

ITU-T Status Update on NB-PLC Standardization

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Status of NB-PLC Recommendations

- ITU has given final approval to both PHY and DLL of next generation OFDM-based NB-PLC international standards:
 - Rec. G.9955 (PHY) approved in 12/2011
 - Rec. G.9956 (DLL) approved in 11/2011
- **G.9955 and G.9956 contain the specifications of three separate and self-contained NB-PLC standards:**
 1. **G.hnem**: a new NB-PLC technology developed by ITU-T in cooperation with members of the G3-PLC and PRIME Alliances;
 2. **G3-PLC**: an established and field-proven NB-PLC technology contributed by members of the G3-PLC Alliance
 3. **PRIME**: an established and field-proven NB-PLC technology contributed by members of the PRIME Alliance
- See also ITU Press Release
http://www.itu.int/net/pressoffice/press_releases/2011/CM16.aspx



Coexistence 1/3

- Agreements supporting coexistence (CX) with other NB-PLC technologies have been in place since Feb. 2010
 - CX with single carrier technologies is in place and support of EN 500065 is mandatory
 - CX with other multicarrier systems is being addressed, in particular with IEEE P1901.2
- Some agreements for CX with P1901.2 have already been reached:
 - ITU-T G.hnem shall define a mode of operation that facilitates CX with IEEE P1901.2
 - The CX scheme between G.hnem and P1901.2 shall require a complexity equally shared between the coexisting technologies
 - That G.hnem shall adopt the SGIP PAP 15 CX requirements (11/10/2011 version)
 - Hooks to support a preamble based CX scheme has already been introduced in G.9955/6



Coexistence 2/3

- Text below is part of the approved G.9955:

“Three mechanisms are defined to allow coexistence with other PLC technologies operating in the same frequency range:

- Frequency division (FD) coexistence mechanism - allows suppressing interference from G.9955 into a particular frequency band or bands by using non-overlapping G.9955 bandplans (see §7.5). Flexible use of different bandplans provides an opportunity to separate systems operating over the same medium in non-overlapping bandplans. The FD coexistence mechanism can provide coexistence with both the narrowband FSK/PSK PLC systems and wideband PLC systems;
- Frequency notching coexistence mechanism – shall be used to suppress interference from G.9955 into a particular (relatively narrow) frequency range by notching out one or more subcarriers (see §7.6.1). Frequency notching allows G.9955 to coexist with the existing narrowband FSK/PSK systems operating over the same frequency band;
- Preamble-based coexistence mechanism – shall be used by G.9955 to fairly share the medium with other types of PLC technologies operating over the same frequency band (and utilizing this coexistence mechanism). The definition of this coexistence mechanism is for further study. This same coexistence mechanism also facilitates coexistence between the G.9955 implementations using different overlapping bandplans.

The above coexistence mechanisms can be applied simultaneously, enabling G.9955 coexistence with multiple PLC technologies operating over the same medium. ”



Coexistence 3/3

- G.hnem group trying to accommodate and contribute to CX work in IEEE 1901.2 even if there is no formal agreement between the two groups
- Intention is to normative reference the CX specs in IEEE 1901.2 if certain conditions are satisfied:
 - CX scheme should be fair
 - CX scheme should impose similar complexity on coexisting technologies
 - CX specs should constitute a compliant implementation of IEEE 1901.2
- G.hnem group contributed some technical choices to IEEE 1901.2
- Next step is for IEEE 1901.2 to evaluate G.hnem contributions, finalize the scheme, and incorporate it in the specs and then proceed with the second WG ballot vote in mid April

