TDX - SNMP

Revision 01-01

Summary

Status

Approved by _____

Revision History

Rev	Date	Author	Description
00-01	2013-07-03	Erik Nielsen	Draft.
00-02	2013-10-09	Erik Nielsen	Draft
01-00	2013-11-06	Erik Nielsen	Release
01-01		Erik Nielsen	

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1. PREFACE

1.1 Purpose and Scope

The purpose of this document is to describe the new SNMP functionality on the TDX. The SNMP implementation follow the MIB module SNMPv2-MIB from Standards/RFCs.

The eCos software on the TDX do support some of the standard MIB. It do e.g. support the SNMP MIB-2 System (RFC 1213) that will be supported with Triax information.

The document is a draft version, and a live document, it will change when the requirements change etc.

The purpose with this document is to give an overview of the Triax MIB, so it is possible to make a plan and estimate for the further work.

The SNMP functionality described in this document is divided into two deliveries.

The individual functionality are marked with either Release 1 or Release 2. Release 1 is for the first delivery and Release 2 for the second delivery.

1.2 References

Ref	Reference
1	http://www.oidview.com/mibs/0/SNMPv2-MIB.html

1.3 Terms and Abbreviations

Term	Explanation
SNMP	Simple Network Management Protocol
SNMPv2	Simple Network Management Protocol version 2
MIB	Management Information Base
OID	Object Identifier
IETF	Internet Engineering Task Force
RFC	Request for Comments (IETF Standard)

1.4 Document Status

The document is in its drafted state.

2. MIB

Triax MIB is located at the below OID
iso.org.dod.internet.private.enterprises.triax
it is the same as
.1.3.6.1.4.1.41359

Where 41359 is the IANA number, that Triax is registered with. After this number Triax defines its own MIB's.

2.1 Triax MIB OID overview

Below is the overview of how Triax MIB OID is organized.

Triax MIB OID Tree				
iso.org.dod.internet.private.enterprises		triax	he	type
Triax	1.3.6.1.4.1	41359		
HeadEnd	1.3.6.1.4.1	41359	1	
EventTraps	1.3.6.1.4.1	41359	1	0
EventMIB	1.3.6.1.4.1	41359	1	2
TDH 800	1.3.6.1.4.1	41359	1	3
TDX	1.3.6.1.4.1	41359	1	4

For the TDX is defined the MIB below

Triax MIB OID Tree					
iso.org.dod.internet.private.enterprises		triax	he	type	MIB
tdxSystemMIB	1.3.6.1.4.1	41359	1	4	1
tdxServiceMIB	1.3.6.1.4.1	41359	1	4	2
tdxEquipmentMIB	1.3.6.1.4.1	41359	1	4	3
tdxRestartMIB	1.3.6.1.4.1	41359	1	4	4
tdxSingelPSUMIB	1.3.6.1.4.1	41359	1	4	5
tdxRedundantPSUMIB	1.3.6.1.4.1	41359	1	4	6

2.1.1 EventMIB

EventMIB is the extra information that is added to the Event Traps.

iso.org.dod.internet.private.enterprises		triax	he	type	Current EventTable	Current Event Entry	entry
managedObjectClass	1.3.6.1.4.1	41359	1	2	1	1	1
managedObjectInstance	1.3.6.1.4.1	41359	1	2	1	1	2
sequenceNumber	1.3.6.1.4.1	41359	1	2	1	1	3
perceivedSeverity	1.3.6.1.4.1	41359	1	2	1	1	4
eventTime	1.3.6.1.4.1	41359	1	2	1	1	5
eventType	1.3.6.1.4.1	41359	1	2	1	1	6
probableCause	1.3.6.1.4.1	41359	1	2	1	1	7

2.1.1.1 managedObjectClass

OID: 1.3.6.1.4.1.41359.1.2.1.1.1

Description:

The *Managed Object Class* specifies the type of object that has issued the event. It is coded as a textual string.The code representation of *Managed Object Class* is shown in Table the below.

Value	Representation
TDH 800	An TDH 800 equipment
TDX	An TDX equipment

2.1.1.2 managedObjectInstance

OID: 1.3.6.1.4.1.41359.1.2.1.1.2

Description:

The *Managed Object Instance* specifies the object of the Managed Object Class that has issued the event. Examples of *Managed Object Instances* are shown in the Table below.

Managed Object Instance	Example	Description
TDH 800	TDH800=IPADR,Source=UNIT0SC	Event generated by TDH 800 UNIT0=Master SC=SystemController FE=FrontEnd[1..N] BE=BackEnd[1..N]
TDX	“TDX=IPADR,Source=UNIT0FE6”	Event generated by TDX UNIT0=Master UNIT1=Subunit UNIT2=Subunit SC=SystemController FE=FrontEnd[1..N] BE=BackEnd[1..N] OUTPUT [A..B]

2.1.1.3 sequenceNumber (EventID)

OID: 1.3.6.1.4.1.41359.1.2.1.1.3

Description:

The *sequence number* is a number that uniquely identifies a specific event.

This is the unique id for an event. It is a combination of 2 distinct parts of information : the event type and the event number.

The first half represents the type and the second (most right) part the event number. This event number represents the bit position of an event in a bitmap of an active event entry.

Thus the value of event can be found using a simple formula: (EventType x 2^16) + AlarmNumber. E.g. an alarm with alarm type 5 and alarm number 3 is represented as 0x00050003.

The code representation of sequence number is shown in the table below.

Value	Representation
0	Sequence number is Unknowen
1	Lowest possible sequence number
4.294.967.295	Highest possible sequence number

2.1.1.4 perceivedSeverity

OID: 1.3.6.1.4.1.41359.1.2.1.1.4

Description:

The *Perceived Severity* of events is coded as an integer. The code representation of *Perceived Severity* is:

- indeterminate(1)
- info(2)
- warning(3)
- minor(4)
- major(5)
- critical(6)

2.1.1.5 eventTime

OID: 1.3.6.1.4.1.41359.1.2.1.1.5

Description:

Event Time indicates the exact time at which the event is issued. It is coded as an octet string according to the *DateAndTime* parameter in SNMPv2. The actual coding in the octet string is binary, which means that the octet string is not immediately printable.
In this protocol, the size of the *Event Time* string is eight octets. The code representation of *Event Time* is shown in Table below. By convention, if the value of the year is zero, it indicates that the *Event Time* is not available for the event.

Octet	Field	Range
1-2	Year	0 to 65536
3	Month	1 to 12
4	Day	1 to 31
5	Hour	0 to 23
6	Minutes	0 to 59
7	Seconds	0 to 59
8	Deci-seconds	0 to 9
9	Direction from UTC	'+'/'-'
10	Hours from UTC	0 to 13
11	Minutes from UTC	0 to 59

Note: If only the local time is known, then the time zone information (fields 9 to 11) is not present.

2.1.1.6 eventType

OID: 1.3.6.1.4.1.41359.1.2.1.1.6

Description:

Event Type groups events. It is coded as an integer. The code representation of *Event Type* is:

- GUI(1)
- other(2)
- equipment (3)
- environmental(4)

2.1.1.7 probableCause

OID: 1.3.6.1.4.1.41359.1.2.1.1.7

Description:

Probable Cause indicates (at a high level) a possible reason for the event being generated. It is coded as an integer.

There are several *Probable Cause* values; for example,

- *None(1)*
- *PowerOn(2)*
- *LossOffPower(3)*
- *Reset(4)*
- *Failure(5)*
- *systemWasResetFromGUI(6)*
- *WatchdogReset(7)*
- *SoftwareReset(8)*
- *AssertFailure(9)*
- *HWWatchdogTriggeredNoAssertsFound(10)*
- *SystemMainsWasRemoved(11)*
- *BackendRestarted(12)*
- *FrontendRestarted(13)*
- *InterlinkDisconnected(14)*
- *VideoDecodingError(15)*
- *CIDescramblingError(16)*
- *CICommunicationDown(17)*
- *InterlinkConnected(18)*
- *CIDescramblingOK(19)*
- *CICommunicationUp(20)*
- *VideoDecodingOK(21)*

2.1.2 Miscellaneous

The SNMP MIB-2 System (RFC 1213)[Ref 1] will be supported with Triax information, as it is showed below.

2.1.2.1 System Description

OID: 1.3.6.1.2.1.1.1
Description: A textual description of the entity.
Access: Read
Type: String
Example: “Triax TDX”
Supported: Release 1

2.1.2.2 System Object ID

OID: 1.3.6.1.2.1.1.2
Description: The vendor's authoritative identification of the network management subsystem contained in the entity
Access: Read
Type: Object Identifier
Example: 1.3.6.1.4.1.41359.1.1.4
Supported: Release 1

2.1.2.3 System Uptime

OID: 1.3.6.1.2.1.1.3
Description: Getting the time since last restart.
Access: Read
Type: TimeTicks
Example: 460 days, 1:43:38.25
Supported: Release 1

2.1.2.4 System contact person

OID: 1.3.6.1.2.1.1.4
Description: The textual identification of the contact person for this managed node.
Access: Read
Type: String
Example:
Supported: Release 1

2.1.2.5 System name

OID: 1.3.6.1.2.1.1.5
Description: An administratively-assigned name for this managed node.
Access: Read
Type: String
Example: “TDX”
Supported: Release 1

2.1.2.6 System location

OID: 1.3.6.1.2.1.1.6
Description: The physical location of this node.
Access: Read
Type: String
Example: “”
Supported: Release 1

2.1.2.7 System service

OID: 1.3.6.1.2.1.1.7
Description: A value which indicates the set of services that this entity primarily offers.
Access: Read
Type: Integer
Example: 72
Supported: Release 1

2.1.2.8 System up time

OID: 1.3.6.1.2.1.1.8
Description: The value of sysUpTime at the time of the most recent change in state or value of any instance of sysORID..
Access: Read
Type: TimeStamp
Example: 0:00:00.00
Supported: Release 1

3. TRAPS

3.1 Trap MIB

3.1.1 Triax Trap MIB

		Triax	he	tdtype	entry
triaxPowerUpTrap	1.3.6.1.4.1	41359	1	0	1
triaxLoginTrap	1.3.6.1.4.1	41359	1	0	2
triaxLogoutTrap	1.3.6.1.4.1	41359	1	0	3
triaxTimeOutTrap	1.3.6.1.4.1	41359	1	0	4
triaxFailedLoginTrap	1.3.6.1.4.1	41359	1	0	5
triaxRestartTrap	1.3.6.1.4.1	41359	1	0	6
triaxInputErrorTrap	1.3.6.1.4.1	41359	1	0	7
triaxCIInsertionTrap	1.3.6.1.4.1	41359	1	0	8
triaxCIRemovalTrap	1.3.6.1.4.1	41359	1	0	9
triaxModuleInsertionTrap	1.3.6.1.4.1	41359	1	0	10
triaxModuleRemovalTrap	1.3.6.1.4.1	41359	1	0	11
triaxCIDescramblingErrorTrap	1.3.6.1.4.1	41359	1	0	12
triaxCICommunicationDownTrap	1.3.6.1.4.1	41359	1	0	13
triaxVideoDecodingErrorTrap	1.3.6.1.4.1	41359	1	0	14
triaxInterlinkDisconnectTrap	1.3.6.1.4.1	41359	1	0	15
triaxConfigurationChangeAppliedTrap	1.3.6.1.4.1	41359	1	0	16
triaxInputOKTrapl	1.3.6.1.4.1	41359	1	0	17
triaxCIDescramblingOKTrap	1.3.6.1.4.1	41359	1	0	18
triaxCICommunicationUpTrap	1.3.6.1.4.1	41359	1	0	19
triaxVideoDecodingOKTrap	1.3.6.1.4.1	41359	1	0	20
triaxInterlinkConnectTrap	1.3.6.1.4.1	41359	1	0	21

3.1.1.1 triaxPowerUpTrap

OID: 1.3.6.1.4.1.41359.1.0.1
Description: This Trap is generated when the TDX is powered up
Supported: Release 1

3.1.1.2 triaxLoginTrap

OID: 1.3.6.1.4.1.41359.1.0.2
Description: This Trap is generated when the web configurator is logged on
Supported: Release 1

3.1.1.3 triaxLogoutTrap

OID: 1.3.6.1.4.1.41359.1.0.3
Description: This Trap is generated when the web configurator is logged out.
Supported: Release 1

3.1.1.4 triaxTimeOutTrap

OID: 1.3.6.1.4.1.41359.1.0.4
Description: This Trap is generated when the web configurator login is timed out.
Supported: Release 1

3.1.1.5 triaxFailedLoginTrap

OID: 1.3.6.1.4.1.41359.1.0.5
Description: This Trap is generated when the web configurator login is failed.
Supported: Release 1

3.1.1.6 triaxRestartTrap

OID: 1.3.6.1.4.1.41359.1.0.6
Description: This Trap is generated when the TDX restart the system controller, front end or a backend.
Supported: Release 1

3.1.1.7 triaxInputErrorTrap

OID: 1.3.6.1.4.1.41359.1.0.7
Description: This Trap is generated when an input module has error. E.g Front End loses lock, missing module, etc.
Supported: Release 1

3.1.1.8 triaxCIInsertionTrap

OID: 1.3.6.1.4.1.41359.1.0.8
Description: This Trap is generated when an CI module is inserted in TDX.
Supported: Release 1

3.1.1.9 triaxCIRemovalTrap

OID: 1.3.6.1.4.1.41359.1.0.9
Description: This Trap is generated when an CI module is removed in TDX.
Supported: Release 1

3.1.1.10 triaxModuleInsertionTrap

OID: 1.3.6.1.4.1.41359.1.0.10
Description: This Trap is generated when an input or output module is inserted.
Supported: Release 1

3.1.1.11 triaxModuleRemovalTrap

OID: 1.3.6.1.4.1.41359.1.0.11
Description: This Trap is generated when an input or output module is removed.
Supported: Release 1

3.1.1.12 triaxCIDescramblingErrorTrap

OID: 1.3.6.1.4.1.41359.1.0.12
Description: This Trap is generated when a service descrambling has an error.
Supported: Release 1

3.1.1.13 triaxCICommunicationDownTrap

OID: 1.3.6.1.4.1.41359.1.0.13
Description: This Trap is generated when communication with CI module fails.
Supported: Release 1

3.1.1.14 triaxVideoDecodingErrorTrap

OID: 1.3.6.1.4.1.41359.1.0.14
Description: This Trap is generated when a video decoding of a service in PAL Back End fails.
Supported: Release 1

3.1.1.15 triaxInterlinkDisconnectTrap

OID: 1.3.6.1.4.1.41359.1.0.15
Description: This Trap is generated when master unit loses connection to a subunit.
Supported: Release 1

3.1.1.16 triaxConfigurationChangeAppliedTrap

OID: 1.3.6.1.4.1.41359.1.0.16
Description: This Trap is generated when the user applies changes in the web configurator.
Supported: Release 1

3.1.1.17 triaxInputOKTrap

OID: 1.3.6.1.4.1.41359.1.0.17
Description: This Trap is generated when an input module errors disappears. E.g errors there can disappear are Front End loses lock, missing module, e.t.c..
Supported: Release 1

3.1.1.18 triaxCIDescramblingOKTrap

OID: 1.3.6.1.4.1.41359.1.0.18
Description: This Trap is generated when a service descrambling error disappears.
Supported: Release 1

3.1.1.19 triaxCICommunicationUPTrap

OID: 1.3.6.1.4.1.41359.1.0.19
Description: This Trap is generated when communication with the CI module do not fail any more.
Supported: Release 1

3.1.1.20 triaxVideoDecodingOKTrap

OID: 1.3.6.1.4.1.41359.1.0.20
Description: This Trap is generated when a video decoding of a service in PAL Back End do not fail any more.
Supported: Release 1

3.1.1.21 triaxInterlinkConnectTrap

OID: 1.3.6.1.4.1.41359.1.0.21
Description: This Trap is generated when master unit connect to a subunit.
Supported: Release 1

3.2 Trap Format

Below is showed how an event Trap look.

```
processed=false,
pdu=[TRAP[requestID=612620706,
errorStatus=Success(0),
errorIndex=0,
VBS[
1.3.6.1.2.1.1.3.0 = 152 days, 19:46:04.94;
1.3.6.1.6.3.1.1.4.1.0 = 1.3.6.1.4.1.41359.1.1.2.1.1;
1.3.6.1.4.1.41359.1.1.2.1.1.1.0 = TDX;
1.3.6.1.4.1.41359.1.1.2.1.1.2.0 = TDX=192.168.0.102,Source=MAINSC;
1.3.6.1.4.1.41359.1.1.2.1.1.3.0 = 49;
1.3.6.1.4.1.41359.1.1.2.1.1.4.0 = 4;
1.3.6.1.4.1.41359.1.1.2.1.1.5.0 = 07:db:0b:04:08:30:0c:2a:2b:00:00;
1.3.6.1.4.1.41359.1.1.2.1.1.6.0 = 2;
1.3.6.1.4.1.41359.1.1.2.1.1.7.0 = 1;
]
```

4. APPENDEX

4.1 Triax MIB definition

4.1.1 TRIAX EVENT MIB

The file appended to the document below is the triax Event MIB

TRIAX-EVENT-MIB

The MIB file shall be opened with notepad or a similar text editor. TRIAX-EVENT_MIB contains only plain text.