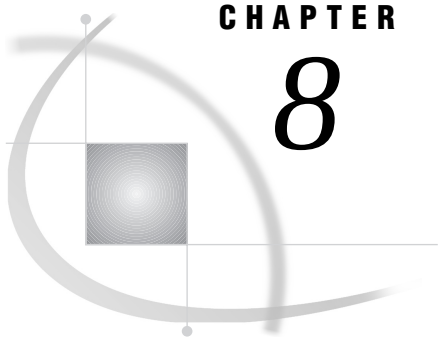

CHAPTER 8

# OS/390: VTAM LU 0 Access Method



## SAS Support for VTAM LU 0 on OS/390

*Note:* The VTAM LU 0 access method applies only to SAS/SHARE. It was implemented in Version 6 for backward compatibility with previous releases of SAS/SHARE. However, beginning with Version 7, VTAM LU 0 is not supported. It is recommended that you use the APPC (LU6.2) access method instead of VTAM LU 0. See Chapter 6, “OS/390: APPC Access Method,” on page 83. △

# SAS/SHARE

*System Administrator or User*
To use the VTAM LU 0 access method with an OS/390 host for SAS/SHARE, perform these tasks:

1. Verify that you have met all your site and software requirements.
2. Verify that the resources for the VTAM LU 0 access method have been defined.
3. Verify that you know how to set SAS options.
4. Set the SAS/SHARE options that you want to use.

## System and Software Requirements for SAS/SHARE

Ensure that the following conditions have been met:

1. ACF/VTAM Version 2.1 or a subsequent version has been installed at your site.
2. SAS software is installed on both the local and the remote hosts.
3. If a link connection is used in your network, ACF/NCP/VS Version 1.3 or a subsequent version has been installed at your site.

## Defining Resources for the VTAM LU 0 Access Method

*Applications Programmer, Network Administrator, and System Installation Staff*
Before you can use SAS/SHARE with the VTAM LU 0 access method, you must first configure VTAM resources. See “System Configuration for the VTAM LU 0 Access Method” on page 140 for SAS/SHARE resource configuration.

## Understanding VTAM Access Method Terminology

Familiarity with these terms will help you when you talk with your systems installation staff about the appropriate SAS option settings.

LU (logical unit)
a device or program by which an end user (LU 0 applications program) gains access to the system on which the VTAM LU 0 access method is configured.

LU pool
a group of LUs provided through the VTAM subsystem that provide the dynamic assignment of an LU from the pre-defined pool to a client in a SAS/SHARE session. Pool size is determined by the setting of the LUFIRST and LULAST variables (see the next section for information about these variables). See “System Configuration for the VTAM LU 0 Access Method” on page 140 for details about defining the properties of the LU pool.

## Setting SAS Options

You must set specific SAS options to enable the connections that you want with SAS/SHARE when using the VTAM access method. The values that you assign to these variables depend on how your VTAM subsystem has been configured. Ask your systems installation staff for advice about these settings.

You may set options in the following forms:

- in an OPTIONS statement in a SAS session or in an AUTOEXEC file:

  OPTIONS *option-name=value*;

  Example:

  ```
  options lu0sec=_trust_;
  ```

- in a SAS configuration file or at a SAS invocation:

  *option-name=value*

  Example:

  ```
  lu0sec=_trust_
  ```

- CLIST variable:

  Add *variable-name*(*default value*) to the SAS CLIST. Then add *variable-name*(*current value*) at the SAS invocation.

  Example CLIST:

  ```
  lu0sec(_trust_)     /* VTAM options */
  ```

  You would specify the CLIST at a SAS invocation, as follows:

  ```
  sdssas lu0sec(_trust_) ('comamid=vtam')
  ```

Values for these variables may contain up to eight characters, consisting of alphanumeric characters, the percent sign (%), the dollar sign ($), the pound sign (#), the at sign (@), and the underscore (_).

If you set multiple forms of the same option, here is the order of precedence that is followed:

OPTIONS statement

AUTOEXEC file

SAS invocation

SAS configuration file

CLIST variable.

## SAS/SHARE Options

LU0SEC=_TRUST_

Set this option at the server.

_TRUST_ specifies that the VTAM LU 0 access method present the userid of a connecting client to the server as if the userid had been validated with a password. The server then uses that userid to validate the user's authority to access SAS libraries.

*Note:* The VTAM LU 0 access method does not validate the userid. △

If the userid of a connecting client is defined to the security software on the server's system, and the userid belongs to that user, the server's authorization verification for SAS libraries will be valid. However, if the connecting client's userid is defined but it belongs to another user, the authorization verification will be inappropriate, but it may allow the unrightful connecting client to access SAS libraries that it would not ordinarily be able to access directly.

APPCSEC = _SECURE_

Set this option at the server before issuing the PROC SERVER statement.

_SECURE_ allows the VTAM LU 0 access method to initialize so that the server can use it.

LUPREFIX=*name*

Set this option at the client and the server.

LUPREFIX specifies an identifying prefix to attach to a value that is in the range defined by the LUFIRST and LULAST options. Combining LUPREFIX and a value in the range defined by the LUFIRST and LULAST options forms an ACBNAME that is assigned to each LU pool member.

You can set this option only in a SAS configuration file or at a SAS invocation.

LUFIRST=*n*

Set this option at the client and the server.

LUFIRST specifies the beginning (numeric) boundary of the range to form the pool of LU names.

You can set this option only in a SAS configuration file or at a SAS invocation.

LULAST=*n*

Set this option at the client and the server.

LULAST specifies the final (numeric) boundary of the range to form the pool of LU names.

You can set this option only in a SAS configuration file or at a SAS invocation.

Example 1:

If you have a maximum pool size (or depth) of 99 LUs and you want an 8-byte ACBNAME LU name, you must select an LUPREFIX value that is 6 bytes long.

```
luprefix=sascon
lufirst=1
lulast=99
```

ACBNAME LU names (or LU pool names) would range from SASCON01 (zero-filling is required) to SASCON99 (no zero-filling is required).

Example 2:

If you have a maximum pool size (or depth) of 9 LUs and you want an 8-byte ACBNAME LU name, you must select an LUPREFIX value that is 7 bytes long.

```
luprefix=sascont
lufirst=1
lulast=9
```

ACBNAME LU names (or LU pool names) would range from SASCONT1 to SASCONT9 (no zero-filling is required).

Example 3:

If you have a maximum pool size (or depth) of 10 LUs and you want a 6-byte ACBNAME LU name, you must select an LUPREFIX value that is 4 bytes long.

```
luprefix=sasc
lufirst=1
lulast=10
```

LU pool names would range from SASC01 (zero-filling is required) to SASC10 (no zero-filling is required).

You may also infer the pool size from the setting of the LULAST and LUFIRST options by using the following formula:

*pool-size*= (LULAST - LUFIRST) + 1

Example:

*pool-size*=(99-1)+1=99

These option settings describe the pool of LUs from which an LU is dynamically selected when a client accesses a SAS/SHARE server.

## Client Tasks

*User or Applications Programmer*

To prepare for accessing a server, make sure that you know how to:

1. Specify the VTAM LU 0 access method.
2. Specify a server name.

## Specifying the VTAM LU 0 Communications Access Method

You must specify the VTAM LU 0 communications access method at the client before you access a server.

Use the following syntax to specify the VTAM LU 0 access method at each connecting client:

```
OPTIONS COMAMID=access-met hod-id;
```

where COMAMID is an acronym for Communications Access Method Identification. *access-method-id* identifies the method that is used by the client to communicate with the server. VTAM (an acronym for Virtual Telecommunications Access Method )is an example of an *access-method-id*.

Example:

```
options comamid=vtam;
```

The server is accessed using the VTAM access method.

You may specify the COMAMID option in an OPTIONS statement, at a SAS invocation, or in a SAS configuration file.

Additionally, you may use the COMAUX1 and COMAUX2 options to designate auxiliary communications access methods. See Table 1.3 on page 10 for the supported access methods by host. If the first method fails to access a server, the second method is attempted, and so on. You can specify up to two auxiliary access methods, depending on the number of methods that are supported between client and server hosts.

COMAUX options can be specified only at a SAS invocation or in a SAS configuration file. The syntax for the COMAUX options follows:

```
COMAUX1=alternate-method
COMAUX2=alternate-method
```

An example of configuration file entries for an OS/390 client connecting to an OS/390 server follows:

```
comamid=vtam
comaux1=tcp
comaux2=xms
```

If the server cannot be reached with the VTAM method, a second attempt is made with the TCP/IP access method, and a third with XMS.

## Specifying a Server Name

To use the VTAM LU 0 access method, a server and a client must be part of the IBM SNA network.

You must specify the server name in the LIBNAME and PROC OPERATE statements as follows:

```
SERVER=server-name
```

where *server-name* is the LU name that is defined in the VTAM configuration. Consult with the person who configured resources for the VTAM LU 0 access method for the configured server name. The VTAM APPL syntax requires a server name that may contain up to eight characters. Because VTAM-naming and SAS-naming requirements are compatible, there should be no naming conflict.

See *SAS Language Reference: Dictionary* for details about SAS naming rules. See *SAS/SHARE User's Guide* for details about the LIBNAME and PROC OPERATE statements.

## Client Example

The following example illustrates the statements that you specify in a configuration file on the OS/390 client:

```
luprefix=sascon
lufirst=1
lulast=10
```

LUPREFIX SASCON is specified with the LUFIRST and LULAST values to form ACBNAME LU names ranging from SASCON01 to SASCON10.

See “Setting SAS Options” on page 134 for details about these options.

The following example illustrates the statements that you specify in an OS/390 client configuration file to access a server with the VTAM access method:

```
options comamid=vtam;
libname sasdata 'edc.prog2.sasdata' server=share1;
```

The VTAM access method is declared. The LIBNAME statement specifies the data library that is accessed through the server SHARE1.

## Server Tasks

*Server Administrator*

To set up a server and make it accessible to a connecting client, perform the following tasks:

1. Specify the VTAM LU 0 access method.
2. Specify the server name.

## Specifying the VTAM LU 0 Access Method

You must specify the VTAM LU 0 communications access method at the server before you create a SAS/SHARE server.

Use the following syntax to specify the VTAM access method at the server:

```
OPTIONS COMAMID=access-method-id;
```

where COMAMID is an acronym for Communications Access Method Identification. *access-method-id* identifies the method used by the server to communicate with the client. VTAM (an acronym for Virtual Telecommunications Access Method) is an example of an *access-method-id*.

For a server that is running on a host on which only one communications access method is available, use only the COMAMID option.

Example:

```
options comamid=vtam;
```

The server will be available only to SAS/SHARE sessions that use the VTAM access method.

You may specify the COMAMID option in an OPTIONS statement, at a SAS invocation, or in a SAS configuration file.

However, if the host on which a server is running supports multiple access methods, you may specify up to two auxiliary access methods by which clients may access the server by using the COMAUX1 and COMAUX2 options. See Table 1.3 on page 10 for the supported access methods by host.

All of the access methods initialize when the server initializes. The activation of multiple access methods makes a server available to several groups of clients, each using a different communications access method simultaneously.

COMAUX options can be specified only at a SAS invocation or in a SAS configuration file. The syntax for the COMAUX options follows:

```
COMAUX1=alternate-method
COMAUX2=alternate-method
```

An example of configuration file entries for a server that is running on an OS/390 host follows:

```
comamid=vtam
comaux1=tcp
comaux2=xms
```

When the server starts, all of the communications access methods are initialized. The server is simultaneously available to client sessions that use the VTAM access method as well as to clients that use the TCP/IP and XMS access methods.

## Specifying a Server Name

To use the VTAM LU 0 access method, a server and a client must be part of the IBM SNA network.

You must specify the server name in the PROC SERVER statement as follows:

```
SERVER=server-name
```

where *server-name* is the LU name that is defined in the VTAM configuration. Consult with the person who configured resources for the VTAM LU 0 access method for the configured server name. The VTAM APPL syntax requires a server name that may contain up to eight characters. Because VTAM naming and SAS naming requirements are compatible, there should be no naming conflict.

See *SAS Language Reference: Dictionary* for details about SAS naming rules. See *SAS/SHARE User's Guide* for details about the PROC SERVER statement.

## Server Example

The following example illustrates the statements that you specify in a configuration file on the OS/390 host at which you start a server: comamid=vtam lu0sec=_trust_ luprefix=sascon lufirst=1 lulast=10

The VTAM LU 0 access method is declared, and the LU0SEC option sets server security that requires clients to supply a userid and a password that are valid on the server. LUPREFIX SASCON is specified with the LUFIRST and LULAST options to form ACBNAME LU names ranging from SASCON01 to SASCON10.

The following statements in a SAS session on the OS/390 remote host start a server:

```
proc server id=share1;
run;
```

The server SHARE1 is started on the OS/390 remote host.

# System Configuration for the VTAM LU 0 Access Method

*Applications Programmer, Network Administrator, or Systems Installation Staff*
Configure resources for the VTAM LU 0 access method by defining the server and the connecting clients in their respective domains.

To configure the OS/390 system for VTAM LU 0, perform the following tasks:

1. Define the server LU in the server's VTAM domain.
2. Define the client LUs in the clients' VTAM domain.
3. Optionally, define cross-domain resources.
4. Optionally, define resources in the same domain.

File these definitions in members of your installation's VTAMLST data set. Add the member names to the configuration startup list (member ATCONN*xx*), where *xx* represents each member in the list.

## Defining a Server

You must define each server with an APPL statement in the VTAM domain in which the server will run. Use the following syntax:

```
VBUILD TYPE=APPL
server-id  APPL AUTH=(ACQ), EAS=n, PARSESS=YES
```

All APPL statements must follow a VBUILD TYPE=APPL statement.
An explanation of each entry follows:

VBUILD TYPE=APPL
specifies that this VBUILD statement defines an application major node.

*server-id*
specifies a unique name for the server in the network. The name may contain up to a maximum of eight characters and is used as the value for the SERVER= option in the PROC SERVER, the PROC OPERATE, and the LIBNAME statements.

AUTH=(ACQ)
specifies that this APPL can initiate a session.

EAS=*n*
specifies the estimated number of concurrent sessions that the server can have with clients in the network. To determine a value for this entry, estimate the number of users that you expect to be connected to the server simultaneously and multiply by three.

PARSESS=YES
indicates support for parallel session capability.

Example:

```
Domain 1 VTAMLST member C01ASAS:

*********************************************
```

```
* Application major node for SAS/SHARE software *
* Server name is C01SHARE                        *
*                                                *
**************************************************
  VBUILD TYPE=APPL
*------------------------------------------------*
* SAS Server application running in domain 1     *
*------------------------------------------------*
C01SHARE APPL AUTH=(ACQ),EAS=30,PARSESS=YES
```

A server is defined in Domain 1. The *server-id* is C01SHARE. The value for *server-id* is used in the SERVER option in the PROC SERVER, the PROC OPERATE, and the LIBNAME statements.

## Defining Each Client

You must define each client application with an APPL statement in the VTAM domain in which the client will run. Separate each entry with a comma. Use the following syntax:

```
VBUILD TYPE=APPL
client-name  APPL ACBNAME=acbname AUTH=(ACQ),
                  EAS=n, PARSESS=YES
```

An explanation of each entry follows:

VBUILD TYPE=APPL
specifies that this VBUILD statement defines an application major node.

*client-name*
specifies a unique name for the client across all networks. The name may contain up to a maximum of eight characters.

ACBNAME=*acbname*
identifies an LU pool member, whose name is formed by combining the value of LUPREFIX with a value that is between the values of the LUFIRST and LULAST options. See “Setting SAS Options” on page 134 for information about forming ACBNAMEs.

AUTH=(ACQ)
specifies that this APPL can initiate a session.

EAS=*n*
specifies the number of concurrent sessions that the user can have at one time. To determine a value for this entry, estimate the number of users that you expect to be connected to the server simultaneously and multiply by three.

PARSESS=YES
indicates support for parallel session capability.

Example:

```
Domain 2 VTAMLST member C02ASAS:

************************************************
*   Application major node for SAS/SHARE software  *
*   LUPREFIX = SASCON, LUFIRST = 1, LULAST = 5     *
************************************************
    VBUILD TYPE=APPL
*----------------------------------------------*
```

```
*   SAS User applications running in domain 2      *
*   and communicating with server C01SHARE in      *
*   domain 1                                       *
*----------------------------------------------------*
C02SI001 APPL ACBNAME=SASCON1,AUTH=(ACQ),EAS=3,PARSESS=YES
C02SI002 APPL ACBNAME=SASCON2,AUTH=(ACQ),EAS=3,PARSESS=YES
C02SI003 APPL ACBNAME=SASCON3,AUTH=(ACQ),EAS=3,PARSESS=YES
C02SI004 APPL ACBNAME=SASCON4,AUTH=(ACQ),EAS=3,PARSESS=YES
C02SI005 APPL ACBNAME=SASCON5,AUTH=(ACQ),EAS=3,PARSESS=YES
```

The APPL statements in Domain 2 define a pool of LUs for clients on Domain 2 that will communicate with the server in Domain 1. The first field shows a unique eight-character client name, and the ACBNAME field shows the name of each LU in the pool, which is formed by combining the value of LUPREFIX with a value that is in the range between the values of the LUFIRST and LULAST options.

## Defining Cross-Domain Resources

A multiple-domain network is a set of connected domains, each controlled by an ACF/VTAM with a cross-domain resource manager (CDRM). In a multiple-domain network, information about other domains must be provided to each ACF/VTAM.

In each domain from which a client will attempt to access a SAS/SHARE server, you must define that server as a cross-domain resource by using a VBUILD statement and a CDRSC statement.

If your site does not support the use of dynamic CDRSC definitions, then you must define each connecting client from other domains as a cross-domain resource in the server's domain.

The VBUILD and CDRSC statement formats follow. Separate each entry with a comma.

```
VBUILD TYPE=CDRSC
name CDRSC CDRM=cdrm-name,ISTATUS=ACTIVE
```

An explanation of each entry follows:

VBUILD TYPE=CDRSC
specifies that this VBUILD statement defines a cross-domain resource major node.

*name*
specifies the name of a server or a client from another domain. This name may contain up to a maximum of eight characters, and it must be identical to that in the name field of the APPL statement for the server or the client in the controlling domain.

CDRM=*cdrm-name*
specifies the name of the CDRM in the domain in which the server or the client is defined as an APPL.

ISTATUS=ACTIVE
specifies that the CDRSC should be initialized as active.

Example:

```
Domain 1 VTAMLST member C01CSAS:

*****************************************************
* CDRSC major node for SAS/SHARE software           *
*****************************************************
*-----------------------------------------------------*
```

```
* CDRSCs for the SAS users in domain 2               *
*                                                    *
* The following statements are needed only if your   *
* installation is not using dynamic CDRSC definition *
*----------------------------------------------------*
    VBUILD TYPE=CDRSC
C02SI001 CDRSC CDRM=C02CDRM,ISTATUS=ACTIVE
C02SI002 CDRSC CDRM=C02CDRM,ISTATUS=ACTIVE
C02SI003 CDRSC CDRM=C02CDRM,ISTATUS=ACTIVE
C02SI004 CDRSC CDRM=C02CDRM,ISTATUS=ACTIVE
C02SI005 CDRSC CDRM=C02CDRM,ISTATUS=ACTIVE
```

Domain 1 contains CDRSC statements that define a corresponding pool of cross-domain resources for its clients.

The first field shows a unique eight-character client name, and the ACBNAME field shows the name of each LU in the pool, which is formed by combining the value of LUPREFIX with a value in the range between the values of the LUFIRST and LULAST options.

Domain 2 also requires a CDRSC statement to define the Domain 1 server as a cross-domain resource.

```
Domain 2 VTAMLST member C02CSAS:

*********************************************
*   CDRSC major node for SAS/SHARE software   *
*********************************************
*-------------------------------------------*
*   CDRSC for the SAS server in domain 1    *
*-------------------------------------------*
   VBUILD TYPE=CDRSC
C01SHARE CDRSC CDRM=C01CDRM,ISTATUS=ACTIVE
```

## Defining Resources within the Same Domain

Cross-memory resources are not needed for clients to access a server in the same domain. Instead, a client will access a server with the VTAM LU 0 access method.

To define resources for a server and clients within the same domain, you have two options:

- Create new APPL statements that define the LU pool in a new VTAMLST member.
- Add new APPL statements that define the LU pool to the Domain 1 server's VTAMLST member CO1ASAS.

An example of the second option follows:

```
Domain 1 VTAMLST member C01ASAS:

*************************************************
*   Application major node for SAS/SHARE software   *
*   Server name is C01SHARE                       *
*************************************************
    VBUILD TYPE=APPL
*-----------------------------------------------*
*   SAS Server application running in domain 1  *
*-----------------------------------------------*
C01SHARE APPL AUTH=(ACQ),EAS=30,PARSESS=YES
*-----------------------------------------------*
```

```
*   SAS User applications running in domain 1       *
*-----------------------------------------------*
C01SI001 APPL ACBNAME=SASCON1,AUTH=(ACQ),EAS=3,PARSESS=YES
C01SI002 APPL ACBNAME=SASCON2,AUTH=(ACQ),EAS=3,PARSESS=YES
C01SI003 APPL ACBNAME=SASCON3,AUTH=(ACQ),EAS=3,PARSESS=YES
C01SI004 APPL ACBNAME=SASCON4,AUTH=(ACQ),EAS=3,PARSESS=YES
C01SI005 APPL ACBNAME=SASCON5,AUTH=(ACQ),EAS=3,PARSESS=YES
```

You have completed the configuration of the VTAM LU 0 access method.

## References

For complete details about configuring the VTAM LU 0 subsystem, see *VTAM Installation and Resource Definition (SC27-0610 for ACF/VTAM Version 2) and VTAM Installation and Resource Definition (SC23-0111 for ACF/VTAM Version 3).*

Contact IBM for information about obtaining this documentation.

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