

Proposal for Extended Box of EPON



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**IEEE 802 plenary meeting, San Diego, CA, USA
July, 2012**

Agenda

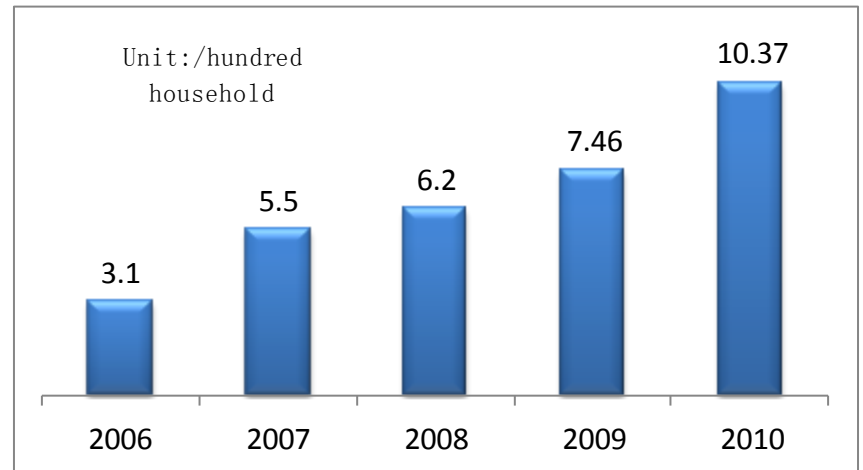
- **Market Requirements**
- **Proposal for Extended Box**



Broadband Market is Huge in Countryside

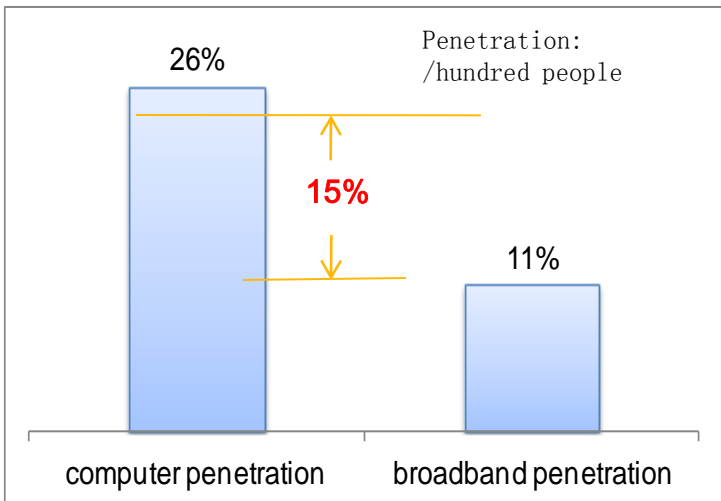
- **Broadband condition improves fast**
- **There is large room for broadband**
- **Rural Internet users grow rapidly**

Rural computer penetration



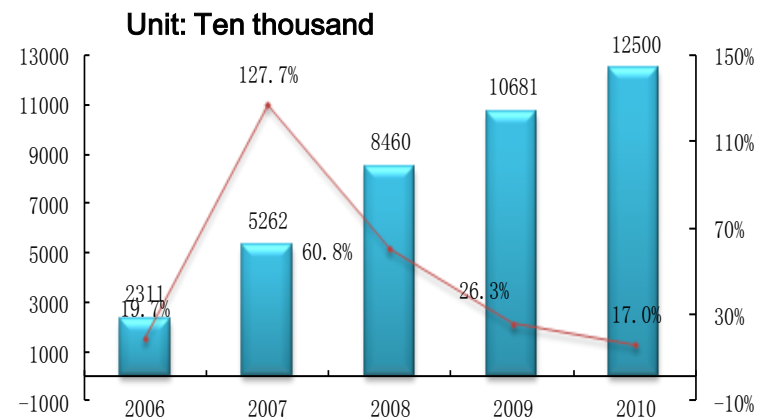
Source : National Bureau of Statistics

Potential of using broadband



Source : Market research in 2010

Rural Internet users



Source : CNNIC

Current Problems of Rural Broadband

■ Network coverage

- ✓ Branch companies claim that difficult network construction is the key point in rural broadband development. And the reason is mainly “Long Distance” between central station and villages.
- ✓ Rural user research finds out that more than half of dissatisfaction is low speed. “PON” can solve this problem.

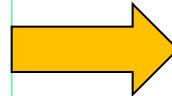
Current Technology Deployed

P2P+DSL : Dominant

1. Fiber or copper from central office to the village, copper from village to users
2. Currently dominant.

Disadvantage:

- Long copper cable
- Low data rate
- Occupation of trunk cable
- Theft of Copper



FTTN (PON) +DSL : Current construction way

1. PON: OLT at central office, Fiber connected to the village
2. Split ratio is adjusted according to the distance

Disadvantage:

- PON reach is not enough. OLT must be in the central office.
- OAM is difficult for OLTs in rural area.
 - Office construction costs too much. The less the better.

Extended Box to Increase PON reach

■ Cost consideration

- ✓ In rural area for a typical scenario, P2P construction cost is about 1.5 times as PON (fiber to the village).
- ✓ Extended box with PON is expected to cost less than P2P.

■ Technical consideration

- ✓ In rural area, both natural and human condition is poor.
- ✓ Strict technical specifications are required for the extended box, such as large temperature range, water-proof, anti-wind, etc.

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Power Budget Extender for EPON

- Power Budget Extender (PBEx) has been proposed in May meeting for scenarios when optical loss budget needs to be increased considerably above 33 dB
- PBEx can be used to realize long reach transmission as well as maintaining large split ratio
- Different solutions can be used to realize the PBEx for EPON including OEO, OA or OEO & OA hybrid schemes
- OEO is a cost-effective and easy to deal with solution for PBEx of EPON

Cost model of different solutions for IG-EPON PBE_x

1 st Sol.		2 nd Sol.		3 rd Sol.		4 th Sol.	
DS	US	DS	US	DS	US	DS	US
OEO	OEO	OA	OA	OEO	OA	OA	OEO
1.0		12.7		6.1		8.7	

Note: The cost model is based on the ratio of different solutions to the 1st Sol.

Cost model of different solutions for Asymmetrical I0G-EPON PBEx

1 st Sol.		2 nd Sol.		3 rd Sol.		4 th Sol.	
DS	US	DS	US	DS	US	DS	US
OEO	OEO	OA	OA	OEO	OA	OA	OEO
1.0		0.9		1.1		1.3	

Note: The cost model is based on the ratio of different solutions to the 1st Sol.

Conclusions

- Marketing requirement for PBEx in rural scenarios was proposed
- Cost model of different solutions for 1G-EPON and 10G-EPON PBEx were given out



Thank You!

Deliver the future-extended EPON for better life and green earth