Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Proposal for BS Software Management**
Date Submitted	**2005-07-12**
Source(s)	Zou Lan, Li Li Huawei Technologies. No.98,Lane91, Eshan Road, Pudong , Shanghai, China Pudong Lujiazui Software Park Joey Chou Intel 5000 W.Chandler Blvd., CH6-210 Chandler, AZ 85226	Voice: +86-21-68644808-24657 Fax: +86-21-50898375 Mailto: zlan@huawei.com Voice: (480)554-6672 Mailto: joey.chou@intel.com
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
Notice	This document has been prepared to assist IEEE 802.16. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.
Release	The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE's name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE's sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.
Patent Policy and Procedures	The contributor is familiar with the IEEE 802.16 Patent Policy and Procedures <http://ieee802.org/16/ipr/patents/policy.html>, including the statement "IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard." Early disclosure to the Working Group of patent information that might be relevant to the standard is essential to reduce the possibility for delays in the development process and increase the likelihood that the draft publication will be approved for publication. Please notify the Chair <mailto:chair@wirelessman.org> as early as possible, in written or electronic form, if patented technology (or technology under patent application) might be incorporated into a draft standard being developed within the IEEE 802.16 Working Group. The Chair will disclose this notification via the IEEE 802.16 web site <http://ieee802.org/16/ipr/patents/notices>.

Proposal for BS Software Management

Zou Lan, Li Li

Huawei

Joey Chou

Intel

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 progress is also very important information for operators to know what's going on during the downloading procedure.

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 wmanDevBsSoftwareUpgradeTable 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 wmanDevBsSoftwareUpgradeTable:

13.2.1.2 wmanDevBsSoftwareUpgradeTable

wmanDevBsObjects

wmanDevBsSoftwareUpgradeTable contains objects associated with BS software upgrades..

wmanDevBsSoftwareUpgradeTable

wmanDevBsNotification

ASN.1 Definitions:

wmanDevBsSoftwareUpgradeTable **OBJECT-TYPE**

SYNTAX SEQUENCE OF wmanDevBsSoftwareUpgradeEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains objects associated with BS software upgrades."
::= { wmanDevBsObjects 1 }

wmanDevBsSoftwareUpgradeTableEntry **OBJECT-TYPE**

SYNTAX wmanDevBsSoftwareUpgradeTableEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table may have multiple entries, and is indexed
by wmanDevBsDeviceIndex. "
INDEX { wmanDevBsDeviceIndex }

::= { wmanDevBsSoftwareUpgradeTable 1 }

wmanDevBsSoftwareUpgradeEntry ::= **SEQUENCE** {

wmanDevBsDeviceIndex	INTEGER,
wmanDevBsVendorId	**OCTET STRING**,
wmanDevBsHwId	**OCTET STRING**,
wmanDevBsCurrentSwVersion	**OCTET STRING**,
wmanDevBsDownloadSwVersion	**OCTET STRING**,
wmanDevBsUpgradeFileName	**OCTET STRING**,
wmanDevBsDownloadSwTrigger	TruthValue,
wmanDevBsDownloadSWProgress	Integer32,
wmanDevBsActivateSwTrigger	TruthValue,
wmanDevBsSoftwareUpgradeTimeStamp	DateAndTime }

wmanDevBsDeviceIndex **OBJECT-TYPE**

SYNTAX INTEGER (1 .. 10)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An index identifies the BS sector in a multiple sector BS environment."
::= { wmanDevBsSoftwareUpgradeEntry 1 }

wmanDevBsVendorId **OBJECT-TYPE**

SYNTAX OCTET STRING (**SIZE** (2..256))

MAX-ACCESS read-only

STATUS current

3

DESCRIPTION

> "This value identifies the managed BS vendor to which the
> software upgrade is to be applied."
::= { wmanDevBsSoftwareUpgradeEntry 2 }

wmanDevBsHwId **OBJECT-TYPE**

SYNTAX OCTET STRING(**SIZE** (2..256))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

> "This value identifies the hardware version to which the
> software upgrade is to be applied."
::= { wmanDevBsSoftwareUpgradeEntry 3 }

wmanDevBsCurrentSwVersion **OBJECT-TYPE**

SYNTAX OCTET STRING(**SIZE** (2..256))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

> "This value identifies the version of software currently running in the BS.
> The value is administered by the vendor identified in the
> Vendor ID field. It should be defined by the vendor to be
> unique with respect to a given hardware ID. After the downloaded
> software being successfully activated , the BS shall copy
> wmanDevBsDownloadSwVersion into wmanDevBsCurrentSwVersion."
::= { wmanDevBsSoftwareUpgradeEntry 4 }

wmanDevBsDownloadSwVersion **OBJECT-TYPE**

SYNTAX OCTET STRING(**SIZE** (2..256))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

> "This value identifies the version of software to be downloaded. The value
> is administered by the vendor identified in the Vendor ID
> field. It should be defined by the vendor to be unique with
> respect to a given hardware ID. This value shall be initialized before
> wmanDevBsDownloadSwTrigger is set."
::= { wmanDevBsSoftwareUpgradeEntry 5 }

wmanDevBsUpgradeFileName **OBJECT-TYPE**

SYNTAX OCTET STRING(**SIZE** (2..256))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

>"The filename is a fully qualified directory path name, indicating where the software is located."

::= { wmanDevBsSoftwareUpgradeEntry 6 }

wmanDevBsDownloadSwTrigger **OBJECT-TYPE**

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

>"Setting this value to True causes the BS to initiate the software download from a server (e.g. software image server).Reading this object always returns FALSE.
>While the download procedure is vendor specific which will not be defined in this standard."

DEFVAL { false }

::= { wmanDevBsSoftwareUpgradeEntry 7 }

wmanDevBsDownloadSWProgress **OBJECT-TYPE**

SYNTAX Integer32 (0..100)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

>"This value indicates the progress of software download in percentage. For example, 50 means 50% of BS software has been downloaded."

::= { wmanDevBsSoftwareUpgradeEntry 8 }

wmanDevBsActivateSwTrigger **OBJECT-TYPE**

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

>"Setting this value to True will activate the newly downloaded BS software. After the BS software has been successfully activated, BS shall copy wmanDevBsDownloadSwVersion into wmanDevBsCurrentSwVersion. Reading this object always returns FALSE."

DEFVAL { false }

::= { wmanDevBsSoftwareUpgradeEntry 9 }

wmanDevBsSoftwareUpgradeTimeStamp **OBJECT-TYPE**

SYNTAX DateAndTime

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This time stamp indicates when the BS software was activated."

::= { wmanDevBsSoftwareUpgradeEntry 10 }