Alcatel BSS Gateway User Guide

Gateway Release: 3.4.1

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Contents

References

Name	Description
Gateway Framework User Guide	This use guide describes in detail the functionality of the Gateway Framework, and the standard suite of tools available.
Alcatel OMC-BSS PM File Format Specification	The document describes the Alcatel OMC-BSS file format specification for performance measurements result data.

Glossary

BSS	Base Station Subsystem
BSC	Base Station Controller
PIF	Parser Intermediate Format
LIF	Loader Input Format
OMC	Operations and Maintenance Centre
PGHR	Performance Generic Header Record
GPMF	Generic Performance Measurement files

Preface

About this Guide

This guide details the vendor specific information on the Gateway release for the Alcatel BSS Gateway. It contains the following information:

- *Chapter 1. Overview.* This chapter gives a brief description of the Alcatel BSS Gateway and the raw data format it parses.
- *Chapter 2: Engine Rules and Configuration.* This chapter details Alcatel BSS specific rules for parsing the raw data and their configuration.
- *Chapter 3: Post Parser Rules and Configuration.* This chapter describes any Alcatel BSS specific Post Parser rules and their configuration.
- *Chapter 4: Tech Pack Support.* This chapter describes any standard support for Tech Packs included with the Gateway.
- *Chapter 5: Installation specific information.* This chapter contains the customer installation specific information that should be completed by Professional Services.

Conventions

The following conventions are used in this guide:

`Fixed width`	Highlights a block of example code, a configuration entry, or a command line instruction

1. Overview

1.1 The Gateway Framework

The Alcatel BSS Gateway uses the Gateway Framework as a container for the execution of its engine and post parser stages. The Gateway Framework and vendor Gateway are de coupled into two separate installations. The Gateway Framework consists of a library of Perl modules that provides functionality such as:

- a container for the execution of the vendor Engine and Post Parser rules for of data transformation
- Intermediate (PIF) and output data (LIF) storage and management
- logging utilities
- cleanup and crash recovery
- statistics gathering

The vendor Gateway plugs into the Gateway Framework and extends this functionality to provide the final Gateway that parses the vendor data.

More information on the standard Gateway configuration is contained in the Gateway Framework User Guide.

Only Alcatel BSS specific configuration details will be described in this document.

1.2 Alcatel BSS Gateway Overview

1.2.1 Network Details

The Alcatel BSS Gateway processes both performance management result and network configuration files made available from the Alcatel OMC-R for the BSC subsection of the mobile network.

The OMC-R makes several file types available to 3rd party applications. The file types of interest to performance management are the Generic Performance Measurement files (GPMF - file type numbers 03) and also the network configuration files.

1.2.2 Data Types

The list of performance types and descriptions processed by the Alcatel BSS Gateway are listed in table 1. The block numbers associated with each performance type are also listed.

Performance Type Number	***Block Numbers***	***Description***
1	11, 12	Traffic Measurements
2	21	Resource Availability Measurements
3	30, 31	Resource Usage measurements CCCH
4	40, 41	Resource Usage measurements SDCCH
5	50, 51	Resource Usage Measurements RTCH
6	60,	Cell hand over measurement counters
7	71	LAPD measurements
8	81	X.25 measurements
9	90, 91, 93	N7 measurements
10	100	SDCCH Observation measurements
11	110	RTCH Measurements Observation
12	120	Internal hand-over observation measurements
13	130	Incoming hand-over observation measurements
14	140	Outgoing hand-over observation
15	150	TCH Observation
18	180, 181	A-Interface measurements
19	190	SMS PP measurements
25	251	SCCP measurements
26	260, 261	Results per serving cell measurements (incoming handovers)
27	270, 271	Results per target cell measurements (outgoing hand-over)
28	280	SDCCH hand-over
29	290	Directed Retry measurements
30	300	MS Cell Broadcast measurements
31	3100, 3110, 3111, 3112, 3115, 3120, 3121.	Radio measurement statistics
32	320	Change of frequency band measurements
33	330	Electro-Magnetic Emission Counters
34	340, 341	Voice Group Call Services
110	1110, 1120, 1122, 1130,	Cell/TRX related overview counters

	1135, 1140.	
180	1800, 1810	Traffic Flow measurements

Table 1 – Performance types processed by the Alcatel BSS Gateway.

1.2.3 Data Version Support

The Alcatel BSS Gateway includes configuration file that support Alcatel BSS data for the following versions:

v5.0, v6.0, v7.0, v7.2, v8.0, v9.0.

1.2.4 Data/File Formats

The following describes the data and filename formats for both the Alcatel BSS performance and configuration data.

1.2.4.1 BSS Performance Data

The Alcatel BSS performance data files are binary files. These files are organised as a sequence of records, all of which are numbered sequentially. The generic record format for these files is a 256 byte unformatted. The exact allocation of each byte is determined by the record type and performance type usage of the record. Unused bytes in a record are padded with FF's.

The first record in a performance result file is called the Performance Generic Header Record (PGHR - record type number 12). The data contained in this record is parsed and copied into the PIF header data output file. The data includes:

- System Record Header (containing information on the PGHR).
- BSS version number,
- Managed Object class and instance name,
- Measurement type
- Measurement period begin date and time
- Measurement period end time.

The rest of the records in the file are called Global Performance Measurement Records GPMR. The contents of the GPMR consists of:

- System Record Header (containing information on the GPMR).
- PM counter results
- Filler (remaining space in record).

The byte mapping for the PM counter results section is published in Alcatel Counter Catalog documents for each version. The Alcatel BSS Gateway captures these mappings in a file called cfile.x.y, where where x and y are the vendor's major and minor release numbers respectively.

Full details on the record layout for GPMF file records may be found in the Alcatel OMC-BSS PM File Format Specification document.

1.2.4.2 BSS Performance Measurement File Name Format

The general format of a BSS file name is composed of 12 characters, where:

"A" through "Z" or "0" through "9" or "- " (hyphen filler)

. = "."

x = "0" through "9"

y = "A" through "Z"

Specifically for performance measurement files, the files have the following format:

PMRESccc

For the measurement type number 110 or 180,ccc = "110" or "180". For the measurement type = 01..09, 18, 19 or 25..32, ccc = "-nn" where nn is the measurement type number.

Examples of performance file names are as follows:

PMRES-01 PMRES-04 PMRES-07 PMRES-18 PMRES-26 PMRES-29 PMRES-32

PMRES-02 PMRES-05 PMRES-08 PMRES-19 PMRES-27 PMRES-30 PMRES110

PMRES-03 PMRES-06 PMRES-09 PMRES-25 PMRES-28 PMRES-31 PMRES180

1.2.4.3 BSS Configuration Data

Alcatel BSS Network configuration data is also made available from the OMC-R. These ASCII files are integrated with the performance data by the Gateway for loading into the Metrica Service Assurance platforms.

The configuration data consists of records and include the following information on the network BSC and Cell configuration per OMC:

- BSS version
- OMC name
- BSC Id
- BSC Name
- BTS Index
- BTS sector
- Cell LAC Id
- Cell CI
- Cell Name
- BTS name

Suitable keys common to both the performance data and the network configuration data are used to integrate the configuration data into the performance data output from the Gateway.

1.2.4.4 BSS Configuration File Name Format

The Alcatel BSS configuration file name format looks like the following:

BSSConf.OMC3.20040611120721

The token making up this filename are as follows:

BSSConf	File type
OMC3	OMC name
1	Year
01	Month
1	Day
2	Hour
02	Minute
21	Second

2. Engine Rules and Configuration

This section describes the engine rules supported in the Alcatel BSS Gateway.

2.1 Alcatel BSS Data

The Alcatel BSS Data engine rule processes the binary performance measurement files (GPMF) output by the Alcatel OMC-R system. The engine utilises an external C based Perl extension module that is primarily responsible for managing the binary byte mapping of the data and the division of records into individual PIF files depending on data types.

The data types supported by the Alcatel BSS engine are listed in table 1. The byte mapping and assignment of the data to counter names is based on the cfile.x.y configuration file, where x and y represent the major and minor Alcatel release numbers respectively (i.e, cfile7.2, cfile8.0).

2.1.1 ALCATEL_BSS_DATA Rule Configuration

The following are the Alcatel BSS Data specific rule contained in the ALCATEL_BSS_DATA rule instance in the EngineConfig.pm.

- CONFIG_FILE

This entry points to the location of the configuration file that describes the layout of the raw binary data files presented to the Gateway.

- ALCATEL_MAX_VERSION

This represents the maximum version of performance data acceptable to this instance of the ALCATEL_BSS module. This value is tested against the Performance Generic Header Record (PGHR) BSS version field. This represents the BSS-Phase-Version : (8x) for BSS B7, (91), (92) or (100) for BSS B8.

- ALCATEL_MIN_VERSION

This represents the minimum version of performance data acceptable to this instance of the ALCATEL_BSS.pm module. This value is tested against the Performance Generic Header Record (PGHR) BSS version field.

2.1.2 Binary Data Configuration File

The cfile.x.y configuration file describes the layout of the raw binary data files presented to the Gateway. The following are the main characteristics of this configuration file:

1. Comment and blank lines are allowed in the file.
2. Comment lines begin with a '#'.
3. The configuration file consists of two types of lines. Block name lines and block counter lines.
4. Block name lines give a name and number to a configuration block. An example of the line is:BLOCK 280 NAME := "TYPE280" END
5. The default interpretation of multibyte mappings is little endian. A different endian can also be specified for a block with the insertion of:

   ENDIAN_ORDER := BIG_ENDIAN"

6. This is required for Type 31 configurations:

   BLOCK 3100 NAME:= "TYPE3100" AND ENDIAN_ORDER := "BIG_ENDIAN" END

7. This results in a transformation for two and four byte entries to decimalised string as follows:

   2 Byte MSB, LSB

   4 Byte (MSW,MSB), (MSW,LSB), (LSW,MSB), (LSW,LSB)

8. A Block Counter line associates a counter with a block.
9. A Block Counter line specifies the counters position in bytes from the start of the block and its size in bytes.

   BLOCK 280 COUNTER:= "counter name" AND OFFSET := 0 AND SIZE := 2 END

10. Valid sizes for a counter are 1, 2, 4, 6 or 16 bytes.
11. Sizes 1,2,4 and 6 are interpreted to be integers.
12. Size 16 counters are taken assumed to a date/time stamp and a just written out untouched.
13. Offsets are either 0 or positive integers.
14. The block numbers, counter name, offset and size for the different file types and versions are all found in the documents produced by Alcatel.
15. In the Alcatel documentation all blocks begin with counters call "BLOCK_TYPE" and "BLOCK_LENGTH", these counters are not included in the configuration file described here. The counter immediately following these counters starts at offset '0'.

16. For ease of reading, when writing a configuration file, all the Block Counter lines should follow immediately after their corresponding Block Name line.
17. The configuration includes a facility to repeat a section of counters in a block. This is required to avoid the repetition of counter names in a one-to-one counter name mapping. This facility is required for block types 3120 and 3121. The repeating is achieved by inserting a REPEAT_START and REPEAT_END=<repeat size> in the configuration as shown:

```
BLOCK  3120 NAME    := "TYPE3120"         END
BLOCK  3120 COUNTER := "bts_index"  AND OFFSET := 0   AND SIZE := 1  END
BLOCK  3120 COUNTER := "bts_sector" AND OFFSET := 1   AND SIZE := 1  END
BLOCK  3120 COUNTER := "trxid"      AND OFFSET := 2   AND SIZE := 1  END
#BLOCK 3120 COUNTER := "FILLER"     AND OFFSET := 3   AND SIZE := 1  END
BLOCK  3120 COUNTER := "NEIGBOUR_ARFCN" AND OFFSET := 4 AND SIZE := 2
REPEAT_START END
BLOCK  3120 COUNTER := "NEIGBOUR_BSIC" AND OFFSET := 6 AND SIZE := 1 END
BLOCK  3120 COUNTER := "RMS8a_1"   AND OFFSET := 7   AND SIZE := 1  END
..

BLOCK  3120 COUNTER := "RMS8a_10" AND OFFSET := 16  AND SIZE := 1  END
BLOCK  3120 COUNTER := "RMS8b"    AND OFFSET := 17  AND SIZE := 4
REPEAT_END := 14 END
```

The parsing will create a new record in the PIF file for every repeat. In this instance there will be 14 repeats per block. All counters outside the repeat section of the block are inserted into each record of the repeat.

2.1.3 PIF File Naming

The PIF output file produced by the Alcatel BSS engine. The tokens used to make up the filename are currently hard coded and are defined in table 2

Token name	**Example**
Data type	TYPE_110
BSS Number	1
OMC name	PMRES
Date	19Apr2004
Start time (hour:min)	13:00
End time (hour:min)	13:30

Table 2 – Tokens making up the PIF filename.

An example of an Alcatel BSS performance file is as follows:

TYPE_110-#-1-#-PMRES-#-19Apr2004-#-13:30-#-14:00-#-I.pif

2.2 Alcatel BSS Configuration

The ALCATEL_BSS_CONFIG module controls the processing of the Alcatel network hierarchy data files.

An example of the contents of an Alcatel BSS network configuration file is given in Appendix A.

2.2.1 ALCATEL_BSS_CONFIG Rule Configuration

The following are the Alcatel BSS Configuration specific rule entries contained in the ALCATEL_BSS_DATA rule instance in the EngineConfig.pm.

2.3 LIF_2_PIF Parser Rule

LIF_2_PIF rule is to parse the Alcatel BSS GPRS (LIF) data files.

3. Post Parser Rules and Configuration

This section describes the post parser rules specific to the Alcatel BSS Gateway.

3.1 TYPE_110

This rule is designed to handle the special post-parsing required for the TYPE_110.

The Alcatel-BSS measurement TYPE_110 contains data blocks of four types. These types are 1110, 1120, 1125 and 1130, and can be extended for new blocks. This rule rearranges the blocks from one input file into two output files.

The first output file, which will start with 'TYPE_1120', contains the information from block types 1110 and 1120. Each line of data in this output file will contain information relating to one CELL. The line will be made up of data from both the 1110 and 1120 blocks.

The second output file, which will start with 'TYPE_1130', contains the information from block types 1125 and 1130. Each line of data in this output file will contain information relating to one TRX. The line will be made up of data from both the 1125 and 1130 blocks.

3.1.1 Rule Configuration

The following are the rule entries specific to the TYPE_110 rule instance in the UserConfig.pm.

- PARENT_BLOCK_NAMES

This entry contains the name of the parent block names. The last instances of these blocks are merged with other blocks, but are not written out them selves.

```
PARENT_BLOCK_NAMES          => [qw(TYPE_1110 TYPE_1125)],
```

- WRITEABLE_BLOCK_PAIR_NAMES

This entry contains the name of the block pair names. For every instance of these blocks, they are merged with the last instance of a parent block, and written out. The actual parent block used is determined by the relationship configured in BLOCK_NAME_RELATIONS.

```
WRITEABLE_BLOCK_PAIR_NAMES   => [qw(TYPE_1120 TYPE_1130)],
```

- WRITEABLE_BLOCK_SINGLE_NAMES

The blocks described here are written out as is in individual PIF files.

```
WRITEABLE_BLOCK_SINGLE_NAMES => [qw(TYPE_1135 TYPE_1140)],
```

- BLOCK_NAME_RELATIONS

This hash establishes the relationship between blocks and the parent blocks with which they will be merged.

```
BLOCK_NAME_RELATIONS => {
    TYPE_1120 => 'TYPE_1110',
    TYPE_1130 => 'TYPE_1125',
    TYPE_1135 => 'TYPE_1135',
    TYPE_1140 => 'TYPE_1140',
},
```

- HEADER_INFO_FOR_OUTPUT_FILENAME

This array describes the counter names to be used in generating the output file name for the TYPE_110 rule.

```
HEADER_INFO_FOR_OUTPUT_FILENAME
                    => [qw(BSSNUM OMCNAME DATE STARTTIME ENDTIME)]
```

3.2 FILE_BLOCK_SPLIT

This post parser tool is designed to break up a PIF file containing different blocks in to separate PIF files each containing only one block type. There are no special configuration entries for this rule.

Example configuration :

```
RULE_TYPE              => 'FILE_BLOCK_SPLIT',
RULE_DESCRIPTION       => 'break up PIF file into blocks',
INPUT_FILE_DESCRIPTION => "TYPE_31.*-#-I.pif",
OUTPUT_FORMAT          => "LIF_Writer",
PRODUCE_PIF            => 0,
```

4. Tech Pack Support

4.1 MPM Tech Pack

The following are list of MPM Tech Pack that uses the Alcatel BSS Gateway

- GSM Alcatel BSS B8.0
- GSM Alcatel BSS B9.0

5. Appendix A – Sample Network Configuration Data

The following is an example of Alcatel BSS network hierarchy data:

BSS configuration file generated 20040420103500

VERSION

800

#

OMC_NAME

OMC3

#

START BSC_SECTION

BSC_NUM, BSC_NAME, MIB_VERSION, BSC_TYPE, BSC_NB_DTC, BSC_NB_ACH,BSC_NB_N7, NB_CELL_GPRS, NB_CELL, NB_TRX;

1,202009801_WHain,103,2,72,2304,8,142,142,211;

2,142009801_Linz,103,2,72,2304,13,222,222,330;

3,S234,103,2,48,1536,11,53,55,121;

END BSC_SECTION

START CELL_SECTION

BSC_NUM, BTS_INDEX, BTS_SECTOR, CELL_LAC, CELL_CI, CELL_NAME, CELL_NB_TCH, CELL_NB_SDCCH, BCCH_COMB, BS_AGBLK_RES, TRX_NB, BTS_NAME, CELL_NB_DYN, CELL_NB_EXTRA_ABIS_TS, CELL_NB_MPDCH;

1,1,1,20010,8452,201005261_1,7,4,1,1,1,201005261_01,0,0,0;

1,2,1,740,7401,cell 1,14,8,0,1,2,BTS G3 784,0,0,0;

1,2,2,740,7402,cell 2,14,8,0,1,2,BTS G3 784,0,0,0;

1,3,1,20010,8130,201000130_1,14,8,0,1,2,201000130_03,0,0,0;

1,5,1,20010,8033,201000029_1,14,8,0,1,2,201000029_05,0,0,0;

1,5,2,20010,18033,201000029_2,14,8,0,1,2,201000029_05,0,0,0;

1,5,3,20010,28033,201000029_3,14,8,0,1,2,201000029_05,0,0,0;

1,6,1,740,7405,cell 5,14,8,0,4,2,BTS G3 762,0,0,0;

1,6,2,740,7406,cell 6,14,8,0,4,2,BTS G3 762,0,0,0;

…

3,101,1,200,2006,cell00200_02006,14,8,0,4,2,789_G3_mini_BTS_101,0,2,0;

3,101,2,200,2009,cell00200_02009,14,8,0,4,2,789_G3_mini_BTS_101,0,0,0;

END CELL_SECTION