TIP_PM_Mon_IA, TIP Performance Management Monitoring Information Agreement

TIP_PM_Mon_IA

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1. Introduction

As the communication world transforms to a service-oriented system, the next generation Service Providers (SP) have to deal with multi-technology, multi-vendor networks. The Service Providers not only have to provide a varied set of services to their customers but also need to contend with the pressure on the networking resources as the services multiply. In such a scenario, it is essential that the SP has a consistent view of the performance and utilization of the entire network. Only then can the SP efficiently utilize and plan the network resources available at his disposal.

As various technologies have developed over time the standards for monitoring the performance of the Network Elements for these have come to differ. This makes it very difficult to extract and correlate the Performance information.

This interface covers the Production and Collection aspects of Performance Management, also called Performance Monitoring.

The aspects of Performance Objective Monitoring will be covered in a separate interface and IA document.

A Performance Management interface allows getting the end-to-end performance and utilization of the network. It also facilitates visualizing the performance of various services deployed in the network.

This interface functionality is closely related to Resource Problem Management and Resource Management. Along with Resource Problem Management, the Performance Management functionality provides inputs to the Service Assurance Modules of OSS.

1.1. Document Structure

The following sections are contained in this document:

- Section 1 is the document introduction
- Section 2 provides a summary description of the interface
- Section 3 describes the Information Model used by this interface
- Section 4 describes all the Service Interfaces contained in this interface

1.2. Conventions Used In This Document

In this document, we use the following color conventions.

In the attribute tables:

- An attribute shown on white background is local.
- An attribute shown on lavender background is inherited.
- An attribute shown on green background is implicit.

Similarly, text in green color indicates implicit or generated data. Implicit information does not appear in the model, but will be added by the generators in the final interface specification based on the decoration present in the model. It can be additional attributes in an entity, additional notifications or additional operations. Implicit data is defined in the Internal Framework Model. Please refer to the Framework Guidebook for details.

All links are with blue color.

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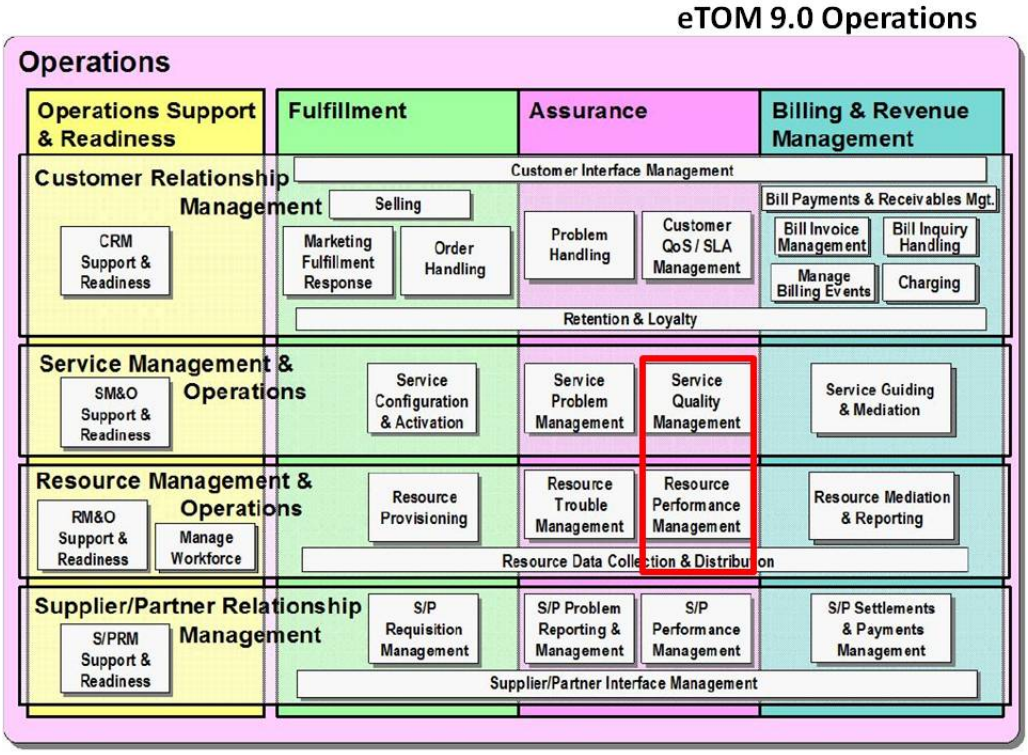
2. Interface Summary

2.1. Context

2.1.1. Relation to eTOM

The Performance Management monitoring interface supports the performance area of the Business Process Framework (eTOM) as shown in the figure below. Processes include Service Quality Management, Resource Performance Management and Resource Data Collection and Distribution.



The specific area of interest for this interface is the eTOM level 2 processes known as Service Quality Management, Resource Performance Management, Resource Data Collecction and Processing.

Interface implications for the various eTOM level 3 processes of the Service Quality Management process with the PM Collection interface are as follows:

- Monitor Service Quality: This process is the main consumer of the PM Collection interface.
- Create Service Performance Degradation Report: This process is an indirect consumer of PM information.
- Analyze Service Quality: This process is an indirect consumer of PM information.
- Track and Manager Service Quality Performance Resolution: This process is an indirect consumer of PM information.
- Improve Service Quality: This process is an indirect consumer of PM information.
- Close Service Performance Degradation Report: This process is an indirect consumer of PM information.
- Report Service Quality Performance: This process is an indirect consumer of PM information.

Interface implications for the various eTOM level 3 processes of the Resource Performance Management process with the PM Collection interface are as follows:

- Monitor Resource Performance: This process is the main consumer of the PM Collection interface.
- Analyze Resource Perfomance: This process is a direct use of the PM Collection interface as it is in charge of initiating, modifying and cancelling performance data collection.
- Control Resource Performance: This process is an indirect consumer of PM information.
- Report Resource Performance: This process is an indirect consumer of PM information.

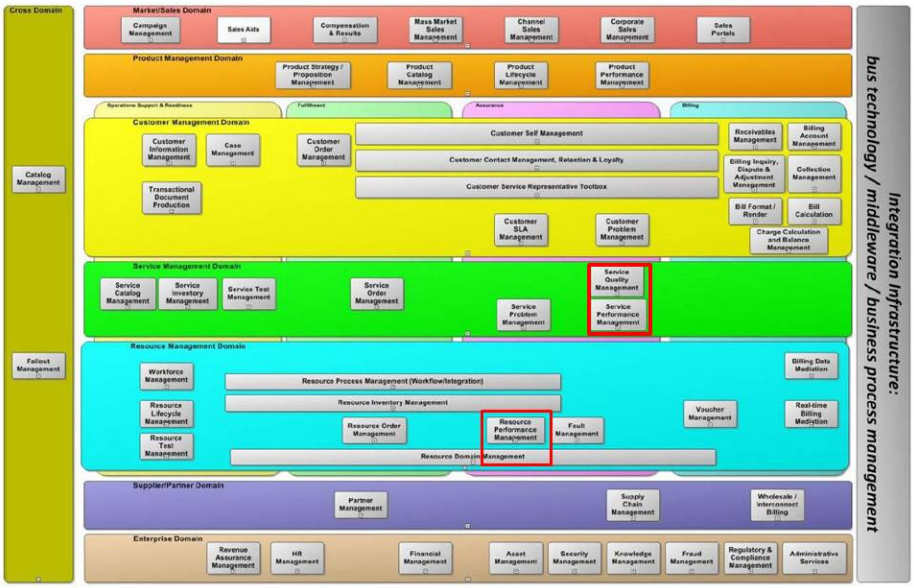
Interface implications for the various eTOM level 3 processes of the Resource Data Collection and Processing process with the PM Collection interface are as follows:

- Collect Resource Data: This process is the main consumer of the PM Collection interface.
- Process Resource Data: This process is an indirect consumer of PM information.
- Report Resource Data: This process is an indirect consumer of PM information.
- Audit Resource Usage Data: This process is an indirect consumer of PM information.

This interface will also use and complement the existing SID Aggregate Business Entities in the Performance Management ABE within the Common Business Entities Domain.

2.1.2. Relation to TAM

In terms of the TAM Rel 4.5, the interface fits the Resource Assurance Management and Resource Domain Management Applications areas as shown on the figure below:



The following item from the TAM Resource Domain Management Applications area is covered:

- Resource Performance Mediation. An EMS acting as Resource Performance Mediation might typically be a server for the PM Collection interface.

The following items from the TAM Resource Performance Management area are covered:

- Resource Performance Monitoring: This application would be typically a client of this interface.
- Resource Performance Analysis: This applicaton would be typically a client of the interface.

2.2. Performance Monitoring

A key concept of this interface is the separation between performance measurements production (e.g. PM Control in MTOSI) and performance measurements collection (sometimes called PM Reporting). This is based on the understanding that for practical efficiency and security reasons, the lifecycle of generating performance indicators may be very different from the lifecycle of collecting them by a performance consuming application. Changes in production of data are usually required for new versions of network elements or other kinds of network changes and are restricted to authorized administrators. Changes in collection are more frequent as PM consuming applications may dynamically ask for various kinds of measurements without a prior setup. This distinction is a key concept in the structure of the interface. The first phase of the work focuses on the interface package for Collection of measurements.

The interface offers work methods for both PM Production and PM Collection. PM Production is operated using PM Production jobs. An authorized PM Consuming application defines the required PM indicators to be generated by the Producing Application, supplying the necessary parameters for the generation of the indicators. Any PM Consuming application may collect the produced indicators. As some of the existing standards, do not make the distinction between PM Production and PM Collection, the interface also provides the way to produce indicators and collect them in a single set of commands. This mode of work can be used as a shortcut in the case when the PM Consuming application needs both to produce the indicators and collect them, having the right permissions for both types of activities.

For the collection of PM data, this interface offers two work methods:

- Measurement Collection Jobs -- Using this method, a PM consuming application will define the required PM data, the scope of the network objects or services to be applied on and scheduling parameters. The PM producing application is responsible for reporting the required PM indicators based on the measurement collection job definition. A client might discover existing Measurement Collection Jobs using a filtered get operation. This method corresponds to the OSS/J measurement jobs.
- Adhoc collection -- This second method of PM collection gives more responsibility to the PM consuming application. Using this method, each request for PM data sent by the PM consuming application is managed as a separate, stand-alone request having its own set of results. It may be used by a PM consuming application in a (client-based) scheduled manner when the requesting side takes the responsibility for the scheduling of requests. This may also be used when a PM consuming application requires ad hoc PM data for specific requests coming from the application layer in a more dynamic scenario of using PM data. This method corresponds to the MTOSI way of requesting PM data.

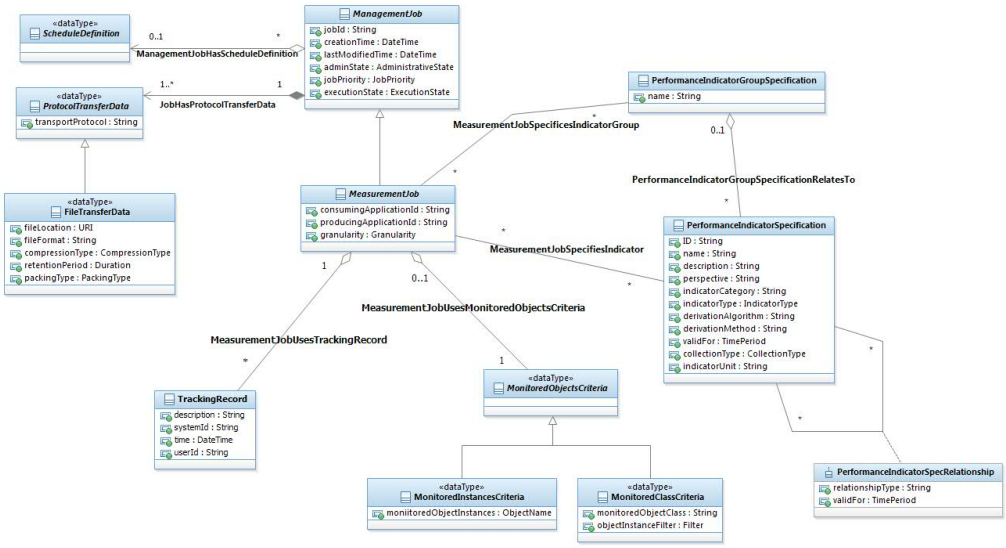
2.3. MeasurementJob

A PM measurement job is the administrative entity defined by a client application to perform a periodic activity related to PM data. The PM activities may be production of measurements, collection of measurements or PM objective monitoring (scheduled evaluation of thresholds).

In each of these cases, the PM measurement job will include the following:

- A set of requested performance indicators
- A network/service scope defining a subset of the network or a subset of the service catalog
- Scheduling parameters
- Specific activity parameters, related to collection, production or objective monitoring

The Measurement Job and its attributes are shown in the figure below:



The Measurement Job inherits the Management Job as specified in the Common Business Entities of SID, using the operations from the Common IA. The generic attributes of a job, a scheduling definition generic mechanism, and the options for transfer protocols are defined at the infrastructures level. For further details, please refer to the Common IA document.

As the measurement job is a concept that can serve different purposes, it is defined as a base abstract entity.

The following attributes and entities are defined as a part of the measurement job:

2.3.1. Performance Indicators Definition

A *Performance Indicator* is a Performance attribute, a type of a parameter that is measured on instances of a measured object Class, on monitored objects. Performance Indicators at the network level are usually reported in groups.

A *Performance Indicator Specification* holds the definition of the requested Performance indicator including: its name, value type, collection type, description and units.

A *Performance Indicator Group* is a set of performance indicators that are reported as a group by an Element Manager or a Network Element. Other common terms in the industry are Counter Set or Counter Group.

A Performance Indicator Group Specification is the logical group of the Performance Indicator Specification objects that compose a Performance Indicator Group. The Performance Indicator Group Specification has a name (string) and it can (optionally) hold the individual performance indicator specification objects.

A Measurement Job, at the base entity level, can define its scope of requested indicators in one of two ways:

- By specifying a list of performance indicator group specification objects. This will be more common for some technologies such as Mobile and IP. In some cases, interfaces may even use just the indicator group names without using the underlying indicators. For these cases, it is assumed that the underlying indicator specifications are standard and agreed on by both parties of the interface.
- By specifying a list of specific performance indicator specification objects. This may be used for cases where equipment vendors do not support performance indicator groups or for service layer indicators where the performance indicator groups may not exist.

2.3.2. Monitored Objects Definition

The *Monitored Objects Criteria* are descibed in section 2.7.

2.3.3. General PM Job Parameters

The measurement job has some general parameters that apply to the different kinds of Performance Measurement jobs:

- Producing Application ID - The identifier of the application that produces performance indicators.
- Consuming Application ID - The identifier of the application that consumes the performance indicators.
- Granularity - The sampling rate of Performance Indicators as determined at the Performance production stage. Granularity supports a range of time granularities from 1 minute to 1 year (as may also be calculated by intermediate OSS systems).
- Tracking Records - The measurement job has associated tracking record objects to log and audit the lifecycle of the measurement job.

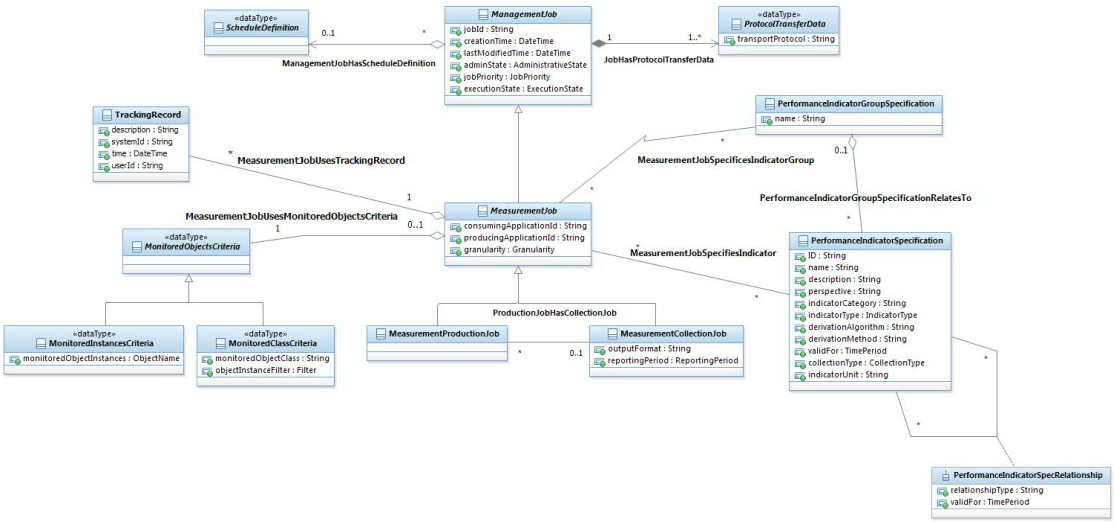
Additionally, the Performance Measurement Job inherits the general parameters from the Management Job (Management Job ABE):

- JobID - The ID of the management job.
- Creation time - The measurement job creation time.
- Last Modified Time - The last time that a measurement job was modified.
- Job Priority - The possible priority of the measurement job, 1 to 10
- Admin State - The administrative state of the management job.
- Execution State - The execution state of the management job.
- Schedule Definition - A schedule object is attached to the measurement job to define the job scheduling.
- Protocol Transfer Data -The information required for a data transfer, based on the transport protocol value(s).

2.4. MeasurementCollectionJob

A Measurement Collection Job is used to control the periodic collection of performance indicators, implemented as a sub-entity of the PM Measurement Job.

The Measurement Collection Job and its attributes are shown in the figure below:



As the Measurement Collection Job inherits from the Measurement Job, it includes all attributes and associations defined in the previous section.

The following attributes are specific to the Measurement Collection Job:

2.4.1. Specific PM Collection Job Parameters

- Output Format - The name (a string) of the file format that is used for transferring the performance data between applications. This may be a standard format such as MTOSI or 3GPP. Alternatively it can be a proprietary format.
- Reporting Period - The rate of collecting Performance Indicator reports

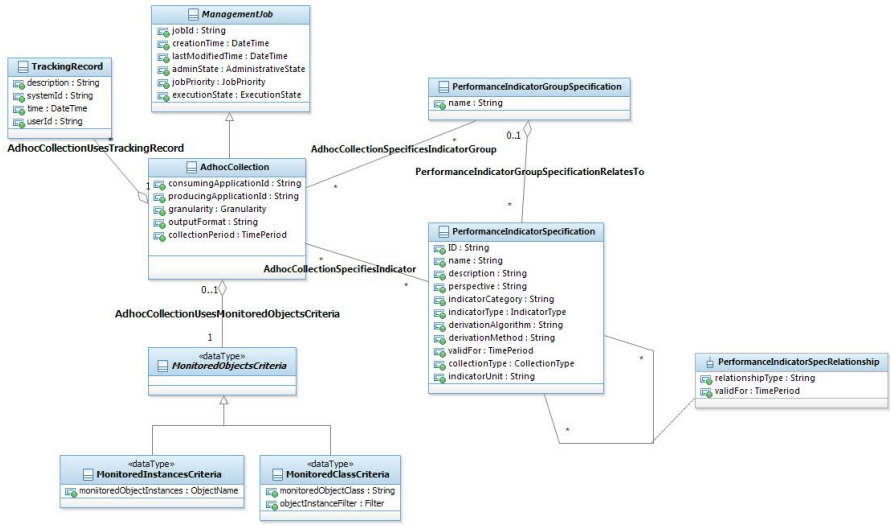
2.5. AdhocCollection

Ad-hoc collection is an on-demand collection method of Performance measurements results from a consuming application, requesting spontaneously a set of data for a set of network or service testing resources for a given temporal context. As the ad-hoc query is a single isolated request, its lifecycle is much simpler and isolated, having a request-response nature.

The parameters of the PM data request are very similar to the parameters of the measurement job; the main difference is related to the administration of the request. These parameters include:

- A set of requested performance indicators
- A network/service scope defining a subset of the network or a subset of the service catalog
- Collection parameters: file and format transport parameters
- Time range

The Adhoc Collection and its attributes are shown in the figure below:



The following attributes and entities are defined as a part of the ad-hoc collection:

2.5.1. Performance Indicators Definition

These indicators are the same as defined for the MeasurementJob. Please refer to section 2.3.1 for details.

2.5.2. Monitored Objects Definition

The *Monitored Objects Criteria* are descibed in section 2.7

2.5.3. Ad-hoc Collection Specific Parameters

Ad hoc collection has the following specific parameters and relationships:

- Granularity - The sampling rate of Performance Indicators as determined at the Performance production stage. Granularity supports a range of time granularities from 1 minute to 1 year (as may also be calculated by intermediate OSS systems).
- Producing Application ID - The identifier of the application that produces the performance indicators.
- Consuming Application ID - The identifier of the application that consumes the performance indicators.

- Output Format - The name (a string) of the file format that is used for transferring the performance data between applications. This may be a standard format such as MTOSI or 3GPP, or alternatively it can be a proprietary format.
- Collection Period - The time range of the requested Performance Indicators. This parameter is the equivalent of the collection job scheduling in the single, one time, collection context.
- Tracking Records - The measurement job has associate tracking record objects to log and audit its generation.

Additionally, the Adhoc Collection Job inherits the general parameters from the Management Job (Management Job ABE):

- JobID - The ID of the management job.
- Creation time - The measurement job creation time.
- Last Modified Time - The last time that a measurement job was modified.
- Job Priority - The possible priority of the measurement job, 1 to 10
- Admin State - The administrative state of the management job.
- Execution State - The execution state of the management job.
- Protocol Transfer Data -The information required for a data transfer, based on the transport protocol value(s).

The ScheduleDefinition present in the ManagementJob is not used for an Adhoc Collection.

2.6. Measurement Production Job

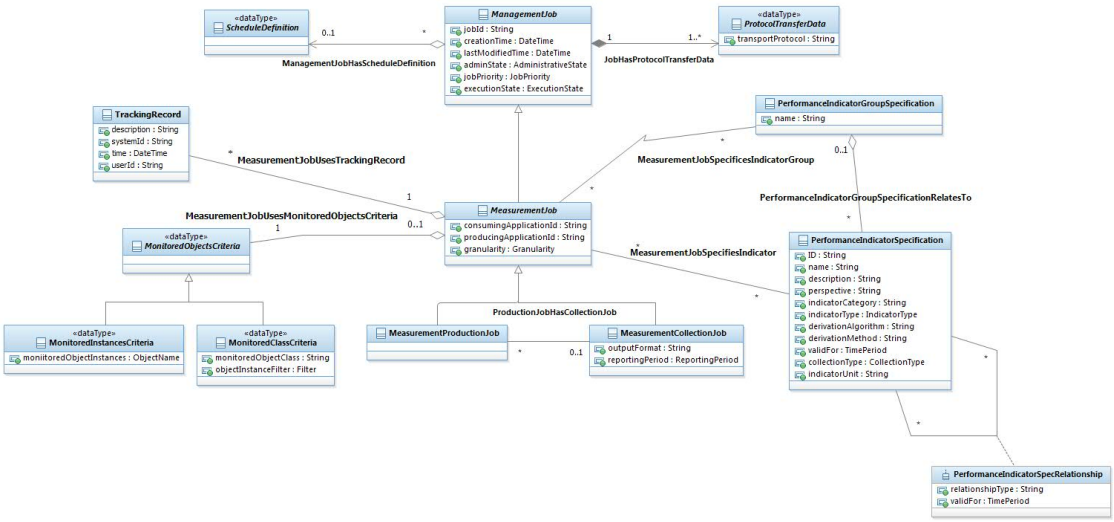
Performance measurements production functionality is about controlling the generation of indicators, the equivalent of PM Control in MTOSI. Production instructions are usually set in the set-up of a PM project. Changes are usually required for new versions of network elements or other kinds of network changes.

The PM Production Interface Service supports to flavors of operations:

- Production only
- Production and Collection - A mode that supports the creation and the deletion of both PM Production and PM Collection, similarly to some of the existing standards (3GPP, OSS/J)

Like the Measurement Collection Job, the Measurement Production Job inherits from the Measurement Job. Its attributes are coming from its ancestors. in addition, the Production Job may have a Collection Job associated with it to support the behavior of same operations on Production and Collection on this pair of jobs.

The Measurement Production Job and its attributes are shown in the figure below:



2.7. Monitored Objects Criteria

A *monitored object* is any network or service entity that is the object of the Performance monitoring. Monitored objects can be managed objects at the network level, physical or logical elements internal to the managed objects, or service entities.

A monitored object belongs to a *monitored object class* which classifies the monitored object. This may be a functional classification at the network level (e.g. a Router, a Cell, etc.), a vendor classification, or a service classification. The classification is assumed to be agreed on outside the scope of the interface.

A measurement job must define a scope of monitored objects using the *monitored objects criteria*. The monitored objects criteria support two kinds of monitored objects specification, represented as two sub-entities:

- Monitored Instances criteria - Specifies a list of individual monitored instances (typed as object names).
- Monitored Class criteria - Specifies a monitored object class (a string) in conjunction with a filter object. The filter is composed of name value pairs that can be used to focus the PM collection

The Monitored Objects Criteria and the derived objects are shown in the figure below:

MonitoredObjectCriteria is an abstract class. It is transformed to a datatype in the implementation.

MonitoredInstancesCriteria has a single attribute monitoredObjectInstances of type ObjectName containing the list of monitored instances. MonitoredInstancesCriteria is transformed to a datatype in the implementation.

MonitoredClassCriteria has 2 attributes:

- monitoredObjectClass: (String, Optional) A monitored object class for specifying the set of instances that are referenced by a PM query.
- objectInstanceFilter: (Filter, Optional) A filter that can be used in conjunction with the monitored object class for specifying the set of instances that are referenced by a PM query.

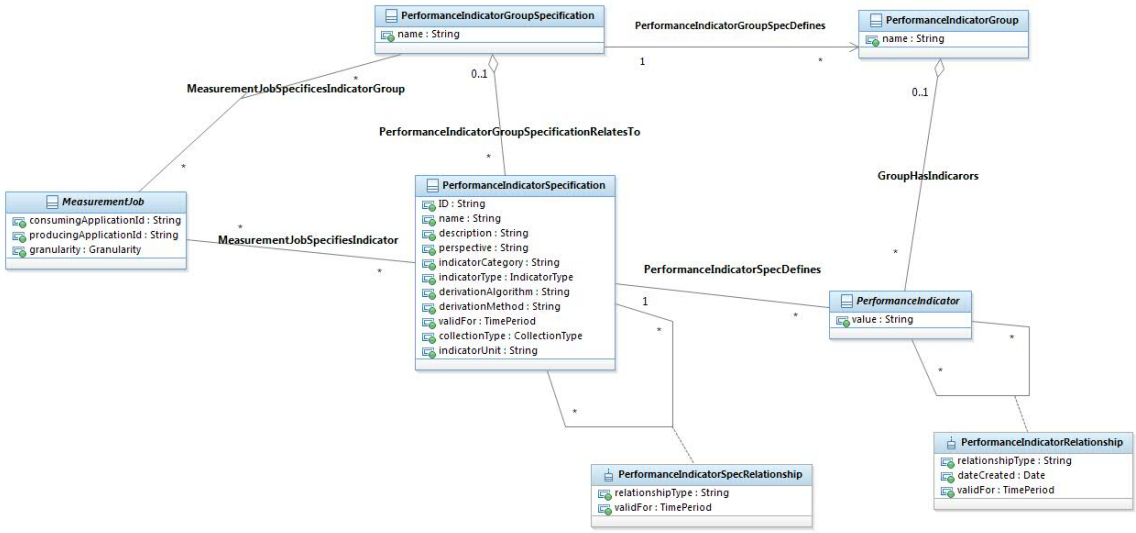
2.8 Performance Indicator Specification

A *Performance Indicator Specification* holds the definition of the requested Performance indicator including: its name, value type, collection type, description and units.

3 changes have been made in this class:

- The attribute valueType has been changed to an enum IndicatorType. Values are: String, Int, Float, Double.
- A new required collectionType attribute has been added. Its type is the enum CollectionType. Values are: Cumulative, Delta, Discrete Event, Gauge, Status Inspection.
- A new indicatorUnit attribute of type String has been added.

The Performance Indicator Specification and its attributes are shown in the figure below:



The attributes of the Performance Indicator Specification are the following:

- ID: (String, Required): A unique identifier for the PerformanceIndicatorSpecification
- name: (String, Required): A word, term, or phrase by which a PerformanceIndicatorSpecification is known and distinguished from other PerformanceIndicatorSpecifications.
- description: (String, Optional): A narrative that explains in detail what the PerformanceIndicatorSpecification is.
- perspective: (String, Optional) The point of view for the PerformanceIndicatorSpecification, such as a single user instance or an aggregation.
- indicatorCategory: (String, Optional) A grouping or set of PerformanceIndicatorSpecifications that are classified together because of common characteristics, such as technology specific, service specific, or technology/service independent.
- valueType: (IndicatorType, Required) A kind of value that the PerformanceIndicator can take: double, float, int, string.
- derivationAlgorithm: (String, Optional) A step-by-step procedure used to calculate the value of the PerformanceIndicator.
- derivationMethod: (String, Optional) For simple calculations, the method used to calculate the value of a PerformanceIndicator, such as average, minimum, maximum, sum, and so forth.
- validFor: (TimePeriod, Optional) The period of time during which the PerformanceIndicatorSpecification is applicable.
- collectionType: (CollectionType, Required) The type of the collection: gauge, commulative, status inspection. Indicators can be produced using these methods.
- indicatorUnit: (String, Optional) The unit by which the indicator is measured. For example: seconds, KBs, rate per second, etc.

2.9. Interface Summary

The Performance Management Monitoring interface is covering 3 new SID Aggregate Business Entities (ABE):

- Performance Monitoring ABE, (L2 ABE) part of the Common Business Entities Domain, under the Performance ABE (L1 ABE).
- Performance Collection ABE, (L3 ABE) part of the Common Business Entities Domain, under the Performance Monitoring ABE.
- Performance Prodcution ABE, (L3 ABE) part of the Common Business Entities Domain, under the Performance Monitoring ABE.

The PM interface is partially an entity-centric interface as it provides services on the 3 main objects of the ABEs:

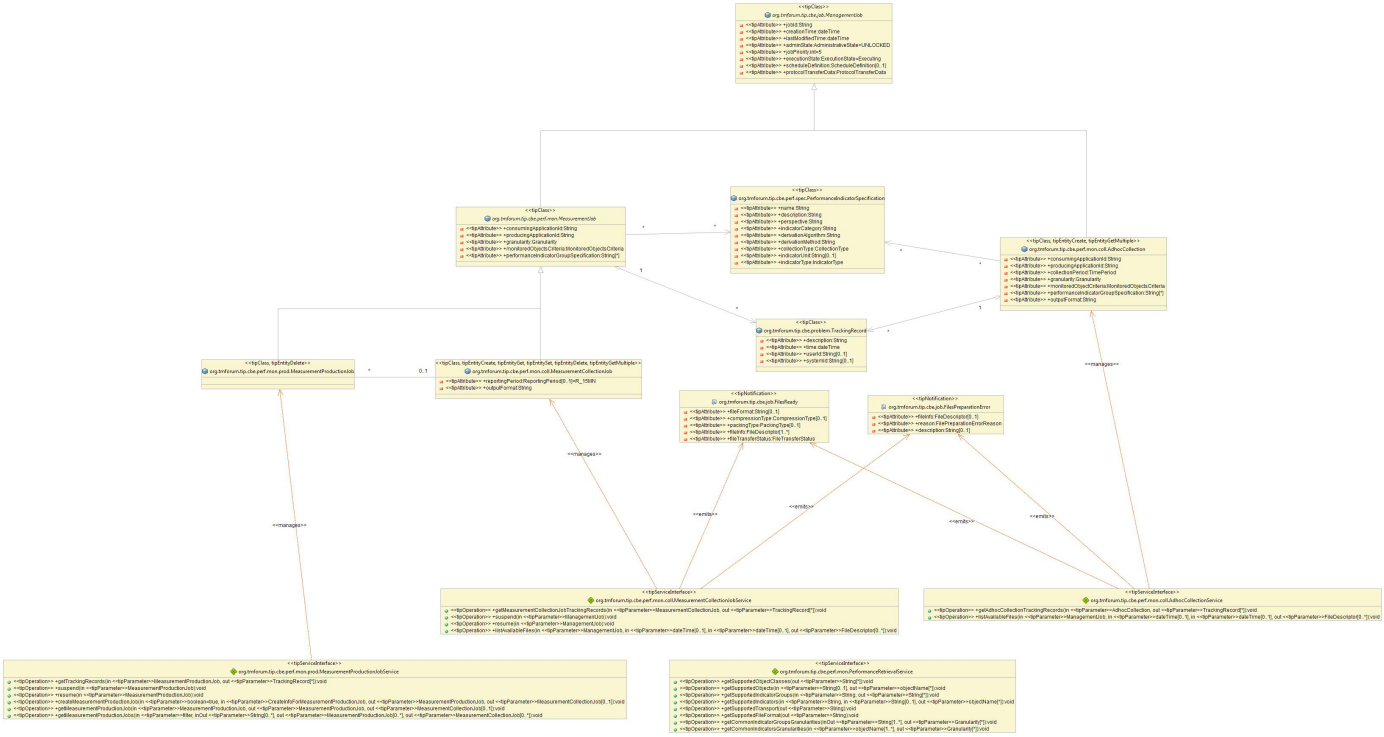
- MeasurementProductionJob
- MeasurementCollectionJob
- AdhocCollection

The Performance Management interface also provides the collection of performance data and contains 4 service interfaces

- MeasurementCollectionJobService: providing all the operations related to the MeasurmentCollectionJob object.
- AdhocCollectionService: providing all the operations related to the AdhocCollection object.
- MeasurementProductionJobService: providing all the operations related to the MeasurementProductionJob object.
- PerformanceRetrievalService: providing all the general retrieval operations for the interface common to both MeasurementProductionJob, MeasurementCollectionJob and AdhocCollection.

The implementation packages that corresponds to the Performance Monitoring ABE, the Performance Collection ABE and the Performance Production ABE will be described first, then the service interfaces will be described.

The picture below presents an overall view of the Information Model of the Performance Management Monitoring Interface:



3. Information Model

Packages available from TIP Performance Management Monitoring:
- org.tmforum.tip.cbe.perf.mon
- org.tmforum.tip.cbe.perf.mon.coll
- org.tmforum.tip.cbe.perf.mon.prod

3.1. Package org.tmforum.tip.cbe.perf.mon

3.1.1. Entities

3.1.1.1. MeasurementJob

- Type: Entity Artifact
- Package: org.tmforum.tip.cbe.perf.mon
- All super types:
  org.tmforum.tip.cbe.job.ManagementJob
  org.tmforum.tip.internal.entity.EntityBase
- Description:
A job for scheduling PM related activities: the collection of performance indicators or the production of performance indicators.
- Properties:
  This entity is abstract
  This entity is optional
  This entity is extendable
  This entity does not generate Object Creation notifications (NA)
  This entity does not generate Object Deletion notifications (NA)
  This entity does not generate Object Discovery notifications (NA)

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3.1.1.1.1. Attributes

name	datatype	properties	description
consumingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that produces performance indicators.
producingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that consumes performance indicators.
granularity	Granularity	- multiplicity is 1 - unique - mandatory - AVC enabled	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 1 - unique - mandatory - AVC enabled	Monitored objects are specified by the MonitoredObjectsCriteria.
performanceIndicatorGroupSpecification	String	- multiplicity is * - read only - unique - invariant - optional - AVC disabled	The requested indicator groups are specified using PerformanceIndicatorGroupSpecification.

jobId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	The ID of the management job.
creationTime	dateTime	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	The creation time of the management job
lastModifiedTime	dateTime	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - read only - unique - default value is 'UNLOCKED' - optional - AVC enabled	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - unique - default value is '5' - optional - AVC enabled	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - unique - default value is 'Executing' - optional - AVC enabled	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - unique - optional - AVC enabled	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
protocolTransferData	ProtocolTransferData	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	Defines the information required for a data transfer.Based on the transport protocol value(s), the corresponding information classes will be used.
identifer	EntityIdentifier	- multiplicity is 1 - unique - invariant - mandatory - AVC enabled	The entity instance identifier EID.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.1.1.1.2. Associations

name	datatype	properties	description
trackingRecord	TrackingRecord	- multiplicity is * - aggregation is none - navigable - read only - unique - passed by value - optional - AVC disabled - association is MeasurementJobJobUsesTrackingRecord	Allows the tracking of modifications on the measurement job.The tracking records should not be returned by default with the measurement job to allow retrieving the job without the tracking records.Whether the tracking records is stored with the measurement job or outside of it is implementation specific.

performanceIndicatorSpecification	PerformanceIndicatorSpecification	- multiplicity is * - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled - association is MeasurementJobSpecifiesIndicator	The requested indicators are specified using PerformanceIndicatorSpecification.

3.1.2. Data Types

3.1.2.1. MonitoredClassCriteria

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon
- All super types:
    org.tmforum.tip.cbe.perf.mon.MonitoredObjectsCriteria
- Description:

A criteria for specifying what monitored objects are referenced by a PM query, specifying a monitored object class in conjunction with a filter.

- Properties:

3.1.2.1.1. Attributes

name	datatype	properties	description
monitoredObjectClass	String	- multiplicity is 0..1 - unique - optional	A monitored object class for specifying the set of instances that are referenced by a PM query.
objectInstanceFilter	filter	- multiplicity is 0..1 - unique - optional	A filter that can be used in conjunction with the monitored object class for specifying the set of instancesthat are referenced by a PM query.

3.1.2.2. MonitoredInstancesCriteria

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon
- All super types:
    org.tmforum.tip.cbe.perf.mon.MonitoredObjectsCriteria
- Description:

A criteria for specifying what monitored objects are referenced by a PM query, specifying a list of monitored object instances.

- Properties:

3.1.2.2.1. Attributes

name	datatype	properties	description
moniitoredObjectInstances	objectName	- multiplicity is * - unique - optional	A list of object identifiers for specifying what monitored objects need to be referenced by a PM query.

3.1.2.3. MonitoredObjectsCriteria

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon
- Description:
A criteria for specifying what monitored objects are referenced by a PM query, both scheduled or ad-hoc.
- Properties:
This datatype is abstract

3.1.2.3.1. Attributes

There are no attributes (local or inherited) available.

3.1.3. Enumerations

3.1.3.1. Granularity

- Type: Enumeration Artifact
- Package: org.tmforum.tip.cbe.perf.mon
- Description:
Sampling rate of the collection or production of performance indicators.
Supported values are : 1mn, 5mn, 15mn, 30mn, 1h, 24h, not applicable. The values 1 month and 1 year are also defined even if not used for collection.Note that litterals cannot start by a digit, so they are prefixed by a letter.For current instantaneous measurements the granularity does not apply which is indicated by the value "NA" (Not Applicable).
- Properties:

3.1.3.1.1. Literals

name	datatype	properties	description
G_1MN	String	value is "G_1MN"	
G_5MN	String	value is "G_5MN"	
G_15MN	String	value is "G_15MN"	
G_30MN	String	value is "G_30MN"	
G_1H	String	value is "G_1H"	
G_24H	String	value is "G_24H"	
G_1M	String	value is "G_1M"	
G_1Y	String	value is "G_1Y"	
NA	String	value is "NA"	

3.1.3.2. ReportingPeriod

- Type: Enumeration Artifact
- Package: org.tmforum.tip.cbe.perf.mon
- Properties:

3.1.3.2.1. Literals

name	datatype	properties	description
R_1MN	String	value is "R_1MN"	
R_5MN	String	value is "R_5MN"	
R_15MN	String	value is "R_15MN"	
R_30MN	String	value is "R_30MN"	
R_1H	String	value is "R_1H"	
R_24H	String	value is "R_24H"	
NA	String	value is "NA"	

3.2. Package org.tmforum.tip.cbe.perf.mon.coll

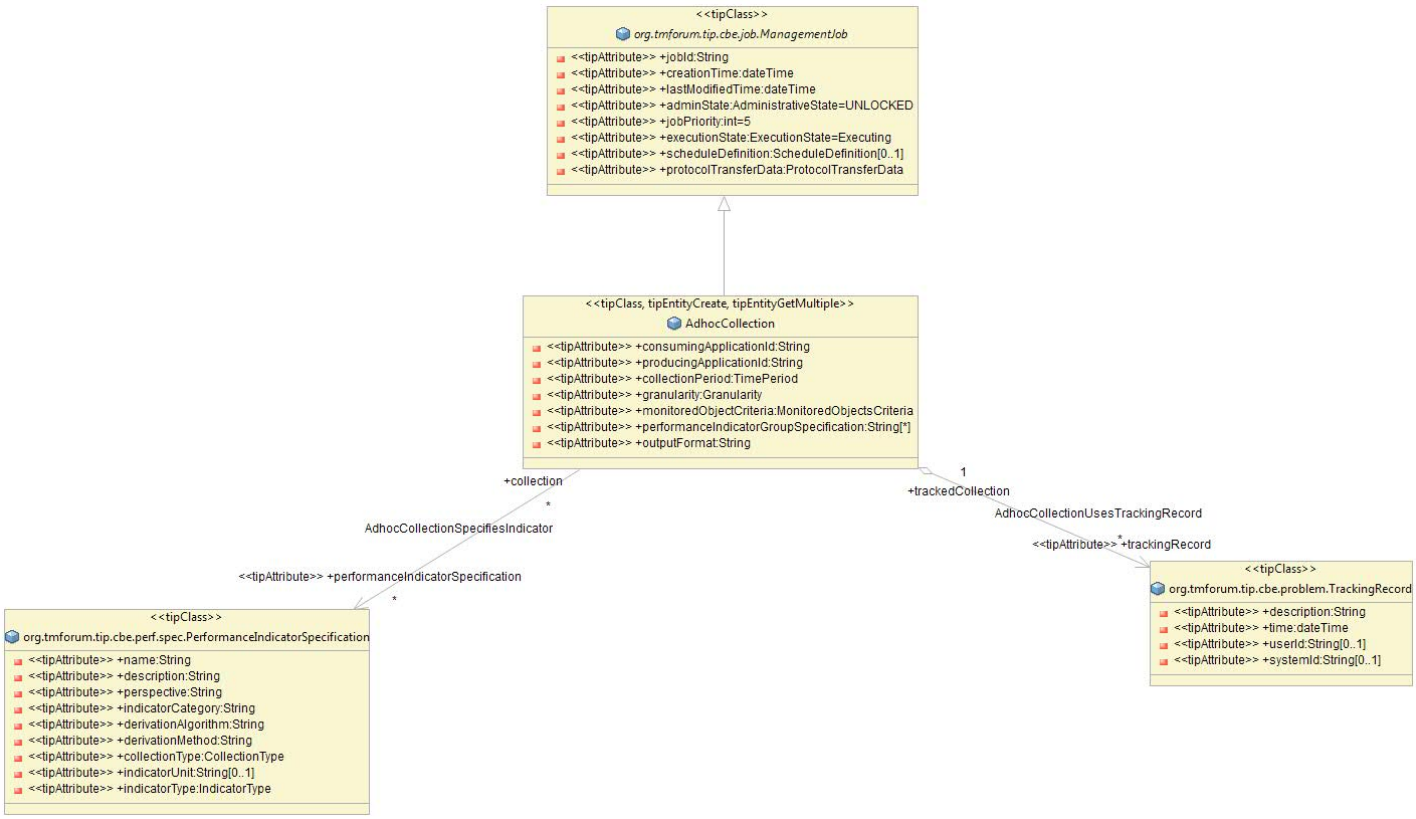
3.2.1. Entities

3.2.1.1. AdhocCollection

- Type: Entity Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- All super types:
  - org.tmforum.tip.cbe.job.ManagementJob
  - org.tmforum.tip.internal.entity.EntityBase
- Description:

A PM query for collecting performance indicators of a certain time range.AdhocCollections ahave no schedule.

- Properties:
  - This entity is optional
  - This entity is extendable
  - This entity does not generate Object Creation notifications
  - This entity does not generate Object Deletion notifications
  - This entity does not generate Object Discovery notifications (NA)
  - This entity supports the Common Create operation
  - This entity supports the Common Get Multiple operation



3.2.1.1.1. Attributes

name	datatype	properties	description
consumingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that consumes performance indicators.
producingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that produces performance indicators.
outputFormat	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The file format that is used for transferring the performance data between applications.
collectionPeriod	TimePeriod	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The time range of the requested Performance Indicators.
granularity	Granularity	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectCriteria	MonitoredObjectsCriteria	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	

performanceIndicatorGroupSpecification	String	- multiplicity is * - read only - unique - invariant - optional - AVC disabled	The requested indicator groups are specified using PerformanceIndicatorGroupSpecification.
jobId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	The ID of the management job.
creationTime	dateTime	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	The creation time of the management job
lastModifiedTime	dateTime	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - read only - unique - default value is 'UNLOCKED' - optional - AVC enabled	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - unique - default value is '5' - optional - AVC enabled	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - unique - default value is 'Executing' - optional - AVC enabled	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - unique - optional - AVC enabled	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
protocolTransferData	ProtocolTransferData	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	Defines the information required for a data transfer.Based on the transport protocol value(s), the corresponding information classes will be used.
identifer	EntityIdentifier	- multiplicity is 1 - unique - invariant - mandatory - AVC enabled	The entity instance identifier EID.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.2.1.1.2. Associations

name	datatype	properties	description

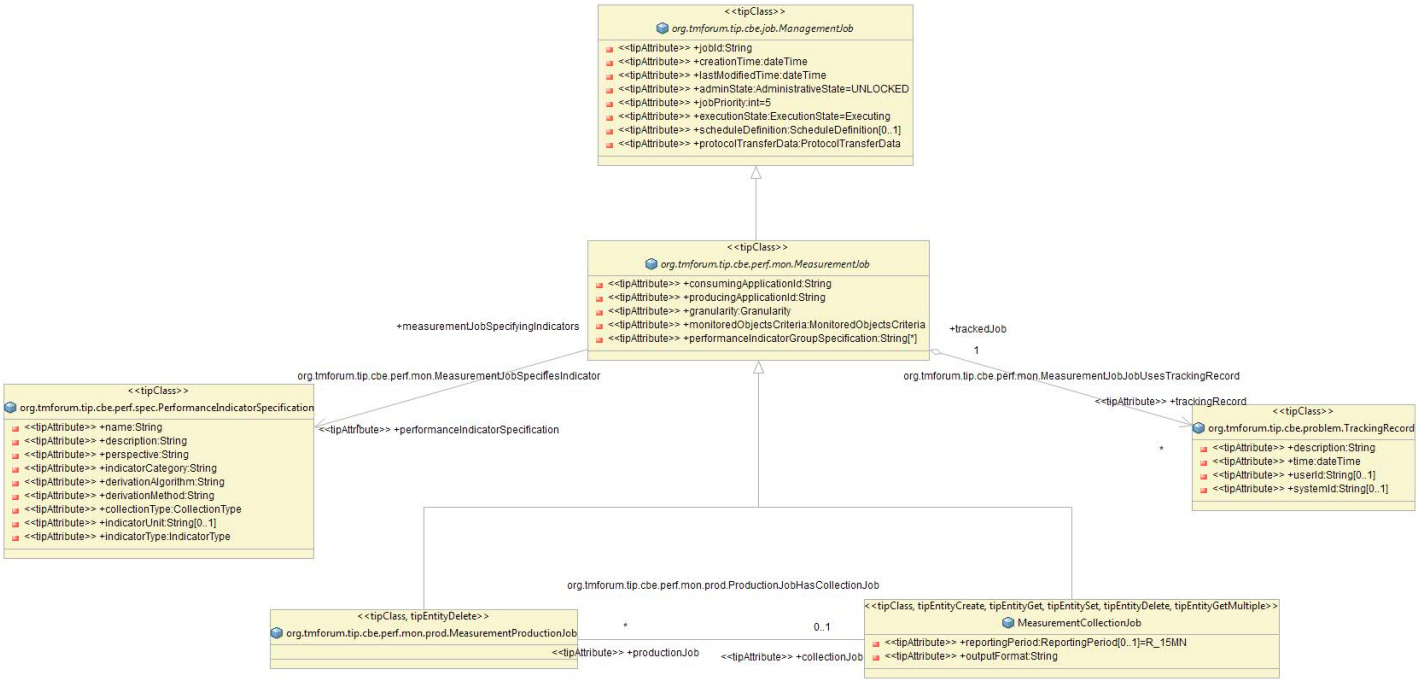
performanceIndicatorSpecification	PerformanceIndicatorSpecification	- multiplicity is * - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled - association is AdhocCollectionSpecifiesIndicator	
trackingRecord	TrackingRecord	- multiplicity is * - aggregation is none - navigable - read only - unique - passed by value - optional - AVC disabled - association is AdhocCollectionUsesTrackingRecord	Allows the tracking of modifications on the adhoc collection.The tracking records should not be returned by default with the adhoc collection to allow retrieving the adhoc collection without the tracking records.Whether the tracking records is stored with the adhoc collection or outside of it is implementation specific.

3.2.1.2. MeasurementCollectionJob

- Type: Entity Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- All super types:
  - org.tmforum.tip.cbe.perf.mon.MeasurementJob
  - org.tmforum.tip.cbe.job.ManagementJob
  - org.tmforum.tip.internal.entity.EntityBase
- Description:

A job for collecting performance indicators.

- Properties:
  - This entity is mandatory
  - This entity is extendable
  - This entity generates Object Creation notifications
  - This entity generates Object Deletion notifications
  - This entity does not generate Object Discovery notifications (NA)
  - This entity supports the Common Get operation
  - This entity supports the Common Set operation
  - This entity supports the Common Create operation
  - This entity supports the Common Delete operation
  - This entity supports the Common Get Multiple operation



3.2.1.2.1. Attributes

name	datatype	properties	description
reportingPeriod	ReportingPeriod	- multiplicity is 0..1 - unique - default value is 'R_15MN' - mandatory - AVC enabled	The rate of collecting Performance Indicators reports.
outputFormat	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The file format that is used for transferring the performance data between applications.
consumingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that produces performance indicators.
producingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that consumes performance indicators.
granularity	Granularity	- multiplicity is 1 - unique - mandatory - AVC enabled	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 1 - unique - mandatory - AVC enabled	Monitored objects are specified by the MonitoredObjectsCriteria.
performanceIndicatorGroupSpecification	String	- multiplicity is * - read only - unique - invariant - optional - AVC disabled	The requested indicator groups are specified using PerformanceIndicatorGroupSpecification.
jobId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	The ID of the management job.

creationTime	dateTime	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	The creation time of the management job
lastModifiedTime	dateTime	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - read only - unique - default value is 'UNLOCKED' - optional - AVC enabled	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - unique - default value is '5' - optional - AVC enabled	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - unique - default value is 'Executing' - optional - AVC enabled	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - unique - optional - AVC enabled	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
protocolTransferData	ProtocolTransferData	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	Defines the information required for a data transfer.Based on the transport protocol value(s), the corresponding information classes will be used.
identifer	EntityIdentifier	- multiplicity is 1 - unique - invariant - mandatory - AVC enabled	The entity instance identifier EID.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.2.1.2.2. Associations

name	datatype	properties	description
productionJob	MeasurementProductionJob	- multiplicity is * - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled (NA) - association is ProductionJobHasCollectionJob	related production job
trackingRecord	TrackingRecord	- multiplicity is * - aggregation is none - navigable - read only - unique - passed by value - optional - AVC disabled - association is MeasurementJobJobUsesTrackingRecord	Allows the tracking of modifications on the measurement job.The tracking records should not be returned by default with the measurement job to allow retrieving the job without the tracking records.Whether the tracking records is stored with the measurement job or outside of it is implementation specific.

performanceIndicatorSpecification	PerformanceIndicatorSpecification	- multiplicity is * - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled - association is MeasurementJobSpecifiesIndicator	The requested indicators are specified using PerformanceIndicatorSpecification.

3.2.2. Data Types

3.2.2.1. CreateDataForAdhocCollection

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This datatype conains all the attributes of the AdhocCollection that are settable at time of object creation.

3.2.2.1.1. Attributes

name	datatype	properties	description
consumingApplicationId	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The identifier of the application that consumes performance indicators.
producingApplicationId	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The identifier of the application that produces performance indicators.
outputFormat	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The file format that is used for transferring the performance data between applications.
collectionPeriod	TimePeriod	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The time range of the requested Performance Indicators.
granularity	Granularity	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectCriteria	MonitoredObjectsCriteria	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	
performanceIndicatorGroupSpecification	String	- multiplicity is * - read only - unique - invariant - optional - AVC disabled	The requested indicator groups are specified using PerformanceIndicatorGroupSpecification.

jobId	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	The ID of the management job.
lastModifiedTime	dateTime	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - read only - unique - default value is 'UNLOCKED' - optional - AVC enabled	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - unique - default value is '5' - optional - AVC enabled	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - unique - default value is 'Executing' - optional - AVC enabled	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - unique - optional - AVC enabled	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
protocolTransferData	ProtocolTransferData	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	Defines the information required for a data transfer.Based on the transport protocol value(s), the corresponding information classes will be used.
performanceIndicatorSpecification	PerformanceIndicatorSpecification	- multiplicity is * - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled - association is AdhocCollectionSpecifiesIndicator	
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.2.2.2. SetDataForMeasurementCollectionJob

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This datatype conains all the attributes of the MeasurementCollectionJob that are settable after object creation.

3.2.2.2.1. Attributes

name	datatype	properties	description
reportingPeriod	ReportingPeriod	- multiplicity is 0..1 - unique - default value is 'R_15MN' - optional - AVC enabled	The rate of collecting Performance Indicators reports.
granularity	Granularity	- multiplicity is 0..1 - unique - optional - AVC enabled	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 0..1 - unique - optional - AVC enabled	Monitored objects are specified by the MonitoredObjectsCriteria.
jobPriority	int	- multiplicity is 0..1 - unique - default value is '5' - optional - AVC enabled	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - unique - default value is 'Executing' - optional - AVC enabled	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - unique - optional - AVC enabled	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.2.2.3. RemoveDataForMeasurementCollectionJob

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This datatype conains all the attributes of the MeasurementCollectionJob that are settable after object creation and are set-valued (multiplicity *, or 1..*).

3.2.2.3.1. Attributes

There are no attributes (local or inherited or implicit) available.

3.2.2.4. AddDataForMeasurementCollectionJob

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This datatype conains all the attributes of the MeasurementCollectionJob that are settable after object creation and are set-valued (multiplicity *, or 1..*).

3.2.2.4.1. Attributes

There are no attributes (local or inherited or implicit) available.

3.2.2.5. CreateDataForMeasurementCollectionJob

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This datatype conains all the attributes of the MeasurementCollectionJob that are settable at time of object creation.

3.2.2.5.1. Attributes

name	datatype	properties	description
reportingPeriod	ReportingPeriod	- multiplicity is 0..1 - unique - default value is 'R_15MN' - optional - AVC enabled	The rate of collecting Performance Indicators reports.
outputFormat	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The file format that is used for transferring the performance data between applications.
consumingApplicationId	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The identifier of the application that produces performance indicators.
producingApplicationId	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled	The identifier of the application that consumes performance indicators.
granularity	Granularity	- multiplicity is 0..1 - unique - optional - AVC enabled	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 0..1 - unique - optional - AVC enabled	Monitored objects are specified by the MonitoredObjectsCriteria.
performanceIndicatorGroupSpecification	String	- multiplicity is * - read only - unique - invariant - optional - AVC disabled	The requested indicator groups are specified using PerformanceIndicatorGroupSpecification.
jobId	String	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	The ID of the management job.
lastModifiedTime	dateTime	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - read only - unique - default value is 'UNLOCKED' - optional - AVC enabled	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - unique - default value is '5' - optional - AVC enabled	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.

executionState	ExecutionState	- multiplicity is 0..1 - unique - default value is 'Executing' - optional - AVC enabled	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - unique - optional - AVC enabled	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
protocolTransferData	ProtocolTransferData	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	Defines the information required for a data transfer.Based on the transport protocol value(s), the corresponding information classes will be used.
performanceIndicatorSpecification	PerformanceIndicatorSpecification	- multiplicity is * - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled - association is MeasurementJobSpecifiesIndicator	The requested indicators are specified using PerformanceIndicatorSpecification.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.2.3. Notifications

3.2.3.1. AdhocCollectionAVCN

- Type: Event Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This is a notification generated from the entity org.tmforum.tip.cbe.perf.mon.coll.AdhocCollection

- All super types:

    org.tmforum.tip.common.notifications.AVCNotification

    org.tmforum.tip.common.notifications.CommonNotification

    org.tmforum.tip.internal.notifications.NotificationBase

3.2.3.1.1. Attributes

name	datatype	properties	description
lastModifiedTime	dateTime	- multiplicity is 0..1 - optional	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - optional	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - optional	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - optional	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - optional	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.

sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.2. MeasurementCollectionJobAVCN

- Type: Event Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This is a notification generated from the entity org.tmforum.tip.cbe.perf.mon.coll.MeasurementCollectionJob

- All super types:

org.tmforum.tip.common.notifications.AVCNotification

org.tmforum.tip.common.notifications.CommonNotification

org.tmforum.tip.internal.notifications.NotificationBase

3.2.3.2.1. Attributes

name	datatype	properties	description
reportingPeriod	ReportingPeriod	- multiplicity is 0..1 - optional	The rate of collecting Performance Indicators reports.
granularity	Granularity	- multiplicity is 0..1 - optional	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 0..1 - optional	Monitored objects are specified by the MonitoredObjectsCriteria.
lastModifiedTime	dateTime	- multiplicity is 0..1 - optional	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - optional	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - optional	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - optional	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - optional	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.3. MeasurementCollectionJobOCN

- Type: Event Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This is a notification generated from the entity org.tmforum.tip.cbe.perf.mon.coll.MeasurementCollectionJob

- All super types:

    org.tmforum.tip.common.notifications.OCNotification

    org.tmforum.tip.common.notifications.CommonNotification

    org.tmforum.tip.internal.notifications.NotificationBase

3.2.3.3.1. Attributes

name	datatype	properties	description
object	MeasurementCollectionJob	- multiplicity is 0..1 - optional - passed by value	A job for collecting performance indicators.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.3.4. MeasurementCollectionJobODelN

- Type: Event Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

This is a notification generated from the entity org.tmforum.tip.cbe.perf.mon.coll.MeasurementCollectionJob

- All super types:

    org.tmforum.tip.common.notifications.ODelNotification

    org.tmforum.tip.common.notifications.CommonNotification

    org.tmforum.tip.internal.notifications.NotificationBase

3.2.3.4.1. Attributes

name	datatype	properties	description
object	MeasurementCollectionJob	- multiplicity is 0..1 - optional - passed by value	A job for collecting performance indicators.

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sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.2.4. Enumerations

3.2.4.1. CollectionResolution

- Type: Enumeration Artifact
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:

Sampling rate of the collection of perfomance indicators.

Supported values are : 1mn, 5mn, 15mn, 30mn, 1h, 24h, not applicable.Note that litterals cannot start by a digit, so they are prefixed by a letter.

- Properties:

3.2.4.1.1. Literals

name	datatype	properties	description
G_24H	String	value is "G_24H"	
G_1H	String	value is "G_1H"	
G_5MN	String	value is "G_5MN"	
G_30MN	String	value is "G_30MN"	
G_1MN	String	value is "G_1MN"	
G_15MN	String	value is "G_15MN"	

3.3. Package org.tmforum.tip.cbe.perf.mon.prod

3.3.1. Entities

3.3.1.1. MeasurementProductionJob

- Type: Entity Artifact
- Package: org.tmforum.tip.cbe.perf.mon.prod
- All super types:

    org.tmforum.tip.cbe.perf.mon.MeasurementJob

    org.tmforum.tip.cbe.job.ManagementJob

    org.tmforum.tip.internal.entity.EntityBase

- Properties:

  This entity is mandatory

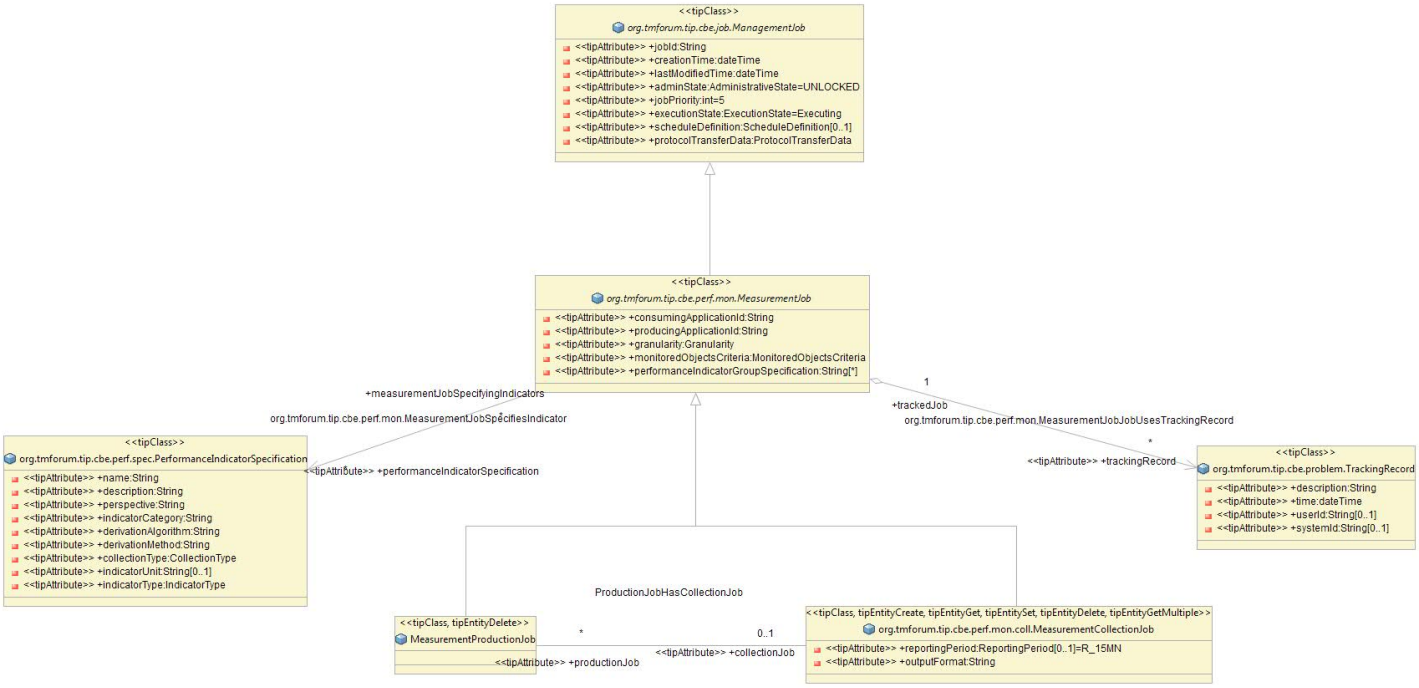
  This entity is extendable

  This entity generates Object Creation notifications

  This entity generates Object Deletion notifications

  This entity does not generate Object Discovery notifications (NA)

  This entity supports the Common Delete operation



3.3.1.1.1. Attributes

name	datatype	properties	description
consumingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that produces performance indicators.
producingApplicationId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled	The identifier of the application that consumes performance indicators.
granularity	Granularity	- multiplicity is 1 - unique - mandatory - AVC enabled	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 1 - unique - mandatory - AVC enabled	Monitored objects are specified by the MonitoredObjectsCriteria.
performanceIndicatorGroupSpecification	String	- multiplicity is * - read only - unique - invariant - optional - AVC disabled	The requested indicator groups are specified using PerformanceIndicatorGroupSpecification.

jobId	String	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	The ID of the management job.
creationTime	dateTime	- multiplicity is 0..1 - read only - unique - invariant - optional - AVC disabled (NA)	The creation time of the management job
lastModifiedTime	dateTime	- multiplicity is 0..1 - read only - unique - optional - AVC enabled	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - read only - unique - default value is 'UNLOCKED' - optional - AVC enabled	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - unique - default value is '5' - optional - AVC enabled	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - unique - default value is 'Executing' - optional - AVC enabled	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - unique - optional - AVC enabled	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
protocolTransferData	ProtocolTransferData	- multiplicity is 1 - read only - unique - invariant - mandatory - AVC disabled (NA)	Defines the information required for a data transfer.Based on the transport protocol value(s), the corresponding information classes will be used.
identifer	EntityIdentifier	- multiplicity is 1 - unique - invariant - mandatory - AVC enabled	The entity instance identifier EID.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional - AVC enabled	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.

3.3.1.1.2. Associations

name	datatype	properties	description
collectionJob	MeasurementCollectionJob	- multiplicity is 0..1 - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled (NA) - association is ProductionJobHasCollectionJob	associated collection job

trackingRecord	TrackingRecord	- multiplicity is * - aggregation is none - navigable - read only - unique - passed by value - optional - AVC disabled - association is MeasurementJobJobUsesTrackingRecord	Allows the tracking of modifications on the measurement job.The tracking records should not be returned by default with the measurement job to allow retrieving the job without the tracking records.Whether the tracking records is stored with the measurement job or outside of it is implementation specific.
performanceIndicatorSpecification	PerformanceIndicatorSpecification	- multiplicity is * - aggregation is none - navigable - read only - unique - invariant - passed by id - optional - AVC disabled - association is MeasurementJobSpecifiesIndicator	The requested indicators are specified using PerformanceIndicatorSpecification.

3.3.2. Data Types

3.3.2.1. CreateInfoForMeasurementProductionJob

- Type: Datatype Artifact
- Package: org.tmforum.tip.cbe.perf.mon.prod
- Description:

This datatype contains all the attributes that are settable at the time of the creation of the MeasurmentProductionJob.Most of these attributes are only valid if the production job has an associated colelction job.

- Properties:

This datatype is extendable

3.3.2.1.1. Attributes

name	datatype	properties	description
reportingPeriod	ReportingPeriod	- multiplicity is 0..1 - read only - unique - default value is 'R_15MN' - optional	the rate of the collecting Performance Indicators reports
outputFormat	String	- multiplicity is 0..1 - read only - unique - optional	The file format that is used for transferring the performance data between applications
granularity	Granularity	- multiplicity is 1 - read only - unique - default value is 'G_15MN' - mandatory	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 0..1 - read only - unique - optional	Monitored objects are specified by the MonitoredObjectsCriteria.
performanceIndicatorGroupSpecificaiton	PerformanceIndicatorGroupSpecification	- multiplicity is 0..1 - read only - unique - passed by value - optional	
adminState	AdministrativeState	- multiplicity is 0..1 - read only - unique - default value is 'UNLOCKED' - optional	The administrative state of the management job

jobPriority	int	- multiplicity is 0..1 - read only - unique - default value is '5' - optional	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - read only - unique - optional	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
protocolTransferData	ProtocolTransferData	- multiplicity is 0..1 - read only - unique - optional	Defines the information required for a data transfer.Based on the transport protocol value(s), the corresponding information classes will be used.
performanceIndicatorSpecification	PerformanceIndicatorSpecification	- multiplicity is 0..1 - read only - unique - passed by value - optional	The requested indicators are specified using PerformanceIndicatorSpecification.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

3.3.3. Notifications

3.3.3.1. MeasurementProductionJobAVCN

- Type: Event Artifact
- Package: org.tmforum.tip.cbe.perf.mon.prod
- Description:

This is a notification generated from the entity org.tmforum.tip.cbe.perf.mon.prod.MeasurementProductionJob

- All super types:

org.tmforum.tip.common.notifications.AVCNotification

org.tmforum.tip.common.notifications.CommonNotification

org.tmforum.tip.internal.notifications.NotificationBase

3.3.3.1.1. Attributes

name	datatype	properties	description
granularity	Granularity	- multiplicity is 0..1 - optional	The sampling rate of Performance Indicators as determined when they are produced. In many cases a different granularity of an indicator will be reflected in a different indicator value (e.g. a gauge)
monitoredObjectsCriteria	MonitoredObjectsCriteria	- multiplicity is 0..1 - optional	Monitored objects are specified by the MonitoredObjectsCriteria.
lastModifiedTime	dateTime	- multiplicity is 0..1 - optional	Defines the time when the management job was last modified.
adminState	AdministrativeState	- multiplicity is 0..1 - optional	The administrative state of the management job
jobPriority	int	- multiplicity is 0..1 - optional	The priority of the management job.The way the management application will use the JobPriority to schedule job execution is application specific and outside of the scope. Integer, limited to a range of 1 to 10.
executionState	ExecutionState	- multiplicity is 0..1 - optional	The execution state of the management job.It is used to indicate a failure in the execution of the job.
scheduleDefinition	ScheduleDefinition	- multiplicity is 0..1 - optional	If the management job is a regular one, then it will include a schedule definition.Not present for one-time jobs.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.

objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.3.3.2. MeasurementProductionJobOCN

- Type: Event Artifact
- Package: org.tmforum.tip.cbe.perf.mon.prod
- Description:

This is a notification generated from the entity org.tmforum.tip.cbe.perf.mon.prod.MeasurementProductionJob

- All super types:

org.tmforum.tip.common.notifications.OCNotification

org.tmforum.tip.common.notifications.CommonNotification

org.tmforum.tip.internal.notifications.NotificationBase

3.3.3.2.1. Attributes

name	datatype	properties	description
object	MeasurementProductionJob	- multiplicity is 0..1 - optional - passed by value	
aliasNames	CheckedCollection	- multiplicity is 0..1 - unique - optional - AVC enabled	The aliasNames attribute contains implementation specific name value pairs for local alternative names for the Entity. This is provided to pass more user friendly names for entities between systems or for debugging. The aliasNames attribute MUST NOT be used by an implimentation when comparing EntityIdentifiers. There is NO GUARANTEE that the contents of the aliasNames attribute is unique.
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

3.3.3.3. MeasurementProductionJobODelN

- Type: Event Artifact
- Package: org.tmforum.tip.cbe.perf.mon.prod
- Description:

This is a notification generated from the entity org.tmforum.tip.cbe.perf.mon.prod.MeasurementProductionJob

- All super types:

org.tmforum.tip.common.notifications.ODelNotification

org.tmforum.tip.common.notifications.CommonNotification

org.tmforum.tip.internal.notifications.NotificationBase

3.3.3.3.1. Attributes

name	datatype	properties	description
object	MeasurementProductionJob	- multiplicity is 0..1 - optional - passed by value	
sourceTime	time	- multiplicity is 0..1 - unique - mandatory	The time at which the event was reported by the source system (NE, EMS or OS).
objectId	EntityIdentifier	- multiplicity is 0..1 - unique - mandatory	The identifier of the object associated with the event, as internal opaque identifier.
objectType	String	- multiplicity is 0..1 - unique - mandatory	The type (class) of the object associated with the event. This attribute is needed to allow simple notification filtering based on the object type.
extensionInfo	Any	- multiplicity is 0..1 - unique - optional	A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.

4. Service Interfaces

Service interfaces available from TIP Performance Management Monitoring model:
- AdhocCollectionService
- MeasurementCollectionJobService
- MeasurementProductionJobService
- PerformanceRetrievalService

4.1. AdhocCollectionService

- Type: Session Artifact (Service Interface)
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:
This service interface provides operations related to the AdhocCollectionService.The operation listAvailableFiles is defined temporary as local operations in this service interface. It will be generated in future through the tipDataTransfer stereotype.
- Operations exposed:
    getAdhocCollectionTrackingRecords
    listAvailableFiles
- Common Operations
    getAdhocCollections
    createAdhocCollection
- Managed entities:
    org.tmforum.tip.cbe.perf.mon.coll.AdhocCollection
- Emitted events:
    org.tmforum.tip.cbe.job.FilesReady
    org.tmforum.tip.cbe.job.FilesPreparationError
- Properties:
    This service interface is optional

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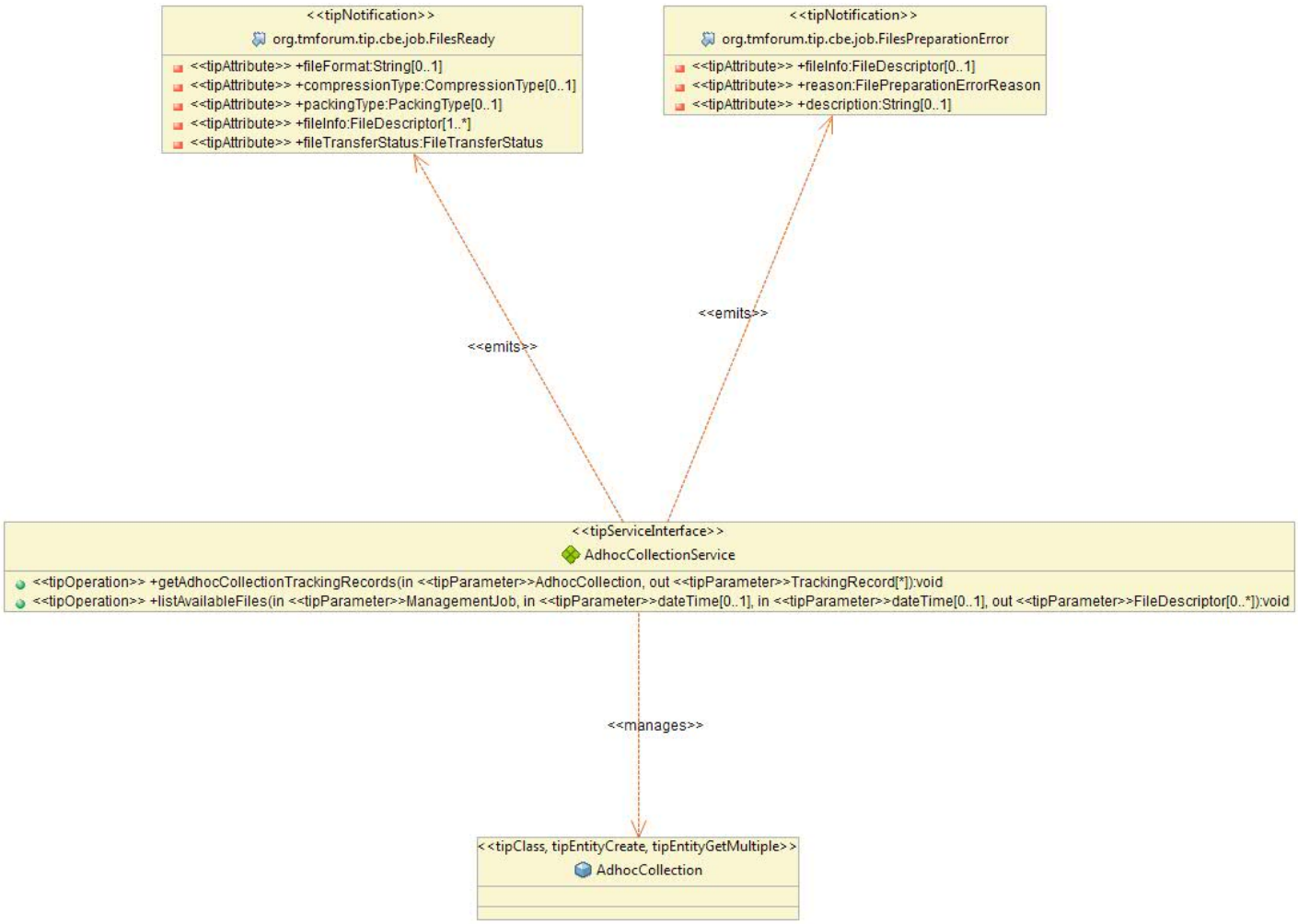


4.1.1. getAdhocCollectionTrackingRecords

- Type: Operation
- Description:

Returns the tracking records for a given adhoc collection.Tracking records allow the tracking of modifications on the adhoc collection.The tracking records should not be embedded in the collection to allow retrieving it without the tracking records. So a specific operation is needed to retrieve them on demand.

- Properties:

This operation uses iterator bulk transfer pattern

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

EntityNotFound

AccessDenied

CommunicationLoss

InternalError

InvalidInput
NotImplemented
UnableToComply

4.1.1.1. Arguments

name	datatype	properties	description
collectionId	AdhocCollection	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	input collection id
trackingRecords	TrackingRecord	- output parameter - multiplicity is * - unique - passed by value - bulk potential - mandatory	returned tracking records

4.1.2. listAvailableFiles

- Type: Operation
- Description:
This operation returns all files generated by the server and available for download. This operation is particularly useful in case of loss of communications as it allows the client to know the files available for which notifications might have been missed.
- Properties:
This operation is not extendable
This operation is mandatory
- Return:
void
- Exceptions:
EntityNotFound
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.1.2.1. Arguments

name	datatype	properties	description
jobId	ManagementJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	
beginTime	dateTime	- input parameter - multiplicity is 0..1 - unique - optional	
endTime	dateTime	- input parameter - multiplicity is 0..1 - unique - optional	

fileInfo	FileDescriptor	- output parameter - multiplicity is 0..* - unique - mandatory	

4.1.3. getAdhocCollections

- Type: Operation
- Description:

This operation returns the adhoc collections matching the input filter.

- Properties:

This operation uses an iterator bulk transfer pattern

This operation is extendable

This operation is optional

- Return:

void

- Exceptions:

FilterNotSupported

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.1.3.1. Arguments

name	datatype	properties	description
filter	Filter	-input parameter -multiplicity is 1 -unique -mandatory -template + query filter	input filter
attributeSelector	String	-input parameter -multiplicity is 0..* -unique -optional	Allow to specify which attributes to return. It allows to return only a subset of the object instead of the full object. If empty, the whole object is returned.
objects	AdhocCollection	-output parameter -multiplicity is 0..* -ordered -unique -passed by value -bulk potential -mandatory	Objects returned by value.
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.1.4. createAdhocCollection

- Type: Operation
- Description:

This operation creates an Adhoc Collection. The collectionPeriod and the protocolTransferData arguments are mandatory.

- Properties:

This operation is optional

- Return:
    void
- Exceptions:
    Duplicate
    CapacityExceeded
    AccessDenied
    CommunicationLoss
    InternalError
    InvalidInput
    NotImplemented
    UnableToComply

4.1.4.1. Arguments

name	datatype	properties	description
referenceObject	AdhocCollection	-input parameter -multiplicity is 0..1 -unique -passed by Id -optional	It specifies an exisitng instance of a managed object of the same class as the new object to be created
createData	CreateDataForAdhocCollection	-input parameter -multiplicity is 1 -unique -mandatory	create data using the datatype generated
createdObject	AdhocCollection	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	created object

4.2. MeasurementCollectionJobService

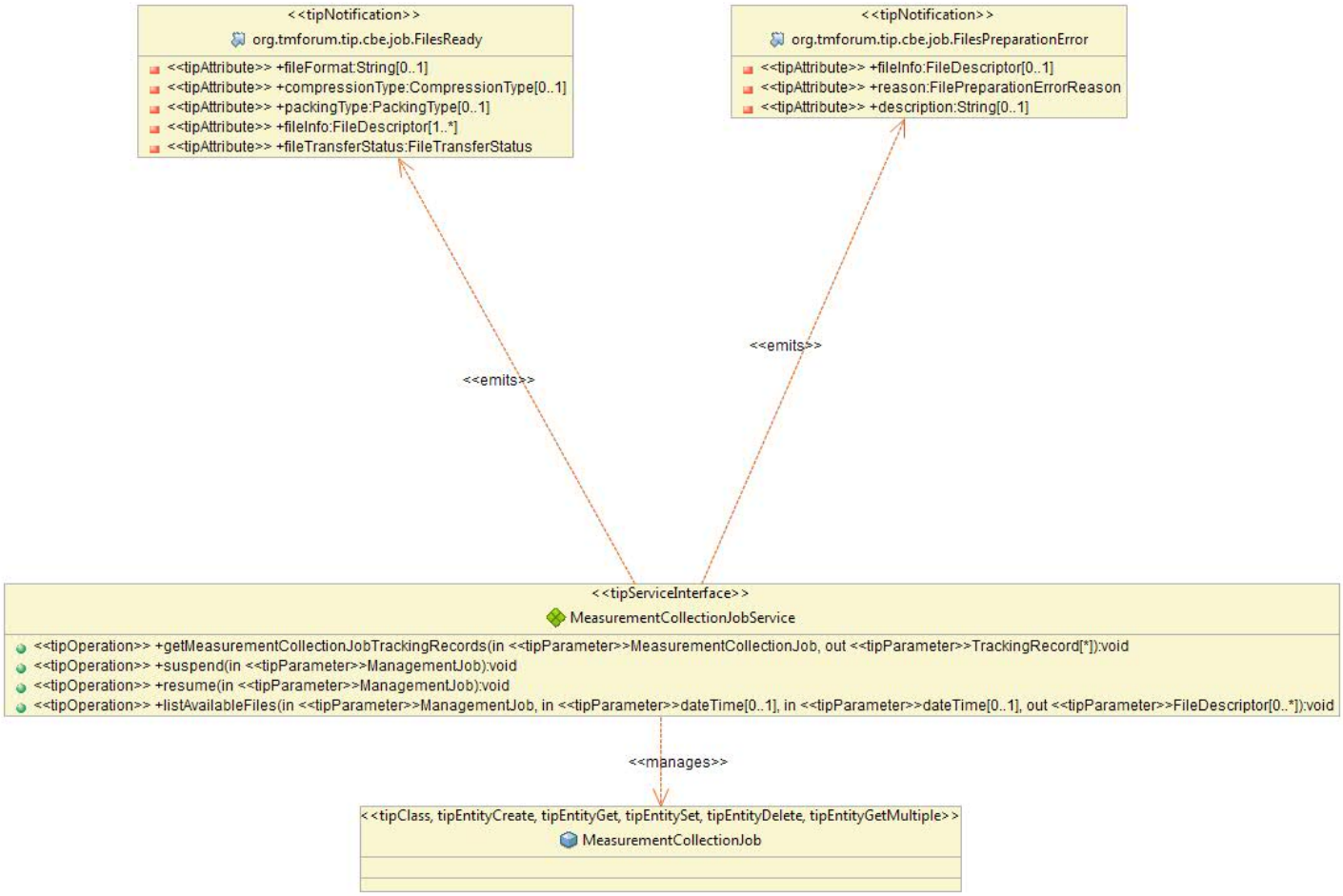
- Type: Session Artifact (Service Interface)
- Package: org.tmforum.tip.cbe.perf.mon.coll
- Description:
This service interface provides operations related to the MeasurementCollectionJob.The operations suspend, resume and listAvailableFiles are defined temporary as local operations in this service interface. They will be generated in future through the tipDataTransfer stereotype.
- Operations exposed:
    getMeasurementCollectionJobTrackingRecords
    suspend
    resume
    listAvailableFiles
- Common Operations
    getMeasurementCollectionJob
    getMeasurementCollectionJobs
    deleteMeasurementCollectionJobs
    setMeasurementCollectionJob
    createMeasurementCollectionJob
- Managed entities:
    org.tmforum.tip.cbe.perf.mon.coll.MeasurementCollectionJob
- Emitted events:

org.tmforum.tip.cbe.job.FilesReady

org.tmforum.tip.cbe.job.FilesPreparationError

- Properties:

This service interface is mandatory



4.2.1. getMeasurementCollectionJobTrackingRecords

- Type: Operation
- Description:

Returns the tracking records for a given collection job.Tracking records allow the tracking of modifications on the collection job.The tracking records should not be embedded in the collection job to allow retrieving it without the tracking records. So a specific operation is needed to retrieve them on demand.

- Properties:

This operation uses iterator bulk transfer pattern

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

EntityNotFound

AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.2.1.1. Arguments

name	datatype	properties	description
jobId	MeasurementCollectionJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	input job Id
trackingRecords	TrackingRecord	- output parameter - multiplicity is * - unique - passed by value - bulk potential - mandatory	returned tracking records

4.2.2. suspend

- Type: Operation
- Description:
This operation suspend the Management Job, making it locked.
- Properties:
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
NotInValidState
EntityNotFound
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.2.2.1. Arguments

name	datatype	properties	description
jobId	ManagementJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	input job

4.2.3. resume

- Type: Operation
- Description:
This operation resumes the Management Job, making it unlocked.
- Properties:
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
NotInValidState
EntityNotFound
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.2.3.1. Arguments

name	datatype	properties	description
jobId	ManagementJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	Identifies the user suspending the job

4.2.4. listAvailableFiles

- Type: Operation
- Description:
This operation returns all files generated by the server and available for download. This operation is particularly useful in case of loss of communications as it allows the client to know the files available for which notifications might have been missed.
- Properties:
This operation is not extendable
This operation is mandatory
- Return:
void
- Exceptions:
EntityNotFound
AccessDenied
CommunicationLoss
InternalError
InvalidInput

NotImplemented

UnableToComply

4.2.4.1. Arguments

name	datatype	properties	description
jobId	ManagementJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	Identifies the system on which the client doing the operation runs
beginTime	dateTime	- input parameter - multiplicity is 0..1 - unique - optional	Identifies the system on which the client doing the operation runs
endTime	dateTime	- input parameter - multiplicity is 0..1 - unique - optional	input job
fileInfo	FileDescriptor	- output parameter - multiplicity is 0..* - unique - mandatory	Identifies the user resuming the job

4.2.5. getMeasurementCollectionJob

- Type: Operation
- Description:

This operation returns by value a single measurement collection job corresponding to the id provided.

- Properties:

This operation is extendable

This operation is optional

- Return:

void

- Exceptions:

EntityNotFound

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.2.5.1. Arguments

name	datatype	properties	description
objectToGet	MeasurementCollectionJob	-input parameter -multiplicity is 1 -unique -passed by Id -mandatory	object to get,identified by EntityIdentifier
object	MeasurementCollectionJob	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	object returned by value
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.2.6. getMeasurementCollectionJobs

- Type: Operation
- Description:

This operation returns a list of measurement collection jobs matching the input filter.

- Properties:

    This operation uses an iterator bulk transfer pattern

    This operation is extendable

    This operation is optional

- Return:

    void

- Exceptions:

    FilterNotSupported

    AccessDenied

    CommunicationLoss

    InternalError

    InvalidInput

    NotImplemented

    UnableToComply

4.2.6.1. Arguments

name	datatype	properties	description
filter	Filter	-input parameter -multiplicity is 1 -unique -mandatory -template + query filter	input filter
attributeSelector	String	-input parameter -multiplicity is 0..* -unique -optional	Allow to specify which attributes to return. It allows to return only a subset of the object instead of the full object. If empty, the whole object is returned.
objects	MeasurementCollectionJob	-output parameter -multiplicity is 0..* -ordered -unique -passed by value -bulk potential -mandatory	Objects returned by value.
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.2.7. deleteMeasurementCollectionJobs

- Type: Operation
- Description:

This operation deletes a measurement collection job.

- Properties:

    This operation is optional

- Return:

    void

- Exceptions:

AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.2.7.1. Arguments

name	datatype	properties	description
objectsToDelete	EntityIdentifier	-input parameter -multiplicity is 1..* -unique -passed by Id -mandatory	objects to delete, identified by EntityIdentifier
failedIds	MeasurementCollectionJob	-output parameter -multiplicity is 0..* -unique -passed by id -optional	failed objects that could not be deleted(by id)
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.2.8. setMeasurementCollectionJob

- Type: Operation
- Description:
This operation sets attribute values in a measurement collection job.
- Properties:
This operation is optional
- Return:
void
- Exceptions:
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.2.8.1. Arguments

name	datatype	properties	description
objectToSet	MeasurementCollectionJob	-input parameter -multiplicity is 1 -unique -passed by Id -mandatory	object to set,passed as an EntityIdentifier
valuesToBeSet	SetDataForMeasurementCollectionJob	-input parameter -multiplicity is 0..1 -unique -optional	values to be added, using datatype build by generators.Note that at least one of the parameter valuesToBeSet, valuesToAdd and valuesToRemove should be present
valuesToAdd	AddDataForMeasurementCollectionJob	-input parameter -multiplicity is 0..1 -unique -optional	values to add, using datatype build by generators.Note that at least one of the parameter valuesToBeSet, valuesToAdd and valuesToRemove should be present

valuesToRemove	RemoveDataForMeasurementCollectionJob	-input parameter -multiplicity is 0..1 -unique -optional	values to remove, using datatype build by generators.Note that at least one of the parameter valuesToBeSet, valuesToAdd and valuesToRemove should be present
modifiedObject	MeasurementCollectionJob	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	modified object by value

4.2.9. createMeasurementCollectionJob

- Type: Operation
- Description:

This operation creates a measurement collection job. The granularity and the protocolTransferData arguments are mandatory.

- Properties:

This operation is optional

- Return:

void

- Exceptions:

Duplicate
CapacityExceeded
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.2.9.1. Arguments

name	datatype	properties	description
referenceObject	MeasurementCollectionJob	-input parameter -multiplicity is 0..1 -unique -passed by Id -optional	It specifies an exisitng instance of a managed object of the same class as the new object to be created
createData	CreateDataForMeasurementCollectionJob	-input parameter -multiplicity is 1 -unique -mandatory	create data using the datatype generated
createdObject	MeasurementCollectionJob	-output parameter -multiplicity is 1 -unique -passed by value -mandatory	created object

4.3. MeasurementProductionJobService

- Type: Session Artifact (Service Interface)
- Package: org.tmforum.tip.cbe.perf.mon.prod
- Description:

This service interface provides operations related to the MeasurementProductionJob.

- Operations exposed:

getTrackingRecords

suspend
resume
createMeasurementProductionJob
getMeasurementProductionJob
getMeasurementProductionJobs
- Common Operations
deleteMeasurementProductionJobs
- Managed entities:
org.tmforum.tip.cbe.perf.mon.prod.MeasurementProductionJob
- Properties:
This service interface is mandatory

4.3.1. getTrackingRecords

- Type: Operation
- Description:
Returns the tracking records for a given collection job.Tracking records allow the tracking of modifications on the collection job.The tracking records should not be embedded in the collection job to allow retrieving it without the tracking records. So a specific operation is needed to retrieve them on demand.
- Properties:
This operation uses iterator bulk transfer pattern
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
EntityNotFound
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.3.1.1. Arguments

name	datatype	properties	description
jobId	MeasurementProductionJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	input job Id
trackingRecords	TrackingRecord	- output parameter - multiplicity is * - unique - passed by value - bulk potential - mandatory	returned tracking records

4.3.2. suspend

- Type: Operation
- Description:
This operation suspend the Management Job, making it locked.
- Properties:
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
NotInValidState
EntityNotFound
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.3.2.1. Arguments

name	datatype	properties	description
jobId	MeasurementProductionJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	input job

4.3.3. resume

- Type: Operation
- Description:
This operation resumes the Management Job, making it unlocked.
- Properties:
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
NotInValidState
EntityNotFound
AccessDenied
CommunicationLoss
InternalError

InvalidInput
NotImplemented
UnableToComply

4.3.3.1. Arguments

name	datatype	properties	description
jobId	MeasurementProductionJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	Identifies the user suspending the job

4.3.4. createMeasurementProductionJob

- Type: Operation
- Description:
This operation creates a measurement production job. If the flag hasAssociatedCollectionJob is true, then an associated measurement collection job will be created.The granularity argument is mandatory.
- Properties:
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
Duplicate
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.3.4.1. Arguments

name	datatype	properties	description
hasAssociatedCollectionJob	boolean	- input parameter - multiplicity is 1 - unique - default value is 'true' - mandatory	indicates if this production job has an associated collection job
createData	CreateInfoForMeasurementProductionJob	- input parameter - multiplicity is 1 - unique - mandatory	create data for the job
createdProductionJob	MeasurementProductionJob	- output parameter - multiplicity is 1 - unique - passed by value - mandatory	created production job
createdCollectionJob	MeasurementCollectionJob	- output parameter - multiplicity is 0..1 - unique - passed by value - optional	associated collection job, if this production job has one

4.3.5. getMeasurementProductionJob

- Type: Operation
- Description:
This operation returns by value a single measurement collection job corresponding to the id provided.If there is an associated collection job, it is returned also.
- Properties:
This operation is extendable
This operation is optional
- Return:
void
- Exceptions:
EntityNotFound
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.3.5.1. Arguments

name	datatype	properties	description
objectToGet	MeasurementProductionJob	- input parameter - multiplicity is 1 - unique - passed by id - mandatory	object to get identified bu Entity Identifier
productionJob	MeasurementProductionJob	- output parameter - multiplicity is 1 - unique - passed by value - mandatory	productionJob, by value
collectionJob	MeasurementCollectionJob	- output parameter - multiplicity is 0..1 - unique - passed by value - optional	associated collection job, if it exists
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.3.6. getMeasurementProductionJobs

- Type: Operation
- Description:
This operation returns a list of measurement collection jobs matching the input filter.
- Properties:
This operation uses iterator bulk transfer pattern
This operation is extendable
This operation is optional

- Return:
  void
- Exceptions:
  FilterNotSupported
  AccessDenied
  CommunicationLoss
  InternalError
  InvalidInput
  NotImplemented
  UnableToComply

4.3.6.1. Arguments

name	datatype	properties	description
filter	filter	- input parameter - multiplicity is 1 - unique - query filter - mandatory	input filter
attributeSelector	String	- input/output parameter - multiplicity is 0..* - unique - optional	Allow to specify which attributes to return. It allows to return only a subset of the object instead of the full object. If empty, the whole object is returned.
productionJobs	MeasurementProductionJob	- output parameter - multiplicity is 0..* - unique - passed by value - mandatory	returned production jobs
collectionJobs	MeasurementCollectionJob	- output parameter - multiplicity is 0..* - unique - passed by value - bulk potential - optional	associated returned collection jobs by value
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.3.7. deleteMeasurementProductionJobs

- Type: Operation
- Description:
Delete the Measurement Production Job. If this job has an associated collection job, then it will also be deleted.
- Properties:
  This operation is optional
- Return:
  void
- Exceptions:
  AccessDenied
  CommunicationLoss
  InternalError
  InvalidInput
  NotImplemented
  UnableToComply

4.3.7.1. Arguments

name	datatype	properties	description
objectsToDelete	EntityIdentifier	-input parameter -multiplicity is 1..* -unique -passed by Id -mandatory	objects to delete, identified by EntityIdentifier
failedIds	MeasurementProductionJob	-output parameter -multiplicity is 0..* -unique -passed by id -optional	failed objects that could not be deleted(by id)
extensionInfo	Any	- multiplicity is 0..1 - input/output parameter - optional	a generic list of any type of elements. Used for vendor extensions or loose element encapsulation from other namespaces.

4.4. PerformanceRetrievalService

- Type: Session Artifact (Service Interface)
- Package: org.tmforum.tip.cbe.perf.mon
- Description:

This service interface provides general retrieval operations for Performance Monitoring.

- Operations exposed:
  - getSupportedObjectClasses
  - getSupportedObjects
  - getSupportedIndicatorGroups
  - getSupportedIndicators
  - getSupportedTransport
  - getSupportedFileFormat
  - getCommonIndicatorGroupsGranularities
  - getCommonIndicatorsGranularities
- Common Operations
- Properties:
  - This service interface is optional

4.4.1. getSupportedObjectClasses

- Type: Operation
- Description:

This operation provides the list of object classes supported by the interface.

- Properties:
  - This operation is not extendable
  - This operation is optional
- Return:
  - void
- Exceptions:
  - AccessDenied
  - CommunicationLoss

InternalError
InvalidInput
NotImplemented
UnableToComply

4.4.1.1. Arguments

name	datatype	properties	description
supportedObjectClasses	String	- output parameter - multiplicity is * - unique - mandatory	supported object classes

4.4.2. getSupportedObjects

- Type: Operation
- Description:
This operation provides the list of object instances supported by the interface.If an object class is provided in input, only the object instances related to the input class will be returned.
- Properties:
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.4.2.1. Arguments

name	datatype	properties	description
inputClass	String	- input parameter - multiplicity is 0..1 - unique - optional	input class (optional)
supportedObjects	objectName	- output parameter - multiplicity is * - unique - mandatory	object instances supported by the interface

4.4.3. getSupportedIndicatorGroups

- Type: Operation
- Description:
This operation provides the list of indicator groups supported by the interface for the class provided in input.

- Properties:
  This operation is not extendable
  This operation is optional
- Return:
  void
- Exceptions:
  AccessDenied
  CommunicationLoss
  InternalError
  InvalidInput
  NotImplemented
  UnableToComply

4.4.3.1. Arguments

name	datatype	properties	description
inputClass	String	- input parameter - multiplicity is 1 - unique - mandatory	input class
supportedIndicatorGroups	String	- output parameter - multiplicity is * - unique - mandatory	returned list of indicator groups

4.4.4. getSupportedIndicators

- Type: Operation
- Description:
This operation provides the list of indicator instances supported by the interface fpr the provided class and/or indicator group.If the indicator group is provided in input, only the indicator instances related to the input class and this group will be returned.
- Properties:
  This operation is not extendable
  This operation is optional
- Return:
  void
- Exceptions:
  AccessDenied
  CommunicationLoss
  InternalError
  InvalidInput
  NotImplemented
  UnableToComply

4.4.4.1. Arguments

name	datatype	properties	description
inputClass	String	- input parameter - multiplicity is 1 - unique - mandatory	input class

inputIndicatorGroup	String	- input parameter - multiplicity is 0..1 - unique - optional	input indicator group
supportedIndicators	objectName	- output parameter - multiplicity is * - unique - mandatory	supported indicators

4.4.5. getSupportedTransport

- Type: Operation
- Description:

This operation provides the transport supported by the interface.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput

NotImplemented

UnableToComply

4.4.5.1. Arguments

name	datatype	properties	description
supportedTransport	String	- output parameter - multiplicity is 1 - unique - mandatory	supported transport

4.4.6. getSupportedFileFormat

- Type: Operation
- Description:

This operation provides the file format supported by the interface.

- Properties:

This operation is not extendable

This operation is optional

- Return:

void

- Exceptions:

AccessDenied

CommunicationLoss

InternalError

InvalidInput
NotImplemented
UnableToComply

4.4.6.1. Arguments

name	datatype	properties	description
supportedFileFormat	String	- output parameter - multiplicity is 1 - unique - mandatory	supported file format

4.4.7. getCommonIndicatorGroupsGranularities

- Type: Operation
- Description:
This operation provides the list of granularities which are common to a set of indicator groups.
- Properties:
This operation is not extendable
This operation is optional
- Return:
void
- Exceptions:
AccessDenied
CommunicationLoss
InternalError
InvalidInput
NotImplemented
UnableToComply

4.4.7.1. Arguments

name	datatype	properties	description
inputIndicatorGroups	String	- input/output parameter - multiplicity is 1..* - unique - mandatory	input indicator groups
commonGranularities	Granularity	- output parameter - multiplicity is * - unique - mandatory	common granularities

4.4.8. getCommonIndicatorsGranularities

- Type: Operation
- Description:
This operation provides the list of granularities which are common to a set of indicators.
- Properties:
This operation is not extendable
This operation is optional

- Return:
  void
- Exceptions:
  AccessDenied
  CommunicationLoss
  InternalError
  InvalidInput
  NotImplemented
  UnableToComply

4.4.8.1. Arguments

name	datatype	properties	description
inputIndicators	objectName	- input parameter - multiplicity is 1..* - unique - mandatory	input indicators
commonGranularities	Granularity	- output parameter - multiplicity is * - unique - mandatory	common granularities