Release Notes for Cisco Billing and Measurements Server Software Release 3.13 and Related Patches

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These release notes provide supporting information related to the Cisco Billing and Measurements Server (BAMS) software Release 3.13 and related patches.

Contents

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Platform Support

Cisco BAMS Release 3.x runs on the Sun Solaris 8 operating system. For installation and platform information, refer to Chapter 1 of the *Cisco Billing and Measurements Server User's Guide*.

Supported Features Cisco BAMS 3.13 (NICS Phase 2)

Cisco BAMS release 3.13 (NICS Phase 2) introduces mapping changes for several fields in NICS output. The fields are: 19, 40, 42, 43, 62, 64, and 65.

CDE tags 4205 to 4210 may be present in both 1010 and 1040 CDBS for completed calls. BAMS uses the value from the 1040 CDB, if the source CDE is present in this CDB.

BAMS fills the fields 42 and 64 with IP addresses. The source CDE 4205 and 4206 may be in the form of either numeric-dot-separated addresses or fully-qualifying Domain Names (DN). If the fully-qualifying Domain Name is used instead of the dot address by the PGW, BAMS fills the field with up to the first 15 characters of the Domain Name for this field.

To define how the NICS output changes differ from the preceding release of Cisco BAMS 3.13, Table 1 includes a second column for PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2), which shows how the CDE tags changed from the initial release of Cisco BAMS 3.13 to Cisco BAMS 3.13 (NICS Phase 2).

Table 1 NICS Output Field Ordering

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	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.	No change.	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	No change.	
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	No change.	None
4	Call Direction	number 1	No direct mapping available, not required, always populated with the digit “0”	No change.	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	No change.	None

Table 1 NICS Output Field Ordering (Continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	Padding and Alignment
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.	No change.	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.	No change.	Right aligned, zero padded on left.
8	Jurisdiction	char(6)	Populated with NUL.	No change.	None
9	Called NAI	number, 3 digits, decimal format	Tag 3007 or 2007 from 1010 or 1030 CDB.	No change.	Right aligned, pad by 0
10	Calling NAI	number, 3 digits, decimal format	Tag 3003 or 2003 from 1010 or 1030 CDB.	No change.	Right aligned, pad 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.	No change.	Right aligned, pad by 0
12	Caller Presentation	char (2)	Always 00.	No change.	
13	Media Type	char (2)	Always 00.	No change.	
14	Connection Date	char (8)	Tag 4100 from 1010 or 1030 CDB. Format: YYYYMMDD	No change.	
15	Connection Time	char (9)	Tag 4100 from 1010 or 1030 CDB. Format: HHMMSSmmm	No change.	
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.	No change.	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.	No change.	Right aligned, padded by "0".
18	Originating Country Code	number (5)	Always NUL, not required.	No change.	None

Table 1 NICS Output Field Ordering (Continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	Padding and Alignment
19	Originating Number	char (40)	CDE 4010 from 1010 or 1030 CDB.	CDE 4010 from 1010 or 1030 CDB, with special rules. **Note** Simplified, these rules change the prefix to 00 in the calling party number if the calling party number nature of address is international. The rules change the prefix to 0 if the calling party number nature of address is national. This applies to egress trunk groups of types 1, 2, 4, and 5 in the TKGPREFIX table associated with the prefix configured in the TRUNKGRP table.	None
20	Dialed Country Code	number (5)	Always NUL, not required.	No change.	None
21	Dialed Number	char (40)	CDE 4012 or CDE 4014 from 1010 or 1030 CDB.	No change.	None
22	Terminating Country Code	number (5)	Always NUL, not required.	No change.	None
23	Terminating Number	char (40)	CDE 4014 from 1010 or 1030 CDB.	No change.	None
24	Charge Number	char (40)	CDE 4011.	No change.	None
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. For long durations, this field uses the time stamp of the 1060 (4001) minus the later of 4104/4105 from the 1010 CDB. Format: HHHMMSSmmm	No change.	Right aligned for each subfield, 0 padded.
26	Carrier ID Code	char (4)	CDE 2014 from 1010/1030, in decimal format, default NUL.	No change.	None
27	Ingress carrier connection date	char (8)	4103 from 1010/1030 CDB. Format: YYYYMMDD	No change.	None

Table 1 NICS Output Field Ordering (Continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	Padding and Alignment
28	Ingress carrier connection time	char (9)	4103 from 1010/1030 CDB. Format: HHMMSSmmm	No change.	None
29	Ingress carrier disconnection date	char (8)	If (CDE 4028 != 1), it uses earlier of CDE 4107 and 4106, otherwise it uses the later of the two. Format: YYYYMMDD NUL for long-duration records.	No change.	None
30	Ingress carrier disconnection time	char (9)	If (CDE 4028 != 1), it uses earlier of CDE 4107 and 4106, otherwise it uses the later of the two. Format: HHMMSSmmm NUL for long-duration records.	No change.	
31	Ingress Remote Point Code	char (9)	CDE 4034 from 1010 or 1030.	No change.	
32	Ingress CIC ID	number (4)	CDE 4068 from 1010 or 1030, default 0000	No change.	Right aligned, zero padded
33	Ingress – Access Device ID	number (10)	Always 0000000000	No change.	Right aligned, zero padded
34	Ingress Module	number (4)	Always 0000	No change.	Right aligned, zero padded
35	Ingress Line	number (4)	Always 0000	No change.	Right aligned, zero padded
36	Ingress Channel	number (4)	Always 0000	No change.	Right aligned, zero padded
37	Ingress trunk group name	char (8)	CDE 4008 from 1010 or 1030 and the prefix value from the trunkgrp table. For example, if the trunk group is 1001 and the prefix is “SIP”, this field is “SIP1001”	No change.	None
38	Ingress trunk name	number (8)	CDE 4009 from 1010 or 1030	No change.	None

Table 1 NICS Output Field Ordering (Continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	Padding and Alignment
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	No change.	None
40	Ingress Coding	char (16)	Always NUL.	Uses 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.	No change.	
42	Ingress – IP Address	char (15)	Always 000.000.000.000	Uses value from CDE 4205. This CDE is available from 1010, 1030 or 1040. The latest value is always used. **Note** If a fully qualifying Domain Name is passed from CDE 4205 instead of the dot address, BAMS uses up to the first 15 characters of the Domain Name for this field.	Three characters for each dot-separated field of the IP address. Right aligned, zero padded.
43	Ingress RTP Port	number (6)	Always 000000	Uses 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	No change.	Right aligned, zero padded

Table 1 NICS Output Field Ordering (Continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	Padding and Alignment
45	Ingress Pkts recv	number (9)	Always 000000000	No change.	Right aligned, zero padded
46	Ingress Pkts dropped	number (9)	Always 000000000	No change.	Right aligned, zero padded
47	End Date	char (8)	Derived from the earlier of CDE 4106 or 4107 in 1010 or 1030 CDB. Format: YYYYMMDD NUL for long-duration records.	No change.	
48	End Time	char (9)	Derived from the earlier of CDE 4106 or 4107 in 1010 or 1030 CDB. Format: HHMMSSmmm NUL for long-duration records.	No change.	
49	Answer Date	char (8)	Derived from 4104 in 1010 or 1030, if 4104 is not present, it uses 4100 in 1010 or 1030. Format: YYYYMMDD	No change.	
50	Answer Time	char (9)	Derived from 4104 in 1010 or 1030, if 4104 is not present, it uses 4100 in 1010 or 1030. Format: HHMMSSmmm,	No change.	
51	Carrier Select Info	number (2)	CDE 2015 from 1010 or 1030, default 00	No change.	
52	Routing select	number (2)	Route index, first two octets of CDE 4045 from 1010, default 00	No change.	Right aligned, zero padded
53	Egress Remote PC	char (9)	CDE 4037 from 1010 or 1030.	No change.	
54	Egress CIC	number (4)	CDE 4072 from 1010 or 1030, default 0000	No change.	Right aligned, zero padded
55	Egress – Access Device ID	char (10)	Always NUL.	No change.	None
56	Egress Module	char (4)	Always NUL.	No change.	
57	Egress Line	char (4)	Always NUL.	No change.	
58	Egress Channel	char (4)	Always NUL.	No change.	

Table 1 NICS Output Field Ordering (Continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	Padding and Alignment
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".	No change.	None
60	Egress trunk name	number (8)	CDE 4016 from 1010 or 1030.	No change.	
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	No change.	
62	Egress Coding	char (16)	Always NUL.	Uses 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.	No change.	
64	Egress – IP Address	char (15)	Always 000.000.000.000	Uses 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 fields. Right aligned, zero padded.

Table 1 NICS Output Field Ordering (Continued)

Field	Field Name	Format	PGW 2200 CDB, CDE Tag Numbers and Derivation	PGW 2200 CDB, CDE Tag Numbers and Derivation (NICS Phase 2)	Padding and Alignment
65	Egress RTP Port	number (6)	Always 000000	Uses value from CDE 4210. This CDE is available from 1010, 1030 or 1040. The latest value is always used.	Right aligned, zero padded
66	Egress Pkts sent	number (9)	Always 000000000	No change.	
67	Egress Pkts recv	number (9)	Always 000000000	No change.	Right aligned, zero padded
68	Egress Pkts dropped	number (9)	Always 000000000	No change.	Right aligned, zero padded
69	Egress carrier connection date	char (8)	4103 from 1010 or 1030. Format: YYYYMMDD	No change.	None
70	Egress carrier connection time	char (9)	4103 from 1010 or 1030. Format: HHMMSSmmm	No change.	None
71	Egress carrier disconnection date	char (8)	If (CDE 4028 == 1), it uses earlier of CDE 4106 and 4107, otherwise it uses the later of the two. Format: YYYYMMDD	No change.	None
72	Egress carrier disconnection time	char (9)	If (CDE 4028 == 1), it uses earlier of CDE 4106 and 4107, otherwise it uses the later of the two. Format: HHMMSSmmm	No change.	None
73	Services		Not used, always NUL.	No change.	None

Supported Features Cisco BAMS 3.13

The following are the main features supported in the Cisco BAMS software:

- Collection of data files from the Cisco PGW 2200 Softswitch with support for up to eight nodes

Note The Cisco PGW 2200 PSTN Gateway has been renamed as the Cisco PGW 2200 Softswitch. Older names of this product are the Cisco VSC 3000 and Cisco SC 2200. Some documents may still use the older names.

- Conversion of Media Gateway Controller (MGC) data to industry-standard BAF format
- Creation of billing files in ASCII and binary formats

- Creation of measurements files and support for dynamic as well as configured measurement nodes
- Extendable ASCII record generation
- NICS record generation
- 1110 Binary record generation

Cisco BAMS Terminology

Cisco has changed some of the names for its products. Not all of these name changes have yet been made within the Cisco BAMS software. Note the following terms used in the Cisco BAMS software and configurations and their more recent Cisco MGC software equivalent.

Cisco BAMS Software Term	Cisco MGC Software Term
Nailed	Signaling mode
Switched	Call Control mode
Cisco MGC node	Cisco PGW node
Cisco MGC software	Cisco MGC software
Cisco SC2200 Signalling Controller	Cisco PGW 2200 PSTN Gateway
Cisco VSC3000 Virtual Switch Controller	Cisco PGW 2200 PSTN Gateway

Related Documentation

Refer to the *Cisco Billing and Measurements Server User's Guide* for details.

Installation Notes

Refer to the *Cisco Billing and Measurements Server User's Guide* for installation information.

Note The filename for the BAMS 3.13 is **CSCOcaBAM.pkg**.

Upgrading from Cisco BAMS Release 2.68

Refer to Appendix B in the *Cisco Billing and Measurements Server User's Guide* for complete upgrade information.

Upgrading from Cisco BAMS Release 3.10

You can upgrade to Release 3.13 from Release 3.10 Patch 3 or higher. Refer to Appendix C in the *Cisco Billing and Measurements Server User's Guide* for complete upgrade information.

Cisco BAMS 3.13 Information

Changes and Features

This section contains information about Cisco BAMS software Release 3.13. This release includes the features and changes in all of the previously available Release 3.13 numbered patches.

New Feature

Cisco BAMS Release 3.13 introduces a new 1110 Binary output format. See the *Cisco Billing and Measurements Server User's Guide* for detailed information about the 1110 Binary output format.

Release 3.13 Patch 13 Information

This section includes the following information about Cisco BAMS 3.13 Patch 13:

- New Feature in Cisco BAMS 3.13 Patch 13
- Installing Cisco BAMS 3.13 Patch 13

New Feature in Cisco BAMS 3.13 Patch 13

Cisco BAMS Release 3.13 Patch 13 introduces MIB-2 support for a new CE Ethernet Interface.

The Quad GigaSwift Card (with CE interfaces) replaces the Quad Fast Ethernet (QFE) card. The Quad Fast Ethernet card is no longer in production.

For information about Sun Solaris 8 installation and the Quad GigaSwift Card support for BAMS, see Chapter 2: Sun Solaris Operating System Installation in the *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide*.

(URL—http://www.cisco.com/en/US/products/sw/voicesw/ps1913/products_installation_and_configuration_guide_chapter09186a008007dfa8.html)

Installing Cisco BAMS 3.13 Patch 13

If you are running a previous patch of Cisco BAMS 3.13, you must remove that patch before installing patch 13. To remove a patch, complete the following steps:

Step 1 Login as the BAMS user.

Step 2 Stop the BAMS application by issuing the command: **stop_system**

Step 3 Logout.

Step 4 Login as root.

Step 5 Issue the command: **pkgrm <*earlier_package_name*>**

To install patch 13, complete the following procedure.

Step 1 Stop the BAMS software. (See the *Cisco Billing and Measurements Server User's Guide* for instructions on stopping and starting the BAMS software.)

Step 2 Login as root.

Step 3 Change directory to the directory in which the downloaded files are located.

Step 4 Install the patch 13 software by issuing the command: **pkgadd -d CISCOBAMS313013.pkg**

Step 5 Logout.

Note If you have a redundant system, apply this patch to both systems before making any provisioning changes.

To remove this patch, complete the following procedure.

Step 1 Login as root.

Step 2 Issue the command: **pkgrm CSCOca013**

Step 3 Logout.

Release 3.13 Patch 12 Information

This section includes the following information pertaining to Cisco BAMS 3.13 Patch 12:

- Additional Information in the *Cisco Billing and Measurements Server User's Guide*—Chapter 8: Configuring BAMS for P01 Output
- Resolved caveats in Cisco BAMS 3.13 Patch 12

Additional Information in BAMS User Guide

Additional information is provided in the P01 output tables in Chapter 8: Configuring BAMS for P01 Output in the *Cisco Billing and Measurements Server User's Guide*. This information clarifies the MGC mapping for several fields in Table 8-2:P01 Header Record and Table 8-3: P01 Call Detail Record.

Resolved Caveats in Cisco BAMS 3.13 Patch 12

This section identifies anomalies discovered in the operation of Cisco BAMS, which are resolved in the release of Cisco BAMS 3.13 patch 12.

CSCed37233

Version	Severity	Description
3.13 P9	1	A PGW CDR file caused BAMS to stop processing and dump core file.

Conditions and Symptoms: While processing a CDR file from the PGW on a BAMS system running BAMS 3.13 Patch 9, the FMT process stopped and dumped core. The system never moved beyond the file in question.

Resolution: The BAMS software is modified to process CDRs properly.

CSCed41193

Version	Severity	Description
3.10 P12	2	CDRS produced after upgrading to BAMS 3.10 patch 12 were askew by 86400 seconds (one day).

Conditions and Symptoms: All Date/time fields reported in ASCII, EXTASCII, and BIN1110 output were off by 86400 seconds (one day).

Resolution: The software is modified to process CDRs accurately.

CSCed38155

Version	Severity	Description
3.13	2	Empty ASCII CDRs and Invalid CALL_REFERENCE_ID messages appear in BAMS logs.

Conditions and Symptoms: BAMS loses CRD information from the Cisco PGW 2200. The message "Invalid_CALL_REFERENCE_ID" is generated in rtrv-syslog:count. The problem occurs when NTP changes year from 2003 to 2004. Thee fixed leap year calculation caused BAMS to discard billing records.

Resolution: Install Cisco BAMS Patch 12, which contains the fix.

The installation script will display text and questions based on the BAMS version and patch level you are currently running. One of the following two conditions will apply:

1. If you are installing Cisco BAMS 3.13 Patch 12 to replace Cisco BAMS 3.13 Patch 9 or earlier, the installation script will display the following text and questions:

```
This patch fixes a problem in BAMS where BAMS failed to produce billing records after
New Years Day 2004.
The CDR files are still archived on BAMS under /opt/CISCOBAMS/CDR/archive
Do you want to re-process billing records using the archived files? [y, n] y
Do you want to save old billing records generated after New Years Day? [y, n]
```

2. If you are installing Cisco BAMS 3.13 Patch 12 to replace Cisco BAMS 3.13 Patch 11, the installation script will display the following text and questions:

```
This patch fixes a problem in BAMS where BAMS failed to produce billing records after
New Years Day 2004. The problem only affects the ASCII, EXTASCII, and BIN1110 outputs.
The CDR files are still archived on BAMS under /opt/CISCOBAMS/CDR/archive
Do you want to re-process billing records using the archived files? [y, n] y
Do you want to save old billing records generated after New Years Day? [y, n]
```

The second question is asked only if you answered Y (yes) to the first question.

If you answer yes to question 1, the CDR files archived since New Years Days UTC will be reprocessed. You should then wait a few hours, or even a few days, depending on the size of the archived files.

If you answer yes to question 2, the billing records generated after New Years Day prior to this patch will be saved. The saved directories are:

/opt/CISCOBAMS/data/s0*X*/backup_dir_2004_1

in which *X* is in the range 1 to 8, for a total of eight nodes on BAMS.

Warning **Because reprocessing requires a large amount of free disk space in the /opt/CISCOBAMS/data partitions, you should backup all the files in /opt/CISCOBAMS/CDR and /opt/CISCOBAMS/data partitions before reprocessing.**

CSCed14544

Version	Severity	Description
3.13	3	CSCOk9000 PGW fallback BAMS has no alarms or error messages.

Conditions and Symptoms: The BAMS has no error messages and all POLL sessions end normally as shown in the syslog; however, no CDR records or measurements are produced. This can occur if the BAMS has packages CSCOk9000 and CSCOh013 installed but the PGW does not.

Resolution: To enable BAMS to properly create CDR records and measurements, all components in the network must have CSCOk9000 and CSCOh013 installed; or, all components in the network must not have CSCOk9000 and CSCOh013 installed.

CSCed02880

Version	Severity	Description
3.10	3	Trunk information is missing in P01 CDR records.

Conditions and Symptoms: P01 CDRs generated by BAMS 3.10 may not contain information about the trunk group of the call. This occurs only for P01 CDRs.

Resolution: The text description for Field 13 in Table 8-3 of the *Cisco Billing and Measurements Server User's Guide*, Release 3.13, has been changed to indicate that this field is always filled with the hexadecimal value FF.

Release 3.13 Patch 9 Information

This section includes the following information pertaining to Cisco BAMS Patch 9:

- Resolved Caveats in Cisco BAMS 3.13 Patch 9

Resolved Caveats in Cisco BAMS 3.13 Patch 9

This section identifies anomalies identified in the operation of preceding releases of Cisco BAMS, which are resolved in the release of Cisco BAMS 3.13 Patch 9:

CSCea60702

Version	Severity	Description
3.10	3	BAMS stops processing CDRs after Daylight Savings Time change.

Conditions and Symptoms: In special circumstances, after DST change, BAMS may stop processing CDRs.

Resolution: The software has been modified. The transitions between Daylight Savings Time and Standard Time will not cause BAMS to stop processing CDRs.

CSCed02880

Version	Severity	Description
3.10	3	Trunk information is missing in P01 CDR records.

Conditions and Symptoms: P01 CDR generated by BAMS 3.10 may not contain information about the trunk group of the call. It happens only for P01 CDRs.

Resolution: The text description for Field 13 in Table 8-3 of the *Cisco Billing and Measurements Server (BAMS), Release 3.13* has been changed to indicate that this field is. always filled with the hexadecimal value FF.

Resolved Caveats in Cisco BAMS 3.13 Patch 8

This section identifies anomalies identified in the operation of preceding releases of Cisco BAMS, which are resolved in the release of Cisco BAMS 3.13 Patch 8:

CSCeb16967

Version	Severity	Description
3.10	3	The Cisco PGW does not retain BAMS configuration after a PGW upgrade.

Conditions and Symptoms: While running the BAMS system within a PGW solution, when the PGW software was upgraded, the BAMS-related PGW configuration made to the dmprSink.dat on the PGW was not retained.

The user must re-apply the needed changes to the PGW configuration so that CDR files are polled correctly.

Resolution: A Caution has been added to the *Cisco Billing and Measurements Server User's Guide* to describe this requirement.

Note This operational condition is addressed only by the addition of a Caution in the *Cisco Billing and Measurements Server User's Guide*.

CSCea31411

Version	Severity	Description
3.12	3	BAMS should cache CDEs from call clearing when no setup is received.

Conditions and Symptoms: BAMS should to be able to cache CDEs from call clearing phases when CDEs for setup have not been received yet. If a call is being setup by one PGW host, then cleared from the other before the initial PGW becomes available, calls will go unbilled.

Resolution: In a normal operating environment, BAMS always receives a 1010 Answer CDB followed by a 1040 Release CDB for any completed call. However, in some cases, the 1040 might be received before the 1010, or the 1010 may not be received.

Cisco BAMS handles the following conditions (not involving the 1060) via use of a CDR Flush Timer as follows:

3. If a 1040 is received and a 1010 is received before the timer expiration, BAMS generates one billing record for each of the output formats. For measurements, BAMS credits the corresponding intervals if they are still open for update when the 1010 is received. If the intervals are closed when 1010 is received, the measurements are not updated for this call.
4. If a 1010 is received, but 1040 is not received within a pre-defined CDR Flush Timer interval (default 12 hours), BAMS generates a billing record for each of the enabled output formats with the partial data contained in the 1010 when the CDR Flush Timer expires. The call ATT pegs are credited the same way as normal calls; the call durations are calculated from the start of the call to the CDR Flush Timer expiration. BAMS flushes the call out of memory after CDR Flush Timer expires.
5. If a 1040 is received, but 1010 is not received within a pre-defined CDR Flush Timer interval (default 12 hours), BAMS generates a billing record for each of the enabled output formats with the partial data contained in the 1040 when the CDR Flush Timer expires. No call durations are credited to any interval. The call TERM pegs are not credited either because the trunk group information is not available in the 1040. BAMS flushes the call out of memory after CDR Flush Timer expires.

Handling Special Timeout Cases

Cisco BAMS now uses a CDR Flush Timer to handle the following conditions:

Case 1

In the first case, BAMS receives the answer event (1010 CDB), but does not receive long duration event (1060 CDB) or release event (1040 CDB) before the CDR Flush Timer expires. (The CDR Flush Timer is based on the system clock.)

Case 2

In the second case, the release event (1040 CDB) arrives before the answer event (1010 CDB). This call will be held in memory by BAMS until the answer record arrives or the CDR Flush Timer expires.

In both cases, when the CDR Flush Timer expires, BAMS generates a partial billing record and flushes the call record from its internal memory.

If the answer or release event of a timeout event arrives later, it is treated as another timeout event because the corresponding answer/release event has already been processed by BAMS.

Note The default CDR Flush Timer value is 12 hours (720 minutes).

Release 3.13 Patch 6 Information

This section includes the following information pertaining to Cisco BAMS Patch 6:

- Resolved caveats in Cisco BAMS 3.13 patch 6

Resolved Caveats in Cisco BAMS 3.13 Patch 6

This section identifies anomalies identified in the operation of preceding releases of Cisco BAMS, which are resolved in the release of Cisco BAMS 3.13 Patch 6:

CSCea70535

Version	Severity	Description
3.10	3	PGW XECfgParm.dat value is incorrect.

Conditions and Symptoms: BAMS 3.10 user doc, page 2-1 “Configuring Cisco MGC for BAMS”, step 7, engine.CDRmessageType should have the following values, engine.CDRmessageType=”1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080"

Resolution: The values for engine.CDRmessageType that should appear in the /opt/CiscoMGC/etc/XECfgParm.dat file were corrected in the *Cisco Billing and Measurements Server User’s Guide* starting with the guide for Release 3.12.

CSCea43670

Version	Severity	Description
3.12	3	BAMs error message FMT235 description is incorrect.

Conditions and Symptoms: In *Cisco Billing and Measurements Server Users Guide* (Release 3.12), the description for FTM235 is:

"FMT235 <number> record(s) failed <trunk/sigpath> lookup for file <name> The <number> argument represents the number of records, the <trunk/sigpath> argument represents the trunk group or sigpath, and the <name> argument represents the filename. This message shows the number of lookup failures per file. To find details of a lookup failure, examine the log file /opt/CiscoBAMS/files/sxx/FMT_cdr.log and search for message FMT233. Correct the appropriate record in the Trunk Group table or in the Nailed Connection table."

However, in the actual alarm text for this error message, there is no actual "trunk group or sigpath" identified.

Resolution: The description of FMT235 is corrected in the *Cisco Billing and Measurements Server Users Guide*, Release 3.13.

CSCea43950

Version	Severity	Description
3.12	3	BAMS Formatter task identifier, FMT233, is not valid.

Conditions and Symptoms: Documentation error for the Formatter Task Messages in the Troubleshooting Cisco BAMS user docs.

The FMT (Formatter) task identifier (FMT233) has changed.

Resolution: The application performs as expected. A note is added to Appendix A in the section "Input CDR Files" to clarify this operation.

BAMS writes the record number (23470 in the cited case) in the task-based log (FMT_cdr.log). These messages are then summarized, and the appropriate ID (233) is appended to "FMT".

Then BAMS writes FMT233 to the syslog, which is located in the opt/CiscoBAMS/files directory.

CSCea47198

Version	Severity	Description
3.12	3	CDR filename format for the <hh> field is in GMT zone for .csv file.

Conditions and Symptoms: The CDR file format is cdr_<yyyy><mm><dd><hh><mm><ss>_<sequence_number>.bin

There is a difference in the CDR file format for .csv and .bin files with respect to the <hh>, hour field.The.bin file will have <hh> field set to use the timezone setting on the BAMS and PGW. The .csv file will have <hh> field set to use the GMT timezone. Thus, the two files will have different names.

Resolution: In fact, this is expected behavior. A note has been added to the section "Input CDR Files" in Appendix A of the *Cisco Billing and Measurements Server User's Guide*, Release 3.13, to clarify this operation.

CSCea47206

Version	Severity	Description
3.12	3	CDR filename format file <ss> is different for .bin vs .csv file.

Conditions and Symptoms: CDRs are created on the PGW2200 and named with the format cdr_<yyyy><mm><dd><hh><mm><ss>_<sequence_number>.bin. BAMS retrieves this CDR file and processes it. As part of the BAMS processing, it creates a comma delimited file with the same file name format as the original CDR but with a '.csv' extension in the /opt/CiscoBAMS/data/sxx/ASCII/ directory.

The problem is that BAMS will on occasion increment the seconds portion <ss> of the file name by one. So the filename for .csv will have the <ss> incremented by 1 compared to the .bin file.

We would expect the two files to have the same name with exception of the extension (.bin or .csv) at the end of the file.

Resolution: The application performs as expected. A note has been added to the section "Input CDR Files" in Appendix A of the *Cisco Billing and Measurements Server User's Guide*, Release 3.13, to clarify this operation.

CSCdw14054

Version	Severity	Description
3.08	3	Deleting a single threshold removes everything in that ID.

Conditions and Symptoms: Deleting a single threshold removes the entire record containing all thresholds for the specified ID.

Resolution: This condition is addressed by a Note added to the *Cisco Billing and Measurements Server User's Guide, Release 3.13* in the section "Updating the Threshold Crossing Alarms Table" in chapter 5.

CSCdy01401

Version	Severity	Description
3.10	3	BAMS locks up when processing BAF CDRs.

Conditions and Symptoms: When configured for BAF formatted CDR's the system will hang (AGS & AGB processes will stop) if the network numbering plan does not confirm to the North American Numbering Plan, that is, if the numbers are too short.

Resolution: A Caution has been added to *Cisco Billing and Measurements Server User's Guide, Release 3.13* in the section "Prerequisites for BAF Records" in chapter 6.

CSCed02880

Version	Severity	Description
3.10	3	Trunk information is missing in P01 CDR records.

Conditions and Symptoms: P01 CDR generated by BAMS 3.10 may not contain information about the trunk group of the call. It happens only for P01 CDRs.

Resolution: The text description for Field 13 in Table 8-3 of the *Cisco Billing and Measurements Server (BAMS), Release 3.13* has been changed to indicate that this field is always filled with the hexadecimal value FF.

Release 3.13 Patch 3 Information

This section includes the following information pertaining to Cisco BAMS Patch 3:

- Release 3.13 Open Caveats
- Resolved Caveats in BAMS 3.13

Release 3.13 Open Caveats

This section describes anomalies identified in the operation of Cisco BAMS Release 3.13. All the caveats listed in this section are open in Cisco BAMS Release 3.13. This section describes severity 1 and 2 caveats and select severity 3 caveats.

The following information is provided for each caveat:

- Version—The version of the Cisco BAMS software where the issue was found
- Severity—The severity level, where 1 is the most severe, and 3 is the least severe being reported here
- Description—A brief description of the issue, which corresponds to the header of the DDTS ticket
- Conditions and Symptoms—A description of the conditions under which the issue has been known to occur and what is observed when it occurs
- Workaround—Solutions, if available, to counteract the issue

CSCea77222

Version	Severity	Description
PGW 9.3(2)	3	The Cisco PGW does not retain the BAMS configuration after a PGW upgrade.

Conditions and Symptoms: When a customer is running the BAMS system within a PGW solution, and the PGW software gets upgraded, the BAMS related PGW configuration made to the dmprSink.dat on the PGW is not retained.

Workaround: Re-apply the required changes to the PGW configuration so that CDR files are polled correctly.

CSCdy58974

Version	Severity	Description
3.12	2	In performing an upgrade, the system comes up in simplex mode.

Conditions and Symptoms: Duplex BAMS are active/active after an upgrade to a new release. After an upgrade, the BAMS units automatically are configured as simplex.

Workaround: Re-run the **change_mode** command and run the **chgno::seqno** to get the units back in sync.

CSCdy58807

Version	Severity	Description
3.12	2	Upon upgrade, the seqno is not retained.

Conditions and Symptoms: After an upgrade installation, the system polls but does not collect any files. Upgrade installation of BAMS with provisioning and data saved.

Workaround: Log into the PGW to see what was the last file picked up prior to upgrade. Execute a **chgno** command on BAMS to set the correct sequence number as the upgrade automatically resets the sequence number back to 00001.

CSCdy68909

Version	Severity	Description
3.12	3	Getting file rename error traps.

Conditions and Symptoms: User receives file rename SNMP traps.

Workaround: None.

CSCdy74303

Version	Severity	Description
3.12	3	Maintenance pegs will be off if the PGW receives both a single block and group block for the same circuit.

Conditions and Symptoms: The BAMS measurements report TTL MAINT USE where there is none and the TTL AVLBL CIC is less than expected. This can occur if the PGW receives both a single and a group block of the same circuit. When the group unblock unblocks the circuit, BAMS still reports the block because of the single block message.

Workaround: Reset all measurements by removing the checkpoint files and restarting ACC.

CSCdv15329

Version	Severity	Description
3.02	3	srcver=default baf is turned off, yet bafinfo is turned on

Conditions and Symptoms: The bafinfo parameter is turned on in case bafoutput is turned on.

Workaround: If bafoutput is turned off, as it is in the default setting, then the value of bafinfo is irrelevant and has no impact on BAMS.

CSCdv90967

Version	Severity	Description
3.07	3	The switchinfo sensortype takes more than 3 digits

Conditions and Symptoms: The switchinfo table has the following parameters: sensortype, sensorid, recoffctype, and recoffcid. The mml program currently allows sensortype and recoffctype to be 4 characters, and sensorid and recoffcid to be 8 characters. When these BAF fields are generated, sensortype and recoffctype are truncated to 3 characters, and sensorid and recoffcid are truncated to 7 characters.

Workaround: When you enter these parameters in mml, limit sensortype and recoffctype to 3 characters and sensorid and recoffcid to 7 characters.

CSCdw11384

Version	Severity	Description
3.08	3	Provisioning stuck in session, but prov-stp says no session

Conditions and Symptoms: Occasionally a provisioning session might be started but not cleanly terminated. If that happens, a user attempting to start a provisioning session might get an error indicating that a session already exists.

Workaround: View the user and date of the existing session to determine whether the session is valid. If the existing session is not valid, execute the **prov-stp::force** command to clear any existing provisioning sessions.

CSCdw11443

Version	Severity	Description
3.08	3	Measurement files appear at same time so no thres alms show

Conditions and Symptoms: A possible condition exists that could create multiple measurements files for different intervals at the same time. Because the measurements for multiple intervals are generated at one time, it is possible to not detect threshold alarms that were set and cleared instantaneously in the intervals generated.

Workaround: Carefully monitor the node syslog to determine if threshold alarms were generated when multiple files were produced simultaneously.

CSCdw13942

Version	Severity	Description
3.08	2	On upgrade of Multi-node system, the system is very slow to create sigpath.

Symptoms and Conditions: When a lot of entries in the sigpath are exported as part of the upgrade feature, it is very slow to upgrade when BAMS begins to execute the sigpath entries one by one. Very slow import of data after an upgrade.

Workaround: Do not choose to Save and Restore configuration on uninstall and install. Instead, save an MML batch file where the **rng** command is used for sigpath entries. Reprovision after the upgrade is complete with your batch file that contains the sigpath entries with ranges.

CSCdx15163

Version	Severity	Description
3.10	3	Change to 1 table results in all tables copied to redundant units.

Conditions and Symptoms: A provisioning edit of a single table results in all tables being synchronized with the remote BAMS. When editing or adding tables on the BAMS unit, this results in all tables, whether or not they were edited or added, being transferred to the remote unit.

Workaround: None.

CSCdx64242

Version	Severity	Description
3.10(3)	2	When TG is not configured, measurements for the TG are not reported.

Conditions and Symptoms: Trunk groups that have not been provisioned in the TRUNKGRP table do not generate measurements. Call data on unprovisioned trunk groups generates the following log message in the node syslog file:

```
FMT235  <number> record(s) failed <lookup type> lookup for file <raw file name>
```

This message indicates that a non-zero number of records failed either the SIGPATH or the TRUNKGRP lookup function. The lookup function populates the TRUNKGRP-related fields based on information from the SIGPATH and TRUNKGRP tables. To get more information on the lookup failure, look for messages of this type in the file /opt/CiscoBAMS/files/sxx/FMT_cdr.log:

```
Fail %s lookup of %s: %d
```

A message of this type indicates the trunk group value that was not defined in the TRUNKGRP table. In a nailed (signalling mode) configuration, this message might indicate the sigpath or bearer channel information that failed lookup in the SIGPATH table.

Workaround: To generate measurements for a trunk group, you must define its value in the TRUNKGRP mml table.

CSCdw66074

Version	Severity	Description
3.08	3	Please add sigpath range option to MML help.

Conditions and Symptoms: Without consulting the user documentation, it is not apparent that you can use ranges when entering sigpath information.

```
mml:4:node04>prov-add:sigpath:?
Billing and Measurements Server - BAMS-00 2002-02-06 13:53:04
B  COMPLD
sigpath (hex 0x#...)
bearchan (hex 0x#...)
trunkgrp (numeric)
trunknum (numeric)
   ;
mml:4:node04>prov-add:sigpath:sigpath=0x150001,bearchan=0x1-0x7c,trunkgrp=15,trunknum=1-12
4
Billing and Measurements Server - BAMS-00 2002-02-06 13:58:17
B  COMPLD
   "SIGPATH"
   ;
mml:4:node04>rtrv-ne
Billing and Measurements Server - BAMS-00 2002-02-06 13:59:22
B  RTRV
   "Type: BAMS"
   "Hardware platform: sun4u sparc SUNW,Ultra-80"
   "Vendor: "Cisco Systems, Inc.""
   "Location: Billing and Measurements Server - BAMS-00"
   "Version: "3.08""
   "Polling Status[s04 (node04)]: ACTIVE"
   "s04 (node04) Node Status: ACTIVATED"
   "VSC1 seqno: 040121"
   "VSC2 seqno: 000001"
   "Local hostname: va-papaya"
   "Unit ID: BAMS-00"
   "BAMS-00 hostname: va-papaya"
   "BAMS-01 hostname: va-pegasus"
   "Measurement Interval: 10 minutes"
   "VSC Configuration: SC2200 Nailed"
   ;
```

Workaround: For information on specifying a sigpath range, see the section "Updating the Nailed Connection Table" in Chapter 5 of the *Cisco Billing and Measurements Server User's Guide*.

CSCdv86781

Version	Severity	Description
3.06	3	Exporting a non-active config on a system node generates a core dump.

Conditions and Symptoms: This problem occurs only when exporting a non-active configuration on a system node.

Workaround: None.

CSCdy10852

Version	Severity	Description
3.10 P6	3	A dynamic configuration of cics does not show in measurements.

Conditions and Symptoms: Dynamic configuration of cics in a trunk group does not change the number of cics in the measurement files. The number of cics stays the same.

Workaround: Restart the system.

CSCdz26059

Version	Severity	Description
3.12	3	MML provisioning does not necessarily provide valid reasons for failure.

Conditions and Symptoms: MML responses to failures may not necessarily represent the true failure reason or a failure at all. This occurs when there is a valid error in a batch provisioning script. This may cause provisioning of valid entries to fail and the reason indicated for the failure may be invalid.

Workaround: When a failure reason is reported, isolate the parameters that failed and try to provision individually. In this manner, you can locate and correct the actual problem.

CSCdz59725

Version	Severity	Description
3.13	3	TCA-TBL help display should pause to enable user to read all entries.

Conditions and Symptoms: If a user does not have a users guide to add tca-tbl entries or would like to cut and paste entries out of the prov-add:tca-tbl:? command, this is difficult as the entries allowed in this table have become so numerous, they exceed a single screen display.

Workaround: None.

CSCdz63196

Version	Severity	Description
3.13(1)	3	NODENAME was reset to the default value.

Conditions and Symptoms: The provisioned nodename for a node disappeared; the nodename was displayed as the default value nodeXX.

Workaround: Re-provision the nodename.

CSCdz66794

Version	Severity	Description
3.13	3	A clr alarm with no msgtext was accepted; but, the alarm was not cleared.

Conditions and Symptoms: For ACC227 alarms, the alarm cannot be cleared without the full msgtext or the msgtext up to the @; however, if the user issues a clr alarm such as is allowed for some alarms without the msgtext, it is accepted. However, if another rtrv-alarms is issued, the user will see that the command had no affect and the ACC227 alarm is still active.

Workaround: ACC227 alarms must be cleared with full or partial msgtext.

CSCdz66813

Version	Severity	Description
3.13	3	PEGS with cond=1 do not always get Pegged

Conditions and Symptoms: After setting up the TCA-TBL, there was no activity. The user expected to see alarms for each meas interval for my TCA-TBL entries with cond=1. When the user started up the call rate, she expected the alarms to clear. Few alarms were set during the inactive period and, for those few, the alarms did not automatically clear when the condition was removed.

Workaround: None.

CSCdz69095

Version	Severity	Description
3.13	3	If there is no activity on a trunk group, the less-than TCAs are never sent.

Conditions and Symptoms: A user set a TCA to send an alert if there was no activity on a configured trunk group. When an instance of no activity occurred, the Threshold Crossing Alert was not sent.

Workaround: None.

CSCdz76556

Version	Severity	Description
3.10(10)	3	While upgrading from release 2.68 to 3.10 (P10), milliseconds were dropped from the ascii output field # 20.

Conditions and Symptoms: Field # 20 of ASCII output has the value .000 rather than a true millisecond value for a call in progress during upgrade from 2.68 to 3.10 patch 10. Note that the seconds value is correct; only the milliseconds value is set to 0.

Workaround: None.

Resolved Caveats in Cisco BAMS 3.13

This section identifies the anomalies identified in the operation of preceding releases of Cisco BAMS, which are resolved in the core release of Cisco BAMS 3.13:

CSCdy61204

Version	Severity	Description
3.12	2	A **prov-diff** command problem corrupts the configuration of the system on which it is run.

Conditions and Symptoms: The BAMS MML command **prov-diff** fails and SNMP traps flood the system monitoring the traps. After the **prov-diff** is performed the unit it is performed on, the tables are corrupt and the system fails over to the other unit with a good config.

Resolution: This problem has been fixed in the MML program.

CSCdy87873

Version	Severity	Description
3.12	2	While upgrading from 3.10 to 3.12 and attempting to preserve data, no NICS directory was created.

Conditions and Symptoms: When the user tried to save the data directories during the uninstall/installprocess while upgrading from 3.10 to 3.12, the NICS directories under each node were not automatically created. When the user turned on nics in nodeparms, errors indicated that the NIC task was dying and restarting until thee user manually created a NICS directory under /opt/CiscoBAMS/data/s0X/.

Resolution: The installation script has been fixed to create the NICS and BIN1110 directory if these subv do not exist in the data node directories.

CSCdv55460

Version	Severity	Description
3.05	3	Received an stty error during installation.

Conditions and Symptoms: Received the an stty error on installations of 3.05.

Resolution: This message has been eliminated by redirecting stderr to /dev/null when the BAMS installation script executes the set_nodenames program.

CSCdx32285

Version	Severity	Description
3.10	2	Solaris 8 (CSCOh005) needs to differentiate between PGW/BAMS

Conditions and Symptoms: Installing the Solaris 8 patch CSCOh005 on the Cisco BAMS server can create problems.

Resolution: This has been resolved in the *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide* as follows:

There is a note on page 2-45, in the section “Installing the Solaris 8 Patch Cluster” (last paragraph before the section “Installing the BAMS Disk Array”):

“For BAMS: If a Disk Array is being used, proceed to the 'Installing the BAMS Disk Array' section on page 2-45. Otherwise, the BAMS software can now be loaded.

NOTE: Do not install the Solaris patch CSCOh005 on the BAMS server.”

Also, Chapter 2: Setup and Installation of the *Cisco Billing and Measurements Server User’s Guide* for release 3.12 specifically mentions that one should not install this patch.

CSCdx32301

Version	Severity	Description
3.10	2	Solaris 8 patch CSCOh015 produces failures on BAMS.

Conditions and Symptoms: Installing the Solaris 8 patch CSCOh015 on the Cisco BAMS server can create problems.

Resolution: This problem was addressed in the *Release Notes for Cisco Billing and Measurements Server Software Release 3.10*, and in Chapter 2 of the *Cisco Billings and Measurements Server User’s Guide* for BAMS release 3.10.

CSCdx34705

Version	Severity	Description
3.10(1)	2	When a system is busy polling, a sw-ovr cannot be performed

Conditions and Symptoms: The mml command **sw-ovr** fails if the node POL task is currently busy. Failure occurs because the polling control record is locked.

Workaround: Monitor the syslog to determine when the polling session is complete and then retry this

CSCdx82276

Version	Severity	Description
3.10 (P4)	2	The new measurements TTL AVLBL CIC shows incorrect numbers if cics are OOS.

Conditions and Symptoms: The measurements are showing the wrong number of cic available when the mgcp link goes down and the cics are OOS.

Resolution: The ACC and COR tasks have been modified to correctly process PGW tag 4032. The format of this tag has been modified in the PGW system. The range of values for this tag has changed from 1-3 to 1-6.

CSCdy10951

Version	Severity	Description
3.10 (P6)	3	TTL AVLBL CIC is always 0.

Conditions and Symptoms: The TTL AVLBL CIC measurement shows 0 on some of the trunk groups. Even if one restarts the PGW, the BAMS measurement does not change.

Resolution: The ACC and COR tasks have been modified to correctly process PGW tag 4032. The format of this tag has been modified in the PGW system. The range of values for this tag has changed from 1-3 to 1-6.

CSCdy10959

Version	Severity	Description
3.10	3	TTL MAINT USE Measurement is incorrect.

Conditions and Symptoms: TTL MAINT USE peg is not accurate.

Resolution: The ACC and COR tasks have been modified to correctly process PGW tag 4032. The format of this tag has been modified in the PGW system. The range of values for this tag has changed from 1-3 to 1-6.

Obtaining Documentation

These sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at this URL:

http://www.cisco.com

Translated documentation is available at this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

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You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/cgi-bin/order/order_root.pl

- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:

  http://www.cisco.com/go/subscription

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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San Jose, CA 95134-9883

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Obtaining Technical Assistance

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Technical Assistance Center

The Cisco Technical Assistance Center (TAC) is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Cisco TAC inquiries are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

The Cisco TAC resource that you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

You can use the Cisco TAC Web Site to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to this URL:

http://www.cisco.com/tac

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

http://www.cisco.com/register/

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC Web Site, you can open a case online by using the TAC Case Open tool at this URL:

http://www.cisco.com/tac/caseopen

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

This document is to be used in conjunction with the documents listed in the "Related Documentation" section.