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## Definitions of Managed Objects for APPN TRAPS

### Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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### Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines objects for receiving notifications from network devices with APPN (Advanced Peer-to-Peer Network) and DLUR (Dependent LU Requester) capabilities. This memo identifies notifications for the APPN and DLUR architecture.

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## 1. Introduction

This document is a product of the SNA NAU Services MIB Working Group. It defines a MIB module for notifications for devices with Advanced Peer-to-Peer Networking (APPN) and Dependent LU Requester (DLUR) capabilities.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [13].

## 2. The SNMP Network Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in RFC 2271 [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 RFC 1902 [5], RFC 1903 [6] and RFC 1904 [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 2272 [11] and RFC 2274 [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 2273 [14] and the view-based access control mechanism described in RFC 2275 [15].

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 identifies the set of objects for reporting the status of devices with APPN and DLUR capabilities via notifications.

See the SNANAU APPN MIB [18] and SNANAU DLUR MIB [19] for the objects for monitoring the configuration and active characteristics of the devices with APPN and DLUR capabilities. Many objects contained in the notifications of this MIB are imported from the APPN and DLUR MIBs. Implementors of this MIB must also implement the APPN MIB. Implementations that support the appnTrapMibDlurConfGroup and the appnTrapMibDlurNotifGroup must also implement the DLUR MIB.

The SNANAU APPN MIB allows a management station to collect the network topology of an APPN network (the network nodes (NNs) in the network and all of transmission groups (TGs) between the network nodes) from an APPN device. It also allows the management station to collect the local topology (TGs to end stations, and locally defined ports and link stations) from an APPN device. While the SNANAU APPN MIB has an efficient way to poll the APPN device for updates to the network topology, using flow reduction sequence numbers (FRSNs) as a table index; it does not have a mechanism to poll the local topology tables (appnLocalTgTable, appnPortTable, and appnLsTable) for status changes.

This MIB provides a mechanism for an APPN device to send notifications to inform the management station of status changes to rows of these tables. Status changes include operational state changes, and for TGs also include control-point to control-point (CP-CP) session state changes. A notification is defined for each type of status change for each table.

The port and link operational state objects have intermediate states. Notifications are only sent for transition to active or inactive state.

Notifications are only sent for row creation if the state is active or operational. This is done to avoid sending a notification as the row is created with an inactive initial state, followed by another notification as the resource is activated.

Notifications are only sent for row deletion if the last state was active or operational. In most cases, a resource must be deactivated before it can be deleted, and the deactivation will cause a notification to be sent. There is no need for a second notification to be sent for the row deletion, except for the case where the deletion occurred without deactivation. In this case, the state of the object in the notification will indicate an inactive state, since a deleted resource can no longer be active.

The purpose of the `appnLocalTgCpCpStateChangeTrap` notification is to identify the loss or recovery of CP-CP sessions on a TG while the TG remains operational. Thus this notification is only sent if there is a change to an `appnLocalTgCpCpSession` object, but not a change to the `appnLocalTgOperational` object. This notification is never sent for the creation or deletion of a row in the `appnLocalTgTable`.

Each notification always contains an object which is a count of the number of times the status of a row in table has changed since the APPN node was last reinitialized. This enables a management station to detect that it has missed a notification, if it does not get the notifications in numerical sequence. If the notifications are not in sequence, the management station should retrieve the entire table to get the correct status for all rows.

Similarly, the SNANAU DLUR MIB provides a mechanism for retrieving the configuration and status of dependent LU server (DLUS) sessions on a device with DLUR capabilities. This MIB defines a notification for a DLUR-DLUS session state change of a row in the `dlurDlusTable`, in the manner described above. A notification is only sent for a session state transition to active or inactive. As with the above notifications, it is only sent on row creation if the initial state is active; and on row deletion is the last state was active, in which case the notification indicates that the state is now inactive.

The SNANAU APPN MIB also provides a mechanism for a management station to collect traffic statistics on intermediate sessions, primarily for accounting purposes. However, when the session is terminated, all statistics from the last poll until the session termination time are lost, since the row for that session is deleted from the `appnIsInTable`. This MIB defines a notification so that the session's final statistics can be sent to a management station. If the notification is not delivered, the final session statistics are lost. If this is a concern, polling of the `appnIsInTable` in the APPN

MIB should be increased to more likely reduce the time between the last poll and the session termination, thereby reducing the amount of data lost.

Highlights of the management functions supported by the APPN TRAP MIB module include the following:

- o A notification for an APPN local TG operational state change.
- o A notification for an APPN local TG CP-CP session state change.
- o A notification for an APPN port operational state change.
- o A notification for an APPN link station operational state change.
- o A notification for a DLUR-DLUS session state change.
- o A notification for reporting final APPN intermediate session statistics.

This MIB module does not support:

- o Objects to query the configuration or status of APPN nodes on demand.
- o Notifications for changes to local topology tables not related to status.

### 3.1. APPN TRAP MIB Structure

The APPN TRAP MIB module contains a group of notifications, and a group of supporting objects.

The group of notifications consists of the following notifications:

#### 1) appnIsrAccountingDataTrap

This notification is generated by an APPN device when an intermediate session is terminating, to report the final accounting statistics of the session.

#### 2) appnLocalTgOperStateChangeTrap

This notification identifies a change to the appnLocalTgOperational object in a row of the SNANAU APPN MIB appnLocalTgTable.

### 3) appnLocalTgCpCpStateChangeTrap

This notification identifies a change to the appnLocalTgCpCpSession object in a row of the SNANAU APPN MIB appnLocalTgTable.

### 4) appnPortOperStateChangeTrap

This notification identifies a change to the appnPortOperState object in a row of the SNANAU APPN MIB appnPortTable.

### 5) appnLsOperStateChangeTrap

This notification identifies a change to the appnLsOperState object in a row of the SNANAU APPN MIB appnLsTable.

### 6) dlurDlusStateChangeTrap

This notification identifies a change to the dlurDlusSessnStatus object in a row of the SNANAU DLUR MIB dlurDlusTable.

The group of supporting objects contains the appnTrapControl object, which controls whether the APPN device generates each type of notification. Note that generation of the appnIsrAccountingDataTrap is not controlled by this object; instead it is controlled by the appnIsInGlobalCtrAdminStatus object in the SNANAU APPN MIB.

Although APPN notification generation could be controlled solely by entries in the snmpNotificationMIB, RFC 2273 [9], the appnTrapControl object exists in this MIB so that implementations are not required to implement RFC 2273 to control generation of APPN notifications. For a notification to be generated and sent as a TRAP or INFORM, the notification type must first be enabled by the appnTrapControl object. It must also not be disabled by an snmpNotificationMIB entry. The destination of notifications is not within the scope of this MIB.

Also contained in this group are objects for the TG, port, link, and DLUR-DLUS session notifications to indicate the number of times each of the tables has had a status change of a row since the APPN node was last reinitialized.

## 4. Definitions

APPN-TRAP-MIB DEFINITIONS ::= BEGIN

IMPORTS

Counter32, OBJECT-TYPE, MODULE-IDENTITY,

NOTIFICATION-TYPE  
FROM SNMPv2-SMI

MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP  
FROM SNMPv2-CONF

appnMIB, appnIsInP2SFmdPius, appnIsInS2PFmdPius,  
appnIsInP2SNonFmdPius, appnIsInS2PNonFmdPius,  
appnIsInP2SFmdBytes, appnIsInS2PFmdBytes,  
appnIsInP2SNonFmdBytes, appnIsInS2PNonFmdBytes,  
appnIsInSessUpTime, appnObjects,  
appnLocalTgOperational, appnLocalTgCpCpSession,  
appnPortOperState, appnLsOperState,  
appnCompliances, appnGroups  
FROM APPN-MIB

dlurDlusSessnStatus  
FROM APPN-DLUR-MIB;

appnTrapMIB MODULE-IDENTITY  
LAST-UPDATED "9808310000Z" -- August 31, 1998  
ORGANIZATION "IETF SNA NAU MIB WG / AIW APPN MIBs SIG"  
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#### DESCRIPTION

"This MIB module defines notifications to be generated by network devices with APPN capabilities. It presupposes support for the APPN MIB. It also presupposes support for the DLUR MIB for implementations that support the DLUR-related groups."

```

 ::= { appnMIB 0 }

-- *****
-- Notifications
-- *****

appnIsrAccountingDataTrap NOTIFICATION-TYPE
    OBJECTS {
        appnIsInP2SFmdPius,
        appnIsInS2PFmdPius,
        appnIsInP2SNonFmdPius,
        appnIsInS2PNonFmdPius,
        appnIsInP2SFmdBytes,
        appnIsInS2PFmdBytes,
        appnIsInP2SNonFmdBytes,
        appnIsInS2PNonFmdBytes,
        appnIsInSessUpTime
    }
    STATUS current
    DESCRIPTION
        "When it has been enabled, this notification is generated by an
        APPN node whenever an ISR session passing through the node is
        taken down, regardless of whether the session went down
        normally or abnormally. Its purpose is to allow a management
        application (primarily an accounting application) that is
        monitoring the ISR counts to receive the final values of these
        counts, so that the application can properly account for the
        amounts the counts were incremented since the last time the
        application polled them. The appnIsInSessUpTime object
        provides the total amount of time that the session was active.

        This notification is not a substitute for polling the ISR
        counts. In particular, the count values reported in this
        notification cannot be assumed to be the complete totals for
        the life of the session, since they may have wrapped while the
        session was up.

        The session to which the objects in this notification apply is
        identified by the fully qualified CP name and PCID that make up
        the table index. An instance of this notification will contain
        exactly one instance of each of its objects, and these objects
        will all belong to the same conceptual row of the
        appnIsInTable.

        Generation of this notification is controlled by the same
        object in the APPN MIB, appnIsInGlobeCtrAdminStatus, that
        controls whether the count objects themselves are being
        incremented."

```



```
::= { appnTrapMIB 1 }
```

```
appnLocalTgOperStateChangeTrap NOTIFICATION-TYPE
```

```
OBJECTS {
    appnLocalTgTableChanges,
    appnLocalTgOperational
}
```

```
STATUS current
```

```
DESCRIPTION
```

"When it has been enabled, this notification makes it possible for an APPN topology application to get asynchronous notifications of local TG operational state changes, and thus to reduce the frequency with which it polls for these changes.

This notification is sent whenever there is a change to the appnLocalTgOperational object in a row of the appnLocalTgTable. This notification is only sent for row creation if the row is created with a value of 'true' for appnLocalTgOperational. This notification is only sent for row deletion if the last value of appnLocalTgOperational was 'true'. In this case, the value of appnLocalTgOperational in the notification shall be 'false', since the deletion of a row indicates that the TG is no longer operational.

The notification is more than a simple 'poll me now' indication. It carries both a count of local TG topology changes, and the current operational state itself. The count of changes allows an application to detect lost notifications, either when polling or upon receiving a subsequent notification, at which point it knows it must retrieve the entire appnLocalTgTable again. This is the same count as used in the appnLocalCpCpStateChangeTrap

A lost notification could indicate a local TG CP-CP session state change or an operational state change.

Generation of this notification is controlled by the appnTrapControl object."

```
::= { appnTrapMIB 2 }
```

```
appnLocalTgCpCpChangeTrap NOTIFICATION-TYPE
```

```
OBJECTS {
    appnLocalTgTableChanges,
    appnLocalTgCpCpSession
}
```

```
STATUS current
```

```
DESCRIPTION
```

"When it has been enabled, this notification makes it possible

for an APPN topology application to get asynchronous notifications of local TG control-point to control-point (CP-CP) session state changes, and thus to reduce the frequency with which it polls for these changes.

This notification is sent whenever there is a change to the appnLocalTgCpCpSession object but NOT the appnLocalTgOperational object in a row of the appnLocalTgTable. This notification is never sent for appnLocalTgTable row creation or deletion.

The notification is more than a simple 'poll me now' indication. It carries both a count of local TG topology changes, and the current CP-CP session state itself. The count of changes allows an application to detect lost notifications, either when polling or upon receiving a subsequent notification, at which point it knows it must retrieve the entire appnLocalTgTable again. This is the same count as used in the appnLocalTgOperStateChangeTrap. A lost notification could indicate a local TG CP-CP session state change or an operational state change.

Generation of this notification is controlled by the appnTrapControl object."

```
::= { appnTrapMIB 3 }
```

appnPortOperStateChangeTrap NOTIFICATION-TYPE

```
OBJECTS {
    appnPortTableChanges,
    appnPortOperState
}
```

STATUS current

DESCRIPTION

"When it has been enabled, this notification makes it possible for an APPN topology application to get asynchronous notifications of port operational state changes, and thus to reduce the frequency with which it polls for these changes. This notification is only sent when a appnPortOperState has transitioned to a value of 'active' or 'inactive'.

This notification is sent whenever there is a appnPortOperState object transition to 'inactive' or 'active' state in the appnPortTable. This notification is only sent for row creation if the row is created with a value of 'active' for appnPortOperState. This notification is only sent for row deletion if the last value of appnPortOperState was 'active'. In this case, the value of appnPortOperState

in the notification shall be 'inactive', since the deletion of a row indicates that the port is no longer active.

The notification is more than a simple 'poll me now' indication. It carries both a count of port table changes, and the operational state itself. The count of changes allows an application to detect lost notifications, either when polling or upon receiving a subsequent notification, at which point it knows it must retrieve the entire appnPortTable again.

Generation of this notification is controlled by the appnTrapControl object."

```
::= { appnTrapMIB 4 }
```

appnLsOperStateChangeTrap NOTIFICATION-TYPE

```
OBJECTS {
    appnLsTableChanges,
    appnLsOperState
}
```

STATUS current

DESCRIPTION

"When it has been enabled, this notification makes it possible for an APPN topology application to get asynchronous notifications of link station operational state changes, and thus to reduce the frequency with which it polls for these changes. This notification is only sent when a appnLsOperState has transitioned to a value of 'active' or 'inactive'.

This notification is sent whenever there is a appnLsOperState object transition to 'inactive' or 'active' state in the appnLsTable. This notification is only sent for row creation if the row is created with a value of 'active' for appnLsOperState. This notification is only sent for row deletion if the last value of appnLsOperState was 'active'. In this case, the value of appnLsOperState in the notification shall be 'inactive', since the deletion of a row indicates that the link station is no longer active.

The notification is more than a simple 'poll me now' indication. It carries both a count of link station table changes, and the operational state itself. The count of changes allows an application to detect lost notifications, either when polling or upon receiving a subsequent notification, at which point it knows it must retrieve the entire appnLsTable again.

Generation of this notification is controlled by the appnTrapControl object."

```
::= { appnTrapMIB 5 }
```

```
dlurDlusStateChangeTrap NOTIFICATION-TYPE
```

```
OBJECTS {
    dlurDlusTableChanges,
    dlurDlusSessnStatus
}
```

```
STATUS current
```

```
DESCRIPTION
```

"When it has been enabled, this notification makes it possible for an APPN topology application to get asynchronous notifications of DLUR-DLUS session changes, and thus to reduce the frequency with which it polls for these changes.

This notification is sent whenever there is a dlurDlusSessnStatus object transition to 'inactive' or 'active' state in the dlurDlusTable. This notification is only sent for row creation if the row is created with a value of 'active' for dlurDlusSessnStatus. This notification is only sent for row deletion if the last value of dlurDlusSessnStatus was 'active'. In this case, the value of dlurDlusSessnStatus in the notification shall be 'inactive', since the deletion of a row indicates that the session is no longer active.

The notification is more than a simple 'poll me now' indication. It carries both a count of DLUR-DLUS table changes, and the session status itself. The count of changes allows an application to detect lost notifications, either when polling or upon receiving a subsequent notification, at which point it knows it must retrieve the entire dlurDlusTable again.

Generation of this notification is controlled by the appnTrapControl object."

```
::= { appnTrapMIB 6 }
```

```
-- *****
-- Supporting Objects
-- *****
```

```
appnTrapObjects          OBJECT IDENTIFIER ::= { appnObjects 7 }
```

```
appnTrapControl OBJECT-TYPE
```

```
SYNTAX BITS {
    appnLocalTgOperStateChangeTrap(0),
    appnLocalTgCpCpChangeTrap(1),
    appnPortOperStateChangeTrap(2),
```

```
        appnLsOperStateChangeTrap(3),
        dlurDlusStateChangeTrap(4)
        -- add other notification types here
    }
MAX-ACCESS read-write
STATUS current
DESCRIPTION
    "An object to turn APPN notification generation on and off.
    Setting a notification type's bit to 1 enables generation of
    notifications of that type, subject to further filtering
    resulting from entries in the snmpNotificationMIB. Setting
    this bit to 0 disables generation of notifications of that
    type.

    Note that generation of the appnIsrAccountingDataTrap is
    controlled by the appnIsInGlobeCtrAdminStatus object in
    the APPN MIB:  if counts of intermediate session traffic
    are being kept at all, then the notification is also enabled."

 ::= { appnTrapObjects 1 }

appnLocalTgTableChanges OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "A count of the number of times a row in the appnLocalTgTable
        has changed status since the APPN node was last reinitialized.
        This counter is incremented whenever a condition is detected
        that would cause a appnLocalTgOperStateChangeTrap or
        appnLocalTgCpCpChangeTrap notification to be sent, whether
        or not those notifications are enabled."

 ::= { appnTrapObjects 2 }

appnPortTableChanges OBJECT-TYPE
    SYNTAX Counter32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "A count of the number of times a row in the appnPortTable
        has changed status since the APPN node was last reinitialized.
        This counter is incremented whenever a condition is detected
        that would cause a appnPortOperStateChangeTrap notification
        to be sent, whether or not this notification is enabled."

 ::= { appnTrapObjects 3 }
```

## appnLsTableChanges OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of times a row in the appnLsTable has changed status since the APPN node was last reinitialized. This counter is incremented whenever a condition is detected that would cause a appnLsOperStateChangeTrap notification to be sent, whether or not this notification is enabled."

```
::= { appnTrapObjects 4 }
```

## dlurDlusTableChanges OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the number of times a row in the dlurDlusTable has changed status since the APPN node was last reinitialized. This counter is incremented whenever a condition is detected that would cause a dlurDlusStateChangeTrap notification to be sent, whether or not this notification is enabled."

```
::= { appnTrapObjects 5 }
```

```
-- *****
```

```
-- Conformance information
```

```
-- *****
```

```
-- Tie into the conformance structure in the APPN MIB:
```

```
-- appnConformance          OBJECT IDENTIFIER ::= {appnMIB 3 }
```

```
--
```

```
-- appnCompliances          OBJECT IDENTIFIER ::= {appnConformance 1 }
```

```
-- appnGroups               OBJECT IDENTIFIER ::= {appnConformance 2 }
```

```
-- Compliance statement
```

```
appnTrapMibCompliance MODULE-COMPLIANCE
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "The compliance statement for the SNMP entities that
        implement the APPN-TRAP-MIB."
```

```
    MODULE -- this module
```

```
--      Conditionally mandatory groups
```

```
        GROUP appnTrapMibIsrNotifGroup
```

```
        DESCRIPTION
```

"This group is mandatory for APPN nodes supporting reporting of final ISR counter values via notifications."

GROUP appnTrapMibTopoConfGroup

DESCRIPTION

"This group is mandatory for APPN nodes supporting polling reduction for local topology."

GROUP appnTrapMibTopoNotifGroup

DESCRIPTION

"This group is mandatory for APPN nodes supporting polling reduction for local topology."

GROUP appnTrapMibDlurConfGroup

DESCRIPTION

"This group is mandatory for APPN nodes supporting polling reduction for the dlurDlusTable."

GROUP appnTrapMibDlurNotifGroup

DESCRIPTION

"This group is mandatory for APPN nodes supporting polling reduction for the dlurDlusTable."

OBJECT appnTrapControl

MIN-ACCESS read-only

DESCRIPTION

"An agent is not required to support a set to this object."

::= { appnCompliances 2 }

-- Units of conformance

appnTrapMibIsrNotifGroup NOTIFICATION-GROUP

NOTIFICATIONS {  
    appnIsrAccountingDataTrap  
}

STATUS current

DESCRIPTION

"A notification for reporting the final values of the APPN MIB's ISR counters."

::= { appnGroups 21 }

appnTrapMibTopoConfGroup OBJECT-GROUP

OBJECTS {  
    appnTrapControl,  
    appnLocalTgTableChanges,  
    appnPortTableChanges,

```

        appnLsTableChanges
    }
    STATUS current
    DESCRIPTION
        "A collection of objects for reducing the polling
        associated with the local topology tables in the
        APPN MIB. Nodes that implement this group SHALL
        also implement the appnTrapMibTopoNotifGroup."

    ::= { appnGroups 22 }

appnTrapMibTopoNotifGroup    NOTIFICATION-GROUP
    NOTIFICATIONS {
        appnLocalTgOperStateChangeTrap,
        appnLocalTgCpCpChangeTrap,
        appnPortOperStateChangeTrap,
        appnLsOperStateChangeTrap
    }
    STATUS current
    DESCRIPTION
        "A collection of notifications for reducing the polling
        associated with the local topology tables in the
        APPN MIB. Nodes that implement this group SHALL
        also implement the appnTrapMibTopoConfGroup."

    ::= { appnGroups 23 }

appnTrapMibDlurConfGroup    OBJECT-GROUP
    OBJECTS {
        appnTrapControl,
        dlurDlusTableChanges
    }
    STATUS current
    DESCRIPTION
        "A collection of objects for reducing the polling
        associated with the dlurDlusTable in the DLUR
        MIB. Nodes that implement this group SHALL also
        implement the appnTrapMibDlurNotifGroup."

    ::= { appnGroups 24 }

appnTrapMibDlurNotifGroup    NOTIFICATION-GROUP
    NOTIFICATIONS {
        dlurDlusStateChangeTrap
    }
    STATUS current
    DESCRIPTION

```



"A notification for reducing the polling associated with the dlurDlusTable in the DLUR MIB. Nodes that implement this group SHALL also implement the appnTrapMibDlurConfGroup."

::= { appnGroups 25 }

END

## 5. Security Considerations

Certain management information defined in this MIB may be considered sensitive in some network environments. Therefore, authentication of received SNMP requests and controlled access to management information SHOULD be employed in such environments. An authentication protocol is defined in [12]. A protocol for access control is defined in [15].

None of the read-only objects in the APPN TRAP MIB reports a password, user data, or anything else that is particularly sensitive. Some enterprises view their network configuration itself, as well as information about network usage and performance, as corporate assets; such enterprises may wish to restrict SNMP access to most of the objects in the MIB.

There is one read-write object in the APPN TRAP MIB, appnTrapControl. This object controls the generation of the notifications defined in the APPN TRAP MIB.

## 6. Intellectual Property

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## 7. Acknowledgments

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