International ATM/IP Solution-level Accounting

The objective of the CS 2000 accounting subsystem is to collect billing data and process this data so that it can be transferred to downstream network operator administrative centers. This NTP discusses the CS 2000 accounting subsystem and its operation in International solutions. The NTP contains the following sections:

- Overview of accounting subsystem operation in International solutions
- SuperNode Billing Application overview

Overview of accounting subsystem operation in International solutions

Call recording formats

The call recording formats supported in International solutions are:

- **Automatic Message Accounting (AMA)**
  With AMA, call information is captured by means of standard-format base records, extended with special-purpose modules to provide further information about the facilities used by a given call. The AMA variant used in international markets is Universal AMA, which uses a subset of the EBAF (Extended BellCore AMA Format) record structures, modified to support open numbering plans. As its name suggests, EBAF was originally defined in a BellCore TR (Technical Requirement) for use in North American networks
- **Station Message Detail Recording (SMDR)**
  SMDR complements standard billing by collecting extra call information to meet customer requirements, for example, for billing internal departments or determining basic call and service usage

patterns. It is intended for use in collecting data for Centrex customers.

Note: SMDR is primarily used to collect information about service usage by subscribers served by Centrex lines, but can also be used to collect information at a customer group level.

Automatic Message Accounting (AMA)
CS 2000 uses a flexible variant of Extended Bellcore AMA Format (EBAF) AMA records for AMA billing. This variant, Universal AMA, uses a subset of the standard EBAF structures, modified to support open numbering plans. AMA records are created at the CS 2000, then downloaded and processed externally to produce subscriber bills. The following sections describe the structure of AMA records.

Dates and times in AMA records are based on the CS 2000 core TOD (Time Of Day) clock.

Note: This section provides only an overview of Universal AMA structures and modules. For a more detailed formal definition, see the Telcordia BAF (web site).

BellCore AMA record types and their generation The main types of record that are typically generated by BellCore AMA include:

- Records generated as a result of call handling. Generation of these records is triggered in the course of translating and routing a call. This type of record must provide the following information in order to allow the charges incurred for a call to be calculated:
  - Originating subscriber number
  - Terminating number or digits
  - Time and date of origination
  - Duration (conversation time) of call
- Records generated as a result of administrative activity. These types of record are typically produced to inform the downstream processor of events and measurements occurring on the CS 2000

at the time the recording is taking place. The following events will typically result in AMA record generation:

— Closing an active recording file

— Opening a new active recording file

AMA base record structures supported CS 2000 supports the generation of five different AMA record types for logging call events. These are distinguished by the following factors:

- the maximum number of called party digits that can be stored: 18 or 30 digits
- whether the record includes an additional field that indicates which types of call completion were encountered:
  - — Normal answer
  - — Call abandoned (clear down during ringing)
  - — Busy treatment
  - — Any other treatment
  - — Abnormal or unknown completion (any other reason)
- whether the record includes carrier selection information

For records without carrier selection information, the base record structure to be used on a given CS 2000 is determined by means of Software Optionality Control options, as summarized in the following table.

Record structure determination by SOC option control

		SOC option BILL0009 (call completion reason)	
		Option IDLE	Option ON
SOC option RBIL0013 (30 digit support)	Option IDLE	Base structure x0510 Maximum 18 digits No call completion reason	Base structure x0511 Maximum 18 digits Call completion reason
	Option ON	Base structure x0513 Maximum 30 digits No call completion reason	Base structure x0514 Maximum 30 digits Call completion reason

Note: The x at the start of the base record structure code represents either 0 for a self-contained base structure record, or 4 if additional modules are appended to the base structure. 00510 and 40513 are examples of complete structure codes.

Carrier selection requires an x0512 base structure record to be used instead of the one of the base structure records listed in the preceding table. This provides a number of additional fields (Bellcore-defined) to contain carrier selection information. The ability to generate an x0512 record is provided by setting the office parameter PRESEL_DEACT_X0512_BILLING (in table OFCENG) to N. An x0512 record will then be generated for every call on which carrier selection is active.

Contents of AMA base record structure The following table lists the fields that may be included in an AMA base structure record.

Fields in AMA base record structure

Information	Field no	Number of BCD characters (see Note 1)
Record Descriptor Word	000	8
Hexadecimal Identifier	00	2
Structure Code (see Note 2)	0	6
Call Type Code (see Note 3)	1	4
Sensor Type	2	4
Sensor Identification	3	8
Recording Office Type	4	4
Recording Office Identification	5	8
Date	6	6
Timing Indicator (see Note 4)	7	6
Study Indicator	8	8
Called Party Off-Hook	9	2
Service Observed, Traffic Sampled	10	2
Operator Action	11	2
Service Feature (see Notes 3, 5)	12	4
Significant Digits In Next Field	55	4

Fields in AMA base record structure

Information	Field no	Number of BCD characters (see Note 1)
Originating Open Digits 1 (see Notes 6, 7)	500	12
Originating Open Digits 2 (see Notes 6, 7)	501	10
Originating Charge Information (see Note 3)	504	4
Domestic/International Indicator	505	2
Significant Digits In Next Field	55	4
Terminating Open Digits 1 (see Notes 6, 8, 9)	502	12 (x0510, x0511, x0512) 16 (x0512, x0513, x0514)
Terminating Open Digits 2 (see Notes 6, 8, 9)	503	10 (x0510, x0511, x0512) 16 (x0512, x0513, x0514)
Connect Time	18	8
Elapsed Time	19	10
Call Completion Reason (see Note 10)	280	4
Module Data (see Note 11)	88	4
Originating Preselect Carrier ID (see Note 12)	543	6
Outgoing Preselect Carrier ID (see Note 12)	543	6
Significant Digits In Next Field (see Note 12)	55	4
Overflow dialled Digits (see Note 12)	33	14
Sent Service Digits (see Note 12)	803	6
Originating Carrier ID (see Notes 12, 13)	544	6
Terminating Carrier ID (see Notes 12, 13)	544	6

Note 1: To calculate the size of a field in bytes, divide the number of BCD characters by two, as two BCD characters fit in one byte. The final character in each field is a # sign (hex C).

Note 2: The structure code identifies the type of base record structure being used. Digits 2-5 are 0510, 0511, 0512, 0513 or 0514, as appropriate. The first digit indicates whether modules are appended to the base structure, as in the following examples for x0510:

00510 Base structure only, no modules appended
40510 Base structure plus appended modules

Note 3: Value obtained through translations. For an IN call that triggers at TDP-3 and re-enters translations before onward routing, service datafill determines whether the value recorded in the billing record is the value for the incoming call leg or the onward-routed call leg.

Note 4: As an example of the field's use in a Succession solution, the network-isolation of a trunk GWC will cause billing record generation for calls controlled by that GWC in which the timing_indicator field is set to 2. This indicates an estimated value in the elapsed_time field of that record.

Note 5: This is the field used to mark a billing record as being for a call initiated through the NEED-based BTUP Call Back When Free (CBWF) feature. This enables both the call charge and CBWF usage to be recorded in a single AMA record. This functionality is activated through option BT_CBWF_BILL in table AMAOPTS.

Note 6: These fields support billing for open numbering schemes (other Bellcore AMA structures use fixed 10-digit numbers). The Originating Open Digits field contains the calling party number, and the Terminating Open Digits field contains the called party number.

Note 7: If a full CLI has been received for an incoming indirect access call and an AMA record is generated for that call, the full CLI is stored in the Originating Open Digits fields of the AMA record. This is primarily intended for use in Inter-Administration Accounting (IAA).

Note 8: Structure codes X0510 and x0511 can store a maximum of 18 terminating digits. Structure codes x0513 and x0514 can store a maximum of 30 terminating digits. In structure codes x0513 and x0514, the fields are therefore referred to as Extended Terminating Open Digits.

Note 9: For an IN call, these fields (normally used to store translated called party number digits) are filled with hexadecimal Fs (1111). These will eventually be overwritten with the final called party number, as modified/provided by Connect

Note 10: Structure codes x0511 and x0514 only.

Note 11: See Modules appended to provide further information for details of module types that can be appended to an AMA record.

Note 12: Structure code x0512 only. Field for carrier selection information.

Note 13: Field has no significance for CS 2000 carrier selection, and is filled with zeroes.

Modules appended to provide further information In some cases, more information is required on a call type than can be provided through the base structure. In this event, modules of data can be appended to the base record. Each module is identified by a unique Module Code, with a Module Code of 000 terminating the module code list appended onto the record. The following table describes the modules that CS 2000 may append to Universal Centrex AMA records.

Modules that can be appended to AMA records

Module code	Contents
008	For IN calls in the DTAG (Deutsche Telekom AG) network, this module records the date and time of: - Receipt of the first FCI operation - Seizure of the outgoing circuit - Seizure of the incoming circuit In order for these modules to be included, the AMAOPTS table entry INAP_CAPT_FCIRECEIPT must be turned ON
022	Long duration call record information. Module appended to each intermediate long call record to record the date and time of the audit, and appended to the final long call record to record the date and time of disconnection (see AMA records for long calls).
025	The circuit release date and time for unanswered calls. Appended only to records generated for unanswered calls.
026	Records call type code and dialled digits for VPN calls. All digits in overlap calls are recorded for calls originating on ETSI ISUP, IBN7 ISUP, BTUP and ETSI PRI. For calls originating on other agents, only the digits contained in the initial call setup message are recorded. Availability of capability is controlled through SOC option BILL0004.
028	Appended to the base structure for an IN call if this has been specified by service data in table SERVINFO. The type 28 module can record up to 15 dialled digits.
030	Contains Basic Service (BS) information for ISDN calls.

Modules that can be appended to AMA records

Module code	Contents
040	Appended to the base structure for an IN call if this has been specified by service data in table SERVINFO. The type 40 module can record up to 24 dialled digits in its dialled Digits 1 and dialled Digits 2 fields.
042	A unique Call Record Sequence Number for the AMA record it is appended to.
046	A generic module used for a variety of purposes. The purpose for which a given module instance has been used is indicated by the source of charge value in the module (this allows type 046 modules to be distinguished if more than one is appended for a given call). Uses currently supported by CS 2000 are: • If option AMACLID is datafilled against an incoming or two-way IBN ISUP trunk in table AMATKOPT then this module will be appended and will contain the calling line ID (source of charge number = 1). Can be used to support call billing to user-provided CLI for PRI calls. • If ENTRYID is datafilled against a DISA station in table DNROUTE or against a VFG in table VIRTGRPS then this module will be appended and will contain the point of entry for the network (source of charge number = 2). • To contain an NDS (Designated Subscriber Number) provided over FTUP or SPIROU (source of charge number = 5). Requires USERCLI to be specified in table AMATKOPT and SOC option RBIL0007. • To contain an unmodified incoming CLI if IC_CLI is specified in table AMATKOPTS (source of charge number = 6).
049	The calling name/number delivery module, which is used to support Subscriber Usage Sensitive Pricing (SUSP) for the CLASS display features CND/DDN and CNAMD (see Subscriber usage-sensitive pricing (SUSP) for feature usage*)*
070	The ISDN Core Module, which records the requested bearer capability, interworking indication, supplementary service usage and release cause. To enable production of module 070, ISDNCIRCUIT must be set to ON in table AMAOPTS. Depending on trunk type, other SOC codes and AMA options may be applicable (SOC code NETK0005 for ETSI ISUP and option APPEND_PRI_MODULE in table AMAOPTS, for example.)

Modules that can be appended to AMA records

Module code	Contents
071	The abbreviated ISDN Core Module, which records the requested bearer capability, interworking indication and release cause for ISDN calls if there is no supplementary service information. To enable production of module 070, ISDNCIRCUIT must be set to ON in table AMAOPTS. Depending on trunk type, other SOC codes and AMA options may be applicable, that is, SOC code NETK0005 for ETSI ISUP and option APPEND_PRI_MODULE in table AMAOPTS. Primarily used to support Bearer Capability billing. Can be used to support bearer capability billing for calls routed through a VFG, even if billing is triggered after routing through the VFG.
073	The terminating user service module, which serves two purposes: • To record information equivalent to module 070 for call terminations. • To record the carrier used for a call.
098	Used to capture carrier connect time and thus permit more accurate billing of interconnect calls. Carrier connect time is based on circuit seizure (sending or receipt of IAM) rather than call completion (ACM/ANM).
100	The Business Group Feature Module is appended to the AMA records when the MDRRAO feature is active for the customer group and SMDR is turned on in translations. Used in conjunction with AMA, this module is intended to replace SMDR as a means of call recording. It is mutually exclusive with SMDR on a per customer group basis.
102	Contains authorisation code entered by subscriber. Controlled by option AUTHAMA in table CUSTSMDR.
103	Contains original dialled digits for redirected calls. For calls that are redirected before being answered, this module enables the capture of redirection reason and redirection number. Controlled by option AMREDIR in CUSTSMDR and by SOC BILL0008.
104	Contains information about a trunk circuit used in a chargeable call. Identifies the Trunk Group Number in addition to the Trunk Member Number for either the originating trunk, terminating trunk or both. Controlled by option TRKINFO in table AMATKOPT

Modules that can be appended to AMA records

Module code	Contents
115	Contains information required to calculate the time taken to answer a call. (Line terminations only.) Controlled by option AMATTA in table CUSTSMDR and by SOC BILL0007.
116	Contains original dialled digits for redirected calls. For calls that are redirected before being answered, this module enables the capture of redirection reason and redirection number. Controlled by option AMREDIR in CUSTSMDR and by SOC BILL0008.
120	Module contains the number that has been datafilled in field GROUPID of table CUSTENG for the originating customer group.
130	Module used for rejected or failed calls, to record whichever of the following is appropriate: • Information about the treatment applied, including treatment origin and treatment application. • ITU release reason (available only if no non-SS7 trunks have been involved in call setup). Produced only in conjunction with module 025 (unanswered call), because a rejected or failed call is by definition unanswered. Capability controlled through SOC option BILL0003 and the Flexible AMA option FLEXRJCT. Also controlled by option AMREDIR in table AMAOPTS.
164	The E.164 / X.121 number module, which records: • Type of number • Country • Digits
180	Module contains the ISDN channel identifier for ISDN call originations terminating on ISDN. Capability activated by setting option APPEND_ISDN_CKT_ID to ON in table AMAOPTS.
181	Module contains the incoming trunk identifier for trunk calls terminated to PRI. Activated by AMAOPTS option APPEND_ISDN_CKT_ID (as for 180).
199	Appended to the base structure for an IN call when this is requested by a FurnishChargingInformation operation from the SCP. This module type contains any required operator-defined data coded as BCD digits (up to 20 bytes / 40 digits).

Modules that can be appended to AMA records

Module code	Contents
306	Module contains a three digit Originating Line Information parameter (OLIP).
504	Module holds details of any time changes (initiated by SETDATE or SETTIME) that have taken place during a call.
509	SUSP billing module, which records the feature codes of the features last activated by the call originator and terminator. It is appended to a call when FTRCODE in table AMAOPTS is set to ON.
513	Contains the following information about a trunk circuit used in a chargeable call: • Trunk CLLI Name in EBCDIC format (32 digits for 16 characters). • Trunk Facility ID containing trunk direction (IC/OG), trunk group and trunk member numbers. Produced instead of module 104 if CLLI_FOR_TRKINFO is ON in table AMAOPTS and if option TRKINFO is ON in table AMATKOPT.
611	Module Codes 611 and 612 are defined as Generic Context modules for recording network- or operator-specific information. Their format is similar, but MC611 can contain 15 digits while MC612 can contain 30 digits. The content of a particular instance of a 611/612 module is indicated by the context identifier in the module. CS 2000 supports the following uses for type 611 modules: • Type 611 module with context identifier 80005 Additional Billing Information, including: - Payphone indicator - Mobile phone indicator - Personal HandyPhone indicator - ISDN indicator - Charge indicator - Bearer capability - National / international call indicator

Modules that can be appended to AMA records

Module code	Contents
611 (continued)	• Type 611 module with context identifier 80006 Carrier Information • Type 611 module with context identifier 80008 Additional Party's Category • Type 611 module with context identifier 80009 User-to-User Information (UUI) Parms • Type 611 module with context identifier 80010 Independent Common Carrier Proprietary Data Group • Type 611 module with context identifier 80014 IN Service Information • Type 611 module with context identifier 80016 Charge Area Information To record Facility IE counts (in forward and backward directions) for QSIG GFT billing. • Type 611 module with context identifier 80026 CLI screening information for screening based on table CLISERV. • Type 611 module with context identifier 80027 To capture protocol indicator, Calling Party Category and ISDN Access Indicator information. • Type 611 module with context identifier 80030 To indicate what type of number portability rerouting has taken place on a call: - Routing using the NIC and the NICRF option - PNRF Onward Routing using the PNRF option - LNP QOR Routing • Type 611 module with context identifier 80035 Network-specific call reference for use in correlating billing records for a call. Activated by STORE_CALLREF option of AMAOPTS. • Type 611 module with context identifier 80050 To capture a protocol indicator, number indicator, and pre-translations NPI and NOA/TON for a call on which the NPI and NOA/TON may have been changed in translations. A type 611 module used for this purpose also captures the PI (Presentation Indicator) setting of the number, as described in A59022630. Enhanced to support NPI and NOA/TON capture for R2 CAS (inc. FDCP), RB-TUP, Brazil TUP and Japan PRI (INS1500).

Modules that can be appended to AMA records

Module code	Contents
611 (continued)	• Type 611 module with context identifier 80058 - The most recent service code associated with a call through universal screening tables encountered during translations. - CLI delivery indicator • Type 611 module with context identifier 80014. To capture an IN billing record correlation ID. Service datafill can be used to ensure that the same correlation ID is used for all the billing records associated with a given IN call, allowing related records to be identified easily. • Type 611 module with context identifier 80024. To capture information for use in Subscriber Usage-Sensitive Pricing (SUSP), as described in Subscriber usage-sensitive pricing (SUSP) for feature usage. • To capture a national/international call indicator for calls incoming over NCCI ISUP and IBN7 trunks. • Type 611 module with context identifier 80080. To capture a Carrier Identification Code (CIC) for a Carrier Pre-Selection (CPS) call if this is specified through option PCIBILL in tables PCIXLA and PCITRK. • Type 611 module with context identifier 80057. Indicates that a call has gone through network translation. Appended for an NTAI call if NTAI is specified in table AMAOPTS. CS 2000 role in call (setting/transit/terminating) will also be recorded. • Type 611 module with context identifier 80058. To capture any or all of the following information for a call: - Completion code (release code / treatment / disconnect) - COS index of originating trunk - Satellite Indicator value Functionality triggered by AMAOPTS options CAPTURE_COMPL_CODE, CAPTURE_CLASS_SERV and CAPTURE_SAT_IND. • Type 611 module with context identifier 80059. To capture either or both of the following parameters for a call, for use in IAA: - FCI (Forward Call Indicators) - BCI (Backward Call Indicators) Functionality triggered by AMAOPTS option CALL_IND. • Used for a number of purposes for IN calls in the DTAG network: - To record a Disconnecting Party Indicator and Charge Band Number (CHBN) - To record ISUP information (Transmission Medium Requirement, Service Type, and Cause Indicator)

Modules that can be appended to AMA records

Module code	Contents
612	Module Codes 611 and 612 are defined as Generic Context modules for recording network- or operator-specific information. Their format is similar, but MC611 can contain 15 digits while MC612 can contain 30 digits (which requires SOC option BILL0013 (30 digit support) to be active). The content of a particular instance of a 611/612 module is indicated by the context identifier in the module. CS 2000 supports the following uses for type 612 modules: • Type 612 module with context identifier 80003. Independent Common Carrier Proprietary Data Group • Type 612 module with context identifier 80007. Charge Rate Information • For a VPN call (context identifier 80011), a type 612 module is equivalent to a type 026 module. Functionality activated through SOC option BILL0004; option BILL0013 determines which module is used. Capability available for PRI calls as described in AJ5089, and for QSIG calls. • For an IN call (context identifier 80011), a type 612 module is equivalent to a type 028 or 040 module (see Note 1). Service data in SERVINFO determines which module is used. • A type 612 module with context identifier 80015 can be used to capture an additional billing number if one is available. Additional number types currently supported: - Presentation Number (PN) - Original Called Number for use in IAA - Redirection Number for use in IAA - Singapore LNP routing number - JI-ISUP Redirection Number • Type 612 module with context identifier 80020. Charge Rate Information • Type 612 module with context identifier 80023. Carrier Information with POI Category • Type 612 module with context identifier 80033. Dialled digits received from incoming agent

Modules that can be appended to AMA records

Module code	Contents
612 (continued)	• Type 612 module with context identifier 80041. For a screened indirect access call for which table CLICNTL specifies that a number other than the CLI should be used for billing, the alternative number can be captured in a type 612 module. • Type 612 module with context identifier 80066. To capture a QoS (Quality of Service) correlation ID. If GWC collection of end-of-call QoS statistics is enabled, such a correlation ID can be used to associate the AMA billing record for a call with the QoS data record provided by the GWC to the QCA (QoS Collector Application). • Type 612 module with context identifier 80051. For a call on which the called party number is changed during translations and routing, this can capture the untranslated number (see 59014037). Enhanced to support untranslated dialled digits capture for R2 CAS (inc. FDCP), RB-TUP, Brazil TUP and Japan PRI (INS1500). • Type 612 module with context identifier 80040. Type 612 modules are used in Turkey to record call information specific to that market, for example, metering pulse counts. The information is stored in two generic digit strings, each comprising 15 BCD digits.
850	Records a customer-dialled account number with up to 18 digits for use in CDAR (Customer-dialled Account Recording). Activated by AMAOPTS option CDAR_EXTENDED. Numbers with up to 14 digits can alternatively be stored in a type 103 module.

Note 1: Any of three module types may be used to record the digits dialled by an IN caller: a type 28 module (up to 15 digits), a type 40 module (up to 24 digits), or a type 612 module (up to 30 digits). The choice is specified by service data in table SERVINFO. There are two scenarios:

- In the case of en-bloc signalling, or of overlap signalling where the number of digits to be collected is not specified by the SCP, the digits recorded are the dialled digits available when the call triggered as an IN call, that is, the same digits conveyed in the InitialDP calledPartyNumber parameter. These are untranslated digits for triggering at TDP-2 or translated digits for triggering at TDP-3.
- In the case of overlap signalling where the SCP uses RRBE to specify the number of digits to be collected, the digits recorded are those provided to the SCP in the ERB sent when EDP-2

(Collected_Info) is encountered after CollectInformation. These consist of the digits available when the call triggered together with any overlap digits received between triggering and EDP-2 detection. Overlap digits received since triggering are always untranslated, while the digits available when the call triggered may be either translated digits (if triggering originally took place at TDP-3) or untranslated digits (if triggering originally took place at TDP-2).

Subscriber usage-sensitive pricing (SUSP) for feature usage

SUSP uses North American structure codes, and can therefore be used in systems that can support these structure codes. SUSP can be used for the features listed in the following table.

SUSP features

Feature		Billing summary			
Acronym	**Name**	**Structure**	**Call code**	**Module appended**	**Description**
CFUx	Call Forward Universal	614, 096	031	611	Structure 614 is generated for the activation of these features. Structure code 096 is generated for the deactivation of these features. Module code 611 is appended to these structure codes to indicate exactly which feature is being billed.
CFFx	Call Forward Fixed				
CFDx	Call Forward on Doesn't Answer				
CFBx	Call Forward on Busy				
CNF	Station Controlled Conference	510	006	509	Module code 509 is appended to the 510 structure code to indicate use of the CNF feature
CXR	Call Transfer	510, 076	006, 026	None	Structure code 076 with call code 026 will be generated whenever a three port conference circuit is accessed. Both CXR and 3WC require a three port conference circuit whenever they are invoked by the subscriber.
3WC	Three Way Calling				

SUSP features

Feature		Billing summary			
Acronym	**Name**	**Structure**	**Call code**	**Module appended**	**Description**
SACB	Subscriber Activated Call Blocking	510	006	611	Structure code 076 with call code 026 will be generated whenever a three port conference circuit is accessed. Both CXR and 3WC require a three port conference circuit whenever they are invoked by the subscriber.
WUCR	Wake Up Service				
MSB	Station Activated Do Not Disturb				
CND	Calling Name Delivery	110	264	49	Structure code 110 with call code 264 is generated during AMA audits or when either feature is removed from the line. Module code 49 is appended when both CND and CNAMD are active on the same line.
CNAMD	Calling Name Delivery				
CNDB	Calling Number Delivery Blocking	1030	330	None	Structure code 1030 with call code 330 is generated when these features are used. Module code 611 is appended for calls initiated by AR (see A59039985). See Note.
ACB	Automatic Callback				
AR	Automatic Recall				
SCF	Selective Call Forwarding	1030	330	None	Structure code 1030 with call code 330 is generated when the screening lists for these features are modified. See Note.
SCA	Selective Call Acceptance				
SCRJ	Selective Call Rejection				

Note: Code 1030 records contain 10-digit originating/terminating numbers. In networks using fixed-length numbers with fewer than 10 digits, numbers are padded by default with the DN_PADDING_DIGIT. Alternatively, REPLACE_PADDING_DIGIT can be used to specify that Nil, B, C, D, E or F should be used for padding instead. See A59017328. AR numbers with more than 10 digits are truncated.

Module code 611 is appended to the base AMA record for a call as a result of pay-per-use billing. This allows the billing record for a call

attempt initiated by a feature to be coordinated with the feature usage record generated on feature activation.

A type 611 module is a generic module with a one-digit string format. For SUSP, this module contains a generic context identifier and a digit string:

- The generic context identifier assigned by Bellcore for subscriber usage recording is 80024.
- The digit string is used to indicate which feature was accessed. For example, a digit string of “8386A4000000040C” indicates that the CFU (Call Forward Universal) feature was accessed.
  - The first twelve characters serve as the service identifier, which represents the feature acronym in EBCDIC format. In this case “83” = c, “86” = f, “A4” = u, and the remaining six characters of the first twelve are represented with zeros, since there are only three letters in the feature acronym.
  - The next two characters, “04”, represent the service event. In this case “04” maps to “subscriber programming.”
  - The last two characters of the digit string are “0C”. 0 is an unused character and C is the SIGN indicating the end of the digit string.

AMA records for long calls Long calls result in the generation of more than one AMA record.

Support for the long call audit process is controlled by AMAOPTS option LONGCALL. The office parameter AMA_LONG_DUR_AUDIT_INTERVAL specifies the threshold value that determines whether a call is regarded as a long call. The value is an integer in the range 1-24, and denotes a number of whole hours. If the value is set to 1, for example, any AMA-billed call that lasts more than one hour will be treated as a long call.

The long call audit process runs at regular intervals to check whether there are long calls in progress. (The audit interval typically corresponds to the long call threshold value.) The audit process also generates a partial billing record for each active long call. Three types of partial billing record may be generated, as follows:

- A first part bill record is generated for a call on the first occasion when the audit process finds it to be still in progress with a call duration greater than the threshold value. With a 1-hour threshold value, for example, a part bill record would be generated for a call with a duration of 1:01, but no action would be taken for a call with

a duration of 0:59. The first part bill record for a long call record has no modules appended.

- An intermediate record is generated on each subsequent occasion when the audit process finds that an already-identified long call is still active. Each intermediate record has an AMA type 022 module appended to it giving the date and time of the audit.
- A completion of long call record is generated when the call is finally released. This final record has an AMA type 022 module appended to it giving the date and time of call disconnect.

Note: It is important to distinguish between long calls, on which both agents are still active, and hung calls, on which one of the trunk agents involved has remained connected after call clearing because of some technical problem. The CCBHNG maintenance tool runs at predefined intervals to check for hung calls and to provide notification of them so that appropriate action can be taken.

Miscellaneous record structures The following section describes the additional record structures used in AMA to reflect non-call-related event information.

- Structure Code 09000:Time Change Entry
  When a SETTIME or SETDATE is performed on the switch, and the TIMECHANGE tuple of table AMAOPTS is ON, a Time Change Record is produced to record the date and time before and after the change.

  Note: The recommended alternative to the use of 09000 records is to append a type 504 module to the AMA record of every call that is active when a SETDATE or SETTIME command is executed. This requested by setting the CALL_TIMECHG option in table AMAOPTS to ON.

- Structure Code 09013:Transfer In
  Placed at the start of each new AMA call recording file in DIRP format.
- Structure Code 09014:Transfer Out
  Placed at the end of an AMA file in DIRP format just before closing it. Includes record and clock counts for the file.
- Structure Code 09049:Hourly Tracer Record

Station message detail recording
In a VPN context, customers may wish to collect additional information about calls as well as the information required for billing, for example, to build up a profile of calls made and received per customer group. The

SMDR system can record details of billable and non-billable calls for each call leg. The SMDR system uses the AMA subsystem to collect the call data and record it on a data storage device for subsequent downloading.

Note: SMDR is primarily used to collect information about service usage by subscribers served by Centrex lines, but can also be used to collect information at a customer group level.

SMDR records provide information such as the following:

- CLLI or customer group
- Calling number or special billing number
- Called number
- Operator console number (if applicable)
- DISA number (if applicable)
- Authorization code
- Account code
- Feature code
- Connect time
- Time and date of call

SMDR capabilities are provided as part of the Centrex Standard software identified by option code MDC00003 in the CCM DRU. Specific SMDR features include:

- F0245 Station Message Detail Recording (SMDR)
- F2368 Separate Output Files for SMDR and AMA
- F2399 Separate SMDR Files per Customer Group
- G0119SMDR Data in AMA Stream

Metering / Advice of Charge (AOC)

Software metering

Software metering is a mechanism for recording the accumulating charges incurred for a call in a software register associated with the originating agent. Charges are recorded as a count of charge units used. The rate at which charge units are used for a given call varies depending on the tariff in effect, which is determined by factors such as the distance, the time of day, and any applicable subscriber discounts.

The software metering mechanism can provide information about call charges over the originating interface. Some regulators and standards

bodies have formally defined charge notification services. One example is the ISDN supplementary service AOC (Advice Of Charge) defined by ETSI for ISDN call originations.

Metering functionality is activated by setting office parameter ENABLE_METERING to Y. If a given CS 2000 is not required to provide metering support as part of its network role, metering functionality can be disabled by setting ENABLE_METERING to N. This improves real-time performance of the switch.

Control of metering for trunk interfaces

CS 2000 supports software metering for ISUP and PRI trunks. Metering is activated on a trunk group basis by means of the MOG (Metering Origination Group) capability, which is assigned by specifying the ICMOG or OGMOG option in table TRKOPTS (ICMOG for incoming trunks, OGMOG for outgoing trunks, either or both for two-way trunks). On a given CS 2000, software meters can be enabled for up to 8192 trunk groups.

A given trunk can be assigned up to four meters for recording charge units used, one each for local, rural, national and international calls. Fewer than four meters need to be assigned if two or more call types share a given meter. For example, all call types could share a single meter.

Nodal AOC

The nodal ISDN AOC supplementary service uses World Metering functionality. CS 2000 supports two variants of this service, which provides call charge information for PRI call originations:

- For Advice Of Charge at End of Call (AOC-E), CS 2000 includes a Facility IE with charging information in the RELEASE message sent to the user during call clearing.
- For Advice Of Charge During Call (AOC-D), CS 2000 sends one or more FACILITY messages at 5-second intervals while the call is active, each containing a Facility IE with charging information. A final Facility IE is also included in the RELEASE message sent to the user during call clearing.

World Metering functionality is used to determine the charges that have been incurred, and thus the content of the Facility IE(s) sent back to the calling user. The charge notification mechanism is not affected.

Order codes for accounting facilities

The following table lists order codes for features that provide accounting facilities.

Order codes for accounting facilities

Order code	Name/description
BILL0001	Billing
BILL0002	Carrier Connect AMA
BILL0003	AMA Reject Calls
BILL0004	VPN AMA Billing
BILL0006	SMDR DE Extension
BILL0007	AMA Time to Answer
BILL0008	AMA Redirection Information
BILL0009	AMA Call Completion Reason
BILL0010	AMA Generation Management Reports
BILL0012	Bearer Capability Billing for BTUP
BILL0013	AMA Support for Numbers with up to 30 Digits
IBILL0002	Australasia Billing Enhancements
IBILL0003	VPN AMA Enhancements
IBILL0004	NOA/NPI Capture in AMA
IBILL0005	SSUTR2 IC Charge Message Billing
IBILL0006	CPC AMA
OAMI0006	Long Call Audit
RBILL0005	Usage Sensitive Billing
RBILL0007	NDS Billing - Indirect Subscribers
RBILL0008	NDS Billing - Direct Subscribers

Order codes for accounting facilities

Order code	Name/description
NSUP0006	BC Billing for ETSI ISUP
SMET0002	Software Metering

AMA configuration and datafill

This section describes the basic configuration of AMA, and the datafill required to activate it.

Note: The datafill in the examples is given in standard DMOPRO format. A familiarity with the DMOPRO command structure is required.

LAMA office establishment

This is a base function required for both Nortel and Bellcore types of AMA. It provides the call recording facilities and the attributes about AMA that apply only to offices with lines.

LAMA office datafill activation The office must be configured as a LAMA office, indicating that local call recording is done in this office. The following table shows the necessary data change required to configure this office for LAMA call recording:

Note: Failure to set this parameter results in AMA billing assuming that this exchange is forwarding its call recording responsibilities into a Centralized AMA (CAMA) office. Do not allow this parameter to remain in a 'N' state.

Activating the LAMA_OFFICE office parameter

```
TABLE OFCOPT

%%    ------

%% LAMA_OFFICE needs to be set, making Centrex AMA

%% billing possible

%%

REP LAMA_OFFICE   Y

QUI
```

Base office provisioning

This section describes the fundamental Bellcore formatting capabilities of the DSM-100E switch. Only the standard Bellcore AMA Call Recording/Call Processing interface is covered. For example, Centrex AMA capabilities are not covered. See Device Independent Recording Package Administration Guide, 297-1001-345, for more information on DIRP.

DIRP configuration To enable the Device Independent Recording Package (DIRP) to receive AMA records and transfer them to a specified recording media, a tuple in Table DIRPSSYS is required. When at the DIRP level of the MAP, define the output device with the appropriate active AMA stream. The table below provides an example of AMA datafill for Table DIRPSSYS.

```
TABLE DIRPSSYS
%%    --------
%% Entry AMA needs to be added, as follows
ADD AMA Y 2 1 AMAPOOL $     CR     NA NA NA    +
     30 30 $  N NA OPENED NNNNNNN 0 NOROTATE +
     NONE NONE N 64 Y
QUI
```

Configuring Bellcore format AMA Unlike other Call Recording Formats, the AMA tuple is automatically provided to a switch. However, the FORMAT field must be changed to BCFMT to activate the Bellcore format variant of AMA. The table below provides an example of datafill for the AMA tuple. Exact values for some of the fields in this data may vary from office to office, according to customer preferences.

```
TABLE CRSFMT
%%    ------
%%
%% KEY FORMAT DATADUMP CDRSRCH ALARMS TIMERDMP TIMERVAL
%% ------------------------------------------------------
REP AMA BCFMT           N             NIL_FM          N

QUI
```

CRSMAP datafill Any other active call recording streams such as SMDR should not be mapped to AMA in the CRSMAP (Call Recording Stream Mapping) table. Such mapping causes downstream processing of AMA records to fail due to the data being interpreted initially as an ‘unrecognized structure code’. This also occurs if NTFMT has inadvertently been set in CRSFMT. Perform a RESTART RELOAD to activate changes to table CRSFMT. An example of CRSMAP datafill is shown below:

```
TABLE CRSMAP
%%    ------
%% Add LAMA and SMDR mapping.
%% KEY         STREAM
%% ------------------------------------------------------------
ADD LAMA       AMA
ADD SMDR       SMDR
QUI
```

Configuring for Universal AMA Billing When an office is configured for Universal AMA Billing, open number structures replace the North American structures, when possible. AMA uses the value set in the UNIVERSAL_AMA_BILLING office parameter to decide whether to apply Universal AMA Billing. When set to Y, open number AMA billing structures are utilized as outlined in this document.

Note: No restart is required to activate this change

Provisioning recording units
A DMS-100E switch is initially configured to provide localized Bellcore AMA and to handle a limited amount of AMA chargeable traffic. To process an increased amount of Bellcore AMA call records, the following office parameters (Table OFCENG) can require provisioning:

- CRS_PRU_POOL2_SIZE
- CRS_SUBRU_POOL1_SIZE
- CRS_SUBRU_POOL2_SIZE
- CRS_SUBRU_POOL3_SIZE
- CRS_SUBRU_POOL4_SIZE

Sub-recording units (SUBRU) store the module code information required on a per call basis. These SUBRUs reside within memory

usage pools. Pool size is determined by office parameters in table OFCENG.

Table 1 SUBRU pool mapping

SUBRU pool	Module codes
Pool 1	30, 100, 104, 120
Pool 2	040, 046, 098, 102, 103, 115, 116, 130, 180, 181, 199, 611
Pool 3	070, 071, 612
Pool 4	026, 028
Pool 5	-
No SUBRU required	022, 025, 042, 306, 504

Triggering AMA through translations
The Universal Translations System generates billing records for calls within a Universal AMA Environment, which includes the ability to use Universal Translations when using NET.DOD Centrex Translations. An outgoing route list is obtained from translations to generate an AMA record. Translations continue to expect more digits and do not try to seize a trunk if:

- the maximum number of digits is not reached (as datafilled in XLA tables)
- interdigit timer does not expire
- no indicator of end of dialing is received

As a result, no AMA record is produced.

Several components to Universal Translations play a role in AMA recording of a call. These are discussed below.

The concept of TYPCALL The TYPCALL for any call on a DMS-100E switch must be one of the following:

- No Prefix Local (NP). This type of call indicates to AMA that the call is routed free of charge, unless AMA is forced by some other

mechanism. Typically, a toll prefix is dialled to indicate that charging applies and is acknowledged by the caller.

- Direct dialled (DD). Call recording should occur for the call. Typically, this is set based on a toll prefix dialled by the subscriber.
- Operator Assisted (OA). Billing information is to be “spilled” forward to an operator. This typically results in the absence of billing in the local exchange.

Universal CLASS mapping to TYPCALL North American translations provide the means to set the TYPCALL of a call directly from within table control. However, Universal Translations do not provide the same capability. Instead, it provides a means to specify the call class from within the xxHEAD and xxCODE tables.

There are a number of CODE and HEAD tables, each one serving a different function. Each table is identified by a two-letter prefix, represented by xx in this text (for example, ACCODE and PXHEAD). The actual table used is determined during translations.

The value used in the CLASS selector from within Universal Translations is then mapped to one of the TYPCALL values specified in the previous section. The following table provides the mappings from the Universal Translations CLASS options to the TYPCALL that triggers billing:

CLASS to TYPCALL mapping

Class	Typecall	Chargeable	Comments
UNKW	NP	No	
IAGRP	NP	No	
ATT	NP	No	
DATT	NP	No	
LCL	NP	No	Recommended value for non-billing
SPEC	NP	No	
EMRG	NP	No	
NATL	DD	Yes	Recommended value for billing

CLASS to TYPCALL mapping

Class	Typecall	Chargeable	Comments
CNTL	DD	Yes	
ICNTL	DD	Yes	
INTL	DD	Yes	Sets the domestic/international AMA indicator to international
OPRA	OA	No	Operator billing assumed
IOPRA	OA	No	
RURAL	NP	No	

This document recommends a CLASS of NATL initiate AMA call recording. To prevent a subsequent call recording, use a class of either IAGRP or LCL to override a CLASS setting of NATL.

Unless stated otherwise, any new CLASS values added in future releases are mapped to NP, No Prefix Local.

The following table gives an example of changing datafill for PXHEAD.

```
TABLE PXHEAD
%%    ------
%%
%% Add translator UXLA1, and specify that billing
%% should take place on all calls through this
%% translator, unless the default CLASS gets
%% overwritten in the code table.
%%
ADD UXLA1 SDFLT DFOP CLASS NATL $ NOCON STD
QUI
```

Translation impacts on terminating open digits The following items have significant impact on the Terminating Open Digits field of the AMA record:

- The DMOD XLASEL Translation Selector. The DMOD selector in tables HEAD and CODE can be used to modify the digits dialled by the subscriber. Any modifications made are reflected in the AMA record. For example, if the dialled digits were 1234567 and DMOD

inserted 987 after the third digit, the AMA record contains 1239874567

- The PF OSEL Option. This is an option of the CONT and RTE Translation Selectors of tables HEAD and CODE. This allows digits to be used up, or labelled as prefix digits, after they are processed. This is so that the next series of digits can be processed. Digits used by the prefix fence will not be included in the AMA record.

Route selector impacts on AMA The following have impacts on the AMA record:

- The RX and IBNRX selectors. The RX/IBNRX selector allows re-translation of the digits. When the RX/IBNRX selector is used for re-translations, the CLASS selector needs to be present in the re-translations in order to produce an AMA record. If the CLASS selector is used during the first pass of the translations (that is before encountering the RX/IBNRX selector), the RX/IBNRX selector overwrites it. In other words, if the CLASS selector is present in the first pass of the translations, and not in the re-translations, there will be no AMA record produced.
- The VFG selector. The VFG selector allows re-translation of the digits. The VIRTGRPS table must be datafilled. Unlike the RX/IBNRX selector, the VFG selector retains the billing information from the first pass of the translations if the CLASS selector is present. In other words, if the CLASS selector is present in the first pass of the translations, and also in the re-translations, there will be two AMA records produced.

Flexible AMA application Flexible AMA provides the ability to define custom AMA characteristics that correspond to tariff requirements. These characteristics can be assigned against a call based on line attributes for the originating facility and universal translations. In particular, Flexible AMA is required for providing AMA on CLI screened access calls.

It is not recommended that Flexible AMA assignments be used to supersede or replace the use of the CLASS selector. Use the assignments to enhance the basic capability that CLASS provides, so that the CLASS option is set appropriately for AMA OM pegging.

Flexible AMA characteristics The flexible AMA functionality allows assignment of the following:

- Call Type Code (Field 1), activated using tables AMAXLAID and/or FLEXAMA
- Service Feature (Field 12), activated using tables AMAXLAID and/or FLEXAMA
- Originating Charge Information (Field 504), activated using table AMAGRPID and/or FLEXAMA
- Rejected call information (Module code 130), activated using tables AMAXLAID and/or FLEXAMA
- Call diversion dropback over ISUP (DFT) trunks (activated using tables AMAXLAID and FLEXAMA)
- AMA CPC capture (activated using tables AMAXLAID and FLEXAMA)
- CGPN and CDPN capture in Module code 611 (using FLEXAMA)

Table AMAGRPID Table AMAGRPID accepts any defined grouping of up to eight characters as a key. Once a group name is datafilled, it can be indexed from tables LINEATTR and FLEXAMA. This offers the opportunity to assign an Originating Charge Information number if the FLEXOCI option is datafilled in table AMAGRPID and indexed in table LINEATTR. This is shown in the following figure:

```
TABLE AMAGRPID
%%    ------
%%
%% Add customer group GRP1 with FLEXOCI
%% option indexed by 1
%%
ADD GRP1 DFLT (FLEXOCI 1) $

QUI
```

Table AMAXLAID Table AMAXLAID accepts any defined grouping of up to eight characters as a key. Items in this table can be indexed from the FLEXAMA table. Use the FLEXCTYP selector provided within table AMAXLAID to trigger the generation of an AMA record, rather than using the CLASS selector.

The following call types can be granted precedence within the FLEXCTYP assignment:

- LOCAL: Local calls receive precedence. This includes calls set to no-prefix local in STDPRTCT or set as CLASS of LCL in tables HEAD and CODE.
- TOLL: Toll calls receive precedence. This includes calls set to Direct dialled in the STDPRTCT table or set in CLASS of NATL or INTL in translations.
- IC: Equal access receive precedence. This allows equal access AMA to be overridden by flexible AMA.
- VPN: VPN calls receive precedence. This causes the AMA generated by the VPN selector of translations to be overridden by flexible AMA.

The FLEXRJCT option has the sub-field REJECTMOD. If this is set to Y, it appends Module code 130 to the AMA record (provided that an AMA record is triggered by another option - FLEXRJCT does not trigger an AMA record by itself. Also, SOC BILL0003 must be active).

The FLEXSF option has the subfield SFEATVAL, which gives a value between 800 and 999. This value is then recorded in the Service Feature field of the AMA record.

The FLEXDBCK option activates AMA records for ISUP (DFT) call diversion dropbacks. The value of the subfield FLEXDBCK_CCODE is entered in the AMA record when this option is active.

The FLEXCLGI option activates AMA capture of Calling Party Category (CPC) for translations. The FLEXCLGI option also enables capture of the ISDN access indicator for FTUP and ETSI ISUP calls.

The FLEXCPNI option activates capture of called/calling party number information in Module codes 611 and 612. This option is also available in Table FLEXAMA.

The FLEXCPNI sub-options are:

- IC_CGPN_INFO activates capture of the incoming CGPN NPI and NOA/TON in Module code 611(effective only if AMAOPTS option IC_CGPN_INFO_REQD is active)
- IC_CDPN_INFO activates capture of the incoming (pre-translations) CDPN NPI and NOA/TON in Module code 611(effective if AMAOPTS option IC_CDPN_INFO_REQD is active)

- OG_CDPN_INFO activates the capture of the outgoing (outpulsed) CDPN NPI and NOA/TON in Module code 611
- OG_CDPN_DIGS activates capture of the outgoing (outpulsed) CDPN digits in Module code 612

An example of datafill for table AMAXLAID is shown in the following figure:

```
TABLE AMAXLAID
%%    ------
%%
%% Adding index XLA1 to the table.


ADD XLA1 NODFLT $

QUI
```

Table FLEXAMA This table is only used when a call has picked up both an AMAGRPID (from table LINEATTR) and an AMAXLAID (from universal translations). The FLEXAMA table defines a set of AMA characteristics for the call based on the particular AMAGRPID and AMAXLAID assigned. If the particular AMAGRPID and AMAXLAID combination does not have a tuple datafilled in table FLEXAMA, then any defaults from tables AMAGRPID and AMAXLAID are used instead.

When a particular AMAGRPID and AMAXLAID combination is specified in the FLEXAMA table, the AMA characteristics update algorithm must be specified prior to defining the flexible AMA characteristics. The choices are:

- GRPDATA: Override only AMA group data (table AMAGRPID)
- XLADATA: Override only AMA translation data (table AMAXLAID)
- ALLDATA: Override data found in tables AMAGRPID and AMAXLAID

All the characteristics of tables AMAGRPID and AMAXLAID can be datafilled within table FLEXAMA. An example datafill for table FLEXAMA is shown below:

```
TABLE FLEXAMA
%%    ------
%%
%% Adding FLEXAMA option

%%
ADD GRP1 XLA1 GRPDATA (FLEXOCI 3) $

QUI
```

Reference NTP

Complete information about the accounting record formats and accounting record file formats, as well as configuration and datafill, can be found in NTP 297-9051-800, *DMS-100 MMP AMA Reference Guide.* This NTP is available in the *International Succession Release DMS-GSP* document collection either on CD-ROM or in Helmsman.

SuperNode Billing Application overview

All AMA records generated by the CS 2000 core are transmitted immediately to the SuperNode Billing Application (SBA). The primary purpose of the SBA, which resides on the core managers (SuperNode Data Manager, CS 2000 Core Manager, Core and Billing Manager 800, or Core and Billing Manager 850), is to process the billing records it receives from the core, and route the records to files. The billing files are then available for transfer to the operating company's downstream processors.

Specifically, the SBA:

- off-loads billing activities from the core. The SBA supports a maximum of fifteen streams of core or filtered billing records that can be routed to processors.
- provides billing stream delivery to multiple destinations
- allows filtering of a billing stream (AMA in DIRP format) based on the same criteria used by AMADUMP
- provides real-time delivery of AMA and CDR records in device-independent recording package (DIRP) format
- provides near real-time delivery of AMA records in AMADNS format
- stores Bellcore AMA Format (EBAF) records in DIRP and AMADNS formats

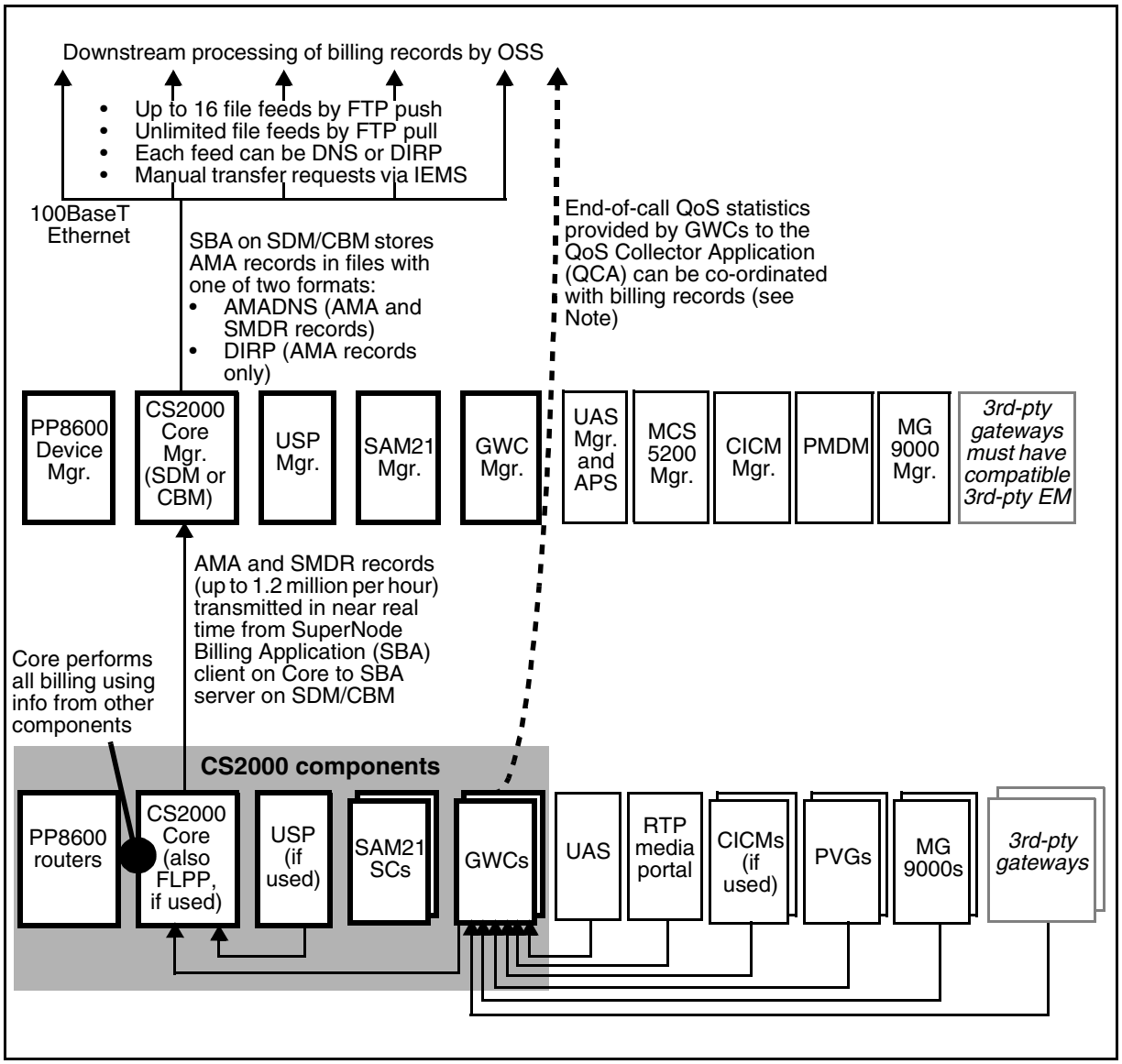
- stores Station Message Detail Recording (SMDR) records in AMADNS format

  Note: Currently, the core manager does not support an SMDR stream in DIRP format. Although the core manager allows you to configure an SMDR stream in DIRP format, the command **core managerbctrl smdr on** produces the following error message: `The stream is not configured or not supported on the core manager.`

- supports DMS-GSP CDR in DIRP format

The following diagram shows how the CS 2000 core gathers billing information from the network components, and off-loads records to the SBA for processing and storage.

SuperNode Billing Application in the CS 2000 solutions



Note: You can configure QoS collector applications (QCA) to collect quality-of-service (QoS) data for calls handled by Gateway Controller (GWC)-driven gateways and forward this data to an operations support system (OSS). After QCA is configured, gateways report per-call QoS data to the GWCs which then send the data to a QCA that is running on a computer on the CS LAN. The QCA makes the QoS data available to a customer-provided OSS, which can then process the data. For more information, see "Provisioning the QoS collector application" in NN10409-500, *ATM/IP Solution-level Configuration Management*. In addition, see the procedure,

"Provisioning in support of QoS reporting" in NN10193-511, *Communication Server 2000 Configuration Management.*

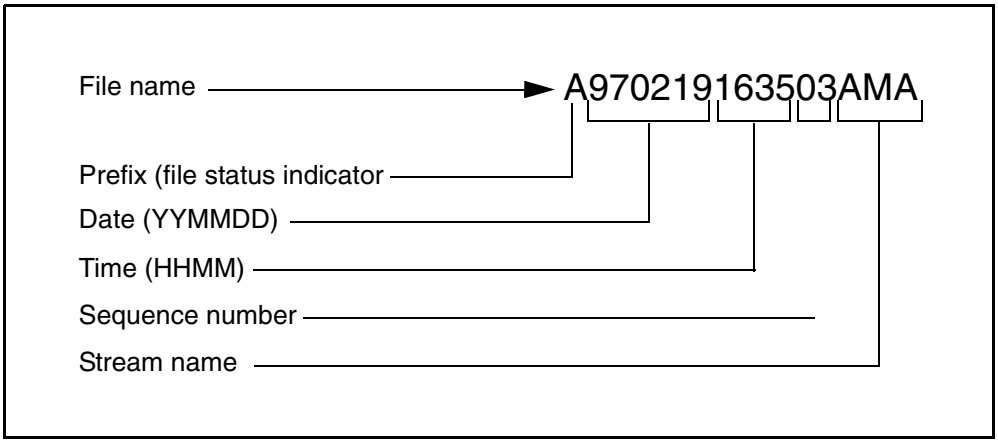
SBA billing file formats

Billing records transmitted from the core to the core manager can be either in DIRP format or in AMADNS format.

DIRP format records

To maintain compatibility with pre-CS 2000 billing systems, the SBA can format the AMA records it receives from the CS 2000 into the same DIRP format used by Nortel TDM switches for AMA records sent to an on-switch IOM or IOC port. The following figure shows an example of a DIRP file name.

DIRP file name



The following table describes the components of an DIRP file name.

Components of a DIRP file name

Component	Description
Prefix	A letter that identifies the status of the DIRP file. When a DIRP file changes status, the prefix in the DIRP file name also changes. In the example above, prefix A means "active". the prefix will change to P, meaning "processed" when the file is in the ClosedSent directory, and to U, meaning "unprocessed" when the file is in the ClosedNotSent directory. The prefixes, R, meaning "removed" and B, meaning "backup" are not supported by SBA.
Date	The date on which the file was created.

Components of a DIRP file name

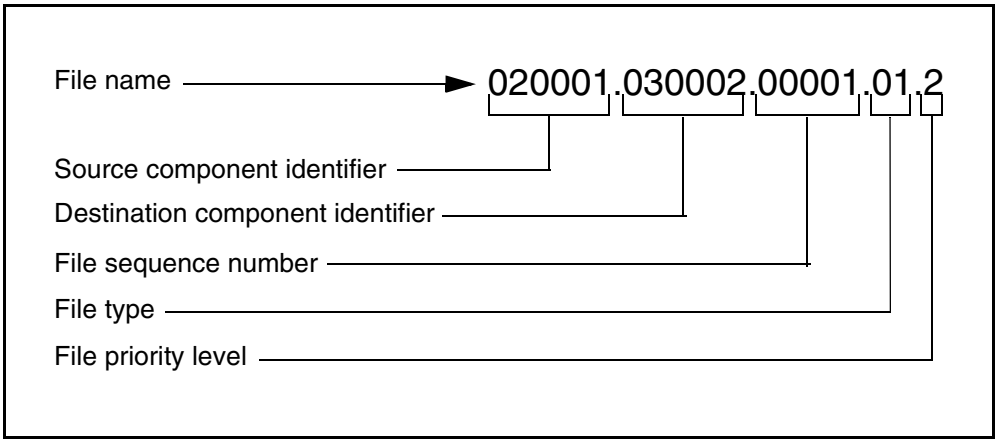
Component	Description
Time	The time of day that the file was created. Initially, the value for time in DIRP file names is OPEN. For each billing stream, the files can have the time and date updated when they are closed. The parameter is stored in the Management Information Base (MIB) of the core manager.
Sequence number	The sequence number of the file.
Stream name	The name of the billing stream associated with the file. This can be AMA, CDR, or SMDR.

For AMA records in DIRP format, the SBA can present AMA records at the core manager in real time if the real time billing application is used in conjunction with the SBA. Real time billing is presentation of AMA records at the core manager within an average of 30 seconds after call completion.

AMADNS format records

Billing records formatted by AMADNS are stored in AMADNS files after formatting. Any unrecognized records are stored in an AMADNS error file.The naming convention and structure of these AMADNS files are detailed in the Bellcore AMADNS specification GR-1343. The following figure shows an example of an AMADNS file name.

AMADNS file name



The following table describes the components of an AMADNS file name.

Components of an AMADNS file name

Component	Description
Source component identifier	A unique number that identifies which AMADNS component is the source of the file
Destination component identifier	A unique number that identifies which AMADNS component is the destination of the file
File sequence number	A number that defines the files in the same file category. Examples: file type, file priority level, source component and destination component.
File type	Type of data contained in a file
File priority level	Level of priority of data in a file

The SBA generates a file header record (FHR) for AMADNS files. This record is similar to the DIRP block header record (BHR) except that it does not contain block information found in the BHR since the AMSDNS format does not use fixed 2K blocks. The FHR appears once for each file after the AMADNS file header. An AMADNS file header is 28 bytes and contains the fields in the following table.

AMADNS file header

Byte	7	6	5	4	3	2	1	0
1	File header length							
2	Source component identification number							
3	Source Component Type				Source component identification number			
4	Destination component identification number							
5	Destination component type				Destination component identification number			
6	File type code:					Data format type		
	Standard file: BAF code=01, SMDR code=11							
	Error file: BAF code=02, SMDR code=12							

AMADNS file header

Byte	7	6	5	4	3	2	1	0
7	Field suppression type		File priority level			Reset status	Pri/Sec status	Record source info type
8-9	File sequence number							
10	File creation time							
11	File creation date				File creation time			
12-13	File creation date							
14	File last modification time							
15	File last modification date				File last modification time			
16-17	File last modification date							
18-21	File length							
22-24	Number of records in file							
25	Record resource type							
26	Record source identification number				Record source type			
27-28	Record source identification number							

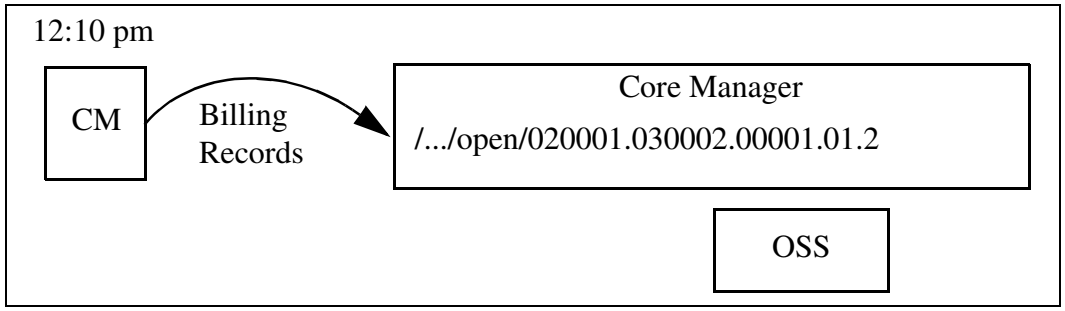
The SBA normally presents AMA records in AMADNS format at the core manager in near real time. This means that under normal operating conditions, AMA records are presented at the core manager within five minutes of call completion.

How the SBA processes AMADNS and DIRP AMA files

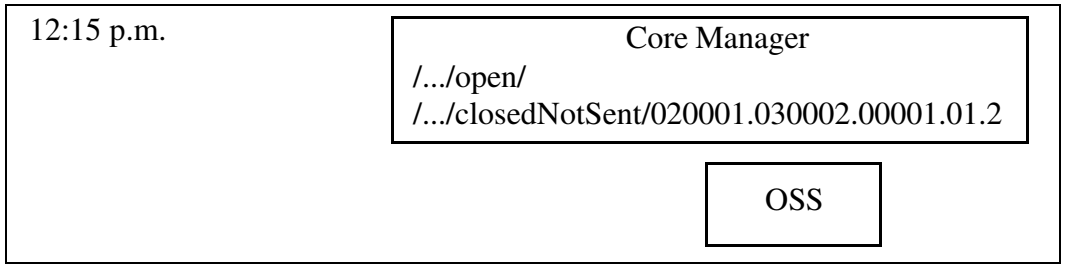
While an AMA file is open and records are being stored, it has a status of "active" and resides in the *open* directory. When the AMA file reaches a limit in terms of number of records, file size, or age, the file is closed, its status is changed to "primary", and the file is moved to the *closedNotSent* directory; no further AMA records can be stored in a closed primary file. When a primary AMA file has been transferred from the core manager to a remote destination, its status is changed to "secondary", and the file is moved to the *closedSent* directory. Once an AMA file has been marked "secondary", the core manager may delete it to make room for newer AMA files.

For example, the CM generates billing records, starting at 12:10 p.m. The billing records are transferred to the core manager (in near real-time) and stored in a file in the “open” directory.

An example of an open directory follows:

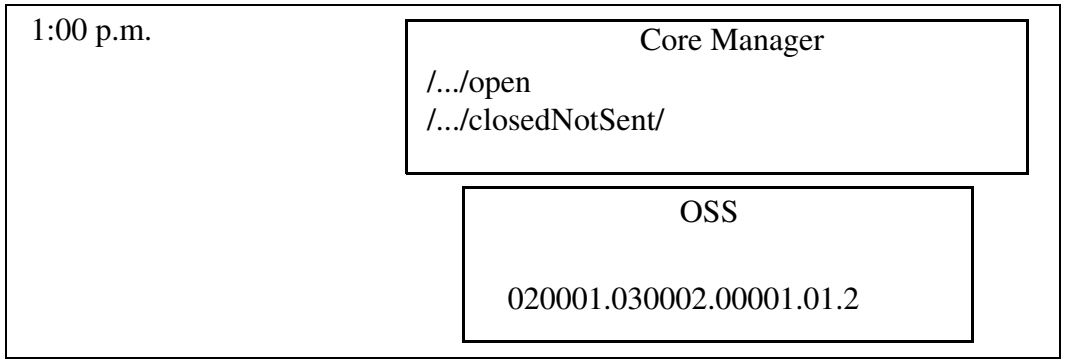


Assume the file is set up to close every 5 minutes. At 12:15 p.m. file 020001.030002.00001.01.2 is closed and moved to the “closedNotSent” subdirectory, as shown below:



Also, assume that billing files are scheduled to be sent to one specific downstream processor every hour, on the hour. Then, at 1:00 p.m. the system is as shown below, with the billing file having been sent to the downstream processor and moved from the “closedNotSent” directory to the “closedSent” directory.

An example of a closedNotSent file transiting to closedSent follows:



Note: Although billing file 020001.030002.00001.01.2 is transferred to the OSS at 1:00 p.m. as scheduled, it is retained in the "closedSent" directory until its space is needed by newer files.

The file closure limits are controlled by the network operator through the MIB of the core manager. The limits that may be defined are described in the following table.

Limits that may be defined to cause file transfer to collector

Limit	Description
Max file size (bytes) reached	Values: 1MB to 20MB for BAF (default: 20MB), 100KB to 20 MB for SMDR (default: 20MB)
Max file size (records) reached	Values: 10,000 to 500,000 for BAF (default: 500,000), 1000 to 500,000 for SMDR (default: 500,000)
File close time	Near real-time timer closes files before they reach max size. Values: 5 min. to 10,080 min., disabled (default: 120 min.)

AMA files may also be explicitly closed through the RMI (Remote Maintenance Interface) to allow clients, such as AMADUMP, immediate access to AMA records.

SBA block flushing for DIRP files

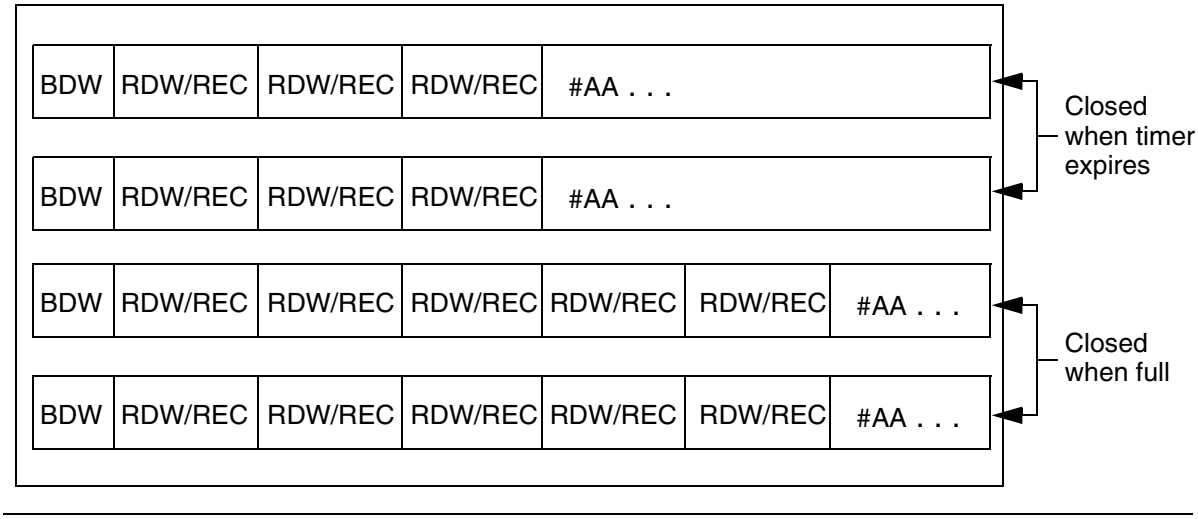
SBA block flushing is an optional capability that uses a timer-based mechanism to close DIRP file blocks after a specified time. The timer value is set through the BILLMTC level during billing stream configuration on the core manager. When a DIRP file block is closed based on time, the block is padded with hex 0xAA for each unused byte in the block. Each block can contain a variable number of call records even when the size of each call record is fixed. SBA block flushing supports only the BAF record format.

Note 1: SBA block flushing does not support customized DIRP file formats that do not allow hex *AA* padding at the end of a block. This type of DIRP file expects CDRs to be of equal size, and each block ends with a special event record. Therefore, GSP CDR DIRP files are not supported.

Note 2: It is recommended that SBA block flushing be used with real-time transfer mechanisms such as Real-Time Billing (RTB).

The following figure shows an example BAF DIRP file when SBA block flushing is activated.

BAF DIRP file when SBA block flushing is activated



BDW = 4 bytes; indicates the size of the data in the block
RDW = 4 bytes; and indicates the size of RDW and REC
RDW/REC does not necessarily have to be the same size.

Billing file transfers

The SBA provides the following methods for transferring billing files of a particular stream to a downstream destination:

- outbound file transfer
- inbound file transfer
- Real Time Billing (RTB) - DIRP file format only
- manual requests

Outbound and Inbound file transfer

Billing files always move from the core manager to the downstream destination, but the file transfers can be initiated by SBA on the core manager (this is called "outbound") or by the downstream destination (this is called "inbound"). The Outbound file transfer mode causes billing files to be sent (or "pushed") from the core manager to the downstream destination on a scheduled basis. The Inbound file transfer mode allows the customer's FTP client to selectively retrieve (or "pull") billing files from the core manager.

Billing streams can be configured on an individual basis for either inbound file transfer or scheduled outbound file transfer. While a stream is in inbound mode, it is still possible to back up data using TAPE level commands. Inbound and outbound file transfer are enabled through the

CONFSTRM command, which is accessible through the BILLMTC level.

Scheduled outbound file transfer allows a single billing stream to be transferred to multiple destinations.

Real Time Billing
Real time billing (RTB) allows billing records to be available for transfer from the core manager 30 seconds after the call is disconnected. Real time billing downloads a small group of records to the DIRP billing file on the downstream destination as the records are added to the open billing file on the core manager. Real time billing uses FTP through an Ethernet connection to deliver records.

Real time billing (RTB) allows a single billing stream to be transferred to multiple destinations.

Multiple destination billing
The multiple destination per billing stream feature allows multiple external clients to register for pushes of billing data on a per-stream basis. Scheduled file transfer and Real Time Billing commands allow for multiple destinations for a single billing stream. Multiple destination capability can be active on multiple billing streams. The billing data sent to the downstream destination is unfiltered.

Filtering billing files for transfer

The SBA enables you to select various subsets of billing records and schedule them for transfer to different locations. For example, you may wish to filter a billing stream to send its billing records for answered calls to one mediation system and its billing records for unanswered calls to another mediation system. This is accomplished by creating billing stream filters.

A billing stream filter creates a new billing stream containing a subset of the records that are in an associated computing module (CM) billing stream. From the perspective of the core manager, filtered billing streams are the same as normal billing streams and can be manipulated through regular multi-destination functions and Real Time Billing.

Filters for billing streams are created only through the AMADUMP tool accessed through the billing maintenance interface (BILLMTC). The AMADUMP tool also enables you to refine and test the filter criteria on existing billing files before you assign the criteria to a filtered stream. After a filter is created, it can also be changed or deleted through the AMADUMP tool. The filter is then configured for a billing stream through the CONFSTRM level of BILLMTC. The steps for creating a billing

stream filter are found in the procedure, Searching and viewing billing records on page 185. The steps for configuring a filtered billing stream are found in the procedure Configuring a billing stream on the core manager on page 83.

The following characteristics apply to billing stream filters:

- Every billing stream may have multiple filtered streams handling its records.
- Every filtered stream is associated with only one CM billing stream. There is no relationship between filtered streams. Each filtered stream is configured independently of any others.
- Each CM billing stream receives all records in the stream, regardless of the presence or activity of filtered streams.
- Filter streams are visible on the CM only in terms of logs and alarms generated by the SBA. Logs and alarms generated by a filtered stream that are sent to the CM are sent under the name of the corresponding CM billing stream and includes the name of the filtered stream.
- Any filtered stream may be configured to handle all records in the billing stream.
- More than one filtered stream may handle a given billing record.

SBA operational modes

The SBA is always operational in one of the following three automatic modes:

- normal
- backup
- recovery

Normal mode processing

When the core side of the SBA communication system receives a buffered billing record from the buffer system, it sends the billing record to the core manager side of the SBA communication system. The core manager side of the SBA communication system passes the billing record to the SBA billing stream for management. The SBA stream management routes the billing record to the SBA File Manager, which writes the billing record to an open file on the SBA-allocated portion of the core manager disk.

Backup mode processing

The SBA goes into backup mode when any of the following conditions occur:

- the core manager and core experience a loss of communication due to an error
- the core manager does not send an acknowledgment that the buffered billing record is successfully written to disk
- you enter the bsy command on the core to busy the core manager
- you enter the bsy command on the core manager to busy the SBA software
- you upgrade SBA software on the core manager
- the core manager experiences a critical alarm due to software errors
- the core manager disk volume is full

The SBA buffer system routes billing records it receives from amaproc to the SBA auxiliary storage system when it is in backup mode. The auxiliary storage system writes each billing record to disk on the core side until communication is restored between the core and the core manager. Once the communication is restored, SBA enters recovery mode.

Recovery mode processing

When the SBA exits the backup mode, it enters the recovery mode. In the recovery mode, the buffer system routes both the active records (real-time) and the backed-up recovery records through the SBA communication system. The SBA File Manager writes the backed-up recovery records and active records to two separate files. Since the backed-up records are written at a rate of 1 block for every three blocks of active data, this can take longer in low traffic periods.

Any stream that drops from normal mode must pass through both backup mode and recovery mode before it can return to normal mode. Because the speed of the stream status transitions very rapidly and because of the timing of the manually-entered posts, however, you may not always see the progression through all three modes.

Effect of one-night processing on the SBA

One-night processing (ONP) is performed when operating company personnel upgrade the core software load. After the datafill is moved to the inactive side of the CS 2000, ONP begins the Switch Active (SWACT) on the inactive side. When the SWACT starts the inactive side of the CS 2000, the SBA application opens a backup file. The SBA

File Manager writes to the file buffer containing billing records that are not acknowledged or received by the SBA on the core manager. The SBA backup file is found and recovered by the other side which avoids any billing loss during a ONP.

SBA user interfaces

The billing maintenance interface (BILLMTC) is an SBA user interface that is similar to the MAP (maintenance and administration position) for the CM. Through the maintenance interface, the user can schedule file transmissions, list and send files, set the stream context for subsequent commands, query a stream, close a current file, view and set management information base (MIB) parameters, and configure a stream. The user login (root or maint) determines which commands and command parameters are available.

The SBA allows closed AMADNS AMA files on the core manager to be searched for specific AMA records using the AMADUMP tool. The search criteria can include filename and record age. AMADUMP can access primary and secondary AMA files, but not active files (these must first be closed and made primary using RMI commands). It can display all records, or can apply a user-defined filter. The AMADUMP tool allows multiple users to access the tool simultaneously, and multiple access to the same file.

Installing SBA

The procedure used for installing SBA on the SDM can be found in NTP NN10125-811, *SDM Accounting*. The procedure used for installing SBA on the CS 2000 Core Manager can be found in NTP NN10126-811, *CS 2000 Core Manager Accounting*. The procedure used for installing SBA on the Core and Billing Manager 800 can be found in NTP NN10352-461, *Core and Billing Manager 800 Upgrades*. The procedure used for installing SBA on the Core and Billing Manager 850 can be found in NTP NN10347-461, *Core and Billing Manager 850 Upgrades.*

Configuring SBA streams

Purpose

An overview of the SBA stream configuration is provided in the following paragraphs and diagram.

Application

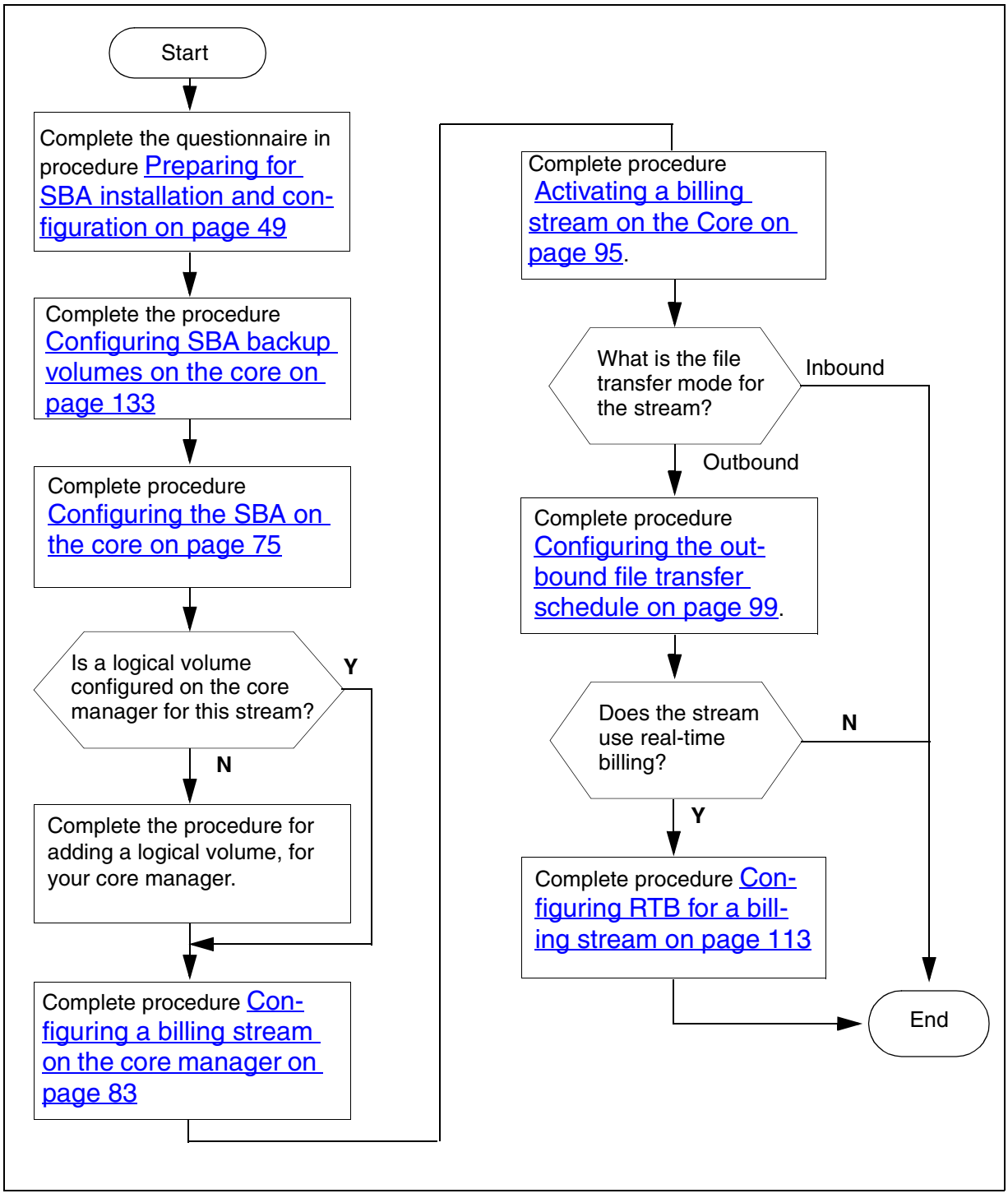
ATTENTION
You must ensure that the links between the core manager and the Core are in service before you configure SBA.

ATTENTION
The option to set a billing stream to *both* the SDM and the DMS core is a temporary solution when you perform maintenance and alarm clearing tasks. The option to set a billing stream to *both* on a permanent basis is not supported.

ATTENTION
SBA does not support the configuration of more than one billing stream at a time from multiple workstations. The last billing stream that is configured is the one that is saved.

The following flowchart shows a high-level overview for the configuration of SuperNode Billing Application (SBA) streams.

Summary of configuring SBA streams



Preparing for SBA installation and configuration

The following procedure contains a series of questionnaires that you must complete before you install and configure the SuperNode Billing Application (SBA) on the core manager for the first time.

In some cases, you may have been directed to this procedure from another procedure to complete or verify the information in one or more of the questionnaires, which include

- General stream information on page 49
- AMADNS filename and header values on page 55
- File closure limits on page 56
- Disk space requirements on page 60
- Outbound file transfer destinations on page 64
- Outbound file transfer protocol on page 70
- Outbound file transfer schedule on page 71

General stream information

The following table contains a list of questions concerning general stream information. Record your answers in the spaces provided.

General stream information (Sheet 1 of 7)

#	Question	Explanation	Answer
1	What is the name of this stream?	*stream_name* The stream name on the SBA must match the stream name on the DMS Switch. ***Note:*** This name must match a stream name in the CM table CRSFMT. Type: string Range: 1 to 4 characters. Example: AMA (not case sensitive)	

General stream information (Sheet 2 of 7)

#	Question	Explanation	Answer
2	Is this a filter stream?	*filter_stream* The filter stream parameter specifies whether the stream is a CM billing stream (Yes) or a filtered stream (No). Type: Boolean Range: Yes or No (not case sensitive)	
3	What is the associated stream name?	*associated_stream* This question applies only for filter streams. The associated stream name parameter specifies the name of the associated CM billing stream. Type: string Range: 1 to 4 characters Example: AMA, OCC (not case sensitive)	
4	What is the name of the Filter Criteria file?	*filter_criteria_file* This question is applicable only for filter streams. Enter the filter criteria file name that contains the expression to be applied for the filtered stream. Type: string Range: 1 to 255 characters (case sensitive)	

General stream information (Sheet 3 of 7)

#	Question	Explanation	Answer
5	What is the record format of this stream?	*record_format* The stream record format on the SBA must match the record format of the DMS Switch stream. The only record formats supported by this product and release are • BC (Bellcore AMA format) and • SMDR (Station Message Detail Recording) • CDR300 • CDR250 Type: enumeration Range: BC, SMDR, CDR300, CDR250 (not case sensitive)	
6	What is the file format of this stream?	*file_format* The is the format of the billing files that SBA creates on the core manager. Type: enumeration Range: DNS, DIRP (not case sensitive) ***Note:*** The core manager does not support an SMDR stream in DIRP format.	

General stream information (Sheet 4 of 7)

#	Question	Explanation	Answer
7	What is the name of the logical volume on the core manager for storing the billing files for this stream?	*logical_volume_name* The logical volume is the name of the directory where the billing files are stored for this stream. Type: string Range: 1 to 255 characters	
8	Will file transfers for this stream be initiated by • SBA (Outbound), or • the downstream destination (Inbound)	*file_transfer_mode* Billing files always move from SBA to the downstream destination, but the file transfers can be initiated by • SBA (this is called outbound) or • the downstream destination (this is called inbound) If Outbound is chosen, the SBA must be configured with additional file transfer information. The outbound file transfer questionnaires must be completed. If Inbound is chosen, the outbound file transfer questionnaires are not needed. Type: enumeration Range: Inbound, Outbound Default: Outbound (not case sensitive)	

General stream information (Sheet 5 of 7)

#	Question	Explanation	Answer
9	What is the desired state for the stream?	*sba_stream_state* The stream state controls where the records are sent. • ON: records are sent only to the SBA • OFF: records are sent only to an existing DIRP system • BOTH: records are sent to both SBA and to an existing DIRP system ***Note 1:*** The BOTH state is intended for startup verification of SBA processing against DIRP processing. Extended use of the BOTH state can result in SBA performance problems. ***Note 2:*** An MTX XA-Core system generating more than 175000 CDRs per hour does not support BOTH or OFF mode. Type: enumeration Range: On, Off, Both (not case sensitive)	
10	Do you want the files renamed with close date?	*files_renamed_with_close_date* This question is applicable only if the file format is DIRP. Type: Boolean Range: Yes, No Default: No (not case sensitive)	

General stream information (Sheet 6 of 7)

#	Question	Explanation	Answer
11	Do you want the files closed for file transfer and writetape?	*files_closed_on_file_ transfer* This question is applicable only if the file format is DIRP Type: Boolean Range: Yes, No Default: No (not case sensitive)	
12	Do you want DIRP blocks closed based on time (applicable only for DIRP file format) *This question appears only when file_type=DIRP and record_format=BAF or CDR250.*	*DIRP_blocks_closed_ based_on_time* This parameter specifies whether the DIRP blocks are to be closed after a defined elapsed time. ***Note 1:*** SBA block flushing does not support customized DIRP file formats that do not allow hex AA padding at the end of a block. This type of DIRP file expects CDRs to be of equal size, and each block ends with a special event record. Therefore, GSP and MCI CDR DIRP files are not supported. ***Note 2:*** It is recommended that block flushing be used with real-time transfer mechanisms such as Automatic File Transfer (AFT) and Real-Time Billing (RTB) Type: Boolean Range: Yes, No Default: No (not case sensitive)	

General stream information (Sheet 7 of 7)

#	Question	Explanation	Answer
13	File DIRP block closure time limit (in seconds) This question appears only when you answer Yes to *DIRP_ blocks_ closed_based_on_time (question 12)*	*DIRP_block_closure_ time_limit* This parameter specifies the maximum amount of time in seconds that a DIRP block is kept open before it is closed. Type: Integer Range: 1 through 120 Default: 1	

AMADNS filename and header values

The following table contains a list of configuration questions concerning AMADNS filename and header values. The values selected are used in the headers and names of the AMADNS files that SBA creates for this stream. Record your answers in the spaces provided.

Note: The source component id and type are not configured per stream and their values will be used by every enabled AMADNS stream on this SBA.

AMADNS filename and header values (Sheet 1 of 2)

#	Question	Explanation	Answer
14	What is the destination component id for this stream?	*destination_id* Type: String Range: 0000 to 4095 Default: 0002	
15	What is the destination component type for this stream?	*destination_type* Type: String Range: 01 to 15 Default: 03	
16	What is the source component id for this SBA?	*source_id* Type: String Range: 0000 to 4095 Default: 0001	
17	What is the source component type for this SBA?	*source_type* Type: String Range: 01 to 15 Default: 02	

AMADNS filename and header values (Sheet 2 of 2)

#	Question	Explanation	Answer
18	What is the standard file type for this stream?	*standard_file_type* Type: Number Range: 1, 6 to 31 Default: 1 (BC), 11 (SMDR)	
19	What is the error file type for this stream?	*error_file_type* Type: Number Range: 1, 6 to 31 Default: 2 (BC), 12 (SMDR)	

File closure limits

The following table contains a list of configuration questions concerning limits that control automatic closing of billing files by SBA. Note that the first of these settings that are reached, triggers the closing of the file. Record your answers in the spaces provided.

File closure limits (Sheet 1 of 4)

#	Question	Explanation	Answer
20	Do you want the files for this stream to be closed after a defined elapsed time?	*close_on_timer* This controls whether SBA closes billing files based on how long the files have been open. A Yes setting causes SBA to leave a file open no longer than the value specified in question 21. A No setting disables automatic file closure based on the default time limit. Type: Boolean Range: Yes, No Default: No (not case sensitive)	

File closure limits (Sheet 2 of 4)

#	Question	Explanation	Answer
21	What is the maximum time that a file can be open for this stream?	*file_open_time_limit* This controls the maximum time SBA keeps a file open. It is enabled only if Yes is the answer to question 20. Skip this question if the answer to question 20 is No. Type: number Units:minutes Range: 5 to 10080 Default: 10080	
22	What is the maximum number of records generated each day for this stream?	*records_per_day* This is used to calculate the maximum number of • records per file, and • bytes per file Type: number Units: Records per day Range: none	
23	What is the maximum size of a record?	*bytes_per_record* This is used to calculate a value for the maximum number of bytes per file. Type: number Units: Bytes per record Range: none	

File closure limits (Sheet 3 of 4)

#	Question	Explanation	Answer
24	What is the maximum number of records per billing file for this stream?	*records_per_file* This controls the maximum number of records a billing file can contain before SBA automatically closes the file. The recommended value based on a target of 300 files a day will be calculated and provided as the default value, if the average number of records per day is one or more. Type: number Units: records per file Range: BC 10000 to 500000 SMDR 1000 to 500000	
25	What is the maximum number of bytes per billing file for this stream?	*bytes_per_file* This controls the maximum size (in bytes) of a billing file before SBA automatically closes it. A recommended value may be calculated with the following formula: Records per day * average record size / 300 = Bytes per file Type: number Units: bytes per file Range: BC:1000000 to 20000000 SMDR: 100000 to 20000000	

File closure limits (Sheet 4 of 4)

#	Question	Explanation	Answer
26	What is the average record size? (not applicable if the number of records per day is 0)	*average_record_size* This parameter specifies the maximum size of a record. The default value is 80, but depends on the record type and the record size as defined on the CM. This prompt appears when the Number of records per day parameter is set to a value other than zero (0).	

Disk space requirements

The following table contains a list of configuration questions related to core manager and DMS-switch disk space required by the SBA. Record your answers in the spaces provided.

Disk space sizing requirements are calculated using the DMS switch value billable Busy Hour Call Attempts (BBHCA). This value is the total number of billing-record-generating calls that are processed within the busiest one hour window of a typical 24-hour day.

For information on the BBHCA estimation factor and its use in calculating required disk space, refer to Calculation of core manager Disk Space Requirements and Calculation of DMS Switch Disk Space Requirements.

Disk space requirements (Sheet 1 of 2)

#	Question	Explanation	Answer
27	How much disk space on the core manager is needed for the billing files for this stream?	*logical_volume_size* If the core manager is unable to send the billing files to the downstream processor, they accumulate on the core manager disk space. The allocated disk space must be capable of holding at least 5 days of SBA billing files. The formula for calculating SBA-required disk space on the core manager is described in Calculation of core manager Disk Space Requirements. Type: number Units: Mbytes Range: NA Default: none Space is allocated in 16 Mb increments.	

Disk space requirements (Sheet 2 of 2)

#	Question	Explanation	Answer
28	How much disk space is needed for backup of billing records on the DMS Switch for this stream?	*dms_disk_space* If the DMS switch is unable to send the billing records to the core manager, they are backed up to the DMS disk space. The allocated DMS disk space must be capable of holding at least a one day accumulation of SBA billing records. The formula for calculating SBA-required disk space on the DMS switch is described in Calculation of core manager Disk Space Requirements. Type: number Units: Mbytes Range: NA Default: none	

Calculation of core manager Disk Space Requirements

The formula for calculating megabytes of disk space needed for SBA billing streams is:

$$\frac{\text{BBHCA} * \text{ALCR} * 10\ \text{hours} * \text{CRRD}}{1048576} \ / \ \text{disk utilization}$$

- BBHCA (Billable busy hour call attempts), multiplied by the ALCR
- ALCR (average length of a call record in bytes), multiplied by
- 10 hours, multiplied by
- CRRD (Call-record retention days), divided by
- 1048576 (the number of bytes in a megabyte), divided by
- the desired disk utilization.

For this calculation, the desired disk utilization is a percentage that is expressed as a decimal from 0.1 and 0.9.

This formula must be applied to each billing stream with the total of all streams representing the total megabytes of disk space required.

Note: The maximum number of files to hold billing records for a billing stream is 15000.

The calculation of 10 hours multiplied by BBHCA is an experience-based factor that can be used to estimate 24 hours of call traffic. If you know that the stream has a high BBHCA for more or less than 10 hours per day, increase or decrease the hours value.

Calculation Example
Assumptions:

- BBHCA = 150000
- Average length of call records = 85 bytes
- Call retention days = 10
- Desired disk utilization = 0.6 (60%)

Calculation:

150000*85*10*10/1048576/.6=2026 Megabytes (2 Gbytes)

Calculation of DMS Switch Disk Space Requirements

Regardless of the volume size determined in this procedure, XA-CORE users cannot configure a backup volume size greater than 2GB. For non-XA-CORE users, the maximum volume size that can be configured is limited to the size of the physical disk.

The recommended formula for calculating the DMS disk space needed for an SBA billing stream is:

BBHCA * ALCR * 10 hours * CRRD

- BBHCA (Billable busy hour call attempts) multiplied by
- ALCR (Average length of a call record in bytes), multiplied by
- 10 hours, multiplied by
- CRRD (Call-record retention days)

This formula must be applied to each billing stream with the total of all streams representing the total DMS Switch disk space required.

The calculation of 10 hours multiplied by BBHCA is an experience-based factor that can be used to estimate 24 hours of call traffic. If you know that the stream has a high BBHCA for more or less than 10 hours per day, increase or decrease the hours value.

Calculation Example
Assumptions:

- BBHCA = 150000
- Average length of call records = 85 bytes
- Call retention days = 2

Calculation:

150000*85*10*2/(1024*1024) = 243 Mbytes of disk space

Outbound file transfer destinations

The following table contains a list of stream configuration questions relating to transferring files from SBA to one or more destinations. This table requires specific configuration information for the destinations, IP addresses, user ids, passwords, and directories. The SBA uses this configuration information to log in, and to transfer the files to the downstream destination. Record your answers in the spaces provided.

Outbound file transfers (Sheet 1 of 6)

#	Question	Explanation	Answer
29	What is the destination to transfer the billing files?	*destination* The combination of the values for stream name, file format type, and destination acts as the key to the schedule tuple. The destination cannot contain unprintable characters or blanks. Type: numeric String Range: 1 to 15 characters Default: none Example: Eventure	

Outbound file transfers (Sheet 2 of 6)

#	Question	Explanation	Answer
30	Which protocol is to be used to transfer billing files from the SBA?	*protocol* *FTPW* uses the File Transfer Protocol *RFTPW* (real time file transfer protocol wrapper) is used for the Real-Time Billing (RTB) application. RFTPW is supported only if the RTB application is configured. ***Note:*** If you configure RFTPW for a schedule tuple, then you must configure RTB for the corresponding stream. Use the procedure Configuring RTB for a billing stream on page 113. *SFTPW* (secure file transfer protocol wrapper) provides secure outbound file transfer using the OpenSSH sftp client. SFTPW is supported only if OpenSSH is installed on the core manager. ***Note:*** The initial host key acceptance of the downstream processor must be performed manually before the SFTP is used to transfer files. This must be performed for each downstream destination. Type: enumeration Range: FTPW, RFTPW, SFTPW Default: FTPW (not case sensitive)	

Outbound file transfers (Sheet 3 of 6)

#	Question	Explanation	Answer
31	What is the IP address of the primary destination for this stream?	*primary_destination* The primary destination is the IP address that the SBA logs into, and transfers the billing files. Type: IP Address Range: 0.0.0.0 to 255.255.255.255 Example: 47.202.35.189	
32	What is the Port for the primary destination?	*primary_port* The primary port number is associated with the primary IP address. Type: numeric Range: SFTPW: 22, 1025 to 65535 FTPW or RFTPW: 21, 1025 to 65535 Default: 22, for SFTPW 21, for FTPW or RFTPW Example: 22	
33	What is the IP address of the alternate destination for this stream?	*alternate_destination* The alternate destination is the IP address that the SBA logs into and transfers the billing files if SBA encounters problems in connecting to the primary destination. If there is no alternate destination, make this entry identical to the primary IP address. Type: IP Address Range: 0.0.0.0 to 255.255.255.255 Example: 47.202.35.189	

Outbound file transfers (Sheet 4 of 6)

#	Question	Explanation	Answer
34	What is the Port for the alternate destination?	*alternate_port* The alternate port number is associated with the alternate IP address. Type: numeric Range: SFTPW: 22, 1025 to 65535 FTPW or RFTPW: 21, 1025 to 65535 Default: 22, for SFTPW 21, for FTPW or RFTPW Example: 22	
35	What is the login for the downstream destination for this stream?	*remote_login* This login is the SBA user id to login to the downstream destination, and to transfer the billing files. Type: string Range: 1 to 20 alphanumeric characters Default: none Example: amadns (case sensitive)	
36	What is the password for the login ID in Question 24 for this stream?	*remote_password* This is the SBA password used to log into the downstream destination to transfer the billing files. Type: string Range: 1 to 20 alphanumeric characters Default: none Example: abracadabra (case sensitive)	

Outbound file transfers (Sheet 5 of 6)

#	Question	Explanation	Answer
37	What is the directory path on the downstream destination where the transferred billing files are to be stored?	*remote_storage_ directory* This is the full path to the directory on the downstream destination where SBA transfers the billing files. If this value is a period (.), the SBA FTP client does not issue a change working directory (CWD) command when a file transfer occurs. Type: string Range: 1 to 255 characters. Example: /users/amadns/billing (case sensitive)	
38	What is the desired field separator character for this stream?	*field_separator* This is a single character that the SBA uses to separate the components of billing file names when they are transferred to the downstream destination. If the downstream destination is a UNIX system, the recommended field separator is a period (.); this results in a file name such as 020001.030002.00001.01.2. If the downstream destination is a system that does not allow more than one period (.) in the filename, the recommended field separator is an underscore (_); this results in a file name such as 020001_030002_00001_01_2. Type: character Range: any printable character Default: . (period) (case sensitive)	

Outbound file transfers (Sheet 6 of 6)

#	Question	Explanation	Answer
39	What is the desired filename extension for this stream?	*file_extension* This is the short character string that SBA uses as an extension for the billing file names when it transfers them to the downstream destination. If the downstream destination is a UNIX system, do not use a filename extension. If the downstream destination is a system that does not allow more than one period (.) in the filename, the filename extension cannot be used. Type: string Range: 0 to 3 characters Default: blank (0 chars) (case sensitive)	

Outbound file transfer protocol

The following table contains a list of configuration questions relating to transferring files from SBA to the downstream destination. This table requires specific configuration limits information to control how the SBA reacts when it encounters problems in connecting to the downstream destination. Record your answers in the spaces provided.

Outbound file transfer protocol

#	Question	Explanation	Answer
40	What is the maximum number of times SBA attempts to complete a failed session with the downstream destination for this stream?	*protocol_max_retries* Type: number Range: 0 to 10 Default: 3	
41	After a session for this stream fails, what is the maximum time in seconds that SBA must wait before attempting re-connection to the downstream destination?	*protocol_retry_wait_time* Type: number Units: seconds Range: 1 to 60 Default: 1	

Outbound file transfer schedule

The following table contains a list of stream configuration questions relating to transferring files from SBA to the downstream destination. This table specifically addresses configuration information concerning when SBA initiates a connection to the downstream destination to transfer billing files. Record your answers in the spaces provided.

Outbound file transfer schedule (Sheet 1 of 3)

#	Question	Explanation	Answer
42	Are scheduled file transfers to the downstream destination required for this stream?	*schedule_active* This controls whether SBA automatically initiates file transfers to the downstream destination. If set to Yes, SBA automatically transfers files to the downstream destination at the times defined by the answers to questions 43, 44 and 45. If this value is set to No, manual file transfers can be made using the sendfile command. Type: Boolean Range: Yes, No Default: No If No, use 0:00 for Answers 43 and 44 and 120 for Answer 45.	

Outbound file transfer schedule (Sheet 2 of 3)

#	Question	Explanation	Answer
43	When should SBA start initiating file transfers to the downstream destination each day?	*schedule_start_time* This setting determines the time of day when SBA starts file transfers to the downstream destination. See the examples following this table for more information. Type: Time of Day Units: hh:mm Range: 00:00 to 23:59 Default: none	
44	When should SBA stop initiating file transfers to the downstream destination each day?	*schedule_stop_time* This setting determines the time of day when SBA ends file transfers to the downstream destination. See the examples following this table for more information. Type: Time of Day Units: hh:mm Range: 00:00 to 23:59 Default: none	

Outbound file transfer schedule (Sheet 3 of 3)

#	Question	Explanation	Answer
45	Within the daily time window defined in questions 43 and 44, how often should the SBA transfer files to the downstream destination?	*schedule_interval* This specifies the interval, in minutes, at which SBA is to initiate billing file transfers to the downstream destination. This interval is only active during the window of time specified by the start time (question 43) and stop time (question 44). See the examples following this table for more information. Type: Number Units: Minutes Range: 5 to 1440 Default: 120	

The following are some examples that show different answers to questions for the start time (question 43), stop time (question 44), and the interval (question 45) and the resulting SBA file transfer times.

Note: If your start time and stop time are identical, then SBA is setup for continuous outbound file transfer.

(Sheet 1 of 2)

Start Time	Stop Time	Interval	SBA Actions	Resulting Transfers
0:00	0:00	240	The SBA transfers files every four hours, at the beginning of the hour, starting at midnight.	The SBA initiates file transfers at 12:00 midnight, 4:00 am, 8:00 am, 12:00 noon, 4:00 pm and 8:00 pm
22:10	2:00	30	The SBA transfers files every thirty minutes at 10 minutes and 40 minutes after the hour, between 10:10 pm and 2 am.	The SBA initiates file transfers at 10:10 pm, 10:40 pm, 11:10 pm, 11:40 pm, 12:10 am, 12:40 am, 1:10 am and 1:40 am

(Sheet 2 of 2)

Start Time	Stop Time	Interval	SBA Actions	Resulting Transfers
3:15	3:15	300	The SBA transfers files every five hours at 15 minutes after the hour, starting at 3:15 am.	SBA initiates file transfers at 3:15 am, 8:15 am, 1:15 pm, 6:15 pm and 11:15 pm.

Configuring the SBA on the core

Purpose

Use the following procedure to configure the SBA application and backup disks on the Core.

Application

ATTENTION
For XA-Core systems running on CSP16 or later, backup volumes can only be configured on IOP disks.

When configuring a stream on the Core, ensure that the backup volumes for the stream are configured on IOP disks. This applies to all streams defined in table SDMBILL, whether they are turned ON or OFF. You can access IOP volumes through the diskut level of the CI prompt. IOP disks usually start with F02L or F17L (for example, F02LAMA, F17LAMA5). To configure backup volumes on IOP disks, refer to procedure Configuring SBA backup volumes on the core on page 133 in this document.

To determine if your system is an XA-core system running CSP16 or later, run the *imagename* command on the Core. The first line of the response begins with “XA”, and the line that begins with “LAYER:TL” indicates 16 or higher.

The following procedures are referenced in this procedure. Ensure that you have access to these procedures if required.

- Preparing for SBA installation and configuration on page 49
- Configuring the outbound file transfer schedule on page 99
- Configuring SBA backup volumes on the core on page 133
- Querying a billing stream on page 183

Datafill requirements

Before you can configure SBA, you must enter the appropriate datafill in tables CRSFMT, CRSMAP, DIRPPOOL, DIRPSSYS, and SDMBILL to have your billing records sent to either core manager or DIRP logical volumes on the Core, or both. The table Location of datafill procedures by PCL lists the PCLs and corresponding NTPs that contain the datafill procedures for these tables.

Location of datafill procedures by PCL

PCL	NTP reference
Local Exchange Carrier (LEC)	*297-8001-351 DMS-100 Family NA100 Customer Data Schema Reference Manual*
Local Exchange Carrier/TOPS (LET)	*297-8021-351 DMS-100 Family NA100 Customer Data Schema Reference Manual*
International	*297-9051-351 DMS-100 Family MMP Customer Data Schema Reference Manual*

Use the procedures in the NTPs listed in the appropriate table when performing step 2 of this procedure.

Billing formats supported

The table Billing formats supported by SBA lists the billing formats supported by SBA. Refer to the appropriate NTP in the table before performing this procedure.

Billing formats supported by SBA (Sheet 1 of 2)

Format	NTP reference
AMA	*297-1001-830 DMS-100 Family Bellcore Format Automatic Message Accounting Reference Guide*
Universal AMA	*297-9051-800 DMS-100 Family DMS-100 MMP AMA Reference Guide*
DMS-300 CDR (formats 09, 14 and 15)	*297-2301-119 Digital Switching Systems DMS-300 Call Detail Recording Description*
GSP CDR	*297-2651-119 Digital Switching Systems DMS-Global Services Platform Billing Records Reference Manual*
SMDR	*297-2071-119 North American DMS-100 Station Message Detail Recording Reference Guide*

Billing formats supported by SBA (Sheet 2 of 2)

Format	NTP reference
Sprint DMS-250 CDR	*297-2611-119 DMS-250 Call Detail Record Reference Manual*
UCS DMS-250 CDR	*297-2621-395 Digital Switching Systems UCS DMS-250 Billing Records Application Guide*

Configuring SBA on the Core

At the MAPCI

1 Log into the Core using your login id and password.

2 Datafill tables CRSFMT, CRSMAP, DIRPPOOL and DIRPSSYS to send the billing records to either the core manager or DIRP logical volumes on the Core, or both.

Refer to the appropriate NTP described in Datafill requirements on page 76 in this procedure.

3 Define the billing stream.

If you are defining	Do
multiple billing streams	step 4
a single billing stream	step 5

4 Set the NUM_CALLREC_STREAMS parameter in table OFCENG to a value that equals or exceeds the number of streams to be configured.

Note: This parameter defines the highest number of billing streams that the switch supports.

5 Configure disk volumes for each stream on the Core for backup purposes. To configure disk volumes, refer to the procedure Configuring SBA backup volumes on the core on page 133.

After you have configured the backup volumes, return to this procedure and go to step 6.

Note 1: These volumes are used in situations where the Core is temporarily unable to pass billing data to the core manager.

Note 2: SBA does not support the configuration of more than one billing stream at a time from multiple workstations. The last billing stream that is configured is the one that is saved.

6 Determine if a UCS DMS-250 CDR stream for BAF conversion is required.

If you	Do
are setting up a UCS DMS-250 CDR stream for BAF conversion	step 7
are not setting up a UCS DMS-250 CDR stream for BAF conversion	step 50

7 Access table OFCVAR:

```
> table ofcvar
```

8 Position on office parameter EDGE_SWITCH:

```
> pos edge_switch
```

9 Enter the change command:

```
> cha
```

The system displays a prompt asking you to confirm whether you want to proceed with the change.

If you	Type
want to proceed with the change	**y** step 10
do not want to proceed with the change	**n**

10 At the system prompt, set the value to **Y**:,

```
> y
```

The system displays a prompt asking you to confirm the value.

If you	Type
want to confirm the value	**y** step 11.
do not want to confirm the value	**n**

11 Set the FCDR_CDR_WORD_LAYOUT office parameter to normal. Access table OFCENG:

```
> table ofceng
```

12 Position on office parameter FCDR_CDR_WORD_LAYOUT:

```
> pos fcdr_cdr_word_layout
```

13 Enter the change command:

```
> change
```

The system displays a prompt asking you to confirm whether you want to proceed with the change.

If you	Enter
want to proceed with the change	**y** step 14
do not want to proceed with the change	**n**

14 At the system prompt, set the value to normal:

```
> normal
```

The system displays a prompt asking you to confirm the value.

If you	Type
want to confirm the value	**y** step 15.
do not want to confirm the value	**n**, and press the Enter key.

Note: If the FCDR_CDR_WORD_LAYOUT office parameter is set to `readlr`, CDR records are not converted to BAF records, and a NOSC alarm appears on the banner at the APPL level of the core manager.

15 Access table AMAPARM:

```
> table amaparm
```

16 Verify tuple “bafsuppr” is set to Y:

```
> pos bafsuppr
```

17 Change the value of the tuple:

```
> rwok on
```

18 Invoke the change command:

```
> cha
```

19 When prompted, confirm you want to proceed with the change:

```
> y
```

20 When prompted, set the value to Y:

```
> y
```

21 When prompted, confirm the value:

```
> y
```

22 Verify tuple “enableaudit” is set to Y:

```
> pos enableaudit
```

If the value is	Do
set to Y (yes)	step 28
set to N (no)	step 23

23 Change the value:

```
> rwok on
```

24 Start the change command:

```
> cha
```

25 When prompted, confirm you want to proceed with the change:

```
> y
```

26 When prompted, set the value to Y:

```
> y
```

27 When prompted, confirm the value:

```
> y
```

28 Access table OFCENG:

```
> table ofceng
```

29 Verify that the billing template is set to AMAREC:

```
> pos fcdr_cdr_tmplt
```

If the value is	Do
AMAREC	step 35
not AMAREC	step 30

30 Change the value:

```
> rwok on
```

31 Start the change command:

```
> cha
```

32 When prompted, confirm you want to proceed with the change:

```
> y
```

33 When prompted, set to the correct value:

```
> internalk_tmplt amarec
```

34 When prompted, confirm the value:

```
> y
```

35 Verify that CDR word layout is set to Normal:

```
> pos fcdr_cdr_work_layout
```

and pressing the Enter key.

If the value is	Do
Normal	step 41
not Normal	step 36

36 Change the value:

```
> rwok on
```

37 Invoke the change command:

```
> cha
```

38 When prompted, confirm you want to proceed with the change:

```
> y
```

39 When prompted, set to the correct value:

```
> normal
```

40 hen prompted, confirm the value:

```
> y
```

41 Verify that CDR size is set to 128:

```
> pos fcdr_cdr_size
```

If the value is	Do
128	step 47
not 128	step 42

42 Change the value:

```
> rwok on
```

43 Start the change command:

```
> cha
```

44 When prompted, confirm you want to proceed with the change:

```
> var_size 128
```

45 When prompted, set to the correct value:

```
> normal
```

46 When prompted, confirm the value:

```
> y
```

47 Ensure the predefined CDR templateID for the CDR2BAF application is present and activate the CTMPLT tool:

```
> ctmplt
```

48 Upgrade the new or changed template:

```
> upgrade
```

49 Verify that AMAREC is the active template:

```
> status
```

50 You have completed this procedure.

Configuring a billing stream on the core manager

Purpose

Use this procedure to add, change, or delete a billing stream on the core manager.

Application

SBA only supports SMDR streams in DNS file format. SBA does not support an SMDR stream in DIRP file format.

The core manager allows you to configure an SMDR stream in DIRP file format. However, when you try to activate the SMDR stream from the Core (with DIRP file format) by using the command **sdmbctrl smdr on** or **sdmbctrl smdr both**, the command fails and the system displays the following error message: `"The stream is not configured or not supported on the SDM."`

Prerequisites

The following prerequisites apply to this procedure:

- The SBA must be in service when this procedure is performed.
- During this procedure, SuperNode Billing Application (SBA) will prompt you for information based on the task you are performing and the type of billing stream. This information is available in the configuration questionnaire completed during the procedure Preparing for SBA installation and configuration on page 49.

  The table Information prompts lists the information from the questionnaire that may be required during this procedure.

Information prompts (Sheet 1 of 3)

CONFSTRM: Add command prompts	Values	# in questionnaire
Stream name	stream_name	1
Is this a filtered stream	filter_stream	2
Associated stream (not applicable to CM billing streams; used for filtered streams)	associated_stream	3
Filter criteria file (not applicable to CM billing streams; used for filtered streams)	filter_criteria_file	4
Stream record format	record format	5
File format	file_format	6

Information prompts (Sheet 2 of 3)

CONFSTRM: Add command prompts	Values	# in questionnaire
Please specify the logical volume	logical_volume_name	7
File transfer mode	file_transfer_mode	8
Destination component Id (applicable only for DNS file format)	destination_id	14
Destination component type (applicable only for DNS file format)	destination_type	15
Source component Id (applicable only for DNS file format)	source_id	16
Source component type ((applicable only for DNS file format)	source_type	17
Customer standard header file type (applicable only for DNS file format)	standard_file_type	18
Customer error header file type (applicable only for DNS file format)	error_file_type	19
Files renamed with close date (applicable only for DIRP file format)	files_renamed_with_ close_date	10
Files closed on file transfer and writetape (applicable for DIRP file format)	files_closed_on_file_ transfer	11
Do you want DIRP blocks closed based on time (applicable only for DIRP file format)	DIRP_blocks_closed_ based_on_time	12
File DIRP block closure time limit (in seconds) (applicable only for DIRP file format)	DIRP block_closure_time_ limit	13
Do you want files closed based on time	close_on_timer	20
File closure time limit (not applicable if you do not want files closed based on time)	file_close_time_limit	21
Maximum number of records per day	records_per_day	22
Average record size (not applicable if records per day is 0)	record_size	26
Maximum number of records per file	records_per_file	24

Information prompts (Sheet 3 of 3)

CONFSTRM: Add command prompts	Values	# in questionnaire
Maximum number of bytes per file	bytes_per_file	25

Procedure

Configuring a billing stream on the core manager

At any workstation or console

1

> **ATTENTION**
> SBA does not support the configuration of more than one billing stream at a time from multiple workstations. The last billing stream that is configured is the billing stream that is saved.

Access the core manager.

2 Access the BILLMTC interface:

```
> billmtc
```

Example response

BILLMTC opens at the main level.

3 Access the CONFSTRM level:

```
> confstrm
```

If you want to	Do
add a billing stream	step 4
change the configuration of a billing stream	step 11
delete a billing stream	step 15

4 Add a stream:

```
> add <stream_name>
```

where

<stream_name>
is the name of the billing stream you want to add

5 Follow the prompts to add each value for the billing stream. Refer to table Information prompts on page 83 for more information.

6 Verify that the values displayed are the correct values. Examples of DNS, DIRP, and filtered billing streams are displayed on the following pages.

Example response: CONFSTRM Add for a DNS file format for a Core and Billing Manager

```
Stream Name -> AMA2
Filter stream -> No
Stream Record Format -> BC
File Format Type -> DNS
Logical Volume Name -> /cbmdata/00/billing/ama2
File Transfer Mode -> OUTBOUND
Destination Component Id -> 2
Destination Component Type -> 3
Source Component Id -> 1
Source Component Type -> 2
Customer Standard Header File Type -> 1
Customer Error Header File Type -> 2
File Closed On Time Valid -> NO
File Closed On Time -> 10080
Number of Records Per Day -> 10080
Average Record Size -> 1000
Maximum number of records -> 10000
Maximum number of bytes -> 1000000

Commit? [Save] {Save Edit Abort}:
```

Example Response: CONFSTRM Add for a DIRP file format for a Core and Billing Manager

```
Stream Name -> OCC
Is this a Filter stream -> NO
Stream Record Format -> CDR250
File Format Type-> DIRP
Please specify the logical Volume ->
/cbmdata/00/billing/occ
File Transfer Mode -> OUTBOUND
Do you want the files renamed with close date ->
NO
Do you want the files closed for file transfer
and writetape -> NO
Do you want DIRP blocks closed based on time ->
YES
File DIRP block Closure time limit (in seconds)
-> 2
Do you want Files closed based on time -> NO
Number of Records Per Day -> 1000000
Average Record Size -> 130
Maximum number of records per file -> 100000
Maximum number of bytes per file -> 20000000

Commit? [Save] {Save Edit Abort}:
```

Example response: CONFSTRM Add for a filtered stream file for a Core and Billing Manager

```
Stream Name -> FLT1
Is this a Filter stream -> Yes
Associated Stream Name -> OCC
Filter Stream Criteria File ->
/sdm/cfdata/rtfilt/CDR.cdr
Stream Record Format -> CDR250
File Format Type -> DIRP
Logical Volume Name -> /cbmdata/00/billing/fltl
File Transfer Mode -> OUTBOUND
Files Renamed With Close Date -> NO
Files closed for file transfer and writetape ->
YES
Do you want DIRP blocks closed based on time ->
YES
File DIRP block Closure time limit (in seconds)
-> 2
Do you want files closed based on time? -> Yes
File Closure time limit -> 10
Number of Records Per Day -> 0
Average Record Size -> 80
Maximum number of records -> 500000
Maximum number of bytes -> 2000000

Commit? [Save] {Save Edit Abort}:
```

If displayed values are	Do
not correct	step 7
correct	step 9

7 Edit the displayed values:

```
> edit
```

8 Correct the values as necessary.

9 Save the displayed values:

```
> save
```

Example response:

```
Saving stream

Configuration of stream is now complete.

Press Return to continue.
```

10 Press the Enter key to return to the CONFTSTRM level.

If you	Do
want to add another billing stream	step 4
do not want to add another billing stream	step 18

11 Change the configuration for a particular billing stream:

```
> change <stream_name>
```

where

<stream_name>
is the name of the billing stream to change

12 Follow the prompts on the screen to change the value of the fields. Refer to table Information prompts on page 83 for more information.

Note: Changing the file format between DIRP and DNS is not supported. You must delete the stream and re-add using the desired format.

13 Save the displayed values:

```
> save
```

Example response:

```
Saving stream

Configuration of stream is now complete.

Press Return to continue.
```

14 Press the Enter key to return to the CONFSTRM level.

If you	Do
want to change the configuration of another billing stream	step 11
do not want to change the configuration of another billing stream	step 18

15

ATTENTION
You must turn off (deactivate) the billing stream from the Core before you can delete the stream on the core manager.

Delete the billing stream:

```
> delete <stream_name>
```

where

<stream_name>
is the name of the billing stream to delete

16 Follow the prompts on the screen to change the value of the fields.

Note: Changing the file format between DIRP and DNS is not supported. You must delete the stream and re-add using the desired format.

17 Confirm the delete command:

```
> yes
```

If you	Do
want to delete another billing stream	step 15
do not want to delete another billing stream	step 18

18 Exit the CONFSTRM level:

```
> quit
```

19 You have completed this procedure.

Configuring a DMS-GSP CDR billing stream

Purpose

Use this procedure to configure a DMS-GSP CDR billing stream.

Prerequisites

Complete the procedure Configuring a billing stream on the core manager on page 83 before you continue with this procedure.

Procedure

Configuring a DMS-GSP CDR billing stream

At the core manager

1. Set the typeOfCDR Mib to GSP:

   ```
   >mib cdr set typeofcdr gsp
   ```

2. If you change the typeOfCDR Mib value after the stream is turned on, you must BSY, then RTS the SBA application to activate the changes to the Mib.

3. You have completed the procedure.

Activating a billing stream on the Core

Purpose

Use the following procedure to activate a billing stream on the Core.

Application

If you change a billing stream that is set to *on* or *both* to *off*, billing to the core manager stops and billing records are no longer sent to the core manager for that billing stream.

If the DIRP system is unable to receive any billing records, all billing records generated while the billing stream is set to *off* are lost.

When you set the billing stream to *on*, you have chosen to send the billing records to the core manager only. When you set the billing stream to *both*, you have chosen to send the billing records to the core manager and to the Core.

Prerequisites

Copy the values for the stream_name and sba_stream_state from Preparing for SBA installation and configuration on page 49 into the following table.

Command to enter	First parameter	Second parameter
sdmbctrl	stream_name	sba_stream_state

Procedure

Activating a billing stream on the Core

At the MAPCI

1 Access the SDMBIL level:

```
> mapci;mtc;appl;sdmbil;post <stream_name>
```

where

<stream_name>
is the stream name value entered in the table

2

CAUTION
Possible loss of service
If you change a billing stream that is set to *on* or *both* to *off*, billing to the core manager stops and billing records are no longer sent to the core manager for that billing stream.

ATTENTION
The option to set a billing stream to *both* only provides a temporary path while you are performing maintenance and alarm clearing tasks. The option to set a billing stream to the *both* mode on a permanent basis is not supported.

ATTENTION
MTX XA-Core systems generating more than 175,000 CDRs per hour do not support the *both* or *off* modes. File transfer limitations of DIRP and IOM/EIU prevent MTX core billing rates higher than 175,000 CDRs per hour.

Activate the billing stream:

```
> sdmbctrl <stream_name> <sba_stream_state>
```

where:

<stream_name>
is the stream name value from step 1

<sba_stream_state>
is the SBA stream state (*both* or *on*) value from step 1

For example, the command **sdmbctrl ama on** sends billing records from the stream named AMA to the core manager. The stream is now running, and the core manager is receiving billing records and writing records to billing files.

Note 1: The `on` state sends billing records to the core manager, the `both` state sends billing records to the core manager and the DIRP system on the Core. However, the core manager does not verify that the DIRP system is functioning properly. Also, when you use the `both` state, this causes a real-time impact to the Core.

Note 2: Currently, the SBA only supports SMDR streams in DNS file format. The SBA does not support an SMDR stream in DIRP file format. The core manager allows you to configure an SMDR stream in DIRP file format. However, when you try to activate the SMDR stream from the Core (with DIRP file format) by using the command **sdmbctrl smdr on** or **sdmbctrl smdr both**, the command fails and the system displays the following error message: `"The stream is not configured or not supported on the SDM."`

3 Verify that the billing records are being processed. To verify the records, refer to Querying a billing stream on page 183 of this document.

4 You have completed this procedure.

Configuring the outbound file transfer schedule

Purpose

Use this procedure to perform the following functions for outbound file transfer for a billing stream:

- add a schedule tuple
- change the schedule tuple
- delete a schedule tuple

Prerequisites

This procedure requires a configured billing stream. Perform the procedure Configuring a billing stream on the core manager on page 83. The billing stream must support DIRP record format and outbound file transfer.

This procedure requires information from the configuration questionnaire completed during the procedure Preparing for SBA installation and configuration on page 49. SBA will prompt for the appropriate information, based on the task you are performing and the type of billing stream. The following table Required information lists the information from the questionnaire that may be required during this procedure.

Required information (Sheet 1 of 2)

Prompt	Values	Question # from questionnaire
Enter stream	stream_name	1
Enter file_format_type	file_format	6
Enter destination	destination	29
Enter protocol	protocol	30
Enter primary_destination	primary_destination	31
Enter primary_port	primary _port	32
Enter alternate_destination	alternate_destination	33
Enter alternate_port	alternate_port	34
Enter start_time	schedule_start_time	43

Required information (Sheet 2 of 2)

Prompt	Values	Question # from questionnaire
Enter stop_time	schedule_stop_time	44
Enter interval	schedule_interval	45
Enter remote_storage_ directory	remote_storage_directory	37
Enter remote_login	remote_login	35
	Note: Special characters may not work in all operating environments. Use special characters only when necessary for outbound file transfer schedules.	
Enter remote_password	remote_password	36
Enter maximum_retries	protocol_max_retries	40
Enter retry_wait_time	protocol_retry_wait_time	41
Enter file_extension	file_extension	39
Enter field_separator	field_separator	38
Enter active	schedule_active	42

Procedure

Configuring the outbound file transfer schedule

At any workstation or console

1 Log into the core manager.

2 Access the billing maintenance level:

```
# billmtc
```

3 Access the schedule level:

```
> schedule
```

4 Determine schedule tuple action.

If you are	Do
adding a schedule tuple	step 5
changing a schedule tuple	step 12
deleting a schedule tuple	step 17

5 Add a schedule tuple for a billing stream:

```
> add
```

6

ATTENTION

Do not configure multiple schedule tuples with the same destination, directory, file format, and file extension. Collisions between billing file names can occur.

Follow the prompts to each value for the schedule tuple. Refer to the table at the start of the procedure for more information. Press the Enter key after entering each value.

Note: If you select SFTPW protocol, for secure outbound data transfer, you must first complete the following tasks:

- OpenSSH must be installed on the core manager
- you must manually accept the known host key for the downstream OSS destination, by performing the procedure Configuring SBA outbound connection security on page 107

When you have completed all fields, SBA displays the values that you entered.

Example response when FTPW protocol is selected

```
Stream: 'AMA'
File_Format_Type: 'DNS'
Destination: 'OSS'
Protocol: 'FTPW'
Primary_Destination: '47.32.45.67'
Primary_Port: '21'
Alternate_Destination: '47.32.67.86'
Alternate_Port: '21'
Start_Time: '00:00'
Stop_Time: '00:00'
Interval: '120'
Remote_Storage_Directory:
'/home/amabilling/billingfiles'
Remote_Login: 'amabilling'
Remote_Password: '******'
Timeout: '30'
Maximum_Retries: '3'
Retry_Wait_Time: '1'
File_Extension: ''
Field_Separator: '.'
Active: 'Yes'

Valid actions are {'Save', 'Edit', 'Abort'}.
Press Enter to accept 'Edit'.
Enter Action:
```

7 Verify that the values displayed are the correct values.

If the values displayed are	Do
not correct	step 8
correct	step 10

8 Press the Enter key to edit the tuple.

9 Enter the name of the field to change, or enter "all" and enter the corrected information for the appropriate field or fields.

10 Save the schedule tuple:

```
> save
```

Example response:

```
Schedule tuple saved

Press Return to Continue
```

11 Press the Enter key to return to the schedule level.

If you	Do
want to add another schedule tuple	step 5
do not want to add another schedule tuple	step 20

12

ATTENTION

You can not change the stream name, file format, and destination fields in a schedule tuple.

If the schedule tuple supports real time billing (RTB), you can not change the value of the protocol.

Change the value of one or more fields in the schedule tuple for a particular stream:

```
> change <stream_name>
```

where

<stream_name>
is the name of the billing stream associated with the schedule tuple you want to change

Note: If you select to change the protocol field, the primary and alternate ports is re-prompted.

If you	Do
receive the following warning	step 13
do not receive the following warning	step 14

Example of warning

```
Warning: Do not delete this Schedule tuple or
proceed with the current modification if there
exists a configured RTB destination which
depends on it.
```

13 Offline and delete the corresponding RTB destination before continuing with this procedure. Contact your next level of support if you have any questions regarding the steps to take or the consequences of this action.

14

ATTENTION

Do not configure multiple schedule tuples with the same destination, directory, file format, and file extension. Collisions between billing file names can occur.

Follow the prompts on the screen to change the value of the desired fields.

Note: If you select SFTPW protocol, for secure outbound data transfer, you must first complete the following tasks:

- OpenSSH must be installed on the core manager
- you must manually accept the known host key for the downstream OSS destination, by performing the procedure Configuring SBA outbound connection security on page 107

When you have completed all fields, SBA displays the values that you entered.

15 When prompted, save the changed schedule tuple:

```
> save
```

Example response:

```
Schedule tuple saved

Press Return to Continue
```

16 Press the Enter key to return to the schedule level.

If you	Do
want to change another schedule tuple	step 12
do not want to change another schedule tuple	step 20

17

ATTENTION
When the schedule tuple for a stream has a corresponding tuple with the same destination, you must delete the RTB tuple before you delete the schedule tuple.

Delete the schedule tuple for the billing stream:

```
> delete <stream_name>
```

where:

<stream_name>
is the name of the billing stream associated with the schedule tuple to delete

If you	Do
receive the following warning	step 18
do not receive the following warning	step 19

Example of warning

```
Warning: Do not delete this Schedule tuple or
proceed with the current modification if there
exists a configured RTB destination which
depends on it.
```

18 Offline and delete the corresponding RTB destination before continuing with this procedure. Contact your next level of support if you have any questions regarding the steps to take or the consequences of this action.

19 Confirm the delete command:

```
> yes
```

If you	Do
want to delete another schedule tuple	step 17
do not want to delete another schedule tuple	step 20

20 Exit the billing maintenance menu:

```
> quit all
```

Note 1: You can test the file transfer settings by executing a manual file transfer by using the **Sendfile** command and

checking that the billing file is transferred to the correct directory of the downstream destination. You can find the **Sendfile** command at position 7 of the FILESYS level from the BILLMTC menu.

Note 2: If you perform an action on the downstream server, for example, shut down the server. This action makes the ftp service on the server unavailable to the core manager. Always delete the associated schedule tuple on the core manager first. If you do not, an FTPW alarm is generated on the CM. Refer to procedure Clearing an FTPW alarm in the core manager documentation, to clear the alarm.

21 You have completed this procedure.

Configuring SBA outbound connection security

Purpose

The SBA outbound connection security feature provides secure outbound file transfer using the OpenSSH SFTP (secure file transfer protocol) client. The SFTP client protects all data, including sensitive users' passwords, by encrypting the data before it leaves the core manager and decrypting the data after it arrives at the downstream OSS destination. The SFTP client also provides data integrity checking to ensure that the data has not been tampered with during the transfer.

Prerequisites

The following prerequisites apply to the SBA outbound connection security feature:

- An SSH sftp server (SFTP server subsystem) that is compatible with the OpenSSH sftp client must be running on the downstream Operations Support System (OSS) in order for the SBA to transfer data with the OpenSSH sftp client.
- OpenSSH software, version 3.7.1p2 or later, and any dependent software must be installed on the core manager in order for SFTPW (Secure File Transfer Protocol wrapper) protocol for outbound file transfer to be used. There is no explicit check performed by the SBA software to determine whether this package or fileset is installed when the SFTPW is being configured. Thus, if the SBA SFTPW application fails to find the sftp program, an SFTPW alarm is raised and the application terminates any transfer event it is attempting to perform.
- For the CBM, the SBA outbound connection security feature depends on the OpenSSH packages as well as NTutil.
- For the SDM and CS 2000 Core Manager, the SBA outbound connection security feature depends on the SDM_OpenSSH.base fileset, which must be installed manually, and the SDM_BASE.util fileset.
- The initial host key acceptance of the downstream processor should be performed manually in order for the SFTPW to be used for file transfer from the core manager. The .ssh/known_hosts file in the maint home directory is edited by SSH software to include the host key. After this is completed, sftp can be used to send files to the downstream OSS. This step must be performed for each downstream destination prior to schedule tuple configuration for SFTPW.

Limitations and restrictions

The following limitations and restrictions apply to the SBA outbound connection security feature:

- Public keys authentication is not supported in this release. All users are authenticated with the userid and password to the downstream OSS.
- The SBA outbound connection security feature does not secure data transfer for the AFT or RTB applications.
- SBA secure outbound file transfer (SFTPW) cannot re-send ClosedSent files when ClosedSent files already exist on the target directory in the downstream system. Therefore, it is important that existing ClosedSent (or processed) files at the downstream system be either moved to another directory or re-named before an attempt is made to re-send ClosedSent files from the core manager to the downstream system.

Procedure

To configure secure data transfer to a downstream OSS destination, it is necessary to first accept the known host key for the downstream OSS destination. Steps 1 through 10 of this procedure enable you to perform this task. This task must be performed whenever the destination downstream OSS is rebooted or whenever the SFTPD server on the OSS is restarted.

Configuring SBA outbound connection security

At the PC or UNIX workstation

1 Establish a telnet connection to the core manager by completing the following substeps.

a Open a terminal window that is VT100 compatible.

b Log onto the core manager from the terminal window prompt:

```
> telnet <ip_address>
```

where:

<ip_address>
is the IP address of the core manager

c When prompted, enter the login ID and password for the root user.

2 Change directory to the maint home directory:

```
> cd ~maint
```

3 Look in the maint directory for the ".ssh" directory:

```
> ls -lad .ssh
```

If	Do
the .ssh file does not exist	step 4
the .ssh file does exist	step 10

4 Create the .ssh directory:

```
> mkdir .ssh
```

5 Change the .ssh directory ownership:

```
> chown maint:maint .ssh
```

6 Change the permissions associated with the .ssh directory:

```
> chmod u+rwx .ssh
```

7 Change to the maint user:

```
> su maint
```

8 Run the ssh client to the downstream OSS destination by providing a "maint" user name and IP address for the ssh client, by performing the following steps:

a Type

```
> ssh -l maint <nn.nn.nn.nn>
```

where

<nn.nn.nn.nn> is the IP address of the ssh client

Example of response

The authenticity of host '10.10.10.10' can't be established.

RSA key fingerprint is 3a:d5:d7:6e:ee:6b:45:fc:b9:0b:92:a7:1c:d8:f1:be.

Are you sure you want to continue connecting (yes/no)?

b Type

```
> yes
```

Example of response

Warning: Permanently added '10.10.10.10' (RSA) to the list of known hosts.

9 Press ctrl + C to terminate the program.

10 Exit the telnet session:

```
> exit
```

11 Configure the outbound file transfer schedule for secure data transfer by performing the procedure Configuring the outbound file transfer schedule on page 99. The protocol used for secure data transfer is SFTPW (secure file transfer protocol wrapper).

12 You have completed this procedure.

Troubleshooting

Possible error scenarios that may occur when you are performing this procedure and the steps to perform in addressing these problems are listed below:

- Connection refused

  This error causes a “Down” status for the SSH Collector Status parameter.

  Example
  Error : ssh; connect to host <hostname/hostip> port 22:
  Connection refused
  Connection closed.

  To resolve this problem:

  — Verify that the host machine is on the network.

  — Verify that the SSH server on the host machine is running and that the configuration is correct (such as, the port number and fingerprint).

- SSH not found

  This error is caused by the ssh not being installed on the core manager.

  Example
  Error: /bin/ksh: ssh: not found.

  To resolve this problem:

  — Verify that the OpenSSH package is installed on the system.

  Note: If your core manager is an AIX-based SDM or CS 2000 Core Manager, you can verify whether the OpenSSH package

is installed by checking for the package at the SWIM level of the sdmmtc user interface.

If the package is not installed, contact your Nortel Networks service representative for assistance in installing the OpenSSH package provided by Nortel Networks.

Note: You should not install the OpenSSH package downloaded from the web unless you are instructed to do so by your Nortel Networks service representative.

- known_hosts file cannot be datafilled

  This error is caused by the non-existence of, or incorrect permissions for, the /home/maint/.ssh (AIX-based SDM) or /cbmdata/users/maint/.ssh (CBM) directory.

  To resolve this problem:

  — Verify that you are logged in as the root user and that you switched user (su) to the maint user.

  — Verify that the directory /home/maint/.ssh (AIX-based SDM) or /cbmdata/users/maint/.ssh (CBM) is present and has read/write permissions set for the maint user. If the directory doesn't exist, create it.

  — Verify that the correct IP address is used for host key acceptance.

- SSH server's host key has changed

  If the server's host key has changed, the client will notify you that the connection cannot proceed until the server's host key is deleted from the known_hosts file using a text editor. Before performing this task, you must contact the system administrator of the SSH server to ensure that the server operation will not be compromised.

  To resolve this problem:

  — Try to create an ssh connection to a different machine. If you receive an error message about a changed or incorrect public key, it is probably due to the host changing its public key. Edit the

file /home/maint/.ssh/known_hosts using a text editor and delete any line containing the name of that host.

— Try to create an ssh connection to that host again and then accept a new public key for the host.

- SSH warns about “man-in-the-middle attack”

  This problem is caused either by someone eavesdropping on your connection or by the host key having been changed.

  To resolve this problem:

  — Contact your system administrator to determine whether the host key has been changed or whether the ip address of the client has been changed.

  — Edit the file /home/maint/.ssh/known_hosts using a text editor and delete any line containing the name of that host.

  — Datafill the known_host keys with new information.

Configuring RTB for a billing stream

Purpose

Use this procedure to perform the following real time billing (RTB) functions:

- add RTB to a billing stream
- change the RTB configuration for a billing stream
- delete RTB from a billing stream

Prerequisites

This procedure has the following prerequisites:

- Configure the billing stream. Perform the procedure Configuring a billing stream on the core manager on page 83. RTB requires outbound file transfer and DIRP file format.
- Configure outbound file transfer for the stream. Perform the procedure Configuring the outbound file transfer schedule on page 99. RTB only supports Real-time File Transfer Protocol Wrapper (RFTPW)

This procedure requires the following information:

- maximum number of retry attempts after RTB fails to transfer a billing file before RTB raises a critical alarm
- directory location on the data processing and management system (DPMS) of the RTB test file and partial file

Procedure

Configuring RTB for a billing stream

At any workstation or console

1 Log into the core manager as the root user.

2 Access the BILLMTC interface:

```
# billmtc
```

Example response:

The BILLMTC interface opens at the main level.

3 Access the schedule level:

> schedule

Example response:

```
BILLMTC accesses the SCHEDULE level.
```

4 Access the RTB level:

> rtb

Example response:

```
BILLMTC accesses the RTB level.
```

5 Access the CONFRTB level:

> confrtb

Example response:

BILLMTC accesses the CONFRTB level.

If you want to	Do
add RTB to a billing stream	step 6
change the RTB configuration for a billing stream	step 13
delete RTB from a billing stream	step 20

6 Add RTB to a billing stream:

> add <stream_name> <file_format> <destination>

where

<stream_name>
is the name of the configured billing stream

<file_format>
is the file format of the configured billing stream

<destination>
is the destination that SBA will transfer the billing files

Note: Scheduled outbound file transfer and real time billing (RTB) allow for multiple destinations for a single billing stream.

Example response:

```
Please enter the RTBMaxConsecutiveFailures
(0...10 [3]:
```

Note: You are unable to abort from this command until a value is provided for the prompt above.

7

ATTENTION
If auto recovery is turned on, do not configure multiple RTB destinations with the same Test File Location or Partial File Location on the DPMS.

Enter the desired maximum retry attempts before RTB raises a critical alarm, and press the Enter key.

Note: The default value is 3.

Example response:

```
Please enter the RTBRemoteTestFileLocation:
```

8 Enter the directory on the DPMS where the RTB test file will reside and press the Enter key.

Note: The default directory is the Remote_Storage_Directory as configured in the Schedule tuple for this stream.

Example response:

```
Please enter the RTBRemotePartialFileLocation
```

9 Enter the directory on the DPMS where the RTB remote partial file resides, and press the Enter key.

Note: The default directory is the Remote_Storage_Directory as configured in the Schedule tuple for this stream.

Example response:

```
You entered:
RTB Max Consecutive Failures: 5
RTB Remote Test File Location: /sba/autorec
RTB Partial File Location: /sba/autorec
Commit? [Save] {Save Edit Abort}:
```

If the displayed values are	Do
not correct	step 10
correct	step 12

10 Edit the displayed values:

```
> edit
```

11 Correct the values as necessary.

12 Save the information you entered:

```
> save
```

If you	Do
want to add RTB to another billing stream	step 6
do not want to add RTB to another billing stream	step 22

13 Change the RTB configuration for a billing stream:

```
> change <stream_name> <file_format>
<destination>
```

where

<stream_name>
is the name of the configured billing stream

<file_format>
is the file format of the configured stream

<destination>
is the billing file transfer destination

Example response:

```
Please enter the RTBMaxConsecutiveFailures
(0...10 [3]:
```

Note: You are unable to abort from this command until a value is provided for the prompt above.

14

ATTENTION
If auto recovery is turned on, do not configure multiple RTB destinations with the same Test File Location or Partial File Location on the DPMS.

Enter the desired maximum retry attempts before RTB raises a critical alarm, and press the Enter key.

Note: The default value is 3.

Example response:

```
Please enter the RTBRemoteTestFileLocation:
```

15 Enter the directory on the DPMS where the RTB test file resides, and press the Enter key.

Note: The default directory is the Remote_Storage_Directory as configured in the Schedule tuple for this stream.

Example response:

```
Please enter the RTBRemotePartialFileLocation
```

16 Enter the directory on the DPMS where the RTB remote partial file resides, and press the Enter key.

Note: The default directory is the Remote_Storage_Directory as configured in the Schedule tuple for this stream.

Example response:

```
You entered:
RTB Max Consecutive Failures: 5
RTB Remote Test File Location: /sba/autorec
RTB Partial File Location: /sba/autorec
Commit? [Save] {Save Edit Abort}:
```

If the displayed values are	Do
not correct	step 17
correct	step 19

17 Edit the displayed values:

```
> edit
```

18 Correct the values as necessary.

19 Save the information you entered:

```
> save
```

If you	Do
want to change the RTB configuration on another billing stream	step 13
do not want to change the RTB configuration on another billing stream	step 22

20 Delete the RTB configuration from a billing stream:

```
> delete <stream_name> <file_format>
<destination>
```

where

<stream_name>
is the name of the configured billing stream

<file_format>
is the file format of the configured stream

<destination>
is the billing file transfer destination

Example response:

```
Are you sure you want to delete the RTB tuple?
(Y/N).
```

21 Confirm the delete command:

```
> y
```

If you	Do
want to delete RTB from another billing stream	step 20
do not want to delete RTB from another billing stream	step 22

22 Quit the BILLMTC interface:

```
> quit all
```

23 You have completed this procedure.

Querying the status of RTB for a billing stream

Purpose

Use this procedure to query the status of the real-time billing (RTB) application for a specific billing stream. The status can be

- InSv (in service)
- SysB (system busy)
- ManB (manually busy)
- OffL
- IsTb

Procedure

Querying RTB status for a stream

At any workstation or console

1 Log into the core manager.

2 Access the billing maintenance interface:

```
# billmtc
```

3 Access the schedule level:

```
> schedule
```

4 Access the RTB level:

```
> rtb
```

5 Query the status of RTB configured for a specific billing stream:

```
> query <streamname>
```

where

streamname
is the SBA billing stream configured with the RTB

The system displays the status of the RTB.

6 You have completed this procedure.

Returning RTB stream instance to service

Purpose

Use this procedure to return real-time billing (RTB) stream instance to service from a ManB (manual busy) state

Procedure

Returning real-time billing to service

At the core manager

1 Log into the core manager.

2 Access the billing maintenance interface:

```
# billmtc
```

3 Access the schedule level:

```
> schedule
```

4 Access the RTB level:

```
> rtb
```

5 Return real-time billing for a stream to service:

> **rts <stream> <file_format> <destination>**

where

stream
is the name of the stream

file_format
is the format of the files in the stream

destination
is the name of the destination that receives the stream

Note: All parameters for this command are mandatory.

6 You have completed this procedure.

Turning auto-recovery on

Purpose

Use this procedure to turn on real time billing (RTB) auto-recovery. Auto-recovery allows RTB to automatically recover from a billing transfer failure with the data and processing management system (DPMS) after exceeding the allowable number of retry attempts. Auto-recovery performs the following functions:

- sends a 10 MB test file to the DPMS to analyze the cause of the file transfer failure
- moves partial *.tmp* files on the DPMS to a partial file directory

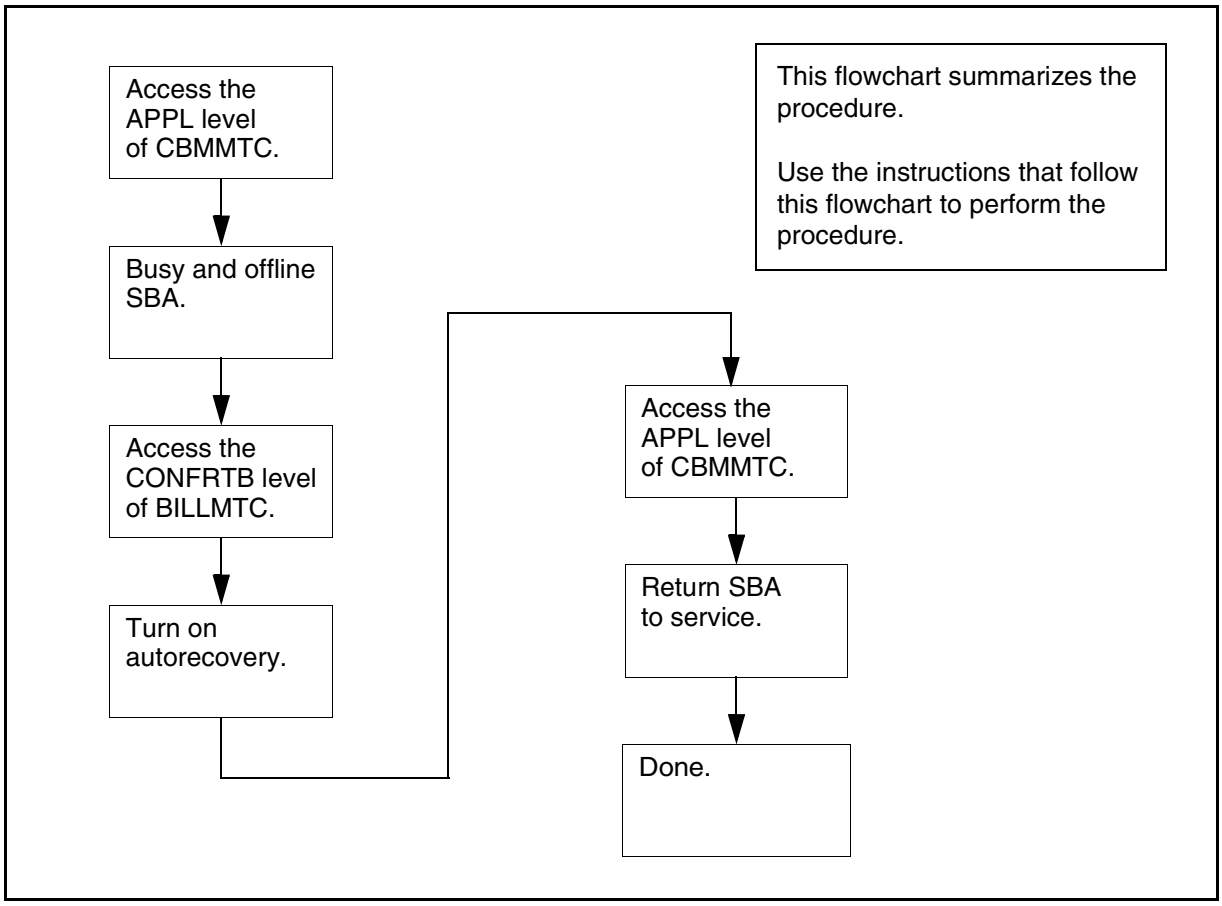
Procedure

The following flowchart summarizes this procedure.

Note: This procedure manually busies SuperNode Billing Application (SBA), which generates the following actions:

- SBA operates in backup mode.
- MAPCI displays a major SBACP alarm under the SDMBIL banner.

Summary of procedure



Turning on auto-recovery

At any workstation or console

1 Access the CBM.

2 Access the APPL level of the CBMMTC interface:

```
> cbmmtc appl
```

Response

CBMMTC accesses the APPL level

3 Use the Up and Down commands to scroll through the list of displayed applications and locate the SBA application.

4 Busy SBA:

```
> bsy <n>
```

where

<n> is the number of the SBA application

Response

CBMMTC displays the following prompt:

```
The application is in service.
This command will cause a service interruption.
Do you wish to proceed?
Please confirm ("YES", "Y", "NO", or "N"):
```

5 Confirm the command:

> y

Response

SBA changes state to ManB.

6 This is an optional step. Offline SBA:

> offl <n>

where

<n> is the number of the SBA application

Response

SBA changes state to OffL.

7 Quit the CBMMTC interface:

> quit all

Response

The display returns to the command prompt.

8 Access the BILLMTC interface:

> billmtc

Response

BILLMTC opens at the main level.

9 Access the Schedule level:

> schedule

Response

BILLMTC shows the Schedule level.

10 Access the RTB level:

> rtb

Response

BILLMTC shows the RTB level.

11 Access the CONFRTB level:

> confrtb

Response

BILLMTC shows the CONFRTB level.

12 Turn auto-recovery on:

> autorec on

Response

"auto-recovery has been turned on."

13 Quit the BILLMTC interface:

> quit all

The display returns to the command prompt.

14 Access the APPL level of the CBMMTC interface:

> cbmmtc appl

Response

CBMMTC accesses the APPL level

15 Use the Up and Down commands to scroll through the list of displayed applications and locate the SBA application.

16 If you placed SBA offline in step 6, busy SBA:

> bsy <n>

Where

<n> is the number of the SBA application

Response

SBA changes state to ManB.

17 Return SBA to service:

> rts <n>

where

<n> is the number of the SBA application

Response

SBA returns to service.

18 You have completed this procedure.

Turning auto-recovery off

Purpose

Use this procedure to turn off Real Time Billing (RTB) auto-recovery for all configured RTB destinations.

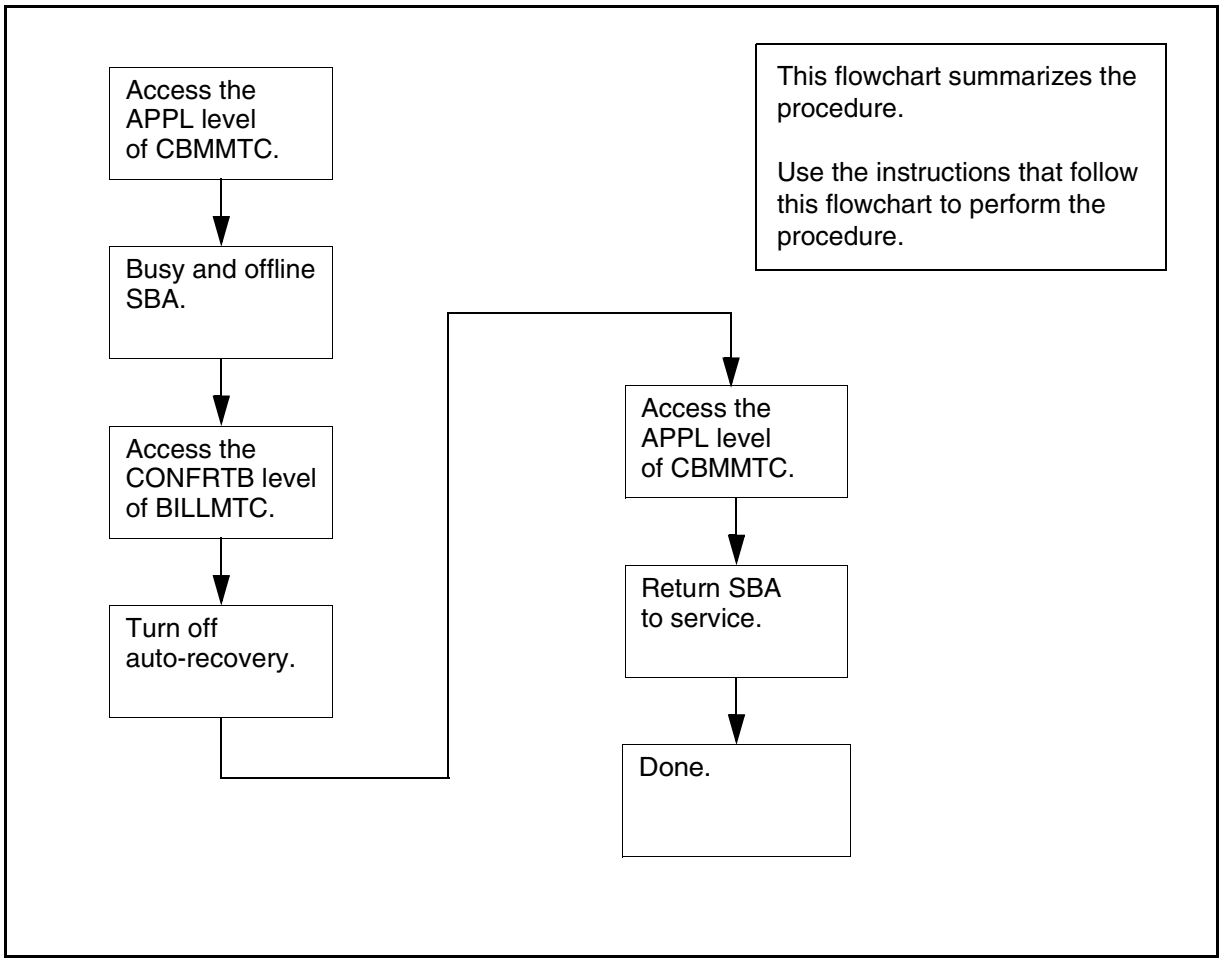
Note: This procedure manually busies SuperNode Billing Application (SBA), which generates the following actions:

- SBA operates in backup mode.
- MAPCI displays a major SBACP alarm appears under the SDMBIL banner.

Procedure

The following flowchart summarizes this procedure. Perform the steps that follow the flowchart to perform the procedure.

Summary of procedure



Turning off auto-recovery

At any workstation or console

1 Access the CBM.

2 Access the APPL level of the CBMMTC interface:

> cbmmtc appl

Response

CBMMTC accesses the APPL level

3 Use the Up and Down commands to scroll through the list of displayed applications and locate the SBA application.

4 Busy SBA:

> bsy <n>

where

<n> is the number of the SBA application

Response

CBMMTC displays the following prompt:

```
The application is in service.
This command will cause a service interruption.
Do you wish to proceed?
Please confirm ("YES", "Y", "NO", or "N"):
```

5 Confirm the command:

> y

Response

SBA changes state to ManB.

6 This is an optional step. Offline SBA:

> offl <n>

where

<n> is the number of the SBA application

Response

SBA changes state to OffL.

7 Quit the CBMMTC interface:

> quit all

Response

The display returns to the command prompt.

8 Access the BILLMTC interface:

```
> billmtc
```

Response

BILLMTC opens at the main level.

9 Access the Schedule level:

```
> schedule
```

Response

BILLMTC shows the Schedule level.

10 Access the RTB level:

```
> rtb
```

Response

BILLMTC shows the RTB level.

11 Access the CONFRTB level:

```
> confrtb
```

Response

BILLMTC shows the CONFRTB level.

12 Turn auto-recovery off:

```
> autorec off
```

BILLMTC turns off autorecovery for all configured RTB destinations.

13 Quit the BILLMTC interface:

```
> quit all
```

The display returns to the command prompt.

14 Access the APPL level of the CBMMTC interface:

```
> cbmmtc appl
```

Response

CBMMTC accesses the APPL level

15 Use the Up and Down commands to scroll through the list of displayed applications and locate the SBA application.

16 If you placed SBA offline (OffL) in step 6, busy SBA:

```
> bsy <n>
```

where

<n> is the number of the SBA application

Response

SBA changes state to ManB.

17 Return SBA to service:

```
> rts <n>
```

where

<n> is the number of the SBA application

Response

SBA returns to service.

18 You have completed this procedure.

Configuring SBA backup volumes on the core

Purpose

Use this procedure to configure backup volumes on IOP, 3PC, DDU, or SLM disks on the core for a billing stream. The maximum number of volumes that can be configured for a billing stream is either 69 or the maximum supported by the underlying hardware, whichever is less per stream.

The following table lists the disk drive backup volumes that you can configure for the BRISC and XA-core platforms.

Platform	Backup volume(s)
BRISC	DDU or SLM
XA-core (for releases prior to SDM16 or CS2E03)	DDU or IOP
XA-core (for SDM16 or CS2E0 and higher)	IOP

Prerequisites

Prior to starting this procedure, you must be aware of the following:

- you must configure additional backup storage to prevent a temporary problem that forces the SBA into long-term backup mode
- the billing stream is aware that the replaced volumes exist, and recovers files from both the swapped-out and swapped-in sets of volumes as part of the recovery process
- the billing stream loses track of swapped-out volumes when a switch of activity (SwAct) or a restart is performed on the DMS or Communication Server 2000 prior to the completion of the recovery of the files
- there is a risk of losing some billing records when you reconfigure or swap-out backup volumes of a stream that is in backup mode during the transition process
- you must allow recovery to complete prior to a switch outage when you choose to swap out an active backup volume during an emergency situation. If not, the billing stream does not recognize the swapped-out volumes.

  If you are using or migrating to a XAC16 system, your backup volumes must be on IOP volumes. If your current backup volumes

are on SLM or DDU volumes and you are running a previous release, you must migrate to IOP volumes before upgrading to this release.

ATTENTION
Ensure the size for backup volumes is sufficient.
Refer to Disk space requirements (Calculation of core disk space requirements) in procedure Preparing for SBA installation and configuration. The absolute minimum size for backup volumes is 30MB.

ATTENTION
Backup volumes must be configured evenly across the available disks of the same disk type in your system.

Procedures

Use the following procedures to configure SBA backup volumes on the core.

Calculate disk space to contain backup volumes

At your system

1 Write down the dms_disk_space value from the procedure Preparing for SBA installation and configuration (answer 28), which shows the amount of disk space required for the backup volumes.

2 Determine the amount of disk space of each disk type in your system to be used for storing the backup volumes. Divide the value you recorded in step 1 by the maximum volume size

supported for the appropriate disk types for your system, obtained from the table below. Record these values.

Disk type	Maximum disks per core	Maximum volumes per device	Maximum volumes configurable for SBA	Maximum volume size
IOP	2	32	64	2GB
3PC	2	32	64	2GB
DDU	10	32	69	64MB
SLM	2	32	64	

3 Ensure that the backup volumes can fit on the disks in your system. Compare the values that you recorded in step 2 with the maximum number of volumes supported for the disk types in your system, obtained from the table in step 2. Determine the next step to perform:

If the number of volumes obtained in step 2	Do
is less than or equal to the maximum number allowed	step 4
is greater than the maximum number allowed	contact the next level of support

4 Determine the next steps to perform.

To configure disk type	Use this procedure
DDU	Configuring DDU disk drive backup volumes on page 136
IOP	Configuring IOP disk drive backup volumes on page 140
SLM	Configuring SLM disk drive backup volumes on page 143
3PC	Configuring 3PC disk drive backup volumes on page 146

Configuring DDU disk drive backup volumes

At the MAP

1 Post the billing stream:

```
> mapci;mtc;appl;sdmbil;post <stream_name>
```

where

<stream_name>
is the name of the billing stream

2 Obtain information about the existing backup volumes for the billing stream:

```
> conf view <stream_name>
```

where

<stream_name>
is the name of the billing stream

Note: SBA does not support configuring more than one billing stream at a time from multiple workstations. The last billing stream that is configured is the one that is saved.

The system displays the name of each backup volume in the stream. Record each backup volume name for future reference.

3 Quit out of the MAPCI level:

```
> quit all
```

4 Display and record the size of a volume and its number of free blocks:

```
> dskut;sv <volume name>
```

where

<volume name>
is the name of one of the volumes that you obtained and recorded in step 2

5 Repeat step 5 for each volume name that you recorded in step 2.

6 Create an eight-character, alphanumeric name for each of the new backup volumes that you determined in the procedure, Calculate disk space to contain backup volumes on page 134 and record each of these names for future reference.

Note 1: DDU volume names can be up to eight alphanumeric characters in length, with the first four characters reserved for the disk prefix.

Note 2: Logical volumes must be configured evenly across the disks.

7 Access the IOD level:

```
> mapci;mtc;iod
```

8 Locate the DDUs:

```
> listdev ddu
```

9 Record the DDU numbers and their respective IOC, CARD, and PORT locations for future reference.

10 Begin to busy a DDU:

```
>ioc <ioc>
```

where

<ioc>
is the IOC controlling the respective DDU

11 Display the DDU card:

```
> card <ddu_card>
```

where

<ddu_card>
is the DDU card number

12 Complete the busy process:

```
> bsy
```

13 Confirm the DDU card number that you selected in step 11 indicates a status of ManB.

14 Display the free space for this DDU:

```
> dskalloc <ddu #>
```

where

<ddu #>
is the DDU card number

Note: Record the free space amount from the dskalloc command that is displayed, for future reference.

15 Determine DDU disk space availability.

If you have	Do
located a DDU with sufficient disk space for the new backup volumes	step 19
not located a DDU with sufficient disk space for the new backup volumes	step 16

16 Return the DDU to service:

```
> rts
```

17 Return to the IOC level:

```
> quit
```

18 Repeat steps 10 through 17 until you locate a DDU with sufficient space for the new backup volumes.

19 Create a new logical volume:

```
> add <volume> <blocksize>
```

where:

<volume>
is the backup volume name

<blocksize>
is the size of the volume. Calculate this by multiplying the maximum volume size allowed for the DDU disk, which is shown in the table in step 2 of the procedure Calculate disk space to contain backup volumes on page 134, by 1024.

Example
add AMA8 51200

This example prompts the system to create the logical volume D000AMA8, consisting of 51200 1024-byte blocks (50 Mbyte) of available disk space.

Note: If you receive an error message while updating the last DDU volume with 64 Mbyte, this volume must be configured with a size less than 32767 blocks.

20 Verify the names of the volume identifiers:

```
> display
```

21 Add an allocation volume to the root directory:

```
> diradd <backup_volume>
```

where:

<backup_volume>
is the backup volume name

22 Update the volume identifiers:

```
> update
```

23 Repeat steps 19 through 22 until each new logical volume has been created.

24 Exit the disk administration level:

```
> quit
```

25 Return the DDU to service:

```
> mapci;mtc;iod;ddu <#>;rts
```

where:

<#>
is the DDU disk drive number (0 or 1) that you busied in step 12

26 Return to the MAPCI level:

```
> quit
```

27 Configure the billing stream of the logical volumes you created in steps 19 through 23 once you receive confirmation that the files are successfully created. Performing the procedure, Configuring SBA backup volumes on a billing stream on page 149.

28 Exit back to the command prompt:

```
> quit all
```

Note: You must alert all operating company personnel who work on the core, and provide the names of the old and new backup volumes and the procedure you used to swap the volumes. They must understand that any restarts or activity switch (SwAct) that occurs before the billing stream returns to normal mode can cause a loss of billing records.

It is imperative that the mode of the billing stream must be closely monitored to ensure that it returns to normal mode without an intervening RESTART or SwAct.

29 You have completed this procedure.

Configuring IOP disk drive backup volumes

At the MAP

1 Post the billing stream:

```
> mapci;mtc;appl;sdmbil;post <stream_name>
```

where

<stream_name>
is the name of the billing stream

2 Obtain information about the existing backup volumes for the billing stream:

```
> conf view <stream_name>
```

where

<stream_name>
is the name of the billing stream

Note: SBA does not support the configuration of more than one billing stream at a time from multiple workstations. The last billing stream that is configured is the one that is saved.

The system displays the name of each backup volume in the stream. Record each backup volume name for future reference.

3 Quit out of the MAPCI level:

```
> quit all
```

4 Display and record the size of a volume and its number of free blocks:

```
> diskut;lv <volume name>
```

where

<volume name>
is the name of one of the volumes that you obtained and recorded in step 2

5 Repeat step 4 for each volume name that you recorded in step 2.

6 Create an alphanumeric name, consisting of a maximum of twelve characters, for each of the new backup volumes that you determined in the procedure Calculate disk space to contain backup volumes on page 134. Record each of these names for future reference.

Note 1: IOP volume names on the IOP disks can be up to twelve alphanumeric characters in length, with the first four characters reserved for the disk prefix.

Note 2: Logical volumes must be configured evenly across the disks.

7 Access the disk administration level:

```
> diskadm <disk prefix>
```

where

<disk prefix>
is one of the prefixes assigned to the two disks; for example, F02L or F17D.

8 Determine the free disk space:

```
> dd
```

9 Note the following example, which is a response to the command performed in step 8, choosing the F02L disk name.

```
Disk drive information for F02L

Date last formatted             :  2000/01/01 01:00:50.145 THU.
Date last modified              :  2001/09/26 11:22:38.587 WED.
Total space for volumes         :  4095 Mbytes
Total free space                :  1014 Mbytes
Size of largest free segment    :  1014 Mbytes
Total number of volumes         :  14

1 Block = 512 bytes
```

10 Determine the size of the largest free segment.

If the size of the largest free segment is	Do
greater than or equal to the maximum allowable volume size for the IOP disk type	step 11
less than the maximum allowable volume size for the IOP disk type	contact your next level of support before proceeding with this procedure

11 Create a new logical volume:

```
> cv <volume> <size> ftfs
```

where

<volume>
is the backup volume name

<size>
is the size of the volume. Compare the size recorded in step 1 of the procedure Calculate disk space to contain backup volumes on page 134, with the allowable size for the IOP disk type (obtained from the table under step 2 of the same procedure. The lesser of the two values must be entered as this size.

Example
cv AMA8 50 ftfs

This entry prompts the system to create the logical volume F17LAMA8, consisting of 50 Mbyte (102400 512-byte blocks) of available disk space.

12 Exit the disk administration level at the prompt:

```
> quit
```

13 Repeat steps 7 through 12 until all new logical volumes have been created.

14 Exit to the command prompt:

```
> quit all
```

15 Configure the billing stream of the logical volumes you created in steps 11 through 14 once you receive confirmation that the files are successfully created. Perform the procedure Configuring SBA backup volumes on a billing stream on page 149.

16 Exit back to the command prompt:

```
> quit all
```

Note: You must alert all operating company personnel who are associated with the DMS switch. Provide the names of the old and new backup volumes and the procedure you used to swap the volumes. They must be made aware of that any RESTARTs or SwActs that occur before the billing stream returns to normal mode can cause a loss of billing records.

Also, it is imperative that the mode of the billing stream must be closely monitored to ensure that it returns to normal mode without an intervening RESTART or SwAct.

17 You have completed this procedure.

Configuring SLM disk drive backup volumes

At the MAP

1 Post the billing stream:

```
> mapci;mtc;appl;sdmbil;post <stream_name>
```

where

<stream_name>
is the name of the billing stream

2 Obtain the names of the existing backup volumes for the billing stream:

```
>conf view <stream_name>
```

where

<stream_name>
is the name of the billing stream

Note: SBA does not support the configuration of more than one billing stream at a time from multiple workstations. The last billing stream that is configured is the one that is saved.

The system displays the name of each backup volume in the stream. Record each backup volume name for future reference.

3 Quit out of the MAPCI level:

```
> quit all
```

4 Display and record the size of a volume and its number of free blocks:

```
> diskut;lv <volume name>
```

where

<volume name>
is the name of one of the volumes that you obtained and recorded in step 2

5 Repeat step 4 for each volume name that you recorded in step 2.

6 Create an eight-character, alphanumeric name for each of the new backup volumes that you determined in the procedure Calculate disk space to contain backup volumes on page 134. Record each of these names for future reference.

Note 1: SLM volume names on the SLM disks can be up to eight alphanumeric characters in length for the core manager, with the first four characters reserved for the disk prefix.

Note 2: Logical volumes must be configured evenly across the disks.

7 Busy SLM 0:

```
> mapci;mtc;iod;slm 0;bsy
```

8 Access the disk administration level:

```
> diskadm <disk prefix>
```

where

<disk prefix>
is one of the prefixes assigned to the two disks; for example, S00D or S01D

9 Determine the free disk space:

```
> dd
```

10 Note the following example, which is a response to the command you performed in step 9, choosing the S00D disk name.

```
Disk drive information for S00D
Drive name:  S00D
Vendor Information              :  SEAGATE  ST31051N 9470
Date last formatted             :  2000/01/01 05:38:44.718
THU.
Date last modified              :  1998/04/23 17:46:59.754
THU.
Total space for volumes         :  1000 Mbytes
Total Free space                :  174 Mbytes
Size of largest free segment    :  174 Mbytes

1 Block = 512 bytes
```

If the size of the largest free segment is	Do
greater than or equal to the maximum allowable volume size for the SLM disk type	step 11
less than the maximum allowable volume size for the SLM disk type	contact your next level of support

11 Create a new logical volume:

```
> cv <volume> <volume_size> std
```

Where

<volume>
is the backup volume name

<volume_size>
is the size of the volume. Compare the size recorded in step 1 of the procedure Calculate disk space to contain backup volumes on page 134 with the allowable size for the IOP disk type (obtained from the table under step 2 of the same procedure. The lesser of the two values must be entered as this size.

Example
cv AMA8 50 std

This entry prompts the system to create the logical volume S00DAMA8, consisting of 50 Mbyte (102400 512-byte blocks) of available disk space.

12 Exit the disk administration level at the prompt:

```
> quit
```

13 RTS the SLM 0 disk drives that you busied in step 7 to an InSv state:

```
> mapci;mtc;iod;slm 0;rts
```

14 Exit to the command prompt:

```
> quit all
```

15 Repeat steps 7 to 14 until all volumes have been created.

16 Configure the billing stream of the logical volumes you created in steps 11 through 14 once you receive confirmation that the files are successfully created, by performing the procedure Configuring SBA backup volumes on a billing stream on page 149

17 Exit back to the command prompt:

```
> quit all
```

Note: You must alert all operating company personnel who are associated with the DMS switch. Provide the names of the old and new backup volumes and the procedure you used to swap the volumes. They must be made aware of that any RESTARTs or SwActs that occur before the billing stream returns to normal mode can cause a loss of billing records.

Also, it is imperative that the mode of the billing stream must be closely monitored to ensure that it returns to normal mode without an intervening RESTART or SwAct.

18 You have completed this procedure.

Configuring 3PC disk drive backup volumes

At the MAP

1 Post the billing stream:

```
> mapci;mtc;appl;sdmbil;post <stream_name>
```

where

<stream_name>
is the name of the billing stream

2 Obtain information about the existing backup volumes for the billing stream:

```
> conf view <stream_name>
```

where

<stream_name>
is the name of the billing stream

Note: SBA does not support the configuration of more than one billing stream at a time from multiple workstations. The last billing stream that is configured is the one that is saved.

The system displays the name of each backup volume in the stream. Record each backup volume name for future reference.

3 Quit out of the MAPCI level:

```
> quit all
```

4 Display and record the size of a volume and its number of free blocks:

```
> diskut;lv <volume name>
```

where

<volume name>
is the name of one of the volumes that you obtained and recorded in step 2

5 Repeat step 4 for each volume name that you recorded in step 2.

6 Create a twelve-character, alphanumeric name for each of the new backup volumes that you determined in the procedure Calculate disk space to contain backup volumes on page 134. Record each of these names for future reference.

Note 1: 3PC volume names on the 3PC disks can be up to twelve alphanumeric characters in length, with the first four characters reserved for the disk prefix.

Note 2: Logical volumes must be configured evenly across the disks.

7 Access the disk administration level:

```
> diskadm <disk prefix>
```

where

<disk prefix>
is one of the prefixes assigned to the two disks; for example, FD00 or FD01

8 Determine the free disk space:

```
> dd
```

9 Note the following example, which is a response to the command performed in step 8, choosing the FD00 disk name.

```
Disk drive information for FD00

Date last formatted              :  2000/01/01 01:00:50.145 THU.
Date last modified               :  2001/09/26 11:22:38.587 WED.
Total space for volumes          :  4095 Mbytes
Total free space                 :  1014 Mbytes
Size of largest free segment     :  1014 Mbytes
Total number of volumes          :  14

1 Block = 512 bytes
```

10 Determine the size of the largest free segment.

If the size of the largest free segment is	Do
greater than or equal to the maximum allowable volume size for the IOP disk type	step 11
less than the maximum allowable volume size for the IOP disk type	contact your next level of support before proceeding with this procedure

11 Create a new logical volume:

```
> cv <volume> <size> ftfs
```

where

<volume>
is the backup volume name

<size>
is the size of the volume. Compare the size recorded in step 1 of the procedure Calculate disk space to contain

backup volumes on page 134 with the allowable size for the IOP disk type (obtained from the table under step 2 of the same procedure. The lesser of the two values must be entered as this size.

Example
cv AMA8 50 ftfs

This entry prompts the system to create the logical volume FD00AMA8, consisting of 50 Mbyte (102400 512-byte blocks) of available disk space.

12 Exit the disk administration level at the prompt:

```
> quit
```

13 Repeat steps 7 through 12 until all new logical volumes have been created.

14 Exit to the command prompt:

```
> quit all
```

15 Configure the billing stream of the logical volumes you created in steps 11 through 14 once you receive confirmation that the files are successfully created, by performing the procedure Configuring SBA backup volumes on a billing stream on page 149

16 Exit back to the command prompt:

```
> quit all
```

Note: You must alert all operating company personnel who are associated with the DMS switch. Provide the names of the old and new backup volumes and the procedure you used to swap the volumes. They must be made aware of that any RESTARTs or SwActs that occur before the billing stream returns to normal mode can cause a loss of billing records.

Also, it is imperative that the mode of the billing stream must be closely monitored to ensure that it returns to normal mode without an intervening RESTART or SwAct.

17 You have completed this procedure.

Configuring SBA backup volumes on a billing stream

Purpose

Use this procedure either to add new SBA backup volumes to a billing stream or to remove SBA backup volumes from a billing stream.

Procedure

Configuring SBA backup volumes on a billing stream

At the MAP

1 Access the billing level by typing

```
> mapci;appl;sdmbil
```

and pressing the Enter key.

2 Determine the next step to perform.

To	Do
Add volumes to a billing stream	step 3
Remove volumes from a billing stream	step 4

3 Add volumes by typing

```
> addvol <stream_name> <volume1> ... <volume5>
```

and pressing the Enter key.

Where:

<stream_name>
is the name of the billing stream

<volume1> ... <volume5>
is the volume name. Up to five volumes (with each entry separated from the preceding entry or succeeding entry by spaces) can be added at one time.

Example
To add five volumes, the command would appear as:

addvol AMA S00DAMA1 S01DAMA2 S00DAMA3 S01DAMA4 S00DAMA5

Repeat this step until all of the volumes have been added to the stream, and then proceed to step 5.

4 Remove volumes by typing

```
> remvol <stream_name> <volume1> ... <volume5>
```

and pressing the Enter key.

Where:

<stream_name>
is the name of the billing stream

<volume1> ... <volume5>
is the volume name. Up to five volumes (with each entry separated from the preceding entry or succeeding entry by spaces) can be removed at one time.

Example
To remove five volumes, the command would appear as:

remvol AMA S00DAMA1 S01DAMA2 S00DAMA3 S01DAMA4 S00DAMA5

Repeat this step until all of the volumes that you wish to remove have been removed from the stream, and then proceed to step 5.

5 You have completed this procedure.

Retrieving billing files for a stream set to inbound file transfer mode

Purpose

Use this procedure to:

- retrieve the billing files in a billing stream that has been configured for inbound file transfer, and
- rename the files to indicate successful retrieval of the billing files.

Application

The FTP “mget” command can retrieve multiple files. For example: “mget *.pri” will retrieve all files ending in “.pri”. FTP prompts the user for each file unless “prompt off” is entered before the get command.

However, there are risks when using the mget command. For example, if the FTP session is interrupted while retrieving files, file renaming (see step 7), may not be performed. This can result in duplicate files on the target machine.

Procedure

At the downstream terminal

1 Log in as the “maint” user and, using the tool of your choice, retrieve the billing files in a billing stream set for inbound file transfer.

If you want to use	Refer to the following for instructions
FTP	Using an FTP client on page 155
SFT (not applicable for CBM)	**Transferring and retrieving files using SFT**, in the *Security and Administration* NTP for your core manager
SFTP	OpenSSH overview on page 157
SCPO	OpenSSH overview on page 157

Steps 2 to 9 provide an example for retrieving files using FTP.

2 FTP into the core manager:

```
> ftp <core manager's IP address>
```

3 Change directory to the stream directory from which files are to be retrieved:

```
> cd ftpdir/<stream name>
```

4 Set the FTP session to retrieve the files in binary format:

```
> bi
```

5 List the files:

```
> ls
```

Note: Files with the extensions:

- "pri" are primary files, or AMADNS files that have not yet been retrieved
- ".sec" are secondary files, or AMADNS files that have been successfully retrieved at least once
- ".unp" are unprocessed files, and
- ".pro" indicates processed files for streams in DIRP file format.

6 Retrieve the desired file:

```
> get <filename.extension>
```

7 Rename the files that you have just retrieved:

- for AMADNS files, if the file was "primary" (.pri extension), rename the file to have the ".sec" (secondary) extension to indicate successful retrieval.
- for DIRP files, if the file was "unprocessed" (.unp extension), rename the file to have the ".pro" (processed) extension to indicate successful retrieval.

Note 1: You must perform step 7 to ensure the reliability of the SBA. Without having the file marked as retrieved, it cannot be considered for removal when the disk reaches capacity and, in that event, billing data can be lost.

Note 2: A root user can retrieve the billing files from the closedNotSent and closedSent directories. However, this action affects the integrity of the billing system, since the files are not get marked "closed sent" and storage problems will occur.

a Rename an AMADNS "primary" file that you retrieved to have the ".sec." extension:

```
> rename <filename>.pri <filename>.sec
```

b Rename a DIRP "unprocessed" file that you retrieved to have the ".pro" extension:

```
> rename <filename>.unp <filename>.pro
```

8 After all desired files are renamed, exit FTP:

```
> bye
```

9 You have completed this procedure.

Using an FTP client

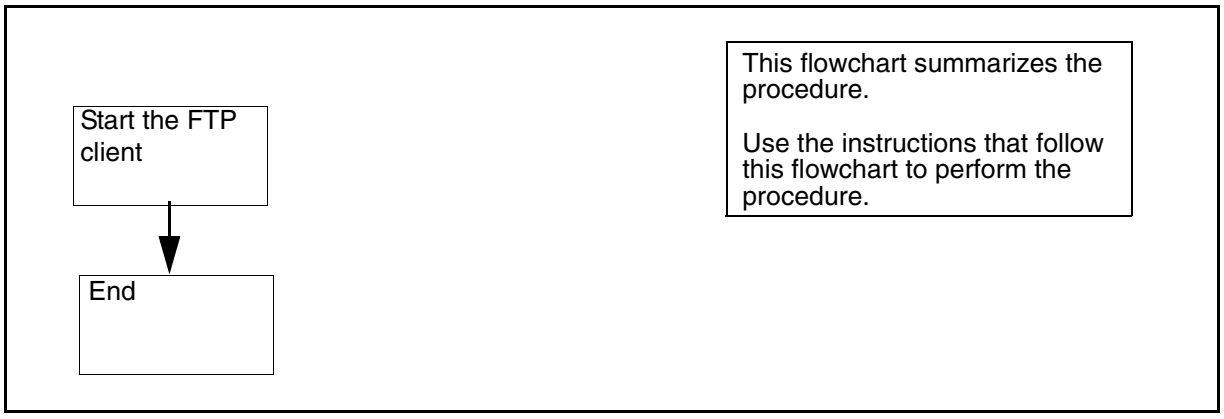
Starting an FTP client

The following procedure describes how to start an FTP client.

Note 1: Nortel Networks recommends that you use the SFT client. FTP userIDs and passwords are passed unencrypted across the network. Standard FTP cannot determine which users are allowed to transfer files to and from the CM.

Note 2: To complete the procedure for starting an FTP client, perform the step-action procedures that follow the flowchart.

Summary of Starting an FTP client



Starting an FTP client

At a UNIX prompt:

1 Start the FTP client workstation by typing

```
> ftp <address>
```

and pressing the Enter key.

where

address
is the IP address, or the DNS address of the FTP server.

Note: The location of the FTP client varies.

2 You have completed this procedure.

For additional instructions on FTP client usage, refer to the documentation of the client application. For instructions on using CM FTP, refer to section CM FTP server.

CM FTP server

SFT clients and FTP clients can both access the CM FTP server by typing SITE CM.You can use standard FTP commands with some exceptions. A list of exceptions follows.

Command limits and restrictions

The following describes limits to standard FTP commands when accessing the CM FTP server.

- The user command is intercepted and disallowed by the SFT server. A user does not have to log in manually.
- The mkdir and rmdir commands are not supported by the CM FTP server. The CM file system only contains volumes. It does not support directory hierarchies within the volume.
- Files transferred to SFDEV are owned by the user $$SYS$$.
- SFT performs a clean-up routine after the SFT application is returned to service. If you attempt to use the SITE CM command immediately after the RTS command is issued, you may experience a delay of about 20 seconds before access to the CM is given.
- File names and volume names are case sensitive. Volume names are always in uppercase, for example, S01DVOL1. File names are usually in uppercase.

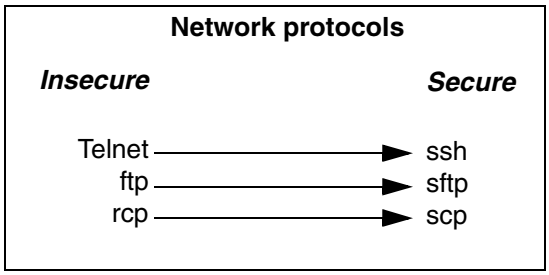
Note: For more information on commands, refer to the commands glossary.

OpenSSH overview

Functional description

ATTENTION
This document is an overview only of the OpenSSH functionality. Nortel Networks does not provide any detailed usage information or client installation procedures. For this information, refer to the official OpenSSH website located at http://www.openssh.com/.

OpenSSH is an open source version of the Secure Shell (SSH) protocol suite of network connectivity tools. Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. OpenSSH is a suite of tools that provides strong authentication and secure communications over unsecure channels.



The suite of tools is as follows:

- SSH (secure shell) - a replacement for telnet

  Using SSH, you can log in to the core manager from a remote system or log in to a remote system from the core manager. You can also execute commands on a remote system. SSH connects and logs into the specified hostname. You must provide your identity to the remote machine. You can also establish a secure CM session from a remote system through the core manager using SSH.

  Access to some functions requires the use of SSH-compatible client software for access to secure telnet and ftp services (via the SSH standard). SSH clients are supplied bundled with some operating systems, but may need to be obtained separately. The following

table lists some sources for SSH clients (sources are not limited to those listed in this table).

Sources for SSH clients

Source	Type
PUTTY	freeware
OpenSSH	freeware
SSH Inc.	commercial
Secure CRT	commercial
WinSCP	freeware

- scp (secure copy) - improved (secure) functionality of rcp (remote copy)

  Using scp, you can securily copy files to and from the core manager or a remote system. Scp uses ssh for data transfer, and uses the same authentication and provides the same security as SSH.

- sftp (secure file transfer program) - a replacement for ftp

  Using sftp, you can perform secure file transfers. Sftp is an interactive program that connects and logs into the specified host, then enters an interactive command mode.

- sshd (OpenSSH SSH daemon) - the server-side daemon

  Sshd is the daemon program for SSH. Together these programs provide secure encrypted communications between two hosts over an insecure network.

Note: The functionality of OpenSSH does not interfere with existing networking services, such as telnet, FTP, DCE, NTP, or SFT.

The implementation of OpenSSH on the core manager provides three authentication methods:

1 password

2 keys (when you are creating the key, you are asked to add an encrypted password associated with this key)

3 combination of keys and password

Note: The administrator on the SDM and the client must be familiar with the key authentication method, before using it.

The basic utilities of OpenSSH are:

- ssh-add - adds RSA or DSA identities to the authentication agent
- ssh-agent - authentication agent
- ssh-keygen - authentication key generation, management and conversion
- sftp-server - an sftp server subsystem

Note 1: For detailed instructions on the use of key authentication, refer to the official OpenSSH website http://www.openssh.com/.

Note 2: Because the man command is not supported on the SDM, it is not available from SSH shell level.

Related procedures

Refer to the procedure “Installing OpenSSH” in the Upgrades document to install the OpenSSH fileset.

For more information, you can refer to the following web sites:

- http://www.openssh.com/ - for Sun, HP, Linux and AIX
- http://www.chiark.greenend.org.uk/%7Esgtatham/putty/ - a free Win32 Telnet/SSH client for Windows

Activating or deactivating secondary file processing

Purpose

Use the following procedure to activate or deactivate secondary file processing.

ATTENTION

You can activate or deactivate secondary file processing only when the SuperNode Billing Application (SBA) is either manually busy (ManB) or offline (Offl). Activation or deactivation takes effect when SBA is returned to service (RTS). Because busying the SBA places it into backup mode on the switch, be sure that adequate space is configured on theCore to prevent loss of billing.

ATTENTION

Data Process and Management System (DPMS) changes may be required to recognize and appropriately handle AMA records when secondary file processing is activated.

Procedure

Activating or deactivating secondary file processing

At the CBM

1 Log into the CBM as the root user.

2 Access the Application level:

```
> cbmmtc appl
```

3 Busy the SuperNode Billing Application:

```
> bsy <x>
```

where:

<x> is the number next to the SBA fileset

4 Quit the Maintenance level:

```
> quit all
```

5 Access the Billing Maintenance level:

```
# billmtc
```

6 Access the Application level:

```
> appl
```

7 Access the Secondary File Processing (SFP) level:

```
> sfp
```

Use the following table to determine your next step.

If you want to	Type
verify whether secondary file processing is either activated or deactivated	> **query**, and press the Enter key. Use the **act** or **deact** command, as directed in this table, to either activate or deactivate secondary file processing.
activate secondary file processing	> **act**, and press the Enter key, then > **y** or > **yes** to confirm, and press the Enter key. Continue to step 8.
deactivate secondary file processing	> **deact**, and press the Enter key, then > **y** or > **yes** to confirm, and press the Enter key. Continue to step 8.

8 Quit the Billing Maintenance level:

```
> quit all
```

9 Access the Maintenance level:

```
# cbmmtc appl
```

10 Return the SuperNode Billing Application to service:

```
> rts <x>
```

where:

<x> is the number next to the SBA fileset

Secondary file processing is either activated or deactivated when SBA returns to service.

11 You have completed this procedure.

Copying billing files to DVD using SBADVDWRITE

Purpose

Use this procedure to back up billing files of a particular stream on to a DVD. The procedure backs up the entire content of the directory that you select. The files are written to the DVD in the directory format, “/<stream name>/<directory name>/files”.

Note 1: This procedure does not move files from ClosedNotSent to ClosedSent state.

Note 2: If you are used to backing up billing files to tape (applicable to core managers on the FX platform), you may notice that the backup to DVD of smaller amounts of data may take comparatively longer to complete. Backup of larger amounts of data may, however, take less time to complete.

Note 3: A critical alarm may be raised under the SYS and CBM banners of the cbmmtc user interface, and log SPFS350 may be generated, when either the /tmp/.iso directory or the /tmp/.tar directory is backed up. This system response is expected and does not require any corrective action.

Prerequisites

The following prerequisites should be observed to ensure a successful backup:

- Ensure that you have an adequate supply of blank DVDs before starting the backup procedure. At least one DVD is required for each stream. A DVD can contain, at most, only one stream worth of billing files. Because a maximum of 2 Gbytes of data can be backed up per DVD, additional DVDs are required for streams that exceed 2 Gbytes in size. The backup program that you run in the procedure will alert you about the number of DVDs that are required for the stream that you are backing up.
- Ensure that the DVDs you are using for the backup are blank, that is, the content is erased. If you are re-using DVD-RW (erasable) DVDs, the content of the DVDs can be erased by performing the procedure Erasing the contents of a CD/DVD on a Sun server on page 179.
- The procedure can be performed only when you are logged in as the root user. It should be performed only during non-peak hours.

Note 1: Files are not locked while they are being copied to DVD.

Note 2: If a SWACT occurs on a CBM850 platform during any part of this procedure, the entire procedure must be performed on the newly-active node.

Procedure

Copying billing files to DVD using SBADVDWRITE

At the CBM

1 Log into the CBM as root user.

2 Ensure that a DVD is present in the DVD drive by typing

```
# /usr/bin/cdrw -l
```

If	Go to
a message displays indicating that there is no device (DVD) in the drive	step 3
a message displays indicating that a device (DVD) is present in the drive	step 4

3 Insert a DVD into the drive as follows:

- **a** Open the DVD drive tray by pressing the eject button located on the front of the DVD drive.
- **b** Insert a blank DVD into the drive tray.
- **c** Press the drive tray to the closed position.
- **d** Go to step 5.

4 Insert a DVD into the drive as follows:

- **a** Open the DVD drive tray by typing

```
# /usr/bin/eject cdrom
```

Note: If the DVD drive tray does not open, either the DVD is already in use or your current directory location is the “cdrom” directory. If the DVD drive is in use, you must wait until it is no longer in use before proceeding to the next step in this procedure. If your current directory location is “cdrom”, change your directory location to another, such as

your home directory, by using the change directory (cd) command.

Example
cd home

b When the DVD drive tray opens, press the tray to the closed position.

5 Start the backup program by typing

```
# sbadvdwrite
```

6 In response to the system prompt, either

Proceed with the backup by pressing the Enter key

or

Stop the backup by typing

```
# Abort
```

If	Go to
you are proceeding with the backup	step 7
you are stopping the backup program	step 15

7 The system will display any configured streams that are available for backing up.

Note: If no configured streams are available for backup, the system will display an error message and will then abort the backup.

Example response:

```
Billing Data DVD Backup Stream Display
-----------------------------------------------
The following streams are available to be backed
up.


AMA
OCC
SMDR


Billing Data DVD Backup Stream Selection
```

```
-------------------------------------------
```

Select a stream to back up as follows:

a Type the name of the stream to backup

b Press the Enter key

8 In response to the system prompt, either

Proceed with the backup by pressing the Enter key

or

Stop the backup by typing

```
# Abort
```

If	Go to
you are proceeding with the backup	step 9
you are stopping the backup program	step 15

9 The system will prompt you to select the directories you want to back up.

Example response:

```
Billing Data DVD Backup Directory Selection
-------------------------------------------
enter the number corresponding to the
directory(s) that you want backed up and hit
return:


1  -Closed Sent
2  -Closed Not Sent
3  -Both Closed Sent and CLosed Not Sent
```

Select the directories that you want backed up as follows:

a Type the number in the list corresponding to the directory, or directories, that you want backed up

b Press the Enter key

10 In response to the system prompt, either

Proceed with the backup by pressing the Enter key

or

Stop the backup by typing

 # Abort

If	Go to
you are proceeding with the backup	step 11
you are stopping the backup program	step 15

11 The system will advise you as to the number of DVDs that are required in order to back up the selected directories.

In response to the system prompt, either

Proceed with the backup by pressing the Enter key

or

Stop the backup by typing

 # Abort

If	Go to
you are proceeding with the backup	step 12
you are stopping the backup program	step 15

12 The backup then begins. As the backup proceeds, the system displays the status of the backup activity. As additional DVDs are required, the system will automatically open the DVD tray and ask you to insert another DVD. As you remove each DVD, it is recommended that you label it using a CD/DVD safe pen.

Example response:

```
creating scratch /tmp/.tar 2046m d97
creating scratch /tmp/.iso 2048m d98
Looking for CD devices...
Checking for media...
Please insert a blank cd and hit <enter> OR type
<abort>:
Checking for media...
```

```
Media is blank

Start cdwrite of /tmp/.tar/billingdir/,
iso_space=/tmp/.iso.

Please wait...

executing /usr/bin/mkisofs -r -J -o
tmp/.iso/iso.img/tmp/.tar/billingdir/

Using P0403021.000;1 for
/tmp/.tar/billingdir/closedSent/P040302182716A
MA (P040302182715AMA)

Using P0403021.001;1 for
/tmp/.tar/billingdir/closedSent/P040302182715A
MA (P040302182614AMA)

Using P0403021.002;1 for
/tmp/.tar/billingdir/closedSent/P040302182614A
MA (P040302181113AMA)

.

.

.

35.63% done, estimate finish Wed Mar 3 16:29:21
2004

71.26% done, estimate finish Wed Mar 3 16:29:21
2004

Total extents actually written=14049

Total translation table size:0

Total rockridge attributes bytes:2364

Total directory bytes:6144

Path table size(bytes):42

Max brk space used c000

14049 extents written (27 Mb)


Looking for CD devices...

Initializing device...done.

Preparing to write DVD

Writing track 1...done.

Finalizing (Can take up to 4 minutes)...done.
```

```
write /tmp/.tar/billingdir/ succeeds
cdwrite exiting with return code 0
removing scratch /tmp/.tar d97
removing scratch /tmp/.iso d98


Billing Data DVD Backup Finished
------------------------------------------------

you have now completed the DVD backup operation.
Please ensure all requested files have been
written to the DVD(s)
```

13 Verify the backup was successful as follows:

a Change your directory location to the directory on the DVD containing the backed-up billing files by typing

cd cdrom/cdrom0/<stream name>/<directory name>

where

<stream name>
is the stream you selected in step 7

<directory name>
is the directory you selected in step 9

b List the content of the DVD by typing

ls -lA

The system responds by listing the content of the DVD. Examine this list, paying close attention to the file names and file sizes. Compare this listing with the file listing that the system provided you as the backup was being performed (see step 12). If there is a difference between the two listings, you should re-run the file backup again.

Note: To ensure that all of the files in a directory were captured in the backup, carefully examine the contents of all DVDs used for the backup. The files in a given directory may span two DVDs.

14 You may remove the DVD by typing

 # /usr/bin/eject cdrom

After you have removed the DVD, it is recommended that you label it using a CD/DVD safe pen.

15 You have completed this procedure.

Copying billing files to DVD manually

Purpose

Use this procedure to back up specific billing files of a particular stream on to a DVD. This procedure should be used only when individual billing files in a stream are to be backed up. For regular billing file backups, use procedure Copying billing files to DVD using SBADVDWRITE on page 165.

Note: This procedure does not move files from ClosedNotSent to ClosedSent state.

Prerequisites

The following prerequisites should be observed to ensure a successful backup of the files you have selected:

- Ensure that the DVD you are using is blank, that is, the content is erased. If you are re-using a DVD-RW (erasable) DVD, the content of the DVD can be erased by performing the procedure Erasing the contents of a CD/DVD on a Sun server on page 179.
- The procedure can be performed only when you are logged in as the root user.

Note 1: Files are not locked while they are being copied to DVD.

Note 2: If a SWACT occurs on a CBM850 platform during any part of this procedure, the entire procedure must be performed on the newly-active node.

Procedure

Copying billing files to DVD manually

At the CBM

1 Log into the CBM as root user.

2 Ensure that a DVD is present in the DVD drive by typing

```
# /usr/bin/cdrw -l
```

If	Go to
a message displays indicating that there is no device (DVD) in the drive	step 3
a message displays indicating that a device (DVD) is present in the drive	step 4

3 Insert a DVD into the drive as follows:

a Open the DVD drive tray by pressing the eject button located on the front of the DVD drive.

b Insert a blank DVD into the drive tray.

c Press the drive tray to the closed position.

d Go to step 5.

4 Insert a DVD into the drive as follows:

a Open the DVD drive tray by typing

```
# /usr/bin/eject cdrom
```

Note: If the DVD drive tray does not open, either the DVD is already in use or your current directory location is the “cdrom” directory. If the DVD drive is in use, you must wait until it is no longer in use before proceeding to the next step in this procedure. If your current directory location is “cdrom”, change your directory location to another, such as your home directory, by using the change directory (cd) command.

Example
cd home

b When the DVD drive tray opens, press the tray to the closed position.

5 Determine whether all of the files that you want to back up will fit on the DVD in the DVD drive as follows:

a Change your directory location to the directory containing the files you want to back up by typing

```
# cd <directory>
```

where

<directory>
is a directory path name, such as "/export/billingfiles/closedSent"

b List the contents of this directory by typing

```
# /usr/bin/ls -l
```

The system responds by displaying the file contents of the directory.

Example response:

```
-rw-r--r-- 1 maint maint 7034800 Feb 3 16:56
data1

-rw-r--r-- 1 maint maint 4915002 Jan 26 18:55
data2

-rw-r--r-- 1 maint maint 10000000 Feb 2 15:21
data3

-rw-r--r-- 1 maint maint 57590000 Jan 23
11:59 data5
```

c Determine the total size of the files to be backed up by adding together the sizes of these files shown in the listing. In the example above, the file sizes are "7034800", "4915002", "10000000", and "57590000". If the total size of the files you want to back up does not exceed 2 Mbyte (2000000000 bytes), only one DVD is required. If the size exceeds 2 Mbyte, additional DVDs will be required.

Note: It is recommended that you distribute the files backed up over multiple DVDs in such a way as to ensure the most efficient use of each DVD.

6 Create an ISO9660 file system from the files you intend to back up by typing

 # /usr/bin/mkisofs -o <destination file> -a -J -L -R <pathspec> (the command is typed on one line, with each of the individual command elements separated by a single space)

where

<destination>
is the name of the binary file that contains the ISO9660 file system

<pathspec>
is the full path name of the files that are to be backed up.

Note 1: Ensure that the directory in which you are creating the ISO9660 binary file contains at least 2 Mbyte of free space.

Note 2: The total size of the files specified in <pathspec> must not exceed 2 Mbyte.

Example
/usr/bin/mkisofs -o export/home/maint/tmatt/tempiso -a -J -L -R /export/billingfiles/closedSent/data1 /export/billingfiles/closedSent/data2

In this example, the <destination> file "export/home/maint/tempiso" is created from <pathspec>, the two files "/export/billingfiles/closedSent/data1" and "/export/billingfiles/closedSent/data2". Note that the full pathnames of the two files are separated by a single space in the command.

7 Write the binary file you created in step 6 to the DVD by typing

```
# /usr/bin/cdrw -C -i <ISO9660 file>
```

where

<ISO9660 file>
is the ISO9660 file system you created in step 6

Example
/usr/bin/cdrw -C -i export/home/maint/tmatt/tempiso

8 Delete the ISO9660 file system you created in step 6 to free the disk space it occupies, by typing

```
# /usr/bin/rm <ISO9660 file>
```

where

<ISO9660 file>
is the ISO9660 file system you created in step 6

9 Verify that the backup was successful as follows:

a Change your directory location to "cdrom0" by typing

```
cd cdrom/cdrom0
```

b List the contents of the DVD by typing

```
ls -l
```

The system responds by listing the contents of the DVD. Examine this listing, paying close attention to the file names and file sizes. Compare this listing with the file listing that you obtained in step 5. If there is a difference between the two listings, you should re-run the file backup again.

10 You may wish to remove the DVD at this time by typing

```
# /usr/bin/eject cdrom
```

After you have removed the DVD from the drive tray, it is recommended that you label it using a CD/DVD safe pen.

11 You have completed this procedure.

Erasing the contents of a CD/DVD on a Sun server

Application

Use this procedure to erase the contents of a CD/DVD on a Sun server (Netra 240), when you want to re-use the CD/DVD.

Prerequisites

None

Action

Perform the following steps to complete this procedure.

At the Sun server

1 Insert the CD/DVD you want to erase into the drive.

At your workstation

2 Telnet to the Sun server by typing

```
> telnet <server>
```

and pressing the Enter key.

where

server
is the IP address or hostname of the Sun server

3 When prompted, enter your user ID and password.

4 Erase the contents of the CD/DVD by typing

```
$ cdrw -b all
```

and pressing the Enter key

Note: You can also use the “fast” and “session” arguments. For more details, refer to the man pages by typing **`man cdrw`**.

5 Remove the CD/DVD from the drive.

6 You have completed this procedure.

Adding a logical volume for SBA through the command line

Purpose

This procedure provides instructions on how to add a logical volume for the SuperNode Billing Application (SBA) through the command line interface.

Procedure

Adding a logical volume for SBA through the command line

At the core manager

1 Log into the core manager as root user.

2 Copy the values for the logical_volume_name and logical_volume_size (answer 7 and 27, respectively) from Preparing for SBA installation and configuration on page 49 and complete the table below.

Command to enter in step 3	First parameter	Second parameter
makelv	logical_volume_name (answer 7)	logical_volume_size (answer 27)

3 Enter the command shown in the table above using the values you copied in step 2, by typing:

```
> makelv <logical_volume_name>
<logical_volume_size>
```

where

<logical_volume_name> is the value for logical_volume_name and <logical_volume_size> is the value for logical_volume_size

Note 1: Once you have entered the makelv command, interruption of the logical volume creation process (through ctrl-C) should be avoided. If the process is accidentally interrupted, however, contact your Nortel Networks Service Representative for assistance.

Note 2: The recommended <logical_volume_name> is "/cbmdata/00/billing/<billing stream name>"

4 You have completed this procedure.

Querying a billing stream

Purpose

Use this procedure to display the status and information for a specific SuperNode billing application (SBA) billing stream or all SBA billing streams.

Application

The MAP displays the following information at the Query command:

- State values:
  RBsy, InSv, SysB or Off for the primary substream. If applicable, a secondary, or recovery, substream is also displayed.
- Records within the open files:
  the number of billing records in open files (records other than ClosedNotSent)
- ClosedNotSentFiles available:
  the number of ClosedNotSent files on the stream's logical volume.
- Records within the ClosedNotSent files:
  the number of billing records contained in the ClosedNotSent files on the stream.
- Date of last file sent:
  the last date and time that a ClosedNotSent file on the stream was made into a ClosedSent file.

Procedure

Querying a billing stream

At the core manager

1 Log into the core manager as the root user.

2 Access the billing maintenance interface:

```
# billmtc
```

3 Determine if you want to query a specific SBA stream or all of the SBA streams.

If you	Do
want to query one SBA stream	step 4
want to query all of the SBA streams	step 5

4 Query an SBA billing stream:

```
> query <streamname>
```

where

streamname
is the SBA billing stream you want to query, for example AMA and OCC

5 Query all of the streams:

```
> query all
```

6 You have completed this procedure.

Searching and viewing billing records

Purpose

Use this procedure to search for and view billing records stored in AMADNS and DIRP file formats, using the AMADUMP tool.

Application

ATTENTION
AMADUMP does not support CDR billing records based on Edit templates. AMADUMP only supports CDR billing records based on Active templates.

You can display all of the records, or you can create filters that allow you to display only records matching a specific criteria. You view the results of AMADUMP on your screen.

The AMADNS file format supports the AMA, UCS CDR, and SMDR, record formats.

The DIRP file format supports the AMA, UCS CDR, Sprint CDR, and MCI Worldcom CDR record formats.

The UCS software on the Core supports user-defined Call Detail Record (CDR) templates for North American Universal Carrier Services (UCS). When activating the CDR templates on the switch, the core manager and Core clocks must be synchronized. For more information about CDR template creation, refer to "*UCS DMS-250 Billing Records Application Guide,* 297-2621-395."

AMADUMP uses the template information to search and display CDR records from billing files associated with UCS switches. AMADUMP does not process billing files if the file creation timestamp of the core manager billing files is older than the timestamp of the active set of CDR templates on the switch. In this case, the active set of templates

may have been altered after the billing file was generated. Obtain timestamps as shown table Obtaining a timestamp.

Obtaining a timestamp

If you want to obtain a timestamp	Do
for billing file creation	procedure Listing billing files on page 197
on the active set of templates on the Core	from the CI prompt, enter > **ctmplt;status**

AMADUMP limitations

The following limitations pertain to the operation of the AMADUMP tool.

Impact from changing CDR templates on the switch

SDM AMADUMP is unable to display all records from billing files containing a mixture of records generated using different CDR templates. This problem is transitional, that is, it may occur for the first billing file after the CDR template is changed on the switch. To help prevent this problem from occurring, changing templates during periods of high call traffic should be avoided. Templates should be changed only during maintenance periods, when call traffic is at a minimum.

If the problem does occur, however, manually rotate the billing file to the closedNotSent state by performing the procedure, Closing billing files on page 203. This will minimize the number of records that are not displayed using the SDM AMADUMP tool. Then, to view the billing file, enter the following “octal dump” command on the command line: **od -x <full pathname of billing file>**

Procedure

Searching and viewing billing records

At any workstation or console

1 Log into the core manager as the root user.

2 Access the billing maintenance level:

```
# billmtc
```

3 Access the tools level:

```
> tools
```

4 Access the amadump level:

```
> amadump <streamname>
```

where

<streamname> is the name of the billing stream

Example

```
> amadump ama
```

5 You can set the search criteria for the dump command, using one or more of the following commands:

Note: Entering each of these commands, provides you with a list of valid parameters for the command.

command	purpose
filter	add one or more filters (maximum of 20), which can be used with the dump command to search and display records - to define a filter, refer to Guidelines for defining filters on page 191 ***Note:*** Use the listfields command to obtain a list of possible field names when you are adding a filtered string.
numblk	set the block number from which to start the search ***Note:*** This applies to DIRP file format only. If the file format is AMADNS, the system ignores this value.
numsrch	set the maximum number of records to search for (1 to 500 000)
numout	set the maximum number of records to display (1 to 500 000)

Note 1: MTX XA-Core systems do not support volumes higher than 175 000 CDRs per hour.

Note 2: When you set numblk, numsrch, and numout, their value is used in subsequent dump commands for the current session. However, if you specify numblk, numsrch, or numout as parameters with the dump command, you override their value.

Note 3: For UCS CDR, you can query and reset the parameters that are currently defined as follows:

Query the search parameters that are currently defined:

```
AMADUMP>> reinit -q
```

Reset the search parameters to their default value:

```
AMADUMP>> reinit -r
```

6 Display the billing records using the dump command and one or more of its parameters. The dump command syntax is as follows:

```
AMADUMP>> dump <display_mode> [sum] [numout
<numout_value>] [numsrch <numsearch_value>]
[numblk <numblock_value>] [filter
<filter_string> or <%filter_number>] [fname
<filename>] [btime <start_time>] [etime
<end_time>]
```

Note 1: You can use either the filename parameter or the time parameters, but not both.

Note 2: The dump command can take up to a few hours to complete depending on the number of files to be scanned. For this reason, you must be selective when you specify the set of files to dump to prevent any unwanted delays.

Parameter	Description
<display mode> {HEX, DETAILS, NODETAILS, NOSHOW} ***Note:*** This is a required parameter.	HEX displays billing records in their raw (hexadecimal) form DETAILS displays billing records with individual fields and field names preceding the fields ***Note:*** Prior to executing the dump command with the details mode, enter the following command if you want to display more records on the screen: `AMADUMP>> set display compact` This command enables compact display for the current session.

Parameter	Description
	NODETAILS displays billing records with individual fields but no field names preceding the fields NOSHOW displays no billing record information. Often used with the "sum" option to display the number of records in the file.
-s *or* sum	displays a summary of the dump: • filenames • total records in each file • total records matched (or selected) from each file • total of all the records in this specific dump • total records matched in this particular dump, and • search criteria used
-no <numout_value> *or* numout <numout_value>	specifies the maximum number of records to display (1 to 500 000)
-ns <numsearch_value> or numsrch <numsearch_ value>	specifies the maximum number of records to search for (1 to 500 000)
-nb <numblock_value> *or* numblk <numblock_value>	specifies the starting block number for the search ***Note:*** This applies to DIRP file format only. If the file format is AMADNS, the system ignores the value.

Parameter	Description
-ft <filter_string> *or* -ft <%filter_number> *or* filter <filter_string> *or* filter <%filter_number>	specifies the filter to be used to search and display the records - to define a filter, refer to Guidelines for defining filters on page 191
-fn <filename> *or* fname <filename>	specifies the file or files to be displayed ***Note:*** o specify multiple files, enter the file list within double quotes and separate each file name with a space.
-b <start_time> *or* btime <start_time>	specifies the start date and time of the records to be searched and displayed
-e <end_time> or etime <end_time>	specifies the end date and time of the records to be searched and displayed ***Note 1:*** You can use the start and end time parameters individually, or together. ***Note 2:*** The start and end time parameters are based on the creation date and time of the files, not the date and time contained within the files.

Note 1: For AMADNS file format, you can use either hyphenated or non-hyphenated options, but not a combination of both. For DIRP file format, you can only use non-hyphenated options.

Note 2: You can obtain the filename, and creation date and time of the files using the following command at the core manager prompt:

```
# listfile <streamname>
```

Note 3: The start time, end time, and filter options are not supported for SMDR record formats.

Note 4: The record count for the AMADUMP “sum” option and listfile commands may not match for SMDR and CDR file formats.

For SMDR, the AMADUMP record count includes all call records and extension records. However, the listfile record count only includes call records.

For UCS CDR in DIRP format, the value of the RECORD_COUNT field in GER is one less than the total number of records (call records and event records) shown by AMADUMP summary.

Note 5: If you want to scroll through all the records, enter “s” when the “more” prompt appears on the screen rather than using the carriage return to see individual records.

Note 6: The filename displayed in the GER record may be different from the filename used in the “dump” command. AMADUMP always displays the filename stored in the GER record as it was created on the core manager (that is, like an active file).

Example:

```
AMADUMP>> dump details sum fname U020510095947OCC
    .....................
    DIRPFNAME A020510095947OCC
```

7 You have completed this procedure.

Guidelines for defining filters

A filter allows you to search and display a sub-set of the billing records. A filter string is used to specify logical and comparison operations between constants and variables. A constant can be an actual number (up to 19 digits), or a string in quotes; a variable is a field name. You can obtain a list of available fields, which can be used as variables in a filter string, using the listfields command.

Note: Variables and string constants are case sensitive. A string constant is anything enclosed in single quotes.

You can define a maximum of 20 filter strings, and specify them as “%<filter_number>” when you use the dump command to display the billing records.

The table Filter operators provides the operators for filters.

Filter operators (Sheet 1 of 2)

Operator	Symbol
parenthesis	( )

Filter operators (Sheet 2 of 2)

Operator	Symbol
Slice a variable	from <int> count <int>. • from <int> starts indexing from 0 • count <int> returns a count of 0 to a variable size of 0 ***Note:*** The slice operation is a ternary operation (state of three) that only works on variables. The result of a slice is a temporary variable.
Multiplication	*
Division	/
Addition	+
Subtraction	-
Greater than	>
Less than	<
Greater than or equal	>=
Less than or equal	<=
Equal to	= (for SMDR) == (for OCC and AMA)
Not equal to	!= or <>
And, Or (both logical and bit-wise)	&, | (SMDR) &&, || (OCC and AMA)

Note 1: The operands are binary, except for the parenthesis, which holds other expressions.

Note 2: For comparison operations, the result is either true (1) or false (0). A comparison is considered true if it evaluates to a value other than zero (0).

Note 3: When a string constant is compared to a variable, it can only be used as a regular expression string. For example, string constants can only be used in an equality operation with the other operand being a variable.

Note 4: For regular expressions, only “equal to” and “not equal to” operations are valid. All other characters are invalid.

Filter syntax
The filter command consists of different syntax for different data types. The data types are

- EBCDIC
- TBCD
- BCD
- BIN
- BIT
- BOOLEAN
- HEX

Filter syntax for EBCDIC Use single or double quotes for EBCDIC digits.

Example
For BAF records:

```
AMADUMP>> filter add 4 RECCD ==’F0’
AMADUMP>> filter add 4 RECCD ==”F0”
```

Example
For CDR records:

```
AMADUMP>> filter add 4 STRUCTURE_CODE ==”00079C”
```

Example
For SMDR records:

```
AMADUMP>> filter add 4 “RECORD_CODE_SM =’D1’”
```

Filter syntax for TBCD Use single or double quotes for TBCD digits. However, when you use a sub-set of TBCD digits in a filter string, you must use double quotes.

Example
For TBCD digits:

```
AMADUMP>> filter add 17 ANISP ==’5124599628’
AMADUMP>> filter add 17 ANISP ==”5124599628”
```

Example
For a sub-set of TBCD digits:

```
AMADUMP>> filter add 17 ANISP ==”51245996”
```

Filter syntax for BCD Use single or double quotes for BCD digits. However, when you use a sub-set of BCD digits in a filter string, you must use double quotes.

Example
For BCD digits:

```
AMADUMP>> filter add 4 STRUCTURE_CODE ==’00001C’
AMADUMP>> filter add 4 STRUCTURE_CODE ==”00001C”
```

Example
For a sub-set of BCD digits:

```
AMADUMP>> filter add 4 STRUCTURE_CODE ==”00001”
```

Filter syntax for BIN Use double quotes or no quotes for BIN digits. However, when you use a sub-set of BIN digits in a filter string, you must use double quotes.

Example
For BIN digits:

```
AMADUMP>> filter add 8 CALLDUR == 1310720
AMADUMP>> filter add 8 CALLDUR == “1310720”
```

Example
For a sub-set of BIN digits:

```
AMADUMP>> filter add 8 CALLDUR == “13107”
```

Filter syntax for BIT Use single or double quotes for BIT digits. However, when you use a sub-set of BIT digits in a filter string, you must use double quotes.

Example
For BIT digits:

```
AMADUMP>> filter add 15 WBCKTS ==
‘11010000000001111101001100111101’
AMADUMP>> filter add 15 WBCKTS ==
“11010000000001111101001100111101”
```

Example
For a sub-set of BIT digits:

```
AMADUMP>> filter add 15 WBCKTS ==
“11010000000001111101001100111”
```

Filter syntax for BOOLEAN Use only double quotes for BOOLEAN digits.

Example
For BOOLEAN digits:

```
AMADUMP>> filter add 17 VARLNGTH == "N"
```

Filter syntax for HEX Use double quotes for HEX digits, however do not use any quotes if you are entering the value in decimal equivalent.

Example
For HEX digits:

```
AMADUMP>> filter add 11 SCPBILL == "fe17700b"
AMADUMP>> filter add 11 SCPBILL == 4262948875
```

Example of filter usage
The following example shows a dump of the AMA stream, selecting records where the call code is greater than 006, or the structure code is less than 00076. The dump command specifies the "or" logical relationship (||) that is to exist between the filters, and specifies the file name.

Example

```
> amadump ama
amadump>> filter add 5 CALL_CODE > '006C'
amadump>> filter add 6 STRUCTURE_CODE < '00076C'
amadump>> set display compact
amadump>> dump details sum filter "%5 || %6" fname
<filename>
```

Listing billing files

Purpose

Use this procedure to list all files currently stored for a specified SuperNode Billing Application (SBA) stream.

Application

You can specify additional criteria for listing files using optional parameters described in the table that follows this procedure.

Procedure

Listing billing files

At the core manager

1 Log into the core manager.

2 Access the billing maintenance interface:

```
# billmtc
```

3 Access the file system level:

```
> filesys
```

4 List the files currently stored in an SBA stream:

```
> listfile <stream_name> <optional_parameters>
```

where

<stream_name> is the name of the billing stream. This parameter is mandatory.

<optional_parameters> is one or more of the optional parameters described in the table that follows this procedure

Example
To list all secondary files in the AMA stream, type

```
> listfile ama state secondary
```
(general file formats)

or

```
> listfile ama -s
```
(AMADNS file format)

5 You have completed this procedure.

The following table describes <optional parameters> available for the listfile command.

Parameter	Value	Definition
For AMADNS file format:		
-a		lists all files (open, closedNotSent, and closedSent).
-b	hh[:mm[:ss]][.mm[/dd[/[yy]yy]] *examples:* 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (begin time) to list only the files that were created at this specific time and later.
-e	[hh[:mm{:ss]][.mm[/dd[/[yy]yy]] examples: 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (end time) to list only those files created before and up to, but not including, this specific time.
-f	file name	specifies the file to list. The file name is in standard AMA format: [source component identifier].[destination component identifier].[file sequence number].[file type].[file sequence number restart indicator].
-o		lists all open files.
-p		lists all primary files currently stored.
-q	integer	Use this parameter (sequence number) to list only those files with a sequence number matching the specified value, or within the range of values stated by <value, value>.
-r <priority>	an integer from 1 to 4 representing DNS priority	List only the files with this priority.

Parameter	Value	Definition
-s		lists all secondary files.
-y <filetype>	an integer (0 to 32)	list only those files with this file type value. Default values are 1 for Standard AMA files, and 2 for Error files.
For general file formats:		
STATE (or state) <value>	PROCESSED, UNPROCESSED, PRIMARY, OPEN, or SECONDARY	Specifies the file state in the stream to be listed. For example, PROCESSED means all processed files are to be displayed.
BTIME (or btime) <date-time>	hh[:mm[:ss]][.mm[/dd[/[yy]yy]] examples: 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (begin time) to list only the files that were created at this time and later.
ETIME (or etime) <value>	[hh[:mm{:ss]][.mm[/dd[/[yy]yy]] examples: 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (end time) to list only those files created before, but not including, the specified time.
SEQNUM (or seqnum) <value, value>	integer, integer defines a range or integers that represent file sequence numbers	Use this parameter to list only those files with a sequence number matching the specieid value, or falling in the range of values stated by <value, value>.
FNAME (or fname) <filename>	file name	Use this parameter to list only this one file with the specified file name. The exact file name must match the string entered.

Parameter	Value	Definition
FTYPE (or ftype) <filetype>	an integer (0 to 32)	Use this parameter to list only those files with this file type value. Default values are 1 for Standard AMA files, and 2 for Error files.
PRIO <priority>	an integer between 1 and 4	Use this parameter to list only the files with this priority.

Listing billing streams

Purpose

Use this procedure to list the configuration information about a billing stream.

Procedure

Listing a billing stream

At any workstation or console

1 Log into the core manager.

2 Access the billing maintenance interface:

```
# billmtc
```

3 Access the configuration stream level:

```
> confstrm
```

4 Display the detail information about a stream:

```
> list {<stream_name> | ALL}
```

where

<stream_name> is the name of the specific billing stream

ALL indicates that you want to display the configuration information about all configured billing streams

5 You have completed this procedure.

Closing billing files

Purpose

Use this procedure to manually close the current billing files.

Application

This procedure changes the state of the current files from open to closedNotSent.

Procedure

Closing billing files

At the core manager

1 Log into the core manager

2 Access the billing maintenance interface:

```
# billmtc
```

3 Access the file system level:

```
> filesys
```

4 Close active billing files:

```
> closec <stream_name>
```

where

<stream_name> is the name of the billing stream from which the files are to be closed

Example

```
> closec ama
```

If the closec command	Do
returns a list of files it acted on	go to step 6
does not return a file name	go to step 5

5 List the primary files to verify that all files are closed. For instructions, refer to procedure Listing billing files on page 197, which is located in this NTP.

6 You have completed this procedure.

Sending billing files from disk

Purpose

Use this procedure to transfer billing files from the core manager to one or more destinations.

Application

This procedure applies to billing streams configured for outbound file transfer (OFT) mode, secure outbound file transfer (SFTPW), or real time billing (RTB).

Procedure

Sending billing files

At the core manager

1 Log into the core manager.

2 Access the billing maintenance interface:

```
# billmtc
```

3 Access the file system level:

```
> filesys
```

4 Send the files downstream:

```
> sendfile <stream_name>
[<optional_parameters>]
```

where

<stream_name> is the name of the billing stream. This parameter is mandatory.

[<optional_parameters>] is one or more of the optional parameters described in the table that follows this procedure

Note 1: The <stream_name> parameter must be first, but the order of the other parameters is not significant.

Note 2: If you do not specify the destination (an optional parameter), the files are sent to all destinations for the stream.

5 Refer to the following table to determine your next step.

If the sendfile command	Do
is successful	go to step 7
is not successful	go to step 6

6 If the system indicates that incorrect parameter values were entered, re-enter the command with the correct parameter values. Otherwise, observe the SDMB logs on the CM in logutil to determine why the sendfile command is not successful. If logs or alarms, or both are generated, refer to the SDM Fault Management document NN10081-911 for a corrective action procedure.

7 You have completed this procedure.

The following table describes <optional parameters> available for the sendfile command.

Parameter	Value	Definition
For AMADNS file format:		
-d <destination>	alphanumeric string (up to 15 characters)	Specifies the name of the destination to which the billing files are sent. When the destination option is not specified, billing files are sent to all destinations under the same stream.
-b	hh[:mm[:ss]][.mm[/dd[/[yy]yy]] examples: 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (begin time) to send only the files that were created at this specified time, and later.
-e	[hh[:mm{:ss]][.mm[/dd[/[yy]yy]] examples: 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (end time) to send only those files created before, but not including, this time.
-f	file name	Specifies file to transmit. The file name is in standard AMA format: [source component identifier].[destination component identifier].[file sequence number].[file type].[file sequence number restart indicator].
-p		Sends all primary files.

Parameter	Value	Definition
-q	integer	Use this parameter (sequence number) to send only those files with a sequence number matching the value, or within the range of values stated by <value, value>.
-r <priority>	an integer between 1 and 4 representing DNS priority	Use this parameter to send only the files with the specified priority.
-s		Sends all secondary files.
-y <filetype>	0 to 32	Use this parameter to send only those files with this file type value. Default values are 1 for Standard AMA files and 2 for Error files.
new_file_state	SENT or NOTSENT	Represents the new file state after it is sent. The default for this parameter is sent. A file with the state closedNotSent changes to closedSent once the file is transferred. If you enter notsent on the command line, the file state does not change to closedSent after the file is transferred. This is only applicable for files in the closedNotSent state (for example, primary or unprocessed).
For general file formats:		
DEST <destination>	alphanumeric string (up to 15 characters)	Specifies the name of the destination for the billing files are sent. When the destination option is not specified, billing files are sent to all destinations under the same stream.
STATE (or state) <value>	PROCESSED, UNPROCESSED, PRIMARY, or SECONDARY	Specifies which files in the stream are to be sent. For example, PROCESSED means that all processed files are sent. For limitations and restrictions pertaining to secure outbound file transfer (SFTPW) of processed or secondary files, refer to Limitations and restrictions on page 108, of the procedure Configuring SBA outbound connection security on page 107.

Parameter	Value	Definition
BTIME (or btime) <date-time>	hh[:mm[:ss]][.mm[/dd[/[yy]yy]] examples: 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (begin time) to send only the files that were created at this time and later.
ETIME (or etime) <value>	[hh[:mm{:ss]][.mm[/dd[/[yy]yy]] examples: 8:00 1/12/03 12:00:00.2/23/03	Use this parameter (end time) to send only those files created before and up to this time, but not including this time.
SEQNUM (or seqnum) <value, value>	integer, integer defines a range or integers that represent file sequence numbers	Use this parameter (sequence number) to send only those files with a sequence number matching the value, or within the range of values stated by <value, value>.
FNAME (or fname) <filename>	file name	Use this parameter to send only the specified file name. The exact file name must match the string entered.
FTYPE (or ftype) <filetype>	an integer between 0 and 32	Use this parameter to send only those files with this filetype value. Default values are 1 for Standard AMA files, and 2 for Error files.
PRIO (or priority)	an integer between 1 and 4	Use this parameter to send only the files with this priority.
new_file_state	SENT or NOTSENT	Represents the new file state after it is sent. The default for this parameter is sent. A file with the state closedNotSent changes to closedSent once the file is transferred. If you enter notsent on the command line, the file state does not change to closedSent after the file is transferred. This is only applicable for files in the closedNotSent state (for example, primary or unprocessed).

Installing SBA

Purpose

Use this procedure to install the SuperNode Billing Application (SBA) on the SDM or the CS 2000 Core Manager. The core manager platform software must be installed before installing SBA.

Application

This procedure applies to users who need to perform an initial installation of SBA on the core manager.

In order to install SBA, you must:

- have root access and maintenance access to the core manager
- be able to execute file transfer protocol (FTP) on the core manager

You can access the core manager through a terminal connection or by logging on to the core manager through a remote UNIX terminal.

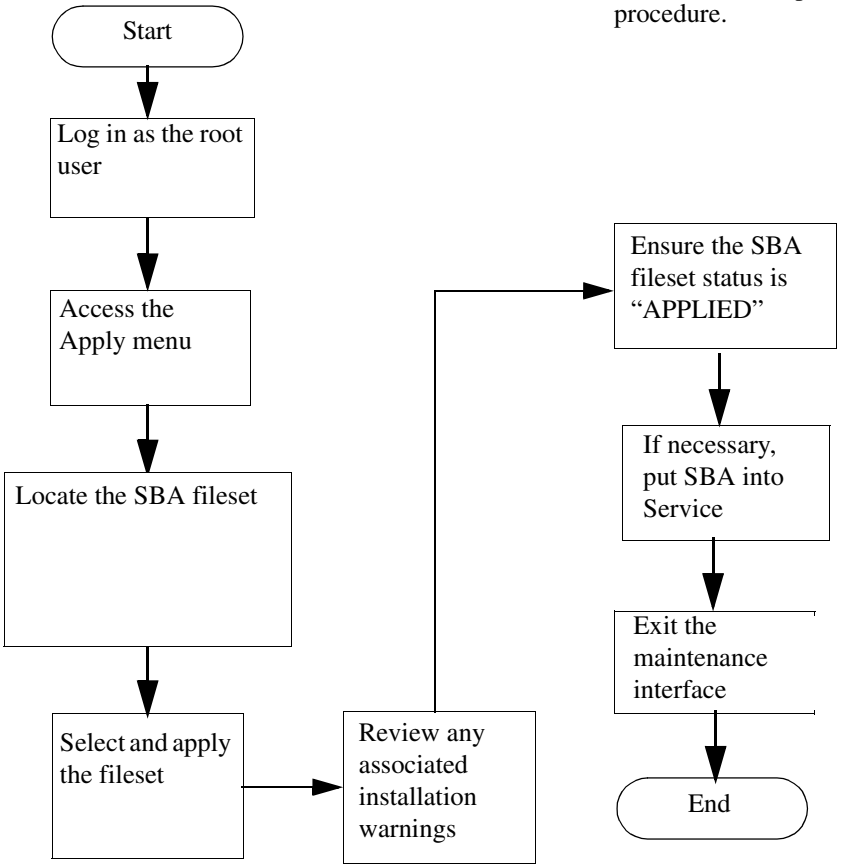
Procedure

The following flowchart lists the general steps involved in the installation process. The steps are detailed in text following this flowchart.

Summary of installing the SBA software for the first time

This flowchart summarizes the procedure.

Use the instructions that follow this flowchart to perform the procedure.



Procedure

Installing SBA

At the core manager

1 Log into core manager using the root user ID and password.

2 Access the maintenance interface:

 # sdmmtc

If you are installing from	Do
tape	insert the CS2E0006 6.x (1 of 1) tape in slot 2 ***Note:*** Wait until the tape drive stabilizes (yellow LED is off) before you proceed. List the contents of the tape: apply 0 and pressing the Enter key.
a directory	list the contents of the directory: apply <directory path>

3 Select the SDM billing application (SBA) fileset:

> select <fileset_num>

where

<fileset_num>
is the number next to the SBA fileset

Note: Use the up or down commands to scroll through the application list to locate the SBA fileset.

4 Apply the SBA fileset:

> apply

Note: The system automatically selects the SDM_ACE fileset, which is required by the billing application. When you confirm the apply command, the system automatically installs the ACE fileset first.

Example response:

```
You have selected to install the following new
filesets or fileset updates.

SDM Billing Application xx.xx.xx.x

You did not select the following filesets that
are required by some of the selected filesets.
If you proceed, they will be applied
automatically before the selected filesets.

SDM ACE distribution x.x.x.x

Do you wish to proceed?
Please confirm ("YES", "Y", "NO", or "N")
```

5 Confirm the apply command:

> y

The installation can take several minutes to complete. When the installation is complete, the core manager displays the list of filesets on the source device. If a "more..." prompt appears, press the Enter key to display the additional information.

Note: If errors are indicated, check the log file specified and enter the load with corrective actions.

Following is an example of a warning from installing SBA:

Example

```
Warnings produced from installing SBA, if
any, are shown below

Press ENTER to continue.
```

6 Determine if warnings were produced.

If	Do
warnings are produced from installing SBA	record any warnings and report to your next level of support (see Installation warning examples on page 214)
no warnings are produced from installing SBA	press Enter, and proceed to step 7

7 Access the Details level:

> details

8 Confirm that the status of SBA fileset is “APPLIED”.

Note: If necessary, use the up or down commands to scroll through the application list to view the filesets.

9 Access the application level:

> appl

10 Busy the SBA:

> bsy <SBA_fileset_num>

Where

<SBA_fileset_num> is the number next to the SBA fileset

11 Return the SBA to service:

> rts <SBA_fileset_num>

Where

<SBA_fileset_num> is the number next to the SBA fileset.

12 Exit the maintenance interface:

> quit all

13 You have completed this procedure.

Installation warning examples

You can receive the following warnings during an SBA installation.

Warning 1

```
WARNING: Executable base_mib_merge not found in the
bin directory

WARNING: Cannot restore the base mib values
```

Explanation 1

There must is a previous version of SBA. The management information base (mib) values from the previous version need to be entered again. Without the base_mib_merge executable file, the values cannot be automatically converted to the new version.

Warning 2

```
WARNING: The base mib command could not be used.

ACTION TO BE TAKEN: The mib executable needs to be
called directly for setting row 0 of
rcLogicalVolumeDir to /sba/ama.
```

Explanation 2

There must is a previous version of SBA because there was a problem using the base_mib command during installation. Set the rcLogicalVolumeDir (row 0) to /sba/ama. After installation, the root user enters the following two commands at the shell prompt:

 # cd /sdm/sba/NA100/bin

 # ./base_mib set -r0 rcLogicalVolumeDir /sba/ama

Warning 3

```
WARNING: The mib command is unable to reach the
baf_mib executable. It needs to be called directly.
```

Explanation 3

The root user needs to access the baf_mib directly, as opposed to accessing through the mib command.

Warning 4

```
WARNING: Executable baf_mib_merge not found in the
bin directory

WARNING: Cannot restore the baf mib values
```

Explanation 4

There is a previous version of SBA. The mib values from the previous version need to be entered again. Without the baf_mib_merge executable file, the values cannot be automatically converted to the new version.

Turning auto-recovery on

Purpose

Use this procedure to turn on real time billing (RTB) auto-recovery. Auto-recovery allows RTB to automatically recover from a billing transfer failure with the data and processing management system (DPMS) after exceeding the allowable number of retry attempts. Auto-recovery performs the following functions:

- sends a 10 MB test file to the DPMS to analyze the cause of the file transfer failure
- moves partial *.tmp* files on the DPMS to a partial file directory

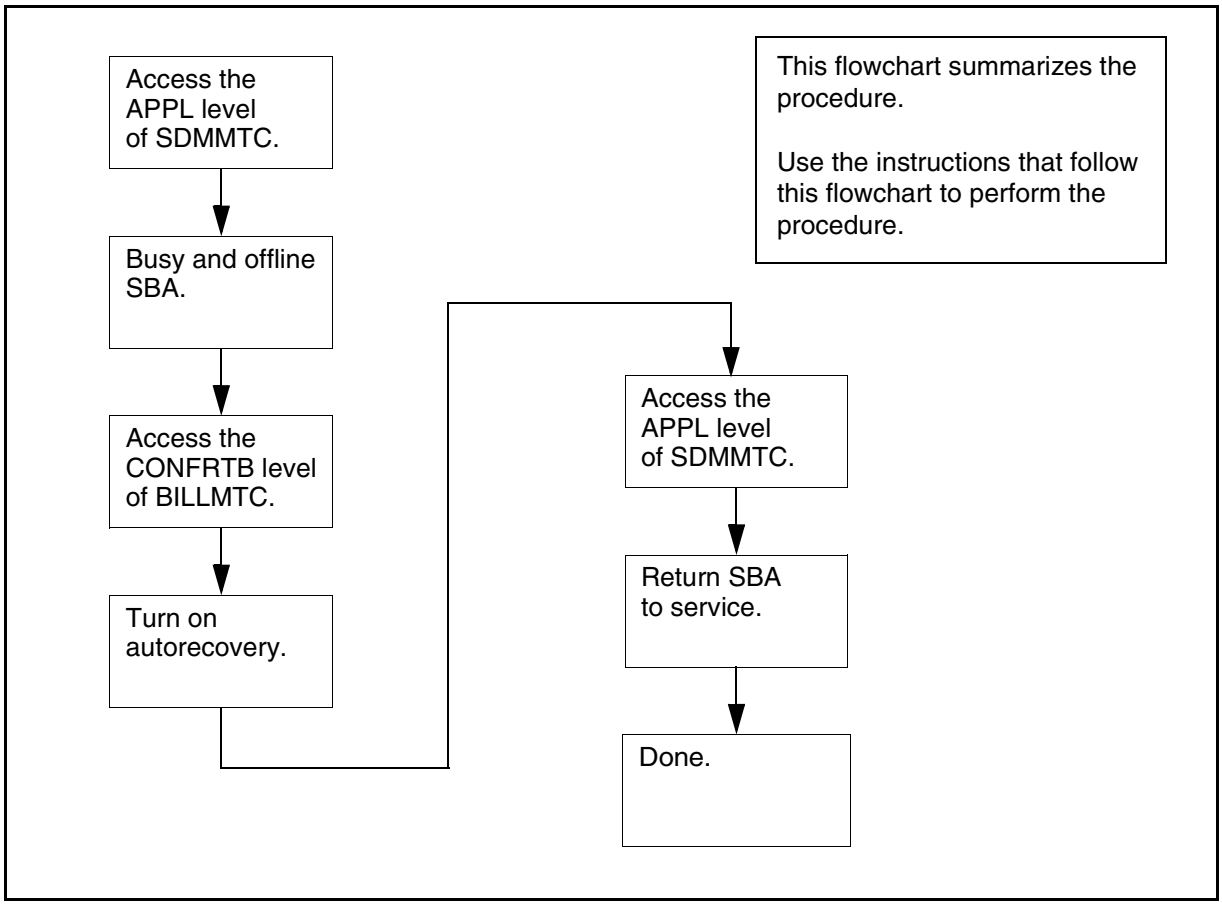
Procedure

The following flowchart summarizes this procedure.

Note: This procedure manually busies SuperNode Billing Application (SBA), which generates the following actions:

- SBA operates in backup mode.
- MAPCI displays a major SBACP alarm appears under the SDMBIL banner.

Summary of procedure



Turning on auto-recovery

At any workstation or console

1 Access the core manager.

2 Access the APPL level of the SDMMTC interface:

```
> sdmmtc appl
```

Response

SDMMTC accesses the APPL level

3 Use the Up and Down commands to scroll through the list of displayed applications and locate the SBA application.

4 Busy SBA:

```
> bsy <n>
```

where

<n> is the number of the SBA application

Response

SDMMTC displays the following prompt:

```
The application is in service.
This command will cause a service interruption.
Do you wish to proceed?
Please confirm ("YES", "Y", "NO", or "N"):
```

5 Confirm the command:

> y

Response

SBA changes state to ManB.

6 This is an optional step. Offline SBA:

> offl <n>

where

<n> is the number of the SBA application

Response

SBA changes state to OffL.

7 Quit the SDMMTC interface:

> quit all

Response

The display returns to the command prompt.

8 Access the BILLMTC interface:

> billmtc

Response

BILLMTC opens at the main level.

9 Access the Schedule level:

> schedule

Response

BILLMTC shows the Schedule level.

10 Access the RTB level:

> rtb

Response

BILLMTC shows the RTB level.

11 Access the CONFRTB level:

```
> confrtb
```

Response

BILLMTC shows the CONFRTB level.

12 Turn auto-recovery on:

```
> autorec on
```

Response

"Autorecovery has been turned on."

13 Quit the BILLMTC interface:

```
> quit all
```

The display returns to the command prompt.

14 Access the APPL level of the SDMMTC interface:

```
> sdmmtc appl
```

Response

SDMMTC accesses the APPL level

15 Use the Up and Down commands to scroll through the list of displayed applications and locate the SBA application.

16 If you placed SBA offline in step 6, busy SBA:

```
> bsy <n>
```

where

<n> is the number of the SBA application

Response

SBA changes state to ManB.

17 Return SBA to service:

```
> rts <n>
```

where

<n> is the number of the SBA application

Response

SBA returns to service.

18 You have completed this procedure.

Adding a logical volume for SBA through SDMMTC

Purpose

Use this procedure to add a logical volume for the SuperNode Billing Application (SBA) using the SDMMTC interface.

Note: You may also perform this procedure from the command line. For instructions, refer to the procedure Adding a logical volume for SBA through the command line on page 181.

Procedure

Adding a logical volume for SBA through SDMMTC

At the core manager

1 Log into the core manager as root user.

2 Access the storage level of the maintenance interface:

```
# sdmmtc storage
```

3 Copy the values for the logical_volume_name and logical_volume_name (answer 7 and 27, respectively) from Preparing for SBA installation and configuration on page 49, into the table below.

Command to enter	First parameter	Second parameter
add lv	logical_volume_name (answer 7)	logical_volume_size (answer 27)

4 Enter the command from the table above using the values you copied from step 3:

```
> add lv <logical_volume_name>
<logical_volume_size>
```

where

<logical_volume_name> is the value for logical_volume_name
<logical_volume_size> is the value for logical_volume_size

5 Exit the maintenance interface:

```
> quit all
```

6 You have completed this procedure.

Copying billing files to tape (backup)

Purpose

Use this procedure to backup billing files of a particular stream on tape.

Application

Use a 90M or 120M tape manufactured by Hewlett Packard (HP), Maxell, Verbatim, or Imation. Any other tapes are not approved by Nortel Networks.

ATTENTION
Write failures can occur when two applications attempt to access the same file at the same time.

When two applications, for example File Transfer Controller (FTC) and the Write command, attempt to access the same file, one of two exception conditions occurs:

- the Write command backs up the file, but issues an error message stating that it has backup the file <filename> but is unable to change the state of the file
- if the FTC has already moved the file to the CloseSent state when the Write command tries to back it up, the Write command issues an error message stating that it is unable to backup<filename>.

In both cases, the Write command exits and does not continue accessing the file list.

Procedure

At the core manager

1 Insert a 90M or 120M tape into the DAT drive (either 0 or 1).

Note: The write command calculates the number of tapes required based on a 90M tape (2GB). A 120M tape has a capacity of 4GB.

2 Log into the core manager.

3 Access the billing maintenance level:

```
# billmtc
```

4 Access the Tape level:

```
> tape
```

5 Perform the backup:

```
> write <parameters>
```

where

<parameters>
is any of the parameters listed in table Command parameters for AMADNS file format on page 226 or table Command parameters for all file formats on page 228

Note 1: When the SBA is running normally, the Write command can run at traffic levels of up to 1.2 million records per hour. However, the Write command must not run when:

- the SBA is operating in the recovery mode, or
- the traffic level is in excess of 750,000 records in an hour.

Note 2: The Write command uses the CPIO utility to back up standard billing files. Each file copied requires a separate invocation of the CPIO utility, and produces a separate archive.

The following table Command parameters for AMADNS file format lists the Write command parameters for AMADNS file format. For the parameters for all other file formats, see table Command parameters for all file formats on page 228.

Command parameters for AMADNS file format

Parameter	Value	Definition
<stream_name>	string	back up the billing files in the specified stream. For example: AMA and OCC.
-p		back up the “primary” billing files.
-s		back up the “secondary” billing files.
-a		back up the all of the billing files (primary and secondary),
-b	[hh[:mm[:ss]]][.mm[/dd[/[yy]yy]]]	back up the billing files that have a creation timestamp equal to or later than the specified timestamp, but not later than the ETIME timestamp, if specified.

Command parameters for AMADNS file format

Parameter	Value	Definition
-e	[hh[:mm[:ss]]][.mm [/dd[/[yy]yy]]]	back up the billing files that have a creation timestamp equal to or earlier than the specified timestamp, but not earlier than the BTIME timestamp, if specified.
-q	integer	back up the billing files that have a sequence number that matches the specified sequence number, or are within the specified range of sequence numbers.
-r	integer	back up the billing files that have the specified DNS priority level. ***Note:*** All DNS files have a priority of 2.
-y	0 to 32	back up the billing files that have the specified file type.
-f	alphanumeric string	back up the specified billing file only.
SENT or NOTSENT	sent or notsent	the file state that the billing files are to be set to once they have been backed up. ***Note:*** If you do not specify this parameter, the system prompts you to specify whether you want to change the state of the files to ClosedSent. If you choose not to have the state changed, the backed up files remain in the same state as before you performed the backup operation.
DAT0 or DAT1	dat0 or dat1	back up the billing files on the specified DAT drive where the tape resides.
-n		do not to eject the tape after the billing files have been backed up. If you do not specify “noeject”, the tape is ejected following the backup.

Command parameters for AMADNS file format

Parameter	Value	Definition
OVERWRITE or APPEND	overwrite or append	OVERWRITE any existing files on the tape with those you are currently backing up, or APPEND preserves any existing files on the tape and add those you are currently backing up.

The following table lists the Write command parameters for all file formats except AMADNS. For the parameters for the AMADNS format, see table Command parameters for AMADNS file format on page 226.

Command parameters for all file formats

Parameter	Value	Definition
<stream_name>	string	back up the billing files in the specified stream.For example: AMA and OCC.
state	processed, unprocessed, primary, secondary, or all	back up the billing files that have the specified state.
btime	[hh[:mm[:ss]]][.mm[/dd[/[yy]yy]]]	back up the billing files that have a creation timestamp equal to or later than the specified timestamp, but not later than the ETIME timestamp, if specified.
etime	[hh[:mm[:ss]]][.mm[/dd[/[yy]yy]]]	back up the billing files that have a creation timestamp equal to or earlier than the specified timestamp, but not earlier than the BTIME timestamp, if specified.
seqnum	integer	back up the billing files that have a sequence number that matches the specified sequence number, or are within the specified range of sequence numbers.
prio	1 to 4	back up the billing files that have the specified DNS priority level.

Command parameters for all file formats

Parameter	Value	Definition
ftype	0 to 32	back up the billing files that have the specified file type. This parameter is not valid for DIRP file format.
fname	alphanumeric string	back up only the specified billing file.
<new_file_state>	sent or notsent	the file state the billing files are to be set to once they have been backed up. ***Note:*** If you do not specify this parameter, the system prompts you to specify whether you want to change the state of the files to ClosedSent. If you choose not to have the state changed, the backed up files remain in the same state as before you performed the backup operation.
DAT0 or DAT1	dat0 or dat1	back up the billing files on the specified DAT drive where the tape resides.
NOEJECT		do not eject the tape after the billing files have been backed up. If you do not specify “noeject”, the tape is ejected following the backup.
OVERWRITE or APPEND	overwrite or append	OVERWRITE any existing files on the tape with those you are currently backing up, or APPEND preserves any existing files on the tape and add those you are currently backing up.

The examples that follow show the command parameters to back up all primary files in stream “baf1”.

Example for AMADNS file format

```
> write baf1 -p
```

Example for general file formats

```
> write baf1 state primary
```

The examples that follow show the command parameters to back up all secondary files in stream “baf1” that were created between the specified time and date and the current time and date.

Example for AMADNS file format

```
> write baf1 -s -b 23:00.5/11/00
```

Example for general file formats

```
> write baf1 state secondary btime 23:00.5/11/00
```

The examples that follow show the command parameters to back up all secondary files in stream baf1 between 10:00 and 12:00 noon of the current day.

Example for AMADNS file format

```
> write baf1 -s -b 10:00 -e 12:00
```

Example for general file formats

```
> write baf1 state secondary btime 1:00 etime
12:00
```

6 Once the backup successfully completes, press Enter to continue.

If you	Do
want to perform another backup	step 5
do not want to perform another backup	you have completed this procedure

Sending billing files from tape

Purpose

Use this procedure to send billing files from a digital audio tape (DAT) to a downstream destination.

Prerequisites

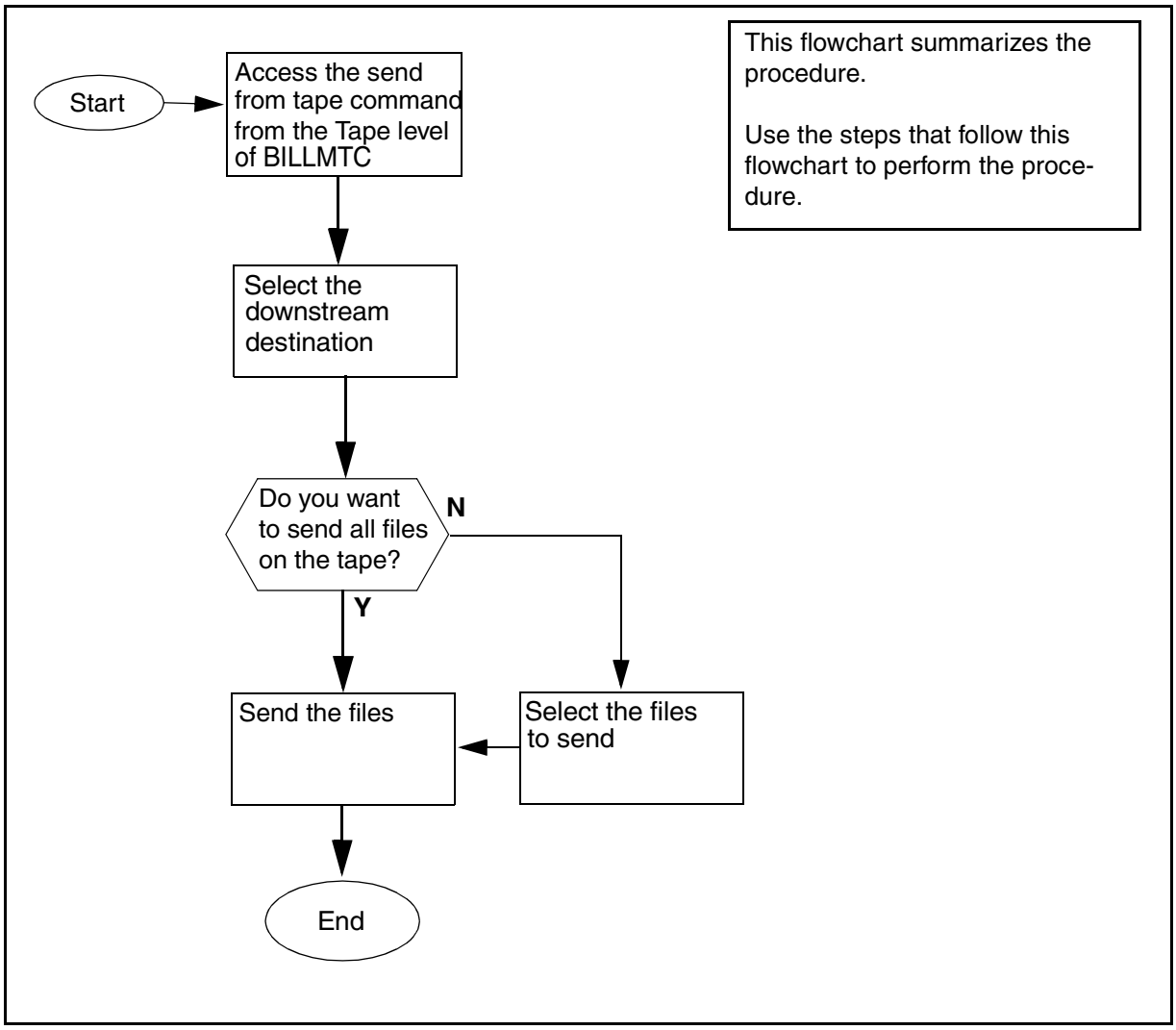
Before you begin this procedure, do the following:

- ensure the DAT tape is in the DAT drive
- record the name of the DAT drive (DAT0 or DAT1)

Procedure

The following flowchart shows a summary of the steps to perform this procedure. Use the steps that follow this flowchart to perform this procedure.

Sending files from tape



Sending billing files from tape

At the core manager

1 Log into the core manager.

2 Access the SuperNode Billing Application (SBA) billing maintenance interface:

```
> billmtc
```

3 Access the tape level:

```
> tape
```

4 Send the files from a DAT tape to a downstream destination:

```
> send <dat_drive>
```

where

<dat_drive> is the DAT0 or DAT1. This parameter is mandatory.

Example

To send files from the tape in DAT drive 0, enter:

```
> send dat0
```

Note: DAT1 is the default tape drive. If no drive is specified, then default DAT1 is selected.

5 Wait for SBA to display a list of possible destinations.

Example response:

```
>Possible destinations for the tape files:
0) stream=BAF1destination=HUBBARD
1) stream=BAF1destination=GIRARD
Select a destination for the tape files or 'x'
to exit {0-1,x}
```

6 Select the destination and the number of the destination.

SBA connects to the destination and prompts you to select the files to send.

Example of response:

```
Connected to 47.239.65.99
Send all files on tape, or prompt for each file?
All files, Prompt, or eXit (A/P/X)?
```

If you want to send	Do
selected files on the tape	step 7
all files on the tape	enter **A** and do step 12

7 Select the files to send.

8 Start the selection process:

> P

9 Wait for SBA to display the name of a file on the tape.

Example of prompt

```
Send file 020001.030002.0001.01.2?
Yes, No, eXit (Y/N/X)
```

If you	Do
want to send the file	step 10
do not want to send the file	type **N**, press the Enter key, and go to step 11

10 Send the file:

> Y

SBA sends the file to the specified destination.

Example response:

```
02.0001.030002.0001.01.2 sent.
```

11 SBA displays the name of the next file on the tape.

If	Do
you want to send the file	step 10
you do not want to send the file	enter **N** repeat step 9
SBA has displayed the names of all the files on the step	step 12

12 Wait for SBA to display the following message.

Example of message

```
End of tape
```

13 You have completed this procedure.

Saving CM amadump records to a UNIX file

Purpose

This procedure provides instructions on how to save the output of an amadump into a UNIX file on the core manager. In this procedure, the core manager is accessed through SDMRLOGIN.

Note: SDMRLOGIN is supported only on DS-512 connected SDMs.

Procedure

Saving CM amadump records to a UNIX file

At the MAPCI

1 Begin to save CM amadump records:

```
> record start onto <devtype>
```

where

<devtype> is sfdev device or any other similar device

2 Log into the core manager:

```
> sdmrlogin
```

At the core manager

3 Log into the core manager as root user.

4 Access amadump and enter the streamname:

```
# amadump <streamname>
```

where

<streamname> is the name of a valid stream configured on the core manager and CM

5 Dump the records:

```
> dump <dump parameters>
```

where

<dump parameters> are the parameters called for when using the amadump sub-command, dump.

Note: This process can take several minutes to perform, depending on the size of the streamname file.

6 Exit amadump once the dump sub-command is complete:

```
> quit
```

7 Exit the core manager remote login session:

```
> exit
```

8 End the save process:

```
> record stop onto <devtype>
```

where

<devtype> is device sfdev or any other similar device you specified in step 1.

The output is stored in the file you created on the device you specified in step 1.

9 You have completed the procedure.

Retrieving, processing, and closing an SBA error file

Purpose

Use this procedure to retrieve, process, and close SBA error files when required.

Application

An error file for each stream is generated when the SuperNode Billing Application (SBA) detects that the declared (or defined) length is greater than the actual length of the data buffer. The data in the buffers is corrupted, but passes the surface transmission tests when transferred through the DS512 links from the CM to the core manager. This is correct, because only the integrity of the data is checked when transferred from the CM to the core manager. The data stream arrives at the core manager exactly as it left the CM, therefore, no error is detected.

Only when the SBA logic processing opens and starts to parse the data does it detect this error. Since the SBA cannot correct the problem at this point, it generates an SBA error file.

Retrieving SBA error files

You retrieve SBA error files the same way you retrieve any other SBA files. Refer to procedure Retrieving billing files for a stream set to inbound file transfer mode on page 151 for more information.

Processing SBA error files

You must manually process SBA error files in order to extract the AMA records. You can open an SBA error file using a hex dump or an octal dump utility on a UNIX machine.

Once the output file is generated from the utility, you must manually parse through the data to determine where each AMA record begins and ends. Following is an example of this exercise using an SBA file without errors, with an interpretation of the data in the output file.

Example of an output file for an SBA file without errors

0000000	1c01	2000	1008	13ff	3e96	05ec	1342	06ec
0000020	1391	7b66	001e	ef00	0210	0000	0068	0000
0000040	aa40	653c	119c	036c	0202	699c	036c	0202
0000060	699c	0081	6c00	000c	0200	000c	0c0c	0c00
0000100	0c0c	0086	0c42	2627	7c14	3051	7c00	0000
0000120	003c	0763	2c00	816c	1430	507c	0000	0001
0000140	4c01	0c30	913c	0c72	0c00	1c03	1523	3000
0000160	0cff	ffff	ffff	ffff	ffff	ffff	ffff	3090
0000200	000c	000c	0070	0000	aa40	625c	119c	036c
0000220	0202	699c	036c	0202	699c	0081	6c00	000c
0000240	0200	000c	0c0c	0c00	0c86	0c64	5919	2c0c
0000260	0086	0c28	9792	9c14	3034	3c00	0000	177c
0000300	5269	2c00	816c	1430	313c	0000	0020	7c01
0000320	0c40	902c	1cff	2c72	0c00	1c08	6043	0000
0000340	0cff	ffff	ffff	ffff	ffff	ffff	ffff	3090
0000360	000c	000c	007e	0000	aa40	364c	142c	036c
0000400	0202	699c	036c	0202	699c	0081	6c00	000c
0000420	0200	000c	0c0c	0c00	0c86	0c61	0908	4c80
0000440	0c84	2882	0c0c	0086	0c67	9398	0c14	3040
0000460	0c00	0000	120c	000c	920c	720c	001c	0860

The first column in the output file indicates the octal address, which is 7 characters. The remaining 8 columns are groups of 4 hex characters. Each row contains 32 hex characters of data, which relates to 16 bytes of data.

Each group of 2 hex characters represents a specific hex value.

- the first 28 bytes of data (starting from 1c01 in the first row with octal address 0000000 to 0000 in the second row (octal address 0000020) represent the DNS file header.
- the next 4 bytes of data (0068 0000) represent the first Record Descriptor Word (RDW).
- The last 2 bytes of the RDW must always be binary zeros (i.e. 0000).

The byte that follows the RDW is the beginning of an AMA record and must always be “aa”.

To calculate the length of an AMA record and determine where it ends. you use the base-10 value of the first 2 bytes (16-bit binary number) of

the RDW. In the example, the first two bytes of the RDW are 0068. The length is in hex format, and you decode it as follows:

- character #4 (8) is multiplied by 1 (8*1=8)
- character #3 (6) is multiplied by 16 raised to 1 power (16*6=96)
- character #2 (0) is multiplied by 16 raised to 2 power (256*0=0)
- character #1(0) is multiplied by 16 raised to 3 power (4096*0=0)

Adding the results, the length of the first AMA record in the example is 104 bytes (8+96=104). Start counting from the first two bytes of the RDW (0068), and count every two characters as 1 byte.

The first AMA record ends with 000c in the row with octal address 0000200. A valid AMA records always ends with “c”.

Continuing with this example, the next RDW (0070 0000) immediately follows the end of the first AMA record. From this RDW, the length of the AMA record to follow calculates out to 112 bytes of data using the same formula as above, that is

- character #4 (0) is multiplied by 1 (0*1=0)
- Character #3 (7) is multiplied by 16 raised to 1 power (16*7=112)
- Character #2 (0) is multiplied by 16 raised to 2 power (256*0=0)
- Character #1 (0) is multiplied by 16 raised to 3 power (4096*0=0)

The second AMA record ends with 000c in the row with octal address 0000360, and is followed by the next RDW (007e 0000). If you continue with this exercise, you can locate all of the other AMA records in this file.

Perform the procedure that follows to process any of your SBA error files.

Processing an SBA error file

On a UNIX machine

1 Open your SBA error file using a hex dump or an octal dump utility. An example of an output file for an SBA error file is shown below:

Example of an output file for an SBA error file

```
0000000   1c59   2202   3010   1352   0409   8464   1bb6   8464
0000020   1b10   1000   0001   0000   0290   2500   1010   000c
0000040   000c   0053   0000   aa00   625c   066c   036c   0916
0000060   601c   036c   0916   601c   0112   2c00   000c   0000
0000100   000c   0c0c   0c02   3c91   6c50   3000   0c0c   0080
0000120   0c65   5626   2c10   3352   4c00   0000   015c   0432
0000140   2c01   122c   1033   479c   0000   0006   0c01   0c30
0000160   978c   1cff   0c8c   0c00   0c00   4b00   00aa   0065
0000200   3c11   9c03   6c09   1660   1c03   6c09   1660   1c01
0000220   122c   0000   0c02   0000   0c0c   0c0c   000c   0c00
0000240   530c   5254   659c   1033   516c   0000   0002   2c05
0000260   552c   0112   2c10   3330   2c00   0000   235c   010c
0000300   4027   6c1c   004b   0000   aa00   653c   119c   036c
0000320   0916   601c   036c   0916   601c   0112   2c00   000c
0000340   0200   000c   1c0c   0c00   0c0c   0053   0c79   6364
0000360   1c10   3354   4c00   0000   000c   0345   2c01   122c
0000400   1033   325c   0000   0021   9c00   1c60   746c   1c00
0000420   4b00   00aa   0065   3c11   9c03   6c09   1660   1c03
0000440   6c09   1660   1c01   122c   0000   0c02   0000   0c1c
0000460   0c0c   000c   0c00   916c   7302   107c   1033   545c
0000500   0000   0000   0c02   222c   0112   2c10   3318   0c00
0000520   0000   365c   001c   4091   9c1c   0cff   ffff   ffff
0000540   ffff   ffff   ffff   ffff   3090   000c   000c   ffff
0000560   ffff   ffff   ffff   ffff   ff30   9000   0c00   0c00
0000600   1010   000c   000c   0000   0000   0000   0000   0000
0000620   0000   0000   0000   0000   0000   0000   0000   0000
*
0010054
```

2 In your output file, locate the DNS header (first 28 bytes).

In the example, the DNS header starts with 1c59 in the first row, and ends with 2500 in the second row.

3 In your output file, locate the RDW (4 bytes that follow the DNS header).

In the example, the RDW is 1010 000c.

4 Verify that the last 2 bytes of the RDW are binary zeros (0000).

If the last 2 bytes of the RDW are	Do
binary zeros (0000)	step 7
not binary zeros (0000)	step 5

In the example, the last 2 bytes of the RDW are 000c (not binary zeros).

5 In your output file, scan row by row and locate the first “aa”, which can indicate the beginning of the first AMA record.

In the example, the first “aa” is located in the row with the octal address 0000040.

6 Verify that the 2 bytes that precede “aa” are binary zeros (0000).

If the 2 bytes that precede “aa” are	Do
binary zeros (0000)	step 7
not binary zeros (0000)	repeat steps 5 and 6 for the next row beginning with “aa”

In the example, the 2 bytes that precede “aa” are binary zeros.

7 Determine the length of the AMA record by calculating the base-10 value of the first 2 bytes of the RDW.

In the example, the first 2 bytes of the RDW are 0053, and the calculation is as follows:

- Character #4 (3) is multiplied by 1 (3*1=3)
- Character #3 (5) is multiplied by 16 raised to 1 power (16*5=80)
- Character #2 (0) is multiplied by 16 raised to 2 power (256*0=0)
- Character #2 (0) is multiplied by 16 raised to 2 power (256*0=0)

8 Using the result from your calculation, locate the end of the AMA record. Start counting from the first two bytes of the RDW, and count every two characters as 1 byte.

You have identified your first AMA record.

In the example, the length of the AMA record is 83 bytes of data. Counting from the first two bytes of the RDW (0053), the first

AMA record ends with “0c” in the row with the octal address 0000160.

9 Verify that the 4 bytes of data that follow the end of your AMA record, which is the next RDW.

If the last 2 bytes of the RDW are	Do
binary zeros (0000)	step 10
not binary zeros (0000)	no other AMA records exist in your output file, and you have completed this procedure

In the example, the next RDW is 004b 0000.

10 Repeat steps 7 through 9.

11 You have completed the procedure.

Closing an SBA error file

You need to manually close error files if the MIB parameter “rcCloseFilesOnGetFiles” is set to no, and if “files closed on time” is set to no for your stream. Otherwise, error files close automatically. To manually close error files, enter the command “closec”.

Activating or deactivating secondary file processing

Purpose

Use the following procedure to activate or deactivate secondary file processing.

Application

Activation or deactivation takes effect when SBA is returned to service (RTS).Busying the SBA places it into backup mode on the switch. Ensure that adequate space is configured on thecore to prevent loss of billing data.

ATTENTION

You can activate or deactivate secondary file processing only when the SuperNode Billing Application (SBA) is either manually busy (ManB) or offline (Offl).

ATTENTION

Data Process and Management System (DPMS) changes may be required to recognize and appropriately handle AMA records when secondary file processing is activated.

Procedure

Activating or deactivating secondary file processing

At the core manager

1 Log into the core manager as the root user.

2 Access the Maintenance level:

```
> sdmmtc
```

3 Access the Application level:

```
> appl
```

4 Busy the SuperNode Billing Application:

```
> bsy <fileset_no>
```

where:

<fileset_no> is the number next to the SBA fileset

5 Quit the Maintenance level:

```
> quit all
```

6 Access the Billing Maintenance level:

```
# billmtc
```

7 Access the Application level:

```
> appl
```

8 Access the Secondary File Processing (SFP) level:

```
> sfp
```

If you want to	Enter
verify whether secondary file processing is either activated or deactivated	> **query** Use the **act** or **deact** command to activate or deactivate secondary file processing.
activate secondary file processing	> **act** > **y** Continue to step 9.
deactivate secondary file processing	> **deact** > **y** Continue to step 9.

9 Quit the Billing Maintenance level:

```
> quit all
```

10 Access the Maintenance level:

```
# sdmmtc
```

11 Access the Application level:

```
> appl
```

12 Return the SuperNode Billing Application to service:

```
> rts <fileset_no>
```

where:

<fileset_no> is the number next to the SBA fileset

Secondary file processing is either activated or deactivated when SBA returns to service.

13 You have completed this procedure.