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Technical Specification

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Advanced Alarm Management (AAM)
Integration Reference Point (IRP);
Common Object Request Broker Architecture (CORBA) Solution Set (SS)
(3GPP TS 32.123 version 9.0.0 Release 9)

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Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

32.121: Advanced Alarm Management Integration Reference Point (IRP): Requirements.

32.122: Advanced Alarm Management Integration Reference Point (IRP): Information Service (IS).

32.123: Advanced Alarm Management Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set.

The Itf-N interface is built up by a number of IRPs and a related Name Convention, which realise the functional capabilities over this interface. The basic structure of the IRPs is defined in 3GPP TS 32.150 [1].

A single network fault may generate a large number of alarms over space and time. In a large and complex network, simultaneous network faults may occur, causing the network operator to be flooded with high volume of alarms. The high volume of alarms, typically the one received by an IRPManager via the getAlarmList or alarm notifications of Alarm IRP specification, greatly inhibits the operator ability to quickly identify and locate the responsible network faults. Advanced AlarmManagement IRP is intended to provide methods to improve this situation.

1 Scope

The purpose of Advanced Alarm Management (AAM) IRP is to define an interface through which an IRPManager can categorize alarm notifications.

The present document is the AAM IRP CORBA Solution Set, whose semantics are specified in AAM IRP Information Service (3GPP TS 32.122 [3]).

This Solution Set specification is related to TS 32.122 v9.0.0.

2 References

The following documents contain provisions that, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

[1] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".

[2] 3GPP TS 32.121: "Telecommunication management; Advanced Alarm Mangement (AAM) Integration Reference Point (IRP): Requirements".

[3] 3GPP TS 32.122: "Telecommunication management; Advanced Alarm Mangement (AAM) Integrations Reference Point (IRP); Information Service (IS)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

IRP: See 3GPP TS 32.150 [1].

IRPAgent: See 3GPP TS 32.150 [1].

IRPManager: See 3GPP TS 32.150 [1].

Alike Alarm: Two alarms are considered alike, if the corresponding alarm notifications are issued by the same object instance with the same alarmType, same perceivedSeverity, same probableCause and same specificProblem (if present).

Lower Edge of Time Window: The point in time which determines the begin of a time span.

Upper Edge of Time Window: The point in time which determines the end of a time span.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AAM Advanced Alarm Management

AAMRule	Advanced Alarm Management Rule
CM	Configuration Management
EM	Element Manager
IOC	Information Object Class
IRP	Integration Reference Point
IS	Information Service
Itf-N	Interface N
MIB	Management Information Base
NE	Network Element

4 Architectural features

The overall architectural feature of Advanced Alarm Mangement IRP is specified in 3GPP TS 32.122 [3].

5 Mapping

5.1 General mappings

Not applicable.

5.2 Operation and notification mapping

The AAM IS (3GPP TS 32.122 [3]) defines semantics of operations visible across the Itf-N.
Table 5.2-1 indicates mapping of these operations and notifications to their equivalents defined in this CORBA SS.

Table 5.2-1: Mapping from IS Operation to SS equivalents

IS Operation / Notification (3GPP TS 32.122)	SS Method	Qualifier
activateAAMRule	activate_aam_rule	M
getAAMRules	get_aam_rules	M
deactivateAAMRule	deactivate_aam_rule	M

5.3 Operation parameter mapping

The AAM IS (3GPP TS 32.122 [3]) defines semantics of parameters carried in operations across the Itf-N.
The following tables indicate the mapping of these parameters, as per operation, to their equivalents defined in this CORBA SS.

Table 5.3-1: Mapping from IS `activate_aam_rule` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
aam_rule_type	AAMConstDefs::AAMRuleType	M
aam_rule_parameter_list	AAMConstDefs:: AAMRuleParameterList	M
filter	AdvancedAlarmManegementConstDefs::FilterType	M
status	Exceptions: AAMConstDefs::ActivateAAMRule, AAMConstDefs::AAMRuleAlreadyActive, GenericIRPManagementSystem::ParameterNotSupported, GenericIRPManagementSystem::InvalidParameter, GenericIRPManagementSystem::ValueNotSupported, GenericIRPManagementSystem::OperationNotSupported	M
aam_rule_identifier	AAMConstDefs:: AAMRuleIdentifier	M

Table 5.3-2: Mapping from IS `get_advanced_alarm_management_rules` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
aam_rule_list	AAMConstDefs::AAMRuleList	M
status	Exceptions: AAMConstDefs::GetAAMRules, GenericIRPManagementSystem::ParameterNotSupported, GenericIRPManagementSystem::InvalidParameter, GenericIRPManagementSystem::ValueNotSupported, GenericIRPManagementSystem::OperationNotSupported	M

Table 5.3-3: Mapping from IS `deactivate_aam_rule` parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
aam_rule_identifier	AAMConstDefs::AAMRuleIdentifier	M
status	Exceptions: AAMConstDefs::DeactivateAAMRule, AAMConstDefs::SpecifiedRuleNotExisting, GenericIRPManagementSystem::ParameterNotSupported, GenericIRPManagementSystem::InvalidParameter, GenericIRPManagementSystem::ValueNotSupported, GenericIRPManagementSystem::OperationNotSupported	M

5.4 Notification parameter mapping

None.

Annex A (normative): IDL specifications

A.1 IDL specification (file name "AAMConstDefs.idl")

```
// File: AAMConstDefs.idl
#ifndef _AAM_CONST_DEFS_IDL_
#define _AAM_CONST_DEFS_IDL_


// This statement must appear after all include statements
#pragma prefix "3gppsa5.org"


/* ## Module: AAMConstDefs */

module AAMConstDefs
{

/*****************************************************************************/
/* definition of types used in several operations for Advanced Alarm Management */
/*****************************************************************************/

enum AAMRuleType {
THRESHOLD_RULE,
TRANSIENT_RULE,
TOGGLE_RULE,
VENDOR_SPECIFIC_RULE
};

enum Status {SUCCESS, FAILURE, AAM_RULE_ALREADY_ACTIVE };

typedef string AAMRuleIdentifier;


/*********************************************************************/
/* types used in operation activateAAMRule and  */
/* types used in operation getAAMRules          */
/*********************************************************************/

typedef string FilterType;

typedef string TimeSpan;
typedef string AlarmOccurenceThreshold;
typedef string SlidingTimeWindow;


struct AAMRuleParameterListForTransientRule
   {
   TimeSpan time_span;
   };


struct AAMRuleParameterListForThresholdRule
   {
   AlarmOccurenceThreshold alarm_occurence_threshold;
   SlidingTimeWindow sliding_time_window;
   };


struct AAMRuleParameterListForToggleRule
   {
   AlarmOccurenceThreshold alarm_occurence_threshold;
   SlidingTimeWindow sliding_time_window_toggling_started;
   SlidingTimeWindow sliding_time_window_toggling_settled;
   };

typedef string VendorSpecificParameterIdentifier;
typedef string VendorSpecificParameterValue;

struct VendorSpecificParameter
```

```
   {
   VendorSpecificParameterIdentifier vendor_specific_parameter_identifier;
   VendorSpecificParameterValue vendor_specific_parameter_value;
   };

typedef sequence <VendorSpecificParameter> AAMRuleParameterListForVendorSpecificRule;


/* The AAMRuleParameterList may contain a list of            */
/* AAMParameters with different content depending on the */
/* AAMRuleType. */
   union AAMRuleParameterList switch (AAMRuleType)
   {
      case THRESHOLD_RULE: AAMRuleParameterListForTransientRule
                           aam_rule_parameter_list_for_transient_rule;
      case TRANSIENT_RULE: AAMRuleParameterListForThresholdRule
                           aam_rule_parameter_list_for_threshold_rule;
      case TOGGLE_RULE: AAMRuleParameterListForToggleRule
                           aam_rule_parameter_list_for_toggle_rule;
      case VENDOR_SPECIFIC_RULE: AAMRuleParameterListForVendorSpecificRule
                           aam_rule_parameter_list_for_vendor_specificRule;
   };


struct AAMRule
   {
   AAMRuleIdentifier aam_rule_identifier;
   AAMRuleType aam_rule_type;
   AAMRuleParameterList aam_rule_parameter_list;
   FilterType filter;
   };

typedef sequence <AAMRule> AAMRuleList;




/*************************************************************************/
/* types used in operation deactivateAAMRule only */
/*************************************************************************/

/* none */


};

#endif //_AAM_CONST_DEFS_IDL_
```

A.2 IDL specification (file name "AAMSystem.idl")

```
//File: AAMSystem.idl
#ifndef _AAM_SYSTEM_IDL_
#define _AAM_SYSTEM_IDL_

#include <AAMConstDefs.idl>
#include <GenericIRPManagementSystem.idl>

// This statement must appear after all include statements
#pragma prefix "3gppsa5.org"

/* ## Module: AAMSystem */

module AdvancedAlarmManagementIRPOperation_1
{

   /*
   If the system fails to complete an operation, then it can provide a reason
   to qualify the exception. The semantics carried in this reason are outside
   the scope of the present document.
   */

   exception ActivateAAMRule { string reason; };
   exception AAMRuleAlreadyActive { string reason; };
   exception GetAAMRules { string reason; };
   exception DeactivateAAMRule { string reason; };
```

```
   exception SpecifiedRuleNotExisting { string reason; };

   interface AdvancedAlarmManagement
   {

      AAMConstDefs::Status activate_aam_rule
      /* for the purpose of this operation see 3GPP TS 32.322 */
         (
         in AAMConstDefs::AAMRuleType
             aam_rule_type,
         in AAMConstDefs::AAMRuleParameterList
             aam_rule_parameter_list,
         in AAMConstDefs::FilterType filter,
         out AAMConstDefs::AAMRuleIdentifier
             aam_rule_identifier

         )
      raises
         (
         ActivateAAMRule,
         AAMRuleAlreadyActive,
         GenericIRPManagementSystem::ParameterNotSupported,
         GenericIRPManagementSystem::InvalidParameter,
         GenericIRPManagementSystem::ValueNotSupported,
         GenericIRPManagementSystem::OperationNotSupported
         );


      AAMConstDefs::Status get_aam_rules
      /* for the purpose of this operation see 3GPP TS 32.322 */
         (
         out AAMConstDefs::AAMRuleList
             aam_rule_list
         )
      raises
         (
         GetAAMRules,
         GenericIRPManagementSystem::ParameterNotSupported,
         GenericIRPManagementSystem::InvalidParameter,
         GenericIRPManagementSystem::ValueNotSupported,
         GenericIRPManagementSystem::OperationNotSupported
         );

      AAMConstDefs::Status deactivate_aam_rule
      /* for the purpose of this operation see 3GPP TS 32.322 */
         (
         in AAMConstDefs::AAMRuleIdentifier
            aam_rule_identifier
         )
      raises
         (
         DeactivateAAMRule,
         SpecifiedRuleNotExisting,
         GenericIRPManagementSystem::ParameterNotSupported,
         GenericIRPManagementSystem::InvalidParameter,
         GenericIRPManagementSystem::ValueNotSupported,
         GenericIRPManagementSystem::OperationNotSupported
         );

   };


};
#endif //_AAM_SYSTEM_IDL_
```

Annex B (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	R	Subject/Comment	Cat	Old	New
Mar 2008	SP-39	SP-080073	--	--	Submitted to SA#39 for Information	--	--	1.0.0
Apr 2008	SP-40	SP-080278	--	--	Submitted to SA#40 for Approval	--	2.0.0	8.0.0
Dec 2009	-	-	-	-	Update to Rel-9 version (MCC)	-	8.0.0	9.0.0

History

Document history		
V9.0.0	February 2010	Publication