Technical Specification Group Services and System Aspects **TSGS#11(01)010028** Meeting #11, Palm Springs, CA, USA, 19-22 March 2001

Source:	SA WG5
Title:	CRs to Configuration Management; Part 3: Notification Integration Reference Point; CORBA Solution Set Version 1:1 (32.106-3)
Document for:	Approval
Agenda Item:	7.5.3

Doc-1st-	Doc-	Spec	CR	R	Phas	Subject	С	Versio	Versio	Workite
SP- 010028	S5- 010033	32.106-3	005		R99	Correct the IDL syntax error in the NotificationIRPSystem module	F	3.2.0	3.3.0	OAM-CM
SP- 010028	S5- 010034	32.106-3	006		R99	Missing NV constant string for the Notify Alarm List Rebuilt reason attribute	F	3.2.0	3.3.0	OAM-CM
SP- 010028	S5- 010035	32.106-3	007		R99	Add CORBA Quality of Service parameters	F	3.2.0	3.3.0	OAM-CM
SP- 010028	S5- 010036	32.106-3	008		R99	Mismatched Notification Id type	F	3.2.0	3.3.0	OAM-CM
SP- 010028	S5- 010037	32.106-3	009		R99	Use stringified IOR instead of type Object for manager_reference	F	3.2.0	3.3.0	OAM-CM
SP- 010028	S5- 010038	32.106-3	010		R99	Mismatched SubscriptionId types	F	3.2.0	3.3.0	OAM-CM
SP- 010028	S5- 010039	32.106-3	011		R99	Remove CosNotifyComm.idl not used in the module NotificationIRPSystem	F	3.2.0	3.3.0	OAM-CM

ж 3	<mark>2.106-3</mark> CR 005 ^{# rev} - ^{# C}	Current version: 3.2.0 [#]						
For <u>HELP</u> on L	sing this form, see bottom of this page or look at the μ	pop-up text over the X symbol	ls.					
Proposed change	affects: # (U)SIM ME/UE Radio Acce	ess Network X Core Netwo	rk <mark>X</mark>					
Title: #	Correct the IDL syntax error in the NotificationIRP	System module						
Source: #	SA5							
Work item code: #	OAM-CM	<i>Date:</i> ೫ <mark>02/03/2001</mark>						
Category: #	F	Release: [#] R99						
	Use <u>one</u> of the following categories: F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.	Use <u>one</u> of the following release. 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)	s:					
Reason for change	: ೫ <mark>Correct the IDL syntax error in the Notifica</mark>	tionIRPSystem module.						
Summary of chang	e: # Remove erroneous semicolon in the IDL modu	ıle.						
Consequences if not approved:	# Each application will need to edit the Notific which is against the rules established in 3GPP	cationIRPSystem.idl file, TS 32.106-6 V3.0.0.						
Clauses affected:	육 Annex A							
Other specs affected:	#Other core specifications#Test specifications0&M Specifications							
Other comments:	¥							

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Annex A (normative): Notification IRP CORBA IDL

/* ## Operation: get_notification_IRP_version
*/
CommonIRPConstDefs::VersionNumberSet get_notification_IRP_version ()
raises (GetNotificationIRPVersion);
______;

			С	HAN	GE	REC	QUE	ST	•			CR-Form-v3
ж	<mark>32.1</mark>	<mark>06-3</mark>	CR 0	06	ç	¥ rev	-	ж	Current ver	sion:	3.2.0	ж
For <u>HELP</u> on	using	this for	m, see l	oottom o	of this	page o	r look	at th	e pop-up tex	t over	the # sy	mbols.
Proposed change	e affec	ts: ¥	(U)SI	M	ME/l	JE	Rac	lio Ad	ccess Netwo	rk X	Core No	etwork X
Title:	¥ Mis	sing <mark>N</mark>	V const	ant strin	<mark>ig for t</mark>	he Not	fy Ala	rm L	ist Rebuilt re	ason	attribute	
Source:	¥ <mark>SA</mark>	5										
Work item code:	ж <mark>ОА</mark>	M-CM							Date: ଖ	6 <mark>02/</mark>	03/2001	
Category:	ж F								Release: ଖ	R9	9	
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Decesar for chem		The		ottribut		nondo	on of	tribut	to of the Neti		rm List D	a built
Reason for chang	ge: њ	notific Howe reas	cation in ever, it is on attrib	32.111 a not de oute into	-3 V3. scribe a Stri	3.0. d what uctured	name I Ever	shou shou nt.	uld be used v	when i	inserting t	he
Summary of chai	nge:೫	An N Struc	v_reas	o <mark>n</mark> strin /ent is c	g cons reated	tant fo I.	r the r	name	of the Name	e Valu	e pair of t	he
Consequences if not approved:	f H	Differ attrib	ent IRP. ute into	Agent v notificat	endors tions.	s will u	se diff	erent	t rules for ins	erting	the reas	on
Clauses affected	: ¥	Anne	хA									
Other specs affected:	ж	X Ot Te Ot	her core est speci &M Spec	e specifi fication cification	cation: s ns	s i	f 32	2.111	-3 V3.3.0			
Other comments	: ¥	32.11	1-3 nee	eds to de	efine h	ow <mark>NV</mark>	REAS	son is	<mark>s used in the</mark>	Struc	tured Eve	ent.

```
const string NV_NOTIFICATION_ID = "a";
const string NV_CORRELATED_NOTIFICATIONS = "b";
const string NV_EVENT_TIME = "c";
const string NV_SYSTEM_DN = "d";
const string NV_MANAGED_OBJECT_CLASS = "e";
const string NV_MANAGED_OBJECT_INSTANCE = "f";
const string NV_PROBABLE_CAUSE = "g";
const string NV_PERCEIVED_SEVERITY = "h";
const string NV_SPECIFIC_PROBLEM = "i";
const string NV_ADDITIONAL_TEXT = "j";
const string NV_ALARM_ID = "k";
const string NV_ACK_USER_ID = "l";
const string NV_ACK_TIME = "m";
const string NV_ACK_SYSTEM_ID = "n";
const string NV_ACK_STATE = "o";
const string NV_BACKED_UP_STATUS = "p";
const string NV_BACK_UP_OBJECT = "q";
const string NV_THRESHOLD_INFO = "r";
const string NV_TREND_INDICATION = "s";
const string NV_STATE_CHANGE_DEFINITION = "t";
const string NV_MONITORED_ATTRIBUTES = "u";
const string NV_PROPOSED_REPAIR_ACTIONS = "v";
const string NV_REASON = "w";
```

/*
This indicates if the subscription is active (not suspended) or inactive.
*/
enum SubscriptionState {Inactive, Active, DontKnow};

};

#endif

	CHAN	GE REQUES	т	CR-Form-v3
^ж 32.1	06-3 CR 007	¥ rev <mark>_</mark> ۴	Current versi	on: 3.2.0 [#]
For <u>HELP</u> on using	this form, see bottom of	f this page or look at	the pop-up text	over the X symbols.
Proposed change affeo	cts: ೫ (U)SIM	ME/UE Radio	Access Network	Core Network X
Title: ೫ Ac	d CORBA Quality of S	ervice parameters		
Source: ೫ SA	٨5			
Work item code: # OA	AM-CM		<i>Date:</i>	02/03/2001
Category: ೫ F			Release: ೫	R99
Use Deta be f	 <u>one</u> of the following categ <i>F</i> (essential correction) <i>A</i> (corresponds to a corre <i>B</i> (Addition of feature), <i>C</i> (Functional modification) <i>D</i> (Editorial modification) ailed explanations of the about in 3GPP TR 21.900. 	ories: ection in an earlier rele n of feature) pove categories can	Use <u>one</u> of t 2 ase) R96 R97 R98 R99 REL-4 REL-5	the following releases: (GSM Phase 2) (Release 1996) (Release 1997) (Release 1998) (Release 1999) (Release 4) (Release 5)
Reason for change: ೫	OMG Notification Ser than First-In, First-Out First-In, First-Out orde This CR clarifies QoS	vice allows the order t. ering is required in T notification ordering	ing of notification MN-based system from a CORBA	ns to be in other order ms. perspective.
Summary of change: \&	Add a new subclause the OMG Notification	(7.4) describing the Service is used and	notification orde when it is not us	ring to be used when ed.
Consequences if # not approved:	Implementations of no As an example, a clea This could result in ur	otification ordering of aring alarm could arr expected behaviour	ther than First-In ive before the or for an IRPMana	, First-Out may occur. iginal alarm. ger.
Clauses affected: #	3.2, 7			
Other specs अ affected:	Other core specific Test specifications O&M Specification	ations %		
Other comments: #				

3.2 Abbreviations

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

СМ	Configuration Management
CORBA	Common Object Request Broker Architecture (OMG)
EC	Event channel (OMG)
IDL	Interface Definition Language (OMG)
IS	Information Service
NC	Notification Channel (OMG)
NE	Network Element
NV	Name and Value pair
EM	Element Manager
OMG	Object Management Group
Qo O S	Quality oof Service
SS	Solution Set
UML	Unified Modelling Language (OMG)

7 IRPAgent's Behaviour

This clause describes some IRPAgent's behaviour not captured by IDL.

- 7.1 Subscription
- 7.2 IRPAgent supports multiple categories of Notifications
- 7.3 IRPAgent's integrity risk of attach_push_b Method

7.4 Quality oOf Service Parameters

The OMG Notification Service [2] supports a variety of Quality oof Service (QoOS) properties, such as reliability and priority, that may be expressed to indicate the delivery characteristics of notifications. While many of these QoOS parameters need to be based on Service Level Agreements, a number of them need to be specified as required. The following OMG Notification Service QoOS parameter settings are required:

- 1. The order policy must shall be set to FifoOrder (#First--in, F#irst--out) [2].
- 2. <u>The message priority must shall be set to 0, i.e., no priority [2].</u>
- 3. <u>The Start Time Supported must</u>shall be set to false, i.e., do not use Start Time [2].
- 4. <u>The Stop Time Supported must</u>shall be set to false, i.e., do not use Stop Time [2].

When the OMG Notification Service is used, the IRPAgent has the responsibility of setting the OMG Notification Service Quality oof Service parameters.

When the OMG Notification Service is not used, the IRPAgent has the responsibility to provide First-in, First-out notification ordering and to not provide priority to one Event Type and/or Extended Event Type over others.

^ж 32.′	<mark>106-3</mark> CR	<mark>008</mark> [#]	rev _ 🖁	Current vers	^{sion:} 3.2.0 [#]		
For <u>HELP</u> on using	g this form, see	bottom of this pa	age or look at	the pop-up text	over the X symbols.		
Proposed change affe	cts:	SIM ME/UE	E Radio	Access Networl	k X Core Network X		
Title: ೫ M	ismatched Not	tification Id type					
Source: ೫ S	A5						
Work item code: ℜ <mark>_</mark> Ο	AM-CM			Date: ೫	02/03/2001		
Category: ೫ F				Release: ೫	R99		
Usi De be	e <u>one</u> of the follo F (essential of A (correspond B (Addition of C (Functional D (Editorial m tailed explanatio found in 3GPP 1 Notification However, the In 32.106-3 it is declared In 32.106-3 This CR pro-	wing categories: orrection) ds to a correction in feature), modification of feat odification) ns of the above cat TR 21.900. I Id is an attribute in Correlated No d as type long. Table 13, is it de oposes that all use	an earlier rele ture) egories can e used in mar is set to diffe otifications d clared as types of Notifica	Use <u>one</u> of 2 ase) R96 R97 R98 R99 REL-4 REL-5 ny of the 3GPP S rent types. lefinition and 32 e unsigned 10 ation Id be of the	the following releases: (GSM Phase 2) (Release 1996) (Release 1997) (Release 1998) (Release 1999) (Release 4) (Release 5) SA5 specifications. .111-3 V3.3.0 Table 11, ong. e same type.		
Summary of change: \$	Change use	e of 32.106-3 Tab	<mark>le 13 use of I</mark>	Notification Id t	o be of type long.		
Consequences if ३ not approved:	& Application	developers will ne	eed to switch	between the dif	ferent types.		
Clauses affected:	6 Table 13						
Other specs ३ affected:	Contentions of the content of the co	re specifications cifications ecifications	ж				
Other comments:	e						

6 Use of OMG Notification StructuredEvent

Table 13 shows the OMG Structured Event attributes (middle column) that are used to carry the common notification attributes defined in Notification IRP: IS (3GPP TS 32.106-2 [5]).

Common attributes defined in Notification IRP: IS (3GPP TS 32.106- 2 [5])	Attribute defined by OMG Structured Event	Comment
There is no corresponding SS attribute.	domain_name	It indicates that the StructuredEvent, carried in the Notification, is defined by a specific 3GPP IRP such as Alarm IRP, as opposed to OMG specified Telecommunication, healthcare, utility, finance, etc. It indicates the CORBA SS version number as well. It is a string. Legal values are defined in module.
		For Alarm IRP version 1:1, the value is ALARM_IRP_VERSION_1_1.
eventType	type_name	It indicates event types of this notification. The semantics of the event type is defined by ITU-T TMN Recommendations. Each IRP, such as Alarm IRP IS version 1, shall identify the ITU-T defined event types for their use. Each such IRP document shall define the values of the identified event Types as well. Dependent on the notification category, possible legal values are: COMMUNICATIONS_ALARM (clause 8.1.1 of ITU-T Recommendation X.736 [8]), QUALITY_OF_SERVICE_ALARM (clause 8.1.1 of ITU-T Recommendation X.736 [8]), PROCESSING_ERROR_ALARM (clause 8.1.1 of ITU-T Recommendation X.736 [8]), EQUIPMENT_ALARM (clause 8.1.1 of ITU-T Recommendation X.736 [8]), EQUIPMENT_ALARM (clause 8.1.1 of ITU-T Recommendation X.736 [8]), ENVIRONMENTAL_ALARM (clause 8.1.1 of ITU-T Recommendation X.736 [8]), INTEGRITY_VIOLATION (ITU-T Recommendation X.736 [1]), INTEGRITY_VIOLATION (ITU-T Recommendation X.736 [1]), SECURITY_VIOLATION (ITU-T Recommendation X.736 [1]), TIME_DOMAIN_VIOLATION (ITU-T Recommendation X.736 [1]), OPERATIONAL_VIOLATION (ITU-T Recommendation X.736 [1]),
		The bracketed number of each type indicates the reference where the semantics of the type is specified. It is a string. See each individual CORBA SS IDL module for each IRP using the Notification IRP, for legal values used by that IRP version. Since each IRP except Notification IRP specifies its own set of event type, the values specified by each IRP are only unique within one IRP. For uniqueness among all IRPs' specifications, the values of event type shall be coupled with the notification category, the value carried in domain_name of the same notification.
extended EventType	event_name	The legal values carried in this attribute are specified by the IRP using the notification. For example, Alarm IRP: CORBA SS (3GPP TS 32.111-3 [7]) defines and uses the following values: NOTIFY_FM_NEW_ALARM, NOTIFY_FM_CHANGED_ALARM, NOTIFY_FM_CHANGED_ALARM, NOTIFY_FM_CLEARED_ALARM and NOTIFY_FM_CLEARED_ALARM and NOTIFY_FM_ALARM_LIST_REBUILT. It is a string. See each individual CORBA SS IDL module for each IRP using the Notification IRP, for legal values used by that IRP version. Since each IRP except Notification IRP specifies its own set of extended event

Table 13: Attributes of StructuredEvent

			type, the values specified by each IRP are only unique within one IRP. For
			uniqueness among all IRPs' specification, the values of extended event type shall
			be coupled with the notification category, the value carried in domain_name of
			the same notification.
	There is no	variable	
	corresponding SS	Header	
	attribute.		
	managed	One NV	Name of NV pair is a string, NV_MANAGED_OBJECT_INSTANCE.
	Object	(name-value)	Value of NV pair is a string. Syntax and semantics of this string conform to the
	Class,	pair of	Managed Object string representation specified in (3GPP TS 32.106-8 [4]). Note
	managed	filterable_	that two SS attributes are carried in this one NV pair since the string representation
	Object	body_fields	specified in 3GPP TS 32.106-8 [4] can convey the semantics of
	Instance		managedObjectClass and managedObjectInstance in one string.
	notification	One NV pair of	Name of NV pair is a string, NV_NOTIFICATION_ID.
	Id	filterable_	Value of NV pair is an unsigned long.
1		body_fields	1 5 5
	eventTime	One NV pair of	Name of NV pair is a string, NV_EVENT_TIME.
		filterable_	Value of NV pair is an IRPTime.
		body_fields	
	systemDN	One NV pair of	Name of NV pair is a string, NV_SYSTEM_DN.
		filterable_	Value of NV pair is a string. Syntax and semantics of this string conforms to the
		body_fields	Managed Object string representation specified in 3GPP TS 32.106-8 [4].
	There is no	remaining_	
	corresponding SS	Body	
	attribute.		

	CHANGE REQUEST
ж (2.106-3 CR 009 [#] rev - [#] Current version: 3.2.0 [#]
For <u>HELP</u> on t	ing this form, see bottom of this page or look at the pop-up text over the \Re symbols.
Proposed change	ffects: ೫ (U)SIM ME/UE Radio Access Network X Core Network
Title: भ	Use stringified IOR instead of type Object for manager_reference
Source: #	SA5
Work item code: भ	OAM-CM Date: # 02/03/2001
Category: भ	F Release: # R99
	Use one of the following categories:Use one of the following releases:F (essential correction)2A (corresponds to a correction in an earlier release)R96B (Addition of feature),R97C (Functional modification of feature)R98D (Editorial modification)R99D tetailed explanations of the above categories canREL-4be found in 3GPP TR 21.900.REL-5Use one of the following releases:2(GSM Phase 2)2(GSM Phase 2)8(Release 1996)8Release 1997)9(Release 1998)9Release 1999)10REL-410REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-511REL-512REL-513REL-514REL-515REL-515REL-516REL-517REL-517REL-518REL-519REL-519REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-510REL-5<
Reason for chang	 If IRPManager uses IOR of type Object in attach and detach, the IRPAgent may not be able to determine if they are referring to the same IRPManager. If IRPManager uses stringified IOR in attach and detach, the IRPAgent can mal the determination. (IOR = Interoperable Object Reference)
Summary of chan	Change all type references of manager_reference from Object to string. Add notes to attach_push, attach_push_b and attach_pull_b methods describing how to generate the parameters.
Consequences if not approved:	# attach_push, attach_push_b and attach_pull, underlying methods in the Notification IRP, would not be able to function correctly.
Clauses affected:	% 5.2 Tables 2, 3, 4, 5 and 8, Annex A
Other specs affected:	% Other core specifications % Test specifications O&M Specifications
Other comments:	X This CR should be implemented before the CR in S5-010033rev2.

3.2 Abbreviations

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

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NC	Notification Channel (OMG)
NE	Network Element
NV	Name and Value pair
EM	Element Manager
OMG	Object Management Group
SS	Solution Set
UML	Unified Modelling Language (OMG)

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5.2 Operation parameter mapping

3GPP TS 32.106-2 [5] defines semantics of parameters carried in operations across the Notification IRP. Table 2 through table 12 indicate the mapping of these parameters, as per operation, to their equivalents defined in this SS.

IS Operation parameter	SS Method parameter	Qualifier					
managerReference	Object_string manager_reference (see NOTE 1)	М					
timeTick long time_tick							
notification	NotificationIRPConstDefs::NotificationCategorySet	0					
Categories	notification_category_set						
filter	string filter (<u>s</u> ee NOTE <u>2</u>)	0					
subscriptionId	Return value of type SubscriptionId	М					
status	Attach, ParameterNotSupported, InvalidParameter,	М					
	AlreadySubscribed,						
	AtLeastOneNotificationCategoryNotSupported						
NOTE 1: —IRPManager c	reates a CosNotifyComm::SequencePushConsumer object and invokes						
CORBA::ORB::	object_to_string to obtain the stringified IOR, say s1. IRPManager stores	the s1.					
IRPManager ser	nds s1 as input parameter of attach_push to IRPAgent. IRPAgent receives s	1, performs					
CORBA::ORB::	string_to_object to obtain the IRPManager's IOR and uses it for its future	methods.					
IRPAgent also s	tores the s1 for future comparisons. IRPManager later calls detach with s1. Il	<u>RPAgent</u>					
receives the strip	receives the stringified IOR s1, compares it with those stored stringified IORs (e.g., s1), finds a ma						
performs the detach process. IRPAgent pushes sequence of Structured Events towards IRPMana							
CosNotifyCom	CosNotifyComm::SequencePushConsumer object push_structured_events method, dep						
the supplied not	the supplied notification categories and filter.						
NOTE 2: The grammar of	the filter string is extended_TCL defined by OMG Notification Service (OMG 7	C Document					
telecom [2]). Th	is grammar shall be the only one used for Alarm IRP: CORBA SS.						

Table 2: Mapping from IS subscribe parameters to SS attach_push equivalents

Table 3: Mapping from IS ${\tt subscribe}\ parameters\ to\ SS\ {\tt attach_push_b}\ equivalents$

IS Operation parameter	SS Method parameter	Qualifier
managerReference	Object_string_manager_reference(see NOTE 1)	М
timeTick	long time_tick	0
notification	NotificationIRPConstDefs::NotificationCategorySet	0
Categories	notification_category_set	
filter	string filter (see NOTE 2)	0
subscriptionId	Return value of type SubscriptionId	М
Not specified in IS	CosNotifyChannelAdmin::SequenceProxyPushSupplier	М
	system_reference (<u>s</u> ee NOTE <u>3</u>)	

status	Attach, OperationNotSupported,	М
	ParameterNotSupported, InvalidParameter,	
	AlreadySubscribed.	
	AtLeastOneNotificationCategoryNotSupported	
NOTE 1:	IRPManager creates a CosNotifyComm::SequencePushConsumer object and invokes	
	CORBA::ORB::object_to_string to obtain the stringified IOR, say s1. IRPManager stores	the s1.
	IRPManager sends s1 as input parameter of attach_push_b to IRPAgent. IRPAgent receives	s s1 and
	stores the s1 for future comparisons. IRPManager later calls detach with s1. IRPAgent receiv	es the
	stringified IOR s1, compares it with those stored stringified IORs (e.g., s1), finds a match, and p	erforms the
	detach process.	
NOTE 2:	The grammar of the filter string is extended_TCL defined by OMG Notification Service (OMG T	C Document
	telecom [2]). This grammar shall be the only one used for Alarm IRP: CORBA SS	
NOTE <u>3</u> :	IRPAgent provides this reference to which IRPManager can invoke methods to manage the sub	scription.
	Valid methods are not defined in this IRP. OMG CORBA Notification Service defines these met	hods. Read
	interface CosNotifyChannelAdmin::SequenceProxyPushSupplier and	
	CosNotifyComm::SequencePushConsumerSequencePushSupplier:proxySupplier,	
	CosNotifyComm::SequencePushSupplier(). IRPManager is expected to invoke	
	connect_sequence_push_consumer()_ <u>method</u> of this interface to connect its own	
	cosNotifyComm::SsequencePushConsummer with this reference. After successful connection	n, IRPAgent
	pushes sequence of Structured Events towards IRPManager.	-

Table 4: Mapping from IS subscribe parameters to SS attach_pull equivalents

IS Operation parameter	SS Method parameter	Qualifier				
managerReference	Object_string manager_reference <u>(see NOTE 1)</u>	М				
timeTick	long time_tick					
notification	tification NotificationIRPConstDefs::NotificationCategorySet					
Categories	notification_category_set					
filter	string filter <u>(see NOTE 2)</u>	0				
subscriptionId	Return value of type SubscriptionId	М				
Not specified in IS.	CosNotifyChannelAdmin::SequenceProxyPullSupplier	М				
-	system_reference <u>(see NOTE 3)</u>					
status	Attach, OperationNotSupported,	М				
	ParameterNotSupported, InvalidParameter,					
	AlreadySubscribed,					
	AtLeastOneNotificationCategoryNotSupported					
NOTE 1: IRPManager crea	ates a CosNotifyComm::SequencePullConsumer object and invokes					
CORBA::ORB::C	<pre>bbject_to_string to obtain the stringified IOR, say s1. IRPManager stores</pre>	the s1.				
IRPManager sen	ds s1 as input parameter of attach pull to IRPAgent. IRPAgent receives s1 an	d stores the				
s1 for future com	parisons. IRPManager later calls detach with s1. IRPAgent receives the string	ngified IOR				
s1, compares it w	vith those stored stringified IORs (e.g., s1), finds a match, and performs the det	ach process.				
NOTE 2: The grammar of t	the filter string is extended_TCL defined by OMG Notification Service (OMG I	C Document				
telecom [2]). This	s grammar shall be the only one used for Alarm IRP: CORBA SS.					
NOTE 3: IRPAgent provide	es this reference to which IRPManager can invoke methods to manage the sub	SCRIPTION.				
	e not defined in this IRP. ONG CORBA Notification Service defines these met	nous. Reau				
	Interface cosNotligenannelAdmin: SequenceProxyPullSupplier and					
	cosnocitycomm. sequenceruitconsumer, in rivinager is expected to invoke					
	connect_sequence_put1_consumer memod or institution connect is own					
LDDMonoger zwill	DDAter reconstructions and the second for the second for the second seco					
IRPlvianager pull	s sequence of Structurea Events from IRPAgent.					

Table 5: Mapping from IS unsubscribe parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
managerReference	Object_<u>string_</u>manager_reference	М
subscriptionId	string subscription_id	0
status	Detach,InvalidParameter	М

Table 8: Mapping from IS getSubscriptionIds parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
managerReference	Object_<u>string</u>manager_reference	М
subscriptionIdList	Return value of type	M
	NotificationIRPConstDefs::SubscriptionIdSet	

status	GetSubscriptionIds,OperationNotSupported,InvalidPara	М
	meter	

```
interface NotificationIRPOperations {
    /* ## Operation: attach_push
    */
   NotificationIRPConstDefs::SubscriptionId attach_push (
      in Object-string manager_reference,
      in long time_tick,
      in NotificationIRPConstDefs::NotificationCategorySet
        notification_category_set,
      in string filter
    )
   raises (Attach, ParameterNotSupported, InvalidParameter, AlreadySubscribed,
            AtLeastOneNotificationCategoryNotSupported);
    /* ## Operation: attach_push_b
    * /
    NotificationIRPConstDefs::SubscriptionId attach_push_b (
      in stringObject manager_reference,
      in long time_tick,
      in NotificationIRPConstDefs::NotificationCategorySet
        notification_category_set,
      in string filter,
      out CosNotifyChannelAdmin::SequenceProxyPushSupplier system_reference
    )
   raises
(Attach, OperationNotSupported, ParameterNotSupported, InvalidParameter, AlreadySubs
cribed,AtLeastOneNotificationCategoryNotSupported);
    /* ## Operation: attach_pull
    * /
    NotificationIRPConstDefs::SubscriptionId attach_pull (
       in Objectstring manager_reference,
       in long time_tick,
       in NotificationIRPConstDefs::NotificationCategorySet
          notification_category_set,
       in string filter,
       out CosNotifyChannelAdmin::SequenceProxyPullSupplier system_reference
    )
   raises (Attach, OperationNotSupported, ParameterNotSupported,
            InvalidParameter, AlreadySubscribed,
            AtLeastOneNotificationCategoryNotSupported);
    /* ## Operation: detach
    */
    void detach (
     in Objectstring manager_reference,
     in string subscription_id
    )
   raises (DetachException, InvalidParameter);
    /* ## Operation: get_notification_IRP_version
   */
   CommonIRPConstDefs::VersionNumberSet get_notification_IRP_version ()
   raises (GetNotificationIRPVersion);
    /* ## Operation: get_subscription_status
```

```
*/
  NotificationIRPConstDefs::NotificationCategorySet get_subscription_status (
   in string subscription_id,
   out string filter_in_effect,
   out NotificationIRPConstDefs::SubscriptionState subscription_state,
   out long time_tick
 )
 raises (GetSubscriptionStatus, OperationNotSupported, InvalidParameter);
 /* ## Operation: get_subscription_ids
 */
 NotificationIRPConstDefs::SubscriptionIdSet get_subscription_ids (
   in Objectstring manager_reference
 )
 raises (GetSubscriptionIds, OperationNotSupported, InvalidParameter);
 /* ## Operation: change_subscription_filter
 * /
  void change_subscription_filter (
    in string subscription_id,
    in string filter
 )
 raises (ChangeSubscriptionFilter,OperationNotSupported,InvalidParameter);
 /* ## Operation: get_notification_categories
 */
 NotificationIRPConstDefs::NotificationCategorySet
      get_notification_categories (
   out NotificationIRPConstDefs::EventTypesSet event_type_list,
   out NotificationIRPConstDefs::ExtendedEventTypesSet
      extended_event_type_list
 )
 raises (GetNotificationCategories,OperationNotSupported);
};
```

#endif

};

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5 Mapping

5.2 Operation parameter mapping

3GPP TS 32.106-2 [5] defines semantics of parameters carried in operations across the Notification IRP. Table 2 through table 12 indicate the mapping of these parameters, as per operation, to their equivalents defined in this SS.

Table 2: Mapping from IS subscribe parameters to SS attach_push equivalents

IS Operation parameter	SS Method parameter	Qualifier
managerReference	Object manager_reference	М
timeTick	long time_tick	0
notification	NotificationIRPConstDefs::NotificationCategorySet	0
Categories	notification_category_set	
filter	string filter (See NOTE)	0
subscriptionId	Return value of type	М
	NotificationIRPConstDefs::SubscriptionId	
status	Attach, ParameterNotSupported, InvalidParameter,	М
	AlreadySubscribed,	
	AtLeastOneNotificationCategoryNotSupported	
NOTE: The grammar of	the filter string is <code>extended_TCL</code> defined by OMG Notification Service (OMG 1	C Document
telecom [2]). Thi	s grammar shall be the only one used for Alarm IRP: CORBA SS.	

Table 3: Mapping from IS subscribe parameters to SS attach_push_b equivalents

IS Operation parameter	SS Method parameter	Qualifier			
managerReference	Object manager_reference				
timeTick	long time_tick	0			
notification	NotificationIRPConstDefs::NotificationCategorySet				
Categories	notification_category_set				
filter	string filter	0			
subscriptionId	Return value of type	М			
	NotificationIRPConstDefs::SubscriptionId				
	SubscriptionId				
Not specified in IS	CosNotifyChannelAdmin::SequenceProxyPushSupplier	М			
	system_reference (See NOTE)				
status	Attach, OperationNotSupported,	М			
	ParameterNotSupported, InvalidParameter,				
	AlreadySubscribed,				
	AtLeastOneNotificationCategoryNotSupported				
NOTE: IRPAgent provide	es this reference to which IRPManager can invoke methods to manage the sub	scription.			
Valid methods ar	e not defined in this IRP. OMG CORBA Notification Service defines these met	hods. Read			
interface Sequer	<pre>SequencePushSupplier:proxySupplier, CosNotifyComm::SequencePushSupplier{}</pre>				
IRPManager is e	Manager is expected to invoke <code>connect_sequence_push_consumer()</code> of this interface to connect i				
own cosNotify	own cosNotifyComm::sequencePushConsummer with this reference. After successful connection,				
IRPAgent pushes	s sequence of Structured Events towards IRPManager.				

Table 4: Mapping from IS subscribe parameters to SS attach_pull equivalents

IS Operation parameter	SS Method parameter	Qualifier
managerReference	Object manager_reference	М
timeTick	long time_tick	0
notification	NotificationIRPConstDefs::NotificationCategorySet	0
Categories	notification_category_set	
filter	string filter	0
subscriptionId	Return value of type	М
	NotificationIRPConstDefs::SubscriptionId	

	SubscriptionId	
Not specified in IS.	CosNotifyChannelAdmin::SequenceProxyPullSupplier	М
	system_reference	
status	Attach, OperationNotSupported,	М
	ParameterNotSupported, InvalidParameter,	
	AlreadySubscribed,	
	AtLeastOneNotificationCategoryNotSupported	

Table 5: Mapping from IS unsubscribe parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
managerReference	Object manager_reference	М
subscriptionId	NotificationIRPConstDefs::SubscriptionId string	0
	subscription_id	
status	Detach,InvalidParameter	М

Table 7: Mapping from IS getSubscriptionStatus parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
subscriptionId	NotificationIRPConstDefs::SubscriptionId string	М
	subscription_id	
notification	Return value of type	М
CategoryList	NotificationIRPConstDefs::NotificationCategorySet	
filterInEffect	string filter_in_effect	0
subscription	NotificationIRPConstDef::SubscriptionState	0
State	subscription_state	
timeTick	long time_tick	0
status	GetSubscriptionStatus,OperationNotSupported,InvalidP	М
	arameter	

Table 9: Mapping from IS changeSubscriptionFilter parameters to SS equivalents

IS Operation parameter	SS Method parameter	Qualifier
subscriptionId	NotificationIRPConstDefs::SubscriptionId string	М
	subscription_id	
filter	string filter	М
status	ChangeSubscriptionFilter,OperationNotSupported,Inval	М
	idParameter	

```
. .
    /* ## Operation: detach
    */
    void detach (
      in Object manager_reference,
     in NotificationIRPConstDefs::SubscriptionId<del>string</del> subscription_id
    )
   raises (DetachException, InvalidParameter);
    /* ## Operation: get_notification_IRP_version
    */
   CommonIRPConstDefs::VersionNumberSet get_notification_IRP_version ()
   raises (GetNotificationIRPVersion);
    /* ## Operation: get_subscription_status
    */
    NotificationIRPConstDefs::NotificationCategorySet get_subscription_status (
     in NotificationIRPConstDefs::SubscriptionIdstring subscription_id,
     out string filter_in_effect,
     out NotificationIRPConstDefs::SubscriptionState subscription_state,
     out long time_tick
    )
   raises (GetSubscriptionStatus, OperationNotSupported, InvalidParameter);
    /* ## Operation: get_subscription_ids
    */
   NotificationIRPConstDefs::SubscriptionIdSet get_subscription_ids (
     in Object manager_reference
    )
   raises (GetSubscriptionIds, OperationNotSupported, InvalidParameter);
    /* ## Operation: change_subscription_filter
    */
    void change_subscription_filter (
       in NotificationIRPConstDefs::SubscriptionIdstring subscription_id,
       in string filter
    )
   raises (ChangeSubscriptionFilter,OperationNotSupported,InvalidParameter);
    /* ## Operation: get_notification_categories
    */
   NotificationIRPConstDefs::NotificationCategorySet
        get_notification_categories (
     out NotificationIRPConstDefs::EventTypesSet event_type_list,
     out NotificationIRPConstDefs::ExtendedEventTypesSet
         extended_event_type_list
    )
   raises (GetNotificationCategories, OperationNotSupported);
  };
};
```

#endif

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/* ## Module: NotificationIRPSystem
 This module implements capabilities of IRPAgent specified in Notification
 IRP: Information Service version 1 and its equivalents in Notification
 IRP: CORBA Solution Set version 1:1.
 ###Module: NotificationIRPSystem_idl
#define NotificationIRPSystem_idl

#include "CosNotifyComm.idl"

```
#include "CosNotifyChannelAdmin.idl"
#include "NotificationIRPConstDefs.idl"
#include "CommonIRPConstDefs.idl"
#pragma prefix "3gppsa5.org"
```