

Routing and Prioritization in SNA Subarea Networks

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Introduction

This document describes routing in legacy Systems Network Architecture (SNA) networks, and the mechanisms that are available to prioritize the traffic. For additional details on some of the concepts discussed here, refer to IBM Systems Network Architecture Routing.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

It is important to understand the following concepts:

- SNA routing is dependent upon the static routing mechanism. All of the routes must be defined with the PATH statements either in the host (VTAMLST) or in the Front End Processor (FEP) (NCPGEN).
- SNA static routing is not defined from end point to end point, but only to the next hop. Each node only has the information on how to get to its adjacent node.
- The routing node is equivalent to the subarea node.
- Transmission Group (TG) can be either the channel connection between the host and FEP (in this case, TG1 is always assigned to the transmission group), or a set of Synchronous Data Link Control (SDLC) links (single link, parallel links).
- Explicit Route (ER) is the physical connection between two adjacent subarea nodes.
- Virtual Route (VR) is the logical connection (Logical Unit (LU)) between network end points.

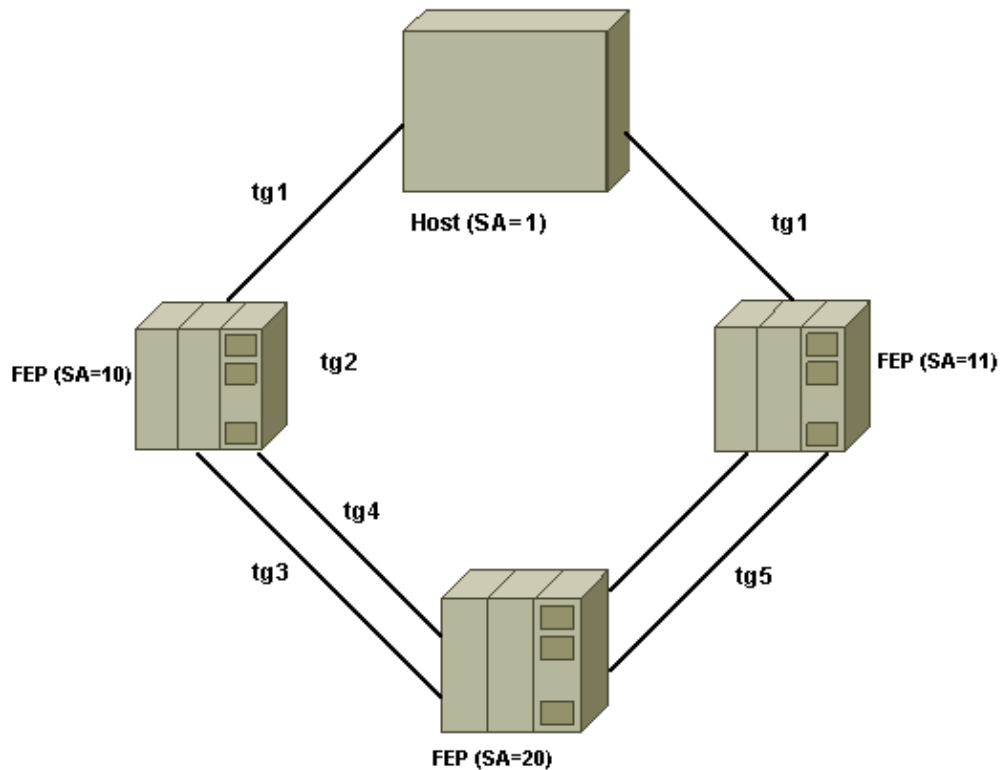
Components Used

This document is not restricted to specific software and hardware versions.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

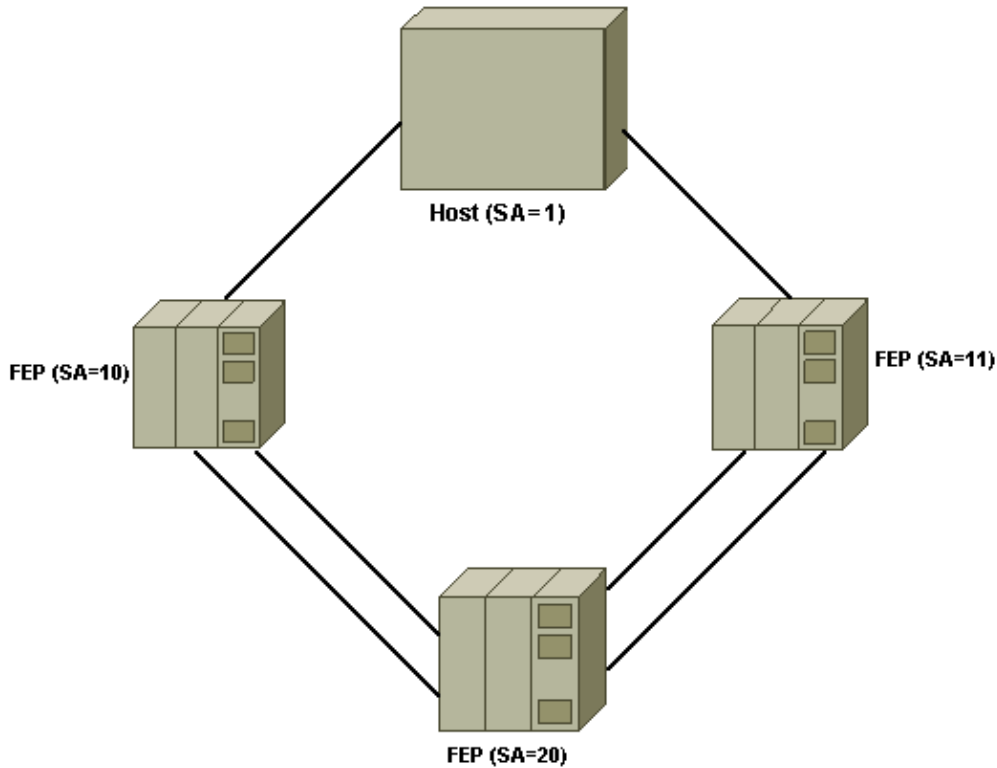
Defining a Route and Assigning a Priority

To get a better understanding of how TG, ER, and VR work, you must understand how a route is defined. Refer to the following network diagram:



To define a route and set up prioritization, follow the steps below.

1. Define the TG ID.



- ◆ tg1 is assigned to the channel connection between host (SA=1) and FEP(SA=10); and host (SA=1) and FEP(SA=11).
- ◆ tg2 is for the link between FEP(SA=10) and FEP(SA=11).
- ◆ tg3 is for the link between FEP(SA=10) and FEP(SA=20).
- ◆ tg4 is for the second link between FEP(SA=10) and FEP(SA=20).
- ◆ tg5 is for the two links between FEP(SA=11) and FEP(SA=20).

2. In this example, define only the routes from the host (SA=1) to the FEP(SA=20).

Define all of the paths from SA=1 to SA=20, as shown below.

```

- SA1 -tg1 - SA10 -tg3 - SA20
- SA1 -tg1 - SA10 -tg4 - SA20
- SA1 -tg1 - SA11 -tg5 - SA20
- SA1 -tg1 - SA10 -tg2 - SA11 - tg5 - SA20
- SA1 -tg1 - SA11 -tg2 - SA10 - tg3 - SA20
- SA1 -tg1 - SA11 -tg2 - SA10 - tg4 - SA20

```

3. Choose the best route and assign it an explicit route number. Since the path was already written down in order, assume that the routes are also in order of the best path. For each path statement, you can define up to eight routes for each path statement. The first four routes are shown below.

```

ER0 = - SA1 -tg1 - SA10 -tg3 - SA20
ER1 = - SA1 -tg1 - SA10 -tg4 - SA20
ER2 = - SA1 -tg1 - SA11 -tg5 - SA20
ER3 = - SA1 -tg1 - SA10 -tg2 - SA11 - tg5 - SA20

```

4. Map the virtual route to the ER, as shown below.

```

VR0 = ER0
VR1 = ER1
VR2 = ER2
VR3 = ER3

```

5. Code the PATH statements, as shown below.

```

Destsa:destination subarea node.

```

```

ERx=(y,z) where x: 0 -> 7
y: adjacent subarea node
z: TG number
VRx=(ER-number)

```

◆ At Host(SA=1):

```

SA1SA20 Path DESTSA=20,ER0=(10,1),ER1=(10,1),ER2=(11,1),ER3=(10,1),
VR0=0,VR1=1,VR2=2,VR3=3

```

◆ At NCPGEN of FEP(SA=10):

```

SA1021 PATH DESTSA=01,ER0=(1,1),ER1=(1,1),ER3=(1,1) SA10220 PATH
DESTSA=20,ER0=(20,3),ER1=(20,4),ER3=(11,2)

```

◆ At NCPGEN of FEP(SA=11);

```

SA1121 PATH DESTSA=01,ER2=(1,1),ER3=(10,2) SA11220 PATH
DESTSA=20,ER2=(20,5),ER3=(20,5)

```

◆ At NCPGEN of FEP(SA=20):

```

SA2021 PATH DESTSA=01,ER0=(10,3),ER1=(10,4),ER3=(11,5),ER4=(11,5)

```

6. After you define the route, assign the priority to each route by using the Class of Service (CoS) macro. The following is a simple version of the CoS macro:

```

COS VR=(x,y) where x is the virtual route number and y is the priority.
There are three levels of priority:

```

```

00 - low
01 - medium
02 - high

```

The COS table appears as follows:

```

ONLINE COS      VR=((0,2),(1,2),(2,2),(3,1))
BATCH COS       VR=((0,0),(1,0),(2,0),(3,0))

```

Begin with a LU session. In the LU macro, there is a parameter which defines a logmode table (or logon mode table). This table will define the sessions characteristics. From this logmode table, you can find the COS table. During the BUILD macro of the VTAM list, you can also define CoS table for the network.

```

(VTAM/NCP) LU      ... ,logmode=logm01,...
                    .....
                    |
                    V
(SYS1.VTAMLIB)TAB01  MODEENT LOGMODE=LOGM01,COS=COS01
                    .....
                    |
                    -----
                    |
                    V
(SYS1.VTAMLIB)COS01  COS      VR=((0,2),(1,2),(2,1),(3,0))
                    .....
                    |
                    -----
                    |
                    V
(VTAMSLT)PATH01     PATH      DESTSA=20,ER0=(10,1),VR0=0
                    .....
                    |

```

The following three bits will be in the FID4 transmission header:

Byte 0 _ _ _ _ _ _ _ _
| -> Network priority, 0 - no network priority
1 - high priority.

*!--- If this bit is on, the frame will be put
!--- into the highest tcp queue(queue 1).*

Byte 1 _ _ _ _ _ _ _ _

Byte 2 _ _ _ _ _ _ _ _
| |
----> Transmission priority field.
00 -low
01 - medium
02 - high

*!--- Depending on these bits, the frame will be
!--- queued into three different queues (2,3,4).
!--- These queues will be drained in the order
!--- of the queue.*

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