

NO NEW WIRES

Inside Wiring Challenges When Installing Triple-Play Services over FTTH

ENGINEERING ASSOCIATES, INC.

Communications Engineers and Consultants Since 1954

1220 Old Alpharetta Road, Suite 390, Alpharetta, Georgia 30005
Telephone: 678-455-7266 ♦ Facsimile: 678-455-9223
www.engineeringassociates.com



NO NEW WIRES

- Deployment of FTTH networks presents new challenges in all portions of a network
- Especially at the Subscriber's Premise
- Powering Issues
- Grounding Issues
 - Wiring Issues



QUESTIONS

- How will Triple-Play Services be propagated through the house?
- How to get from Point A to points B, C, D, and E.
 - Voice = Use existing twisted pair?
 - Data = Run new CAT 5 cable?
 - RF Analog Video = Use existing coax?
 - What about IPTV?



QUESTIONS

THROW IN:

- Higher bandwidth requirements
- Multiple PCs
- Multiple Televisions
- IPTV in conjunction with RF video
- The challenge begins



Non-Technical Challenges

- Basic challenges start with:
 - Setting up appointments with the Subscriber
 - Not knowing how much time to allocate
 - Not knowing what resources are needed
 - Increased liabilities (drilling new holes)
 - All of the above relate to cost and customer satisfaction



Voice Challenges

- Telephone Wiring - As easy as it gets.
- Most homes are already wired for telephone, so
- Connect new ONT to existing NID, and you're done. Right?
- For a large percentage of homes, this is true!
- However, there ARE a few things that must be considered.



Voice Challenges (Cont'd.)

Telephone Wiring Concerns:

1. Where to connect to the NID?
House side or Service-provider side?
2. ONT protection and NID grounding
3. Know your ONT specifications for:
 - REN per line (5 is standard)
 - Maximum REN per ONT
 - Maximum distance to phone
100m, 500ft, other
 - Type of phones to be served
loop start vs. ground start
Does your ONT do both?



Data Challenges

Data:

- Most homes will not have existing CAT 5
- Some newer homes will
- Probably will have to run at least one new CAT 5 from the ONT
- (Maybe not! Could take advantage of another option.)



Analog Video Challenges

RF Analog Video:

- Typically can use the existing coax
- Replace F connectors (reduce ingress)
- Replace splitters (to 5-1000Mhz)
- Be careful of customer equipment

(It may not pass the return path or have a high loss factor.)



IPTV Challenges

- But bring in IPTV and an important shift in priorities and focus in the home networking sector takes place, not just in home wiring challenges.



IPTV Challenges (Cont'd.)

Square Peg in a round Hole



IPTV Challenges (Cont'd.)

- Service providers are seeing home networking as a critical component for IPTV - one they need to control. The market is shifting from consumer-driven to service-provider driven.
- Remote management and control of the subscriber premise is just as critical as the home network medium.



IPTV Challenges (Cont'd.)

- Access network architecture may influence and/or dictate the choice of home networking technology.
- Home networking technologies are evolving from external adapters to integrated technology components within ONTs, IP STBs, home gateways, etc.



IPTV Possible Solutions

- Most companies are looking at one of four technologies as possible solutions.
 - 802.11n (next generation wireless)
 - HomePlug AV (use of electrical wiring)
 - Multimedia over Coax Alliance (MOCA)
 - Home Phoneline Network Alliance (HPNA)



IPTV Possible Solutions (Cont'd.)

	802.11x (NG WiFi)	HomePlug AV	MoCA	HPNAv3
Physical Medium	Air	Electrical Powerline	Coax cabling (RG6 & RG59)	Coax and phoneline (RG6 & RG59 coax)
Data Rate	802.11g max 54Mbps; video-optimized consistent throughput 15-30Mbps range;	200Mbps max; 120Mbps realistic; observed testing 50-80Mbps max	270Mbps max; 140Mbps realistic; 100+Mbps proven in field. NG chipsets targeting 160-200Mbps.	140Mbps max, 128Mbps initial chipsets; 80-100Mbps proven in field. v3.1 max PHY rate 340Mbps.



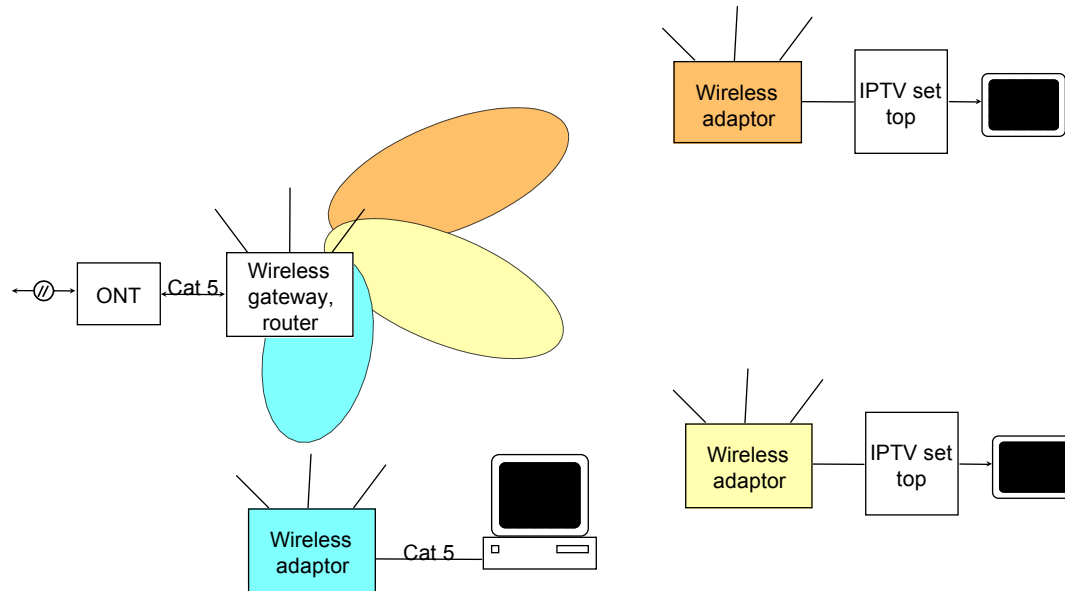
802.11n Wireless

- 802.11n probably the best known
- Slow road toward finalization of standard
- Final standard expected by end of 2008
- Speeds 100 Mbps and beyond (600 Mbps??)
- Still need to run at least one wire to wireless hub (not integrated in ONT or STB)
- Limited deployments supporting video
- Security concerns by content providers
- Carriers worldwide will drive next generation development



802.11n Wireless (Cont'd.)

Wireless distribution



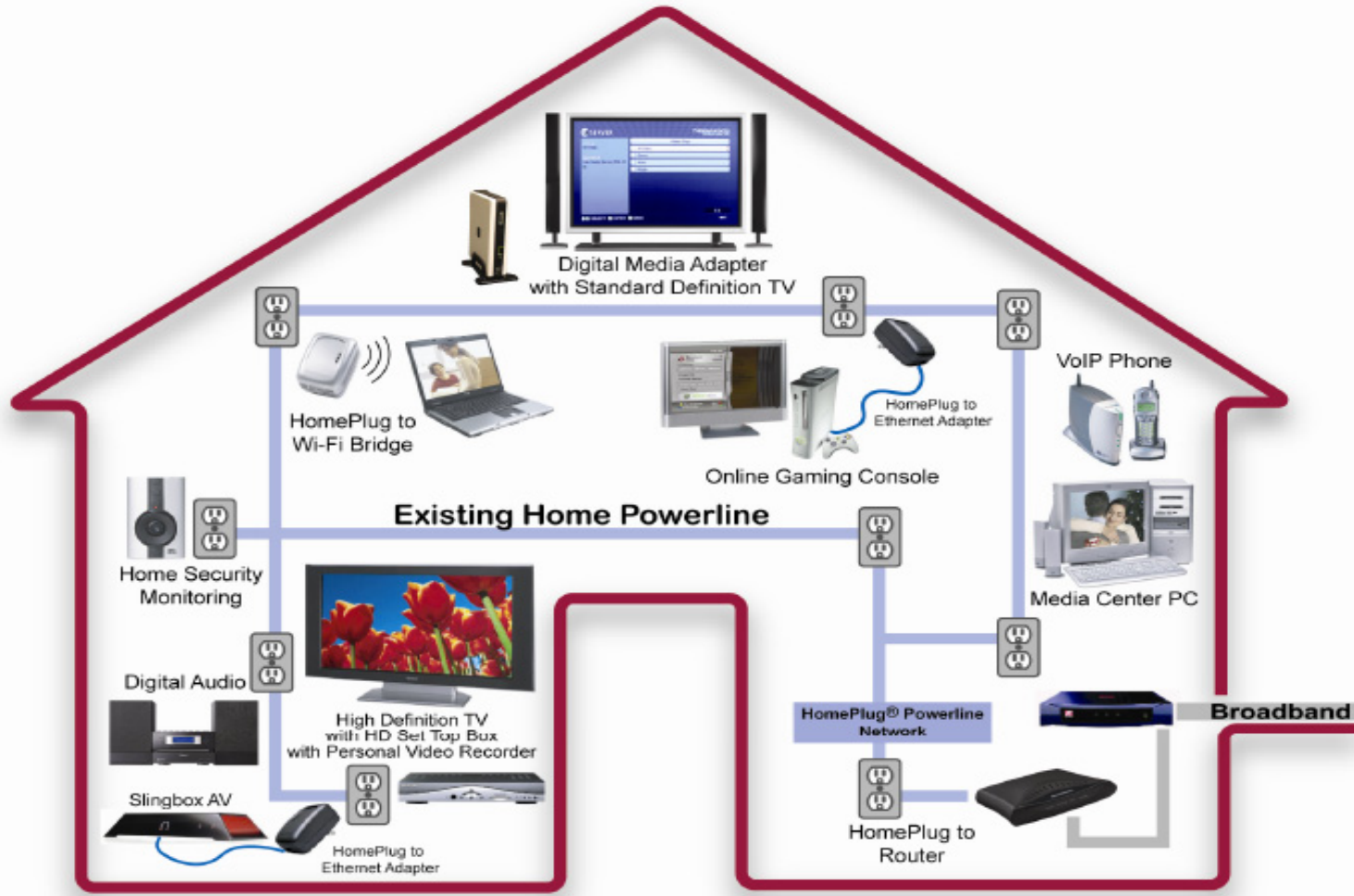
HomePlug AV

- HomePlug AV - www.homeplug.org
- Operates over existing electrical wiring
- Operates using the 2-28Mhz spectrum
- Capable of 200 Mbps (test showing only 80Mbps)
- Uses plug-and-play equipment
- Still need to run at least one wire to gateway (not integrated in ONT or STB)
- Mostly used overseas
- Highly susceptible to interference (microwaves, hairdryers, etc.)



Not recommended for video

HomePlug AV (Cont'd.)



MOCA

- MOCA
- Multimedia over Coax Alliance - www.mocalliance.org
- Private group put together standard
- Started in early 2004
- Transmits above the cable TV band (above 850Mhz)
- Only works over coax
- Several product manufacturers and users in this group

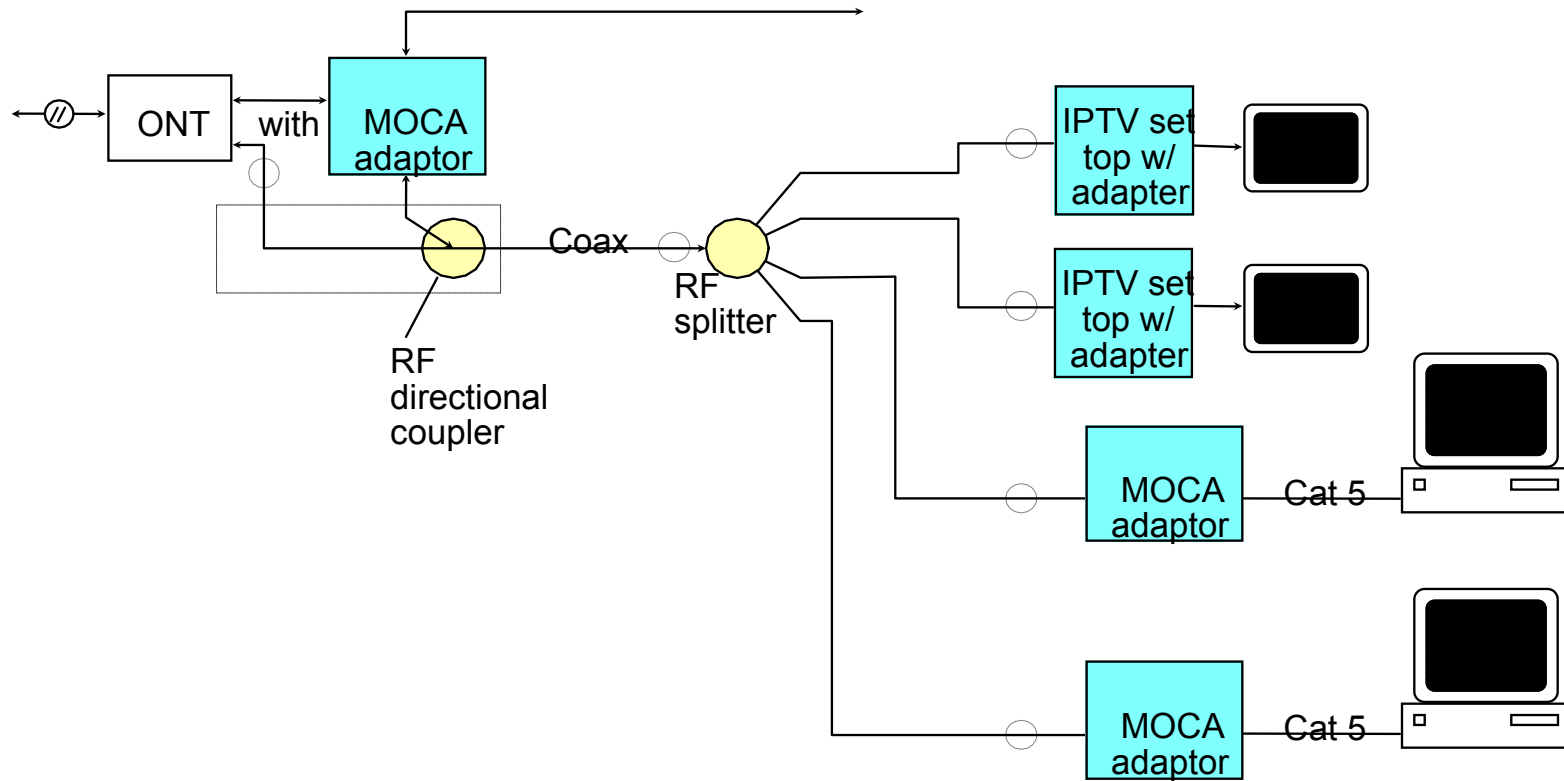


MOCA (Cont'd.)

- MOCA (Continued)
- Practical speed 100 Mbps (target 200 Mbps)
- Already supported in some ONTs and IP STB
- Will co-exist with analog video
- Homes with coax existing in multiple rooms are prime candidates



MOCA (Cont'd.)



HPNA 3.0

- HPNA 3.0 - www.Homepna.org
- Home Phoneline Network Alliance
- Developed for Phone line but has become popular for coax
- First introduced in 1998
- Transmits below the cable TV band (5 - 42Mhz)
- Will co-exist with analog video
- Can utilize existing twisted pair with proper adapters

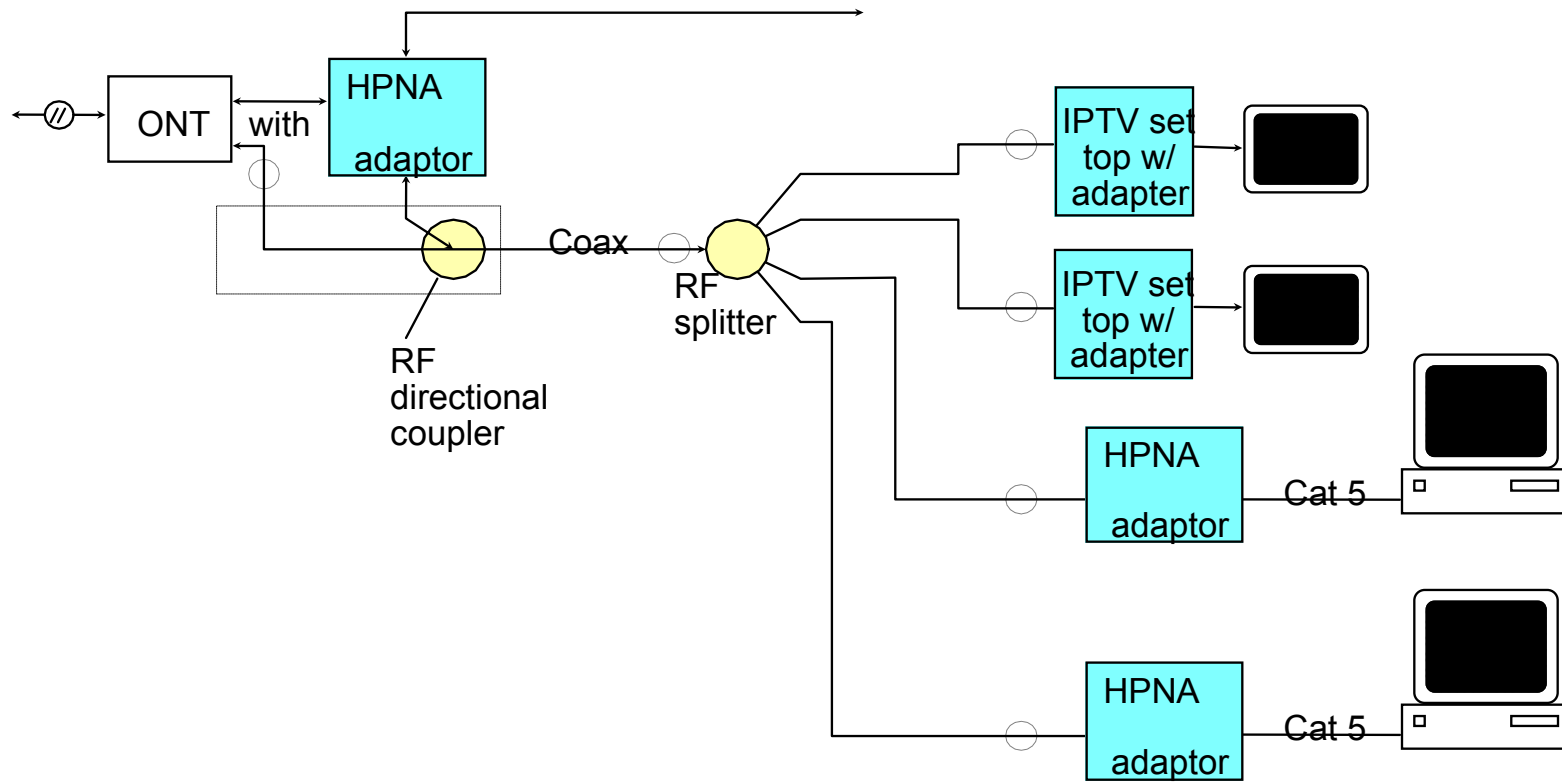


HPNA 3.0 (Cont'd.)

- Many product manufacturers
- Practical speed 100 Mbps (shooting for 340 Mbps)
- Already supported in ONTs, IP STB for coax
- No built-in isolation between MDU; users sharing a master ONT



HPNA 3.0 (Cont'd.)



SUMMARY

- Which technology is best?
- Of the four mentioned, MOCA and HPNA are the front runners
- Will there really be no more new wires?
- Not 100% of the time
- But it is definitely worth the time and effort to investigate your options in your planning process.



NO NEW WIRES

