# Alcatel-Lucent 5620

## SERVICE AWARE MANAGER | RELEASE 9.0 R7

### 3GPP OSS INTERFACE COMPLIANCE STATEMENTS

**3HE 06510 AAAG TQZZA Edition 01**

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8.10 This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario. The application of the United Nations Convention on Contracts for the International Sale of Goods is hereby expressly excluded.

# *Preface*

The Preface provides general information about the 5620 Service Aware Manager documentation suite, including this guide.

## Prerequisites

Readers of the 5620 SAM documentation suite are assumed to be familiar with the following:

- 5620 SAM software structure and components
- 5620 SAM GUI operations and tools
- typical 5620 SAM management tasks and procedures
- device and network management concepts

## 5620 SAM documentation suite

The 5620 SAM documentation suite describes the 5620 SAM and the associated network management of its supported devices. Contact your Alcatel-Lucent support representative for information about specific network or facility considerations.

Table 1 lists the documents in the 5620 SAM customer documentation suite.

**Table 1 5620 SAM customer documentation suite**

| Guide | Description |
|---|---|
| **5620 SAM core documentation** | |
| *5620 SAM Release Description* | The *5620 SAM Release Description* provides information about the new features associated with a 5620 SAM software release. |

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| Guide | Description |
|---|---|
| *5620 SAM Planning Guide* | The *5620 SAM Planning Guide* provides information about 5620 SAM scalability and recommended hardware configurations. |
| *5620 SAM System Architecture Guide* | The *5620 SAM System Architecture Guide* is intended for technology officers and network planners to increase their knowledge of the 5620 SAM software structure and components. It describes the system structure, software components, and interfaces of the 5620 SAM. In addition, 5620 SAM fault tolerance, security, and network management capabilities are discussed from an architectural perspective. |
| *5620 SAM \| 5650 CPAM Installation and Upgrade Guide* | The *5620 SAM \| 5650 CPAM Installation and Upgrade Guide* provides OS considerations, configuration information, and procedures for the following:<br>• installing, upgrading, and uninstalling 5620 SAM and 5650 CPAM software in standalone and redundant deployments<br>• 5620 SAM system migration to a different system<br>• conversion from a standalone to a redundant 5620 SAM system |
| *5620 SAM User Guide* | The *5620 SAM User Guide* provides information about using the 5620 SAM to manage the service-aware IP/MPLS network, including GUI basics, commissioning, service configuration, and policy management.<br>The *5620 SAM User Guide* uses a task-based format. Each chapter contains:<br>• a workflow that describes the steps for configuring and using the functions<br>• detailed procedures that list the configurable parameters on the associated forms<br>5620 SAM management information specific to LTE network elements is covered in the *5620 SAM LTE ePC User Guide* and *5620 SAM LTE RAN User Guide*.<br>5620 SAM management information specific to 1830 PSS network elements is covered in the *5620 SAM Optical User Guide*. |
| *5620 SAM Integration Guide* | The *5620 SAM Integration Guide* provides procedures to allow the 5620 SAM to integrate with additional components. |
| *5620 SAM Supervision Module User Guide* | The *5620 SAM Supervision Module User Guide* provides information about how to configure and use the web-based 5620 SAM Supervision Module for fault management and at-a-glance network element monitoring. |
| *5620 SAM Scripts and Templates Developer Guide* | The *5620 SAM Scripts and Templates Developer Guide* provides information that allows you to develop, manage, and execute CLI-based or XML-based scripts or templates.<br>The guide is intended for developers, skilled administrators, and operators who are expected to be familiar with the following:<br>• CLI scripting, XML, and the Velocity engine<br>• basic scripting or programming<br>• 5620 SAM functions |
| *5620 SAM Parameter Guide* | The *5620 SAM Parameter Guide* provides:<br>• parameter descriptions that include value ranges and default values<br>• parameter options and option descriptions<br>• parameter and option dependencies<br>• parameter mappings to the 5620 SAM-O XML equivalent property names<br>There are dynamic links between the procedures in the *5620 SAM User Guide* and the parameter descriptions in the *5620 SAM Parameter Guide*.<br>Parameters specific to LTE network elements are covered in the *5620 SAM LTE Parameter Reference*.<br>Parameters specific to 1830 PSS network elements are covered in the *5620 SAM Optical Parameter Reference*. |
| *5620 SAM Statistics Management Guide* | The *5620 SAM Statistics Management Guide* provides information about how to configure performance and accounting statistics collection and how to view counters using the 5620 SAM. Network examples are included. |

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| Guide | Description |
|---|---|
| *5620 SAM Maintenance Guide* | The *5620 SAM Maintenance Guide* provides procedures for:<br>• generating baseline information for 5620 SAM applications<br>• performing daily, weekly, monthly, and as-required maintenance activities for 5620 SAM-managed networks |
| *5620 SAM Troubleshooting Guide* | The *5620 SAM Troubleshooting Guide* provides task-based procedures and user documentation to:<br>• help resolve issues in the managed and management networks<br>• identify the root cause and plan corrective action for:<br>  • alarm conditions on a network object or customer service<br>  • problems on customer services with no associated alarms<br>• list problem scenarios, possible solutions, and tools to help check:<br>  • network management LANs<br>  • network management platforms and operating systems<br>  • 5620 SAM client GUIs and client OSS applications<br>  • 5620 SAM servers<br>  • 5620 SAM databases |
| *5620 SAM Alarm Reference* | The *5620 SAM Alarm Reference* provides a list of all alarms that the 5620 SAM can raise. The reference is organized by network element type. |
| *5620 SAM Glossary* | The *5620 SAM Glossary* defines terms and acronyms used in all of the 5620 SAM documentation, including 5620 SAM LTE documentation. |
| *5620 SAM Network Element Compatibility Guide* | The *5620 SAM Network Element Compatibility Guide* provides release-specific information about the compatibility of managed device features in 5620 SAM releases. |
| **5620 SAM LTE documentation** | |
| *5620 SAM LTE RAN Release Description* | The *5620 SAM LTE RAN Release Description* provides information about the LTE RAN features associated with the release. |
| *5620 SAM LTE ePC User Guide* | The *5620 SAM LTE ePC User Guide* describes how to discover, configure, and manage LTE ePC devices using the 5620 SAM. The guide is intended for LTE ePC network planners, administrators, and operators.<br>Alcatel-Lucent recommends that you review the entire *5620 SAM LTE ePC User Guide* before you attempt to use the 5620 SAM in your LTE network. |
| *5620 SAM LTE RAN User Guide* | The *5620 SAM LTE RAN User Guide* describes how to discover, configure, and manage the Evolved NodeB, or eNodeB, using the 5620 SAM. The guide is intended for LTE RAN network planners, administrators, and operators.<br>Alcatel-Lucent recommends that you review the entire *5620 SAM LTE RAN User Guide* before you attempt to use the 5620 SAM in your LTE network. |
| *5620 SAM LTE Parameter Reference* | The *5620 SAM LTE Parameter Reference* provides a list of all LTE ePC and LTE RAN parameters supported in the 5620 SAM. |
| **5620 SAM-O documentation** | |
| *5620 SAM XML OSS Interface Developer Guide* | The *5620 SAM XML OSS Interface Developer Guide* provides information that allows you to:<br>• use the 5620 SAM XML OSS interface to access network management information<br>• learn about the information model associated with the managed network<br>• develop OSS applications using the packaged methods, classes, data types, and objects necessary to manage 5620 SAM functions |
| *5620 SAM 3GPP OSS Interface Developer Guide* | The *5620 SAM 3GPP OSS Interface Developer Guide* describes the components and architecture of the 3GPP OSS interface to the 5620 SAM. It includes procedures and samples to assist OSS application developers to use the 3GPP interface to manage LTE devices. |

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| Guide | Description |
|---|---|
| *5620 SAM 3GPP OSS Interface Compliance Statements* | The *5620 SAM 3GPP OSS Interface Compliance Statements* document describes the compliance of the 5620 SAM 3GPP OSS interface with the 3GPP standard. |
| **5620 SAM optical documentation** | |
| *5620 SAM Optical User Guide* | The *5620 SAM Optical User Guide* describes how to discover, configure, and manage optical devices using the 5620 SAM. The guide is intended for optical network planners, administrators, and operators.<br>Alcatel-Lucent recommends that you review the entire *5620 SAM Optical User Guide* before you attempt to use the 5620 SAM in your network. |
| *5620 SAM Optical Parameter Reference* | The *5620 SAM Optical Parameter Reference* provides a list of all optical device parameters supported in the 5620 SAM. |

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## Obtaining customer documentation

You can obtain 5620 SAM customer documentation:

- from the product
- on the web

### On-product documentation

The 5620 SAM on-product customer documentation is delivered in HTML and PDF. Choose Help→User Documentation from the 5620 SAM client GUI to open the help system in a web browser.

The help system opens to the User Documentation Index, which provides a summary of and links to all 5620 SAM customer documents.

Click on the Using the help system tab on the User Documentation Index page to find usage tips for navigating and searching within the on-product customer documentation.

You can return to the User Documentation Index at any time by clicking on the Home icon, shown in Figure 1.

**Figure 1 Home icon**

### Documentation on the web

The 5620 SAM customer documentation is available for download in PDF format from the Alcatel-Lucent Customer Support Center: http://www.alcatel-lucent.com/myaccess. If you are a new user and require access to this service, please contact your Alcatel-Lucent support representative.

In addition to the guides listed in Table 1, Release Notices and other documents not delivered on-product are posted to this site.

### Working with PDFs

You can download PDFs of individual guides from the Alcatel-Lucent Customer Support Center, or you can choose to download a zip of all PDFs for a particular release.

You can use the Search function of Acrobat Reader (File→Search) to find a term in a PDF of any 5620 SAM document. To refine your search, use appropriate search options (for example, search for whole words only or enable case-sensitive searching). You can also search for a term in multiple PDFs at once, provided that they are located in the same directory. For more information, see the Help for Acrobat Reader.

Cross-book hotlinks, for example, from a parameter name in the *5620 SAM User Guide* to a description of that parameter in the *5620 SAM Parameter Guide*, work only if both PDF files are in the same directory.

**Note —** Users of Mozilla browsers may receive an error message when opening the PDF files in the 5620 SAM documentation suite. The offline storage and default cache values used by the browsers are the cause of the error message.

Alcatel-Lucent recommends changing the Mozilla Firefox offline storage or Mozilla 1.7 cache value to 100 Mbytes to eliminate the error message.

## Documentation conventions

Table 2 lists the conventions that are used throughout the documentation.

**Table 2 Documentation conventions**

| Convention | Description | Example |
|---|---|---|
| Key name | Press a keyboard key | Delete |
| Italics | Identifies a variable | *hostname* |
| Key+Key | Type the appropriate consecutive keystroke sequence | CTRL+G |
| Key-Key | Type the appropriate simultaneous keystroke sequence | CTRL-G |
| * | An asterisk is a wildcard character, which means “any character” in a search argument. | log_file*.txt |
| ↵ | Press the Return key | ↵ |
| — | An em dash indicates there is no information. | — |
| → | Indicates that a cascading submenu results from selecting a menu item | Policies→Alarm Policies |

### Procedures with options or substeps

When there are options in a procedure, they are identified by letters. When there are substeps in a procedure, they are identified by Roman numerals.

### Example of options in a procedure

At step 1, you can choose option a or b. At step 2, you must do what the step indicates.

1 This step offers two options. You must choose one of the following.

   a This is one option.

   b This is another option.

2 You must perform this step.

### Example of substeps in a procedure

At step 1, you must perform a series of substeps within a step. At step 2, you must do what the step indicates.

1 This step has a series of substeps that you must perform to complete the step. You must perform the following substeps.

   i This is the first substep.

   ii This is the second substep.

   iii This is the third substep.

2 You must perform this step.

## Measurement conventions

Measurements in this document are expressed in metric units and follow the Système international d'unités (SI) standard for abbreviation of metric units. If imperial measurements are included, they appear in brackets following the metric unit.

Table 3 lists the measurement symbols used in this document.

**Table 3 Bits and bytes conventions**

| Measurement | Symbol |
|---|---|
| bit | b |
| byte | byte |
| kilobits per second | kb/s |

## Important information

The following conventions are used to indicate important information:

**Warning —** Warning indicates that the described activity or situation may, or will, cause equipment damage or serious performance problems.

**Caution —** Caution indicates that the described activity or situation may, or will, cause service interruption.

**Note —** Notes provide information that is, or may be, of special interest.

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# Appendices

# *5620 SAM 3GPP OSS Interface Compliance Statements*

# 1 — Introduction

## 1.1 Overview

This document describes the CNBI R3.0 & R3.1 statements of compliance with 3GPP R7 and R8.

The following IRPs are supported:

- Entry Point IRP
- Notification IRP
- Communications Surveillance IRP
- Basic CM IRP
- Kernel IRP
- Fault Management IRP
- Inventory Management IRP (R3.1 only).

Additionally, the Generic IRP is inherited by the above IRPs. It will support operations to get versions, operations and notifications profile of each supported IRP.

**Note —** Source for IRP information is taken from the September 2008 3GPP R7 & December 2009 R8 32-series specifications, except for the security IRP which is a proprietary implementation.

# 2 — Interface Behaviour

## 2.1 Transfer Method

The CORBA transfer method is used for this interface. The application level protocol used over the interface between the agent and manager is CORBA-IIOP.

## 2.2 Available References

CNBI R3.1 will support 3GPP CORBA R7 or R8, but not both simultaneously. It will be configurable to work in either R7 or R8 mode. The system shall be re-started to switch from one mode to the other.

At start-up, CNBI R3.1 will generate one single EP IRP reference that will provide access to either R7 or R8 IRPs depending on the configured mode.

## 2.3 Notification Service

The system will provide its own notification service which will be started and stopped with CNBI.

The system will support notifications using the attach_push model.

# 3 — IRP Support

## 3.1 IRP Overview

The system will support a single IRPAgent which supports the following IRPs – for full details of the methods supported and any limitations see this chapter for more details.

For the methods marked below as not supported, the system will raise an exception:

- OperationNotSupported if declared in the interface (for methods with O qualifier)
- <method_name>Exception in other cases.

Methods in not supported IRPs will raise a generic CORBA exception (as CNBI will not include the IDL for them).

## 3.2 Entry Point IRP

The following interfaces are defined:

**Table 3-1 Entry Point Interfaces**

| Interface Name | Method name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| EPIRPOperations | getIRPOutline | M | Y | Y |
| | getIRPReference | M | Y | Y |
| | releaseIRPReference | M | N | N |
| EPIRPNotifications | notifyIRPInfoChanges | M | N | N |

### References

Entry Point (EP) Integration Reference Point (IRP)

**Table 3-2 Entry Point references**

| | |
|---|---|
| TS 32.361 | Requirements |
| TS 32.362 | Information Service (IS) |
| TS 32.363 | Common Object Request Broker Architecture (CORBA) Solution Set (SS) |

### General

#### Supported IRP Version Information

For reference, the table below shows the IRPs and version information which can be returned or used by the notifications/operations in this section.

**Table 3-3 Supported IRP versions**

| iRPId (R7) | rDN (R8) | iRPVersionSet_R7 | iRPVersionSet_R8 |
|---|---|---|---|
| EPIRP | EPIRP = 1 | { “32.363 V7.0” } | { “32.363 V8.2” } |
| NotificationIRP | NotificationIRP = 1 | { “32.303 V7.0” } | { “32.303 V8.0” } |
| CSIRP | CSIRP = 1 | { “32.353 V7.0” } | { “32.353 V8.0” } |
| BasicCMIRP | BasicCMIRP = 1 | { “32.603 V7.0” } | { “32.603 V8.1” } |
| KernelIRP | KernelIRP = 1 | { “32.663 V7.0” } | { “32.663 V8.1” } |
| AlarmIRP | AlarmIRP = 1 | { “32.111-3 V7.1” } | { “32.111-3 V8.0” } |

## Operations

## getIRPOutline

### Definition

This is used to access information on the supported IRPs.

**Note —** The system will only return IRP information for its own IRPAgent.

```
EPIRPConstDefs::Result get_irp_outline(
   in ManagedGenericIRPConstDefs::VersionNumber irp_version,
   out EPIRPConstDefs::SupportedIRPList supported_irp_list
)
raises (GetIRPOutline, InvalidIRPVersion);
```

### R7 Parameters

**Table 3-4 R7 parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| iRPVersion | Input | ManagedGenericIRPConstDefs::VersionNumber | An IRP version to use as a filter for the output – see Table 3-3 for a list of the supported IRP versions<br>If this field is empty, no filtering will be performed and all data is returned. |

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| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| supportedIRPList | Output | A<br><br>`DN system_dn;`<br><br>and a sequence of<br><br>`struct IRPElement`<br><br>`{`<br><br>`IRPId irp_id;`<br>`ManagedGenericIRPConstDefs::`<br>`VersionNumberSet irp_versions;`<br><br>`IRPManagementScopeOpt irp_management_scope;`<br><br>`};` | Returns:<br>• the systemDN of the local agent<br>• the list of iRPId and iRPVersionSet as shown in Table 3-3<br><br>The iRPManagementScope will always be empty. |
| Status | Output | `EPIRPConstDefs::Result` | |

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### R8 Parameters

**Table 3-5 R8 parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| iRPVersion | Input | ManagedGenericIRPConstDefs::VersionNumber | An IRP version to use as a filter for the output. See Table 3-3 for a list of the supported IRP versions.<br>If this field is empty, no filtering will be performed and all data is returned. |

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| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| supportedIRPList | Output | A<br>`DN system_dn;`<br>And a sequence of<br>`struct IRPElement`<br>`{`<br>`RDN r_DN;`<br>`ManagedGenericIRPConstDefs::VersionNumberSet irp_versions;`<br>`IRPManagementScopeOpt irp_management_scope;`<br>`};` | Returns<br>• the systemDN of the local agent<br>• the list of r_DN and iRPVersionSet as shown in Table 3-3<br>The iRPManagementScope will always be empty. |
| Status | Output | `EPIRPConstDefs::Result` | |

**(2 of 2)**

### Exceptions

**Table 3-6 getIRPOutline exceptions**

| Exception Name | Purpose |
|---|---|
| InvalidIRPVersion | The supplied IRP version is not supported by this agent (that is, is not in the list in Table 3-3). |
| GetIRPOutline | Generic software error |

## getIRPReference

### R7 Definition

This operation is used to request an IRP reference.

```
EPIRPConstDefs::Result get_irp_reference(
   in EPIRPConstDefs::ManagerIdentifier manager_identifier,
   in EPIRPConstDefs::DN system_dn,
   in EPIRPConstDefs::IRPId irp_id,
   out string irp_reference
)
```

```
raises (GetIRPReference,
        ManagedGenericIRPSystem::InvalidParameter);
```

### R8 Definition

This operation is used to request an IRP reference.

```
EPIRPConstDefs::Result get_irp_reference(
   in EPIRPConstDefs::ManagerIdentifier manager_identifier,
   in EPIRPConstDefs::DN system_dn,
   in EPIRPConstDefs:: RDN r_DN,
   out string irp_reference
)
raises (GetIRPReference,
        ManagedGenericIRPSystem::InvalidParameter);
```

### R7 Parameters

**Table 3-7 R7 parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| managerIdentifier | Input | ManagerIdentifier manager_identifier | An identifier for the manager |
| systemDN | Input | DN system_dn | The value of the systenDN system parameter |
| iRPId | Input | IRPId irp_id | The IRP Id – from the set shown in Table 3-3 |
| iRPReference | Output | String irp_reference | A reference to the requested IRP. |
| Status | Output | EPIRPConstDefs::Result | |

### R8 Parameters

**Table 3-8 R8 parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| managerIdentifier | Input | ManagerIdentifier manager_identifier | An identifier for the manager |
| systemDN | Input | DN system_dn | The value of the systenDN system parameter |

**(1 of 2)**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| R_DN | Input | RDN r_DN | The IRP RDN from the set shown in Table 3-3 |
| iRPReference | Output | String irp_reference | A reference to the requested IRP. |
| Status | Output | EPIRPConstDefs::Result | |

**(2 of 2)**

### Exceptions

**Table 3-9 getIRPReference exceptions**

| Exception Name | Purpose |
|---|---|
| InvalidParameter | The supplied IRP version is not supported by this agent (from the set shown in Table 3-3) |
| GetIRPReference | Generic software error |

## 3.3 Notification IRP

The following interfaces are defined:

**Table 3-10 Notification Interface**

| Interface Name | Method name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| notificationIRPManagement | Subscribe | M | Y | Y |
| | Unsubscribe | M | Y | Y |
| subscriberManagement | getSubscriptionIds | O | Y | Y |
| subscriptionStatusOperations | getSubscriptionStatus | O | Y | Y |
| subscriptionFilterOperations | changeSubscriptionFilter | O | N | N |
| subscriptionSuspendOperations | suspendSubscription | O | N | N |
| | resumeSubscription | O | N | N |
| IRPManagementOperations | getNotificationCategories | O | Y | Y |
| NotificationIRPNotification | Push_structured_events | M | Y | Y |

### References

Notification Integration Reference Point (IRP)

**Table 3-11 NIRP References**

| NIRP Reference | Description |
|---|---|
| TS 32.301 | Requirements |
| TS 32.302 | Information Service (IS) |
| TS 32.303 | Common Object Request Broker Architecture (CORBA) Solution Set (SS) |

## General

### Notification Id

The system will use the following rules for the generation of the notificationId field:

- For alarm notifications and alarm data retrievals: the field is not supported.
- For other notifications: the value is not supported and fixed at 0.

### Subscription Removal and Time Tick Support

The system will support the following range of values for the time tick attribute:

- 0: infinite (does not time out)
- 15-1440: time in minutes between which the manager must perform a GetSubscriptionStatus operation.

If the manager does not perform a GetSubscriptionStatus operation in the time internal the subscription will be automatically removed.

### Suspend and Resume

The operations to suspend and resume a subscription are not supported.

## Operations

## subscribe

### Definition

This operation is used to create a subscription to receive notifications. If additional requests are made when a subscription is already present, the notification categories will be added to those already supported for this subscription.

```
NotificationIRPConstDefs::SubscriptionId attach_push (

   in string manager_reference,

   in ManagedGenericIRPConstDefs::UnsignedLongOpt time_tick,

   in NotificationIRPConstDefs::NotificationCategorySetOpt
```

```
            notification_categories,

          in ManagedGenericIRPConstDefs::StringOpt filter

      )

      raises (Attach,
ManagedGenericIRPSystem::ParameterNotSupported,

              ManagedGenericIRPSystem::InvalidParameter,
AlreadySubscribed,

              AtLeastOneNotificationCategoryNotSupported);
```

### Parameters

**Table 3-12 subscribe parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| managerReference | Input | string manager_reference | Identifier for the manager |
| timeTick | Input | ManagedGenericIRPConstDefs::UnsignedLongOpt time_tick | See Subscription Removal and Time Tick Support for details of the supported values. |
| notification Categories | Input | A flag to indicate whether the category list is provided and a set of strings specifying the categories | See Table 3-13 for a list of supported notification categories<br>An empty value means all notification categories |
| subscriptionId | Output | NotificationIRPConstDefs::SubscriptionId | The subscription id for this subscription |

The following notification categories are supported:

**Table 3-13 supported categories**

| Category name | R7 value | R8 value |
|---|---|---|
| Alarms | 32.111-3 V7.1 | 32.111-3 V8.0 |
| Kernel | 32.663 V7.0 | 32.663 V8.1 |
| Communications Surveillance | 32.353 V7.0 | 32.353 V8.0 |

### Exceptions

**Table 3-14 subscribe exceptions**

| Exception Name | Purpose |
|---|---|
| ParameterNotSupported | Not supported. |

**(1 of 2)**

| Exception Name | Purpose |
|---|---|
| InvalidParameter | Empty or invalid manager Reference |
| AlreadySubscribed | The managerReference is already subscribed to the notification category. |
| AtLeastOneNotificationCategoryNotSupported | One or more of the specified notification categories is already supported |
| Attach | Generic software error |

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## unsubscribe

### Definition

The manager can use this operation to cancel a subscription

```
      void detach (

         in string manager_reference,

         in NotificationIRPConstDefs::SubscriptionIdOpt
subscription_id

      )

      raises (DetachException,

              ManagedGenericIRPSystem::ParameterNotSupported,

              ManagedGenericIRPSystem::InvalidParameter);
```

### Parameters

**Table 3-15 unsubscribe parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| managerReference | Input | string manager_reference | Identifier for the manager |
| subscriptionId | Input | NotificationIRPConstDefs::SubscriptionIdOpt subscription_id | The subscription id. If this value is supplied, only the subscriptions with this id are cancelled. |
| Status | Output | EPIRPConstDefs::Result | |

### Exceptions

**Table 3-16 unsubscribe exceptions**

| Exception Name | Purpose |
|---|---|
| ParameterNotSupported | Not supported |
| InvalidParameter | The specified managerReference or subscriptionId is invalid |
| DetachException | Generic software error |

## getSubscriptionStatus

### Definition

The manager uses this operation to find the status of its subscriptions and to inform the agent that the subscription is still required.

**Note —** A manager must perform this operation within the specified timeTick period otherwise the Agent will remove the subscription.

```
      NotificationIRPConstDefs::NotificationCategorySet
get_subscription_status

      (

         in NotificationIRPConstDefs::SubscriptionId
subscription_id,

         out ManagedGenericIRPConstDefs::StringOpt filter_in_effect,

         out NotificationIRPConstDefs::SubscriptionStateOpt
subscription_state,

         out ManagedGenericIRPConstDefs::UnsignedLongOpt time_tick

      )

      raises (GetSubscriptionStatus,

              ManagedGenericIRPSystem::OperationNotSupported,

              ManagedGenericIRPSystem::InvalidParameter);
```

### Parameters

**Table 3-17 getSubscriptionStatus parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| subscriptionId | Input | NotificationIRPConstDefs::SubscriptionId subscription_id, | Subscription id to check the status |
| filterInEffect | Output | ManagedGenericIRPConstDefs::StringOpt filter_in_effect | The filter configuration for the subscription |
| SubscriptionState | Output | NotificationIRPConstDefs::SubscriptionStateOpt subscription_state | ACTIVE, SUSPENDED and INVALID will be supported |
| timeTick | Output | ManagedGenericIRPConstDefs::UnsignedLongOpt time_tick | The timeTick value provided with the subscription |
| notification CategorySet | Output | NotificationIRPConstDefs::NotificationCategorySet | A list of the notification categories supported. See Section 3.3 Operations |

### Exceptions

**Table 3-18 getSubscriptionStatus exceptions**

| Exception Name | Purpose |
|---|---|
| OperationNotSupported | Not supported |
| InvalidParameter | The specified subscriptionId is invalid. |
| GetSubscriptionStatus | Generic software error |

## getSubscriptionIds

### Definition

The manager uses this operation to get the values of all still valid (not unsubscribed or removed by IRPAgent) subscriptionIds assigned by NotificationIRP as result of previously subscribe operations performed by this IRPManager.

```
NotificationIRPConstDefs::SubscriptionIdSet get_subscription_ids (

         in string manager_reference

      )

      raises (GetSubscriptionIds,

              ManagedGenericIRPSystem::OperationNotSupported,

              ManagedGenericIRPSystem::InvalidParameter);
```

### Parameters

**Table 3-19 getSubscriptionIds parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| managerReference | Input | string manager_reference | Reference of IRPManager that requests the set of active subscription identifiers related to it |
| subscriptionIdSet | Output | NotificationIRPConstDefs::SubscriptionIdSet | The list of valid subscription identifiers for that IRP Manager |

### Exceptions

**Table 3-20 getSubscriptionIds exceptions**

| Exception Name | Purpose |
|---|---|
| GetSubscriptionIds | Supported |
| OperationNotSupported | Not supported |
| InvalidParameter | The specified managerReference is invalid. |

## getNotificationCategories

### Definition

The IRPManager invokes this operation to query the categories of notification supported by IRPAgent.

```
NotificationIRPConstDefs::NotificationCategorySet

   get_notification_categories (

      out NotificationIRPConstDefs::NotificationTypesSetOpt

         notification_type_list

)

raises (GetNotificationCategories,

        ManagedGenericIRPSystem::OperationNotSupported);
```

### Parameters

**Table 3-21 getNotificationCategories parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| NotificationCategoryList | Output | NotificationIRPConstDefs::NotificationCategorySet | The list of supported notification categories |
| Not present in IS | Output | NotificationIRPConstDefs::NotificationTypesSetOpt | The list of notification types for each category |

### Exceptions

**Table 3-22 getNotificationCategories exceptions**

| Exception Name | Purpose |
|---|---|
| GetNotificationCategories | Supported |
| OperationNotSupported | Not supported |

## 3.4 Communication Surveillance IRP

The following interfaces are defined:

**Table 3-23 Communication surveillance IRP interfaces**

| Interface Name | Method name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| CSIRPOperations_1 | getHeartbeatPeriod | M | Y | Y |
| | triggerHeartbeat | M | N | N |
| CSIRPOperations_2 | setHeartbeatPeriod | O | N | N |
| CSIRPNotifications | notifyHeartbeat | M | Y | Y |

### References

Communication Surveillance Integration Reference Point (IRP)

**Table 3-24 CSIRP references**

| | |
|---|---|
| TS 32.351 | Requirements |
| TS 32.352 | Information Service (IS) |

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| | |
|---|---|
| TS 32.353 | Common Object Request Broker Architecture (CORBA) Solution Set (SS) |

**(2 of 2)**

## Operations

## GetHeartBeatPeriod

### Definition

The manager can use this operation to retrieve the heart beat period.

```
CSIRPConstDefs::Result get_heartbeat_period(
   out CSIRPConstDefs::HeartbeatPeriod heartbeat_period
)
raises (GetHeartbeatPeriod);
```

### Parameters

**Table 3-25 GetHeartBeatPeriod parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| heartbeat_period | Output | CSIRPConstDefs::HeartbeatPeriod | The heartbeat period in minutes. |

### Exceptions

**Table 3-26 GetHeartBeatPeriod exceptions**

| Exception Name | Purpose |
|---|---|
| GetHeartbeatPeriod | Generic software error |

## Notifications

## notifyHeartbeat

### Definition

The agent supports a configurable heartbeat timer via a system parameter – a notifyHeartbeat notification is sent when the heartbeat count-down timer reaches zero.

### Parameters

**Table 3-27 notifyHeartbeat parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| objectClass | Output | One NV pair of filterable_body_fields | Details of the CS IRP instance |
| objectInstance | Output | One NV pair of filterable_body_fields | |
| notificationId | Output | One NV pair of remaining_body | |
| eventTime | Output | One NV pair of filterable_body_fields | Set to the current time |
| systemDN | Output | One NV pair of filterable_body_fields | The value of the systenDN system parameter |
| notificationType | Output | One NV pair of remaining_body | Set to "notifyHeartbeat" |
| heartbeatPeriod | Output | One NV pair of remaining_body | Set to the heartbeat period value |
| Locator | Output | One NV pair of remaining_body | Empty |
| triggerFlag | Output | One NV pair of remaining_body | Empty |
| managerIdentifier | Output | One NV pair of remaining_body | Empty |

### Triggering Event

This event is triggered when the count down timer equals 0.

## 3.5 Basic CM IRP

The following interfaces are defined:

**Table 3-28 Basic CM IRP interfaces**

| Interface Name | Method name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| PassiveCmIRPOperations | getMoAttributes | M | Y | Y |
| | getContainment | O | Y | Y |
| | cancelOperation | O | Y | Y |
| ActiveCmIRPOperations | createMo | O | N | N |
| | deleteMo | O | N | N |
| | setMOAttributes | O | N | N |

### References

Basic CM Reference Point (IRP)

**Table 3-29 Basic CMRP references**

| | |
|---|---|
| TS 32.601 | Requirements |
| TS 32.602 | Information Service (IS) |
| TS 32.603 | Common Object Request Broker Architecture (CORBA) Solution Set (SS) |

## General

Basic CM is supported at an NE level only, for example, only NEs and NE level attributes can be retrieved.

The following set of attributes are supported:

- managedElementId
- dnPrefix - settable through a system parameter.
- userLabel
- locationName
- swVersion
- vendorName

**Note —** Fixed to the string “Alcatel-Lucent”

- userDefinedState

**Note —** Fixed to an empty string

- managedElementType
- managedBy - set through a system parameter

**Note —** The behaviour of the operations described here are solution set dependent – so their behaviour will be described in terms of the solution set.

## getMoAttributes and GetContainment

### Definition

These operations share the same definition in the CORBA solution set and so are described together. They are used to access a list of NE names and attribute values.

```
BasicCmInformationIterator find_managed_objects(

        in BasicCMIRPConstDefs::DN base_object,

        in BasicCMIRPConstDefs::SearchControl search_control,
```

```
            in BasicCMIRPConstDefs::AttributeNameSet
requested_attributes)

      raises (

         FindManagedObjects,

         ManagedGenericIRPSystem::ParameterNotSupported,

         ManagedGenericIRPSystem::InvalidParameter,

         ManagedGenericIRPSystem::ValueNotSupported,

         ManagedGenericIRPSystem::OperationNotSupported,

         UndefinedMOException,

         IllegalDNFormatException,

         UndefinedScopeException,

         IllegalScopeTypeException,

         IllegalScopeLevelException,

         IllegalFilterFormatException,

         FilterComplexityLimit);
```

### Parameters

**Table 3-30 getMoAttributes and GetContainment parameters**

| IS Name | Qualifier | CORBA SS Details | Details for getMOAttributes | Details for getContainment |
|---|---|---|---|---|
| invokeIdentifierIn | Input | N/A | - | |
| baseObjectInstance | Input | BasicCMIRPConstDefs ::DN base_object | If the value is set to a NE, information for that NE only is returned. If the value is set to the base object value information for the list of NEs will be returned. | If the value is set to the base object value information for the list of NEs will be returned. |
| scope | Input | Search_control - subfield are: | | |
| Filter | Input | Type | Will be ignored | |
| | | Level | Will be ignored | |
| | | Filter | Will be ignored | |
| | | Contents | NAMES_AND_ATTRIBUTES | NAMES |
| attributeListIn | Input | requested_attributes | Will be ignored | |

**(1 of 2)**

| IS Name | Qualifier | CORBA SS Details | Details for getMOAttributes | Details for getContainment |
|---|---|---|---|---|
| invokeIdentifierOut | Input | Supported via the returned iterator (BasicCmInformationIterator) | Handled by returning an iterator | |
| managedObjectClass | Output | | The NE Name | |
| managedObjectInstance | Output | | | |
| attributeListOut | Output | | The NE's attribute value; see getMoAttributes and GetContainment for a list of the supported attributes. | Always empty |
| status | Output | N/A | — | |

**(2 of 2)**

### Exceptions

**Table 3-31 getMoAttributes and GetContainment exceptions**

| Exception Name | Purpose |
|---|---|
| ParameterNotSupported | Not supported |
| InvalidParameter | Invalid baseObjectInstance |
| ValueNotSupported | Not supported |
| IllegalDNFormatException | Not supported |
| UndefinedMOException, | Base object instance does not exist |
| IllegalDNFormatException | Not supported |
| UndefinedScopeException | Not supported |
| IllegalScopeTypeException | Not supported |
| IllegalScopeLevelException | Not supported |
| IllegalFilterFormatException | Not supported |
| FilterComplexityLimit | Not supported |
| FindManagedObjects | Generic software error |

## cancelOperation

### Definition

This operation is supported at the solution set level by allowing the destroy operation to be performed on the iterator returned from getContainment or getMoAttributes.

### Parameters

Not applicable – performed directly on the iterator returned by the previous operation.

#### Exceptions

Not applicable – the object must exist in order for the destroy operation to be performed

## 3.6 Kernel IRP

The following interfaces are defined:

**Table 3-32 Kernel IRP interfaces**

| Interface Name | Method name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| KernelCmIRPOperations | getNRMIRPVersion | M | Y | Y |
| KernelCmIRPNotifications | objectCreation | O | Y | Y |
| | objectDeletion | O | Y | Y |
| | objectAttributeValueChange | O | Y | Y |
| | notifyCMreSyncRequired | O | N | N |
| | notifyStateChange | O | N | N |

### References

Kernel Integration Reference Point (IRP)

**Table 3-33 KIRP references**

| | |
|---|---|
| TS 32.661 | Requirements |
| TS 32.662 | Information Service (IS) |
| TS 32.663 | Common Object Request Broker Architecture (CORBA) Solution Set (SS) |

### Operations

### getNRMIRPVersion

#### Definition

It returns the list of supported Network Resource IRP versions:

```
void get_nrm_irp_version

      (

         out ManagedGenericIRPConstDefs::VersionNumberSet
version_number_list,
```

```
        out ManagedGenericIRPConstDefs::VersionNumberSet
vse_version_number_list

      )

      raises (GetNRMIRPVersion);
```

### Parameters

**Table 3-34 getNRMIRPVersion parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| versionNumberList | Output | ManagedGenericIRPConstDefs::VersionNumberSet version_number_list | NRM version number supported (3GPP Release dependant). |
| vSEVersionNumberList | Output | ManagedGenericIRPConstDefs::VersionNumberSet vse_version_number_list | Not supported. |
| status | Output | N/A | — |

## Notifications

## notifyObjectCreation

### Definition

This notification will be used to notify the creation of a managed object. For this release it will only be supported for object creation for NE objects.

### Parameters

**Table 3-35 notifyObjectCreation parameters**

| IS Name | Qualifier | Comments |
|---|---|---|
| objectClass | Output | Name of the instance which has been created. |
| objectInstance | Output | Name of the instance which has been created. |
| notificationId | Output | Fixed to 0 |
| eventTime | Output | Set to current time |
| systemDN | Output | The value of the systenDN system parameter |
| notificationType | Output | Set to “x6” |
| correlatednotifications | Output | Empty |
| additionalText | Output | Empty |
| sourceIndicator | Output | Fixed to “MANAGEMENT OPERATION” |

**(1 of 2)**

| IS Name | Qualifier | Comments |
|---|---|---|
| attributeList | Output | Set to the attribute list for the NE as described in Section 3.5. |

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#### Triggering Event

Creation of a network element.

### notifyObjectDeletion

#### Definition

This notification will be used to notify the deletion of a managed object. For this release it will only be supported for object deletion for NE objects.

#### Parameters

**Table 3-36 notifyObjectDeletion parameters**

| IS Name | Qualifier | Comments |
|---|---|---|
| objectClass | Output | Name of the instance which has been deleted. |
| objectInstance | Output | |
| notificationId | Output | Fixed to 0 |
| eventTime | Output | Set to current time |
| systemDN | Output | The value of the systenDN system parameter |
| notificationType | Output | Set to “x7” |
| correlatednotifications | Output | Empty |
| additionalText | Output | |
| sourceIndicator | Output | Fixed to “MANAGEMENT OPERATION” |
| attributeList | Output | Empty |

#### Triggering Event

Deletion of the network element.

### notifyAttributeValueChange

#### Definition

This notification will be used to notify the change in attribute values of a managed object. For this release it will only be supported for attributes on NE objects.

### Input Parameters

**Table 3-37 notifyAttributeValueChange parameters**

| IS Name | Qualifier | Comments |
|---|---|---|
| objectClass | Output | Name of the instance which has been deleted. |
| objectInstance | Output | |
| notificationId | Output | Fixed to 0 |
| eventTime | Output | Set to current time |
| systemDN | Output | The value of the systenDN system parameter |
| notificationType | Output | Set to “x8” |
| correlatednotifications | Output | Empty |
| additionalText | Output | |
| sourceIndicator | Output | Fixed to “MANAGEMENT OPERATION” |
| attributeList | Output | The set of changed attribute values for the updated NE (1). |

Note

(1) Only the attributes listed in Section 3.5 will be monitored for changes and the update provided will include only the new value and not the previous value.

### Triggering Event

Change in attribute value.

## 3.7 Fault Management IRP

The following interfaces are defined:

**Table 3-38 Fault management interfaces**

| Interface Name | Method name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| AlarmIRPOperations | acknowledgeAlarms | M | Y | Y |
| | getAlarmList | M | Y | Y |
| | getAlarmCount | O | Y | Y |
| | unacknowledgeAlarms | O | N | N |
| | setComment | O | Y | Y |
| | clearAlarms | O | Y | Y |
| AlarmIRPNotifications | notifyNewAlarm | M | Y | Y |

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| Interface Name | Method name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| | notifyAckStateChanged | M | Y | Y |
| | notifyClearedAlarm | M | Y | Y |
| | notifyAlarmListRebuilt | M | Y | Y |
| | notifyChangedAlarm | O | Y | Y |
| | notifyComments | O | N | N |
| | notifyPotentialFaultyAlarmList | O | N | N |

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## References

Fault Management Reference Point (IRP)

**Table 3-39 FMRP references**

| | |
|---|---|
| TS 32.111-1-700 | Requirements |
| TS 32.111-2-710 | Information Service (IS) |
| TS 32.111-3-701 | Common Object Request Broker Architecture (CORBA) Solution Set (SS) |

## Common Information

## Handling of Alarm Id

From TS 32.311-3 it is optional for the agent to provide the alarm id in some cases and the manager should generate an alarm id as a concatenation of managedObjectInstance, eventType, probableCause and specificProblem

However, for all alarmId values in this interface, a name/value pair containing the actual alarm id will be provided. The alarmId will be based on the fault management provider's internal alarm identifier for the alarm. For all operations performed, the manager should provide an alarmId previously returned by the agent from a get alarm list operation.

## Retrieved Alarms & Alarm Lifecycle

The alarm list will contain all currently active alarms from the fault provider's current alarm list – depending on the fault provider configuration, this may contain:

- All currently active alarms (i.e. AlarmInformation whose perceivedSeverity is not Cleared) and
  all alarms that are Cleared but not yet acknowledged (or)
- All currently active alarms (i.e. AlarmInformation whose perceivedSeverity is not Cleared)

The alarm lifecycle reported by the system will match that provided by the fault provider.

## Alarm Comments

The system will support the northbound system creating additional comments on alarms, but not reading the existing set of comments or receiving notifications for new comments.

## Interaction Between Notifications and Alarm Retrieval Requests

The system will process notifications independently from any alarm retrieval requests - so if a 3GPP client is performing an alarm list retrieval, it may still receive alarm notifications at the same time.

The 3GPP client should queue any notifications received between the sending of the get all alarms request and the receipt of the final batch of data from the iterator. The 3GPP client should then replay the stored notifications on the data in its alarm database to pick up the missing updates.

## AlarmInformation

The following attributes are supported from the alarm model assuming the hosting product 5620 SAM provides acceptable values for the alarm data for the attributes to be mapped. See notifyNewAlarm for more information.

**Table 3-40 alarmInformation attributes**

| Attribute name | Comments |
|---|---|
| AlarmId | See Handling of Alarm Id for more information. |
| notificationId | N |
| alarmRaisedTime | Y |
| alarmClearedTime | Y |
| alarmChangedTime | Y |
| eventType | Y |
| probableCause | Y |
| perceivedSeverity | Y |
| specificProblem | Y |
| backedUpStatus | N |
| trendIndication | N |
| thresholdInfo | N |
| stateChangedDefinition | N |
| monitoredAttributes | N |
| proposedRepairActions | N |
| additionalText | Y |
| additionalInformation | N |
| ackTime | Y |
| ackUserId | Y |
| ackSystemId | N |
| ackState | Y |
| clearUserId | Y |
| clearSystemId | N |
| serviceUser | N |
| serviceProvider | N |
| securityAlarmDetector | N |

**Note —** See notifyNewAlarm for a description of which attribute is applicable for the different types of alarms.

## AlarmIRPOperations

## Get Alarm List

### Definition

GetAlarmList returns the set of active (see Retrieved Alarms & Alarm Lifecycle) alarms available in the system.

This operation is only support in synchronous mode – i.e. the data is returned via an iterator and not via notifications.

```
AlarmIRPConstDefs::AlarmInformationSeq get_alarm_list (
   in ManagedGenericIRPConstDefs::StringOpt filter,
   in AlarmIRPConstDefs::DNOpt base_object,
   out boolean flag,
   out AlarmInformationIterator iter
)
raises (GetAlarmList, FilterComplexityLimit,
ManagedGenericIRPSystem::ParameterNotSupported,
        ManagedGenericIRPSystem::InvalidParameter);
```

### Parameters

**Table 3-41 Get Alarm List parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| alarmAckState | Input | ManagedGenericIRPConstDefs::StringOpt | The following fields will be supported for filtering:<br>• probableCause<br>• perceivedSeverity<br>• alarm type<br>• ack state<br>See Appendix A for a description of the supported filter syntax. |
| Filter | Input | | |
| baseObjectClass/ baseObjectInstance | Input | AlarmIRPConstDefs::DNOpt base_object | An object name as described in Appendix B |
| - | Output | boolean flag | Always "FALSE" |
| - | Output | AlarmInformationIterator iter | The iterator controlling the return of the alarms |
| - | Output | AlarmIRPConstDefs::AlarmInformationSeq | Not used |

### Output Data

The alarm data will be returned via an iterator. The tables below show the list of attributes returned and how they relate to the information in the original alarm data provided by the hosting product.

**Note —** Any restrictions in the hosting product for an attribute will limit the data provided across the 3GPP interface in an equivalent way.

Depending on the alarm type, different sets of attributes are reported:

- AlarmType = COMMUNICATIONS_ALARM, ENVIRONMENTAL_ALARM, EQUIPMENT_ALARM, QUALITY_OF_SERVICE_ALARM or PROCESSING_ERROR_ALARM – Non-security alarm
- AlarmType = SECURITY_SERVICE_OR_MECHANISM_VIOLATION, OPERATIONAL_VIOLATION, PHYSICAL_VIOLATION, TIMEDOMAIN_VIOLATION, INTEGRITY_VIOLATION – Security alarm.

**Table 3-42 Get Alarm List output data**

| Name | Rules for Completion based on the received Alarm Data | Present in Alarm Type |
|---|---|---|
| notificationType | Data value based on the alarm state:<br>• notifyNewAlarm – the alarm is in the raised state and alarmChangeTime has not been set<br>• notifyChangedAlarm – the alarm is in the raised state but alarmChangeTime has been set<br>• notifyClearedAlarm – the alarm is in the cleared state | Both |
| alarmType | The reported alarm type. | Both |
| objectClass, objectInstance | Generated from the reported object of the alarm. | Both |
| notificationId | not supported | |
| eventTime | The parameter carries the<br>• alarmRaisedTime in case notificationType carries notifyNewAlarm<br>• alarmClearedTime in case notificationType carries notifyClearedAlarm<br>• alarmChangeTime in case the notificationType carries notifyChangedAlarm | Both |
| systemDN | The value of the systenDN system parameter | Both |
| alarmId | As described in | Both |
| alarmRaisedTime | The alarm raise time | Both |
| alarmClearedTime | For a cleared alarm, the reported clear or empty if the alarm has not been cleared. | Both |
| probableCause | The incoming probable cause will be mapped to the defined set provided by the hosting product<br>If the probableCause is not known in the list, it will be reported as “INDETERMINATE”. | Both |

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| Name | Rules for Completion based on the received Alarm Data | Present in Alarm Type |
|---|---|---|
| perceivedSeverity | The severity of the alarm as reported, modified by any rules in the fault management system. | Both |
| specificProblem | Copied from the reported alarm nam.<br>. | Both |
| backedUpStatus | Not supported | Non-security |
| trendIndication | Not supported | Non-security |
| thresholdInfo | Not supported | Non-security |
| stateChangeDefinition | Not supported | Non-security |
| monitoredAttributes | Not supported | Non-security |
| proposedRepairActions | Not supported | Non-security |
| additionalText | The additionalText for the alarm as reported, modified by any rules in the fault management system. | Both |
| additionalInformation | Not supported | Both |
| ackTime | The current value of Ack time if the alarm is acknowledged | Both |
| ackUserId | The current value of Ack user if the alarm is acknowledged | Both |
| ackSystemId | Not supported | Both |
| ackState | The alarm acknowledgement state | Both |
| clearUserId | The clear User id if the alarm has been cleared | Both |
| clearSystemId | Not supported | Both |
| backUpObject | Not supported | Both |
| correlatedNotifications | Not supported | Both |
| comments | Not supported | - |
| serviceUser | Not supported | Security |
| serviceProvider | Not supported | Security |
| securityAlarmDetector | Not supported | Security |

**(2 of 2)**

### Filtering

The following attributes will be supported for use in filtering:

- ProbableCause

**Note —** Probable Cause value “INDETERMINATE” cannot be used for filtering.

- PerceivedSeverity
- Alarm type
- Ack state

These attributes may be combined by using “AND” and “OR” to make specific filters.

See Appendix A for a description of how these attributes are represented in the filter.

### Exceptions

**Table 3-43 Get Alarm List exceptions**

| Exception Name | Purpose |
|---|---|
| FilterComplexityLimit | Not supported |
| ParameterNotSupported | Not supported |
| InvalidParameter | Invalid filter or base object |
| GetAlarmList | Generic software error |

## AcknowledgeAlarms

### Definition

The IRPManager invokes this operation to acknowledge one or more alarms by specific alarmId.

```
ManagedGenericIRPConstDefs::Signal acknowledge_alarms (

         in AlarmIRPConstDefs::AlarmInformationIdAndSevSeq

            alarm_information_id_and_sev_list,

         in string ack_user_id,

         in ManagedGenericIRPConstDefs::StringOpt ack_system_id,

         out AlarmIRPConstDefs::BadAcknowledgeAlarmInfoSeq

            bad_ack_alarm_info_list

      )

      raises (AcknowledgeAlarms,
ManagedGenericIRPSystem::ParameterNotSupported,

              ManagedGenericIRPSystem::InvalidParameter);
```

The specified alarm will be updated as follows:

- Acknowledgement State set to Acknowledged.
- Acknowledgement User set to a predefined value. The value of the ackUserId will be added as a comment to the alarm instance.
- Acknowledgement System id will be added as a comment to the alarm instance
- Acknowledgement Time of the alarm will be set to the current time.

The system will perform no verification of the provided values for the ackUserId and ackSystemId fields.

**Note —** Any perceivedSeverity in the request will be ignored and the alarms acknowledged on the basis of matching the alarmId only.

### Parameters

**Table 3-44 AcknowledgeAlarms parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| alarmInformationAndSeverityReferenceList | Input | List of AlarmInformation.alarmId and AlarmInformation.perceivedSeverity | Contains the alarm details to acknowledge. The information in the perceivedSeverity part will be ignored. |
| AckUserId | Input | AlarmInformation.ackUserId | Added as comment. |
| ackSystemId | Input | AlarmInformation.ackSystemId | Added as comment. |
| badAlarm Information ReferenceList | Output | AlarmIRPConstDefs:: BadAcknowledgeAlarmInfoSeq bad_ack_alarm_info_list | The alarms which were not successfully acknolwedged |

### Exceptions

**Table 3-45 AcknowledgeAlarms exceptions**

| Exception Name | Purpose |
|---|---|
| ParameterNotSupported | Not supported |
| InvalidParameter | The alarm id information received is not valid |
| AcknowledgeAlarms | Generic software error |

## getAlarmCount

### Definition

This operation allows the manager to retrieve a list of alarm counts by severity for alarms in various raise/clear and acknowledgement states.

```
void get_alarm_count (
   in ManagedGenericIRPConstDefs::StringOpt filter,
   out unsigned long critical_count,
   out unsigned long major_count,
```

```
            out unsigned long minor_count,

            out unsigned long warning_count,

            out unsigned long indeterminate_count,

            out unsigned long cleared_count

        )

    raises (GetAlarmCount, FilterComplexityLimit,
            ManagedGenericIRPSystem::OperationNotSupported,

                ManagedGenericIRPSystem::ParameterNotSupported,

                ManagedGenericIRPSystem::InvalidParameter);
```

The applicability of alarms in certain states depends on the fault provider's system configuration, see Retrieved Alarms & Alarm Lifecycle for more information. If the manager selects an acknowledgement state/alarm state combination which is not possible in the fault provider's configuration, the alarm counts will be returned as 0 for each severity and no exception or error will be returned.

### Parameters

**Table 3-46 getAlarmCount parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| Filter | Input | ManagedGenericIRPConstDefs::StringOpt filter | See Appendix A for a description of the supported filter syntax. |
| alarmAckState | Input | | |
| criticalCount, majorCount, minorCount, warningCount, indeterminateCount, clearedCount | Output | out unsigned long critical_count<br>out unsigned long major_count<br>out unsigned long minor_count<br>out unsigned long warning_count<br>out unsigned long indeterminate_count<br>out unsigned long cleared_count | The alarm count (1). |
| Status | Output | N/A | - |

Note

(1) Any alarms which meet the filter criteria and were reported to the fault provider with a severity of INFO or NONE will be included in the "IndeterminateCount" counter.

### Exceptions

**Table 3-47 getAlarmCount exceptions**

| Exception Name | Purpose |
|---|---|
| FilterComplexityLimit | Not supported. |

**(1 of 2)**

| Exception Name | Purpose |
|---|---|
| OperationNotSupported | Not supported |
| ParameterNotSupported | Not supported |
| InvalidParameter | Invalid filter. |
| GetAlarmCount | Generic software error |

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### Supported Filter Syntax

**Table 3-48 getAlarmCount supported filter syntax**

| "IS" Values (i.e. client request) | Value of filter |
|---|---|
| all alarms | Empty string |
| all active alarms | Empty string |
| all active and acknowledged alarms | $.filterable_data(n) == 1 |
| all active and unacknowledged | $.filterable_data(n) == 2 |
| all cleared and unacknowledged alarms | |
| all unacknowledged | |

## UnacknowledgeAlarms

Not supported

## SetComment

### Definition

The IRPManager invokes this operation to record a comment in one or more AlarmInformation instances in AlarmList.

```
      ManagedGenericIRPConstDefs::Signal comment_alarms (

         in AlarmIRPConstDefs::AlarmInformationIdSeq
alarm_information_id_list,

         in string comment_user_id,

         in ManagedGenericIRPConstDefs::StringOpt comment_system_id,

         in string comment_text,

         out AlarmIRPConstDefs::BadAlarmInformationIdSeq

            bad_alarm_information_id_list

      )
```

```
      raises (CommentAlarms,
ManagedGenericIRPSystem::OperationNotSupported,

              ManagedGenericIRPSystem::ParameterNotSupported,

              ManagedGenericIRPSystem::InvalidParameter);
```

The specified commentText will be added to the existing list of notes associated with the specified alarms with the User Id for that note set to a predefined value. The input parameters commentUserId and commentSystemId will be appended to the note text. The notes time field will be set to the current time.

The system will perform no verification of the provided values for the commentUserId and commentSystemId fields.

### Input Parameters

**Table 3-49 SetComment input parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| AlarmInformation ReferenceList | Input | AlarmIRPConstDefs::AlarmInformationIdSeq alarm_information_id_list | List of alarm identifiers to which the comment will be applied |
| commentUserId | Input | string comment_user_id | Appendded to the commentText |
| commentSystemId | Input | ManagedGenericIRPConstDefs::StringOpt comment_system_id | Appendded to the commentText |
| commentText | Input | string comment_text | Comment text to apply |
| badAlarm Information ReferenceList | Output | AlarmIRPConstDefs::BadAlarmInformationIdSeq<br>bad_alarm_information_id_list | |
| Status | Output | N/A | - |

### Exceptions

**Table 3-50 SetComment exceptions**

| Exception Name | Purpose |
|---|---|
| OperationNotSupported | Not supported |
| ParameterNotSupported | Not supported |
| InvalidParameter | Used if an unknown alarm id appears in the alarm information parameter |
| CommentAlarms | Generic software error |

## ClearAlarms

### Definition

The IRPManager invokes this operation to clear one or more AlarmInformation instances in AlarmList.

```
      ManagedGenericIRPConstDefs::Signal clear_alarms (

         in AlarmIRPConstDefs::AlarmInformationIdSeq
alarm_information_id_list,

         in string clear_user_id,

         in ManagedGenericIRPConstDefs::StringOpt clear_system_id,

         out AlarmIRPConstDefs::BadAlarmInformationIdSeq

            bad_alarm_information_id_list

      )

      raises (ClearAlarms,
ManagedGenericIRPSystem::OperationNotSupported,

              ManagedGenericIRPSystem::ParameterNotSupported,

              ManagedGenericIRPSystem::InvalidParameter);
```

This operation will only be available for ADMC alarms.

For alarms which are cleared by this operation, the alarm severity field will be updated to “Cleared”, the ClearTime field will be set to the current time, the ClearedBy field will be set to a predefined value. The clearUserId and clear clearSystemId input parameters will be added as a comment to the alarm instance. The alarm clear user id will be set to a preconfigured user.

The system will perform no verification of the provided values for the clearUserId or clearSystemId field.

### Input Parameter

**Table 3-51 ClearAlarms input parameters**

| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| AlarmInformation ReferenceList | Input | AlarmIRPConstDefs::AlarmInformationIdSeq alarm_information_id_list | List of alarm identifiers to which the comment will be applied |
| clearUserId | Input | string clear_user_id | Added as comment. |
| clearSystemId | Input | ManagedGenericIRPConstDefs::StringOpt clear_system_id | Added as comment. |

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| IS Name | Qualifier | CORBA SS Details | Purpose |
|---|---|---|---|
| badAlarmInformation ReferenceList | Output | AlarmIRPConstDefs::BadAlarmInformationId Seq bad_alarm_information_id_list | Alarms for which the clear couldn't be performed |
| Status | Output | N/A | - |

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### Exceptions

**Table 3-52 ClearAlarms exceptions**

| Exception Name | Purpose |
|---|---|
| OperationNotSupported | Not supported |
| ParameterNotSupported | Not supported |
| InvalidParameter | Used if an unknown alarm id appears in the alarm information parameter or if an alarm id refers to an ADAC alarm |
| ClearAlarms | Generic software error |

## notifyNewAlarm

### Definition

This notification is reported when a new alarm has been added to the alarm list.

### Parameters

The table below shows the attributes which will be reported with the alarm and any special behaviour which is different from that described in the attribute description of getAlarmList.

**Table 3-53 notifyNewAlarm parameters**

| Parameter Name | Generation Rules |
|---|---|
| objectClass | As described in getAlarmList |
| objectInstance | As described in getAlarmList |
| notificationId | As described in getAlarmList |
| eventTime | Set to the deviceTime reported with the alarm. |
| systemDN | As described in getAlarmList |
| notificationType | Fixed to "notifyNewAlarm" |
| probableCause | As described in getAlarmList |
| perceivedSeverity | As described in getAlarmList |
| alarmType | As described in getAlarmList. |

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| Parameter Name | Generation Rules |
|---|---|
| specificProblem | As described in getAlarmList. |
| correlatedNotifications | As described in getAlarmList. |
| backedUpStatus | As described in getAlarmList. |
| backUpObject | As described in getAlarmList. |
| trendIndication | As described in getAlarmList. |
| thresholdInfo | As described in getAlarmList. |
| stateChangeDefinition | As described in getAlarmList. |
| monitoredAttributes | As described in getAlarmList. |
| proposedRepairActions | As described in getAlarmList. |
| additionalText | As described in getAlarmList. |
| additionalInformation | As described in getAlarmList. |
| alarmId | As described in getAlarmList. |
| serviceUser | As described in getAlarmList. |
| serviceProvider | As described in getAlarmList. |
| SecurityAlarmDetector | As described in getAlarmList. |

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## notifyAckStateChanged

### Definition

The subscribed IRPManager instances are notified regarding changes in alarm Acknowledgement State between unacknowledged and acknowledged.

### Parameters

The table below shows the attributes which will be reported with the alarm and any special behaviour which is different from that described in the attribute description of getAlarmList.

**Table 3-54 notifyAckStateChanged parameters**

| Parameter Name | Comment to generate from faultEventNotification |
|---|---|
| objectClass | As described in getAlarmList |
| objectInstance | As described in getAlarmList |
| notificationId | As described in getAlarmList |
| eventTime | Set to the acknowledgeTime |
| systemDN | As described in getAlarmList |
| notificationType | Set to “notifyAckStateChanged” |
| probableCause | As described in getAlarmList |

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| Parameter Name | Comment to generate from faultEventNotification |
|---|---|
| perceived Severity | As described in getAlarmList |
| alarmType | As described in getAlarmList |
| alarmId | As described in getAlarmList |
| ackState | The current acknowledgement state of the alarm. |
| ackUserId | The current value of the acknowledgedBy field |
| ackSystemId | The current value of the AckSystemId field. |

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### Triggering Event

Acknowledgement of an alarm from:

- Hosting Product
- System GUI
- Northbound interface, including the connected northbound interface to which the notification is being sent.

## notifyClearedAlarm

### Definition

IRPAgent notifies the subscribed IRPManager of alarm clearing.

The set of correlatedNotification is never reported and the clearUserId and clearSystemId are completed whatever the source of the alarm clear event.

### Parameters

The table below shows the attributes which will be reported with the alarm and any special behaviour which is different from that described in the attribute description of getAlarmList.

**Table 3-55 notifyClearedAlarm parameters**

| Parameter Name | Comment |
|---|---|
| objectClass | As described in getAlarmList |
| objectInstance | As described in getAlarmList |
| notificationId | As described in getAlarmList |
| eventTime | Set to the deviceChangedTime |
| systemDN | As described in getAlarmList |
| notificationType | Set to “notifyClearedAlarm” |
| probableCause | As described in getAlarmList |
| perceivedSeverity | Fixed to Cleared |

**(1 of 2)**

| Parameter Name | Comment |
|---|---|
| alarmType | As described in getAlarmList |
| correlated Notifications | Not supported |
| clearUserId | Always forwarded, whatever the source of the clear |
| clearSystemId | Always forwarded, whatever the source of the clear |
| alarmId | See NotifyNewAlarm |

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### Triggering Event

Clearing of an alarm from:

- Hosting Product
- System GUI
- Northbound interface, including the connected northbound interface to which the notification is being sent.

## notifyChangedAlarm

### Definition

The subscribed managers are notified of changes to alarm severity.

### Parameters

The table below shows the attributes which will be reported with the alarm and any special behaviour which is different from that described in the attribute description of getAlarmList.

**Table 3-56 notifyChangedAlarm parameters**

| Parameter Name | Comment |
|---|---|
| objectClass | As described in getAlarmList |
| objectInstance | As described in getAlarmList |
| notificationId | See NotifyNewAlarm. |
| eventTime | Set to the alarmChangeTime |
| systemDN | See NotifyNewAlarm |
| notificationType | Set to “notifyChangedAlarm” |
| probableCause | As described in getAlarmList |
| perceivedSeverity | See NotifyNewAlarm. |
| alarmType | As described in getAlarmList |
| alarmId | See NotifyNewAlarm. |

#### Triggering Event

This notification is only triggered by a change in perceivedSeverity attribute value (except to the value "Cleared").

### NotifyPotentialFaultyAlarmList

Not supported.

### notifyAlarmListRebuilt

#### Definition

It is sent when the alarm list has been rebuilt or it is again available.

#### Parameters

The table below shows the notification parameters:

**Table 3-57 notifyAlarmListRebuilt parameters**

| Parameter Name | Comment |
|---|---|
| objectClass | It carries the class of the instance identified in systemDN parameter or alternatively, the MonitoredEntity.objectClass |
| objectInstance | It carries the class of the instance identified in systemDN parameter or alternatively, the MonitoredEntity.objectInstance. |
| notificationId | See NotifyNewAlarm. |
| eventTime | Set to the time when the alarm list has been rebuilt or becomes available again |
| systemDN | See NotifyNewAlarm |
| notificationType | Set to “notifyAlarmListRebuilt” |
| reason | It carries the reason why the IRPAgent has rebuilt the AlarmList. |
| alarmListAlignmentRequirement | Not supported |

#### Triggering Condition

CNBI has reestablished the subscription to the reception of alarm notifications from a remote alarm feed after the connection with that feed got broken and alarm notifications may have been lost during the connection unavailability time.

## 3.8 Generic IRP

Additionally the following operations are supported from the generic IRP and inherited into the other IRPs:

**Table 3-58 Generic IRP interface**

| Interface Name | Method Name | Support Qualifier | 3GPP R7 | 3GPP R8 |
|---|---|---|---|---|
| genericIRPVersionOperations | Get IRP Versions | M | Y | Y |
| | Get Operations Profile | O | Y | Y |
| | Get Notification Profile | O | Y | Y |

The behavior for these operations will be defined in a common place rather than in the inherited IRPs.

## References

Generic Integration Reference Point (IRP)

**Table 3-59 Generic IRP references**

| | |
|---|---|
| TS 32.311 | Requirements |
| TS 32.312 | Information Service (IS) |
| TS 32.313 | Common Object Request Broker Architecture (CORBA) Solution Set (SS) |

## Background

The operations defined in this section are inherited into other IRPs (e.g. FM, Kernel).

## genericIRPVersionOperations

## getIRPVersion

### Definition

This operation returns the supported IRP versions for an interface. The values returned will be dependent on the IRP – see below for details.

### Parameters

**Table 3-60 getIRPVersion parameters**

| IS Name | Qualifier | Used in… | CORBA SS Details | R7 | R8 |
|---|---|---|---|---|---|
| versionNumberSet | Output | FM IRP (get_alarm_irp_versions) | ManagedGenericIRPConstDefs::VersionNumberSet | 32.111-3 V7.1 | 32.111-3 V8.0 |
| | | Kernel IRP (get_kernel_irp_version) | ManagedGenericIRPConstDefs::VersionNumberSet version_number_list | 32.663 V7.0 | 32.663 V8.1 |
| | | | ManagedGenericIRPConstDefs::VersionNumberSet vse_version_number_list | Empty set | Empty set |
| | | Basic CM IRP (get_basic_cm_irp_version) | ManagedGenericIRPConstDefs::VersionNumberSet | 32.603 V7.0 | 32.603 V8.0 |
| | | Entry Point IRP (get_ep_irp_versions) | ManagedGenericIRPConstDefs::VersionNumberSet | 32.363 V7.0 | 32.363 V8.1 |
| | | Notifications IRP (get_notification_irp_versions) | ManagedGenericIRPConstDefs::VersionNumberSet | 32.303 V7.0 | 32.303 V8.0 |
| | | Communication Surveillance (get_cs_irp_versions) | ManagedGenericIRPConstDefs::VersionNumberSet | 32.353 V7.0 | 32.353 V8.0 |
| Status | Output | - | - | - | - |

### Exceptions

**Table 3-61 getIRPVersion exceptions**

| Exception Name | Used in... | Purpose |
|---|---|---|
| GetAlarmIRPVersions | FM IRP (get_alarm_irp_versions) | Generic software error |
| GetKernelCMIRPVersionsException | Kernel IRP (get_kernel_irp_version) | Generic software error |
| GetBasicCmIRPVersion | Basic CM IRP (get_basic_cm_irp_version) | Generic software error |
| GetEPIRPVersions | Entry Point IRP (get_ep_irp_versions) | Generic software error |
| GetNotificationIRPVersions | Notifications IRP (get_notification_irp_versions) | Generic software error |
| GetCSIRPVersions | Communication Surveillance (get_cs_irp_versions) | Generic software error |

## getOperationsProfile

### Definition

This operation returns the supported operations in a specified IRP. The value returned will be dependent on the IRP; see Table 3-62 for details.

### Parameters

The iRPVersion parameter is supported and specifies the IRP version number to look up. The version number is supported if it is listed in the description of get IRP version.

**Table 3-62 getOperationsProfile parameters**

| IS Name | Qualifier | Used in… | CORBA SS Details | Contents |
|---|---|---|---|---|
| iRPVersion | Input | FM IRP (get_alarm_irp_operations_profile) | ManagedGenericIRPConstDefs::VersionNumber alarm_irp_version | IRP Version number |
| | | Kernel IRP (get_kernel_cm_irp operations_profile) | ManagedGenericIRPConstDefs::VersionNumber kernel_cm_irp_version | IRP Version number |
| | | Basic CM IRP (get_basic_cm_operations_profile) | ManagedGenericIRPConstDefs::VersionNumber basic_cm_irp_version | IRP Version number |
| | | Entry Point IRP (get_ep_irp_operations_profile) | ManagedGenericIRPConstDefs::VersionNumber irp_version | IRP Version number |
| | | Notification IRP (get_notification_irp_operations_profile) | ManagedGenericIRPConstDefs::VersionNumber notification_irp_version | IRP Version number |
| | | Communication Surveillance IRP (get_cs_irp_operations_profile) | ManagedGenericIRPConstDefs::VersionNumber irp_version | IRP Version number |
| operationNameProfile (and) operationParameterProfile | Output | FM IRP (get_alarm_irp_operations_profile) | ManagedGenericIRPConstDefs::MethodList | Supported set of operations and their parameters |
| | | Kernel IRP (get_kernel_cm_irp operations_profile) | | Empty list |
| | | Basic CM IRP (get_basic_cm_irp_operation_profile) | | Supported set of operations and their parameters |
| | | Entry Point IRP (get_ep_irp_operations_profile) | | Supported set of operations and their parameters |
| | | Notification IRP (get_notification_irp_operations_profile) | | Supported set of operations and their parameters |
| | | Communication Surveillance IRP (get_cs_irp_operations_profile) | | Supported set of operations and their parameters |
| status | Output | - | - | - |

### Exceptions

**Table 3-63 getOperationsProfile exceptions**

| Exception Name | Used in... | Purpose |
|---|---|---|
| GetAlarmIRPVersions | FM IRP (get_alarm_irp_versions) | Generic software error |
| GetKernelCMIRPVersionsException | Kernel IRP (get_kernel_irp_version) | Generic software error |
| GetBasicCmIRPVersion | Basic CM IRP (get_basic_cm_irp_version) | Generic software error |
| GetEPIRPVersions | Entry Point IRP (get_ep_irp_versions) | Generic software error |
| GetNotificationIRPVersions | Notifications IRP (get_notification_irp_versions) | Generic software error |
| GetCSIRPVersions | Communication Surveillance (get_cs_irp_versions) | Generic software error |

## getNotificationsProfile

### Definition

This operation returns the supported notifications in a specified IRP. The value returned will be dependent on the IRP; see Table 3-64 for details.

The value returned will be dependent on the IRP; see Table 3-64 for details for details.

### Parameters

The iRPVersion parameter is supported and specifies the IRP version number to look up. The version number is supported if it is listed in the description of get IRP version.

**Table 3-64 getNotificationsProfile parameters**

| IS Name | Qualifier | Used in… | CORBA SS Details | Contents |
|---|---|---|---|---|
| iRPVersion | Input | FM IRP (get_alarm_irp_notifications_profile) | ManagedGenericIRPConstDefs::VersionNumber alarm_irp_version | IRP Version number |
| | | Kernel IRP (get_kernel_cm_irp notifications _profile) | ManagedGenericIRPConstDefs::VersionNumber kernel_cm_irp_version | IRP Version number |
| | | Basic CM IRP (get_basic_notifications_profile) | ManagedGenericIRPConstDefs::VersionNumber basic_cm_irp_version | IRP Version number |
| | | Entry Point IRP (get_ep_irp_ notifications _profile) | ManagedGenericIRPConstDefs::VersionNumber irp_version | IRP Version number |
| | | Notification IRP (get_notification_irp_ notifications _profile) | ManagedGenericIRPConstDefs::VersionNumber notification_irp_version | IRP Version number |
| | | Communication Surveillance IRP (get_cs_irp_ notifications _profile) | ManagedGenericIRPConstDefs::VersionNumber irp_version | IRP Version number |
| operationName Profile (and) operationParameterProfile | Output | FM IRP (get_alarm_irp_ notifications _profile) | ManagedGenericIRPConstDefs::MethodList | Supported set of notifications and their parameters |
| | | Kernel IRP (get_kernel_cm_irp notifications _profile) | | Supported set of notifications and their parameters |
| | | Basic CM IRP (get_basic_cm_irp_ notifications _profile) | | Empty List |
| | | Entry Point IRP (get_ep_irp_ notifications _profile) | | Empty List |
| | | Notification IRP (get_notification_irp_ notifications _profile) | | Empty List |
| | | Communication Surveillance IRP (get_cs_irp_ notifications _profile) | | Supported set of notifications and their parameters |
| status | Output | - | | - |

### Exceptions

**Table 3-65 getNotificationsProfile exceptions**

| Exception Name | Used in... | Purpose |
|---|---|---|
| GetAlarmIRPNotificationProfile | FM IRP (get_alarm_irp_notification_profile) | Generic software error |
| InvalidParameter | | Supported |
| OperationNotSupported | | Not supported |
| GetKernelCMIRPNotificationProfileException | Kernel IRP (get_kernel_cm_irp_ notification _profile) | Generic software error |
| InvalidParameter | | Supported |
| OperationNotSupported | | Not supported |
| GetBasicCmIRPNotificationProfile | Basic CM IRP (get_basic_cm_irp_ notification _profile) | Generic software error |
| InvalidParameter | | Supported |
| OperationNotSupported | | Not supported |
| GetEPIRPNotificationProfile | Entry Point IRP (get_ep_irp_ notification _profile) | Generic software error |
| InvalidParameter | | Supported |
| OperationNotSupported | | Not supported |
| GetNotificationIRPNotificationProfile | Notifications IRP (get_notification_irp_ notification _profile) | Generic software error |
| InvalidParameter | | Supported |
| OperationNotSupported | | Not supported |
| GetCSIRPNotificationProfile | Communication Surveillance (get_cs_irp_ notification _profile) | Generic software error |
| InvalidParameter | | Supported |
| OperationNotSupported | | Not supported |

## 3.9 Inventory Management IRP (R3.1 only)

3GPP does not define any interface for Inventory Management IRP. It does, however, define the InventoryUnit object class (TS 32.692) and the schema (TS 32.695, InventoryNrm.xsd) to which inventory files shall adhere.

CNBI R3.1 supports generation of 3GPP inventory reports compliant with the InventoryNrm.xsd schema for the following InventoryUnit attributes:

- inventoryUnitId
- inventoryUnitType
- vendorUnitFamilyType
- vendorUnitTypeNumber

- vendorName
- serialNumber

The inventoryUnitId will contain the DN of the InventoryUnit MO.

InventoryUnit instances will be grouped by ManagedElement instance.

In the following section, each supported IRP interface and parameters will be detailed. Unless stated otherwise, compliance applies to both R7 and R8.

# *Appendices*

# A. Definition of Filter Language

## A.1 Overview

Table A-1 below describes how to represent a supported attribute as a filter criteria, the operations in which the filter criteria is supported, and the range of the valid values.

**Table A-1 Filter language**

| Attribute Name | Reference String in Filter | Supported In Operations | Operands Supported | Supported Values |
|---|---|---|---|---|
| ackState | $.filterable_data(n) | get_alarm_list, get_alarm_count | == | Acknowledged -> 1<br>Unacknowledged -> 2 |
| perceivedSeverity | $.filterable_data(h) | get_alarm_list | == | INDETERMINATE -> 1<br>CRITICAL -> 2<br>MAJOR -> 3<br>MINOR -> 4<br>WARNING -> 5<br>CLEARED -> 6 |
| probableCause | $.filterable_data(g) | get_alarm_list | == | An integer from the available probable cause set |
| alarmType | $.header.fixed_header.event_name | get_alarm_list | == | COMMUNICATIONS_ALARM -> x1<br>PROCESSING_ERROR_ALARM -> x2<br>ENVIRONMENTAL_ALARM -> x3<br>QUALITY_OF_SERVICE_ALARM -> x4<br>EQUIPMENT_ALARM -> x5<br>INTEGRITY_VIOLATION -> x6<br>OPERATIONAL_VIOLATION -> x7<br>PHYSICAL_VIOLATION -> x8<br>SECURITY_SERVICE_OR_MECHANISM_VIOLATION -> x9<br>TIME_DOMAIN_VIOLATION -> x10 |
| Notification_type | $.header.fixed_header.type_name | – | == | NOTIFY_FM_NEW_ALARM > x1<br>NOTIFY_FM_CHANGED_ALARM -> x2<br>NOTIFY_FM_ACK_STATE_CHANGED -> x3<br>NOTIFY_FM_CLEARED_ALARM -> x5 |
| Object Instance | $filterable_data(e) | – | == | String representing the object name |

# B. Use of Object name for Alarm filtering

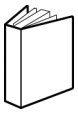
# B.1 Use of Object name for Alarm Filtering

For some operations, the object name field can be used as a basis for alarm filtering. The support is described in Table B-1.

**Table B-1 Object names for alarm filtering**

| Operation | Sample Object Name Format | Meaning |
|---|---|---|
| getAlarmList | <empty string> | All alarms |
| | SubNetwork=X, ManagedElement=Y | All alarms on a given Network Element |
| GetMoAttributes<br>GetContainment | <empty string> | All NE data |
| | SubNetwork=X, ManagedElement=Y | Data for a specific NE |

# Customer documentation and product support



## Customer documentation

http://www.alcatel-lucent.com/myaccess

Product manuals and documentation updates are available at alcatel-lucent.com. If you are a new user and require access to this service, please contact your Alcatel-Lucent sales representative.

## Technical Support

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