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भारत संचार निगम लिमिटेड
(भारत सरकार का उपक्रम)
BHARAT SANCHAR NIGAM LIMITED
(A Govt. of India Enterprise)

No. BSNL-CO/SP/2008-09/WiMAX Rural Ph-II

dated : 24.03.2011

To,

The WiMAX Nodal Officer
All Telecom Circle (except A&N and Kerala)
Bharat Sanchar Nigam Ltd.

**Subject : Detailed guidelines for BTS to OCLAN / RPR connectivity under WiMAX
Rural Ph-II project**

Some circles/ Vendors are facing problems in connecting "BTS to OCLAN/RPR" under WiMAX Rural Ph-II project. In this regards, the detailed guidelines & procedure for the connectivity under different scenarios is attached as **ANNEX-I**.

Circles are requested to provide connectivity materials like SFP, "STM1 CPE available with BSNL transmission wing" etc for early integration of these BTS.

P.K.Sharma
24/03/11

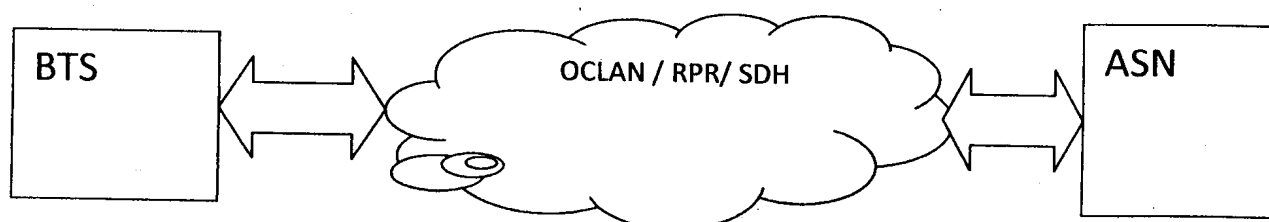
(P.K.Sharma)
AGM(WiMAX)

Copy to:

1. CGM, All Telecom Circle (except A&N and Kerala)
2. Ms/ Gemini / ZTE / ICOMM / VMC

Integration of Rural Ph-II Wimax BTS

Under Wimax Rural Ph-II PO, various vendors have supplied the BTS equipment which is to be connected to the respective ASNs thru various means, by triple play equipment like OCLAN, RPR and also by utilizing SDH network.



As most of the equipment is to be installed in rural sites, different scenarios emerges depending on the location of BTS and the nearest OCLAN location. They are:

Co-located site: Both BTS and OCLAN/RPR are located in the same floor/site where direct connection with a copper/OFC cable is possible.

Non co-located sites: When the BTS is far off from the nearest OCLAN/RPR port the connectivity is to be achieved either by extending E1s or by utilizing the SDH network. To meet this scenario E1 and STM converters alongwith the SFPs have been ordered on the Wimax ph-II vendors.

Utilizing the existing BSNL SDH Network: Apart from the above two scenarios, BTS can also be directly connected to ASN(LAN switch of ASN) by the traditional SDH network thus bypassing the OCLAN/RPR network. This solution resolves the difficulties faced with integration thru OCLAN/ RPR where the ports are either exhausted or ports are not compatible (SFPs etc.,)

Resources available in the BSNL Network:

OCLAN: Equipment supplied by vendors like ZTE and NSN has FE electrical & FE optical ports with SFPs of 850nm. GE ports are also available.

These SFPs of 850nm can be replaced with SFPs of 1310nm Single mode available with BSNL.

Hence the OCLAN can work in both 850nm&1310nm modes by inserting the correct SFP based on site requirement.

RPR Network: Equipment supplied by M/s.UTSTARCOM has FE ports with 850nm SFP along with GE ports. However, this equipment donot support 1310nm single mode SFPs.

Hence, to achieve BTS integration, the SFPs available with STM and E1 converters(ie., 1310nm) which are supplied by Wimax vendors(M/s.ICOMM,M/s.Gemini&M/s. VMCL) are to be replaced by 850nm SFPs.

Details of Equipment supplied by Wimax vendors: Details of the ordered equipment ie., BTS, STM and E1 converters, SFPs are given below:

Name of vendor	BTS interfaces	STM&E1 Converter interfaces
M/s.ZTE	FE Electrical	Towards BTS: FE Electrical Towards OCLAN/BSNL : FE optical 850nm but SFPs of 1310 are compatible
M/s.ICOMM	FE Electrical& GE Optical	Towards BTS: FE Electrical Towards OCLAN/BSNL: FE optical 1310nm but SFPs of 850nm are compatible
M/s. Gemini	FE Electrical	Towards BTS: FE Electrical Towards OCLAN/BSNL: FE optical 1310nm but SFPs of 850nm are compatible.
M/s.VMCL	FE Electrical	Towards BTS: FE Electrical Towards OCLAN/BSNL: FE optical 1310nm but SFPs of 850nm are compatible.

Difficulties faced by some circles so far: Some circles had difficulties in the integration thru OCLAN/RPR as the available ports on OCLAN/RPR are only 850nm multimode.

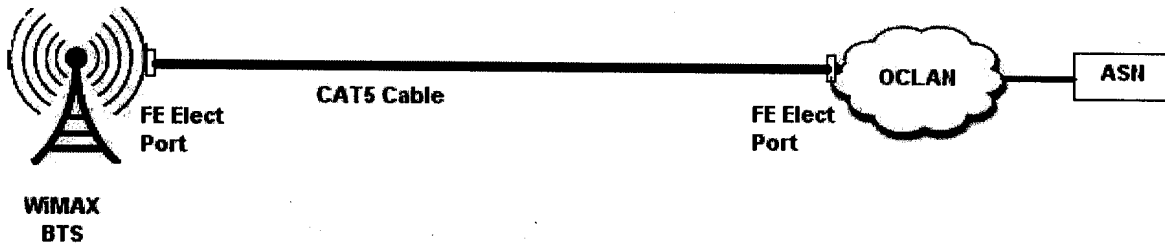
Solution: The STM& E1 converters supplied by wimax vendors are compatible to both optical 1310 and 850 nm SFPs and has a FE electrical output where the BTS can be connected. Hence, depending on the site specific scenario, the corresponding SFP needs to be plugged/replaced. Hence, even though sufficient number of SFPs are ordered on vendors, circles shall keep a Buffer stock of SFPs and make them available to Wimax vendors, if required.

However, circles shall explore other means also for providing connectivity as detailed below:

1. STM 1 CPE equipment available with BSNL
2. Spare DSLAM ports
3. GPON/FTTH equipment
4. Mini links(Microwave)

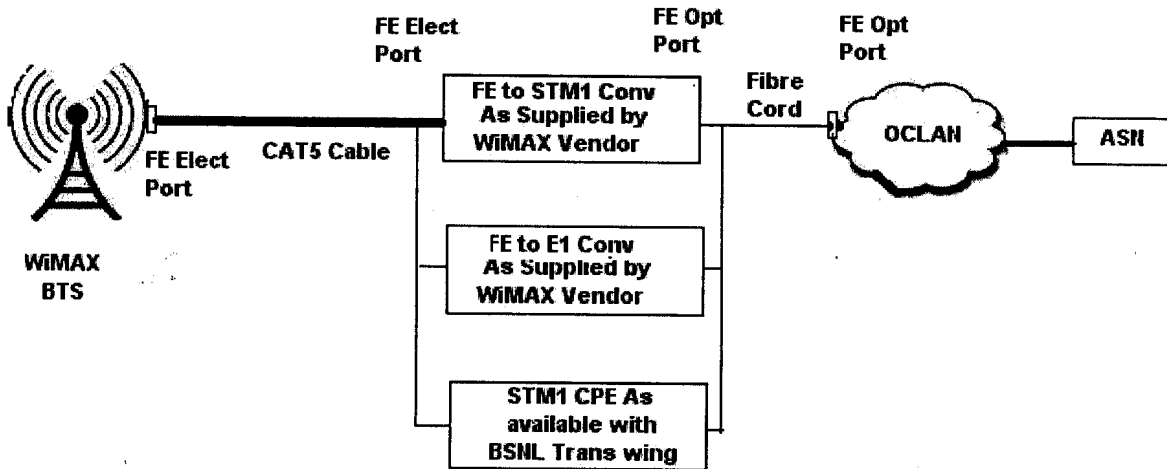
Case 1: BTS Co-located with OCLAN

Scenario "A" - OCLAN with FE Electrical Port



Scenario "B" - OCLAN with FE Optical (850/1310nm interchangeable) Port

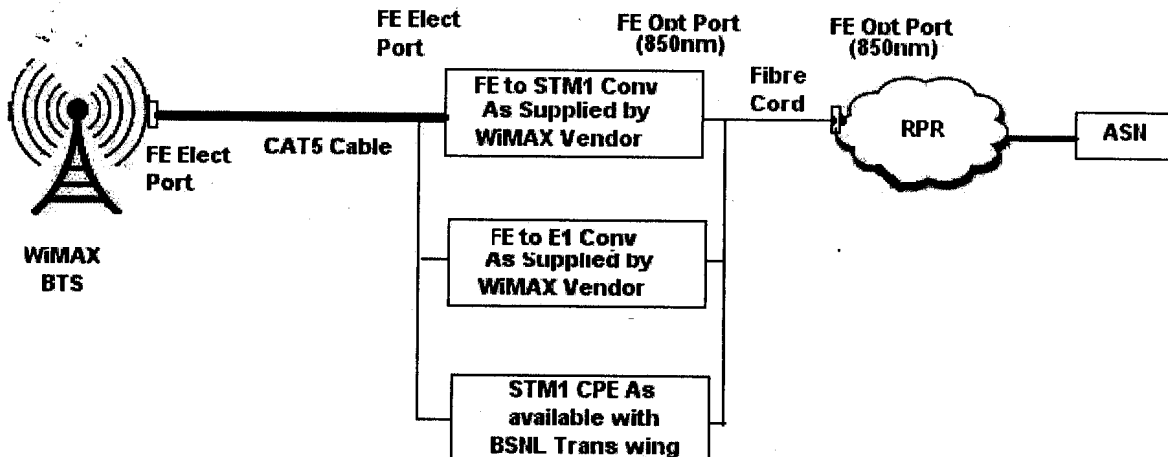
"FE to STM Converter" OR "FE to E1 Converter" OR "STM1 CPE available with BSNL transmission wing" may be utilized at OCLAN end & CAT5 cable can be plugged into BTS.



Note: SFP (850 nm) available at OCLAN end to be taken out & to be replace with SFP(1310nm). Thus, 850nm SFP becomes spare, which may be used in Scenario "C" as shown below.

Scenario "C" - RPR with FE Optical (850nm) Port

- "FE to STM Converter" OR "FE to E1 Converter" OR "STM1 CPE available with BSNL transmission wing" may be utilized at OCLAN end & CAT5 cable can be plugged into BTS.
- In RPR n/w, 1310nm SFP does not work. Hence 850nm SFP is to be inserted into STM Converter, E1 Converter or STM1 CPE by pulling out 1310nm SFP.

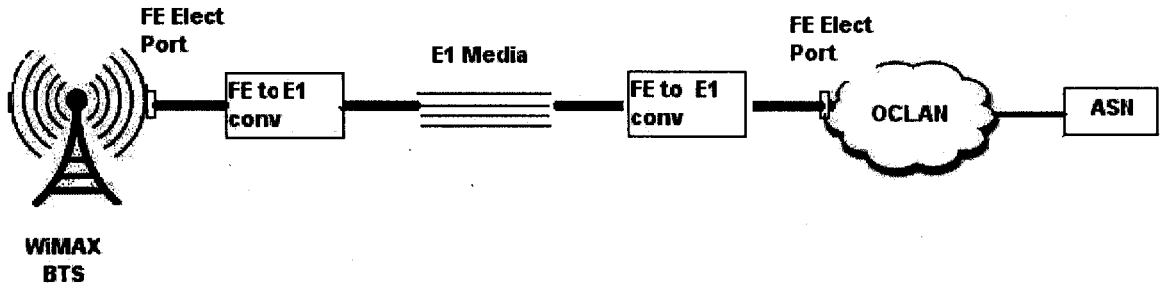


Note: In Case RPR connectivity is to be given only through GE port i.e. 1550nm, then the corresponding SFP of 1550nm(SM) is to be inserted in STM conv/E1 conv/ STM1 CPE by taking out 1310nm SFP.

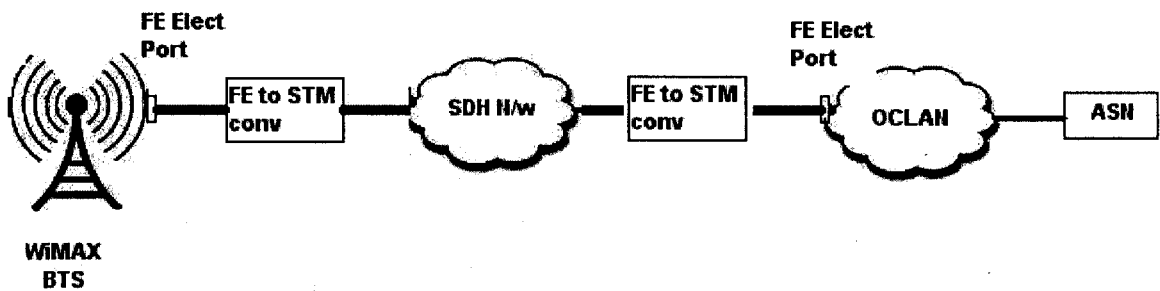
Case 2: BTS "Non Co-located" with OCLAN

Scenario "A" - OCLAN with FE Electrical Port

Sol 1: With E1 Media

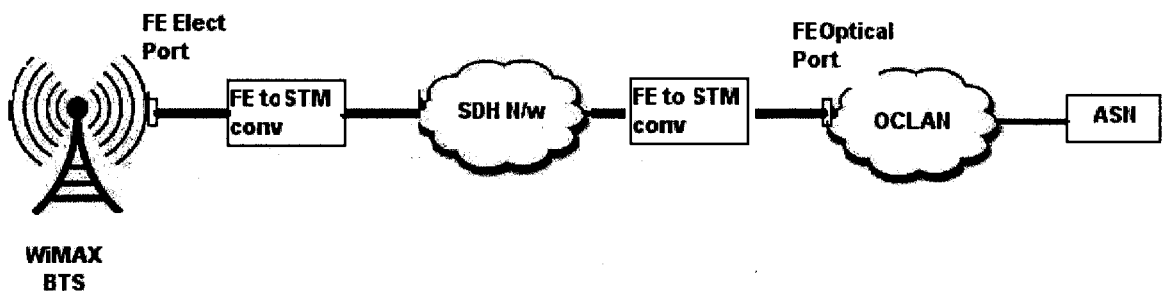


Sol 2: With SDH N/w

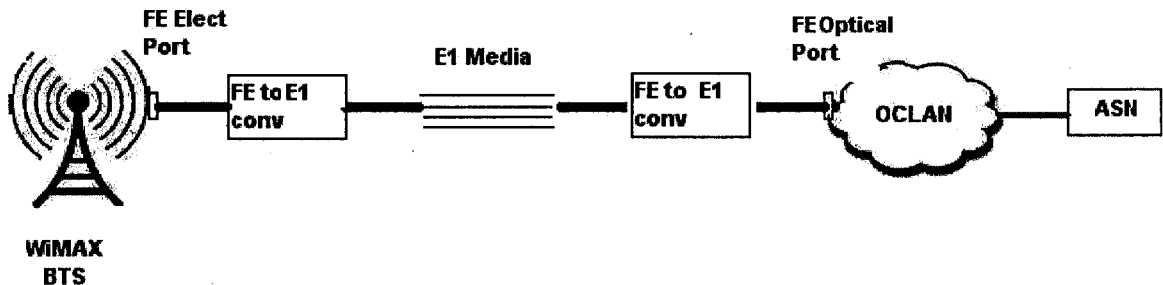


Scenario "B" - OCLAN with FE Optical (850/1310nm interchangeable) Port

Sol 1: With SDH N/w



Sol 2: With E1 Media

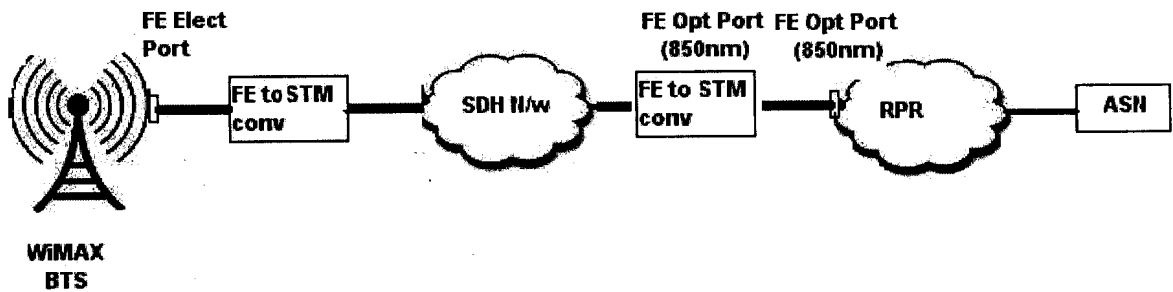


Note: SFP (850 nm) available at OCLAN end to be taken out & to be replace with SFP(1310nm). Thus, 850nm SFP becomes spare, which may be used in Scenario "C" as shown below.

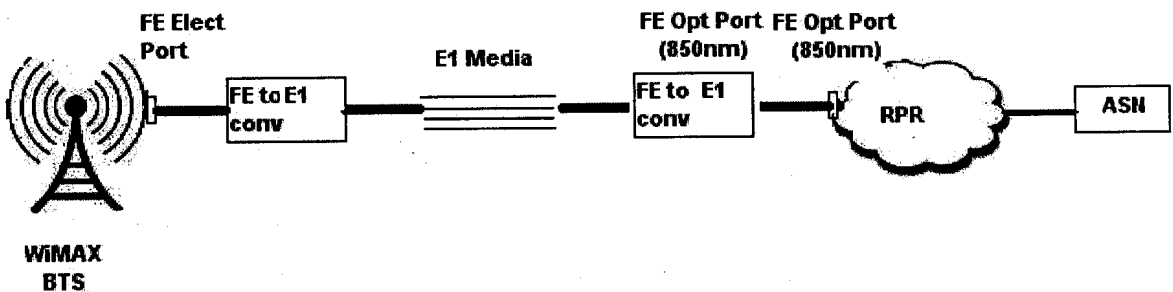
Scenario "C" – RPR with FE Optical (850nm) Port

- In RPR n/w, 1310nm SFP does not work. Hence 850nm SFP is to be inserted into E1 Converter by pulling out 1310nm SFP.

Sol 1: With SDH N/w



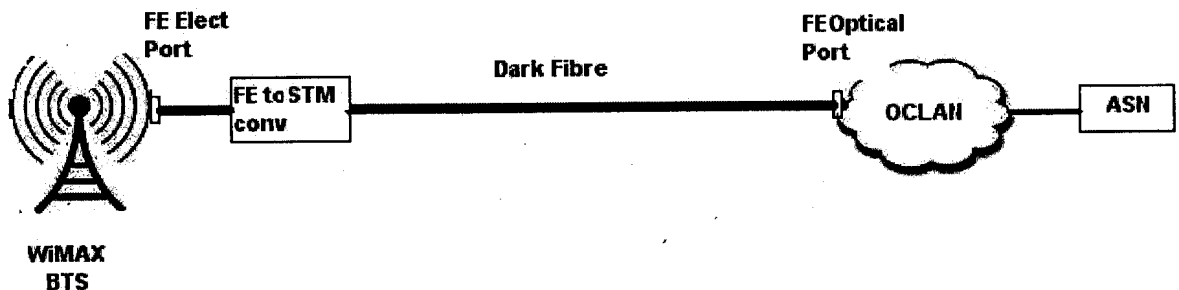
Sol 2: With E1 Media



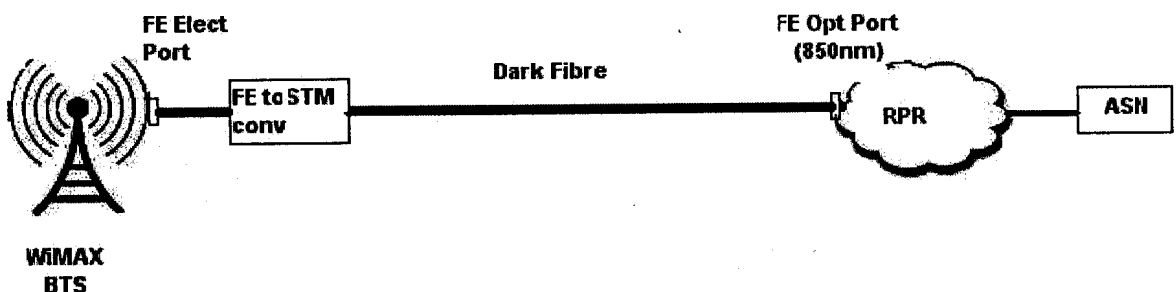
Note: In Case RPR connectivity is to be given only through GE port i.e. 1550nm, then the corresponding SFP of 1550nm(SM) is to be inserted in STM conv/E1 conv/ STM1 CPE by taking out 1310nm SFP.

Scenario "D" – BTS connected with Dark Fibre

Sol 1:



Sol 2:



Note:

- SFP (850 nm) available at OCLAN end to be taken out & to be replace with SFP(1310nm).
- In Case RPR connectivity is to be given only through GE port i.e. 1550nm, then the corresponding SFP of 1550nm(SM) is to be inserted in STM conv/E1 conv/ STM1 CPE by taking out 1310nm SFP.