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Re:	Contribution on IEEE 802.16f/D5	
Abstract	This contribution proposed a method to upgrade the software of BS from network management center through adding Software management entry MIB. Add this feature can greatly save operators' CAPEX and OPEX.	
Purpose	Adoption	
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Proposal for BS Software Management

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Introduction

Software upgrading is frequently used procedures for operators during maintenance work. And it's very common improper upgrading will easily cause the system working abnormal. As most of the upgrading is made by human being and consequently it requires professional engineers to do the upgrading work. Nonstandard upgrading operations increased the maintenance expenses and also increased the risk of operator mistakes.

Actually software upgrading procedures will only contain two steps. One is downloading the new software version to devices, another is activating the corresponding software version. It's a very easy and common way for operator to understand and follow. These two steps are steps shown to operators. The complex internal processing should be encapsulated for vendor specific implementation.

Also the download and activate progress are also very important information for operators to know what's going on during the upgrading.

Software Management feature for BS becomes more and more important when network expanding. It's very useful and convenient for the remote operation from network management center. Not need to go site by site to perform the upgrading operation, especially when the BS sites are scattered located. It will save CAPEX and OPEX for operators. Also, based on this feature, from the network management system, bulk upgrading can be made and greatly shorten the upgrading time during the whole system upgrading procedures.

This contribution proposes to add Software management MIB definition in the current 802.16f MIB, the new added MIB entry can be used for software management entry to upgrade BS from network manager locally or remotely.

Proposed Text Changes

1. [Change the text in section 13. 2 wmanDevMib as the following]

1.1 Add Node wmanDevBsSoftwareManagement in Figure 15—wmanDevMib Structure, keep the previous structure definition intact.

wmanDevMib (1.0.8802.16.1)

1.2 Add new section 13.2.1.2 wmanDevBsSoftwareManagement:

13.2.1.2 wmanDevBsSoftwareManagement
Figure 17 shows the structure of wmanDevBsSoftwareManagement subtree that contains BS managed objects related to software management.

wmanDevBsSoftwareManagement (1.0.8802.16.1.1.2)
Figure 17 wmanDevBsSoftwareManagement Structure

13.2.1.2.1 wmanDevBsSWVersionTable

This table contains BS software version information. Each entry of the table contains BS vendor id , BS software versions and activation indication. And only one activation indication can be true.

13.2.1.2.2 wmanDevBsDownloadTable

This table contains BS software version information. Each entry of the table contains BS vendor id , BS software versions and activation indication. And only one activation indication can be true.

13.2.1.2.3 wmanDevBsHWVersionTable

This table contains BS hardware version information. Each entry of the table contains hardware description and corresponding hardware version information.

13.2.1.2.4 wmanDevBsDownloadTable

This table contains BS software download information.

13.2.1.2.5 wmanDevBsActivateTable

This table contains BS software activation information.

ASN.1 Definitions:

wmanDevBsSoftwareManagement OBJECT IDENTIFIER ::= { wmanDevBsObjects 2 }

wmanDevBsSwmFtpConfigTable OBJECT IDENTIFIER ::= { wmanDevBsSoftwareManagement 2 }

wmanDevBsSWVersionTable OBJECT-TYPE

SYNTAX SEQUENCE OF WmanDevBsSWVersionEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains BS software version information. Each entry of the table contains BS vendor id , BS software versions and activation indication. And only one activation indication can be true."

::= { wmanDevBsSoftwareManagement 3 }

wmanDevBsHWVersionTable OBJECT-TYPE

SYNTAX SEQUENCE OF WmanDevBsHWVersionEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains BS hardware version information. Each entry of the table contains BS vendor id , BS software versions and activation indication."

::= { wmanDevBsSoftwareManagement 4 }

wmanDevBsDownloadTable OBJECT IDENTIFIER ::= { wmanDevBsSoftwareManagement 5 }

wmanDevBsActivateTable OBJECT IDENTIFIER ::= { wmanDevBsSoftwareManagement 6 }

wmanDevBsSwmFtpServer OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Server IP address contains the BS software."

::= { wmanDevBsSwmFtpConfigTable 1 }

wmanDevBsSwmFtpUserName OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"FTP User name information."

::= { wmanDevBsSwmFtpConfigTable 2 }

wmanDevBsSwmFtpPassword OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"FTP password corresponding to the wmanDevBsSwmFtpUserName."

::= { wmanDevBsSwmFtpConfigTable 3 }

wmanDevBsSwmFileName OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Software file information which includes directory information."

::= { wmanDevBsSwmFtpConfigTable 4 }

wmanDevBsSWVersionEntry OBJECT-TYPE

SYNTAX WmanDevBsSWVersionEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table is indexed by wmanDevBsSWVersion."

INDEX { wmanDevBsSWVersion }

::= { wmanDevBsSWVersionTable 1 }

wmanDevBsVendorId OBJECT-TYPE**SYNTAX OCTET STRING****MAX-ACCESS read-only****STATUS current****DESCRIPTION**

"This value identifies the BS vendor to which the software upgrade is to be applied."

::= { wmanDevBsSWVersionEntry 1 }

wmanDevBsSWVersion OBJECT-TYPE**SYNTAX OCTET STRING****MAX-ACCESS read-only****STATUS current****DESCRIPTION**

"This value identifies the BS software version."

::= { wmanDevBsSWVersionEntry 2 }

wmanDevBsSWVersionIndication OBJECT-TYPE**SYNTAX OCTET STRING****MAX-ACCESS read-only****STATUS current****DESCRIPTION**

"This value identifies the activation status of BS software versions."

::= { wmanDevBsSWVersionEntry 3 }

wmanDevBsHWVersionEntry OBJECT-TYPE**SYNTAX WmanDevBsHWVersionEntry****MAX-ACCESS not-accessible****STATUS current****DESCRIPTION**

"This table is indexed
by wmanDevBsHWVersion."

INDEX { wmanDevBsHWVersion }

::= { wmanDevBsHWVersionTable 1 }

wmanDevBsHWDescription OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This value identifies the BS hardware information."

::= { wmanDevBsHWVersionEntry 1 }

wmanDevBsHWVersion OBJECT-TYPE

SYNTAX OCTET STRING

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This value identifies the BS hardware version."

::= { wmanDevBsHWVersionEntry 2 }

wmanDevBsDownloadSW OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object is used to enable BS software download action."

::= { wmanDevBsDownloadTable 1 }

wmanDevBsDownloadSWProgress OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This value identifies the BS software download progress information. "

::= { wmanDevBsDownloadTable 2 }

wmanDevBsActivateSW OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object is used to enable BS software activation action."

::= { wmanDevBsActivateTable 1 }

wmanDevBsActivateSWProgress OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This value identifies the BS software activation progress information. "

::= { wmanDevBsActivateTable 2 }