Silence Suppression and Energy Efficiency

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Silence suppression review

- Silence suppression is used in telephony to describe the process of not transmitting information over the network when one of the parties involved in a call is not speaking, thereby reducing bandwidth usage.
  - Given that typically only one party in a conversation speaks at any one time, silence suppression can achieve overall bandwidth savings in the order of 50% over the duration of a telephone call.
- Two methods are implemented in the industry:
  - Discontinuous reception (DRX) - The mobile device and the network negotiate phases, in which data transfer occurs. During other times the device turns its receiver off.
  - Discontinuous transmission (DTX) is a means by which a mobile telephone is temporarily shut off or muted while the phone lacks a voice input.

Energy Efficiency

- Breaking the path:
  1. The cellular phone- the device is working in DRX and DTX as the manufacture designed
  2. RoE sender and receiver- Keep alive method (next page)
  3. Ethernet Network- EEE or other method that will be standardized in 802.3ba or other.

RoE proposal

Keep alive method-

- The transmission side (the RoE sender side) is placed into standby for a given amount of time (few msec and can be increased to hundreds msec if there is no info to send)
- When the standby time ended, a sync frame is sent by the RoE sender side periodically. The sync frame contains information/Flag that indicates if there is any waiting data for transmission.

Other standards work

- In 802.11 wireless networks, a compatible access cards and access points negotiate a power saving mode arrangement.
- IEEE 802.3az (Energy Efficient targeting a 100-Mbps to 10-Gbps Ethernet link using 100GBASE-TX, 1000BASE-T, 10GBASE-T, 10GBASE-KR, 10GBASE-RX4, and 1000BASE-KX physical layers (PHYs). The EEE is optional to the existing Ethernet standards involved with the above items and provides sleep mode for energy conservation.
  - Sleep mode provides an **Active State** and **Low-Power Idle (LPI)** state, where the data is transmitted at the full rate in the **Active State** and the **LPI state** is used when there is no data to be sent. During an **LPI state**, the link transmits LPI packets during an inactive period and periodically transmits short refresh signals to keep the link alive and to align the receivers with the current link status. An **Active State** is entered again when data to be sent is received.