>
<tr>
<td>DATASET_OPTIONS</td>
<td>specifies a character string that indicates the options to use for opening and accessing a SAS data set that contains e-mail addresses that are used to populate addressn. Specify this property as value=value=option-1=option-2=....</td>
</tr>
<tr>
<td>ENCODING</td>
<td>specifies a character string that indicates the text encoding to use for the message body.</td>
</tr>
<tr>
<td>FROM</td>
<td>specifies a character string that indicates the name or e-mail address of the sender (or package publisher) of the e-mail message. This value is the name or e-mail address that the e-mail will appear to be from. Note that the FROM field is valid only with the SMTP e-mail interface.</td>
</tr>
<tr>
<td>FTP_PASSWORD</td>
<td>indicates the password that is needed to log on to the remote host at which the archive will be stored. Specify this property only when the remote host is secured.</td>
</tr>
<tr>
<td>FTP_USER</td>
<td>indicates the user ID that is needed to log on to the remote host at which the archive will be stored. Specify this property only when the remote host is secured.</td>
</tr>
<tr>
<td>HTTP_PASSWORD</td>
<td>indicates the password that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.</td>
</tr>
<tr>
<td>HTTP_PROXY_URL</td>
<td>indicates the URL of the proxy server.</td>
</tr>
<tr>
<td>HTTP_USER</td>
<td>indicates the user ID that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.</td>
</tr>
</tbody>
</table>
| IF_EXISTS         | specifies one of the following character strings. Use the IF_EXISTS property to control the treatment of same-named...
collections already existing on the server. "NOREPLACE" indicates that if the package being published contains a collection that already exists on the server, the PUBLISH_PACKAGE call is to return immediately without affecting the contents of the existing collection. "UPDATE" indicates that if the collection already exists on the server, the PUBLISH_PACKAGE call is to update the existing collection by replacing like-named entities and adding newly named entities. If "UPDATE" is specified and both the package to publish and the existing collection have an HTML set (created with INSERT_HTML) with the same NESTED_NAME, then the HTML set in the published package replaces the HTML set in the existing collection. "UPDATEANY" is identical to "UPDATE" except that the CALL PUBLISH_PACKAGE routine can be used to update a collection that SAS did not create. A consequence of using "UPDATEANY" is that SAS will be unable to retrieve the published package. Note that when names are generated automatically for HTML set collections, the publish code ensures that name collisions will not occur.

PARENT_URL specifies a character string that indicates the URL under which the WebDAV collection is placed. The collection is automatically assigned a unique name.

PROCESS_VIEWER specifies a character string of "yes" to indicate that the rendered view will be delivered in e-mail. If you specify the PROCESS_VIEWER property with the ARCHIVE_PATH property, then the archive is created but is not sent as an attachment in e-mail. Instead, viewer processing occurs and the rendered view is sent in e-mail.

REPLYTO specifies a character string that indicates the designated e-mail address to which package
recipients might respond. Note that the REPLYTO field is valid only with the SMTP e-mail interface.

**SENDER**

specifies a character string that indicates the e-mail address of the sender (or package publisher) of the e-mail message. A valid e-mail address should be specified. This address will receive any bounced or undeliverable e-mail. This value is the actual e-mail address that the e-mail is sent from.

**SUBJECT**

specifies a character string that provides the subject line for the e-mail message.

**TARGET_VIEW_MIMETYPE**

specifies a character string that indicates the MIME type of the rendered view for delivery to a WebDAV-compliant server. The target view MIME type overrides the default view MIME type, which is automatically inferred from the viewer. Typical MIME types are HTML (.htm) and plain text (.txt) files. If this field remains blank, then the viewer filename extension is used to locate the MIME type in the appropriate registry. Windows hosts use the Windows Registry; other hosts use the SAS Registry.

**TARGET_VIEW_NAME**

specifies a character string that indicates the name of the rendered view for delivery to a WebDAV-compliant server. The specified target view name overrides the default name, which is index.html.

**TARGET_VIEWER_MIMETYPE**

see TARGET_VIEW_MIMETYPE.

**TARGET_VIEWER_NAME**

see TARGET_VIEW_NAME.

**TEXT_VIEWER_NAME**

specifies a character string that indicates the name of a text viewer template that formats package content for viewing in e-mail by using either FILEREF:SAS_fileref or FILENAME:external_filename. A text viewer template might be necessary if the destination e-mail program does not support the HTML MIME type.
VIEWER_NAME

specifies a character string that indicates the name of the HTML viewer template to be applied when publishing e-mail by using either FILEREF:SAS_fileref or FILENAME:external_filename.

Type Character or Numeric, Input

Details

Default Behavior

When publishing to e-mail, the e-mail message is sent in plain text format by default. Only inserted reference entries are published to e-mail. For details about inserting reference entries, see the CALL INSERT_REF Routine on page 72.

The package description field precedes the reference value in the e-mail message. All other entries that are inserted into the package are ignored.

To override the default behavior, you can specify the ARCHIVE_PATH, COLLECTION_URL, PARENT_URL, TEXT_VIEWER_NAME, or VIEWER_NAME properties.

Note: If the mailer is not running in a Windows NT operating environment, then you will be prompted for the mail profile to use when you send the e-mail message. To avoid being prompted, specify the EMAILID and EMAILPW options at SAS invocation. For example:

sas -EMAILID "Microsoft Outlook"

Archive Path Properties

If you specify the ARCHIVE_PATH property, then an archive is created and published as an e-mail attachment. All entries that are inserted into the package are published as an archive. If you specify a value for ARCHIVE_PATH, then the created archive is stored at the designated location. To create a temporary archive that is deleted after the package is published, specify an ARCHIVE_PATH value of "" or "tempfile".

If you specify ARCHIVE_PATH as an FTP URL or as an HTTP URL, and need details about archive properties, see PACKAGE_PUBLISH (Publish Package to Archive) on page 80.

Note: In order to create an archive under the z/OS operating environment, the z/OS environment must support UNIX System Services directories.

If you specify the PROCESS_VIEWER property (with either the VIEWER_NAME or TEXT_VIEWER_NAME property) along with the ARCHIVE_PATH property, then the archive is created but is not sent as an attachment in e-mail. Instead, viewer processing occurs and the rendered view is sent in e-mail.

For more information about the application of viewer properties, see “Viewer Processing” on page 21.
When publishing to an archive with the e-mail transport, you can specify the following archive properties: ARCHIVE_NAME, ARCHIVE_PATH, FTP_PASSWORD, FTP_USER, HTTP_PASSWORD, HTTP_PROXY_URL, or HTTP_USER.

Viewer Properties

If you specify the VIEWER_NAME or TEXT_VIEWER_NAME property, then the viewer is used to create the e-mail message and to apply substitutions. VIEWER_NAME renders the view in HTML format. TEXT_VIEWER_NAME renders the view in text format. Only the package information that is rendered by the viewer is published.

If you specify the PROCESS_VIEWER property (with either the VIEWER_NAME or TEXT_VIEWER_NAME property) along with the ARCHIVE_PATH property, then the archive is created but is not sent as an attachment in e-mail. Instead, viewer processing occurs and the rendered view is sent in e-mail.

WebDAV Properties

If you specify the COLLECTION_URL property, then the package is published to the specified URL on a WebDAV-compliant web server. An example of a collection URL is http://www.host.com/AlphaliteAirways/revenue/quarter1. The collection is named quarter1. The e-mail message that is sent to subscribers will contain a reference to the URL that is specified in the COLLECTION_URL property.

The PARENT_URL property is similar to the COLLECTION_URL property except that it specifies the location under which the new WebDAV collection is to be placed. The CALL PUBLISH_PACKAGE routine generates a unique name for the new collection. The unique name is limited to eight characters, with the first character as an s. An example of a parent URL directory location is http://www.host.com/AlphaliteAirways/revenue. An example of a collection name that is automatically generated might be s9811239. The e-mail message contains a reference to the collection, which is the URL that you specified in the PARENT_URL property.

The specifications of COLLECTION_URL and PARENT_URL are mutually exclusive.

When publishing to a WebDAV-compliant server with the e-mail transport, you can specify the following WebDAV properties: HTTP_PASSWORD, HTTP_PROXY_URL, HTTP_USER, IF_EXISTS, TARGET_VIEW_MIMETYPE, TARGET_VIEW_NAME, and VIEWER_NAME (or TEXT_VIEWER_NAME).

WebDAV publishing uses the following file extensions for each item type:

<table>
<thead>
<tr>
<th>Item Type</th>
<th>File Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATALOG</td>
<td>.sac</td>
</tr>
<tr>
<td>DATA</td>
<td>.sad</td>
</tr>
<tr>
<td>MDDB</td>
<td>.sam</td>
</tr>
<tr>
<td>REFERENCE</td>
<td>.ref</td>
</tr>
</tbody>
</table>

Table 5.3 File Extensions for Item Types
### Examples:

#### Example 1: Using PACKAGE_PUBLISH to Publish to E-mail

```plaintext
publishType = "TO_EMAIL";
properties='';
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties,
    "user1@alphaliteairways.com", "John Smith",
    "jsmith@alphaliteairways.com");
```

#### Example 2: Using PACKAGE_PUBLISH to Publish to E-mail with the SUBJECT Property

```plaintext
publishType = "TO_EMAIL";
subject = "Nightly Builds Update";
properties="SUBJECT";
Addr = "admins-l@alphaliteair03.vm.com";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, subject, Addr);
```

#### Example 3: Using PACKAGE_PUBLISH to Publish to Two E-mail Addresses with the APPLIED_VIEWER_NAME Property

The following example publishes a package to two e-mail addresses and designates the viewer to be used when formatting the e-mail message. The e-mail message will contain only content that can be rendered in a view. The rendered view is deleted after it is published.

In order to save the rendered view explicitly, you can specify the APPLIED_VIEWER_NAME property and a filename value.

```plaintext
publishType = "TO_EMAIL";
properties="SUBJECT, VIEWER_NAME";
subject = "Nightly Build Updates";
viewer = "filename:template.html";
Addr = "admins-l@alphaliteair03.vm.com";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, subject, viewer,
    "buildmonitor@alphaliteairways.com", Addr);
```

#### Example 4: Using PACKAGE_PUBLISH to Publish to E-mail with the ARCHIVE_PATH Property

```plaintext
publishType = "TO_EMAIL";
properties="ARCHIVE_PATH";
apath = "/u/users1";
Addr = "admins-l@alphaliteair05";
CALL PACKAGE_PUBLISH(packageId, publishType,
Example 5: Using PACKAGE_PUBLISH to Publish a Collection URL on a WebDAV-Compliant Server to E-mail

The following example uses the e-mail transport to publish a collection URL on a WebDAV-compliant server. The HTTP user ID and password enable the publisher to bind to the secured HTTP server. All e-mail recipients who are members of the mail list receive the e-mail announcement that the best rates are accessible at the specified URL.

```plaintext
publishType = "TO_EMAIL";
properties = "COLLECTION_URL, SUBJECT",
             "HTTP_USER", "HTTP_PASSWORD";
collurl = "http://www.alphaliteairways/fares/discount";
subj = "Announcing Best Rates Yet";
http_user = "vicdamone";
http_password = "myway";
Addr = "admins-l@alphaliteair05";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties,
                      collurl, subj, http_user, http_password, Addr);
```

Example 6: Using PACKAGE_PUBLISH to Publish to E-mail Addresses That Are in a Password-Protected SAS Data Set

The following example specifies e-mail addresses that are stored in a variable in a password-protected SAS data set.

```plaintext
publishType = "TO_EMAIL";
properties = "SUBJECT, ADDRESS_DATASET_LIBNAME,
             ADDRESS_DATASET_MEMNAME, ADDRESSLIST_VARIABLE_NAME,
             DATASET_OPTIONS";
subject = "Get out and Vote!";
lib = "voterreg";
mem = "northeast";
var = "emailaddr";
opt = "pw='born2run'";
CALL PACKAGE_PUBLISH(packageId, publishType, rc,
                      properties, subject, lib, mem, var, opt);
```

CALL PACKAGE_PUBLISH Routine: Publish Package to Queues

Publishes a package to one or more message queues.

**Syntax**

```plaintext
CALL PACKAGE_PUBLISH(package-ID, publish-type, rc, properties,
< property-value-1, property-value-2, ...>, queue-1<, queue-2, ...>);
```
Required Arguments

**package-ID**
identifies the package that is to be published.

*Type*  Numeric, Input

**publish-type**
indicates how to publish the package. To publish the package by using the queue transport, specify a *publish-type* of TO_QUEUE.

*Type*  Character, Input

**rc**
receives a return code.

*Type*  Numeric, Output

**properties**
identifies a comma-separated list of optional property names. Specify any of the following property names, or specify " to indicate that no properties are to be applied:
- ARCHIVE_NAME
- ARCHIVE_PATH
- CORRELATIONID
- FTP_PASSWORD
- FTP_USER
- HTTP_PASSWORD
- HTTP_PROXY_URL
- HTTP_USER

*Type*  Character, Input

**queue-1 <, queue2, …>**
character string that specifies the queue(s) that will be used to publish the package. When publishing to MSMQ queues, use the following syntax:

`MSMQ://queueHostMachineName\queueName`

When publishing to IBM WebSphere MQ queues, use the following syntax:

`MQSERIES://queueManager:queueName`

or

`MQSERIES-C://queueManager:queueName`

MQSERIES specifies the server interface that is used to connect to a queue manager that is local. MQSERIES-C specifies the client interface that is used, allowing the queue manager to be local or remote.

*Type*  Character, Input
Optional Argument

property-value-1, property-value-2, ...

specifies one value for each specified property name. The order of the property
values must match the order of the property names in the properties parameter.
Valid property values are defined as follows:

- **ARCHIVE_NAME** specifies a character string that indicates the name
  of the archive file.
- **ARCHIVE_PATH** specifies a character string that indicates the path
  where the archive should be created.
- **CORRELATIONID** specifies a binary character string correlator that is
  used on the package header message.
- **FTP_PASSWORD** indicates the password that is needed to log on to
  the remote host at which the archive will be stored. Specify this property only when the remote host is
  secured.
- **FTP_USER** indicates the user ID that is needed to log on to the
  remote host at which the archive will be stored. Specify this property only when the remote host is
  secured.
- **HTTP_PASSWORD** indicates the password that is needed to bind to the
  web server on which the package is published. Specify this property only when the web server is
  secured.
- **HTTP_PROXY_URL** indicates the URL of the proxy server.
- **HTTP_USER** indicates the user ID that is needed to bind to the
  web server on which the package is published. Specify this property only when the web server is
  secured.

Type: Character or Numeric, Input

Details

When publishing to a queue, all entries in the package are published to the queue
by default. To override this default, specify the ARCHIVE_PATH property, which
indicates that an archive is to be created and only the archive will be published to
the queue. The archive will contain all package entries.

If you specify a value for ARCHIVE_PATH, then the archive is stored at the
designated location. To create a temporary archive that is deleted after the package
is published, specify an ARCHIVE_PATH value of "" or "tempfile".

If you specify ARCHIVE_PATH as an FTP URL or as an HTTP URL, and need
details about specifying archive properties, see PACKAGE_PUBLISH (Publish
Package to Archive) on page 80.

Note: In the z/OS operating environment, you can publish archives only to UNIX
System Services directories.

Queues that support transactional units of work are recommended. By using these
types of queues, the queue transport prevents partial packages from remaining on
the queue in cases where errors are encountered during package publishing. For MSMQ, this means that the queue should be transactional. For IBM WebSphere MQ, this means that the queue should support synchronization points.

When you specify the CORRELATIONID property, the package message uses the specified CORRELATIONID value. You can retrieve packages from the queue by correlation ID.

Examples:

Example 1: Using PACKAGE_PUBLISH to Publish to Two Queues with the CORRELATIONID Property

The following example publishes a package to two queues. One queue is an IBM WebSphere MQ queue that is named PCONE; the second queue is an MSMQ queue that is specified by the queue manager, who is named JSMITH. A CORRELATIONID of 12345678901234567890 is assigned to the package to be published to both queues.

```
publishType = "TO_QUEUE";
FirstQ = "MQSERIES://PCONE:LOCAL";
SecondQ = "MSMQ://JSMITH:TRANSQ";
CorrValue = "12345678901234567890";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, "CORRELATIONID", CorrValue, firstQ, secondQ);
```

Example 2: Using PACKAGE_PUBLISH to Publish to a Queue

The following example publishes the package to one queue and does not apply any additional queue properties:

```
publishType = "TO_QUEUE";
firstQ = "MQSERIES://PCONE:MYQ";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, ",", firstQ);
```

Example 3: Using PACKAGE_PUBLISH to Publish an Archive to a Queue with the ARCHIVE_PATH Property

The following example creates an archive and publishes it to a queue. The ARCHIVE_PATH property is specified as "tempfile". After the archive is published to the queue, the temporary, local copy is deleted automatically. The archive contains all entries that are inserted into the package.

```
publishType = "TO_QUEUE";
firstQ = "MQSERIES://PCONE:MYQ";
prop = "ARCHIVE_PATH";
archivePath = "tempfile";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, prop, archivePath, firstQ);
```
CALL PACKAGE_PUBLISH Routine: Publish Package to Microsoft SharePoint

Publishes a package to SharePoint.

Syntax

CALL PACKAGE_PUBLISH(package-ID, publish-type, rc, properties,
< property-value-1, property-value-2, …> );

Required Arguments

package-ID
identifies the package that is to be published.

Type Numeric, Input

publish-type
indicates how to publish the package. To publish the package using the SharePoint transport, specify a publish-type of TO_SHAREPOINT.

Type Character, Input

rc
receives a return code.

Type Numeric, Output

properties
identifies a comma-separated list of optional property names. Specify any of the following property names, or specify " to indicate that no properties are to be applied:

- APPLIED_TEXT_VIEWER_NAME
- APPLIED_VIEWER_NAME
- ARCHIVE_FULLPATH
- ARCHIVE_NAME
- ARCHIVE_PATH
- COLLECTION_FOLDER
- COLLECTION_URL
- DEBUG_FILE
- GENERATED_NAME
- HTTP_PASSWORD
- HTTP_USER
- IF_EXISTS
- INITIALIZE_SITE
CALL PACKAGE_PUBLISH Routine: Publish Package to Microsoft SharePoint

- LIST_NAME
- PARENT_FOLDER
- PARENT_URL
- SITE_URL
- TARGET_VIEW_MIMETYPE
- TARGET_VIEW_NAME
- TARGET_VIEWER_MIMETYPE
- TARGET_VIEWER_NAME
- TEXT_VIEWER_NAME
- VIEWER_NAME

Type: Character, Input

Optional Argument

`property-value-1, property-value-2, ...`

specifies one value for each specified property name. The order of the property values must match the order of the property names in the properties parameter. Valid property values are defined as follows:

### APPLIED_TEXT_VIEWER_NAME

specifies a character string that names the rendered package view, which results from the application of the text viewer template. To specify the name of the rendered package view, use either `FILEREF: SAS_fileref` or `FILENAME: external_filename`. This property is valid only when the `TEXT_VIEWER_NAME` property is also specified. By default, the rendered view is created as a temporary file. This property overrides the default, causing the rendered view to be saved permanently to a file.

### APPLIED_VIEWER_NAME

specifies a character string that indicates the name of the rendered package view, which results from the application of the HTML viewer template. To specify the name of the rendered package view, use either `FILEREF: SAS_fileref` or `FILENAME: external_filename`. This property is valid only when the `VIEWER_NAME` property is also specified. By default, the rendered view is created as a temporary file. This property overrides the default, causing the rendered view to be saved permanently to a file.
ARCHIVE_FULLPATH
returns the complete URL path of the published archive on the server. The URL path includes the name of the archive, as specified by ARCHIVE_NAME or the generated name if ARCHIVE_NAME is not specified. This output property is returned only if ARCHIVE_PATH is specified.

ARCHIVE_NAME
specifies a character string that indicates the name of the archive file.

ARCHIVE_PATH
specifies a character string that indicates the path where the archive should be created.

COLLECTION_FOLDER
specifies both the parent folder and the collection folder together. This property is relative to the list name. Do not specify a value for this property if you are using the COLLECTION_URL property.

COLLECTION_URL
specifies a character string that indicates the URL in which the SharePoint collection is placed. The COLLECTION_URL is specified in the following format: http://host/site/list-name/folder-name. This is the equivalent of specifying the SITE_URL, LIST_NAME, and COLLECTION_FOLDER properties separately. Do not specify a value for this property if you are using the SITE_URL, LIST_NAME, or COLLECTION_FOLDER properties. Note that when you use COLLECTION_URL, the default behavior is to replace the existing collection at that location. Do not use this property if the SharePoint URL has one of the following formats: http://host/site/subsiteN/list-name/folder-name or http://host-is-the-sitename/list-name/folder-name.

DEBUG_FILE
specifies the name of the file that will contain debug wire trace output.

GENERATED_NAME
returns the name of the package, whether this value was generated by SAS or specified by another property. This property is an output property. If the package is published with a PARENT_URL, and ARCHIVE_PATH is not specified, then the package is published as a folder that contains the contents of the package and not as
CALL PACKAGE_PUBLISH Routine: Publish Package to Microsoft SharePoint

a .spk file. In this case, the return value for GENERATED_NAME will not be the name of the archive but the name of the package. For SharePoint, this is a folder name.

HTTP_PASSWORD indicates the password that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.

HTTP_USER indicates the user ID that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.

IF_EXISTS specifies one of the following character strings. Use the IF_EXISTS property to control the treatment of same-named collections already existing on the server. "NOREPLACE" indicates that if the package being published contains a collection that already exists on the server, the PUBLISH_PACKAGE call is to return immediately without affecting the contents of the existing collection. "UPDATE" indicates that if the collection already exists on the server, the PUBLISH_PACKAGE call is to update the existing collection by replacing like-named entities and adding newly named entities. If "UPDATE" is specified and both the package to publish and the existing collection have an HTML set (created with INSERT_HTML) with the same NESTED_NAME, then the HTML set in the published package replaces the HTML set in the existing collection. "UPDATEANY" is identical to "UPDATE" except that the CALL PUBLISH_PACKAGE routine can be used to update a collection that SAS did not create. A consequence of using "UPDATEANY" is that SAS will be unable to retrieve the published package. Note that when names are generated automatically for HTML set collections, the publish code ensures that name collisions will not occur.

INITIALIZE_SITE enables an administrator to initialize a SharePoint site. Before a SharePoint site is used for the first time, it must be initialized with SharePoint content.
types and column metadata defined by SAS.

**LIST_NAME** specifies a document library in the SharePoint site. SharePoint document libraries are a special type of list that is used for ordering folders and files. Do not specify a value for this property if you are using the COLLECTION_URL or PARENT_URL properties.

**PARENT_FOLDER** specifies the parent folder of a generated collection name. This property is relative to the list name. Do not specify a value for this property if you are using the PARENT_URL property.

**PARENT_URL** specifies a character string that indicates the URL under which the WebDAV collection is placed. The collection is automatically assigned a unique name. Do not specify a value for this property if you are using the SITE_URL, LIST_NAME, or PARENT_FOLDER properties.

**SITE_URL** defines the transfer protocol (HTTP or HTTPS), the host name, and the SharePoint site. Do not specify a value for this property if you are using the COLLECTION_URL or PARENT_URL properties.

**TARGET_VIEW_MIMETYPE** specifies a character string that indicates the MIME type of the rendered view for delivery to a SharePoint server. The target view MIME type overrides the default view MIME type, which is automatically inferred from the viewer. Typical MIME types are HTML (.htm) and plain text (.txt) files. If this field remains blank, then the viewer filename extension is used to locate the MIME type in the appropriate registry. Windows hosts use the Windows Registry; other hosts use the SAS Registry. The TARGET_VIEW_MIMETYPE and TARGET_VIEWER_MIMETYPE properties are synonymous.

**TARGET_VIEW_NAME** specifies a character string that indicates the name of the rendered view that is published with the package to the SharePoint server. The specified target view name overrides the default name, which is index.html. The TARGET_VIEW_NAME and
TARGET_VIEWER_NAME properties are synonymous.

TARGET_VIEWER_MIMETYPE see TARGET_VIEW_MIMETYPE.

TARGET_VIEWER_NAME see TARGET_VIEW_NAME.

TEXT_VIEWER_NAME specifies a character string that indicates the name of a text viewer template that formats package content for later viewing by a web browser or text editor or other program that is specific to the viewer template. Syntax is either FILEREF: SAS_fileref or FILENAME: external_filename.

VIEWER_NAME specifies a character string that indicates the name of the HTML viewer template to be applied by using either FILEREF: SAS_fileref or FILENAME: external_filename.

### Details

### Default Behavior

Publishing with a publish-type of TO_SHAREPOINT publishes a package to a specified URL on a SharePoint server. The HTTPS protocol is supported when publishing to a SharePoint site. SharePoint enables distributed authoring and versioning, which enables collaborative development of web files on remote servers.

The SharePoint transport stores package entries as members of a collection.

If you specify the COLLECTION_URL property, then the package is published to the specified URL on a SharePoint server. When you use COLLECTION_URL, the default behavior is to replace the existing collection and its nested directories at that location. If you do not want to replace an existing collection and its nested directories, then you must use the IF_EXISTS property. An example of a collection URL is

http://www.host.com/AlphaliteAirways/revenue/quarter1

The collection is named quarter1.

The PARENT_URL property is similar to the COLLECTION_URL property except that it specifies the location under which the new SharePoint collection is to be placed. The CALL PUBLISH_PACKAGE routine generates a unique name for the new collection. The unique name is limited to eight characters with the first character as an s. An example of a parent URL directory location is http://www.host.com/AlphaliteAirways/revenue. An example of a collection name that is automatically generated might be s9811239.

The specifications of the COLLECTION_URL property and the PARENT_URL property are mutually exclusive.

Publishing to SharePoint is similar to publishing to WebDAV. The primary difference is how the file destination is specified in the CALL PACKAGE_PUBLISH routine. Instead of the package destination being a single URL, SharePoint requires three pieces of information: SITE_URL, LIST_NAME, and PARENT_FOLDER or

COLLECTION_FOLDER. However, if the SharePoint site is not nested, a single COLLECTION_URL or PARENT_URL property, which contains all information, can be used (for example, http://host/site/list-name/folder-name). SharePoint sites can be nested. For example, a site could be http://myhost/MyMainSite/SiteUnderneath. Because SharePoint sites can be nested, the SITE_NAME, LIST_NAME, and COLLECTION_FOLDER properties must be specified separately. To view a collection with a web browser, combine all three pieces of information (for example, http://host/site/list-name/folder-name).

A COLLECTION_URL can represent only a top-level site because the SharePoint URL syntax does not allow for parsing to determine how many nested levels there are. For example, http://host/topsite/nestedsite/Documents is a nested site URL. For a nested site, the SITE_NAME, LIST_NAME, and COLLECTION_FOLDER properties must be used. If a COLLECTION_URL is mistakenly used with a nested site URL, the caller will receive an HTTP status of 404 (NOT FOUND) because the URL will not be properly parsed.

Similar to COLLECTION_URL, PARENT_URL can be used only with a top-level SharePoint site. For nested sites, SITE_NAME, LIST_NAME, and PARENT_FOLDER properties must be used.

SharePoint publishing uses the following file extensions for each item type:

<table>
<thead>
<tr>
<th>Item Type</th>
<th>File Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCHIVE</td>
<td>.spk</td>
</tr>
<tr>
<td>CATALOG</td>
<td>.stc</td>
</tr>
<tr>
<td>COMMA-SEPARATED VALUES</td>
<td>.csv</td>
</tr>
<tr>
<td>DATA</td>
<td>.stc</td>
</tr>
<tr>
<td>MDDB</td>
<td>.sam</td>
</tr>
<tr>
<td>REFERENCE</td>
<td>.ref</td>
</tr>
<tr>
<td>VIEW</td>
<td>.sav</td>
</tr>
</tbody>
</table>

If you are publishing to SharePoint or WebDAV, SSL setup can be done using TKESSL. For more information, see Encryption in SAS.

Initializing the Site

Before a SharePoint site is used for the first time, it must be initialized with SharePoint content types and column metadata defined by SAS. Use the INITIALIZE_SITE property to initialize the SharePoint site.

Note that after a document library list is initialized, you can manually enable the use of content types. This step is useful if you want to view the SharePoint site with a web browser and view the properties on the file, such as the description or expiration date. To enable the use of content types, go to Site Actions and select Site Libraries and Lists. Then customize Shared Documents and click Advanced Settings. Select Yes to allow management of content types.
To update an existing package in a site document library, you must first make sure the site library allows updates to existing packages. Go to Site Actions and select Site Settings. Next, select Site Libraries and Lists (or Shared Documents). Under Versioning settings, set Require documents to be checked out before they can be edited? to No.

Viewer Properties

If you specify the VIEWER_NAME property with the COLLECTION_URL or PARENT_URL property, then the view is rendered in HTML format. If you specify the TEXT_VIEWER_NAME with the COLLECTION_URL or PARENT_URL properties, then the view is rendered in text format.

The specified viewer is used to create a rendered view that is named index.html. To override the default name that is assigned to the rendered view, use the APPLIED_VIEWER_NAME or APPLIED_TEXT_VIEWER_NAME, as appropriate, to specify a filename for the rendered view.

Archive Path Properties

If you specify the ARCHIVE_PATH property, then an archive is created and published as a binary package on a SharePoint server. All entries that are inserted into the package are published as an archive. If you specify a value for ARCHIVE_PATH, then the created archive is stored at the designated location. To create a temporary archive that is deleted after the package is published, specify an ARCHIVE_PATH value of "" or "tempfile".

For more details about how to use the archive properties, see “CALL PACKAGE_PUBLISH Routine: Publish Package to Archive” on page 80.

Note: In order to create an archive under the z/OS operating environment, the z/OS environment must support UNIX System Services directories.

When publishing a binary package with the SharePoint transport, you can specify the following archive properties: ARCHIVE_NAME, ARCHIVE_PATH, or ARCHIVE_FULLPATH.

Applying a Name/Value Pair to a Package and a Package Item

When publishing to SharePoint, optional name/value pairs are transmitted to the SharePoint server in XML format.

For details about specifying the name-value parameter for a single package item, see the applicable INSERT_item CALL routine, where item can be any of the following:

- CATALOG
- DATASET
- FILE
- HTML
- MDDB
- PROC SQL VIEW
- REFERENCE
- VIEWER
Examples:

Example 1: Using PACKAGE_PUBLISH with the COLLECTION_FOLDER Property to Publish to SharePoint

The following example uses the COLLECTION_FOLDER property:

```plaintext
publishType = 'TO_SHAREPOINT';
properties = 'SITE_URL, LIST_NAME, COLLECTION_FOLDER, HTTP_USER, HTTP_PASSWORD';
siteUrl = 'http://www.alphaliteairways.com/sale';
listName = 'fares';
collectionFolder = 'Fare Lists';
userName = 'JohnSmith';
password = 'secret';

CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, siteUrl, listName, collectionFolder, userName, password);
```

Example 2: Using PACKAGE_PUBLISH with the COLLECTION_URL Property to Publish to SharePoint

The following example uses the COLLECTION_URL property:

```plaintext
publishType = 'TO_SHAREPOINT';
properties = 'COLLECTION_URL, HTTP_USER, HTTP_PASSWORD';
collectionUrl = 'http://www.alphaliteairways.com/sale/fares/Fare Lists';
userName = 'vicdamone';
password = 'myway';

CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, collectionUrl, userName, password);
```

Example 3: Using PACKAGE_PUBLISH with the INITIALIZE_SITE Property to Initialize a Site and Publish to SharePoint

Before a SharePoint site can be used, it must be initialized by an administrator. To initialize the site, use the INITIALIZE_SITE property, as follows:

```plaintext
publishType = 'TO_SHAREPOINT';
properties = 'SITE_URL, LIST_NAME, HTTP_USER, HTTP_PASSWORD, INITIALIZE_SITE';
siteUrl = 'http://www.alphaliteairways.com/';
userName = 'vicdamone';
password = 'myway';
initialize = 'TRUE';

CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, siteUrl, listName, userName, password, initialize);
```

CALL PACKAGE_PUBLISH Routine: Publish Package to Subscribers

Publishes a package to subscribers who are associated with specified channel.
CALL PACKAGE_PUBLISH Routine: Publish Package to Subscribers

Syntax

CALL PACKAGE_PUBLISH(package-ID, publish-type, rc, properties, 
< property-value-1, property-value-2, …> , channel);

Required Arguments

**package-ID**
- identifies the package that is to be published.
- Type: Numeric, Input

**publish-type**
- indicates how to publish the package. To publish a package to the subscribers of a channel, specify a `publish-type` value of TO_SUBSCRIBERS.
- Type: Character, Input

**rc**
- receives a return code.
- Type: Numeric, Output

**properties**
- identifies a comma-separated list of optional property names. Specify any of the following property names, or specify " to indicate that no properties are to be applied:
  - APPLIED_TEXT_VIEWER_NAME
  - APPLIED_VIEWER_NAME
  - ARCHIVE_NAME
  - ARCHIVE_PATH
  - CHANNEL_STORE
  - COLLECTION_URL
  - CORRELATIONID
  - ENCODING
  - FOLDER_PATH
  - FROM
  - FTP_PASSWORD
  - FTP_USER
  - GENERATED_NAME
  - HTTP_PASSWORD
  - HTTP_PROXY_URL
  - HTTP_USER
  - IF_EXISTS
  - METAPASS
channel
specifies the name of the channel as it is defined in the SAS Metadata Repository. The channel contains a list of subscribers to whom the package will be published.

Optional Argument

property-value-1, property-value-2, ...
specifies one value for each specified property name. The order of the property values must match the order of the property names in the properties parameter. Valid property values are defined as follows:

APPLIED_TEXT_VIEWER_NAME specifies a character string that names the rendered package view, which results from the application of the text viewer template to the package for viewing in e-mail. To specify the name of the rendered package view, use either FILEREF: SAS_fileref or FILENAME: external_filename. This property is valid only when the TEXT_VIEWER_NAME property is also specified. By default, the rendered view is created as a temporary file. This property overrides the default, causing the rendered view to be saved permanently to a file.

APPLIED_VIEWER_NAME specifies a character string that indicates the name of the rendered package view, which results from the application of the HTML viewer template to the package for viewing in e-mail. To specify the name of the rendered package view, use either FILEREF: SAS_fileref or FILENAME: external_filename. This property is valid only when the VIEWER_NAME property is also specified. By default, the
rendered view is created as a temporary file. This property overrides the default, causing the rendered view to be saved permanently to a file.

ARCHIVE_NAME specifies a character string that indicates the name of the archive file.

ARCHIVE_PATH specifies a character string that indicates the path where the archive should be created.

CHANNEL_STORE specifies a character string that indicates the SAS Metadata Repository containing the channel and subscriber metadata. If channel definitions and subscriber definitions are maintained in a SAS Metadata Repository, then the syntax for the CHANNEL_STORE property is as follows: SAS-OMA://hostname[:portreposname=repositoryName; The hostname is the name of SAS Metadata Server that contains channel information. HOSTNAME must be a DNS name or IP address of a host that is running a SAS Metadata Server. The port is the TCP port of the SAS Metadata Server. If no port is specified, then 8561 is used as a default. The reposname is the name of the repository.

COLLECTION_URL specifies a character string that indicates the URL in which the WebDAV collection is placed. You assign an explicit filename to the collection. Note that when you use COLLECTION_URL, the default behavior is to replace the existing collection at that location.

CORRELATIONID specifies a binary character string correlator that is used on the package header message.

ENCODING specifies a character string that indicates the text encoding to use for the message body.

FOLDER_PATH specifies the folder path for the channel of interest. This value is used to search for channels with specific names that exist in specific folder locations. When a user defines a channel via SAS Management Console, all channels by default exist in the /Channels folder. SAS Management Console allows the user to define multiple folders and subfolders. All FOLDER_PATH properties must start with /Channels and then can identify subfolders if necessary. For example, a channel named “Sales” might be defined in two different folders: /
FROM specifies a character string that indicates the sender (or package publisher) of the e-mail message. Note that the FROM field is valid only with the SMTP e-mail interface.

FTP_PASSWORD indicates the password that is needed to log on to the remote host at which the archive will be stored. Specify this property only when the remote host is secured.

FTP_USER indicates the user ID that is needed to log on to the remote host at which the archive will be stored. Specify this property only when the remote host is secured.

GENERATED_NAME returns the name of the package, whether this value was generated by SAS or specified by another property. This property is an output property. If the package is published with a PARENT_URL, and ARCHIVE_PATH is not specified, then the package is published as a folder that contains the contents of the package and not as a .spk file. In this case, the return value for GENERATED_NAME will not be the name of the archive but the name of the package. For SharePoint, this is a folder name.

HTTP_PASSWORD indicates the password that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.

HTTP_PROXY_URL indicates the URL of the proxy server.

HTTP_USER indicates the user ID that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.

IF_EXISTS specifies one of the following character strings. Use the IF_EXISTS property to control the treatment of same-named collections already existing on the server. "NOREPLACE" indicates that if the package being published contains a collection that already exists on the server, the PUBLISH_PACKAGE call is to return immediately without affecting the contents of the existing collection. "UPDATE" indicates that if the collection already exists on the server, the PUBLISH_PACKAGE call is to update the existing collection by replacing like-named entities and adding newly named entities. If "UPDATE" is specified and both the package to publish...
and the existing collection have an HTML set (created with INSERT_HTML) with the same NESTED_NAME, then the HTML set in the published package replaces the HTML set in the existing collection. "UPDATEANY" is identical to "UPDATE" except that the CALL PUBLISH_PACKAGE routine can be used to update a collection that SAS did not create. A consequence of using "UPDATEANY" is that SAS will be unable to retrieve the published package. Note that when names are generated automatically for HTML set collections, the publish code ensures that name collisions will not occur.

**METAPASS**

specifies the password to use when binding to the SAS Metadata Server. If the METAPASS property is not specified on the CALL PACKAGE_PUBLISH routine, then the METAPASS system option, if set, will be used when binding to the SAS Metadata Server.

**METAUSER**

specifies the user name to use when binding to the SAS Metadata Server. If the METAUSER property is not specified on the CALL PACKAGE_PUBLISH routine, then the METAUSER system option, if set, will be used when binding to the SAS Metadata Server.

**PARENT_URL**

specifies a character string that indicates the URL under which the WebDAV collection is placed. The collection is automatically assigned a unique name.

**PROCESS_VIEWER**

specifies a character string of "yes" to indicate that the rendered view will be delivered in e-mail. If you specify the PROCESS_VIEWER property with the ARCHIVE_PATH property, then the archive is created but is not sent as an attachment in e-mail. Instead, viewer processing occurs and the rendered view is sent in e-mail.

**REPLYTO**

specifies a character string that indicates the designated e-mail address to which package recipients might respond. Note that the REPLYTO field is valid only with the SMTP e-mail interface.

**SUBJECT**

specifies a character string that provides the subject line for the e-mail message.

**TARGET_VIEW_MIMETYPE**

specifies a character string that indicates the MIME type of the rendered view for delivery to a WebDAV-compliant server. The target view MIME type overrides the default view MIME type, which is automatically
inferred from the viewer. Typical MIME types are HTML (.htm) and plain text (.txt) files. If this field remains blank, then the viewer filename extension is used to locate the MIME type in the appropriate registry. Windows hosts use the Windows Registry; other hosts use the SAS Registry.

**TARGET_VIEW_NAME**

specifies a character string that indicates the name of the rendered view for delivery to a WebDAV-compliant server. The specified target view name overrides the default name, which is index.html.

**TARGET_VIEWER_MIMETYPE**

see TARGET_VIEW_MIMETYPE.

**TARGET_VIEWER_NAME**

see TARGET_VIEW_NAME.

**TEXT_VIEWER_NAME**

specifies a character string that indicates the name of a text viewer template that formats package content for viewing in e-mail by using either FILEREF:SAS_filerref or FILENAME:external_filename. A text viewer template might be necessary if the destination e-mail program does not support the HTML MIME type.

**VIEWER_NAME**

specifies a character string that indicates the name of the HTML viewer template to be applied when publishing e-mail by using either FILEREF:SAS_filerref or FILENAME:external_filename.

**Details**

**Overview of Publishing to a Channel**

When a package is published to a channel, the package is published to each subscriber of the channel. Each subscriber's entry contains an attribute that specifies the publishing transport method: e-mail, message queue, WebDAV-Compliant server, or none.

You can use the Publishing Framework plug-in for SAS Management Console to define and manage channels and subscribers. This plug-in also enables subscribers to define filters that determine what packages are published to them. For more information about filters, see “Filtering Packages and Package Entries” on page 51.

When publishing to subscribers, the CALL PACKAGE_PUBLISH routine ensures that the package is published to each subscriber only once, thus eliminating any duplication. When the delivery transport is a message queue, the queue name is used as the key to enforce uniqueness. When the delivery transport is WebDAV, the collection URL is used as the key to enforce uniqueness. A parent URL is always unique because the WebDAV transport always creates a unique collection name for parent URLs. When the delivery transport is e-mail, the subscriber's e-mail address is used as the key to enforce uniqueness.
In order to publish to a channel, the publisher must have Write permission. For information about permissions by task for working with publishing channels, see *SAS Intelligence Platform: Security Administration Guide*.

**Note:** You can use the package cleanup utility to delete packages that have been published to a channel. This utility is part of the Web Infrastructure Platform. For more information, see the Javadoc.

### Default Properties

For channel subscribers who specify an e-mail delivery transport, the default action is to publish the e-mail message in plain text format. Only inserted references are published to the e-mail subscriber. For details, see the *CALL INSERT_REF Routine* on page 72.

The package description field precedes the reference value in the e-mail message. All other inserted entries are ignored. For channel subscribers who specify a queue delivery transport, the default action is to publish all inserted entries to the queue.

### Viewer Properties

To override the default e-mail behavior, you can specify the VIEWER_NAME or TEXT_VIEWER_NAME property on the CALL PACKAGE_PUBLISH routine. The specified viewer is used to create the content of the e-mail message and to apply substitutions. If you specify VIEWER_NAME, then the e-mail message is published in HTML format. If you specify TEXT_VIEWER_NAME, then the e-mail message is published in text format. Only the package information that is rendered by the viewer is published.

E-mail subscribers can configure the format in which they want to receive the e-mail, either in HTML or text format. The default behavior is that the message is published in HTML format. If the e-mail subscriber specifies text format, then the viewer is not used, and the subscriber receives reference entries only. For more information about the viewer facility, see the chapter about *viewer processing on page 21*.

The VIEWER_NAME and TEXT_VIEWER_NAME properties override the default behavior for WebDAV subscribers as well. If you specify VIEWER_NAME, then the view is rendered in HTML format. If you specify TEXT_VIEWER_NAME, then the view is rendered in text format. The specified viewer is used to create a rendered view that is named index.html. To override the default name that is assigned the rendered view, use the APPLIED_VIEWER_NAME or APPLIED_TEXT_VIEWER_NAME, as appropriate, to specify a filename for the rendered view.

The VIEWER_NAME and TEXT_VIEWER_NAME properties are ignored by the queue and archive transports.

If you specify the VIEWER_NAME or TEXT_VIEWER_NAME property with the COLLECTION_URL or PARENT_URL property, then the e-mail message contains a reference to a URL. The specified viewer is used to create a rendered view that is named index.html. To override the default name that is assigned to the rendered view, use the TARGET_VIEW_NAME or TARGET_VIEW_MIMETYPE, as appropriate, to specify a filename for the rendered view. The package is published to a WebDAV-compliant server. For channel subscribers who specify an e-mail delivery transport, the default action is to notify subscribers of the URL of the published package. For channel subscribers who specify a message queue delivery transport, no notification is given to indicate the package's availability on the web.
Archive Path Property

When publishing to subscribers, the ARCHIVE_PATH property indicates that the package is to be persisted to an archive using the specified archive path. The ARCHIVE_PATH property identifies where the archive is to be persisted. This property can be a physical pathname, an FTP URL, or an HTTP URL. The channel metadata can be defined with a default persistent store. A persistent store identifies a default transport that is used to persist the package before publishing to the channel subscribers. The persistent store can be defined as a default archive path. If you specify a blank value for the ARCHIVE_PATH property, then the channel’s default archive path is used to determine where the archive is to be persisted.

For channel subscribers who specify e-mail as the delivery transport, the created archive is included as an attachment to the e-mail message. If you specify the PROCESS_VIEWER property along with the ARCHIVE_PATH property, then the archive is created but is not sent as an attachment in e-mail. Instead, viewer processing occurs and the rendered view is sent in e-mail. For channel subscribers who specify a queue delivery transport, the created archive is published to the queue. For channel subscribers who specify a WebDAV delivery transport, the archive is published as a binary package to the WebDAV server.

If the ARCHIVE_PATH property is specified with a blank value, then the channel's default archive path metadata is used to determine where the archive is to be persisted. The name of the archive is automatically generated and the archive metadata is then cataloged in the channel metadata. For details about how to define a channel's default archive, see the Help in the Publishing Framework plug-in for SAS Management Console.

If the ARCHIVE_PATH is an HTTP URL, then the URL identifies the HTTP server to use when persisting the archive. If it is a secured server, then you must specify the HTTP_USER and HTTP_PASSWORD properties. Specifying the HTTP_PROXY_URL property is optional. If the ARCHIVE_PATH is an FTP URL, then the URL identifies the FTP server to use when persisting the archive. If it is a secured host, then you must specify the FTP_USER and FTP_PASSWORD properties.

Note: If you specify both the ARCHIVE_PATH and either the VIEWER_NAME or TEXT_VIEWER_NAME properties, then the viewer property is ignored.

Note: In order to create an archive under the z/OS operating environment, the z/OS environment must support UNIX System Services directories.

WebDAV Properties

The channel metadata can be defined with a default persistent store. A persistent store identifies a default transport that is used to persist the package before publishing to the channel subscribers. The persistent store can be defined as a default WebDAV server.

If the COLLECTION_URL or PARENT_URL property value is blank, then the package is published to the default WebDAV server configured in the channel metadata. If you specify a non-blank COLLECTION_URL or PARENT_URL property value, then the specified URL is used as the persisted location. When a non-blank value is specified for COLLECTION_URL, the URL identifies the full path and the explicit collection name. When a non-blank value is specified for PARENT_URL, the
URL identifies the full path and a unique name is assigned to the collection automatically.

Channel subscribers who specify an e-mail delivery transport are notified about the availability of the new collection. The e-mail message contains a reference to the value of the COLLECTION_URL or PARENT_URL property, which specifies the URL to which the package is published. For channel subscribers who specify a message queue delivery transport, no notification is given to announce the collection's availability.

The COLLECTION_URL (or PARENT_URL) property and the ARCHIVE_PATH property are mutually exclusive.

When publishing to a WebDAV-compliant server with the COLLECTION_URL or PARENT_URL properties, you can specify the following WebDAV properties: HTTP_PASSWORD, HTTP_PROXY_URL, HTTP_USER, IF_EXISTS, TARGET_VIEW_MIMETYPE, TARGET_VIEW_NAME, and VIEWER_NAME (or TEXT_VIEWER_NAME).

WebDAV publishing uses the following file extensions for each item type:

<table>
<thead>
<tr>
<th>Item Type</th>
<th>File Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATALOG</td>
<td>.sac</td>
</tr>
<tr>
<td>DATA</td>
<td>.sad</td>
</tr>
<tr>
<td>MDDB</td>
<td>.sam</td>
</tr>
<tr>
<td>REFERENCE</td>
<td>.ref</td>
</tr>
<tr>
<td>VIEW</td>
<td>.sav</td>
</tr>
</tbody>
</table>

Examples:

Example 1: Using PACKAGE_PUBLISH to Publish to Subscribers

The following example publishes the specified package to all subscribers of the Report channel. The SAS Metadata Server on ALPAIR03 is searched for the stored channel and subscriber information. The SAS Metadata Server is using port 4059 and the repository to use is MyRepos.

```bash
channelStore = 
   "SAS-OMA://alpair03.sys.com:4059";
channelName = "Report";
prop = "channel_store,metauser,metapass";
user = "myUserName";
password = "myPassword";
CALL PACKAGE_PUBLISH(packageId, "TO_SUBSCRIBERS", rc, prop,
   channelStore, user, password, channelName);
```
Example 2: Using PACKAGE_PUBLISH to Publish to Subscribers with the Subject Property

The following example publishes the package to all subscribers of the HR channel. The subject property is specified so that all e-mail subscribers will receive the message with the specified subject.

```plaintext
publishType = "TO_SUBSCRIBERS";
storeInfo = "SAS-OMA://alpair03.sys.com:8561";
channel = 'HR';
property = "SUBJECT, CHANNEL_STORE, METAUSER, METAPASS";
subject = "Weekly HR Updates:"
user = "myUserName";
password = "myPassword";
CALL PACKAGE_PUBLISH(packageId, "TO_SUBSCRIBERS",
    rc, property, subject, storeInfo, user, password, channel);
```

---

CALL PACKAGE_PUBLISH Routine: Publish Package to a WebDAV-Compliant Server

Publishes a package to a WebDAV-compliant server.

**Syntax**

```plaintext
CALL PACKAGE_PUBLISH(package-ID, publish-type, rc, properties,
    property-value-1, property-value-2, ...);
```

**Required Arguments**

<table>
<thead>
<tr>
<th><strong>package-ID</strong></th>
<th>identifies the package that is to be published.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Numeric, Input</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>publish-type</strong></th>
<th>indicates how to publish the package. To publish the package using the WebDAV transport, specify a publish-type of TO_WEBDAV.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Character, Input</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>rc</strong></th>
<th>receives a return code.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Numeric, Output</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>properties</strong></th>
<th>identifies a comma-separated list of optional property names. Specify any of the following property names, or specify &quot; to indicate that no properties are to be applied:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Note</strong></td>
<td>APPLIED_TEXT_VIEWER_NAME</td>
</tr>
</tbody>
</table>
CALL PACKAGE_PUBLISH Routine: Publish Package to a WebDAV-Compliant Server

- APPLIED_VIEWER_NAME
- ARCHIVE_FULLPATH
- ARCHIVE_NAME
- ARCHIVE_PATH
- COLLECTION_URL
- GENERATED_NAME
- HTTP_PASSWORD
- HTTP_PROXY_URL
- HTTP_TOKENAUTH
- HTTP_USER
- IF_EXISTS
- PARENT_URL
- TARGET_VIEW_MIMETYPE
- TARGET_VIEW_NAME
- TARGET_VIEWER_MIMETYPE
- TARGET_VIEWER_NAME
- TEXT_VIEWER_NAME
- VIEWER_NAME

**Type**: Character, Input

**Optional Argument**

*property-value-1, property-value-2, ...*

specifies one value for each specified property name. The order of the property values must match the order of the property names in the properties parameter. Valid property values are defined as follows:

- **APPLIED_TEXT_VIEWER_NAME**: specifies a character string that names the rendered package view, which results from the application of the text viewer template. To specify the name of the rendered package view, use either **FILEREF:**SAS_fileref or **FILENAME:**external_filename. This property is valid only when the TEXT_VIEWER_NAME property is also specified. By default, the rendered view is created as a temporary file. This property overrides the default, causing the rendered view to be saved permanently to a file.

- **APPLIED_VIEWER_NAME**: specifies a character string that indicates the name of the rendered package view, which results from the application of the HTML viewer template. To specify the name of the
rendered package view, use either
\texttt{FILEREF: SAS\textunderscore fileref} or
\texttt{FILENAME: external\_filename}. This
property is valid only when the
\texttt{VIEWER\_NAME} property is also
specified. By default, the rendered view
is created as a temporary file. This
property overrides the default, causing
the rendered view to be saved
permanently to a file.

\texttt{ARCHIVE\_FULLPATH} returns the complete URL path of the
published archive on the server. The
URL path includes the name of the archive, as specified by
\texttt{ARCHIVE\_NAME} or the generated
name if \texttt{ARCHIVE\_NAME} is not
specified. This output property is
returned only if \texttt{ARCHIVE\_PATH} is
specified.

\texttt{ARCHIVE\_NAME} specifies a character string that
indicates the name of the archive file.

\texttt{ARCHIVE\_PATH} specifies a character string that
indicates the path where the archive
should be created.

\texttt{COLLECTION\_URL} specifies a character string that
indicates the URL in which the
WebDAV collection is placed. You
assign an explicit filename to the
collection. Note that when you use
\texttt{COLLECTION\_URL}, the default
behavior is to replace the existing
collection at that location.

\texttt{GENERATED\_NAME} returns the name of the package,
whether this value was generated by
SAS or specified by another property.
This property is an output property. If
the package is published with a
\texttt{PARENT\_URL}, and \texttt{ARCHIVE\_PATH}
is not specified, then the package is
published as a folder that contains the
contents of the package and not as
a .spk file. In this case, the return value
for \texttt{GENERATED\_NAME} will not be the
name of the archive but the name of
the package. For SharePoint, this is a
folder name.

\texttt{HTTP\_PASSWORD} indicates the password that is needed
to bind to the web server on which the
package is published. Specify this
property only when the web server is
secured.

\texttt{HTTP\_PROXY\_URL} indicates the URL of the proxy server.
HTTP_TOKENAUTH enables token authentication to a SAS Content Server. Value must be set to TRUE, FALSE, YES, or NO. Do not specify values for HTTP_USER or HTTP_PASSWORD if you are using this property.

HTTP_USER indicates the user ID that is needed to bind to the web server on which the package is published. Specify this property only when the web server is secured.

IF_EXISTS specifies one of the following character strings. Use the IF_EXISTS property to control the treatment of same-named collections already existing on the server. "NOREPLACE" indicates that if the package being published contains a collection that already exists on the server, the PUBLISH_PACKAGE call is to return immediately without affecting the contents of the existing collection. "UPDATE" indicates that if the collection already exists on the server, the PUBLISH_PACKAGE call is to update the existing collection by replacing like-named entities and adding newly named entities. If "UPDATE" is specified and both the package to publish and the existing collection have an HTML set (created with INSERT_HTML) with the same NESTED_NAME, then the HTML set in the published package replaces the HTML set in the existing collection. "UPDATEANY" is identical to "UPDATE" except that the CALL PUBLISH_PACKAGE routine can be used to update a collection that SAS did not create. A consequence of using "UPDATEANY" is that SAS will be unable to retrieve the published package. Note that when names are generated automatically for HTML set collections, the publish code ensures that name collisions will not occur.

PARENT_URL specifies a character string that indicates the URL under which the WebDAV collection is placed. The collection is automatically assigned a unique name.

TARGET_VIEW_MIMETYPE specifies a character string that indicates the MIME type of the rendered view for delivery to a WebDAV-compliant server. The target
view MIME type overrides the default view MIME type, which is automatically inferred from the viewer. Typical MIME types are HTML (.htm) and plain text (.txt) files. If this field remains blank, then the viewer filename extension is used to locate the MIME type in the appropriate registry. Windows hosts use the Windows Registry; other hosts use the SAS Registry.

**TARGET_VIEW_NAME** specifies a character string that indicates the name of the rendered view for delivery to a WebDAV-compliant server. The specified target view name overrides the default name, which is index.html.

**TEXT_VIEWER_NAME** specifies a character string that indicates the name of a text viewer template that formats package content for viewing in e-mail by using either FILENAME:external_filename. A text viewer template might be necessary if the destination e-mail program does not support the HTML MIME type.

**VIEWER_NAME** specifies a character string that indicates the name of the HTML viewer template to be applied when publishing e-mail by using either FILENAME:external_filename.

<table>
<thead>
<tr>
<th>Type</th>
<th>Character or Numeric, Input or Output</th>
</tr>
</thead>
</table>

**Details**

**Default Behavior**

Publishing with a *publish-type* of TO_WEBDAV publishes a package to a specified URL on a WebDAV-compliant server. Starting with SAS 9.2, the HTTPS protocol is supported when publishing to a WebDAV server. WebDAV servers enable distributed authoring and versioning, which enables collaborative development of web files on remote servers.

The WebDAV transport stores package entries as members of a collection.

If you specify the COLLECTION_URL property, then the package is published to the specified URL on a WebDAV-compliant web server. When you use COLLECTION_URL, the default behavior is to replace the existing collection and its nested directories at that location. If you do not want to replace an existing collection and its nested directories, then you must use the IF_EXISTS property. An example of a collection URL is

http://www.host.com/AlphaliteAirways/revenue/quarter1

The collection is named quarter1.
The PARENT_URL property is similar to the COLLECTION_URL property except that it specifies the location under which the new WebDAV collection is to be placed. The CALL PUBLISH_PACKAGE routine generates a unique name for the new collection. The unique name is limited to eight characters with the first character as an s. An example of a parent URL directory location is http://www.host.com/AlphaliteAirways/revenue. An example of a collection name that is automatically generated might be s9811239.

The specifications of the COLLECTION_URL property and the PARENT_URL property are mutually exclusive.

To announce the availability of new WebDAV collections on WebDAV-compliant servers, use a publish-type of TO_SUBSCRIBERS or TO_EMAIL.

WebDAV publishing uses the following file extensions for each item type:

**Table 5.6 File Extensions for Item Types**

<table>
<thead>
<tr>
<th>Item Type</th>
<th>File Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCHIVE</td>
<td>.spk</td>
</tr>
<tr>
<td>CATALOG</td>
<td>.sac</td>
</tr>
<tr>
<td>COMMA-SEPARATED VALUES</td>
<td>.csv</td>
</tr>
<tr>
<td>DATA</td>
<td>.sad</td>
</tr>
<tr>
<td>MDDB</td>
<td>.sam</td>
</tr>
<tr>
<td>REFERENCE</td>
<td>.ref</td>
</tr>
<tr>
<td>VIEW</td>
<td>.sav</td>
</tr>
</tbody>
</table>

If you are publishing to SharePoint or WebDAV, SSL setup can be done using TKESSL. For more information, see *Encryption in SAS*.

**Viewer Properties**

If you specify the VIEWER_NAME property with the COLLECTION_URL or PARENT_URL property, then the view is rendered in HTML format. If you specify the TEXT_VIEWER_NAME with the COLLECTION_URL or PARENT_URL properties, then the view is rendered in text format.

The specified viewer is used to create a rendered view that is named index.html. To override the default name that is assigned to the rendered view, use the APPLIED_VIEWER_NAME or APPLIED_TEXT_VIEWER_NAME, as appropriate, to specify a filename for the rendered view.

**Archive Path Properties**

If you specify the ARCHIVE_PATH property, then an archive is created and published as a binary package on a WEBDAV-compliant server. All entries that are inserted into the package are published as an archive. If you specify a value for ARCHIVE_PATH, then the created archive is stored at the designated location.
create a temporary archive that is deleted after the package is published, specify an ARCHIVE_PATH value of "" or "tempfile".

For more details about how to use the archive properties, see "CALL PACKAGE_PUBLISH Routine: Publish Package to Archive" on page 80.

---

**Note:** In order to create an archive under the z/OS operating environment, the z/OS environment must support UNIX System Services directories.

---

When publishing a binary package with the WEBDAV transport, you can specify the following archive properties: ARCHIVE_NAME, ARCHIVE_PATH, or ARCHIVE_FULLPATH.

**Applying a Name/Value Pair to a Package and a Package Item**

When publishing to a WebDAV-compliant server, optional name/value pairs are transmitted to the WebDAV server in XML format. XML format requires that the name portion of the name/value pair specification follow these conventions:

- It must begin with an alphabetic character or an underscore.
- It can contain only alphabetic characters, numeric characters, and these special characters: . (period), - (hyphen), and _ (underscore).

If a namespace is associated with the name portion of a name/value pair, then the name can also include a colon (:). Name/value pairs not explicitly associated with a namespace might not be retained by the WebDAV server. For details about the NAMESPACE property or about specifying the name-value parameter for an entire package, see PACKAGE_BEGIN on page 77.

For details about specifying the name-value parameter for a single package item, see the applicable INSERT_ITEM CALL routine, where item can be any of the following:

- CATALOG
- DATASET
- FILE
- HTML
- MDDB
- PROC SQL VIEW
- REFERENCE
- VIEWER

**Examples:**

**Example 1: Using PACKAGE_PUBLISH to Publish to a WebDAV Server**

The following example uses the HTTPS protocol when publishing to the WebDAV server:

```plaintext
rc = 0;
publishType = "TO_WEBDAV";
http_user="vicdamone";
```
Example 2: Using PACKAGE_PUBLISH to Publish to a Specified Proxy Server

The following example publishes a package to a URL via the specified proxy server by using the specified credentials:

```c
rc = 0;
publishType = "TO_WEBDAV";
properties="COLLECTION_URL, HTTP_PROXY_URL,
           IF_EXISTS, HTTP_USER, HTTP_PASSWORD";
cUrl = "http://www.alpair.secureweb/NightlyMaintReport";
pUrl = "http://www.alpair.proxy:8000/";
exists = "update";
user = "JohnSmith";
password = "secret";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties,
                      cUrl, pUrl, exists, user, password);
```

Example 3: Using PACKAGE_PUBLISH to Publish a Collection URL on a WebDAV-Compliant Server to a WebDAV Server

The following example uses the e-mail transport to publish a collection URL on a WebDAV-compliant server. The HTTP user ID and password enable the publisher to bind to the secured HTTP server. All e-mail recipients who are members of the mail list receive the e-mail announcement that the best rates are accessible at the specified URL.

```c
publishType = "TO_EMAIL";
properties="COLLECTION_URL, SUBJECT,
           HTTP_USER, HTTP_PASSWORD";
collurl="http://www.alphaliteairways/fares/discount.html";
subj="Announcing Best Rates Yet";
http_user="vicdamone";
http_password="myway";
Addr = "admins-l@alphaliteair05";
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties,
                      collurl, subj, http_user, http_password, Addr);
```

Example 4: Using PACKAGE_PUBLISH to Publish to a WebDAV Server with the ARCHIVE_PATH Property

The following example uses the ARCHIVE_PATH property to publish a binary package to the WebDAV-compliant server. The archive path is specified as "tempfile" so that the locally created archive file will be deleted once it has been published to the WebDAV server.

```c
publishType = "TO_WEBDAV";
properties="COLLECTION_URL, ARCHIVE_PATH";
cUrl = "http://www.alpair.secureweb/Reports";
apath = "tempfile";
```
CALL PACKAGE_PUBLISH(packageId, publishType, rc, properties, cUrl, apath);

CALL COMPANION_NEXT Routine

Retrieves the next companion HTML file in the ODS HTML set.

Syntax

CALL COMPANION_NEXT(entry-ID, path, filename, url, rc <, properties, property-value-1, property-value-2, ...> );

Required Arguments

entry-ID
identifies the companion HTML file entry.
Type Numeric, Input

path
specifies the full path of the location that will receive the retrieved file.
Type Character, Input

filename
returns the name of the new file.
Type Character, Output

url
returns the URL of the companion file.
Type Character, Output

rc
receives a return code.
Type Numeric, Output

Optional Arguments

properties
identifies a comma-separated list of optional property names. Valid property names are as follows:
- ENCODING
- MIMETYPE
Type Character, Input
**property-value-1, property-value-2, ...**
specifies one value for each specified property name. The order of the property values must match the order of the property names in the **properties** parameter. Valid property values are defined as follows:

**ENCODING** input character string that specifies the target encoding for the companion file. The companion file is translated into the specified encoding. An example of a target encoding value is ISO-8859-1.

**MIMETYPE** character output parameter that identifies the MIME type of the companion file. The MIME type is returned in the MIMETYPE variable. The publisher of the companion file can set the user-specified MIME type after the companion file is published. If the publisher does not specify the MIME type, then the returned value is blank.

**Type** Character, Input

**Details**

The publisher can choose to publish any combination of the HTML files. Included in the set of published files can be any number of additional HTML files or companion files.

The **filename** and **url** parameters are character variables that are updated by the CALL routine. Because they are updated, they must be initialized with a length large enough to contain the name of the file or the URL that is being returned. If not, the returned value will be truncated and a warning will be printed indicating that one or more parameters were truncated. When called from within the DATA step, use the LENGTH statement to define the length of the variable. When called from within a macro, initialize the variable to some value so that it will have an appropriate length.

For details about how HTML files are published and how the optional encoding property can be used to provide encoding information to package recipients, see “Publish and Retrieve Encoding Behavior” on page 49.

**Examples:**

**Example 1: Using COMPANION_NEXT**

The following example retrieves an HTML file and then retrieves the next companion HTML file in the set.

```plaintext
data _null_;
length contents $64 frame $64 pages $64
     body $64 contentsUrl $256 frameUrl $256
     PagesUrl $256 bodyUrl $256;
path ='/finance/accounting/doc';
CALL RETRIEVE_HTML(entryId, path, body, bodyUrl, frame,
     frameUrl, contents, contentsUrl, pages, pagesUrl,rc);

CALL COMPANION_NEXT(entryId, path, fname, url, rc);
```
Example 2: Using COMPANION_NEXT with Specified MIME Type

The following example retrieves an HTML file and then retrieves the next companion HTML file in the set. If the publisher specifies a MIME type when publishing a package, then the optional MIMETYPE property is specified in order for its MIME type to be returned. The MIME type will be returned in the mime variable.

data _null_;  
length contents $64 frame $64 pages $64 body $64  
   contentsUrl $256 frameUrl $256 PagesUrl $256  
   bodyUrl $256 mime $64;  
path ='/finance/accounting/doc';  
CALL RETRIEVE_HTML(entryId, path, body, bodyUrl, frame,  
   frameUrl, contents, contentsUrl, pages, pagesUrl,rc);  
properties="MIMETYPE";  
CALL COMPANION_NEXT(entryId, path, fname,  
   url, rc, properties, mime);  

CALL ENTRY_FIRST Routine

Returns header information for the first entry in a package.

Syntax

CALL ENTRY_FIRST(package-ID, entry-ID, entry-type, user-specified-string,  
description, name-value,  
rc<, properties, property-value-1, property-value-2, ...> );  

Required Arguments

package-ID  
identifies the package.  
Type Numeric, Input

entry-ID  
returns the identifier of the entry.  
Type Numeric, Output

entry-type  
returns the type of the entry. Available types include the following:

- BINARY
- CATALOG
- DATASET
- HTML
- MDDB
CALL ENTRY_FIRST Routine

- NESTED_PACKAGE
- REFERENCE
- SQLVIEW
- TEXT
- VIEWER

**Type** Character, Output

**user-specified-string**

returns a string from the specified entry. For string content, see the Details section.

**Type** Character, Output

**description**

returns the entry description from the specified entry.

**Type** Character, Output

**name-value**

returns the name/value pairs assigned to the specified entry. Name/value pairs are site-specific; they are used for the purpose of filtering.

**Type** Character, Output

**rc**

receives a return code.

**Type** Numeric, Output

Optional Arguments

**properties**

identifies a comma-separated list of optional property names. Valid property names are as follows:

- FILENAME

**Type** Character, Input

**property-value-1, property-value-2, ...**

returns one value for each specified property name. Valid property names are supported as follows:

FILENAME output character string variable that returns the name of the file (as it exists in the package).

**Type** Character, Output

**Details**

The header information returned by this CALL routine identifies the type of the entry and provides descriptive information.
The ENTRY_FIRST CALL routine repositions the entry cursor to the start of the list of entries. When the packages are retrieved by way of the CALL RETRIEVE_PACKAGE routine, the entry cursor is positioned at the start of the entry list by default. As a consequence, the CALL ENTRY_FIRST routine does not have to be called before the CALL ENTRY_NEXT routine.

The user-specified-string parameter is returned to provide further content information about the entry. The value returned is the value that was provided by the publisher at insert time. At this time, only file entries can return a value for this parameter. All other entry types return a blank value. For file entries, this field is the user-specified MIME type.

Example: Using ENTRY_FIRST

The following example returns header information for the first entry in the package.

CALL ENTRY_FIRST(packageId, entryId, type, uSpec, desc, nv, rc);

CALL ENTRY_NEXT Routine

Returns header information from the next entry in a package.

Syntax

CALL ENTRY_NEXT(package-ID, entry-ID, entry-type, user-specified-string, description, name-value, rc<, properties, property-value-1, property-value-2, …>);

Required Arguments

**package-ID**

identifies the package.

Type Numeric, Input

**entry-ID**

returns the identifier of the entry.

Type Numeric, Output

**entry-type**

returns the type of the entry. Available types include the following:

- BINARY
- CATALOG
- DATASET
- HTML
- MDDB
- NESTED_PACKAGE
REFERENCE
SQLVIEW
TEXT
VIEWER

**user-specified-string**
returns a string from the specified entry. For string content, see the Details section.

**description**
returns the entry description from the specified entry.

**name-value**
returns the name/value pairs assigned to the specified entry. Name/value pairs are site-specific; they are used for the purpose of filtering.

**rc**
receives a return code.

Optional Arguments

**properties**
identifies a comma-separated list of optional property names. Valid property names are as follows:

- **FILENAME**

**property-value-1, property-value-2, …**
returns one value for each specified property name. Valid property names are supported as follows:

FILENAME output character string variable that returns the name of the file (as it exists in the package).

Details
The header information returned by this CALL routine identifies the type of the entry and provides descriptive information.

The user-specified-string parameter provides content information about the entry. The value returned is the value that was provided by the publisher when the entry was inserted in the package. For this release, only file entries can return a
value for this parameter. All other entry types return a blank value. For file entries, this field is the user-specified MIME type.

When a package is retrieved, the entry cursor is positioned at the start of the entry list by default. As a consequence, the `CALL ENTRY_FIRST routine` does not have to be called before `CALL ENTRY_NEXT routine`. The `CALL ENTRY_FIRST routine` can be used at a later time in order to move the entry cursor back to the start of the entry list.

**Example: Using ENTRY_NEXT**

The following example positions the cursor at the start of an entry list.

```
CALL ENTRY_NEXT(packageId, entryId, type,
               uSpec, desc, nv, rc);
```

---

**CALL PACKAGE_DESTROY Routine**

Deletes a package.

**Syntax**

```
CALL PACKAGE_DESTROY(package-ID, rc);
```

**Required Arguments**

- **package-ID**
  - identifies the package to be deleted.
  - Type: Numeric, Input

- **rc**
  - receives a return code.
  - Type: Numeric, Output

**Details**

If the queue transport is used, then the package is removed from the queue, along with all messages that are associated with the package. If the package contains nested packages, then all entries that are contained within the nested packages are also removed from the queue. If the archive transport is used, then the archive is deleted. If the WebDAV transport is used, then the package and its contents are deleted from the WebDAV server. If the SharePoint transport is used, then the package and its contents are removed from the SharePoint server.

The `CALL PACKAGE_DESTROY routine` does not support package identifiers that represent nested packages, which are returned by way of the `CALL RETRIEVE_NESTED routine`. The `CALL PACKAGE_DESTROY routine` supports only top-level package identifiers, which are returned by the `CALL PACKAGE_FIRST` and `CALL PACKAGE_NEXT` routines.
Example: Using the CALL PACKAGE_DESTROY Routine

The following example removes a package from a queue.

```c
rc=0;
CALL PACKAGE_DESTROY(packageId, rc);
```

CALL PACKAGE_FIRST Routine

Returns the header information for the first package in the package list.

Syntax

```c
CALL PACKAGE_FIRST(package-list-ID, package-ID, number-of-entries,
    description, datetime,
    name-value, channel, rc<, properties, property-value-1, property-value-2, ...>);
```

Required Arguments

- **package-list-ID**
  - identifies the list of retrieved packages.
  - Type: Numeric, Output

- **package-ID**
  - identifies the retrieved package.
  - Type: Numeric, Output

- **number-of-entries**
  - returns the number of entries in the package.
  - Type: Numeric, Output

- **description**
  - returns a description of the package.
  - Type: Character, Output

- **datetime**
  - returns the date and time that the package was published, in GMT format.
  - Type: Numeric, Output

- **name-value**
  - returns the name/value pairs assigned to the package. Name/value pairs are site-specific; they are used for the purpose of filtering.
  - Type: Character, Output

- **channel**
  - returns the name of a channel to which the package was published.
  - Type: Character, Output
rc receives a return code.

Type Numeric, Output

Optional Arguments

properties identifies a comma-separated list of optional property names to be returned from the package. Valid property names are as follows:

■ ABSTRACT
■ EXPIRATION_DATETIME

Type Character, Input

property-value-1, property-value-2, ...
returns one value for each specified property. The order of the values matches the order of the property names in the properties parameter. Valid property values are defined as follows:

ABSTRACT character string variable, if specified, is returned to the ABSTRACT variable.

EXPIRATION_DATETIME numeric variable, if specified, is returned as the package expiration date-and-time stamp to the EXPIRATION_DATETIME variable. The date-and-time stamp is in GMT format.

Type Character or Numeric, Output

Examples:

Example 1: Using PACKAGE_FIRST

The following example opens the JSMITH queue, retrieves the descriptive header information for all packages, and then returns the header information for the first package.

plist=0;
qname = "MQSERIES://LOCAL:JSMITH";
rc=0;
total=0;
nameValue='';
CALL RETRIEVE_PACKAGE(plist, "FROM_QUEUE",
                      qname, total, rc);

packageId = 0;
desc='';
um=0;
dt=0;
nv='';
ch='';
rc=0;
CALL PACKAGE_FIRST(plist, packageId,
Example 2: Using PACKAGE_FIRST with Properties

The following example demonstrates the use of properties.

```c
plist=0;
qname = "MQSERIES://LOCAL:JSMITH";
rc=0;
total=0;
nameValue='';
CALL RETRIEVE_PACKAGE(list, "FROM_QUEUE",
   qname, total, rc);

packageId = 0;
desc='';
um=0;
exp=0;
abstract='';
dt=0;
nv='';
ch='';
rc=0;
props='ABSTRACT, EXPIRATION_DATETIME';
CALL PACKAGE_FIRST(plist, packageId, num, desc,
   dt, nv, ch, rc, props, abstract, exp);
```

CALL PACKAGE_NEXT Routine

Returns the header information for the next package in the package list.

**Syntax**

```c
CALL PACKAGE_NEXT(package-list-ID, package-ID, number-of-entries, description, datetime,
   name-value, channel, rc<, properties, property-value-1, property-value-2, ...>);
```

**Required Arguments**

- **package-list-ID**
  - identifies the list of retrieved packages.
  - **Type**: Numeric, Input

- **package-ID**
  - returns the name of the retrieved package.
  - **Type**: Numeric, Output

- **number-of-entries**
  - returns the total number of entries in the package.
**description**

describes the package.

**datetime**

returns the date and time value that the package was published, in GMT format.

**name-value**

returns the name/value pairs assigned to the package. Name/value pairs are site-specific; they are used for the purpose of filtering.

**channel**

returns the name of the channel to which the package was published.

**rc**

receives a return code.

Optional Arguments

**properties**

identifies a comma-separated list of optional property names to be returned from the package. Valid property names are as follows:

- **ABSTRACT**
- **EXPIRATION_DATETIME**

**property-value-1, property-value-2, ...**

returns one value for each specified property. The order of the values matches the order of the property names in the **properties** parameter. Valid property values are defined as follows:

- **ABSTRACT**
  character string variable, if specified, is returned to the ABSTRACT variable.

- **EXPIRATION_DATETIME**
  numeric variable, if specified, is returned as the package expiration date/time stamp to the EXPIRATION_DATETIME variable. The date/time stamp is in GMT format.
Examples:

Example 1: Using PACKAGE_NEXT

The following example returns the header information for the next package that is associated with the list of packages named PLIST.

```c
packageId = 0;
desc='';
num=0;
exp=0;
dt=0;
nv='';
ch='';
rc=0;
CALL PACKAGE_NEXT(plist, packageId, num, desc, dt, nv, ch, rc);
```

Example 2: Using PACKAGE_NEXT with the ABSTRACT Property

The following example uses the ABSTRACT property so that the abstract value is returned in the abs variable.

```c
packageId = 0;
desc='';
num=0;
exp=0;
dt=0;
nv='';
ch='';
abs='';
props="ABSTRACT";
rc=0;
CALL PACKAGE_NEXT(plist, packageId, num, desc, dt, nv, ch, rc, props, abs);
```

CALL PACKAGE_TERM Routine

Frees all resources associated with the package list identifier.

Syntax

```c
CALL PACKAGE_TERM(package-list-ID, rc);
```

Required Arguments

- **package-list-ID**
  - identifies the list of packages.
  - Type: Numeric, Input
**rc**
receives a return code.
Type Numeric, Output

**Details**
This CALL routine is used when publishing a package.

**Note:** This CALL routine is required if you are using circular referential integrity constraints (if you are publishing a package that references another package, which in turn references the original package).

**Example: Using PACKAGE_TERM**
The following example frees all resources that are associated with `packageListId`.

```sas
CALL PACKAGE_TERM(packageListId, rc);
```

### CALL RETRIEVE_CATALOG Routine
Retrieves a catalog from a package.

**Syntax**

```sas
CALL RETRIEVE_CATALOG(entry-ID, libref, member-name, rc);
```

**Required Arguments**

- **entry-ID**
  identifies the catalog entry.
  Type Numeric, Input

- **libref**
  specifies the SAS library that will contain the retrieved catalog.
  Type Character, Input

- **member-name**
  names the retrieved catalog.
  Type Character, Input

- **rc**
  receives a return code.
  Type Numeric, Output
Details
If the member-name parameter is blank, then the CALL RETRIEVE_CATALOG routine creates the catalog by using the original member name as it was defined at publish time.

Example: Using RETRIEVE_CATALOG
The following example retrieves a catalog from the package and creates the catalog WORK.TMPCAT.

```plaintext
lib = 'work';
mem = 'tmpcat';
CALL RETRIEVE_CATALOG(entryId, lib, mem, rc);
```

CALL RETRIEVE_DATASET Routine
This CALL routine retrieves a data set entry from a package.

Syntax

```plaintext
CALL RETRIEVE_DATASET(entry-ID, libref, member-name, rc <, properties, property-value-1, property-value-2, ... > );
```

Required Arguments

- **entry-ID**
  - identifies the data set entry.
  - Type: Numeric, Input

- **libref**
  - specifies the SAS library that will contain the retrieved data set.
  - Type: Character, Input

- **member-name**
  - names the retrieved data set.
  - Type: Character, Input

- **rc**
  - receives a return code.
  - Type: Numeric, Output

Optional Arguments

- **properties**
  - identifies a comma-separated list of optional property names. Valid property names are as follows:
  - DATASET_OPTIONS
CSV_SEPARATOR
CSV_FLAG

**property-value-1, property-value-2, ...**
specifies one value for each specified property name. The order of the property values must match the order of the property names in the `properties` parameter. Valid property values are defined as follows:

**DATASET_OPTIONS** character parameter SAS data set options that are to be applied to the retrieved data set. For a complete list of data set options, see the SAS Data Set Options topic in the SAS Help.

**CSV_SEPARATOR** character property that applies only when the CALL RETRIEVE_DATASET routine is called on a CSV file entry. When this occurs, the CSV file is transformed into a SAS data set. A binary CSV file is identified by a MIME type of `application/x-comma-separated-values`. Use the CSV_SEPARATOR property to indicate the separator to be used when creating the CSV file. The default separator is a comma. If the CSV file was created at publish time by transforming a SAS data set into a CSV file, then the separator used to create the CSV file will always take precedence. If the CSV file was not created at publish time, then the CSV_SEPARATOR property can be used to specify the separator value used. If the CSV file was not created at publish time and no separator property is specified, then the separator is specified as a comma, by default.

**CSV_FLAG** character property that only applies when calling the CALL RETRIEVE_DATASET routine for a binary file entry. A binary CSV file is identified by a MIME type of `application/x-comma-separated-values`. This property is a CSV override flag. By default when converting this binary CSV file into a SAS data set, the first line will be processed as variable names. The second line will be processed as variable label names. All remaining lines will be processed as data. To override this default behavior, the CSV_FLAG value must be NO_VARIABLES or NO_LABELS. To specify both values, specify two CSV_FLAG properties, one with a value of NO_VARIABLES, the other with a value of NO_LABELS. By default, when a CSV file is converted into a data set, the variable lengths are determined by the first row of data. If subsequent rows have greater lengths, then the variable data is truncated. To override this default behavior, specify the CSV_FLAG with a property of NO_TRUNCATION. When this flag value is specified, truncation will not occur, but multiple passes of the data might be necessary in order to perform the resizing.
CALL RETRIEVE_DATASET Routine

If the MEMNAME parameter is blank, then the CALL RETRIEVE_DATASET routine creates the data set using the original member name as it was defined at publish time.

Examples:

Example 1: Using RETRIEVE_DATASET

The following example retrieves the data set WORK.OUTDATA entry from the package.

```plaintext
lib = 'work';
mem = 'outdata';
CALL RETRIEVE_DATASET(rid, lib, mem, rc);
```

Example 2: Using RETRIEVE_DATASET with CSV_FLAG Properties

The following example specifies two CSV_FLAG properties.

```plaintext
prop='CSV_SEPARATOR,CSV_FLAG,CSV_FLAG';
separator='/';
flag1 = 'NO_VARIABLES';
flag2 = 'NO_LABELS';
CALL RETRIEVE_DATASET(entryId, libname, memname,
    rc, prop, separator, flag1, flag2);
```

CALL RETRIEVE_FILE Routine

Retrieves an external binary or text file from a package.

Syntax

```plaintext
CALL RETRIEVE_FILE(entry-ID, filename, rc);
```

Required Arguments

- `entry-ID`
  - identifies the file entry.
  - Type: Numeric, Input

- `filename`
  - specifies the name of the file or fileref, using the following syntax:
    - FILENAME: external_filename
    - FILEREF: SAS_fileref
Type  Character, Input

rc  receives a return code.
Type  Numeric, Output

Details
Specifying "FILENAME:", without a filename, applies to the retrieved file the same name that was used when the file was initially inserted into the package.

Example: Using RETRIEVE_FILE
The following example retrieves a binary file from a queue.

define fname = "filename: /users/jsmith.bin"
CALL RETRIEVE_FILE(entryId, fname, rc);

CALL RETRIEVE_HTML Routine
Retrieves an HTML entry from a package.

Syntax
CALL RETRIEVE_HTML(entry-ID, path, body, body-URL, frame, frame-URL, contents, contents-URL, pages, pages-URL, rc<, properties, property-value-1, property-value-2, …>);

Required Arguments

- **entry-ID** identifies the HTML entry.
  Type  Numeric, Input

- **path** specifies the full designation of the location that will receive the retrieved files.
  Type  Character, Input

- **body** returns the name of the HTML body file.
  Type  Character, Output

- **body-URL** returns the URL of the HTML body file.
  Type  Character, Output
frame
returns the name of the HTML frame file.
Type Character, Output

frame-URL
returns the URL of the HTML frame file.
Type Character, Output

contents
returns the name of the HTML contents file.
Type Character, Output

contents-URL
returns the URL of the HTML contents file.
Type Character, Output

pages
returns the name of the HTML page file.
Type Character, Output

pages-URL
returns the URL of the HTML page file.
Type Character, Output

rc
receives a return code.
Type Numeric, Output

Optional Arguments

properties
identifies a comma-separated list of optional property names. Valid property names are as follows:
- ENCODING
- BODY_TOTAL
- FILE_TOTAL
- COMPANION_TOTAL
Type Character, Input

property-value-1, property-value-2, ...
specifies one value for each specified property name. The order of the property values must match the order of the property names in the properties parameter. Valid property values are defined as follows:

ENCODING input character string that indicates the target encoding for the retrieved HTML file. An example of a target encoding value is ISO-8859-1.
BODY_TOTAL  numeric output parameter that returns the total number of HTML body files published as part of this set.

FILE_TOTAL  numeric output parameter that returns the total number of all HTML files published as part of this set. This includes all body, page, contents, frame, and additional HTML files and companion files.

COMPANION_TOTAL  numeric output parameter that returns the total number of extraneous HTML files that were published as part of this set.

Type  Character or Numeric, Input or Output

Details
The ODS entry can contain any combination of the following: ODS HTML file, contents file, pages file, or frame file.

The publisher can choose to publish any combination of the HTML files. To indicate those files that were not published as part of this set, the output parameter that contains the created filename will be updated to "". For example, if only the body was published, then the page, contents, and frame parameters will be returned as "".

The pages, pages-URL, body, body-URL, frame, frame-URL, contents, and contents-URL parameters are character variables that are updated by the CALL routine. Because they are updated, they must be initialized with a length large enough to contain the name of the returned filename or URL. If the length of the character variable is less than the length of the returned filename or URL, the filename or URL will be truncated and a warning will be issued. When calling the CALL RETRIEVE_HTML routine from within the DATA step, use the LENGTH statement to define the length of the character variable. When calling RETRIEVE_HTML from within a macro, initialize the variable to some value so that it will have an appropriate length, as shown in the second example below.

For information on how HTML files are published and how the optional encoding property can be used to provide encoding information to package recipients, see “Publish and Retrieve Encoding Behavior” on page 49.

Examples:

Example 1: Using RETRIEVE_HTML
The following example retrieves HTML entry information from the package.

data _null_;
length contents $64 frame $64 pages $64 body $64
   contentsUrl $256 frameUrl $256
   PagesUrl $256 bodyUrl $256;
   path = '/maintenance/schedule/doc';
CALL RETRIEVE_HTML(entryId, path, body,
   bodyUrl, frame, frameUrl, contents,
   contentsUrl, pages, pagesUrl, rc);
Example 2: Using RETRIEVE_HTML with Macro Variables

The following example uses a macro to initialize a variable to a specific length and then retrieves HTML information from the package.

```sas
%macro initLen(variable, len);
    %let &variable=.;
    %do i=2 %to &len
        %let &variable=&&&variable
    %end;
%mend;

%initLen(contents, 64);
%initLen(contentsUrl, 256);
%initLen(pages, 64);
%initLen(pagesUrl, 256);
%initLen(body, 64);
%initLen(bodyUrl, 256);
%initLen(frame, 64);
%initLen(frameUrl, 256);
%let path=/users/maintenance/doc;
%let rc=0;
%syscall RETRIEVE_HTML(entryId, path, body, bodyUrl, frame, frameUrl, contents, contentsUrl, pages, pagesUrl, rc);
```

CALL RETRIEVE_MDDB Routine
Retrieves an MDDB entry from a package.

**Syntax**

```sas
CALL RETRIEVE_MDDB(entry-ID, libref, member-name, rc);
```

**Required Arguments**

- **entry-ID**
  - identifies the MDDB entry.
  - Type: Numeric, Input

- **libref**
  - specifies the SAS library that will contain the retrieved MDDB.
  - Type: Character, Input

- **member-name**
  - specifies the name of the retrieved MDDB.
  - Type: Character, Input
rc receives a return code.

Type Numeric, Output

Details

An MDDB is a multidimensional database (not a data set) offered by SAS. An MDDB is a specialized storage facility that can be created by tools such as multidimensional data viewers, which populate the MDDB with data that is retrieved from sources such as a data warehouse. The matrix format of MDDBs allows the viewer to access data quickly and easily.

If the member-name parameter is blank, then the CALL RETRIEVE_MDDB routine creates the MDDB using the original member name as it was defined at publish time.

Example: Using RETRIEVE_MDDB

The following example retrieves an MDDB entry WORK.OUTDATA from the package:

```
lib = 'work';
mem = 'outdata';
CALL RETRIEVE_MDDB(entryId, lib, mem, rc);
```

CALL RETRIEVE_NEStED Routine

Retrieves the descriptive header information for a nested package entry.

Syntax

```
CALL RETRIEVE_NEStED(entry-ID, package-ID, number-of-entries, description,
datetime,
name-value, rc);
```

Required Arguments

**entry-ID**

identifies the nested package entry.

Type Numeric, Input

**package-ID**

returns the identifier of the nested package.

Type Numeric, Output

**number-of-entries**

returns the number of entries in the nested package.

Type Numeric, Output
**description**
returns the description of the nested package entry.

*Type* Character, Output

**datetime**
returns the date and time that the nested package was published, in GMT format.

*Type* Numeric, Output

**name-value**
returns the name/value pairs assigned to the specified entry. Name/value pairs are site-specific; they are used for the purpose of filtering.

*Type* Character, Output

**rc**
receives a return code.

*Type* Numeric, Output

**Details**
The descriptive header information that is returned on this CALL routine includes the nested package description, name/value string, datetime stamp, and total number of entries that are contained in the nested package.

The returned package-ID can then be used on subsequent CALL ENTRY_FIRST and CALL ENTRY_NEXT routines to retrieve the entry information.

Package identifiers that are returned on the CALL RETRIEVE_NESTED routine cannot be used on the CALL PACKAGE_DESTROY routine. The CALL RETRIEVE_NESTED routine supports only top-level packages, excluding nested packages. When PACKAGE_DESTROY is called on a top-level package, all entries, including all nested packages and their entries, are removed from the queue.

**Example: Using RETRIEVE_NESTED**
The following example retrieves the descriptive header information for the nested package entry that is associated with entryId.

```c
packageId=0;
num=0;
desc='';
dt=0;
nv='';
rc=0;
CALL RETRIEVE_NESTED(entryId, packageId,
   num, desc, dt, nv, rc);
```

**CALL RETRIEVE_PACKAGE Routine**
This CALL routine retrieves descriptive header information for all packages.
Syntax

CALL RETRIEVE_PACKAGE(package-list-ID, retrieval-type, retrieval-information, total-packages, rc<, properties, property-value-1, property-value-2, ...>);

Required Arguments

**package-list-ID**
identifies the list of packages.

*Type* Numeric, Output

**retrieval-type**
specifies the transport to use when retrieving a package. Valid values include the following:

- FROM_QUEUE
- FROM_ARCHIVE
- FROM_WEBDAV
- FROM_SHAREPOINT

*Type* Character, Input

**retrieval-information**
specifies transport-specific information that determines the package to retrieve. When retrieving from an archive, specify the physical path and name of the archive, excluding the extension. When retrieving from a WebDAV-compliant server, specify the URL that identifies the package to retrieve. When retrieving from MSMQ queues, use the following syntax:

`MSMQ://queueHostMachineName\queueName`

When retrieving from IBM WebSphere MQ queues, use the following syntax:

`MQSERIES://queueManager:queueName`

or

`MQSERIES-C://queueManager:queueName`

MQSERIES specifies the server interface that is used to connect to a queue manager that is local. MQSERIES-C specifies the client interface that is used, allowing the queue manager to be local or remote.

When retrieving from SharePoint, use the value for SITE_URL.

*Type* Character, Input

**total-packages**
provides the total number of packages found.

*Type* Numeric, Output

**rc**
receives a return code.
Optional Arguments

**properties**
identifies a comma-separated list of optional property names. Valid property names are as follows:

- COLLECTION_NAME
- CORRELATIONID
- FTP_PASSWORD
- FTP_USER
- HTTP_PASSWORD
- HTTP_PROXY_URL
- HTTP_USER
- LIST_NAME
- NAMESPACES
- QUEUE_TIMEOUT

**property-value-1, property-value-2, ...**
specifies a value for each specified property name. The order of the property values must match the order of the property names specified in the **properties** parameter. Valid property values are defined as follows:

- **COLLECTION_NAME**
  This character string specifies retrieval of only those packages that have the specified correlation identifier. (Applies only to the message queue transport.)

- **CORRELATIONID**
  This character string specifies retrieval of only those packages that have the specified correlation identifier. (Applies only to the message queue transport.)

- **FTP_PASSWORD**
  When retrieving with the archive transport (FROM_ARCHIVE), this character string indicates the password that is used to connect to the remote host. Specify this property only when the host does not accept anonymous access. (Applies to the FROM_ARCHIVE property when the FTP protocol is used.)

- **FTP_USER**
  When retrieving with the archive transport, this character string indicates the name of the user to connect to the remote host. (Applies to the FROM_ARCHIVE property when the FTP protocol is used.)

- **HTTP_PASSWORD**
  When retrieving with the WebDAV transport (FROM_WEBDAV), this character string indicates the password used to bind to the web server. Specify this property only when the web server does not accept anonymous access. (Applies to the FROM_ARCHIVE property when the HTTP protocol is used.)
HTTP_PROXY_URL  When retrieving with the WebDAV transport, this character string indicates the URL of the proxy server. (Applies to the archive transport when the HTTP protocol is used with archive specifications.)

HTTP_USER  When retrieving with the WebDAV transport, this character string indicates the name of the user to bind to the web server. (Applies to the FROM_ARCHIVE property when the HTTP protocol is used.)

LIST_NAME  When retrieving with the SharePoint transport, this character string indicates a document library in the SharePoint site. SharePoint document libraries are a special type of list that is used for ordering folders and files.

NAMESPACEs  When retrieving with the WebDAV transport, this character string lists one or more namespaces that you are interested in, using the syntax shown in the following example:

```
```

QUEUE_TIMEOUT  This numeric value identifies the number of seconds for the poll time-out. By default, if this property is not specified, the CALL RETRIEVE_PACKAGE routine polls and returns immediately with the number of packages found, if any. To override this default, specify the QUEUE_TIMEOUT property so that the CALL RETRIEVE_PACKAGE routine will continue to poll for packages until at least one package is found on the queue or until the time-out occurs, whichever occurs first.

Type  Character or Numeric, Input

Details

When retrieving FROM_QUEUE, this CALL routine retrieves descriptive header information for all packages that are found on the specified queue. The total number of packages found is returned. The descriptive header information for each package can be obtained by executing the CALL PACKAGE_FIRST and CALL PACKAGE_NEXT routines.

When retrieving from the queue transport, no entries or packages are removed or deleted from the queue. Packages can be removed by calling the CALL PACKAGE_DESTROY routine.

The ARCHIVE_PATH property identifies where the archive is created. When retrieving from an archive, the name of the archive can be specified as a physical pathname, an FTP URL, or an HTTP URL.

When retrieving from a WebDAV-compliant server, the name of the archive can be specified as an FTP URL or an HTTP URL.
In the z/OS operating environment, archives can be retrieved only from UNIX System Services directories.

Examples:

Example 1: Using RETRIEVE_PACKAGE to Retrieve Information for Packages on a Queue

The following example opens the queue JSMITH and retrieves the descriptive header information for all packages on that queue and the total number of packages on the queue.

```plaintext
plist=0;
qname = "MQSERIES://LOCAL:JSMITH";
rc=0;
total=0;
nameValue='';
CALL RETRIEVE_PACKAGE(plist, "FROM_QUEUE",
    qname, total, rc);
```

Example 2: Using RETRIEVE_PACKAGE to Retrieve an Archive

The following example retrieves the archive named STATUS.

```plaintext
plist=0;
archiveName = "/maintenance/status";
rc=0;
total=0;
CALL RETRIEVE_PACKAGE(plist, "FROM_ARCHIVE",
    archiveName, total, rc);
```

Example 3: Using RETRIEVE_PACKAGE to Retrieve a Package from a WebDAV Server

The following example retrieves the package from WebDAV by using the specified URL.

```plaintext
plist=0;
url = "http://AlphaliteAirways.host.com/~flights";
rc=0;
total=0;
property='namespaces';
ns="homePage='http://AlphaliteAirs.com/'";
CALL RETRIEVE_PACKAGE(plist, "FROM_WEBDAV",
    url, total, rc, property, ns);
```

Example 4: Using RETRIEVE_PACKAGE with a Queue Polling Time-out

The following example applies a queue polling time-out value of 120 seconds. The RETRIEVE routine seeks packages on the queue until at least one package is located or the 120-second time-out expires, whichever occurs first.

```plaintext
plist=0;
qname = "MQSERIES://LOCAL:JSMITH";
```
rc=0;
total=0;
nameValue='';
prop='queue_timeout';
timeout = 120;
CALL RETRIEVE_PACKAGE(plist, "FROM_QUEUE",
    qname, total, rc, prop, timeout);

Example 5: Using RETRIEVE_PACKAGE to Extract Entries from an Archive

The following example is a SAS program that extracts entries from an archive. The RETRIEVE_PACKAGE routine opens the archive file and retrieves the headers for all package entries. Subsequent RETRIEVE routines are called to retrieve the contents of the entries (in this example, data sets, catalogs, and MDDBs) and to dispose of them appropriately.

data _null_
    length description nameValue type userSpec msg $255;
    length libname $8;
    length memname $32;
    CALL RETRIEVE_PACKAGE(packageId,"FROM_ARCHIVE",
        "AlphaliteAir",tp,rc);
    do while (rc = 0);
        CALL ENTRY_NEXT(packageId,eid,type,userSpec,
            description,nameValue,rc);
        if (rc = 0) then select (type);
        when ("DATASET")
            CALL RETRIEVE_DATASET(eid,libname,memname,rc);
        when ("CATALOG")
            CALL RETRIEVE_CATALOG(eid,libname,memname,rc);
        when ("MDDB")
            CALL RETRIEVE_MDB(eid,libname,memname,rc);
        otherwise;
    end;
    end;
    CALL PACKAGE_TERM(packageId,rc);
run;

Example 6: Using RETRIEVE_PACKAGE to Retrieve a Package from SharePoint

The following example is a SAS program that retrieves a package from SharePoint.

data _null_
    length properties nameValue entryType userSpec filename filepath channel $ 255;
    length abstract desc msg $2048;
    abstract = '';
    channel = '';
    entryCount = 0;
    entryId = 0;
    packageId = 0;
    rc = 0;
    totalPackages = 0;
    packageId = 0;
    numberEntries = 0;
Example 6: Using RETRIEVE_PACKAGE to Retrieve a Package from SharePoint

retrievalType = 'FROM_SHAREPOINT';
siteUrl       = 'http://host/site';
retrievalInfo = siteUrl;
properties    = 'LIST_NAME, COLLECTION_FOLDER, HTTP_USER, HTTP_PASSWORD';
listName      = 'Shared Documents';
folderName    = 'File Collection';
userName      = 'username';
password      = 'password';

CALL RETRIEVE_PACKAGE(packageId, retrievalType, retrievalInfo, totalPackages, rc,
                       properties, listName, folderName, userName, password);
if rc ne 0 then do;
  msg = sysmsg();
  put msg;
  ABORT;
end;

properties = 'ABSTRACT';

CALL PACKAGE_FIRST(packageId, numberEntries, desc, dateTime, nameValue, channel, rc,
                     properties, abstract);
if (rc = 0) then do;
  put "packageId: "     packageId;
  put " numberEntries: " numberEntries;
  put " Description: " desc;
  put " nameValue: "   nameValue;
  put " dateTime: "    dateTime datetime21.2 " GMT";
  put " abstract: "    abstract;
end;
else do;
  msg = sysmsg();
  put msg;
  ABORT;
end;

properties = 'FILENAME';
do while (rc = 0);
  CALL ENTRY_NEXT(packageId, entryId, entryType, userSpec, desc, nameValue, rc,
                   properties, filename);
  if (rc = 0) then do;
    entryCount = entryCount + 1;
    put 'Entry: ' entryCount;
    put '        entryId: '     entryId;
    put '        Type: '        entryType;
    put '        UserSpec: '    userSpec;
    put '        Description: ' desc;
    put '        nameValue: '   nameValue;
    if (entryType = 'TEXT' OR entryType = 'BINARY') then do;
      filepath = 'FILENAME: C:\Public\' || filename;
      CALL RETRIEVE_FILE(entryId, filepath, rc2);
      if (rc2 ne 0) then do;
        msg = sysmsg();
        put msg;
      end;
    end;
  end;
end;
CALL RETRIEVE_REF Routine

Retrieves a reference from a package.

Syntax

CALL RETRIEVE_REF(entry-ID, reference-type, reference, rc);

Required Arguments

entry-ID
identifies the reference entry to be retrieved.

Type Numeric, Input

reference-type
returns the type of the reference, the value of which can be HTML or URL.

Type Character, Output

reference
returns the value of the reference.

Type Character, Output

rc
receives a return code.

Type Numeric, Output

Example: Using the CALL RETRIEVE_REF Routine

The following example retrieves a reference entry from a package.
CALL RETRIEVE_SQLVIEW Routine

Retrieves a PROC SQL view from a package.

Syntax

CALL RETRIEVE_SQLVIEW(entry-ID, libref, member-name, rc);

Required Arguments

**entry-ID**
identifies the PROC SQL view entry.

Type  Numeric, Input

**libref**
specifies the SAS library that will contain the retrieved PROC SQL view.

Type  Character, Input

**member-name**
specifies the member name of the PROC SQL view.

Type  Character, Input

**rc**
receives a return code.

Type  Numeric, Output

Details

If the member-name parameter is blank, then the CALL RETRIEVE_SQLVIEW routine creates the PROC SQL view by using the original member name as it was defined at publish time.

Example: Using RETRIEVE_SQLVIEW

The following example retrieves the PROC SQL view WORK.OUTDATA from the package.

```sas
lib = 'work';
mem = 'outdata';
CALL RETRIEVE_SQLVIEW(entryId, lib, mem, rc);
```
CALL RETRIEVE_VIEWER Routine

Retrieves a viewer entry from a package.

Syntax

CALL RETRIEVE_VIEWER(entry-ID, filename, rc
<, properties, property-value-1, property-value-2, ...> );

Required Arguments

entry-ID
identifies the file entry.
Type Numeric, Input

filename
specifies the name of the file or fileref, using the following syntax:
- FILENAME: external_filename
- FILEREF: SAS_fileref
Type Character, Input

rc
receives a return code.
Type Numeric, Output

Optional Arguments

properties
identifies a comma-separated list of optional property names. Valid property names are as follows:
- ENCODING
Type Character, Input

property-value-1, property-value-2, ...
specifies one value for each specified property name. The order of the property values must match the order of the property names in the properties parameter. Valid property values are defined as follows:

ENCODING input character string that indicates the target encoding for the retrieved viewer file. An example of a target encoding value is ISO-8859-1.
Type Character, Input
Details

Specifying "FILENAME:\", without an external filename, applies to the retrieved file the same name that was used when the file was initially inserted into the package.

Example: Using RETRIEVE_VIEWER

The following example retrieves a viewer from a package.

```sql
fname = "filename: /users/jsmith.bin";
CALL RETRIEVE_VIEWER(entryId, fname, rc);
```

Examples:

Example 1: Example: Publishing in the DATA Step

The following example builds a package, explicitly publishes to two queues, and then publishes to a channel that is defined in the SAS Metadata Repository. This example uses the DATA step, but easily can be changed to use the macro interface.

```sql
filename f 'c:\frame.html' ;
filename c 'c:\contents.html' ;
filename p 'c:\page.html' ;
filename b 'c:\body.html' ;
ods html frame = f contents = c(url="contents.html")
     body = b(url="body.html") page=p(url="page.html") ;
/* run some data steps/procs to generate ODS output */
data b;
   do i= 1 to 1000;
      output;
   end;
run;

data emp;
input fname $ lname $ ages state $ siblings ;
cards;
   Steph Lyons  32 NC  4
   Richard Jones 40 NC  2
   Mary White  74 NC  1
   Kai Burns  3 NC  1
   Dakota Nelson 1 NC  1
   Paul Black  79 NC  8
   Digger Harris 5 NC  0
   Coby Thomas  1 NC  0
   Julie Mack  6 NC  1
   Amy Gill  3 NC  1
   Brian Meadows 16 HA  1
   Richard Wills 17 HA  1
   Diane Brown  48 CO  4
   Pamela Smith 42 HA  4
   Joe Thompson 44 WA  10
```
Michael Grant 23 IL 1  
Michael Ford 31 NM 4  
Ken Bush 28 NC 1  
Brian Carter 27 NC 1  
Laurie Clinton 32 NC 1  
Kevin Anderson 33 NC 1  
Steve Kennedy 33 NC 1  
run;  
quit;  
proc print;run;  
proc contents;run;  
ods html close;  
data _null_;  
rC=0;a='a';b='b';c='c';d='d';  
length filename $64 mimeType $24 fileType  
$10 nameValue $100 description $100;  
packageId = 0;  
nameValue="type=(test) coverage=(filtering, transports)";  
cALL PACKAGE_BEGIN(packageId,"Main results package.",  
nameValue, rc);  
if (rc eq 0) then put 'Package begin successful.';  
else do;  
msg = sysmsg();  
put msg;  
end;  
gifpid=0;  
cALL PACKAGE_BEGIN(gifpid,"Gif nested package.",',', rc);  
if (rc eq 0) then put 'Gif package begin successful.';  
else do;  
msg = sysmsg();  
put msg;  
end;  
nameValue="type=report, topic=census";  
description="North Carolina residents.";  
libref = "WORK";  
memname="EMP";  
cALL INSERT_DATASET(packageId, libref, memname,  
description, nameValue, rc);  
if rc ne 0 then do;  
msg = sysmsg();  
put msg;  
end;  
else  
put 'Insert data set successful.';  
cALL INSERT_HTML(packageId,"fileref:b", ",",  
"fileref:f", ",",  
"fileref:c", ",",  
"fileref:p", ",", "ODS HTML Output",',', rc);  
if rc ne 0 then do;
msg = sysmsg();
   put msg;
end;
else
   put 'Insert html successful.';

CALL INSERTDATASET(packageId,"WORK","b",
   "B dataset...",',', rc);
if rc ne 0 then do;
   msg = sysmsg();
   put msg;
end;
else
   put 'Insert data set successful';

/* insert package (nested package *)
CALL INSERTPACKAGE(packageId, gifpid,rc);
if rc eq 0 then put 'Insert package successful';
else do;
   msg = sysmsg();
   put msg;
end;
*/

description = "Gif for marketing campaign."
filename = "filename:campaign01.01.gif"
fileType = "Binary"
mimeType = "Image/Gif"
CALL INSERTFILE(gifpid, filename, fileType,
   mimeType, description,'', rc);
if rc ne 0 then do;
   msg = sysmsg();
   put msg;
end;
else
   put 'Insert file (gif) successful.';

description = "Test VRML file."
filename = "filename:test.wrl"
fileType = "text"
mimeType = "model/vrml"
CALL INSERTFILE(packageId, filename, fileType,
   mimeType, description,'', rc);
if rc ne 0 then do;
   msg = sysmsg();
   put msg;
end;
else
   put 'Insert file (vrml) successful.';

/* send package to the two queues that are specified */
CALL PACKAGE_PUBLISH(packageId, "TO_QUEUE", rc, properties,
   "MQSERIES://JSMITH.LOCAL", "MSMQ://JSMITH\transq");
if rc ne 0 then do;
   msg = sysmsg();
   put msg;
Example 2: Example: Publishing in a Macro

The following example builds a package, publishes the package to a channel that is defined in the SAS Metadata Repository, and then explicitly publishes to one queue. This example uses macro variables rather than the DATA step, which allows you the flexibility to use CALL routines throughout your code, as other processing completes. This example also illustrates how publish CALL routines are used with other SAS statements.

```sas
%macro chkrc(function);
   %if &rc = 0 %then %put "NOTE: &function succeeded.";
   %else %do;
      %let msg= %sysfunc(sysmsg());
      %put &function failed - &msg
   %end;
%mend;

%let packageId = 0;
%let nameValue=type=(test) coverage=(filtering,
   transports);
%let rc = 0;
%let packageId = 0;
%let description=main results package;
%syscall package_begin(packageId,description, nameValue, rc);
```
Example 2: Publishing in a Macro

```sas
%chkrc(Package Begin);

%let gifpid=0;
%let description=Gif nested package. ;
%let nameValue=;
%syscall package_begin(gifpid, description, nameValue, rc);
%chkrc(Package Begin);

filename f 'c:\frame.html';
filename c 'c:\contents.html';
filename p 'c:\page.html';
filename b 'c:\body.html';
ods html frame = f
   contents =c(url="contents.html")
   body = b(url="body.html")
   page=p(url="page.html");

/* run some data steps/procs to generate ODS output */
data b;
   do i= 1 to 1000;
      output;
   end;run;

%let nameValue=;
%let description= B, testing dataset;
%let libref = WORK;
%let memname= B;
%syscall insert_dataset(packageId,libref, memname, description, nameValue, rc);
%chkrc(Insert Dataset);

data emp;
   input fname $ lname $ ages state $ siblings;
   cards;
   Steph Jones 32 NC 4
   Richard Long 40 NC 2
   Mary Robins 74 NC 1
   Kai Mack 3 NC 1
   Dakota Wills 1 NC 1
   Paul Thomas 79 NC 8
   Digger Johnson 5 NC 0
   Coby Gregson 1 NC 0
   Julie Thomson 6 NC 1
   Amy Billins 3 NC 1
   Brian Gere 16 HA 1
   Richard Carter 17 HA 1
   Diane Ford 48 CO 4
   Pamela Aarons 42 HA 4
   Joe Ashford 44 WA 10
   Michael Clark 23 IL 1
   Michael Harris 31 NM 4
   Ken Porter 28 NC 1
   Brian Harrison 27 NC 1
   Laurie Smith 32 NC 1
   Kevin Black 33 NC 1
```
Steve Jackson 33 NC 1
run;
quit;

%let nameValue= type=report, topic=census;
%let description=North Carolina residents.;
%let libref = WORK;
%let memname= EMP;
%syscall insert_dataset(packageId, libref, memname, description, nameValue, rc);
%chkrc(Insert Dataset);

proc print;run;
proc contents;run;
ods html close;

%let body=fileref:b;
%let frame=fileref:f;
%let contents=fileref:c;
%let pages=fileref:p;
%let description=Generated ODS output.;
%let curl="contents.html";
%let burl = "body.html";
%let furl = "frame.html";
%let purl = "page.html";
%syscall insert_html(packageId, body, burl, frame, frameurl, contents, curl, pages, purl, description, nameValue, rc);
%chkrc(Insert Html);

/* insert nested package */
%syscall insert_package(packageId, gifpid,rc);
%chkrc(Insert Package);

%let giffile=filename:Boeing747.gif;
%let description=New 747 paint scheme.;
%let fileType = text;
%let mimeType = %quote(Image/gif);
%syscall insert_file(gifpid, giffile, fileType, mimeType, description, nameValue, rc);
%chkrc(Insert File);

/* publish to the filter test channel defined in the SAS Metadata Repository */
%let storeinfo="SAS-OMA://alpair01.sys.com:8561";
%let channel=FilterTest;
%let properties='channel_store, subject, metauser, metapass';
%let subject=Filter Testing Results;
%let user = myUserName;
%let password = myPassword;
%let publishType=to_subscribers;
CALL PACKAGE_PUBLISH(packageId, "TO_SUBSCRIBERS", rc, properties, storeinfo, subject, user, password, channel);
%chkrc(publish package);
Example 3: Example: Publishing with the FTP Access Method

The following example uses the FTP access method to put ODS-generated output onto the server jsmith.pc.alpair.com in the Windows operating environment. Note that the CALL INSERT_REFERENCE routine is used so that only references to the newly created HTML files are inserted into the package. Subscribers using the EMAIL transport engine receive an e-mail message, with an embedded link to the HTML files within it.

```plaintext
filename myfram ftp 'odsftpf.htm'
   host='jsmith.pc.alpair.com'
   user='anonymous'
   pass='smi96Gth';

filename mybody ftp 'odsftpb.htm'
   host='jsmith.pc.alpair.com'
   user='anonymous'
   pass='smi96Gth';

filename mypage ftp 'odsftpp.htm'
   host='jsmith.pc.alpair.com'
   user='anonymous'
   pass='smi96Gth';

filename mycont ftp 'odsftpc.htm'
   host='jsmith.pc.alpair.com'
   user='anonymous'
   pass='smi96Gth';

ods listing close;
ods html frame=myfram body=mybody page=mypage contents=mycont;

title 'ODS HTML Generation to PC Files via FTP Access Method';
data retail;
   set alpairhelp.retail;
   decade = floor(year/10) * 10;
   run;

proc format;
   /* maps foreground colors for total sales */
```
value salecol
  low-1500 = 'red'
  1500-2000 = 'yellow'
  2000-high = 'green';

  /* gives the row labels some color */
value decbg
  1980 = '#00aaaa'
  1990 = '#00cccc';

  /* gives the decade flyovers */
value decfly
  1980 = 'Me Me Me Generation'
  1990 = 'Kinder Gentler Generation';
run;

proc tabulate data=retail;
  class year decade;
  classlev decade / s={background=decbg. 
    flyover=decfly.};
  classlev year / s=<parent>;
  var sales;
  table decade * year ,
     sales *
     (  sum * f=dollar12. *
       {style={foreground=salecol. font_weight=bold}}
       median * f=dollar12. * {style={foreground=black}}
     );
run;

data a;
  do j=1 to 5;
    do k=1 to 5;
      do i = 1 to 10;
        x=ranuni(i);
        output;
      end;
    end;
  end;
run;

proc sort data=a; by j;
run;

proc sort data=a; by j k;
run;

proc univariate; by j k; var i;
run;

title1;
quit;
ods html close;

data _null_; 
  length desc $ 1000;
Example 3: Publishing with the FTP Access Method

```plaintext
rc=0;a='a';b='b';c='c';d='d';

packageId = 0;

CALL PACKAGE_BEGIN(packageId,"Weekly Activities Report",
    'Type=Report', rc);
if (rc eq 0) then put 'Package begin successful.';
else do;
    msg = sysmsg();
    put msg;
end;

desc="Retail sales information and miscellaneous
    statistics viewed at ":
    nv="";
    CALL INSERT_REF(packageId, "HTML",
        "http://jsmith.pc.alpair.com/odsftpf.htm",
        desc, nv, rc);
    if rc ne 0 then do;
        msg = sysmsg();
        put msg;
    end;
else
    put 'Insert reference ok';

storeinfo =
    "SAS-OMA://alpsrv03.sys.com:8561";
    channel='emailonly';
    subject = "Monday's Update"
    properties = 'subject, channel_store, metauser, metapass'
    user = "myUserName";
    password = "myPassword";
    CALL PACKAGE_PUBLISH(packageId, "TO_SUBSCRIBERS", rc,
        properties, subject, storeinfo, user, password,
        channel1);
    if rc ne 0 then do;
        msg = sysmsg();
        put msg;
    end;
else
    put 'Publish successful';

CALL PACKAGE_END(packageId,rc);
if rc ne 0 then do;
    msg = sysmsg();
    put msg;
end;
else
    put 'Package term successful';

run;
quid;
```
Appendix 1

Planning and Implementing Your Publishing Solution

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Plan the Information Architecture

Designing a successful publish and subscribe implementation starts with an understanding of why your organization is implementing the system. You will need to know what type of information needs to be distributed to users and how widely that information needs to be distributed. The two main considerations in planning are efficiency (helping users avoid information overload) and security (enforcing any site-required content restrictions).

For example, you could start the planning process by understanding that your organization needs to disseminate sales information throughout the marketing organization and inventory data to the production organization. Starting with this knowledge, you can begin the process of breaking down the general categories of information into specific information channels by using a hierarchical model.

How you divide and subset the categories depends on your organization's needs, but you should work toward creating information channels as focused as possible, without making them too tightly focused to be useful. Channels that are broadly defined leave users not knowing whether information that is delivered over the channel will be useful to them. Channels that are too precisely defined force users to subscribe to a long list of channels in order to ensure that they receive the information that they need.

To help focus the information that users receive, set up policies for name/value keywords. Name/value pairs are attributes that are specified when a package is published and that help identify the package contents. Each subscriber definition can include a name/value filter that allows only packages that meet the subscriber's needs to be delivered.

For example, if you publish a package with a name/value attribute of market=(Mexico), that package is seen only by those subscribers whose
name/value filter indicates that they are interested in information about the Mexican market. Although the names and associated values can be anything that your organization finds useful, you must establish a list of acceptable keywords and values for those keywords. This list is essential in order for publishers to be able to provide consistent metadata that identifies published content and for subscribers to be able to filter published content in order to focus on the information that they need.

When you define your information channels, you must also consider the users that will be accessing those channels as well as any restrictions that need to be placed on the channels. Although these aspects of planning are discussed separately, in practice, they are examined at the same time as you are defining your channels. You cannot define an information channel without first knowing who needs to see the information and how that information should be restricted.

The hierarchical model that you use can be based on both subject and access level. For example, it is often appropriate to use group or department-level distinctions. Identify any channels that must be restricted for either who can contribute or who can subscribe. Restrictions are defined on channels, so do not mix access levels within a channel (for example, do not include sensitive and non-sensitive content in a channel). For example, if you plan for a single channel to distribute accounting information throughout your organization, you will encounter a security problem when the accounting department needs to publish sensitive information (such as employee salaries). With only a single, unrestricted channel, you cannot publish the information to a specific set of users. In your consultations with users, you must identify information channels whose access needs to be controlled.

Establish the Content Pipeline

To establish the content pipeline, perform the following steps:

1. Develop or modify applications that will be used to create the content to be published. These applications can take the form of stand-alone applications that are written in a visual programming language or SAS programs. Publishers must obtain or install the appropriate publishing application for their needs. For example, an individual or department that needs to publish data-intensive reports on a regular basis might use a SAS program for publishing, while a user who needs to send information to a changing number of users on an occasional basis might use the publishing functionality that is provided by SAS Enterprise Guide or SAS Information Delivery Portal.

2. For the initial set of information channels, identify the users and groups that are initially subscribed to those channels. If the publishing framework has open access, then users can subscribe themselves to channels. Otherwise, administrators can define the subscribers for each channel.

3. Determine how information is to be distributed to subscribers (whether by text-formatted e-mail or HTML-formatted e-mail, with a WebDAV server, or through a queue).

4. Gather address information, which is necessary for defining subscribers.

5. Create a PUBLISHERS group, and enable the PUBLISHERS group to authenticate to the content server (if it is a secured HTTP, FTP, or WebDAV
server). Credentials can be included in your code or stored in metadata. The following example scenarios all require the publisher to have server credentials:

- publishing to a subscriber with a delivery transport that is defined as a secured WebDAV server
- publishing to a channel's persistent store that is defined as a secured WebDAV server
- publishing to a channel's persistent store that is defined as an archive path that is a secured HTTP server
- publishing to a channel's persistent store that is defined as an archive path that is a secured FTP server

Note: Token authentication is supported, beginning with SAS 9.2. For more information about SAS token authentication, see SAS Intelligence Platform: Security Administration Guide.

It is usually most efficient to create one metadata group that includes all publishers as members and give that group one login for each secured HTTP, FTP, or WebDAV server. Each server must be registered in the metadata in its own authentication domain. For example, the contents of the group's Accounts tab might as shown in the following table:

<table>
<thead>
<tr>
<th>Authentication Domain</th>
<th>User ID</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>IISauth</td>
<td>sharedIISid</td>
<td>sharedIISpassword</td>
</tr>
<tr>
<td>FTPauth</td>
<td>sharedFTPid</td>
<td>sharedFTPpassword</td>
</tr>
</tbody>
</table>

Note: If you publish directly to subscribers who have their own WebDAV servers, each of those servers must be registered in its own authentication domain. The group's Accounts tab must include a login for each such server. For more information about credential management, see SAS Intelligence Platform: Security Administration Guide.

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Configure Channels and Subscribers

Use the New Subscriber and New Channel wizards in the Publishing Framework plug-in for SAS Management Console to define the channels and subscribers that you identified during the planning phase. Begin by defining the subscribers; the New Channel wizard enables you to associate defined subscribers to a channel. For more information, see the Help for the Publishing Framework plug-in.
Implement Content Restrictions in the SAS Metadata Authorization Layer

You can implement content restrictions in the SAS metadata authorization layer in order to:

- control who can publish to a channel
- control who can create a new channel
- control who can self-subscribe to a channel

For more information about authorization and permissions by task, see SAS Intelligence Platform: Security Administration Guide.

**Note:** In a new deployment, only the SAS Administrators group can add channels, subscribers, and content. To enable all registered users to update and publish to a particular channel, navigate on the Folders tab to System ⇒ Publishing ⇒ Channels and grant W and WM to SASUSERS on that channel's Authorization tab (WM is required to publish only if a channel has an archive persistent store). To enable all registered users to add channels or subscribers, grant WMM on the relevant parent folder (for example, on the System ⇒ Publishing ⇒ Subscribers ⇒ Content Subscribers folder). For more information about using permissions, see the SAS Intelligence Platform: Security Administration Guide.

Announce Solution and Train Users

After the publishers and subscribers install the necessary applications, you can announce your implementation to your organization. You will also need to follow up the announcement with training for both publishers and subscribers, with training broken down by publishing methods, publishing needs, and subscriber applications.