



# Configuring BAMS for NICS Output

## Overview

This chapter describes the NICS billing record output by the Cisco Billing and Measurements Server (BAMS). You enable NICS output with the NODEPARMS tag ID. For more information, see the [“NODEPARMS Tag ID” section on page 5-10](#).

Once you have configured your system for NICS output you also need to populate the prefix field in the Trunk Group table (see the [“TRUNKGRP—Trunk Group Table” section on page 5-30](#)), and the fields in the Trunk Group Prefix table (see the [“TKGPREFIX—Trunk Group Prefix Table” section on page 5-32](#)).



**Note**

If the length of the data in the CDR file obtained from the Cisco PGW 2200 is greater than that which is expected by BAMS, the data value will be truncated.

## NICS Output

NICS output files are created by the NIC task. These files are stored in the NICS subdirectory of the `/data/nodename` directory (for example, `/data/s0x/NICS`). The fields generated in the NICS output are explained in [Table 9-1](#). The NICS file-naming conventions are explained in [“File-Naming Conventions” section on page A-4](#).

## NICS File Sequence Numbering

The following rules apply to the generation of NICS file-sequence numbering:

- BAMS generates a NICS file sequence number (FSN) for each NICS output file.
- The NICS FSN increments by one each time a new NICS output file is produced.
- The NICS FSN is not affected by PGW failover, and is independent of the PGW file sequence number.
- The NICS FSN is in the range 0001 through 9999. When BAMS first starts up without a previous FSN, the first FSN is 0001. When the FSN reaches 9999 the next FSN is 0001.
- BAMS stores the NICS FSN on disk so that the FSN is not affected by system shutdown.

## NICS Billing Output File Names

NICS files are named in the following format:

CDR.<switch name>.<NICS FSN>.<date time>

- The switch name is the same as the switch ID (field 3).
- The NICS FSN is generated by BAMS as described in “[NICS File Sequence Numbering](#)” section on page 9-1.
- The date time is the date and time when the file is created. BAMS takes the file creation time, CDE 6001 from the 1090 CDB and converts it to the format YYYYMMDDhhmmss in UTC.

## Synchronizing NICS FSNs between Redundant BAMS Nodes



### Note

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This section applies only to redundant BAMS nodes.

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BAMS synchronizes the NICS file sequence number every day at midnight, using the same logic as that of NICS record sequence-number synchronizing.

In some cases, the active and the standby BAMS nodes may not generate the same FSN for the same CDR file. This can occur if one BAMS node is running before the other BAMS node is ready, if the redundancy is set up after BAMS starts processing CDRs, or if one BAMS node misses some CDR files.

To synchronize the FSNs in a redundant configuration, BAMS synchronizes the FSN on a daily basis. BAMS exchanges the FSN before processing the first NICS output file for the day. The date-time from the NICSOUTPUT filename is used to determine whether a file is the first file of the day. All Date-Time values are in UTC.

### Delay in Processing

BAMS waits no longer than one hour for the FSN from the remote node before proceeding without synchronization. If the timer expires, BAMS raises a minor alarm.

### Larger FSN Prevalence

In a redundant configuration, both BAMS nodes use the greater FSN from the two BAMS nodes as the new FSN for the first file of the day.

BAMS sends the date-time being synchronized and the sequence number for each synchronization.

For example, “10-3-2002, 00:01:30, 1234” informs the other node that the next file being processed has time stamp 10/03/2002 00:01:30 (from the 1090 CDB time stamp), and the next FSN is 1234.

BAMS raises a minor alarm if a gap is detected between the current FSN and the previous FSN after synchronization.

## NICS Data Format

[Table 9-1](#) defines the field name, format, length, PGW 2200 CDB, CDE tag numbers and derivation mapping, and padding and alignment for NICS output.

Table 9-1 NICS Output Field Ordering

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	Padding and Alignment
1	Record Sequence Number (RSN)	(1-25 digits), number in decimal format	No direct mapping. BAMS generates the RSN on its own as a 64-bit integer, starting from 1. First record, RSN = 1. Second record, RSN=2, ... The Nth record, RSN = N, ... The RSN is not reset when BAMS restarts or when BAMS generates a new output file.	None
2	Call Event ID	char (26)	Char (1-6), softswitch group ID, first 6 characters of tag 6000 from 1090 CDB. Char (7-14), date in YYYYMMDD format, using value from tag 4100/4101 in CDB 1010 or 1030, uses 4001 if neither is available. Char (15-23), time in HHMMSSmmm format. Char (24-26), the sequence number, decimal format left padded by 0. Uses the last 3 digits of the following number: (tag4002) & 0xffffffff	
3	NICS Identifier (a.k.a. Switch id)	char (10)	CDE tag 6000 from CDB 1090. Tag 6000 may contain up to 32 characters, only up to the first 10 characters are used	None
4	Call Direction	number 1	No direct mapping available, not required, always populated with the digit "0"	None
5	Link ID	number 1	All 1030 CDBs: 0 1040 CDBs without any previous 1060s 0 the first 1060, 1 the second and later 1060, 2 1040 with any previous 1060s, 3	None
6	Calling Party Cat	char(3)	Same as tag 3000 or tag 2000 in 1010 or 1030 CDB, whichever is present. In decimal format, such as 000, 013, etc. Defaults to "000" if no tag 2000 or 3000 is found.	Right aligned, zero padded on left.
7	Origin Line Info		Same as tag 2002 or 3002 in 1010 or 1030 CDB. In decimal format, such as 000, 013, etc., defaults to "000" if no 3002 or 2002 is found.	Right aligned, zero padded on left.
8	Jurisdiction	char(6)	Populated with NUL.	None

Table 9-1 NICS Output Field Ordering (continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	Padding and Alignment
9	Called NAI	number, 3 digits, decimal format	Tag 3007 or 2007 from 1010 or 1030 CDB.	Right aligned, padded by 0
10	Calling NAI	number, 3 digits, decimal format	Tag 3003 or 2003 from 1010 or 1030 CDB.	Right aligned, padded by 0
11	Charge NAI	number, 3 digits, decimal format	Tag 2004 from 1010 or 1030 CDB, defaults to 000 if tag is not available.	Right aligned, padded by 0
12	Caller Presentation	char (2)	Always 00.	
13	Media Type	char (2)	Always 00.	
14	Connection Date	char (8)	Tag 4100 from 1010 or 1030 CDB. Format: YYYYMMDD	
15	Connection Time	char (9)	Tag 4100 from 1010 or 1030 CDB. Format: HHMMSSmmm	
16	Answer Indicator	number (1)	If both tags 4104 and 4105 are present in 1030 or 1010 CDB, the digit is 1. Otherwise the digit is 0.	None
17	Call Termination Code	number (3), decimal	Same as in tag 2008 or 3008 CDE. For example, "016", "031", defaults to NUL for long-duration records.	Right aligned, padded by "0".
18	Originating Country Code	number (5)	Always NUL, not required.	None
19	Originating number	char (40)	CDE 4010 from 1010 or 1030 CDB, with special rules.	None
20	Dialed Country Code	number (5)	Always NUL, not required.	None
21	Dialed Number	char (40)	CDE 4012 from 1010 or 1030 CDB, with special rules.	None
22	Terminating Country Code	number (5)	Always NUL, not required.	None
23	Terminating Number	char (40)	CDE 4014 from 1010 or 1030 CDB.	None
24	Charge Number	char (40)	CDE 4011.	None

Table 9-1 NICS Output Field Ordering (continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	Padding and Alignment
25	Elapsed Time	char (10)	The earlier of 4106 or 4107 from CDB 1040/1030 minus the later of 4104 or 4105 from 1010/1030 CDB or the time stamp (4001) of the last 1060 CDB.  For long durations, this field uses the time stamp of the current 1060 (4001) minus the later of 4104/4105 from the 1010 CDB and the 4001 from the previous 1060 CDB (if any).  Format: HHHMMSSmmm	Right aligned for each subfield, 0 padded.
26	Carrier ID Code	char (4)	CDE 2014 from 1010/1030, in decimal format, default NUL.	None
27	Ingress carrier connection date	char (8)	4103 from 1010/1030 CDB.  Format: YYYYMMDD	None
28	Ingress carrier connection time	char (9)	4103 from 1010/1030 CDB.  Format: HHMMSSmmm	None
29	Ingress carrier disconnection date	char (8)	If (CDE 4028 != 1), it uses the earlier of CDE 4107 and 4106; otherwise, it uses the later of the two.  Format: YYYYMMDD  NUL for long-duration records.	None
30	Ingress carrier disconnection time	char (9)	If (CDE 4028 != 1), it uses the earlier of CDE 4107 and 4106; otherwise, it uses the later of the two.  Format: HHMMSSmmm  NUL for long-duration records.	None
31	Ingress Remote Point Code	char (9)	CDE 4034 from 1010 or 1030.	
32	Ingress CIC ID	number (4)	CDE 4068 from 1010 or 1030, default 0000	Right aligned, zero padded
33	Ingress – Access Device ID	number (10)	Always 0000000000	Right aligned, zero padded
34	Ingress Module	number (4)	Always 0000	Right aligned, zero padded
35	Ingress Line	number (4)	Always 0000	Right aligned, zero padded
36	Ingress Channel	number (4)	Always 0000	Right aligned, zero padded

Table 9-1 NICS Output Field Ordering (continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	Padding and Alignment
37	Ingress trunk group name	char (8)	CDE 4008 from 1010 or 1030 and the prefix value from the Trunk Group table.  For example, if the trunk group is 1001 and the prefix is "SIP", this field is "SIP1001"	None
38	Ingress trunk name	number (8)	CDE 4009 from 1010 or 1030	None
39	Ingress Protocol	char (10)	CDE 4069 from 1010/1030. Values:  0 = ISDN_PRI 1 = SS7 2 = DPNSS 3 = CAS 4 = ASN 5 = Unknown 6 = EISUP 7 = H323 8 = SIP 9 = MGCP  Default = Unknown	None
40	Ingress Coding	char (16)	Use value from CDE 4207. This CDE is available from 1010, 1030 or 1040. The latest value is always used.	None
41	Ingress Audio Cap	char (16)	Always NUL.	
42	Ingress - IP Address	char (15)	Use value from CDE 4205. This CDE is available from 1010, 1030 or 1040. The latest value is always used.	Three chars for each dot-separated field of the IP address. Right aligned, zero padded.
43	Ingress RTP Port	number (6)	Use value from CDE 4209. This CDE is available from 1010, 1030 or 1040. The latest value is always used.	Right aligned, zero padded
44	Ingress Pkts sent	number (9)	Always 000000000	Right aligned, zero padded

Table 9-1 NICS Output Field Ordering (continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	Padding and Alignment
45	Ingress Pkts recv	number (9)	Always 000000000	Right aligned, zero padded
46	Ingress Pkts dropped	number (9)	Always 000000000	Right aligned, zero padded
47	End Date	char (8)	Derived from the earlier of CDE 4106 or 4107 in 1010 or 1030 CDB. For long distance, this field uses the time stamp of the current CDB (CDE 4001). Format: YYYYMMDD	
48	End Time	char (9)	Derived from the earlier of CDE 4106 or 4107 in 1010 or 1030 CDB. For long distance, this field uses the time stamp of the current CDB (CDE 4001). Format: HHMMSSmmm	
49	Answer Date	char (8)	For the first record (Link_ID = 0 or 1), the value is derived from 4104 in 1010 or 1030; if 4104 is not present, it uses 4100 in 1010 or 1030. For the second and later records of the same call, it uses the time stamp (CDE 4001) of the previous 1060 CDB. Format: YYYYMMDD	
50	Answer Time	char (9)	For the first record (Link_ID = 0 or 1), the value is derived from 4104 in 1010 or 1030; if 4104 is not present, it uses 4100 in 1010 or 1030. For the second and later records of the same call, it uses the time stamp (CDE 4001) of the previous 1060 CDB. Format: HHMMSSmmm	
51	Carrier Select Info	number (2)	CDE 2015 from 1010 or 1030, default 00	
52	Routing select	number (2)	Route index, first two octets of CDE 4045 from 1010, default 00	Right aligned, zero padded
53	Egress Remote PC	char (9)	CDE 4037 from 1010 or 1030.	
54	Egress CIC	number (4)	CDE 4072 from 1010 or 1030, default 0000	Right aligned, zero padded
55	Egress—Access Device ID	char (10)	Always NUL.	None

Table 9-1 NICS Output Field Ordering (continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	Padding and Alignment
56	Egress Module	char (4)	Always NUL.	
57	Egress Line	char (4)	Always NUL.	
58	Egress Channel	char (4)	Always NUL.	
59	Egress trunk group name	char (8)	CDE 4015 from 1010 or 1030, and the prefix value from the Trunk Group table.  For example, if the trunk group is 2001 and the prefix is “P”, this field is “P2001”.	None
60	Egress trunk name	number (8)	CDE 4016 from 1010 or 1030.	
61	Egress Protocol	char (10)	CDE 4073 from 1010 or 1030. Values:  0 = ISDN_PRI 1 = SS7 2 = DPNSS 3 = CAS 4 = ASN 5 = Unknown 6 = EISUP 7 = H323 8 = SIP 9 = MGCP  Default = Unknown	
62	Egress Coding	char (16)	Use value from CDE 4208. This CDE is available from 1010, 1030 or 1040. The latest value is always used.	
63	Egress Audio Cap	char (16)	Always NUL.	
64	Egress—IP Address	char (15)	Use value from CDE 4206. This CDE is available from 1010, 1030 or 1040. The latest value is always used.	Three characters for each dot-separated field of the IP address. Right aligned, zero padded.
65	Egress RTP Port	number (6)	Use value from CDE 4210. This CDE is available from 1010, 1030 or 1040. The latest value is always used.	Right aligned, zero padded



Table 9-1 NICS Output Field Ordering (continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	Padding and Alignment
66	Egress Pkts sent	number (9)	Always 000000000	Right aligned, zero padded
67	Egress Pkts recv	number (9)	Always 000000000	Right aligned, zero padded
68	Egress Pkts dropped	number (9)	Always 000000000	Right aligned, zero padded
69	Egress carrier connection date	char (8)	4103 from 1010 or 1030. Format: YYYYMMDD	None
70	Egress carrier connection time	char (9)	4103 from 1010 or 1030. Format: HHMMSSmmm	None
71	Egress carrier disconnection date	char (8)	If (CDE 4028 == 1), it uses the earlier of CDE 4106 and 4107; otherwise, it uses the later of the two. Format: YYYYMMDD	None
72	Egress carrier disconnection time	char (9)	If (CDE 4028 == 1), it uses the earlier of CDE 4106 and 4107; otherwise, it uses the later of the two. Format: HHMMSSmmm	None
73	Services		Not used, always NUL.	None

