DIGITALLY ENHANCED CORDLESS TELECOMMUNICATIONS

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Chad Watson

WHAT THE DECT?

▶ Wireless digital communication standard(s) used primarily for cordless phone systems maintained by ETSI

▶ Originated in Europe where it replaced CT1 and CT2, both 900 MHz standards

▶ Standardized communications across manufacturers allow more efficient use of bandwidth, as well as added interoperability to the end user

▶ Adopted in over 110 countries

▶ Recognized as a 3G system by the International Telecommunication Union

▶ European and US standards are incompatible (as usual)

APPLICATIONS

▶ Residential/Business cordless phones

　　▶ Fixed Part (phone base) transmits to the Portable Part (handset)

　　▶ In data applications, devices are defined as Hybrid Parts

▶ Lesser known:

　　▶ Baby monitors

　　▶ Wireless LANs (IP-DECT)

　　▶ City-wide phone service

EUROPEAN DECT

▶ Frequency Range:
  ▶ 1880 – 1900 MHz

▶ Channelization:
  ▶ 10 channels, 1.728 MHz between carriers

▶ Channel access:
  ▶ FMDA, TDMA and TDD

▶ Time Slots:
  ▶ 12 Up Stream, 12 Down Stream

▶ Modulation:
  ▶ GFSK, 4PSK, 8PSK, 16QAM and 64QAM

▶ Audio Codec:
  ▶ G.726, G.711, MPEG-4 ER LD AAC

▶ Net Bit Rate:
  ▶ 32 kbit/s

▶ TX Power:
  ▶ 250 mW Peak, 10 mW average

▶ Bit Error Rate:
  ▶ <= 0.001

▶ RX Sensitivity:
  ▶ <= -83 dBm

▶ Range:
  ▶ < 500 meters

EUROPEAN DECT

▶ Seamless handover and full mobility management capabilities with authentication and ciphering

▶ Added support for:

  ▶ PSTN/ISDN

  ▶ VoIP (SIP or H.323)

  ▶ PABX

▶ DECT Packet Radio Service (DPRS)

  ▶ Data up to 840 kbit/s (GFSK modulation) or up to 5 Mbit/s (High Level Modulation)

▶ Separation from ISM bands promotes interference free and Wi-Fi safe communication

EUROPEAN DECT

- Recommended G.726 audio codec
  - Adaptive differential pulse-code modulation fits a sampling frequency of 8 KHz into 32 kbit/s by employing a 4-bit sample size
  - Varies the quantization step size in the companding algorithm to ensure functionality across a wide SNR range

- Industry size
  - Siemens HiPath 4000 series boasts 15 million users alone
  - Although, double-digit negative growth in 2009

- Interception and Eavesdropping
  - Packet capture utilities allow hackers to eavesdrop very easily
  - How-to's can be found openly online

VARIANTS

▶ US - DECT 6.0

  ▶ Frequency Range:

    ▶ 1920 – 1930 MHz

  ▶ Channels:

    ▶ 5 channels, 1.728 MHz between carriers

  ▶ TX Power:

    ▶ 100 mW Peak, 4 mW average

  ▶ All other details are the same

  ▶ Note incompatibility with EU versions

▶ DECT ULE

  ▶ Low energy market, competing with ZigBee and Bluetooth

  ▶ Boasts less interference due to operation in the 1.9 GHz range outside of the ISM band

  ▶ Aiming for the home automation, security, healthcare, and monitoring markets

  ▶ 70 meters indoors

QUESTIONS?