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Pub 100-20 One-Time Notification	Centers for Medicare & Medicaid Services (CMS)
Transmittal 517	Date: JULY 17, 2009
	Change Request 6367

Transmittal 517 rescinds and replaces Transmittal 450, dated February 20, 2009. The Effective and Implementation dates have been changed from July 31, 2009, to October 1, 2009, and October 5, 2009, respectively. In addition, requirement 6367.9 has been added. All other information remains the same.

SUBJECT: System Network Architecture (SNA) Requirements for New CMS-Net Wide Area Network (WAN)

I. SUMMARY OF CHANGES: System Network Architecture (SNA) requirements for new CMS Net Wide Area Network (WAN)

New / Revised Material

Effective Date: October 1, 2009

Implementation Date: October 5, 2009

The Contractor and shared system maintainers shall be prepared to transition to the new SNA MPLS Network as early as August 1, 2009.

Disclaimer for manual changes only: The revision date and transmittal number apply only to red italicized material. Any other material was previously published and remains unchanged. However, if this revision contains a table of contents, you will receive the new/revised information only, and not the entire table of contents.

II. CHANGES IN MANUAL INSTRUCTIONS: (N/A if manual is not updated)

R=REVISED, N=NEW, D=DELETED

R/N/D	CHAPTER/SECTION/SUBSECTION/TITLE
N/A	

III. FUNDING:

SECTION A: For Fiscal Intermediaries and Carriers:

No additional funding will be provided by CMS; Contractor activities are to be carried out within their operating budgets.

SECTION B: For Medicare Administrative Contractors (MACs):

The Medicare Administrative Contractor is hereby advised that this constitutes technical direction as defined in your contract. CMS does not construe this as a change to the MAC Statement of Work. The contractor is not obligated to incur costs in excess of the amounts allotted in your contract unless and until specifically authorized by the contracting officer. If the contractor considers anything provided, as described above, to be outside the current scope of work, the contractor shall withhold performance on the part(s) in question and immediately notify the contracting officer, in writing or by e-mail, and request formal directions regarding continued performance requirements.

IV. ATTACHMENTS:

One-Time Notification

**Unless otherwise specified, the effective date is the date of service.*

Number	Requirement	Responsibility (place an "X" in each applicable column)									
		A / B M A C	D M E M A C	F I	C A R R I E R	R H I	Shared-System Maintainers				OTHER
							F I S S	M C S	V M S	C W F	
6367.6	SNA partners shall make network routing changes to support locating SNA partners on the MDCN and MPLS CMSNET WANs.	X	X	X	X	X	X	X	X	X	
6367.7	SNA partners shall establish static EE links to the BDC and CDS.	X	X	X	X	X	X	X	X	X	
6367.8	SNA partners shall establish connectivity to the Global Virtual Routed Network that allows dynamic EE connections to be used.	X	X	X	X	X	X	X	X	X	
6367.9	SNA partners shall be prepared to transition to the new SNA MPLS Network as early as August 1, 2009.	X	X	X	X	X	X	X	X	X	

III. PROVIDER EDUCATION TABLE

Number	Requirement	Responsibility (place an "X" in each applicable column)									
		A / B M A C	D M E M A C	F I	C A R R I E R	R H I	Shared-System Maintainers				OTHER
							F I S S	M C S	V M S	C W F	
	None.										

IV. SUPPORTING INFORMATION

Section A: For any recommendations and supporting information associated with listed requirements, use the box below:

Use "Should" to denote a recommendation.

X-Ref Requirement Number	Recommendations or other supporting information:
	N/A

Section B: For all other recommendations and supporting information, use this space:

The CMS-NET WAN will require business partners that currently use SNA Sub area protocols to access business applications to transition to the use of IBM Enterprise Extender technology. This will require changes to be made to their SNA infrastructure.

V. CONTACTS

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VI. FUNDING

Section A: For *Fiscal Intermediaries (FIs)*, *Regional Home Health Intermediaries (RHHIs)*, and/or *Carriers*:

No additional funding will be provided by CMS; contractor activities are to be carried out within their operating budgets.

Section B: For *Medicare Administrative Contractors (MACs)*:

The Medicare Administrative Contractor is hereby advised that this constitutes technical direction as defined in your contract. CMS does not construe this as a change to the MAC Statement of Work. The contractor is not obligated to incur costs in excess of the amounts allotted in your contract unless and until specifically authorized by the contracting officer. If the contractor considers anything provided, as described above, to be outside the current scope of work, the contractor shall withhold performance on the part(s) in question and immediately notify the contracting officer, in writing or by e-mail, and request formal directions regarding continued performance requirements.

2 Attachments

SNA Guide for CMSNET Business Partners



Version Record

This policy manual is a living document and updated on an ongoing basis. The current version of this document serves as the official source for policies. Document version represents a modification to the document due to correspondence, clarification, and/or additional resources. The approval date of the version also represents the version date.

Ver. #	Date	Name	Description of Change
01	08/18/2008	Richard Funderburk	Document creation
02	10/10/2008	David Guess	Edited to focus on CMSNET Business Partners
03	11/06/2008	David Guess	Various edits of first draft
04	11/10/2008	David Guess	Updates to examples after EE core test
05	12/04/2008	David Guess	Apply updates after management review
06	01/08/2009	David Guess	Strikeout the March 31 deadline date. (section 1.2)
07	01/09/2009	David Guess	Add Security parameter to EE resources

Notifications

Notifications precede referenced text in the order of warnings, cautions, and then notes. Use separate concise notifications for each topic or idea.

WARNING: Use only if danger of injury or death, also include chemical hazards and potential electrical shock.

CAUTION: Use to indicate possible damage to network, equipment, or facilities.

NOTE: Use for abbreviated general information needed to remind or clarify.

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Section 1: General Information

1.1 Purpose

This guide provides the method, timeline, and tasks associated with the migration of CMS business partners from the existing MDCN SNA network managed by AT&T Global Network Services (AGNS) to their MPLS facilities for connectivity to CMSNET, a network established to support SNA communications for CMS business partners based on the Enterprise Extender (EE) technology.

1.2 Introduction

AT&T Global Network Services (AGNS) has announced that all CMS customers will be migrated from MDCN services to MPLS. AGNS is also dropping their support for the menu systems for CMS customers **by March 31, 2009**. CMS is taking steps to migrate CMS customers from the AGNS managed SNA environment to CMSNET, an SNA network managed internally by the EDC staff. AT&T will continue to support the underlying MPLS infrastructure that provides secure transport services for existing IP based applications (such as NDM) in addition to the SNA traffic for CMSNET.

Initially the EDC systems will be migrated to CMSNET prior to the migration of the CMS business partners. These datacenters will form the core network across Verizon OC-3 circuits. Two of the EDCs, CDS and BDC, will be established as the bridge nodes for the APPN network (USEDN01). The bridge nodes will manage all SNA session requests from CMS customers. The CMSNET SNA Guide for Core Systems describes the process for building the core network. After the CMSNET core systems are established, the migration of business partners to CMSNET can begin.

1.3 Network Design

The CMSNET SNA network design is built around Enterprise Extender (EE) technology and includes the global connection network (GCN) feature. GCN enables dynamic APPN connections (RTP pipes) directly between two EE nodes. Without GCN, all EE packets between CMS business partners must flow through an EDC bridge node. With GCN, only the initial session setup packets flow through the bridge node. The border nodes (BNs) on each end then create a dynamic, temporary RTP pipe (PU T2.1 session) between them and the subsequent session packets flow directly between the two BNs. The implementation of GCN requires the additional definition of a global virtual routing node (GVRN) at border nodes of each business partner and on the non-bridge nodes in the core. The bridge nodes will not require a GVRN resource because they will already have a direct static connection to each of the other nodes. Note that the AGNS network does NOT use GCN.

1.4 Requirements

This CMSNET SNA guide assumes the following for every CMS business partner system.

1. VTAM level is CS/V1R6 or better. This is required in order to use GCN with DNS
2. The TCPIP stack uses a static VIPA (Virtual IP Address), which is a requirement of EE
3. EE VIPAs do not use private IP addresses across the network (static NAT is allowed)
4. Business partner gateway nodes are APPN network nodes (NN or ICN) with BN=YES
5. VTAM is configured for hostname support (DNS resolution)

1.5 Timeline for Migration to CMSNET

Here is a brief overview of tasks and timelines for this project.

1.5.1 EE Preparation

1. Review the business partner EE guide to get an idea of what lies ahead.
2. Distribute the TCP/IP Tasks to the appropriate people (firewall, network, and DNS staff). Arrange a call with EDC to discuss any TCP/IP questions or concerns.
3. For each gateway VTAM that will connect to CMSNET:
 - a. Determine the VIPA (Virtual IP Address), both local and NAT (if using NAT)
 - b. Identify the fully qualified CPNAME (NETID and SSCPNAME)
 - c. Determine local DNS hostname (SSCPNAME.cmsnet.gov)
4. EDC will notify the other core systems and all business partners on CMSNET to update their firewalls and routes for VIPAs (suggest 30 days notice).
5. All sites update their local host tables with the hostnames and IP addresses
6. Complete all preparation tasks. Schedule calls with EDC as needed to discuss any questions or concerns.
7. When the preparation tasks are complete (Section 1.6), schedule a call with EDC to review the status of each item.
8. CP-CP non-disruptive test with the bridge nodes (CDS & BDC).

1.5.2 EE Implementation

This is disruptive to production traffic. We recommend both steps.

Business partners cutover to MPLS and EE on CMSNET

1. Plan to test for a few hours, then definitely back out.
2. Plan to test and implement, and only back out if necessary.

NOTE: EDC will schedule cutover dates on weekends during the months of March through May. We recommend a one week delay between the disruptive test and the cutover for mitigation.

In each case, plan on at least 2 hours to perform the test plan and resolve any issues. During this initial 2-hour test period, have local firewall and router staff available to assist with debugging if needed. If the business partners want to bring in any testers, have them join after the initial 2-hour test period.

1.5.3 EE Backout

This section details the required instructions to remove the system from the CMSNET network.

Preparation Tasks for Migration to CMSNET

1.6 **Preparation Checklist**

Use the list of preparation tasks below as a checklist to verify preparations for the migration to CMSNET. Refer to the detailed explanation for each task on the subsequent pages. Complete each task and implement the changes prior to the migration to CMSNET.

1.6.1 **TCP/IP Tasks**

1. Firewall Rules for EE
2. IP Routes for EE hosts
3. Local host tables for DNS names
4. TCP/IP Stack Configuration

1.6.2 **VTAM Tasks**

5. Obtain VTAM samples from the EDC
6. Verify maintenance levels of VTAM and TCPIP
7. Review local VTAM start options
8. Copy COSAPPN and IBMTGPS to VTAMLST
9. IPL (if necessary) to implement maintenance and start option changes
10. Add model PU major nodes (RTP and VRN) and update ATCCONxx
11. Create a global logmode table (ISTINCLM or MTAPPN)
12. Update existing CDRSCs with MODETAB and CPNAME operands
13. Update ADJCLUST tables (and ADJSSCP tables if subarea is still supported)
14. Stage new ADJSSCP and ADJCLUST tables for the migration to CMSNET
15. Activate XCA major node for EE with static and GCN groups
16. Stage SNET major nodes for static bridge node connections
17. Self tests (XCA, DNS)
18. Provide a list of local APPLIDs for testing
19. Send a copy of VTAM definitions and displays to EDC
20. Develop a test script and execute it prior to migration
21. Schedule a non-disruptive Mini CP-CP Test with the bridge nodes

1.7 Preparation Task Details

1.7.1 Firewall Rules for Inbound EE Traffic

NOTE: Provide a copy of this page 8 and page 9 to local Router and Firewall administrators.

EE uses UDP Ports 12000 through 12004. Permit EE traffic bi-directionally because either side could and will initiate the connections. There are three options for configuring the firewall rules. The samples below show how to code these rules in a Cisco Pix firewall.

a.a.a.a = local VIPA(s) z.z.z.z = remote VIPAs

1.7.1.1 Option 1

Permit any remote host, limited to a specific range of UDP ports. With this option, you only need 1 entry for each of local EE VIPAs. This option is the easiest in that no further maintenance is needed.

1. conduit permit udp host a.a.a.a range 12000 12004 any range 12000 12004

1.7.1.2 Option 2

Permit any remote host, limited to very specific UDP ports. With this option, you need five entries for each of local EE VIPAs. This option is also easy in that no further maintenance is needed.

1. conduit permit udp host a.a.a.a eq 12000 any eq 12000
2. conduit permit udp host a.a.a.a eq 12001 any eq 12001
3. conduit permit udp host a.a.a.a eq 12002 any eq 12002
4. conduit permit udp host a.a.a.a eq 12003 any eq 12003
5. conduit permit udp host a.a.a.a eq 12004 any eq 12004

1.7.1.3 Option 3

Specifically define each remote VIPA.

With this option, you need one entry for each pair of remote-local VIPAs. See the list of remote EE Host VIPAs. This option requires firewall updates every time a new Plan converts to EE.

1. conduit permit udp host a.a.a.a range 12000 12004 host z.z.z.z1 range 12000 12004
2. conduit permit udp host a.a.a.a range 12000 12004 host z.z.z.z2 range 12000 12004
3. conduit permit udp host a.a.a.a range 12000 12004 host z.z.z.z3 range 12000 12004
4. conduit permit udp host etc.

1.7.2 IP Routes for EE Hosts

For each of the EE VIPAs on page 10, verify that you have IP routes in place from local mainframe, through the appropriate firewall, and out to CMSNET.

1.7.3 DNS for EE Hosts

NOTE: No DNS servers will be available during the initial deployment. However, the use of DNS hostnames is essential for the successful implementation of the connection network. Hostnames and IP addresses must match across all CMS business partners. Only the IP address for the local hostname will vary when a customer's private IP address is being NAT'd into the public IP address used by CMS partners.

EDC will assign a special hostname for the EE VTAM to use on CMSNET. This name will need to resolve internally to the local (non-NATed) IP address and externally to its NATed CMSNET IP address.

1.7.3.1 Local Host Name Resolution

During VTAM startup (and any time local XCA Major Node is activated), local hostname must resolve internally to local (non-NATed) VIPA. You must create entries in the TCPIP local host names table for the local hostname as well as for the hostnames of all remote core systems. Eventually, we will also include the hostnames for all business partners in our local host table.

To create an entry in the mainframe host names table:

5. Create or update the TCPIP.HOSTS file. Add an entry for the EE hostname, and run the MAKESITE command.
6. In TCPIP.DATA, be sure to specify DATASETPREFIX and code "LOOKUP LOCAL DNS". This tells the resolver to look in the local host table first, and then go to DNS only if not found. The default is "LOOKUP DNS", which means the host table is not used.
7. Add a DD card to local VTAM Proc for the TCPIP.DATA file:

```
//SYSTCPD DD DISP=SHR,DSN=tcPIP.data
```

1.7.3.2 DNS Tests

To verify name resolution, use the TSO command: PING name.

(Note: NSLOOKUP uses only DNS, whereas PING uses local "LOOKUP LOCAL DNS" sequence.

Lookup each host name listed on the following page.

8. PING local own hostnames. They should resolve to the local (non-NATed) VIPA IP address.

PING local_sscpname.CMSNET.GOV

9. PING for all remote hostnames. They should resolve to their CMSNET IP address.

PING remote_sscpname.CMSNET.GOV

1.7.4 TCP/IP Stack Configuration

IBM consulting services recommends the following parameters.

```

IPCONFIG
  IGNOREREDIRECT
  NODATAGRAMFWD
  SOURCEVIPA
  MULTIPATH PERCONNECTION
  PATHMTUDISCOVERY

TCPCONFIG INTERVAL 5
  SENDGARBAGE FALSE
  RESTRICTLOWPORTS
  TCPSENDBFRSIZE 64K
  TCPRCVBFRSIZE 64K
  FINWAIT2TIME 100

UDPCONFIG RESTRICTLOWPORTS
  UDPSENDB 65535
  UDPRCVB 65535

PORT
; UDP PORT reservations for EE
  12000 UDP NET      ; VTAM EE (local VTAM task name)
  12001 UDP NET      ; VTAM EE (local VTAM task name)
  12002 UDP NET      ; VTAM EE (local VTAM task name)
  12003 UDP NET      ; VTAM EE (local VTAM task name)
  12004 UDP NET      ; VTAM EE (local VTAM task name)

=====

; VIPA Parns
DEVICE VIPA01 VIRTUAL 0
LINK  VLINK1 VIRTUAL 0 VIPA01

HOME
  xxx.xxx.xxx.xxx VLINK1

PRIMARYINTERFACE VLINK1

=====

; Enterprise Extender / VTAM
DEVICE IUTSAMEH MPCPTP
LINK  EELINK  MPCPTP IUTSAMEH

; START: Starts a device or interface
START IUTSAMEH

```

Figure 1-1 Recommended TCP/IP Stack Configuration

1.7.5 Obtain VTAM samples from the EDC

Sample text files are available from EDC for the VTAM resource definitions required for this migration.

1.7.6 Verify Maintenance Levels of VTAM and TCPIP

On IBMLink, see Informational APAR II12223. This APAR lists the recommended maintenance levels of VTAM and TCPIP for EE on z/OS.

Note: Apply the fix for APAR OA19437 (pre-V1R9) to display valid WT values on GVRN links.

1.7.7 Review Local VTAM Start Options

```

CONFIG=nn,          local configuration deck (ATCCONnn)
NETID=USED01,
APPNCOS=#CONNECT,
BN=YES,
BNDYN=NONE,
BNORD=DEFINED,
CDRDYN=YES,
CDRSCTI=150,
CONNTYPE=APPN,
CPCP=YES,
DIALRTRY=NO,
DUPDEFS=NONE,
DYNADJCP=YES,
DYNMODTB=MTAPPN, global mode table - used only on dynamic CDRSCs
DYNLU=YES,
ENHADDR=YES,
HOSTNAME=bp_cpname.cmsnet.gov,
HOTIOTRM=30,
HPR=RTP,
HPRPST=(480S,240S,180S,10S),    Check IP convergence time
INITDB=NONE,
IOPURGE=6M,
ISTCOSDF=NONE,
MSGLEVEL=CS390,
NODETYPE=NN,
NQNMDE=NAME,
NUMTREES=100,
PSRETRY=(10M,5M,2M,90S),
RESUSAGE=100,
SORDER=APPNFRST,
SRCHRED=ON,
SUPP=NOSUP,
TCPNAME=TCPIP,
TNSTAT,
VERIFYCP=OPTIONAL,
XNETALS=YES,

```

Figure 1-2 VTAM Start Parameters (ATCSTRxx)

1.7.8 Copy COSAPPN and IBMTGPS to VTAMLST

Two APPN tables must be present in VTAMLST: COSAPPN and IBMTGPS.

IBM supplies two versions of a COS table for APPN. COSAPPN, the original member, is an 8-row table. The newer member, ISTACST2, is a 12-row table that replaces COSAPPN. CMS recommends the implementation of the 12-row table. To verify the APPN COS table is the newer 12-row table, browse the member COSAPPN in VTAMLST and check the first comments lines for the name ISTACST2.

MACRO NAME(S): COSAPPN (or ISTACST2).

If the APPN tables are missing from VTAMLST, proceed as follows:

1. Copy ISTACST2 and IBMTGPS from SYS1.ASAMPLIB to VTAMLST
2. Rename ISTACST2 to COSAPPN

VTAM automatically activates COSAPPN and IBMTGPS during startup. You do not need to code them in the VTAM start deck (ATCCONxx). Also, do not assemble these tables.

To refresh the APPN tables dynamically, issue the following commands:

1. V NET,ACT,ID=COSAPPN
2. V NET,ACT,ID=IBMTGPS

Confirm the following messages during VTAM initialization:

IST1132I COSAPPN IS ACTIVE, TYPE = APPN COS TABLE

IST1132I IBMTGPS IS ACTIVE, TYPE = TG PROFILE TABLE

1.7.9 IPL (if necessary) to implement maintenance and start options

Schedule an IPL to implement the IBM recommended maintenance and to establish the standard VTAM start options prior to any connectivity test with the CMS bridge systems. This will eliminate the requirement to IPL as a back out from the connectivity tests to be conducted at a later date.

1.7.10 Add Model PU Major Node (RTP and VRN)

When SNA sessions are started in an APPN network, a dynamic PU is built to represent the RTP (pipe) that will carry all sessions for the specific traffic class between a pair of APPN nodes. If the dynamic PU is built with the default value of DISCNT=YES, the RTP PU will be deactivated after all sessions using the RTP have ended. To retain the RTP PU connection for subsequent sessions, define a model PU to override the value for DISCNT. Set the parameter value to NO or to a time value of at least 30 minutes.

1. Create an RTP Model PU Major Node in VTAMLST (MODEL RTP).

<pre> VBUILD TYPE=MODEL RTPPU PU DYNTYPE=RTP,DISCNT=(DELAY,,1800) 30 MINUTES </pre>
Figure 1-3 Example VBUILD TYPE=MODEL (RTP)

Global VRNs utilize dynamic PUs to represent each EE connection across the connection network. When a dynamic PU is built with the default value of DISCNT=YES, VTAM considers the dynamic PU to be a 'limited resource'. CICS LU6.2 sessions do not remain active because the BIND (request and/or response) indicates it to be a limited resource. When supporting CICS LU6.2 sessions, this model major node is required.

2. Create a VRN Model PU Major Node in VTAMLST (MODELVRN).

<pre> VBUILD TYPE=MODEL VRNPU PU DYNTYPE=VN,DISCNT=(DELAY,,600) 10 MINUTES </pre>
Figure 1-4 Example VBUILD TYPE=MODEL (VRN)

3. Add MODEL RTP and MODEL VRN to the VTAM start deck (ATCCONxx).

NOTE: A model PU may already exist with these characteristics for RTP and VRN connections. Only one model of each type is necessary. The model PU will always be in a RESET status. This is normal.

1.7.11 Create MTAPPN

1. Create a 'global' mode table that contains the mode entries from all active mode tables. Include any new entries from the CMS mode table (MTAPPN) in your global mode table.
2. Identify all log mode table source decks. Assemble and link them into VTAMLIB.
3. If you add any new entries to MTAPPN, send them to EDC so we can update our table.

1.7.12 Update existing CDRSCs

1. For all external CDRSCs code CPNAME=DUMMY and MODETAB=MTAPPN. There are two ways to do this as shown below.
2. For any CDRSC that could be a DLU/SLU on a local PLU initiated session (such as NDM, NJE, and LU6.2 APPLs), code DLOGMOD=local.logmode.

```
NETWORK NETID=SAMPNET
AXTPX  CDRSC  CPNAME=DUMMY,MODETAB=MTAPPN
AXCICS CDRSC  CPNAME=DUMMY,MODETAB=MTAPPN
AXNDM  CDRSC  CPNAME=DUMMY,MODETAB=MTAPPN,DLOGMOD=local-NDM-logmode
AXNJE  CDRSC  CPNAME=DUMMY,MODETAB=MTAPPN,DLOGMOD=local-NJE-logmode
```

Figure 1-5 Example: VBUILD TYPE=CDRSC

```
NETWORK NETID=SAMPNET
GROUP1  GROUP  MODETAB=MTAPPN,CPNAME=DUMMY
* Group parms filter down to lower level resources
AXXTPX  CDRSC
AXXCICS CDRSC
AXXNDM  CDRSC  DLOGMOD=local-NDM-logmode
AXXNJE  CDRSC  DLOGMOD=local-NJE-logmode
```

Figure 1-6 Example: VBUILD TYPE=CDRSC with GROUP

CPNAME - Coding a CPNAME (any name will do) tells VTAM to add this resource to the local APPN Directory so that other local APPN nodes can find it.

MODETAB - During session setup across an APPN network, the VTAM host of the OLU uses the logmode entry name specified by the OLU to select the APPNCOS. If the OLU does not specify a logmode name, the OLU VTAM will use the logmode name defined on the SLU resource. The VTAM of the OLU use the APPNCOS value on the logmode entry in the mode table of the SLU. For all PLU initiated sessions, the CDRSC is the SLU and therefore the mode table is required on each CDRSC.

NOTE: The actual session BIND image will still come from the mode table of the SLU on the VTAM host that owns the SLU. MODETAB=MTAPPN is necessary on CDRSCs in the VTAM host of the OLU for the sole purpose of selecting the APPNCOS.

NOTE: The VTAM start parameter DYNMODTB=MTAPPN will only define a mode table for dynamic CDRSCs. The MODETAB=MTAPPN parameter is necessary on all pre-defined CDRSCs.

1.7.13 Update current ADJSSCP tables

VTAM uses the ADJSSCP table to define the search order in the SUBAREA network.

The NETID for the bridge nodes in the CMS core network is USEDNC01.

If the current SNA connectivity with other CMS business partner hosts is across AT&T MDCN subarea (SNI) links, define the table to set SORDER=SUBAREA (subarea first, then APPN).

VBUILD TYPE=ADJSSCP ADJACENT SSCP TABLE		
*		
	NETWORK NETID=USEDNC01,SORDER=SUBAREA	* Search subarea 1st, then APPN
	NETWORK NETID=bp_netid,SORDER=SUBAREA	* Search subarea 1st, then APPN
	NETWORK NETID=bp_netid,SORDER=SUBAREA	* Search subarea 1st, then APPN
IBMGW	ADJCDRM	
IBMGW2	ADJCDRM	
IBMGW3	ADJCDRM	
IBMGW4	ADJCDRM	

Figure 1-7 Example Tables - ADJSSCP Table for local subarea network

Otherwise, if the current SNA connectivity to the other CMS business partner hosts is across EE links via AGNS, set SORDER=APPN and set ISTAPNCP as the ADJCDRM.

VBUILD TYPE=ADJSSCP ADJACENT SSCP TABLE		
*		
	NETWORK NETID=USEDNC01,SORDER=APPN	* Search APPN
	NETWORK NETID=bp_netid,SORDER=APPN	* Search APPN
	NETWORK NETID=bp_netid,SORDER=APPN	* Search APPN
ISTAPNCP	ADJCDRM	* APPN network

Figure 1-8 Example Tables - ADJSSCP Table for local APPN network

If your system no longer supports any subarea traffic, please remove all CDRMs and ADJSSCP tables.

1.7.14 Update current ADJCLUST tables

VTAM uses ADJCLUST tables to define the search order in the APPN network.

Only VTAM border nodes (BNs) use ADJCLUST tables.

The parameter BNDYN=NONE must be specified on all networks and on this VTAM start option.

Always define APPN searches for the native NETID and for the default network (no NETID) to search the NNs and EN in the local network only by setting the NEXTTCP value to the local VTAM SSCPNAME.

If the current SNA connectivity to CMS business partners is across APPN (EE) links with AT&T, you should already define an ADJCLUST table to send all APPN searches for a NETID that belongs to a CMS business partner to IBMIN.IBMGW and IBMIN.IBMGW3.

To prepare for the migration to CMSNET, each business partner will need to create or modify the ADJCLUST table on their border node to include the CMS bridge nodes as the primary NEXTTCP names in the search list.

```

*-----
*- DEFAULT TABLE (NO NETID)
*-----
NETWORK BNDYN=NONE
  NEXTTCP CPNAME=local_NETID.local_cpname    (search locally)
*-----
*- NATIVE NETWORK TABLE
*-----
NETWORK BNDYN=NONE,NETID=local_NETID
  NEXTTCP CPNAME=local_NETID.local_cpname    (search locally)
*-----
*- CMS BUSINESS PARTNER NETWORK TABLES
*-----
NETWORK BNDYN=NONE,SNVC=5,NETID=(BP1_NETID,BP2_NETID)
NEXTTCP CPNAME=IBMIN.IBMGW          (search AGNS)
NEXTTCP CPNAME=IBMIN.IBMGW3        (search AGNS)
NEXTTCP CPNAME=USEDN01.CP4EDC1     (search pri bridge node)
NEXTTCP CPNAME=USEDN01.CP3EDC1     (search sec bridge node)

```

Figure 1-9 Example Tables - ADJCLUST Table

After the migration to CMSNET, when there is no longer APPN connectivity across APPN (EE) links with AT&T, you can remove the IBMGWx values from the list of NEXTTCP names in the ADJCLUST table.

1.7.15 XCA Major Node

The XCA resource with MEDIUM=HPRIP defines the interface that VTAM will use for EE connections. When activated, VTAM will allocate the internally defined IUTSAMEH resource. To complete the initialization of the VTAM to TCPIP interface, you must define a LINK in the TCPIP profile with the DEVICE name of IUTSAMEH (or you can use the DYNAMICXCF feature if operating in a sysplex).

NOTE: If the VTAM host has already implemented EE, update the local existing XCAEE Major Node. Otherwise, create a new one. VTAM allows only one active XCA major node for EE (MEDIUM=HPRIP).

XCAEE	VBUILD TYPE=XCA	
PREEXCAL PORT	IPTOS=(20,40,80,C0,C0),	X
	HPREELIV=YES, ENABLE HPR LIVENESS REDUCTION (EE)	X
	MEDIUM=HPRIP,	X
	LIVTIME=25,	X
	SRQTIME=15,	X
	SRQRETRY=7,	X
	SAPADDR=04	
*		
*	* Static EE Point to Point Group - Business Partner gateway nodes only	
*		
GREECMS GROUP	AUTOGEN=(5,LNCMS,PUCMS), Business Partner NN	X
	ANSWER=ON,	X
	CALL=INOUT,	X
	DIAL=YES,	X
	DYNPU=NO,	X
	HOSTNAME=xxxxxxxx.cmsnet.gov, local SSCPNAME + domain	X
	KEEPACT=YES,	X
	ISTATUS=ACTIVE	
*		
*	*Dynamic EE connections using GVRN	
*		
GREEGCN GROUP	AUTOGEN=(30,LNGCN,PUGCN), Business Partner NN	X
	ANSWER=ON,	X
	CALL=INOUT,	X
	CAPACITY=2M,	X
	COSTBYTE=0,	X
	DIAL=YES,	X
	DYNPU=NO,	X
	HOSTNAME=xxxxxxxx.cmsnet.gov, local SSCPNAME + domain	X
	KEEPACT=YES,	X
	SECURITY=SECURE,	X
	TGP=EEXTCAMP,	X
	UNRCHTIM=0,	X
	VNNAME=CMSNET.GVRN,	X
	VNTYPE=GLOBAL,	X
	ISTATUS=ACTIVE	

Figure 1-10 Example Tables - XCA Major Node for EE (business partners)

Verify the XCAEE major node contains the following parameter values in the GCN group:

3. HOSTNAME - Code the local HOSTNAME (SSCPNAME + cmsnet.gov).
4. TGP - For CMS TGs, always code TGP=EEXTCAMP.
5. CAPACITY – Contact EDC for the appropriate capacity value. (more info below)
6. COSTBYTE – Code COSTBYTE=0 for preference over COSTBYTE in the static SW-Node.
7. UNRCHTIM – For VTAM V1R6 and above, hard code UNRCHTIM=0 on the GCN group. If the GCN cannot get you to the destination, neither will any other EDC path.

NOTE: AUTOGEN generates 30 lines for dynamic HPR connections to business partners.

NOTE: 30 LINES will be more than enough at the start, but may have to be increased later as more business partners migrate to EE. You can monitor the usage of AUTOGEN lines by displaying the GCN GROUP.

Various IBM documents indicate that EE performance will be best when the ARB algorithms know the true speed of the underlying IP network. (ARB is the Adaptive Rate-Based Flow Control or Congestion Control mechanism used by HPR.) The best way to do this is to specify CAPACITY in the local EE switched major node (static PUs) and on the GCN group (in the XCAEE Major Node). Code the values for the TGP and CAPACITY in these two places identically. For CMS TGs, code TGP=EEXTCAMP.

For CAPACITY, the value to code is the lowest speed link in the IP path, which is typically the MPLS WAN link managed by AT&T. For more info, see SNA Resource Definition Reference: V1R6 page 547, V1R7 page 553, and V1R9 page 560

To encourage use of the GCN path, code COSTBYTE=0 in the GCN group and COSTBYTE=150 on the static PU in the SWNET Major Node

1.7.16 SWNET Major Nodes to the CMS bridge nodes

1. On the business partner's gateway node, create SWNET major nodes to define the static connection to each bridge node.
2. Code COSTBYTE=150 to encourage use of the GCN (which has COSTBYTE=0).

SWEECP3		VBUILD TYPE=SWNET	
*			
PUEECP3	PU	ADDR=01,	X
		ANS=CONT,	X
		CAPACITY=2M,	X
		CONNTYPE=APPN,	X
		CPCP=YES,	X
		CPNAME=CP3EDC1, remote bridge node	X
		NETID=USEDNC01,	X
		PUTYPE=2,	X
		HPR=YES,	X
		SECURITY=SECURE,	X
		TGP=EEXTCAMP, use EEXTCAMP for CMS	X
		COSTBYTE=150,	X
		DISCNT=NO,	X
		DWACT=YES,	X
		DWINOP=YES,	X
		ISTATUS=ACTIVE	
*			
	PATH	GRPNM=GREECMS, use static EE group from XCA	X
		REDDELAY=300, wait 300s (5M) between redials	X
		REDIAL=FOREVER,	X
		HOSTNAME=CP3EDC1.cmsnet.gov, Remote bridge node	
SWEECP4		VBUILD TYPE=SWNET	
*			
PUEECP4	PU	ADDR=01,	X
		ANS=CONT,	X
		CAPACITY=2M,	X
		CONNTYPE=APPN,	X
		CPCP=YES,	X
		CPNAME=CP4EDC1, remote bridge node	X
		NETID=USEDNC01,	X
		PUTYPE=2,	X
		HPR=YES,	X
		SECURITY=SECURE,	X
		TGP=EEXTCAMP, use EEXTCAMP for CMS	X
		COSTBYTE=150,	X
		DISCNT=NO,	X
		DWACT=YES,	X
		DWINOP=YES,	X
		ISTATUS=ACTIVE	
*			
	PATH	GRPNM=GREECMS, use static EE group from XCA	X
		REDDELAY=300, wait 300s (5M) between redials	X
		REDIAL=FOREVER,	X
		HOSTNAME=CP4EDC1.cmsnet.gov, Remote bridge node	

Figure 1-11 Example: SWNET Major Nodes for static EE links to CMS bridge nodes

NOTE: Ensure the PATH statement value for GRPNM points to the correct group in the XCA. It should point to GREECMS (the primary group). It should NOT point to the GCN group.

1.7.17 XCA Check

- After you activate local XCA Major Node, and again after an IPL:
 - D NET,GREECMS,SCOPE=ALL, verify all LINES are ACTIVE
 - D NET,GREEGCN,SCOPE=ALL, verify all LINES are ACTIVE

1.7.18 Send a copy of local definitions

When local VTAMs are running as APPN nodes, and are defined local XCA and SWNET major nodes, send the following information to EDC from each VTAM that will connect to the CMS core.

- Please send each as a text file attachment (.txt) to retain original formatting.

- a. D NET,VTAMOPTS
- b. XCAEE Major Node (from VTAMLST)
- c. SWNET Major Node (from VTAMLST)
- d. ADJSSCP and ADJCLUST tables

1.7.19 Pre-cutover Tests

Before cutting over to EE on the MPLS network, do the following tests. The goal is to resolve any problems before attempting the cut over.

1. TCPIP SETUP
 - a. Verify that all the IP routes are in place
 - b. Verify that the firewall updates have been made
 - c. Verify that DNS hostname resolution has been tested

1.7.20 Provide a List of APPLIDs

Send a list of APPLIDs to EDC that you want us and other business partners to test during the cutover to the CMSNET. Send to email location: EDC_SNA@cms.hhs.gov. This will help validate that we can connect to each of the LPARs in your network. It is best to provide a TPX, Netview, or TSO on each major LPAR. Provide the following information:

Table 1-2 List of Local APPLIDs

NETID	APPLID	APPL Type	Node CPname	Node Type	Command to exit from the application

CMSNET Implementation

1.8 Schedule Changes for Cutover to EE on MPLS

This is disruptive to production traffic. We recommend a two step implementation.

1. Plan to test for a few hours, then definitely back out.
2. Plan to test and implement, and only back out if necessary.

In either case, plan on at least 2 hours to perform the test plan and resolve any issues. During this initial 2-hour test period, have local firewall and router staff available to assist with debugging if needed. If you want to bring in any testers from local Plan or other Plans, have them join after the initial 2-hour test period.

1. Identify required tasks and ensure completion:

- a. ___ ACT XCAEE Major Node
- b. ___ ACT SWEECMS1 (SWNET Major Node)
- c. ___ ACT SWEECMS2 (SWNET Major Node)
- d. ___ D NET,CPCP
- e. ___ ACT new ADJCLUST tables
- f. ___ ACT new ADJSSCP tables

NOTE: If staying in production, add the following two tasks:

- g. ___ Update ATCCONxx to reflect the changes
- h. ___ Update the ISTATUS of AGNS SNI Links (in NCP or SWNET)

1.9 Testing Connectivity across CMSNET

1. Test APINGs from local BNs, NNs, ENs to the CMS bridge nodes. Notice whether the path is via an APPN TG directly to the CMS bridge node.
 - a. D NET,APING,ID=USEDNC01.CPeEDCn
 - b. D NET,APING,ID= USEDNC01.CPeEDCn ,LOGMODE=#BATCH
 - c. D NET,APING,ID= USEDNC01.CPeEDCn,LOGMODE=#INTER
 - d. D NET,APING,ID= USEDNC01.CPeEDCn,LOGMODE=ISTCOSDF

2. Test access to each of the following applids.
 - a. Only a Logon is needed, not a Signon.
 - b. Test from local BNs, NNs, ENs, and from any subarea VTAMs in the local network.
 - c. Test via LOGON APPLID() commands and from local Session Manager (TPX, etc.).
 - d. Plan testing some NDM and NJE sessions to verify they use the correct COS.

Table 2-3 List of Target APPLIDs

NETID	APPLID	APPL Type	Exit via	Description

1.10 VTAM Diagnostic Messages

1. VTAM Start Options controls which messages VTAM displays for session setup failures.
 - a. Display local current settings via D NET,VTAMOPTS,FUNCTION=MESSAGES
 - b. Dynamically modify a setting via F NET,VTAMOPTS,LSIRFMSG=ALLNNS
2. If you encounter any issues during testing, it may help to see all related messages. Temporarily use the following settings to view all related messages:

CAUTION: LSIRFMSG will generate a LOT of messages. Be sure to change it back to NONE.

- a. ESIRFMSG=ALLSSCP
- b. FSIRFMSG=ALLSSCP
- c. SIRFMSG=ALLSSCP
- d. RSIRFMSG=ALLSSCP (new in V1R7)
- e. LSIRFMSG=ALLNNS

1.10.1 GCN Testing

1. XCA Displays - verify that all the LINEs are ACTIVE
 - a. Display the XCA major node: D NET,E,ID=xcaee
 - b. Display the static group for CMS: D NET,E,ID=GREECMS
 - c. Display the dynamic group :D NET,E,ID=GREEGCN

2. Do APINGs to the other CPs in the GCN.
 - a. Verify that the first TGN listed is CMSNET.GVRN.

```
D NET,APING,ID=USEDN01.CP4EDC1
...
IST2103I RSCV TOWARDS SLU
IST1460I TGN CPNAME TG TYPE HPR
IST1461I 21 CMSNET.GVRN1 APPN RTP
IST1461I 21 USEDN01.CP4EDC1 ISL RTP
```

Figure 2-12 Example APINGs

- b. Repeat the APINGs, testing each APPNCOS via the major LOGMODEs. Again, verify that the first TGN listed is CMSNET.GVRN.


```
D NET,APING,ID=netid.cpname,LOGMODE=#BATCH
D NET,APING,ID=netid.cpname,LOGMODE=#INTER
D NET,APING,ID=netid.cpname,LOGMODE=ISTCOSDF
```
3. If the APING results are not as expected, do these APPN TOPO displays using the appropriate APPNCOS values: APPNCOS=#INTER, #BATCH, and #CONNECT.

- a.

```
D NET,TOPO,ORIG=local_cpname,DEST=USEDN01.CPeEDCn,APPNCOS=#xxx
```
 - b.

```
D NET,TOPO,ORIG=local_cpname,DEST= CMSNET.GVRN1,APPNCOS=#xxxx
```

The CAPACITY and PDELAY in both displays should be equal.

The COSTBYTE should be different: CPeEDCn=150 and GVRN=0.

The WEIGHT of GVRN1 should be less than half of CPeEDCn.

- c.

```
D NET,TOPO,ORIG=localnet.cpname,DEST=othernet.cpname,APPNCOS=#xxxx
```

The ISL WEIGHT of other CPs and should be less than half of CPeEDCn.

NOTE: To see ISL WEIGHT prior to V1R9, you need APAR OA19437.

4. During testing, you might notice this message

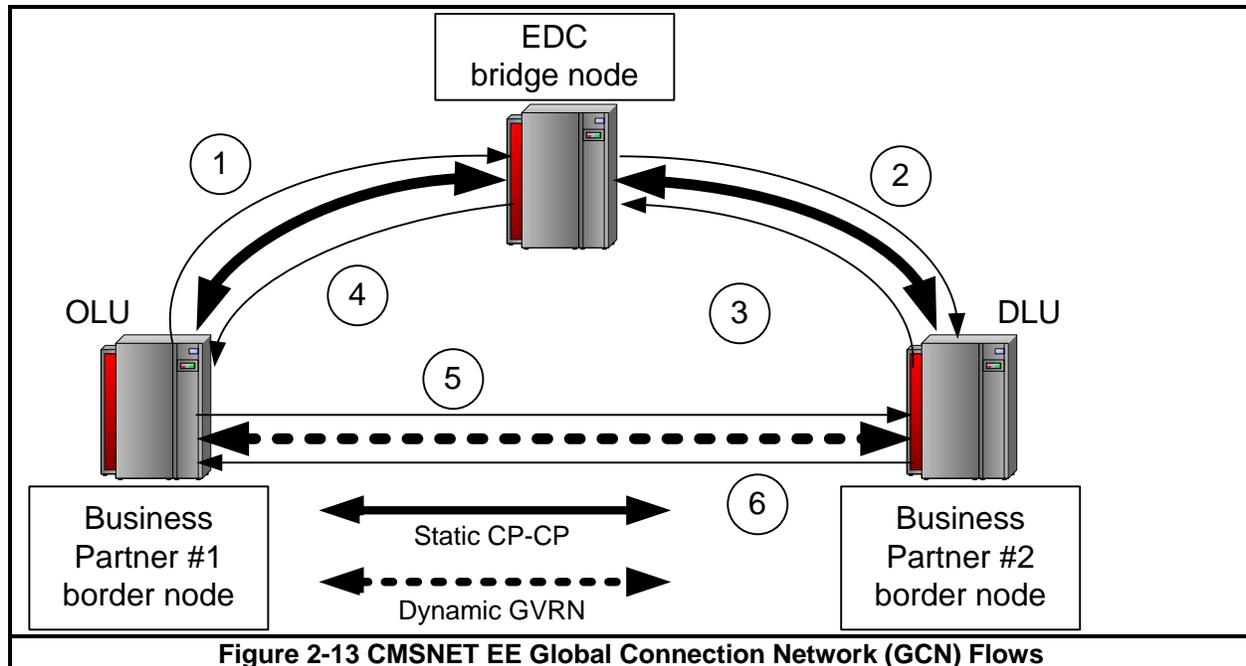

```
IST1576I DYNAMIC SWITCHED MAJOR NODE ISTDSWMN CREATED
```

 - a. The expected behavior is one dynamic CNVxxxxx is created for the dynamic RTP session between the OLU CP and the DLU CP, then normal CNRs are used for the actual session.


```
D NET,RSCLIST,ID=CNV*, dynamic GCN RTPs (major node = ISTDSWMN)
D NET,RSCLIST,ID=CNR*, normal SESSION RTPs (major node = ISTRTPMN)
D NET,E,ID=CNVxxxxx, display details of a GCN RTP PU
D NET,E,ID=line name, display the associated LINE (from the PU display)
```

1.10.2 CMSNET EE Global Connection Network (GCN) Flows

The OLU-CP (VTAM) and the DLU-CP both have a pre-defined CP-CP session with each of the CMS bridge nodes (CPeEDCn) via the SWN definitions. Do not predefine CP-CP sessions to every possible destination because that would require an exponential number of PU definitions at each site.



1. The flow is in the following sequence:
 - b. Start a session, the OLU sends the request to a bridge node on the CP-CP session.
 - c. The bridge node forwards the request to the DLU on its CP-CP session.
 - d. The DLU responds to the bridge node.
 - e. The bridge node returns the response to the OLU.
2. Within the response, the DLU indicates that it belongs to a GCN called CMSNET.GVRN and provides its hostname. This is the HOSTNAME value coded in the XCA GCN Group (sscpname.CMSNET.GOV).
 - f. GREEGCN GROUP HOSTNAME=sscpname.CMSNET.GOV
 - g. VNNAME=CMSNET.GVRN, VIRTUAL NETWORK NODE *
 - h. TGP=EEXTCAMP, USE EEXTCAMP FOR CMS *
 - i. CAPACITY=??, GET VALUE FROM EDC *
 - j. COSTBYTE=0, ENCOURAGES USE OF THE GCN *
3. The OLU inspects the response. The OLU realizes that it also participates in that GCN.
4. The OLU now has two possible paths for the session:

NOTE: If everything is coded correctly, the OLU selects the GCN as the best path.

 - k. Through the bridge node (where the response arrived)
 - l. Through the GCN The OLU inspects APPN topography of the 2 possible paths, and the path with the lowest ISL Weight is selected. (ISL Weight is a factor of TGP, CAPACITY, COSTBYTE, and other factors.

5. The OLU now resolves the HOSTNAME that arrived in the response. It looks up the hostname in the local host table and gets back the IP Address of the DLU.
6. The OLU will then send the session traffic directly to the DLU via its IP Address.
7. The DLU will respond directly to the OLU via its IP Address.

The session will flow directly between the OLU and the DLU without passing through the bridge node. This reduces CPU cycles and network traffic on the bridge node. The bridge node assists with the session setup but is not involved once the session is established.

Section 2: EE Backout

1. Identify required tasks and ensure completion:
 - a. ___ INACT SWEECMS1 (SWNET Major Node)
 - b. ___ INACT SWEECMS2 (SWNET Major Node)
 - c. ___ INACT XCAEE Major Node (optional)
 - d. ___ ACT old ADJSSCP tables
 - e. ___ Update ATCCONxx to reflect the changes
2. Contact EDC Technical Support Center (TSC) Help Desk for guidance.



SNA Strategy for the CMS Private Wide Area Network (WAN) Requirements and Business Rules

Prepared with assistance and input by the following CMS business partners:

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1.0 Version History

Exhibit 1A, Version History Table, outlines the version history of the *CMS SNA Strategy for the Private Wide Area Network: Requirements and Business Rules*.

Exhibit 1A: - Version History Table

Version #	Date	Author(s)	Reviewer(s)	Summary of Changes
0.1	5/21/2007	Robert Burger	Gordon Mundy, EDCG Sherry Wilke, EDCG	Initial Draft
0.2	6/12/2007	Burger/Mundy	Gordon Mundy EDCG Sherry Wilke EDCG	Revisions
0.3	01/05/2009	Mundy/Wilke	Gordon Mundy EDCG Sherry Wilke EDCG	Revisions

2.0 CMS SNA High Level Requirements & Design Considerations

2.1 High Level Technical Requirements

1. The CMS strategic direction for access/connectivity with legacy mainframe application is to use the Internet Protocol (IP) wherever possible. Therefore, SNA business partners are encouraged to use IP wherever possible to connect to SNA sessions.
2. Business partner Connect:Direct file transfers must utilize IP.
3. Business partner JES2/NJE sessions must utilize IP.
4. Scripted logons (including userID/password) will be allowed for server to server sessions.
5. Scripted logons used by individuals must prompt the individual to key his/her password. No group userIDs will be allowed on the new MPLS WAN.
6. On the new WAN, a CMS menu (hosted at the EDCs) will replace the current AT&T menu system. All CMS authorized login scripts that access services must be reviewed and updated, as required, to function with the new CMS menu.
7. All TN3270 clients must be configured to use TLS encryption (SSL 3.1).
8. All IVRs must be configured to use TLS encryption (SSL 3.1).
9. SNA business partners that require APPLID to APPLID SNA connectivity must implement Enterprise Extender (EE) to support SNA sessions and must adhere to the following requirements:
 - Mainframe platforms must be on a supported release of z/OS.
 - Mainframe platforms must have at least one MVS partition configured.
 - Mid-Tier Server or SNA Gateway platforms must support EE as an End Node or Branch Extender and utilize hostname capabilities.
 - Firewalls/network IP routing between the EDCs and all CMS business partners must allow UDP ports 12000 -12004 data zone to data zone.
 - All SNA business partners must implement Global Virtual Routing Node (GVRN).
 - Each EDC and CMS business partner must maintain a global MODETAB containing all of the mode table entries names from the active mode tables of every VTAM host in CMSNET.
 - DNS and hostnames must be used (no hard-coded IP's for any EE connections).
 - VIPA must be on a separate subnet from any real interface subnets.
 - Sites with Medicare and non-Medicare circuits must ensure that data is routed on the appropriate circuit.