# ACSLS SUPPORT FOR DUAL TCP/IP CONNECTIONS

## TO THE SL8500 MODULAR LIBRARY SYSTEM

17 August 2006

## Overview

Dual TCP/IP is an option that can be purchased for the SL8500. It provides two TCP/IP connections to the SL8500. However, you can continue to use the SL8500 with only one of the two connections operational. For more information on this feature, refer to the *StreamLine SL8500 Modular Library System Dual TCP/IP Feature* document. The latest copy can be found on the Customer Resource Center (CRC).

The purpose of dual TCP/IP is to automatically recognize and avoid a failing communication path. Since this is automated, there is no need for you to manually switch from an inoperative connection.

In order to take full advantage of dual TCP/IP support on the SL8500, the routing tables on the ACSLS server must be managed using the "route" command. This forces a route to the defined network interfaces on the SL8500 which in essence, creates a one to one relationship between interfaces. For further information on the UNIX "route" command, please refer to the manpages on your ACSLS server.

## Requirements

- Please coordinate with both your system administrator and network administrator to understand your current network environment and to identify all necessary IP addresses in advance.
- Please coordinate with your system administrator to either configure your network interface or to validate that it is configured properly.
- Verify you have the minimum software level and have installed the following PUTs (if appropriate) and PTFs.
    - ACSLS 7.1.0 for Solaris SPARC
        - PUT0601S
        - PTF849144S (this does not apply to ACSLS HA)
    - ACSLS 7.1.0 for AIX
        - PUT0601A
        - PTF849144A (AIX)
    - ACSLS 7.1.1 for Solaris 10 x86
        - PTF849144S

# Configuration

It is recommended that ACSLS keep two connections to the library open since ACSLS uses all active connections. If one connection is inoperative ACSLS uses the remaining operative connection, while continuing to try to re-establish communication on the failing connection.

The preferred configuration for dual TCP/IP implementations would be two network interfaces on two separate subnets for the ACSLS server as shown in Scenario 1. This provides maximum throughput and minimum resource contention with regard to network communications while adding a second physical connection improving reliability.

To configure two TCP/IP connections to a single library use the **acsss_config** utility or Dynamic Configuration (**config**). You must enter the number (2) of connections there are to the library and the name of the devices (IP addresses). Refer to the *ACSLS 7.1/7.1.1 Installation, Configuration, and Administration Guide* for more information on these utilities.

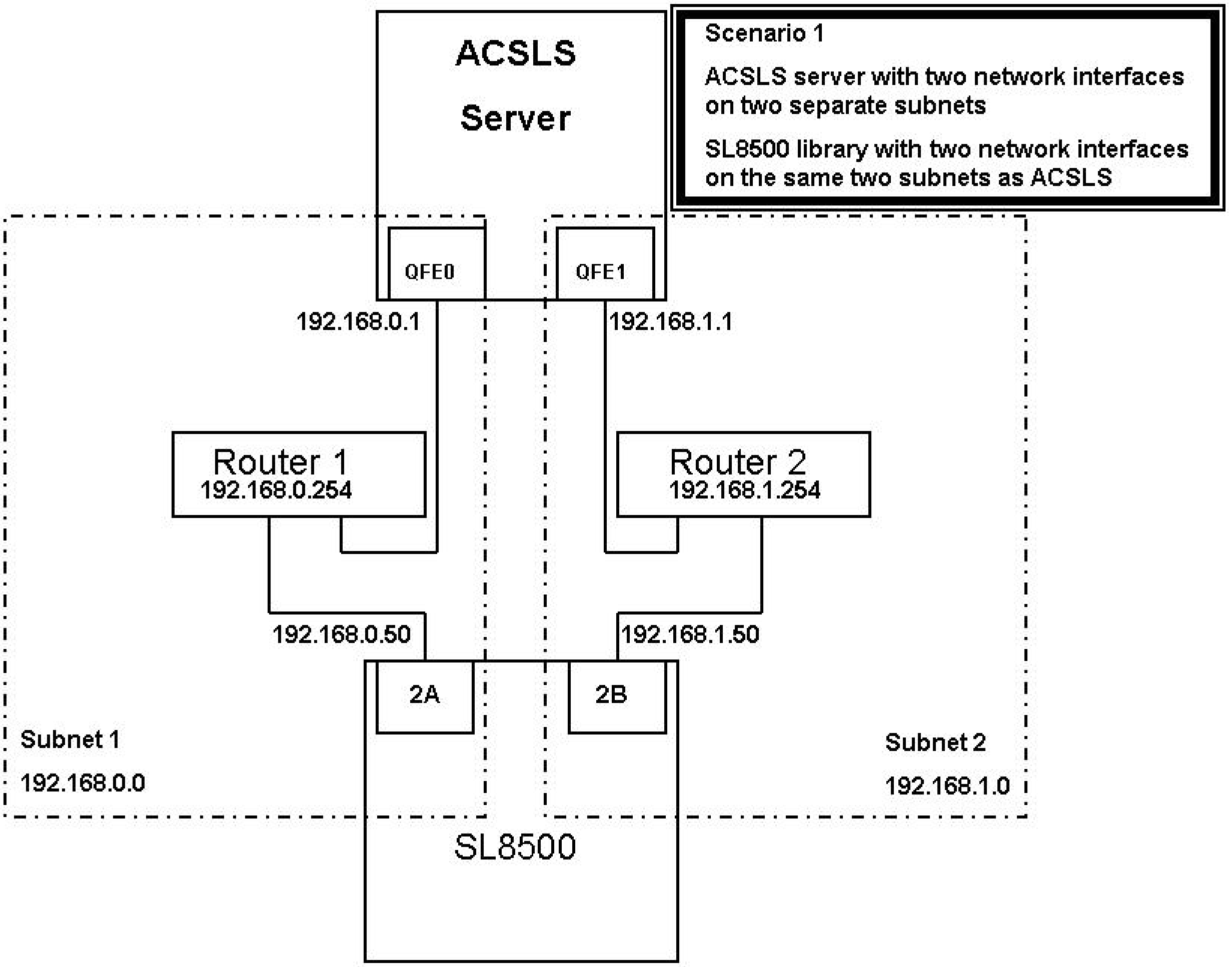
The following scenarios provide examples for configuring the ACSLS server. For instructions on configuring the SL8500 dual TCP/IP feature, please refer to the *StreamLine SL8500 Modular Library System Dual TCP/IP Feature* document.

These scenarios use private subnet IP addresses and will not be the same in your environment. These scenarios assume that your network devices have been configured and are functioning properly.

## Scenario 1

Scenario 1 is the preferred configuration for the dual TCP/IP feature.

In this configuration, the ACSLS server contains two network interfaces that reside on two separate subnets. The SL8500 also contains two network interfaces that reside on the same two subnets as the ACSLS server.



In this scenario, the SL8500 uses a one to one relationship with the network interfaces on the ACSLS server in which the:

- qfe0 interface on the ACSLS server only communicates with the 2A interface on the SL8500
- qfe1 interface on ACSLS only communicates with 2B on the SL8500.

Using the UNIX “route” commands, you force this relationship. To do this:

- For Solaris: as user **root**, type the following commands:

```
#route add 192.168.0.50 -ifp qfe0 192.168.0.254
#route add 192.168.1.50 -ifp qfe1 192.168.1.254
```

- For AIX: as user **root**, type the following commands:

```
#route add 192.168.0.50 -if qfe0 192.168.0.254
#route add 192.168.1.50 -if qfe1 192.168.1.254
```

The first route command routes any communication with 192.168.0.50 to go through qfe0 on the ACSLS server and then go through Router 1.

The second command routes any communication with 192.168.1.50 to go through qfe1 on the ACSLS server and then go through router 2.

You can validate that the routes are in the routing table by typing:

```
# netstat –r
```

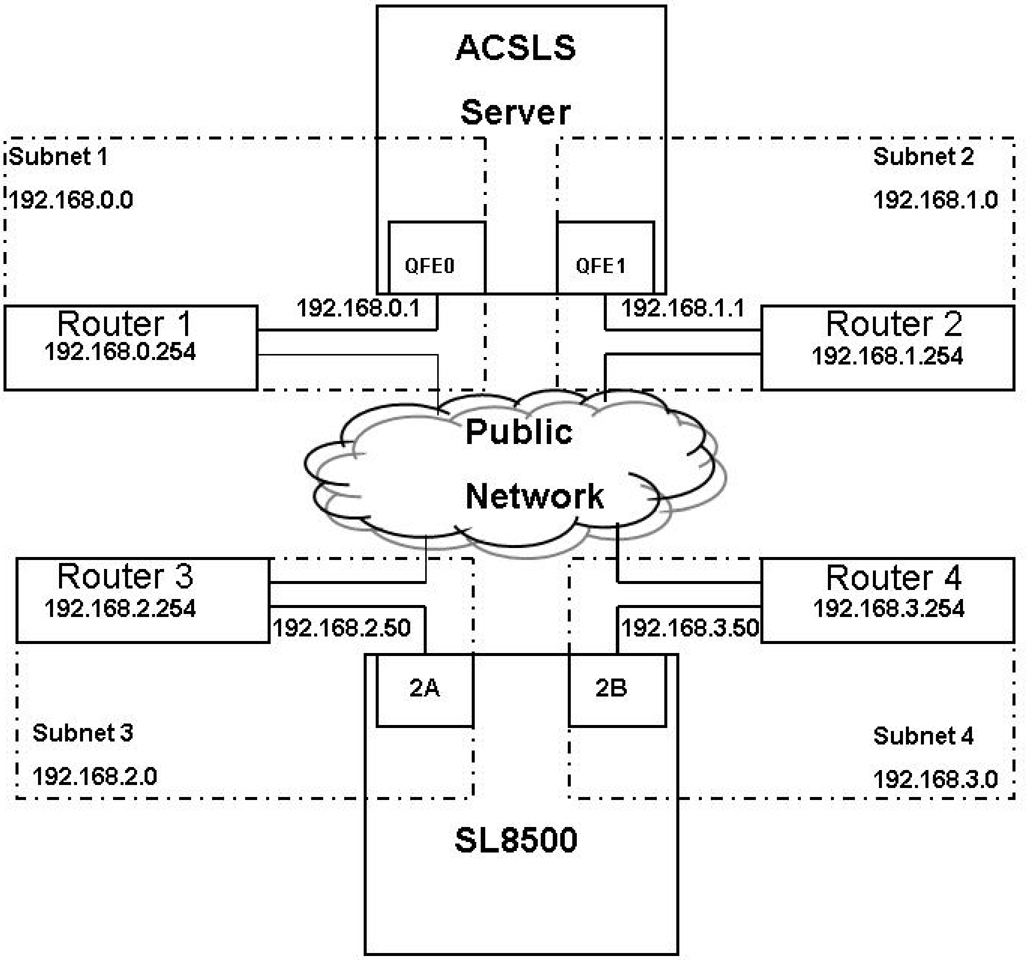
```
Routing Table: IPv4
  Destination           Gateway           Flags  Ref   Use   Interface
-------------------- -------------------- ----- ----- ------ ---------
192.168.0.50          192.168.0.254        UGH   1      0     qfe0
192.168.1.50          192.168.1.254        UGH   1      0     qfe1
192.168.0.0           192.168.0.1          U     1      7     qfe0
192.168.1.0           192.168.1.1          U     1      0     qfe1
BASE-ADDRESS.MCAST.NET 192.168.0.1         U     1      0     qfe0
default               192.168.0.254        UG    1     33
localhost             localhost            UH    4     77     lo0
```

You can see the first two entries are the ones that were just added.  All communication with 192.168.0.50 will go through qfe0 and communication with 192.168.1.50 will go through qfe1.

**Remember:** You must also configure the SL8500 routing tables according to the instructions in the *StreamLine SL8500 Modular Library System Dual TCP/ IP Feature* document.

## Scenario 2

Scenario 2 also shows two interfaces on the ACSLS server on two separate subnets but communication to the SL8500 will pass through the public network.  Even with this difference, the commands stay the same.



**Scenario 2:**

ACSLS server with two network interfaces on separate subnets from library

SL8500 with two network interfaces on separate subnets from ACSLS

Both ACSLS and SL8500 using public network

Using the UNIX "route" commands, you force this relationship. To do this:

- For Solaris: as user **root**, type the following commands:

```
#route add 192.168.0.50 -ifp qfe0 192.168.0.254
#route add 192.168.1.50 -ifp qfe1 192.168.1.254
```

- For AIX: as user **root**, type the following commands:

```
#route add 192.168.0.50 -if qfe0 192.168.0.254
#route add 192.168.1.50 -if qfe1 192.168.1.254
```

The default routes for the ACSLS remain the same. The routes within the subnets will know how to route communication to the SL8500 through the public LAN and you are still forcing the one to one relationship with the interfaces. Again, this is seen using the following command:

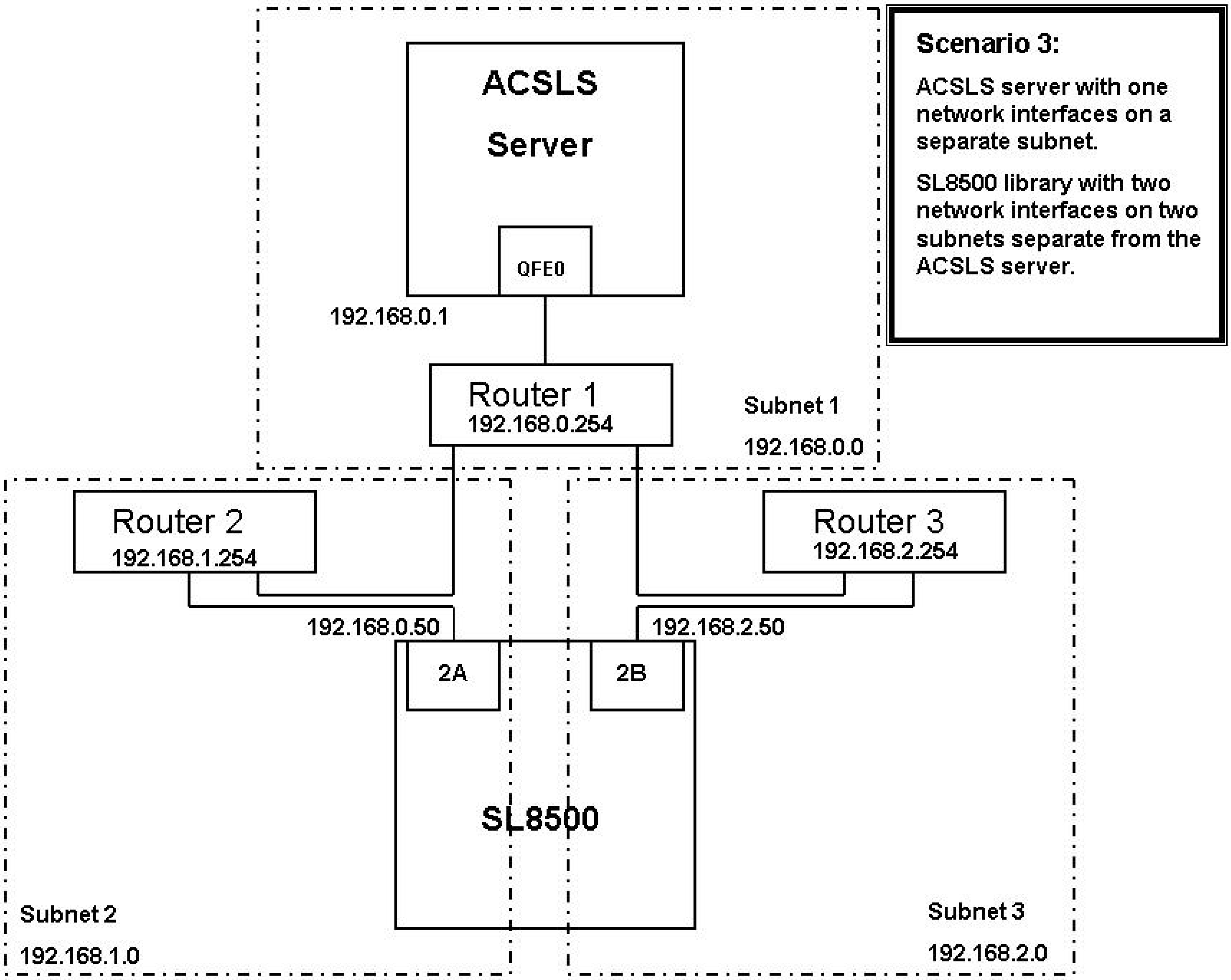
```
# netstat –r
```

```
Routing Table: IPv4
  Destination           Gateway           Flags  Ref   Use   Interface
-------------------- -------------------- ----- ----- ------ ---------
192.168.0.50          192.168.0.254        UGH   1      0     qfe0
192.168.1.50          192.168.1.254        UGH   1      0     qfe1
192.168.0.0           192.168.0.1          U     1      7     qfe0
192.168.1.0           192.168.1.1          U     1      0     qfe1
BASE-ADDRESS.MCAST.NET 192.168.0.1         U     1      0     qfe0
default               192.168.0.254        UG    1     33
localhost             localhost            UH    4     77     lo0
```

**Remember:** You must also configure the SL8500 routing tables according to the instructions in the *StreamLine SL8500 Modular Library System Dual TCP/ IP Feature* document.

## Scenario 3

Scenario 3 **is not the preferred method** but will work.  You can employ the dual TCP/IP feature on the SL8500 without using two network interfaces on the ACSLS server.  This reduces reliability because if the ACSLS server network interface fails, communication with the library fails.  If you do intend to implement this scenario, there is no need for special configuration on the ACSLS server.  The default route is already established for normal network configuration, and it would be redundant to add specialized routes using the same default route.  It is worth noting here that you still need to configure the SL8500 according to the instructions in the *StreamLine SL8500 Modular Library System Dual TCP/IP Feature* document.



**Scenario 3:**

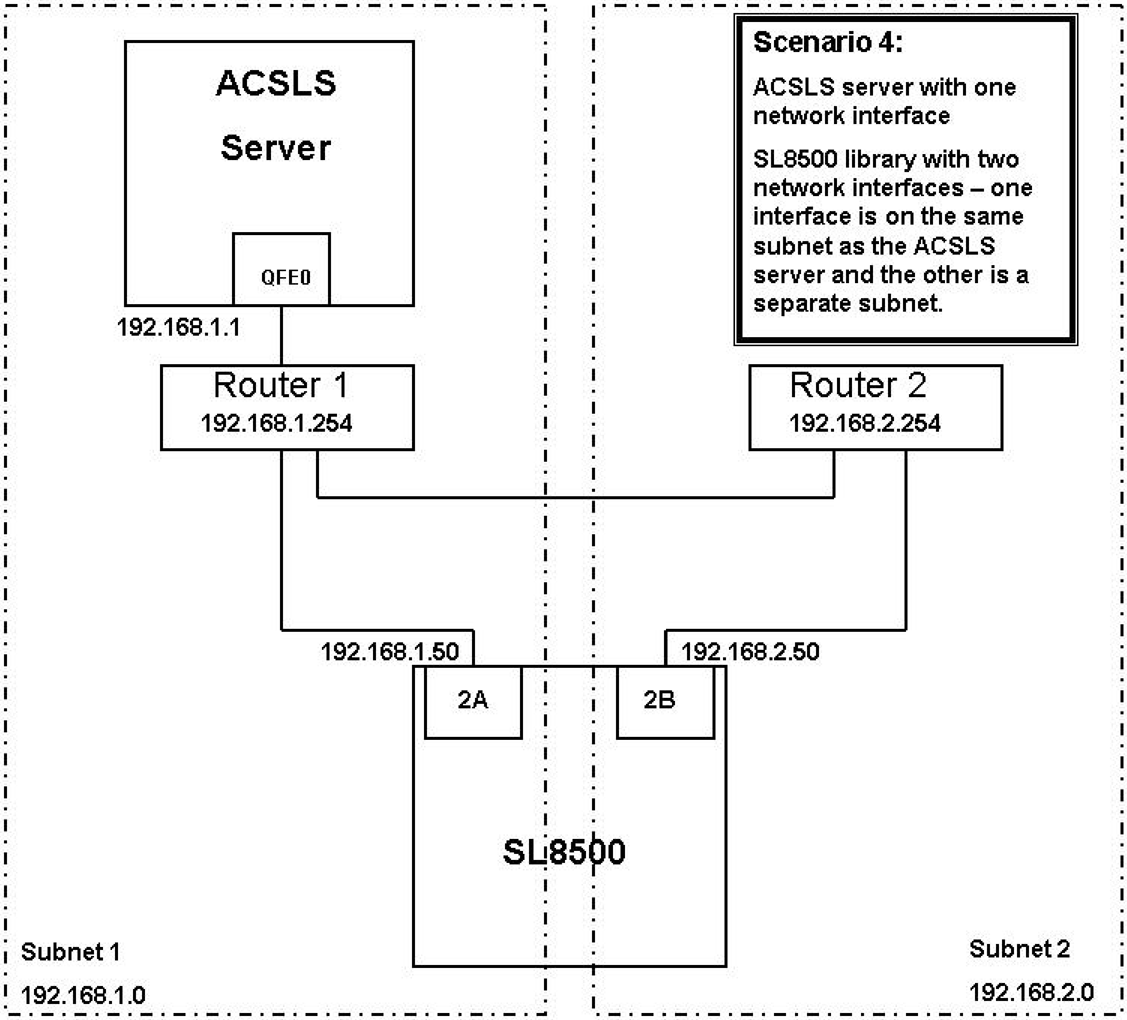
ACSLS server with one network interfaces on a separate subnet.

SL8500 library with two network interfaces on two subnets separate from the ACSLS server.

## Scenario 4

Scenario 4 also shows the ACSLS server using a single network interface while the SL8500 has two interfaces on two different subnets.  This also **is not a preferred method** since there is no redundant interface on the ACSLS server.

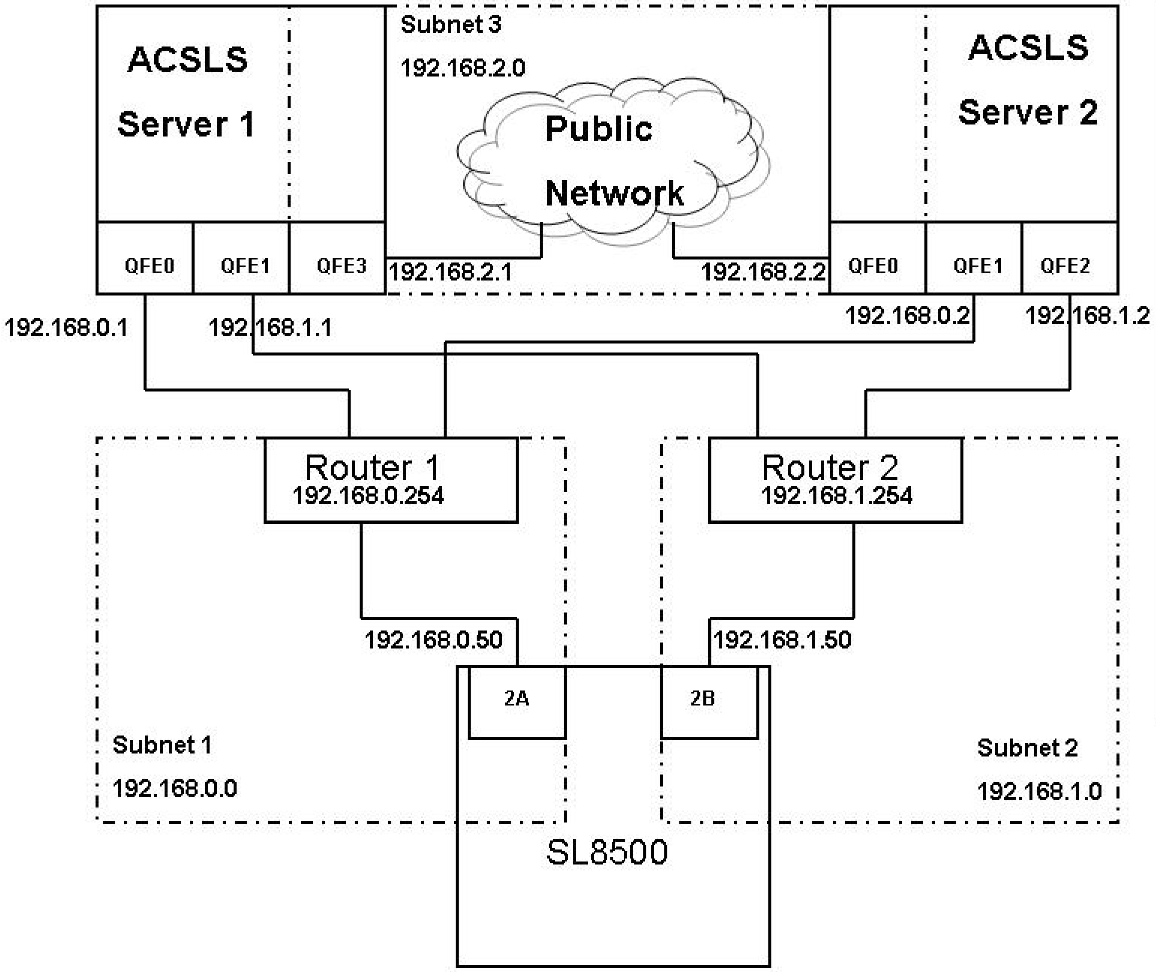
As in Scenario 3, there is no need for special configuration on the ACSLS server.  Routing is already handled with a normal network configuration but the SL8500 still needs to be configured.


ACSLS
Server
QFE0
192.168.1.1
Router 1
192.168.1.254
Scenario 4:
ACSLS server with one network interface
SL8500 library with two network interfaces – one interface is on the same subnet as the ACSLS server and the other is a separate subnet.
Router 2
192.168.2.254
192.168.1.50
192.168.2.50
2A
2B
SL8500
Subnet 1
192.168.1.0
Subnet 2
192.168.2.0

**Remember:** You must also configure the SL8500 routing tables according to the instructions in the *StreamLine SL8500 Modular Library System Dual TCP/ IP Feature* document.

## Scenario 5

Scenario 5 shows Highly Available ACSLS (ACSLS HA) in a dual TCP/IP environment.



Scenario 5
**ACSLS HA**

Two Highly Available ACSLS servers (ACSLS HA), both with three network interfaces, two separate private subnets with the SL8500 and a third public network.

One SL8500 library with two network interfaces on the same two private subnets as the ACSLS servers

The big difference with this scenario is that ACSLS HA uses two different servers with each using different network interfaces. This means that custom route entries must be added to both ACSLS servers.

For the Solaris user:

- On ACSLS server 1, you would type:

```
# route add 192.168.0.50 –ifp qfe0 192.168.0.254
# route add 192.168.1.1 –ifp qfe1 192.168.0.254
```

- On ACSLS Server 2, you would type:

```
# route add 192.168.0.2 –ifp qfe1 192.168.0.254
# route add 192.168.1.2 –ifp qfe2 192.168.1.254
```

You must add the IP addresses for both servers to the SL8500 configuration. Please refer to the *StreamLine SL8500 Modular Library System Dual TCP/IP Feature* document.

It is important that you separate the SL8500 network interfaces over two different subnets when on ACSLS HA. The purpose of a Highly Available environment is to build in redundancy and eliminate single points of failure.

**Remember:** You must also configure the SL8500 routing tables according to the instructions in the *StreamLine SL8500 Modular Library System Dual TCP/ IP Feature* document.

## Retaining Customized Routing Table Entries after a Reboot

Any customized routing table entries will be lost after a system re-boot. This is the nature of system routing tables and is expected behavior.

In order to support the Dual TCP/IP feature on the SL8500, it is necessary to add custom entries to the routing tables on the ACSLS server. When the ACSLS server is re-booted, all routing table entries are flushed and any necessary routes to the SL8500 are removed. Since this is the nature of the operating system, there are a couple of different ways to handle this situation:

1. You can create scripts to add custom routes to be initialized at boot time.

   These scripts can then be placed in the *rc directory structure* for automatic execution at boot time. Please refer to your system documentation for details on the best way to implement this.

2. You can install the appropriate PTF for your operating system as discussed under Requirements. Please refer to the PTF README for installation instructions.

   This allows the ACSLS startup scripts to add your custom routing entries at boot up time. The PTF includes new script entries that will check for a file that contains customized route table entries. Any entries found will be added to the routing table automatically using the UNIX *route* command.

   For standalone ACSLS installations this is a desirable method to maintain route entries that are necessary for SL8500 support.

   **Important:** This solution **will not work** if the ACSLS installation is a Highly Available ACSLS (ACSLS/HA) environment.

   > In this case, you need to use the first method to maintain routing tables.
   >
   > ACSLS HA handles system initialization differently than a standalone ACSLS server. ACSLS HA relies on Veritas Cluster Server to manage its clustered resources which means ACSLS cannot be automatically started by way of the system RC mechanism at boot time. This is handled strictly by the Veritas agents, and the S87ACSLS startup scripts are never used. Because of this, you cannot use ACSLS PTF849144S to retain the custom routing table entries. You need to add a script with the appropriate “route add” commands and locate it within the */etc/rc2.d* directory structure. It is highly recommended that any customers with an ACSLS HA environment engage Sun Professional Services – preferably the same PS consultant that originally installed the ACSLS HA system.

# Removing Special Routing Commands

Use the route command to remove any special routing commands that have been added erroneously or are no longer needed to the earlier configuration.

As user **root**, type the following commands:

```
# route delete 192.168.0.50 192.168.0.254
```

This says to remove the route to 192.168.0.50 (the SL8500) using the default route of 192.168.0.254.  The route is then removed.