
Source: SA5 (Telecom Management)
Title: Rel-5 CR 32.111-3 (Fault Management; Alarm IRP CORBA solution set)
: Add missing IDL definitions to support Security Alarms
Document for: Decision
Agenda Item: 7.5.3

Doc-1st-Level	Spec	CR	Ph	Subject	Cat	Ver-Cur	Doc-2nd-Level	WI
SP-030626	32.111-3	031	Rel-5	Add missing IDL definitions to support Security Alarms	F	5.4.0	S5-037240	OAM-NIM

CHANGE REQUEST

⌘ **32.111-3 CR 031** ⌘ rev **-** ⌘ Current version: **5.4.0** ⌘

For [HELP](#) on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Add missing IDL definitions to support Security Alarms		
Source:	⌘ SA5 (J.Schmidt@Motorola.com)		
Work item code:	⌘ OAM-NIM	Date:	⌘ 21/11/2003
Category:	⌘ F	Release:	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ IDL definitions are missing, required to support Security Alarms.
Summary of change:	⌘ Adding missing IDL definitions.
Consequences if not approved:	⌘ Security Alarms cannot be sufficiently supported by the Alarm IRP.

Clauses affected:	⌘ Annex A.1										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
Y	N										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

KEEP the History box of the TS to be changed (see end of the present document), please

Changes in Annex A.1

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

```
#ifndef AlarmIRPConstDefs_idl
#define AlarmIRPConstDefs_idl

#include "CosNotification.idl"
#include "ManagedGenericIRPConstDefs.idl"

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

/* ## Module: AlarmIRPConstDefs
This module contains commonly used definitions for Alarm IRP
=====
*/
module AlarmIRPConstDefs
{

    /*
    This block identifies the alarm types specified for this IRP version.
    These types carry the same semantics as the TMN ITU-T defined event
    types of the same name.
    Their encodings for this version of Alarm IRP are defined here. Other IRP
    documents, or other versions of Alarm IRP, shall identify their own
    alarm types for their use. They shall define their encodings
    as well. Values defined here are unique among themselves.
    */
    interface AlarmType
    {
        const string COMMUNICATIONS_ALARM = "x1";
        const string PROCESSING_ERROR_ALARM = "x2";
        const string ENVIRONMENTAL_ALARM = "x3";
        const string QUALITY_OF_SERVICE_ALARM = "x4";
        const string EQUIPMENT_ALARM = "x5";
        const string INTEGRITY_VIOLATION = "x6";
        const string OPERATIONAL_VIOLATION = "x7";
        const string PHYSICAL_VIOLATION = "x8";
        const string SECURITY_SERVICE_OR_MECHANISM_VIOLATION = "x9";
        const string TIME_DOMAIN_VIOLATION = "x10";
    };

    /*
    This block identifies the notification types defined by this
    Alarm IRP version.
    */
    interface NotificationType
    {
        const string NOTIFY_FM_NEW_ALARM = "x1";
        const string NOTIFY_FM_CHANGED_ALARM = "x2";
        const string NOTIFY_FM_ACK_STATE_CHANGED = "x3";
        const string NOTIFY_FM_COMMENT_ADDED = "x4";
        const string NOTIFY_FM_CLEARED_ALARM = "x5";
        const string NOTIFY_FM_ALARM_LIST_REBUILT = "x6";
        const string NOTIFY_FM_POTENTIAL_FAULTY_ALARM_LIST = "x7";
    };
};
```

```

/*
This block identifies the levels of severity.
*/
interface PerceivedSeverity
{
    const short INDETERMINATE = 1;
    const short CRITICAL = 2;
    const short MAJOR = 3;
    const short MINOR = 4;
    const short WARNING = 5;
    const short CLEARED = 6;
};

/*
This block identifies the probable cause of a reported alarm.
*/
interface ProbableCause
{
    /*
    Probable causes originating from M.3100.
    Values below correspond to M.3100 values.
    */
    const short INDETERMINATE = 0;
    const short ALARM_INDICATION_SIGNAL = 1;
    const short CALL_SETUP_FAILURE = 2;
    const short DEGRADED_SIGNAL_M3100 = 3;
    const short FAR_END_RECEIVER_FAILURE = 4;
    const short FRAMING_ERROR_M3100 = 5;
    const short LOSS_OF_FRAME = 6;
    const short LOSS_OF_POINTER = 7;
    const short LOSS_OF_SIGNAL = 8;
    const short PAYLOAD_TYPE_MISMATCH = 9;
    const short TRANSMISSION_ERROR = 10;
    const short REMOTE_ALARM_INTERFACE = 11;
    const short EXCESSIVE_BIT_ERROR_RATE = 12;
    const short PATH_TRACE_MISMATCH = 13;
    const short UNAVAILABLE = 14;
    const short SIGNAL_LABEL_MISMATCH = 15;
    const short LOSS_OF_MULTI_FRAME = 16;
    const short COMMUNICATIONS_RECEIVE_FAILURE = 17;
    const short COMMUNICATIONS_TRANSMIT_FAILURE = 18;
    const short MODULATION_FAILURE = 19;
    const short DEMODULATION_FAILURE = 20;
    // Values 21-26 correspond to duplicated probable causes
    // Values 27-50 are reserved for M.3100 potential future extensions
    const short BACK_PLANE_FAILURE = 51;
    const short DATA_SET_PROBLEM = 52;
    const short EQUIPMENT_IDENTIFIER_DUPLICATION = 53;
    const short EXTERNAL_DEVICE_PROBLEM = 54;
    const short LINE_CARD_PROBLEM = 55;
    const short MULTIPLEXER_PROBLEM_M3100 = 56;
    const short NE_IDENTIFIER_DUPLICATION = 57;
    const short POWER_PROBLEM_M3100 = 58;
    const short PROCESSOR_PROBLEM_M3100 = 59;
    const short PROTECTION_PATH_FAILURE = 60;
    const short RECEIVER_FAILURE_M3100 = 61;
    const short REPLACEABLE_UNIT_MISSING = 62;
    const short REPLACEABLE_UNIT_TYPE_MISMATCH = 63;
    const short SYNCHRONISATION_SOURCE_MISMATCH = 64;
    const short TERMINAL_PROBLEM = 65;
    const short TIMING_PROBLEM_M3100 = 66;
    const short TRANSMITTER_FAILURE_M3100 = 67;
    const short TRUNK_CARD_PROBLEM = 68;
};

```

```

const short REPLACEABLE_UNIT_PROBLEM = 69;
const short REAL_TIME_CLOCK_FAILURE = 70;
// Values 71-80 correspond to duplicated probable causes
const short PROTECTION_MECHANISM_FAILURE = 81;
const short PROTECTING_RESOURCE_FAILURE = 82;
// Values 83-100 are reserved for M.3100 potential future extensions
const short AIR_COMPRESSOR_FAILURE = 101;
const short AIR_CONDITIONING_FAILURE = 102;
const short AIR_DRYER_FAILURE = 103;
const short BATTERY_DISCHARGING = 104;
const short BATTERY_FAILURE = 105;
const short COMMERCIAL_POWER_FAILURE = 106;
const short COOLING_FAN_FAILURE = 107;
const short ENGINE_FAILURE = 108;
const short FIRE_DETECTOR_FAILURE = 109;
const short FUSE_FAILURE = 110;
const short GENERATOR_FAILURE = 111;
const short LOW_BATTERY_THRESHOLD = 112;
const short PUMP_FAILURE_M3100 = 113;
const short RECTIFIER_FAILURE = 114;
const short RECTIFIER_HIGH_VOLTAGE = 115;
const short RECTIFIER_LOW_F_VOLTAGE = 116;
const short VENTILATION_SYSTEM_FAILURE = 117;
const short ENCLOSURE_DOOR_OPEN_M3100 = 118;
const short EXPLOSIVE_GAS = 119;
const short FIRE = 120;
const short FLOOD = 121;
const short HIGH_HUMIDITY = 122;
const short HIGH_TEMPERATURE = 123;
const short HIGH_WIND = 124;
const short ICE_BUILD_UP = 125;
const short INTRUSION_DETECTION = 126;
const short LOW_FUEL = 127;
const short LOW_HUMIDITY = 128;
const short LOW_CABLE_PRESSURE = 129;
const short LOW_TEMPERATURE = 130;
const short LOW_WATER = 131;
const short SMOKE = 132;
const short TOXIC_GAS = 133;
// Values 134-135 correspond to duplicated probable causes
const short EXTERNAL_POINT_FAILURE = 136;
// Values 137-150 are reserved for potential M.3100 future extensions
const short STORAGE_CAPACITY_PROBLEM_M3100 = 151;
const short MEMORY_MISMATCH = 152;
const short CORRUPT_DATA_M3100 = 153;
const short OUT_OF_CPU_CYCLES = 154;
const short SOFTWARE_ENVIRONMENT_PROBLEM = 155;
const short SOFTWARE_DOWNLOAD_FAILURE = 156;
const short LOSS_OF_REAL_TIME = 157;
const short REINITIALIZED = 158;
// Values 159-167 correspond to duplicated probable causes
// Values 168-200 are reserved for potential M.3100 future extensions
// Values 201-202 correspond to duplicated probable causes
const short EXCESSIVE_ERROR_RATE = 203;
// Values 204-207 correspond to duplicated probable causes
// Values 208-300 are reserved for potential M.3100 future extensions
/*
Probable causes originating from X.721.
Values below correspond to X.721 values with an offset of 300.
*/
const short ADAPTER_ERROR = 301;
const short APPLICATION_SUBSYSTEM_FAILURE = 302;
const short BANDWIDTH_REDUCTION = 303;

```

```

// Value 304 corresponds to a duplicated probable cause
const short COMMUNICATION_PROTOCOL_ERROR = 305;
const short COMMUNICATION_SUBSYSTEM_FAILURE = 306;
const short CONFIGURATION_OR_CUSTOMIZING_ERROR = 307;
const short CONGESTION = 308;
// Value 309 corresponds to a duplicated probable cause
const short CPU_CYCLES_LIMIT_EXCEEDED = 310;
const short DATA_SET_OR_MODEM_ERROR = 311;
// Value 312 corresponds to a duplicated probable cause
const short DTE_DCE_INTERFACE_ERROR = 313;
// Value 314 corresponds to a duplicated probable cause
const short EQUIPMENT_MALFUNCTION = 315;
const short EXCESSIVE_VIBRATION = 316;
const short FILE_ERROR = 317;
// Values 318-320 correspond to duplicated probable causes
const short HEATING_OR_VENTILATION_OR_COOLING_SYSTEM_PROBLEM = 321;
const short HUMIDITY_UNACCEPTABLE = 322;
const short INPUT_OUTPUT_DEVICE_ERROR = 323;
const short INPUT_DEVICE_ERROR = 324;
const short LAN_ERROR = 325;
const short LEAK_DETECTION = 326;
const short LOCAL_NODE_TRANSMISSION_ERROR = 327;
// Values 328-329 correspond to duplicated probable causes
const short MATERIAL_SUPPLY_EXHAUSTED = 330;
// Value 331 corresponds to a duplicated probable cause
const short OUT_OF_MEMORY = 332;
const short OUTPUT_DEVICE_ERROR = 333;
const short PERFORMANCE_DEGRADED = 334;
// Value 335 corresponds to a duplicated probable cause
const short PRESSURE_UNACCEPTABLE = 336;
// Values 337-338 correspond to duplicated probable causes
const short QUEUE_SIZE_EXCEEDED = 339;
const short RECEIVE_FAILURE = 340;
// Value 341 corresponds to a duplicated probable cause
const short REMOTE_NODE_TRANSMISSION_ERROR = 342;
const short RESOURCE_AT_OR_NEARING_CAPACITY = 343;
const short RESPONSE_TIME_EXCESSIVE = 344;
const short RETRANSMISSION_RATE_EXCESSIVE = 345;
const short SOFTWARE_ERROR = 346;
const short SOFTWARE_PROGRAM_ABNORMALLY_TERMINATED = 347;
const short SOFTWARE_PROGRAM_ERROR = 348;
// Value 349 corresponds to a duplicated probable cause
const short TEMPERATURE_UNACCEPTABLE = 350;
const short THRESHOLD_CROSSED = 351;
// Value 352 corresponds to a duplicated probable cause
const short TOXIC_LEAK_DETECTED = 353;
const short TRANSMIT_FAILURE = 354;
// Value 355 corresponds to a duplicated probable cause
const short UNDERLYING_RESOURCE_UNAVAILABLE = 356;
const short VERSION_MISMATCH = 357;
// Values 358-500 are reserved for potential X.721 future extensions
/*
Probable causes originating from GSM 12.11.
Values below correspond to GSM 12.11 values with an offset of 500.
*/
const short A_BIS_TO_BTS_INTERFACE_FAILURE = 501;
const short A_BIS_TO_TRX_INTERFACE_FAILURE = 502;
const short ANTENNA_PROBLEM = 503;
const short BATTERY_BREAKDOWN = 504;
const short BATTERY_CHARGING_FAULT = 505;
const short CLOCK_SYNCHRONISATION_PROBLEM = 506;
const short COMBINER_PROBLEM = 507;
const short DISK_PROBLEM = 508;

```

```

// Value 509 corresponds to a duplicated probable cause
const short EXCESSIVE_RECEIVER_TEMPERATURE = 510;
const short EXCESSIVE_TRANSMITTER_OUTPUT_POWER = 511;
const short EXCESSIVE_TRANSMITTER_TEMPERATURE = 512;
const short FREQUENCY_HOPPING_DEGRADED = 513;
const short FREQUENCY_HOPPING_FAILURE = 514;
const short FREQUENCY_REDEFINITION_FAILED = 515;
const short LINE_INTERFACE_FAILURE = 516;
const short LINK_FAILURE = 517;
const short LOSS_OF_SYNCHRONISATION = 518;
const short LOST_REDUNDANCY = 519;
const short MAINS_BREAKDOWN_WITH_BATTERY_BACKUP = 520;
const short MAINS_BREAKDOWN_WITHOUT_BATTERY_BACKUP = 521;
const short POWER_SUPPLY_FAILURE = 522;
const short RECEIVER_ANTENNA_FAULT = 523;
// Value 524 corresponds to a duplicated probable cause
const short RECEIVER_MULTICOUPLER_FAILURE = 525;
const short REDUCED_TRANSMITTER_OUTPUT_POWER = 526;
const short SIGNAL_QUALITY_EVALUATION_FAULT = 527;
const short TIMESLOT_HARDWARE_FAILURE = 528;
const short TRANSCEIVER_PROBLEM = 529;
const short TRANSCODER_PROBLEM = 530;
const short TRANSCODER_OR_RATE_ADAPTER_PROBLEM = 531;
const short TRANSMITTER_ANTENNA_FAILURE = 532;
const short TRANSMITTER_ANTENNA_NOT_ADJUSTED = 533;
// Value 534 corresponds to a duplicated probable cause
const short TRANSMITTER_LOW_VOLTAGE_OR_CURRENT = 535;
const short TRANSMITTER_OFF_FREQUENCY = 536;
const short DATABASE_INCONSISTENCY = 537;
const short FILE_SYSTEM_CALL_UNSUCCESSFUL = 538;
const short INPUT_PARAMETER_OUT_OF_RANGE = 539;
const short INVALID_PARAMETER = 540;
const short INVALID_POINTER = 541;
const short MESSAGE_NOT_EXPECTED = 542;
const short MESSAGE_NOT_INITIALISED = 543;
const short MESSAGE_OUT_OF_SEQUENCE = 544;
const short SYSTEM_CALL_UNSUCCESSFUL = 545;
const short TIMEOUT_EXPIRED = 546;
const short VARIABLE_OUT_OF_RANGE = 547;
const short WATCH_DOG_TIMER_EXPIRED = 548;
const short COOLING_SYSTEM_FAILURE = 549;
const short EXTERNAL_EQUIPMENT_FAILURE = 550;
const short EXTERNAL_POWER_SUPPLY_FAILURE = 551;
const short EXTERNAL_TRANSMISSION_DEVICE_FAILURE = 552;
// Values 553-560 correspond to duplicated probable causes
const short REDUCED_ALARM_REPORTING = 561;
const short REDUCED_EVENT_REPORTING = 562;
const short RECUCED_LOGGING_CAPABILITY = 563;
const short SYSTEM_RESOURCES_OVERLOAD = 564;
const short BROADCAST_CHANNEL_FAILURE = 565;
const short CALL_ESTABLISHMENT_ERROR = 566;
const short INVALID_MESSAGE_RECEIVED = 567;
const short INVALID_MSU_RECEIVED = 568;
const short LAPD_LINK_PROTOCOL_FAILURE = 569;
const short LOCAL_ALARM_INDICATION = 570;
const short REMOTE_ALARM_INDICATION = 571;
const short ROUTING_FAILURE = 572;
const short SS7_PROTOCOL_FAILURE = 573;
const short TRANSMISSION_FAILURE = 574;
// Value 575 corresponds to a duplicated probable cause
// Values 576-700 are reserved for potential GSM 12.11 future extensions
/*
Probable causes originating from M.3100 security alarm causes.

```

```

Values below correspond to M.3100 values with an offset of 700.
*/
const short AUTHENTICATION_FAILURE = 701;
const short BREACH_OF_CONFIDENTIALITY = 702;
const short CABLE_TAMPER = 703;
const short DELAYED_INFORMATION = 704;
const short DENIAL_OF_SERVICE = 705;
const short DUPLICATE_INFORMATION = 706;
const short INFORMATION_MISSING = 707;
const short INFORMATION_MODIFICATION_DETECTED = 708;
const short INFORMATION_OUT_OF_SEQUENCE = 709;
// Value 710 corresponds to a duplicated probable cause
const short KEY_EXPIRED = 711;
const short NON_REPUDIATION_FAILURE = 712;
const short OUT_OF_HOURS_ACTIVITY = 713;
const short OUT_OF_SERVICE = 714;
const short PROCEDURAL_ERROR = 715;
const short UNAUTHORISED_ACCESS_ATTEMPT = 716;
const short UNEXPECTED_INFORMATION = 717;
const short UNSPECIFIED_REASON = 718;
// Values 719-800 are reserved for potential M.3100 future extensions
};

/*
This block identifies the acknowledgement state of a reported alarm.
*/
interface AckState
{
    const short ACKNOWLEDGED = 1;
    const short UNACKNOWLEDGED = 2;
};

/*
This block identifies attributes which are included as part of the Alarm IRP
These attribute values should not clash with those defined for the attributes
of notification header (see IDL of Notification IRP).
*/
interface AttributeNameValue
{
    const string ALARM_ID = "f";
    const string PROBABLE_CAUSE = "g";
    const string PERCEIVED_SEVERITY = "h";
    const string SPECIFIC_PROBLEM = "i";
    const string ADDITIONAL_TEXT = "j";
    const string ACK_TIME = "k";
    const string ACK_USER_ID = "l";
    const string ACK_SYSTEM_ID = "m";
    const string ACK_STATE = "n";
    const string COMMENTS = "o";
    const string BACKED_UP_STATUS = "p";
    const string BACK_UP_OBJECT = "q";
    const string THRESHOLD_INFO = "r";
    const string TREND_INDICATION = "s";
    const string STATE_CHANGE_DEFINITION = "t";
    const string MONITORED_ATTRIBUTES = "u";
    const string PROPOSED_REPAIR_ACTIONS = "v";
    const string CORRELATED_NOTIFICATIONS = "w";
    const string REASON = "x";
    const string CLEAR_USER_ID = "y";
    const string CLEAR_SYSTEM_ID = "z";
    const string ALARM_LIST_ALIGNMENT_REQUIREMENT = "ff";
    const string SERVICE_USER = "gg";
    const string SERVICE_PROVIDER = "hh";
};

```



```

| const string SECURITY_ALARM_DETECTOR = "ii";
};

/*
Defines the content of a Comment
*/
struct Comment
{
    ManagedGenericIRPConstDefs::IRPTime comment_time;
    string comment_text;
    string user_id;
    string system_id;
};

/*
Defines a set of comments which are placed in the COMMENTS attribute
of a structured event.
*/
typedef sequence <Comment> CommentSet;

/*
It indicates if an object has a back up.
True implies backed up. False implies not backed up.
*/
typedef boolean BackedUpStatusType;

/*
It indicates if the threshold crossed was in the up or down direction.
*/
enum ThresholdIndicationType {Up, Down};

/*
It indicates if the AlarmList alignment is required.
*/
enum AlarmListAlignmentRequirementType {Required, NotRequired};

/* FloatTypeOpt is an optional type.
If the discriminator is true the value is present.
Otherwise the value is null.
*/
union FloatTypeOpt switch (boolean)
{
    case TRUE: float value;
};

/* ThresholdLevelIndType describes multi-level
threshold crossings.
Up is the only permitted choice for a counter.
If indication is "up", low value is optional.

@member indication: indicates up or down direction
of crossing.
@member low: the low observed value.
@member high: the high observed value.
*/
struct ThresholdLevelIndType
{
    ThresholdIndicationType indication;
}

```

```

    FloatTypeOpt low;
    float high;
};

/* ThresholdLevelIndTypeOpt is an optional type.
   If the discriminator is true the value is present.
   Otherwise, the value is null.
*/

union ThresholdLevelIndTypeOpt switch (boolean)
{
    case TRUE: ThresholdLevelIndType value;
};

/* ThresholdInfoType indicates some guage or counter
   attribute passed a set threshold.

   @member attributeID: identifies the attribute that
       crossed the threshold.
   @member observedValue: attributes that are of type
       integer will be converted to floats.
   @member thresholdlevel: This parameter is for
       multi-level threhsolds. Optional.
   @member armTime: May contain empty string.
*/

struct ThresholdInfoType
{
    string attributeID;
    float observedValue;
    ThresholdLevelIndTypeOpt thresholdLevel;
    string armTime;
};

/*
   It indicates if some observed condition is getting better, worse,
   or not changing.
*/
enum TrendIndicationType {LessSevere, NoChange, MoreSevere};

/*
   It is used to report a changed attribute value.
*/
struct AttributeValueChangeType
{
    string attribute_name;
    any    old_value; // type depends on attribute
    any    new_value; // type depends on attribute
};

typedef sequence <AttributeValueChangeType> AttributeChangeSetType;

/*
   It is used to report an attribute and its value.
*/
struct AttributeValueType
{
    string attribute_name;
    any    value; // type depends on the attribute
};

```

```

typedef sequence <AttributeValueType> AttributeSetType;

typedef sequence <long> NotifIdSetType;

/*
This holds identifiers of notifications that are correlated.
*/
struct CorelatedNotification
{
    string source; // Contains DN of MO that emitted the set of notifications
                  // DN string format in compliance with Name Convention for
                  // Managed Object.
                  // This may be a zero-length string. In this case, the MO
                  // is identified by the value of the MOI attribute
                  // of the Structured Event, i.e., the notification.
    NotifIdSetType notif_id_set; // Set of related notification ids
};

/*
Correlated Notification sets are sets of Correlated Notification
structures.
*/
typedef sequence <CorelatedNotification> CorrelatedNotificationSetType;

/*
Define the structure of Alarm ID and Perceived Severity used within the
alarm acknowledgment operation. Note: perceived_severity is an optional
parameter. If this value is present, it must have one of the defined values
of Interface PerceivedSeverity.
*/
struct AlarmInformationIdAndSev
{
    string alarm_information_reference;
    ManagedGenericIRPConstDefs::ShortTypeOpt perceived_severity;
};

/*
Define set of the above structure of Alarm ID and Perceived Severity.
*/
typedef sequence <AlarmInformationIdAndSev> AlarmInformationIdAndSevSeq;

/*
It indicates the reason for an alarm acknowledgement to have failed:
- The specified Alarm Information is absent from the Alarm List
- The Perceived Severity to be acknowledged has changed and/or is different
  within the Alarm List
- The acknowledgement failed for some other reason
*/
enum AcknowledgeFailureCategories
{
    UnknownAlarmId,
    WrongPerceivedSeverity,
    AcknowledgmentFailed
};

/*
Define the structure returned when an operation fails for a set of alarm ids.
A reason is provided in order to indicate why the operation failed.
*/
struct BadAlarmInformationId
{
    string alarm_information_reference;
    string reason;
};

```

```
};

/*
Define the structure returned when the acknowledge operation fails for a set
of alarm ids.
A failure category and a reason are provided in order to indicate why the
operation failed.
*/
struct BadAcknowledgeAlarmInfo
{
    string alarm_information_reference;
    AcknowledgeFailureCategories failure_category;
    string reason;
};

typedef sequence <BadAlarmInformationId> BadAlarmInformationIdSeq;
typedef sequence <BadAcknowledgeAlarmInfo> BadAcknowledgeAlarmInfoSeq;
typedef sequence <string> AlarmInformationIdSeq;
typedef CosNotification::EventBatch AlarmInformationSeq;
};
#endif
```

End of Changes in Annex A.1 End of Document
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Annex B (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Mar 2000	S_07	SP-000012	--	--	Approved at TSG SA #7 and placed under Change Control	2.0.0	3.0.0
Mar 2000	--	--	--	--	cosmetic	3.0.0	3.0.1
Jun 2000	S_08	SP-000253	005	--	Split of TS - Part 3: Alarm Integration Reference Point (IRP): CORBA Solution Set (SS)	3.0.1	3.1.0
Sep 2000	S_09	SP-000439	003	--	Correct push_structured_event of push_structured_events	3.1.0	3.2.0
Sep 2000	S_09	SP-000439	004	--	Remove the use of interface to encapsulate const strings	3.1.0	3.2.0
Dec 2000	S_10	SP-000521	001	1	Allow "Structured Event Filterable Body Fields" to be absent if parameters are not used	3.2.0	3.3.0
Dec 2000	S_10	SP-000521	002	1	Specific behaviour of the Iterator	3.2.0	3.3.0
Dec 2000	S_10	SP-000521	005	--	Inconsistent qualifiers	3.2.0	3.3.0
Mar 2001	S_11	SP-010032	006	--	Missing how "Notify Alarm List Rebuilt" reason attribute is located in Structured Event	3.3.0	3.4.0
Mar 2001	S_11	SP-010032	007	--	Use alarmInformationBody in additionalInformation.ackTime	3.3.0	3.4.0
Jun 2001	S_12	SP-010239	008	--	Probable Cause "Intrusion Detection" is missing	3.4.0	3.5.0
Jun 2001	S_12	SP-010282	009	--	Alarm IRP: CORBA SS Rel4 - Addition of feature.	3.5.1	4.0.0
Sep 2001	S_13	SP-010469	010	--	Correction of BadAlarmInformationIdSeq parameter type	4.0.0	4.1.0
Sep 2001	S_13	SP-010474	011	--	Definition of thresholdInfo in Alarm IRP: CORBA SS	4.0.0	4.1.0
Sep 2001	S_13	SP-010522	012	--	Eliminate guesses on IDL file names in Alarm IRP: CORBA SS	4.0.0	4.1.0
Mar 2002	S_15	SP-020015	014	--	Correction of erroneous and addition of missing mapping tables	4.1.0	4.2.0
Mar 2002	S_15	SP-020028	015	--	Addition of "perceivedSeverity" as parameter to "acknowledgeAlarms" operation (CORBA SS)	4.1.0	4.2.0
Mar 2002	S_15	--	--	--	Automatic upgrade to Rel-5 (no Rel-5 CR)	4.2.0	5.0.0
Sep 2002	S_17	SP-020476	017	--	Addition of "indeterminate" probable cause in IDL definition	5.0.0	5.1.0
Sep 2002	S_17	SP-020477	018	--	Add clearAlarm and other updates	5.0.0	5.1.0
Sep 2002	S_17	SP-020478	021	--	Add security alarms support in Alarm IRP: CORBA SS	5.0.0	5.1.0
Sep 2002	S_17	SP-020479	019	--	Add optional string parameters in CORBA Solution Set	5.0.0	5.1.0
Dec 2002	S_18	SP-020751	023	--	Add additionalInformation parameter in notification in Alarm IRP: CORBA SS (Alignment with Information Service in Rel-5 32111-2)	5.1.0	5.2.0
Dec 2002	S_18	SP-020752	024	--	Add notifyPotentialFaultyAlarmList in Alarm IRP: CORBA SS (Alignment with Information Service in Rel-5 32111-2)	5.1.0	5.2.0
Mar 2003	S_19	SP-030064	026	--	Correction of CORBA ALARM_IRP_VERSION in line with adopted Rel-5 policy	5.2.0	5.3.0
Mar 2003	S_19	SP-030062	028	--	Add missing ITU-T M.3100 Probable Cause values & Correct CORBA IDL errors	5.2.0	5.3.0
Mar 2003	S_19	SP-030138	029	--	Correction of CORBA IDL Optional clearSystemId	5.2.0	5.3.0
Jun 2003	S_20	SP-030276	030	--	Correction of CORBA type definition in struct "AlarmInformationIdAndSev"	5.3.0	5.4.0