

**Application Performance Measurement MIB  
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#### **1. Abstract**

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in TCP/IP-based internets. In particular, it defines objects for measuring the application performance as experienced by end-



users.

## **2. The SNMP Management Framework**

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2571](#) [1].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and described in STD 16, [RFC 1155](#) [2], STD 16, [RFC 1212](#) [3] and [RFC 1215](#) [4]. The second version, called SMIV2, is described in STD 58, [RFC 2578](#) [5], [RFC 2579](#) [6] and [RFC 2580](#) [7].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, [RFC 1157](#) [8]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in [RFC 1901](#) [9] and [RFC 1906](#) [10]. The third version of the message protocol is called SNMPv3 and described in [RFC 1906](#) [10], [RFC 2572](#) [11] and [RFC 2574](#) [12].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, [RFC 1157](#) [8]. A second set of protocol operations and associated PDU formats is described in [RFC 1905](#) [13].
- o A set of fundamental applications described in [RFC 2573](#) [14] and the view-based access control mechanism described in [RFC 2575](#) [15].

A more detailed introduction to the current SNMP Management Framework can be found in [RFC 2570](#) [22].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.



This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

### **3. Overview**

This document continues the architecture created in the RMON MIB [18] by providing analysis of application performance as experienced by end-users.

Application performance measurement measures the quality of service delivered to end-users by applications. With this perspective, a true end-to-end view of the IT infrastructure results, combining the performance of the application, desktop, network, and server, as well as any positive or negative interactions between these components.

Despite all the technically sophisticated ways in which networking and system resources can be measured, human end-users perceive only two things about an application: availability and responsiveness.

Availability - The percentage of the time that the application is ready to give a user service.

Responsiveness - The speed at which the application delivers the requested service.

A transaction is an action initiated by a user that starts and completes a distributed processing function. A transaction begins when a user initiates a request for service (i.e. pushing a submit button) and ends when the work is completed (i.e. information is provided or a confirmation is delivered). A transaction is the fundamental item measured by the APM MIB.

Application protocols implement one of three different types of transactions: transaction-oriented, throughput-oriented, or streaming-oriented. While the availability metric is the same for all three types, the responsiveness metric varies:

Transaction-Oriented: These transactions have a fairly constant workload to perform for all transactions. The responsiveness metric for transaction-oriented applications is application response time, the elapsed time between the user's request for service (e.g. pushing the submit button) and the completion of the request (e.g. displaying the results) and is measured in milliseconds. This is commonly referred to as end-user response time.



Throughput-Oriented: These transactions have widely varying workloads based on the amount of data requested. The responsiveness metric for throughput-oriented applications is seconds per terabit. For example, 2Kbps is equal to 500 Million sec/Tb and 1Gbps is equal to 1000 sec/Tb. The inverting of the popular bits per second is done so that for all responsiveness metrics, lower values are better. Software that displays these metrics to humans is urged to convert them to a more familiar form when displaying them, for example kilobits per second or megabits per second.

Streaming-Oriented: These transactions deliver data at a constant metered rate of speed regardless of excess capacity in the networking and computing infrastructure. However, when the infrastructure's cannot deliver data at this speed, interruption of service or degradation of service can result. The responsiveness metric for streaming-oriented applications is the signal quality ratio of time that the service is degraded or interrupted to the total service time. This metric is measured in parts per million.

### **3.1. Report Aggregation**

This MIB provides functions to aggregate measurements into higher level summaries.

Every transaction is identified by its application, server, and client and has an availability measure as well as a responsiveness measure. The appropriate responsiveness measure is context-sensitive depending on whether the application is transaction-oriented, throughput-oriented, or streaming-oriented. For example, in a 5 minute period several transactions might be recorded:

Application	Client	Server	Successful	Responsiveness
HTTP	Jim	Amazon	1	6 sec.
SAP/R3	Jane	SAP	1	17 sec.
HTTP	Joe	HR	0	-
FTP	Jim	ietf	1	47MspTb (212 Kbps)
HTTP	Joe	HR	1	25 sec.
RealVideo	Joe	CNN	1	100.0%
HTTP	Jane	HR	1	5 sec.





These transactions can be aggregated in several ways, providing statistical summaries - for example summarizing all HTTP transactions, or all HTTP transactions to the HR Server. Note that data from different applications may not be summarized because:

1. The performance characteristics of different applications differ widely enough to render statistical analysis meaningless.
2. The responsiveness metrics of different applications may be different, making a statistical analysis impossible (in other words, one application may be transaction-oriented, while another is throughput-oriented).

Aggregating transactions collected over a period requires an aggregation algorithm. In this MIB, transaction aggregation always results in the following statistics:

#### TransactionCount

The total number of transactions during this period

#### SuccessfulTransactions

The total number of transactions that were successful. The management station can derive the percent success by dividing SuccessfulTransactions by the TransactionCount.

#### ResponsivenessMean

The average of the responsiveness metric for all aggregated transactions that completed successfully

#### ResponsivenessMin

The minimum responsiveness metric for all aggregated transactions that completed successfully

#### ResponsivenessMax

The maximum responsiveness metric for all aggregated transactions that completed successfully

#### ResponsivenessBx

The count of successful transactions whose responsiveness metric fell into the range specified for Bx. There are 7 buckets specified. Because the performance of different applications varies widely, the bucket ranges are specified separately for each application (in the apmAppDirectoryTable) so that they may be



tuned to typical performance of each application.

For example, when aggregating the previous set of transactions by application we get (for simplicity the example only shows TransactionCount, SuccessfulTransactions, and ResponsivenessMean):

Application	Count	Successful	ResponsivenessMean
HTTP	4	3	12 sec.
SAP/R3	1	1	17 sec.
FTP	1	1	212 Kbps.
RealVideo	1	1	100.0%

There are four different types of aggregation.

The flows(1) aggregation is the simplest. All transactions that share common application/server/client 3-tuples are aggregated together, resulting in a set of metrics for all such unique 3-tuples.

The clients(2) aggregation results in somewhat more aggregation (i.e. fewer resulting records). All transactions that share common application/client tuples are aggregated together, resulting in a set of metrics for all such unique tuples.

The servers(3) aggregation usually results in still more aggregation (i.e. fewer resulting records). All transactions that share common application/server tuples are aggregated together, resulting in a set of metrics for all such unique tuples.

The applications(4) aggregation results in the most aggregation (i.e. the fewest resulting records). All transactions that share a common application are aggregated together, resulting in a set of metrics for all such unique applications.







### **3.2. Structure of MIB**

The objects are arranged into the following groups:

- APM Application Directory Group
- APM User Defined Applications Group
- APM Report Group
- APM Current Transaction Group
- APM Exception Group
- APM Notification Group

These groups are the basic unit of conformance. If an agent implements a group, then it must implement all objects in that group. While this section provides an overview of grouping and conformance information for this MIB, the authoritative reference for such information is contained in the MODULE-COMPLIANCE and OBJECT-GROUP macros later in this MIB.

These groups are defined to provide a means of assigning object identifiers, and to provide a method for implementors of managed agents to know which objects they must implement.

#### **3.2.1. The APM Application Directory Group**

The APM Application Directory group contains configuration objects for every application or application verb monitored on this system. This group consists of the apmAppDirectoryTable.

#### **3.2.2. The APM User Defined Applications Group**

The APM User Defined Applications Group contains objects that allow for the tracking of applications or application verbs that aren't registered in the protocolDirectoryTable. This group consist of the apmHttpFilterTable and the apmUserDefinedAppTable.

#### **3.2.3. The APM Report Group**

The APM Report Group is used to prepare regular reports that aggregate application performance by flow, by client, by





server, or by application. This group consists of the `apmReportControlTable` and the `apmReportTable`.

#### **3.2.4. The APM Current Transaction Group**

The APM Current Transaction Group is used to show the transactions that are currently in progress, along with their responsiveness metric.

Because many transactions last a very short time, they will exist in this table for a very short time. Thus, polling this table is not an effective mechanism for retrieving all transactions.

This table is designed to allow a management station to check on the status of long-lived transactions. Because the `apmReport` and `apmException` mechanisms act only on transactions that have finished, a network manager may not have visibility for some time into the performance of long-lived transactions such as streaming applications, large data transfers, or (very) poorly performing transactions. In fact, by their very definition, the `apmReport` and `apmException` mechanisms only provide visibility into a problem after nothing can be done about it. The `apmCurrentTransactionTable` provides visibility into transactions that are currently executing and will allow a management station to find status of long-lived transactions.

#### **3.2.5. The APM Exception Group**

The APM Exception Group is used to generate immediate notifications of transactions that cross certain thresholds. The `apmExceptionTable` is used to configure which thresholds are to be checked for which types of transactions. The `apmTransactionResponsivenessAlarm` notification is sent when a transaction occurs with a responsiveness that crosses a threshold. The `apmTransactionUnsuccessfulAlarm` notification is sent when a transaction fails for which exception checking was configured.

#### **3.2.6. The APM Notification Group**

The APM Notification Group contains 2 notifications that are sent when thresholds in the APM Exception Table are exceeded.



#### 4. Definitions

APM-MIB DEFINITIONS ::= BEGIN

IMPORTS

```
    MODULE-IDENTITY, OBJECT-TYPE,
    NOTIFICATION-TYPE,
    Counter32, Integer32, Unsigned32                FROM SNMPv2-SMI
    TEXTUAL-CONVENTION, RowStatus, TimeStamp,
    TruthValue, DateAndTime                        FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP,
    NOTIFICATION-GROUP                            FROM SNMPv2-CONF
    SnmpAdminString                               FROM SNMP-FRAMEWORK-MIB
    rmon, OwnerString                             FROM RMON-MIB
    DataSource, protocolDirLocalIndex             FROM RMON2-MIB;
```

-- Application Performance Measurement MIB

apm MODULE-IDENTITY

LAST-UPDATED "200011221500Z" -- November 22, 2000

ORGANIZATION "IETF RMON MIB Working Group"

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DESCRIPTION

"The MIB module for measuring application performance as experienced by end-users. This MIB module augments the original RMON MIB as specified in [RFC 1757](#) and the RMON2 MIB as specified in [RFC 2021](#)."

REVISION "200011221500Z" -- November 22, 2000

DESCRIPTION

"The original version of this MIB, published as RFCXXXX."

::= { rmon 23 }

AppLocalIndex ::= TEXTUAL-CONVENTION

DISPLAY-HINT "255a"

STATUS current

DESCRIPTION

"A locally arbitrary unique identifier associated with an application or application verb.

All objects of type AppLocalIndex are assigned by the agent



out of a common number space. In other words, AppLocalIndex values assigned to entries in one table must not overlap with AppLocalIndex values assigned to entries in another table. Further, every protocolDirLocalIndex value registered by the agent automatically assigns the same value out of the AppLocalIndex number space.

For example, if the protocolDirLocalIndex values { 1, 3, 5, 7 } have been assigned, and the apmHttpFilterLocalIndex values { 6, 8, 9 } have been assigned:

- Assignment of new AppLocalIndex values must not use the values { 1, 3, 5, 6, 7, 8, 9 }.
- AppLocalIndex values { 1, 3, 5, 7 } are automatically assigned and are associated with the identical value of protocolDirLocalIndex. In particular, an entry in the apmAppDirectoryTable indexed by a value provides further information about a protocol indexed by the same value in the protocolDirectoryTable of RMON2.

The value for each supported application must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization, except that if an application is deleted and re-created, it must be re-created with a new value that has not been used since the last re-initialization.

The specific value is meaningful only within a given SNMP entity. An AppLocalIndex value must not be re-used until the next agent restart."

SYNTAX           Integer32 (1..2147483647)

-- The APM Application Directory Group

apmAppDirectoryTable OBJECT-TYPE

SYNTAX           SEQUENCE OF ApmAppDirectoryEntry

MAX-ACCESS      not-accessible

STATUS           current

DESCRIPTION

"The APM MIB directory of applications and application verbs. Some of these applications are registered in the RMON2 protocol directory, and some of them are registered in other tables in this MIB. Regardless of where an application is originally registered, it is assigned an AppLocalIndex value that is the primary index for this table."



```
::= { apm 1 }
```

apmAppDirectoryEntry OBJECT-TYPE

SYNTAX ApmAppDirectoryEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The APM MIB directory of applications and application verbs. An entry will exist in this table for all applications for which application performance measuring is supported."

INDEX { apmAppDirectoryAppLocalIndex,  
apmAppDirectoryResponsivenessType }

```
::= { apmAppDirectoryTable 1 }
```

ApmAppDirectoryEntry ::= SEQUENCE {

apmAppDirectoryAppLocalIndex AppLocalIndex,

apmAppDirectoryResponsivenessType INTEGER,

apmAppDirectoryConfig INTEGER,

apmAppDirectoryResponsivenessBoundary1 Integer32,

apmAppDirectoryResponsivenessBoundary2 Integer32,

apmAppDirectoryResponsivenessBoundary3 Integer32,

apmAppDirectoryResponsivenessBoundary4 Integer32,

apmAppDirectoryResponsivenessBoundary5 Integer32,

apmAppDirectoryResponsivenessBoundary6 Integer32

}

apmAppDirectoryAppLocalIndex OBJECT-TYPE

SYNTAX AppLocalIndex

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The AppLocalIndex assigned for this application Directory entry."

```
::= { apmAppDirectoryEntry 1 }
```

apmAppDirectoryResponsivenessType OBJECT-TYPE

SYNTAX INTEGER {  
transactionOriented(1),  
throughputOriented(2),  
streamingOriented(3)  
}

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This object describes and configures the agent's support for





application performance measurement for this application. There are 3 types of measurements for different types of applications:

Transaction-Oriented applications have a fairly constant workload to perform for all transactions. The responsiveness metric for transaction-oriented applications is application response time (from first request to final delivery of service) and is measured in milliseconds. This is commonly referred to as end-user response time.

Throughput-Oriented applications have widely varying workloads based on the nature of the client request. In particular, throughput-oriented applications vary widely in the amount of data that must be transported to satisfy the request. The responsiveness metric for throughput-oriented applications is seconds per terabit. [Ref: 2Kbps= 500 Million, 1Gbps=1000]. The inverting of the popular bits per second is done so that for all responsiveness metrics, lower values are better.

Streaming-Oriented applications deliver data at a constant metered rate of speed regardless of the responsiveness of the networking and computing infrastructure. This constant rate of speed is generally spec'ed to be below (sometimes well below) the nominal capability of the infrastructure. However, when the infrastructure's cannot deliver data at this speed, interruption of service or degradation of service can result. The responsiveness metric for streaming-oriented applications is the ratio of time that the service is degraded or interrupted to the total service time. This metric is measured in parts per million.

Note that for some applications, measuring more than one responsiveness type may be interesting. For agents that wish to support more than one measurement for a application, they will populate this table with 2 entries for that application, one for each type."

```
::= { apmAppDirectoryEntry 2 }
```

apmAppDirectoryConfig OBJECT-TYPE

```
SYNTAX      INTEGER {
                notSupported(1),
                supportedOff(2),
                supportedOn(3)
            }
```



MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object describes and configures support for application performance measurement for this application. When the agent creates entries in this table for all applications that it understands, it will set the entry to notSupported(1) if it doesn't have the capability to measure application performance for this application.

If the value of this object is notSupported(1), the agent will not measure application performance metrics for this application and shall not allow this object to be changed to any other value. If the value of this object is supportedOn(3), the agent supports measurement of application performance metrics for this application and is configured to measure such metrics for all APM MIB functions and all interfaces. If the value of this object is supportedOff(2), the agent supports measurement of application performance for this application but is configured to not measure these metrics for any APM MIB functions or interfaces. Whenever this value changes from supportedOn(3) to supportedOff(2), the agent shall delete all related entries in all tables in this MIB."

::= { apmAppDirectoryEntry 3 }

apmAppDirectoryResponsivenessBoundary1 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The boundary value between bucket1 and bucket 2. If this value is modified, all entries in the apmReportTable must be deleted."

::= { apmAppDirectoryEntry 4 }

apmAppDirectoryResponsivenessBoundary2 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The boundary value between bucket2 and bucket 3. If this value is modified, all entries in the apmReportTable must be deleted."

::= { apmAppDirectoryEntry 5 }



## apmAppDirectoryResponsivenessBoundary3 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"The boundary value between bucket3 and bucket 4. If this value is modified, all entries in the apmReportTable must be deleted."

::= { apmAppDirectoryEntry 6 }

## apmAppDirectoryResponsivenessBoundary4 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"The boundary value between bucket4 and bucket 5. If this value is modified, all entries in the apmReportTable must be deleted."

::= { apmAppDirectoryEntry 7 }

## apmAppDirectoryResponsivenessBoundary5 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"The boundary value between bucket5 and bucket 6. If this value is modified, all entries in the apmReportTable must be deleted."

::= { apmAppDirectoryEntry 8 }

## apmAppDirectoryResponsivenessBoundary6 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"The boundary value between bucket6 and bucket 7. If this value is modified, all entries in the apmReportTable must be deleted."

::= { apmAppDirectoryEntry 9 }



-- APM HTTP Filter Table

-- The HTTP Filter Table creates virtual applications which measure the  
-- performance of certain web pages or sets of web pages. Some  
-- circumstances where this is particularly useful are:

--

- - An Intranet or ASP scenario where a business application is  
-- running on one or more web pages or scripts.  
-- (i.e. /expense/submit.cgi?employeeID=3426&...)
- - A web-hosting scenario where one wants to measure the  
-- service level for a particular customer
- - An e-commerce scenario where the performance of certain  
-- pages needs to be monitored more closely.  
-- (i.e. shopping cart, shipping, credit card authorization)

apmHttpFilterTable OBJECT-TYPE

SYNTAX SEQUENCE OF ApmHttpFilterEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that creates virtual applications which measure the  
performance of certain web pages or sets of web pages.

Note that when entries exist in this table some HTTP  
transactions will be summarized twice: in applications  
represented here as well as the HTTP application. If entries  
in this table overlap, these transactions may be summarized  
additional times."

::= { apm 2 }

apmHttpFilterEntry OBJECT-TYPE

SYNTAX ApmHttpFilterEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A virtual application which measure the performance of certain  
web pages or sets of web pages."

INDEX { apmHttpFilterIndex }

::= { apmHttpFilterTable 1 }

ApmHttpFilterEntry ::= SEQUENCE {

apmHttpFilterIndex	Integer32,
apmHttpFilterAppLocalIndex	AppLocalIndex,
apmHttpFilterServerProtocol	Integer32,
apmHttpFilterServerAddress	OCTET STRING,





```
    apmHttpFilterURLPath      OCTET STRING,  
    apmHttpFilterMatchType    INTEGER,  
    apmHttpFilterRowStatus    RowStatus  
}
```

apmHttpFilterIndex OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An index that uniquely identifies an entry in the  
apmHttpFilterTable."

::= { apmHttpFilterEntry 1 }

apmHttpFilterAppLocalIndex OBJECT-TYPE

SYNTAX AppLocalIndex

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The AppLocalIndex that represents HTTP transactions  
that match this entry."

This object is read-only. A value is created by the agent from  
an unused AppLocalIndex value when this apmHttpFilterEntry is  
created."

::= { apmHttpFilterEntry 2 }

apmHttpFilterServerProtocol OBJECT-TYPE

SYNTAX Integer32 (1..2147483647)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The protocolDirLocalIndex value of the network level protocol  
of the apmHttpFilterServerAddress."

::= { apmHttpFilterEntry 3 }

apmHttpFilterServerAddress OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This entry will only represent transactions coming from the  
network address specified in this object."

This is represented as an octet string with



specific semantics and length as identified  
by the apmNameProtocolDirLocalIndex component of the index.

If this object is the zero-length string, then this entry will  
match the associated apmHttpFilterURL `from' address."

::= { apmHttpFilterEntry 4 }

#### apmHttpFilterURLPath OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-create

STATUS current

##### DESCRIPTION

"This entry will only represent HTTP transactions  
whose URL path component matches this value.

Prior to the matching, the URL is stripped of any server  
address or DNS name and consists solely of the path name on  
that server.

The value of the associated apmHttpFilterMatchType dictates  
the type of matching that will be attempted."

::= { apmHttpFilterEntry 5 }

#### apmHttpFilterMatchType OBJECT-TYPE

SYNTAX INTEGER {  
    exact(1),  
    prefix(2)  
}

MAX-ACCESS read-create

STATUS current

##### DESCRIPTION

"The matching algorithm used to compare the URL pathname.

If the value is exact(1), then the pathname component will be  
compared with the associated apmHttpFilterURLPath and  
will only be associated with this entry if it matches exactly.

If the value is prefix(2), then the pathname component will be  
compared with the associated apmHttpFilterURLPath and will  
only be associated with this entry if the beginning of the  
pathname matches every octet of this value. Octets that extend  
beyond the length of this value are ignored."

::= { apmHttpFilterEntry 6 }

#### apmHttpFilterRowStatus OBJECT-TYPE



```
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of this apmHttpFilterEntry."
 ::= { apmHttpFilterEntry 7 }
```

apmHttpIgnoreUnregisteredURLs OBJECT-TYPE

```
SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "When true, this agent will only monitor URLs registered in
    the apmHttpFilterTable.

    This will be used in environments that wish to monitor only
    targeted URLs and to ignore large volumes of internet web
    browsing traffic."
 ::= { apm 3 }
```

apmHttp404IsFailure OBJECT-TYPE

```
SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "When true, this agent will recognize HTTP 404 Errors and will
    treat them as unavailable transactions. When false or when
    this object isn't supported, they will be treated as
    successful transactions.

    This object allows such error pages to be tracked at the
    possible expense of having user typo's treated as poor service
    on the part of the web server."
 ::= { apm 4 }
```

-- The APM User-Defined Application Table

```
-- Many application protocols will never be registered with a
-- standards body (and thus included in a protocol directory standard)
-- because they are custom, in-house or proprietary
-- applications. Nevertheless, implementation strategies exist for
-- monitoring the end-user experience of these applications.
--
-- This read-only table provides a means for the agent to advertise
-- which user-defined applications it is monitoring and to associate each
```



-- with an AppLocalIndex value. It is an implementation-dependent  
-- matter as to how the agent learns how to monitor these  
-- applications.

apmUserDefinedAppTable OBJECT-TYPE

SYNTAX SEQUENCE OF ApmUserDefinedAppEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table that advertises user-defined applications that the agent is measuring.

Note that when entries exist in this table some transactions can be summarized more than once if there is overlap between applications defined here and applications defined in the protocol directory or in the httpFilter table."

::= { apm 5 }

apmUserDefinedAppEntry OBJECT-TYPE

SYNTAX ApmUserDefinedAppEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A user-defined application that the agent is measuring, along with its AppLocalIndex assignment."

INDEX { apmUserDefinedAppLocalIndex }

::= { apmUserDefinedAppTable 1 }

ApmUserDefinedAppEntry ::= SEQUENCE {

apmUserDefinedAppLocalIndex AppLocalIndex,

apmUserDefinedAppParentIndex Integer32,

apmUserDefinedAppApplication SnmpAdminString

}

apmUserDefinedAppLocalIndex OBJECT-TYPE

SYNTAX AppLocalIndex

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The agent-assigned AppLocalIndex value for this user-defined application."

::= { apmUserDefinedAppEntry 1 }

apmUserDefinedAppParentIndex OBJECT-TYPE





```
SYNTAX      Integer32 (1..2147483647)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The protocolDirLocalIndex value of the highest-layer
    protocol defined in the protocolDirectoryTable that this
    application is a child of."
 ::= { apmUserDefinedAppEntry 2 }
```

apmUserDefinedAppApplication OBJECT-TYPE

```
SYNTAX      SnmpAdminString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "A human readable descriptive tag for this application."
 ::= { apmUserDefinedAppEntry 3 }
```

-- The APM Name Table

apmNameTable OBJECT-TYPE

SYNTAX SEQUENCE OF ApmNameEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A client machine may have multiple addresses during a period of monitoring. The apmNameTable assigns a long-lived identifier to a client and records what addresses were assigned to that client for periods of time. Various implementation techniques exist for tracking this mapping but if an agent is unable to track client address mappings, it may map client identifiers to client addresses rather than to distinct client machines.

When available, the agent may also record the machine name and/or user name which may be valuable for displaying to humans."

::= { apm 6 }

apmNameEntry OBJECT-TYPE

SYNTAX ApmNameEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry in the APM name table. An entry exists for each period of time that a client has been associated with a particular address."

INDEX { apmNameClientID,  
apmNameProtocolDirLocalIndex,  
apmNameClientAddress,  
apmNameMappingStartTime }

::= { apmNameTable 1 }

ApmNameEntry ::= SEQUENCE {

apmNameClientID	Unsigned32,
apmNameProtocolDirLocalIndex	Integer32,
apmNameClientAddress	OCTET STRING,
apmNameMappingStartTime	DateAndTime,
apmNameMachineName	SnmpAdminString,
apmNameUserName	SnmpAdminString

}

apmNameClientID OBJECT-TYPE



SYNTAX        Unsigned32 (0..4294967295)  
MAX-ACCESS   not-accessible  
STATUS        current  
DESCRIPTION  
    "A unique ID assigned to the machine represented by this  
    mapping. This ID is assigned by the agent using an  
    implementation-specific algorithm."  
::= { apmNameEntry 1 }

apmNameProtocolDirLocalIndex OBJECT-TYPE

SYNTAX        Integer32 (1..2147483647)  
MAX-ACCESS   not-accessible  
STATUS        current  
DESCRIPTION  
    "The network level protocol of this client address."  
::= { apmNameEntry 2 }

apmNameClientAddress OBJECT-TYPE

SYNTAX        OCTET STRING  
MAX-ACCESS   not-accessible  
STATUS        current  
DESCRIPTION  
    "The network client address for this client when this mapping  
    was active.  
  
    This is represented as an octet string with  
    specific semantics and length as identified  
    by the apmNameProtocolDirLocalIndex component of the index.  
  
    Since this object is an index variable, it is encoded in the  
    index according to the index encoding rules. For example, if  
    the apmNameProtocolDirLocalIndex indicates an encapsulation of  
    ip, this object is encoded as a length octet of 4, followed by  
    the 4 octets of the ip address, in network byte order."  
::= { apmNameEntry 3 }

apmNameMappingStartTime OBJECT-TYPE

SYNTAX        DateAndTime  
MAX-ACCESS   not-accessible  
STATUS        current  
DESCRIPTION  
    "The time that the agent first discovered this mapping  
    as active."  
::= { apmNameEntry 4 }



**apmNameMachineName OBJECT-TYPE**

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"The human readable name of the client machine.

If the client has no machine name or the agent is unable to learn the machine name, this object will be a zero-length string."

::= { apmNameEntry 5 }

**apmNameUserName OBJECT-TYPE**

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

**DESCRIPTION**

"The human readable name of a user using the client machine.

If the client has no recorded user name or the agent is unable to learn a user name, this object will be a zero-length string."

::= { apmNameEntry 6 }





-- The APM Report Group

apmReportControlTable OBJECT-TYPE

SYNTAX SEQUENCE OF ApmReportControlEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Parameters that control the creation of a set of reports that aggregate application performance."

::= { apm 7 }

apmReportControlEntry OBJECT-TYPE

SYNTAX ApmReportControlEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A conceptual row in the apmReportControlTable.

An example of the indexing of this table is  
apmReportControlDuration.3"

INDEX { apmReportControlIndex }

::= { apmReportControlTable 1 }

ApmReportControlEntry ::= SEQUENCE {

apmReportControlIndex	Integer32,
apmReportControlDataSource	DataSource,
apmReportControlAggregationType	INTEGER,
apmReportControlInterval	Integer32,
apmReportControlRequestedSize	Integer32,
apmReportControlGrantedSize	Integer32,
apmReportControlRequestedReports	Integer32,
apmReportControlGrantedReports	Integer32,
apmReportControlStartTime	TimeStamp,
apmReportControlReportNumber	Integer32,
apmReportControlInsertsDenied	Integer32,
apmReportControlDroppedFrames	Counter32,
apmReportControlOwner	OwnerString,
apmReportControlStatus	RowStatus

}

apmReportControlIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS not-accessible

STATUS current



## DESCRIPTION

"An index that uniquely identifies an entry in the apmReportControlTable. Each such entry defines a unique report whose results are placed in the apmReportTable on behalf of this apmReportControlEntry."

::= { apmReportControlEntry 1 }

## apmReportControlDataSource OBJECT-TYPE

SYNTAX DataSource

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"The source of the data for APM Reports generated on behalf of this apmReportControlEntry."

This object may not be modified if the associated apmReportControlStatus object is equal to active(1)."

::= { apmReportControlEntry 2 }

## apmReportControlAggregationType OBJECT-TYPE

SYNTAX INTEGER {  
    flows(1),     -- Least Aggregation  
    clients(2),  
    servers(3),  
    applications(4) -- Most Aggregation  
}

MAX-ACCESS read-create

STATUS current

## DESCRIPTION

"The type of aggregation being performed for this set of reports."

The metrics for a single transaction are the responsiveness of the transaction and whether the transaction succeeded (a boolean). When such metrics are aggregated in this MIB, these metrics are replaced by averages and distributions of responsiveness and availability. The metrics describing aggregates are constant no matter which type of aggregation is being performed. These metrics may be found in the apmReportTable.

The flows(1) aggregation is the simplest. All transactions that share common application/server/client 3-tuples are aggregated together, resulting in a set of metrics for all such unique 3-tuples.



The clients(2) aggregation results in somewhat more aggregation (i.e. fewer resulting records). All transactions that share common application/client tuples are aggregated together, resulting in a set of metrics for all such unique tuples.

The servers(3) aggregation usually results in still more aggregation (i.e. fewer resulting records). All transactions that share common application/server tuples are aggregated together, resulting in a set of metrics for all such unique tuples.

The applications(4) aggregation results in the most aggregation (i.e. the fewest resulting records). All transactions that share a common application are aggregated together, resulting in a set of metrics for all such unique applications.

Note that it is not meaningful to aggregate applications, as different applications have widely varying characteristics. As a result, this set of aggregations is complete.

This object may not be modified if the associated apmReportControlStatus object is equal to active(1)."

::= { apmReportControlEntry 3 }

#### apmReportControlInterval OBJECT-TYPE

SYNTAX Integer32 (1..86400)

UNITS "Seconds"

MAX-ACCESS read-create

STATUS current

##### DESCRIPTION

"The interval in seconds over which data is accumulated before being aggregated into a report in the apmReportTable. All reports with the same apmReportControlIndex will be based on the same interval."

This object may not be modified if the associated apmReportControlStatus object is equal to active(1)."

DEFVAL { 3600 }

::= { apmReportControlEntry 4 }

#### apmReportControlRequestedSize OBJECT-TYPE

SYNTAX Integer32 (0..2147483647)

MAX-ACCESS read-create



STATUS current

DESCRIPTION

"The number of entries requested to be allocated for each report generated on behalf of this entry."

::= { apmReportControlEntry 5 }

apmReportControlGrantedSize OBJECT-TYPE

SYNTAX Integer32 (0..2147483647)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of entries per report the agent has allocated based on the requested amount in apmReportControlRequestedSize. Since multiple reports are saved, the total number of entries allocated will be this number multiplied by the value of apmReportControlGrantedReports, or 1 if that object doesn't exist.

When the associated apmReportControlRequestedSize object is created or modified, the agent should set this object as closely to the requested value as is possible for the particular implementation and available resources. When considering resources available, the agent must consider its ability to allocate this many entries for all reports.

Note that while the actual number of entries stored in the reports may fluctuate due to changing conditions, the agent must continue to have storage available to satisfy the full report size for all reports when necessary. Further, the agent must not lower this value except as a result of a set to the associated apmReportControlRequestedSize object."

::= { apmReportControlEntry 6 }

apmReportControlRequestedReports OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The number of saved reports requested to be allocated on behalf of this entry."

::= { apmReportControlEntry 7 }

apmReportControlGrantedReports OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS read-only





STATUS current

DESCRIPTION

"The number of saved reports the agent has allocated based on the requested amount in apmReportControlRequestedReports. Since each report can have many entries, the total number of entries allocated will be this number multiplied by the value of apmReportControlGrantedSize, or 1 if that object doesn't exist.

When the associated apmReportControlRequestedReports object is created or modified, the agent should set this object as closely to the requested value as is possible for the particular implementation and available resources. When considering resources available, the agent must consider its ability to allocate this many reports each with the number of entries represented by apmReportControlGrantedSize, or 1 if that object doesn't exist.

Note that while the storage required for each report may fluctuate due to changing conditions, the agent must continue to have storage available to satisfy the full report size for all reports when necessary. Further, the agent must not lower this value except as a result of a set to the associated apmReportControlRequestedSize object."

::= { apmReportControlEntry 8 }

apmReportControlStartTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime when the system began processing the report in progress. Note that the report in progress is not available.

This object may be used by the management station to figure out the start time for all previous reports saved for this apmReportControlEntry, as reports are started at fixed intervals."

::= { apmReportControlEntry 9 }

apmReportControlReportNumber OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only



STATUS current

DESCRIPTION

"The number of the report in progress. When an apmReportControlEntry is activated, the first report will be numbered zero."

::= { apmReportControlEntry 10 }

apmReportControlInsertsDenied OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of failed attempts to add an entry to reports for this apmReportControlEntry because the number of entries would have exceeded apmReportControlGrantedSize.

This number is valuable in determining if enough entries have been allocated for reports in light of fluctuating network usage. Note that an entry that is denied will often be attempted again, this number will not predict the exact number of additional entries needed, but can be used to understand the relative magnitude of the problem.

Also note that there is no ordering specified for the entries in the report, thus there are no rules for which entries will be omitted when not enough entries are available. As a consequence, the agent is not required to delete 'least valuable' entries first."

::= { apmReportControlEntry 11 }

apmReportControlDroppedFrames OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of frames which were received by the agent and therefore not accounted for in the \*StatsDropEvents, but for which the agent chose not to count for this entry for whatever reason. Most often, this event occurs when the agent is out of some resources and decides to shed load from this collection.

This count does not include packets that were not counted because they had MAC-layer errors.



Note that if the apmReportTables are inactive because no applications are enabled in the application directory, this value should be 0.

Note that, unlike the dropEvents counter, this number is the exact number of frames dropped."

::= { apmReportControlEntry 12 }

apmReportControlOwner OBJECT-TYPE

SYNTAX OwnerString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The entity that configured this entry and is therefore using the resources assigned to it."

::= { apmReportControlEntry 13 }

apmReportControlStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The status of this apmReportControlEntry.

An entry may not exist in the active state unless all objects in the entry have an appropriate value.

If this object is not equal to active(1), all associated entries in the apmReportTable shall be deleted by the agent."

::= { apmReportControlEntry 14 }

-- The APM Report Table

apmReportTable OBJECT-TYPE

SYNTAX SEQUENCE OF ApmReportEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The data resulting from aggregated APM reports. Consult the definition of apmReportControlAggregationType for the definition of the various types of aggregations."

::= { apm 8 }

apmReportEntry OBJECT-TYPE



SYNTAX       ApmReportEntry

MAX-ACCESS   not-accessible

STATUS       current

#### DESCRIPTION

"A conceptual row in the apmReportTable.

The apmReportControlIndex value in the index identifies the apmReportControlEntry on whose behalf this entry was created. The apmReportIndex value in the index identifies which report (in the series of reports) this entry is a part of.

The protocolDirLocalIndex value in the index identifies the network layer protocol of the apmReportServerAddress.

When the associated apmReportControlAggregationType value is equal to application(4), this value will equal 0.

The apmReportServerAddress value in the index identifies the network layer address of the server in transactions aggregated in this entry.

The apmReportClientID value in the index identifies the client in transactions aggregated in this entry. It is a reference to the clientID recorded in the apmNameTable.

The apmReportResponsivenessType value in the index identifies the type of responsiveness metric reported by this entry and uniquely identifies this entry when more than one responsiveness metric is measured for a flow.

An example of the indexing of this entry is

apmReportTransactionCount.3.15.34.18.4.128.2.6.7.4.128.2.6.6.1"

```
INDEX { apmReportControlIndex, apmReportIndex,
        apmReportAppLocalIndex, protocolDirLocalIndex,
        apmReportServerAddress, apmReportClientID,
        apmReportResponsivenessType }
```

```
::= { apmReportTable 1 }
```

```
ApmReportEntry ::= SEQUENCE {
    apmReportIndex                Integer32,
    apmReportAppLocalIndex        AppLocalIndex,
    apmReportServerAddress        OCTET STRING,
    apmReportClientID             Unsigned32,
    apmReportResponsivenessType   INTEGER,
    apmReportTransactionCount     Integer32,
    apmReportSuccessfulTransactions Integer32,
    apmReportResponsivenessMean   Integer32,
    apmReportResponsivenessMin    Integer32,
    apmReportResponsivenessMax    Integer32,
    apmReportResponsivenessB1     Integer32,
```





```
    apmReportResponsivenessB2      Integer32,  
    apmReportResponsivenessB3      Integer32,  
    apmReportResponsivenessB4      Integer32,  
    apmReportResponsivenessB5      Integer32,  
    apmReportResponsivenessB6      Integer32,  
    apmReportResponsivenessB7      Integer32  
}
```

apmReportIndex OBJECT-TYPE

```
SYNTAX      Integer32 (0..2147483647)  
MAX-ACCESS  not-accessible  
STATUS      current  
DESCRIPTION  
    "The value of apmReportControlReportNumber for the report to  
    which this entry belongs."  
 ::= { apmReportEntry 1 }
```

apmReportAppLocalIndex OBJECT-TYPE

```
SYNTAX      AppLocalIndex  
MAX-ACCESS  not-accessible  
STATUS      current  
DESCRIPTION  
    "The common application of the transactions aggregated  
    in this entry."  
 ::= { apmReportEntry 2 }
```

apmReportServerAddress OBJECT-TYPE

```
SYNTAX      OCTET STRING  
MAX-ACCESS  not-accessible  
STATUS      current  
DESCRIPTION  
    "The network server address for this apmReportEntry.
```

This is represented as an octet string with specific semantics and length as identified by the protocolDirLocalIndex component of the index.

Since this object is an index variable, it is encoded in the index according to the index encoding rules. For example, if the protocolDirLocalIndex indicates an encapsulation of ip, this object is encoded as a length octet of 4, followed by the 4 octets of the ip address, in network byte order.

If the associated apmReportControlAggregationType is equal to application(4) or client(2), then this object will be a null



string and will be encoded simply as a length octet of 0."  
 ::= { apmReportEntry 3 }

apmReportClientID OBJECT-TYPE

SYNTAX        Unsigned32 (0..4294967295)  
MAX-ACCESS   not-accessible  
STATUS        current  
DESCRIPTION

"The clientID for the client represented by this  
apmReportEntry.

If the associated apmReportControlAggregationType is equal to  
application(4) or server(3), then this object will be set to 0."  
 ::= { apmReportEntry 4 }

apmReportResponsivenessType OBJECT-TYPE

SYNTAX        INTEGER {  
                 transactionOriented(1),  
                 throughputOriented(2),  
                 streamingOriented(3)  
              }  
MAX-ACCESS   not-accessible  
STATUS        current  
DESCRIPTION

"The type of measurement that this entry represents. Entries  
will only exist for measurements configured by the  
apmAppDirectoryResponsivenessType object."

::= { apmReportEntry 5 }

apmReportTransactionCount OBJECT-TYPE

SYNTAX        Integer32  
MAX-ACCESS   read-only  
STATUS        current  
DESCRIPTION

"The total number of transactions aggregated into this record."

::= { apmReportEntry 6 }

apmReportSuccessfulTransactions OBJECT-TYPE

SYNTAX        Integer32  
MAX-ACCESS   read-only  
STATUS        current  
DESCRIPTION

"The total number of successful transactions aggregated into  
this record."

::= { apmReportEntry 7 }



**apmReportResponsivenessMean OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The arithmetic mean of the responsiveness metrics for all transactions aggregated into this record."

::= { apmReportEntry 8 }

**apmReportResponsivenessMin OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The minimum of the responsiveness metrics for all transactions aggregated into this record."

::= { apmReportEntry 9 }

**apmReportResponsivenessMax OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The maximum of the responsiveness metrics for all transactions aggregated into this record."

::= { apmReportEntry 10 }

**apmReportResponsivenessB1 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of transactions aggregated into this record whose responsiveness was less than boundary1 value for this protocol."

::= { apmReportEntry 11 }

**apmReportResponsivenessB2 OBJECT-TYPE**

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of transactions aggregated into this record whose responsiveness was greater than or equal to the boundary1"



value for this application and less than the boundary2 value for this application."  
 ::= { apmReportEntry 12 }

apmReportResponsivenessB3 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of transactions aggregated into this record whose responsiveness was greater than or equal to the boundary2 value for this application and less than the boundary3 value for this application."

::= { apmReportEntry 13 }

apmReportResponsivenessB4 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of transactions aggregated into this record whose responsiveness was greater than or equal to the boundary3 value for this application and less than the boundary4 value for this application."

::= { apmReportEntry 14 }

apmReportResponsivenessB5 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of transactions aggregated into this record whose responsiveness was greater than or equal to the boundary4 value for this application and less than the boundary5 value for this application."

::= { apmReportEntry 15 }

apmReportResponsivenessB6 OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of transactions aggregated into this record whose responsiveness was greater than or equal to the boundary5 value for this application and less than the boundary6 value for this application."





```
    this application."
 ::= { apmReportEntry 16 }
```

apmReportResponsivenessB7 OBJECT-TYPE

```
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of transactions aggregated into this record whose
    responsiveness was greater than or equal to the boundary6
    value for this application."
 ::= { apmReportEntry 17 }
```

-- APM Current Transaction Table

apmCurrentTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF ApmCurrentEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table contains all transactions that have been started
    but have not yet finished."
 ::= { apm 9 }
```

apmCurrentEntry OBJECT-TYPE

```
SYNTAX      ApmCurrentEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A conceptual row in the apmCurrentTable.

    The protocolDirLocalIndex value in the index identifies
    the network layer protocol of the apmCurrentServerAddress and
    apmCurrentClientAddress.
    The apmCurrentServerAddress value in the index identifies the
    network layer address of the server in the transaction
    represented by this entry.
    The apmCurrentClientID value in the index identifies the
    client in the transaction represented by this entry.
    The apmCurrentResponsivenessType value in the index identifies
    the type of responsiveness metric reported by this entry and
    uniquely identifies this entry when more than one
    responsiveness metric is measured for a transaction.
```

An example of the indexing of this entry is



```

    apmCurrentTransactionCount.34.18.4.128.2.6.7.4.128.2.6.6.23698.1"
INDEX { apmCurrentAppLocalIndex, protocolDirLocalIndex,
        apmCurrentServerAddress, apmCurrentClientID,
        apmCurrentTransactionID,
        apmCurrentResponsivenessType }
 ::= { apmCurrentTable 1 }

```

```

ApmCurrentEntry ::= SEQUENCE {
    apmCurrentAppLocalIndex      AppLocalIndex,
    apmCurrentServerAddress      OCTET STRING,
    apmCurrentClientID           Unsigned32,
    apmCurrentTransactionID      Integer32,
    apmCurrentResponsivenessType INTEGER,
    apmCurrentResponsiveness     Integer32,
    apmCurrentSuccess            TruthValue
}

```

```

apmCurrentAppLocalIndex OBJECT-TYPE
    SYNTAX      AppLocalIndex
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The application of the transaction represented by
        in this entry."
    ::= { apmCurrentEntry 1 }

```

```

apmCurrentServerAddress OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The network server address for this apmCurrentEntry.

```

This is represented as an octet string with specific semantics and length as identified by the protocolDirLocalIndex component of the index.

For example, if the protocolDirLocalIndex indicates an encapsulation of ip, this object is encoded as a length octet of 4, followed by the 4 octets of the ip address, in network byte order."

```

 ::= { apmCurrentEntry 2 }

```

```

apmCurrentClientID OBJECT-TYPE
    SYNTAX      Unsigned32 (0..4294967295)

```



MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
    "The clientID for the client in this apmCurrentEntry."  
 ::= { apmCurrentEntry 3 }

apmCurrentTransactionID OBJECT-TYPE

SYNTAX Integer32 (0..2147483647)  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
    "A unique value for this transaction amongst other  
    transactions sharing the same application layer protocol and  
    server and client addresses. Implementations may choose to use  
    the value of the client's source port, when possible."  
 ::= { apmCurrentEntry 4 }

apmCurrentResponsivenessType OBJECT-TYPE

SYNTAX INTEGER {  
    transactionOriented(1),  
    throughputOriented(2),  
    streamingOriented(3)  
}  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
    "The type of measurement that this entry represents. Entries  
    will only exist for measurements configured by the  
    apmAppDirectoryResponsivenessType object."  
 ::= { apmCurrentEntry 5 }

apmCurrentResponsiveness OBJECT-TYPE

SYNTAX Integer32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
    "The current value of the responsiveness metric for this  
    transaction.  
  
    Note that this value may change over the lifetime of the  
    transaction and it is the final value of this metric that is  
    recorded as the responsiveness of the transaction for use in  
    other APM MIB functions."  
 ::= { apmCurrentEntry 6 }



## apmCurrentSuccess OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The success of this transaction up to this time. A transaction that has failed may exist in this table until it is closed. Once a transaction has been marked as failed, it cannot move back into the successful state."

::= { apmCurrentEntry 7 }

-- The APM exception table

## apmExceptionTable OBJECT-TYPE

SYNTAX SEQUENCE OF ApmExceptionEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"This table creates filters so that a management station can get immediate notification of a transaction that has had poor availability or responsiveness."

Each apmExceptionEntry is associated with a particular type of transaction and is applied to all transactions of that type. Multiple apmExceptionEntries may be associated with a particular type of transaction. A transaction type is identified by value of the apmExceptionAppLocalIndex object.

Because the quality of a transaction is not known until it is completed, these thresholds are only applied after the transaction has completed."

::= { apm 10 }

## apmExceptionEntry OBJECT-TYPE

SYNTAX ApmExceptionEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"A conceptual row in the apmExceptionTable."

INDEX { apmExceptionAppLocalIndex,  
apmAppDirectoryResponsivenessType, apmExceptionIndex }

::= { apmExceptionTable 1 }

ApmExceptionEntry ::= SEQUENCE {

apmExceptionAppLocalIndex

AppLocalIndex,





apmExceptionIndex	Integer32,
apmExceptionResponsivenessComparison	INTEGER,
apmExceptionResponsivenessThreshold	Integer32,
apmExceptionUnsuccessfulException	INTEGER,
apmExceptionOwner	OwnerString,
apmExceptionStatus	RowStatus

}

apmExceptionAppLocalIndex OBJECT-TYPE

SYNTAX AppLocalIndex  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"The application whose transactions will be monitored for exceptions."  
::= { apmExceptionEntry 1 }

apmExceptionIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"An index that uniquely identifies an entry in the apmExceptionTable. Each such entry sets up thresholds for a particular measurement of a particular application.  
  
Note that even though the index of the apmExceptionTable contains other objects (e.g. apmExceptionAppLocalIndex) that may disambiguate apmExceptionEntries, no two apmExceptionEntries may have the same value of apmExceptionIndex."  
::= { apmExceptionEntry 2 }

apmExceptionResponsivenessComparison OBJECT-TYPE

SYNTAX INTEGER {  
    none(1),  
    greater(2),  
    less(3)  
}  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"If this value is greater(2) or less(3), the associated apmExceptionResponsivenessThreshold will be compared to this value and an exception will be created if the responsiveness is greater than the threshold (greater(2)) or less than the



```
    threshold (less(3))."  
 ::= { apmExceptionEntry 3 }
```

apmExceptionResponsivenessThreshold OBJECT-TYPE

```
SYNTAX      Integer32  
MAX-ACCESS  read-create  
STATUS      current  
DESCRIPTION  
    "The threshold that responsiveness metrics are compared to."  
 ::= { apmExceptionEntry 4 }
```

apmExceptionUnsuccessfulException OBJECT-TYPE

```
SYNTAX      INTEGER {  
                off(1),  
                on(2)  
            }  
MAX-ACCESS  read-create  
STATUS      current  
DESCRIPTION  
    "If this value is on(2), an exception will be created if a  
    transaction of the associated type is unsuccessful."  
 ::= { apmExceptionEntry 5 }
```

apmExceptionOwner OBJECT-TYPE

```
SYNTAX      OwnerString  
MAX-ACCESS  read-create  
STATUS      current  
DESCRIPTION  
    "The entity that configured this entry and is  
    therefore using the resources assigned to it."  
 ::= { apmExceptionEntry 6 }
```

apmExceptionStatus OBJECT-TYPE

```
SYNTAX      RowStatus  
MAX-ACCESS  read-create  
STATUS      current  
DESCRIPTION  
    "The status of this apmExceptionEntry."  
 ::= { apmExceptionEntry 7 }
```

-- APM Notifications

apmNotifications OBJECT IDENTIFIER ::= { apm 11 }

apmTransactionResponsivenessAlarm NOTIFICATION-TYPE



```
OBJECTS      { apmExceptionResponsivenessThreshold,
                apmCurrentResponsiveness }
STATUS       current
DESCRIPTION
    "Notification sent when a transaction exceeds a threshold
    defined in the apmException table. The index of the
    included apmExceptionResponsivenessThreshold object identifies
    the apmExceptionEntry that specified the threshold. The
    apmCurrentResponsiveness variable identifies the actual
    transaction and its responsiveness."
::= { apmNotifications 1 }
```

apmTransactionUnsuccessfulAlarm NOTIFICATION-TYPE

```
OBJECTS      { apmExceptionResponsivenessThreshold }
STATUS       current
DESCRIPTION
    "Notification sent when a transaction is unsuccessful.
    The index of the included apmExceptionResponsivenessThreshold
    object identifies both the type of the transaction that caused
    this notification as well as the apmExceptionEntry that
    specified the threshold."
::= { apmNotifications 2 }
```

```
rmonConformance    OBJECT IDENTIFIER ::= { rmon 20 }
apmCompliances      OBJECT IDENTIFIER ::= { rmonConformance 11 }
apmGroups           OBJECT IDENTIFIER ::= { rmonConformance 12 }
```

apmCompliance MODULE-COMPLIANCE

```
STATUS current
DESCRIPTION
    "Describes the requirements for conformance to
    the APM MIB"
MODULE -- this module
    MANDATORY-GROUPS { apmAppDirectoryGroup, apmReportGroup }
::= { apmCompliances 1 }
```

apmAppDirectoryGroup OBJECT-GROUP

```
OBJECTS { apmAppDirectoryConfig,
          apmAppDirectoryResponsivenessBoundary1,
          apmAppDirectoryResponsivenessBoundary2,
          apmAppDirectoryResponsivenessBoundary3,
          apmAppDirectoryResponsivenessBoundary4,
          apmAppDirectoryResponsivenessBoundary5,
          apmAppDirectoryResponsivenessBoundary6,
```



```
        apmNameMachineName,
        apmNameUserName }
STATUS   current
DESCRIPTION
    "The APM MIB directory of applications and application verbs."
 ::= { apmGroups 1 }
```

```
apmUserDefinedApplicationsGroup OBJECT-GROUP
    OBJECTS {
        apmHttpFilterAppLocalIndex,
        apmHttpFilterServerProtocol,
        apmHttpFilterServerAddress, apmHttpFilterURLPath,
        apmHttpFilterMatchType, apmHttpFilterRowStatus,
        apmHttpIgnoreUnregisteredURLs, apmHttp404IsFailure,
        apmUserDefinedAppParentIndex,
        apmUserDefinedAppApplication }
STATUS   current
DESCRIPTION
    "Objects used for creating and managing user-defined
    applications."
 ::= { apmGroups 2 }
```

```
apmReportGroup OBJECT-GROUP
    OBJECTS { apmReportControlDataSource,
        apmReportControlAggregationType,
        apmReportControlInterval,
        apmReportControlRequestedSize,
        apmReportControlGrantedSize,
        apmReportControlRequestedReports,
        apmReportControlGrantedReports,
        apmReportControlStartTime,
        apmReportControlReportNumber,
        apmReportControlInsertsDenied,
        apmReportControlDroppedFrames,
        apmReportControlOwner,
        apmReportControlStatus,
        apmReportTransactionCount,
        apmReportSuccessfulTransactions,
        apmReportResponsivenessMean,
        apmReportResponsivenessMin,
        apmReportResponsivenessMax,
        apmReportResponsivenessB1,
        apmReportResponsivenessB2,
        apmReportResponsivenessB3,
        apmReportResponsivenessB4,
        apmReportResponsivenessB5,
```





```
        apmReportResponsivenessB6,
        apmReportResponsivenessB7 }
STATUS    current
DESCRIPTION
    "The apm report group controls the creation and retrieval of
    reports that aggregate application performance."
 ::= { apmGroups 3 }

apmCurrentTransactionGroup OBJECT-GROUP
    OBJECTS { apmCurrentResponsiveness,
               apmCurrentSuccess }
STATUS    current
DESCRIPTION
    "The apm current transaction group contains statistics for
    transactions that have not yet terminated."
 ::= { apmGroups 4 }

apmExceptionGroup OBJECT-GROUP
    OBJECTS { apmExceptionResponsivenessComparison,
               apmExceptionResponsivenessThreshold,
               apmExceptionUnsuccessfulException,
               apmExceptionOwner,
               apmExceptionStatus }
STATUS    current
DESCRIPTION
    "The apm exception group causes notifications to be sent
    whenever transactions are detected that had poor availability
    or responsiveness."
 ::= { apmGroups 5 }

apmNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS { apmTransactionResponsivenessAlarm,
                    apmTransactionUnsuccessfulAlarm }
STATUS          current
DESCRIPTION
    "Notifications sent by an APM MIB agent."
 ::= { apmGroups 6 }

END
```



## 5. Security Considerations

This MIB contains network addresses, application usage information, and conversation statistics. Data of this nature may be considered sensitive in some environments. In such environments the administrator may wish to restrict SNMP access to the agent.

There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

SNMPv1 by itself is not a secure environment. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB.

It is recommended that the implementors consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [12] and the View-based Access Control Model [RFC 2575](#) [15] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.



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## Table of Contents

<a href="#">1</a> Abstract .....	<a href="#">1</a>
<a href="#">2</a> The SNMP Management Framework .....	<a href="#">2</a>
<a href="#">3</a> Overview .....	<a href="#">4</a>
<a href="#">3.1</a> Report Aggregation .....	<a href="#">5</a>
<a href="#">3.2</a> Structure of MIB .....	<a href="#">9</a>
<a href="#">3.2.1</a> The APM Application Directory Group .....	<a href="#">9</a>
<a href="#">3.2.2</a> The APM User Defined Applications Group .....	<a href="#">9</a>
<a href="#">3.2.3</a> The APM Report Group .....	<a href="#">9</a>
<a href="#">3.2.4</a> The APM Current Transaction Group .....	<a href="#">10</a>
<a href="#">3.2.5</a> The APM Exception Group .....	<a href="#">10</a>
<a href="#">3.2.6</a> The APM Notification Group .....	<a href="#">10</a>
<a href="#">4</a> Definitions .....	<a href="#">11</a>
<a href="#">5</a> Security Considerations .....	<a href="#">47</a>
<a href="#">6</a> References .....	<a href="#">48</a>
<a href="#">7</a> Intellectual Property .....	<a href="#">50</a>
<a href="#">8</a> Full Copyright Statement .....	<a href="#">50</a>