

C-DOT 4G BROADBAND WIRELESS TECHNOLOGY (LTE-A)



The C-DOT LTE-A solution is a standards-based, packet only core network and an eNodeB with a simplified and modular architecture, providing support for and mobility between multiple heterogeneous access networks including (E-UTRAN and LTE Advanced air interface), 3GPP legacy systems (for example GERAN or UTRAN) but also non-3GPP systems (for example WiMAX or cdma2000, WiFi). This solution enables the mobile network operator to offer a new set of services to the users and enables products and network deployments to be built for bandwidth intensive services. It provides IP connectivity to terminals for both data and voice services.

C-DOT LTE-A solution comprises of the following network entities : the e-NodeB, the Mobility Management Entity (MME), the Home Subscriber Server (HSS), the Serving Gateway (S-GW), the Packet Data Network Gateway (P-GW) and the Policy And Charging Control Entity (PCRF).

SALIENT FEATURES

- ◆ Simplified Network Topology.
- ◆ Well Defined Interfaces.
- ◆ Support for Integration with Non-3GPP Access Networks.
- ◆ Centralized Policy and Charging Support.
- ◆ Handovers between 3GPP and Non-3GPP Networks.
- ◆ Scalable Architecture.
- ◆ High Availability support for EPC nodes.
- ◆ Voice Services through IMS.
- ◆ Log Management through Syslog and Log Rotate.



MME (Mobile Management Entity)

Features supported

- ◆ NAS signalling security.
- ◆ Inter CN node signalling for mobility between 3GPP access networks .
- ◆ Tracking Area list management.
- ◆ PDN GW and Serving GW selection.
- ◆ MME selection for handovers with MME change.
- ◆ SGSN selection for handovers to 2G or 3G 3GPP access networks.
- ◆ Roaming (S6a towards home HSS).
- ◆ Authentication and Authorization.
- ◆ Bearer management functions.
- ◆ Lawful Interception.
- ◆ UE Reachability procedures.

Interfaces supported

- ◆ S6a with HSS as per 3GPP TS 29.272.
- ◆ S1-MME with E-UTRAN as per 3GPP TS 36.412 and TS 36.413.
- ◆ S10 with other MME as per 3GPP TS 29.274.
- ◆ S11 interface with SGW via GTP v2 as per 3GPP TS 29.274.

E-Node B

Features Supported

- ◆ Based on 3GPP TR architecture.
- ◆ Supports Rel9 & 10 specifications of LTE.
- ◆ Supports RRH on CPRI.

- ◆ Supports Band 1,7,13 in FDD and 40 in TDD bands.
- ◆ Configurable 16 to 64 UE support.
- ◆ Centralized NMS/EMS on SNMP and Tr69.
- ◆ Supports 3 sector WiFi with antenna and beam steering with cognitive radio based mesh protocol.
- ◆ Operator and Active sharing for WiFi.
- ◆ WiFi can be configured for LTE off load or Backhaul.
- ◆ LTE can be configured for back haul, with WiFi serving as hot spot.
- ◆ Supports GSM-2G services using SDR technologies.
- ◆ Outdoor pole mounted solar powered solution with inbuilt patch and provision for external antennas and GPS.

Interfaces Supported

- ◆ S1-MME and SI-U interfaces.
- ◆ GPS for timing synchronization and carrier Ethernet.
- ◆ CPRI for RRH.
- ◆ 2X 10/100/1000Mbps Ethernet interfaces.
- ◆ POTS and G703 interface.

Management Interfaces Supported

- ◆ SNMP versions 1,2.
- ◆ Tr69.

C-DOT Serving Gateway

- ◆ C-DOT Serving GW terminates the interface towards E-UTRAN.

Features supported

- ◆ Mobility anchoring for inter-eNodeB handover.
- ◆ Mobility anchoring for inter-3GPP mobility.
- ◆ UE IDLE mode downlink packet buffering and initiation of network triggered service request procedure.
- ◆ Lawful Interception.
- ◆ Packet routing and forwarding.
- ◆ Transport level packet marking in the uplink and the downlink, e.g. setting the DiffServ Code Point, based on the QCI of the associated EPS bearer.
- ◆ Accounting for inter-operator charging. For GTP-based S5/S8, the Serving GW generates accounting data per UE and bearer.
- ◆ Interfacing OFCS for charging.

Interfaces Supported

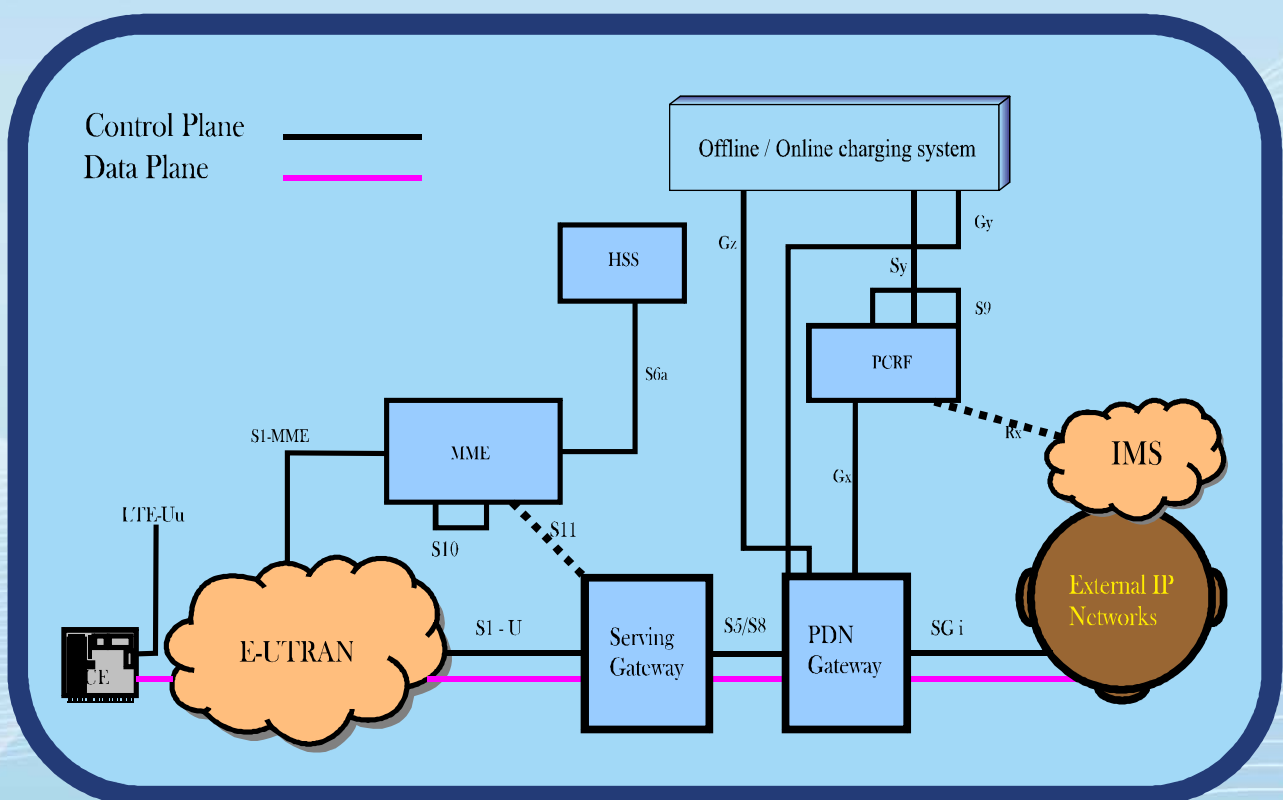
- ◆ S5/S8 Interface towards PGW as per TS 29.274.
- ◆ S11 Interface towards MME as per TS 29.274.
- ◆ Gz Interface towards OFCS as per TS 32.240, TS 32.295.

C-DOT PDN Gateway

- ◆ C-DOT PDN GW terminates the SGi interface towards the PDN. It provides PDN connectivity to E-UTRAN capable UEs over the S5/S8 interface.

Features supported

- ◆ Per-user based packet filtering (by e.g. deep packet inspection) and policy enforcement.
- ◆ Lawful Interception.
- ◆ UE IP address allocation.
- ◆ Transport level packet marking in the uplink and



downlink, e.g. setting the DiffServ Code Point, based on the QCI of the associated EPS bearer.

- ◆ Accounting per UE and bearer and for inter-operator charging.
- ◆ Interfacing OFCS and OCS for charging.
- ◆ UL and DL service level gating control, rate enforcement (e.g. by rate policing/shaping) and charging.
- ◆ DHCPv4 (server and client) and DHCPv6 (client and server) functions.
- ◆ UL and DL bearer binding.

Interfaces Supported

- ◆ S5 interface towards SGW as per TS 29.274.
- ◆ Gx interface towards PCRF as per TS 23.203.
- ◆ Gz interface towards OFCS as per TS 32.240, TS 32.295.
- ◆ Sgi interface towards packet data network as per TS 29.061.

C-DOT PCRF

- ◆ C-DOT PCRF is the policy and charging control element.

Features supported

- ◆ Policy control (Gating, Quality of service control)
- ◆ Flow based charging control.
- ◆ Roaming users supported.

- ◆ Usage monitoring control per user.
- ◆ Policy decisions based on subscriber spending limits, Subscriber profile, Operator data.
- ◆ Service data flow based charging support.
- ◆ Volume, Time and Event based charging support.
- ◆ Different rates and charging models supported based on the location of a user.

Interfaces Supported

- ◆ Gx towards P-GW as per TS 23.203, TS 29.212.
- ◆ Rx towards AF as per TS 29.213, TS 29.214.
- ◆ Sy towards OCS as per TS 29.219.

C-DOT HSS

- ◆ C-DOT HSS provides user profile management functionality.

Features supported

- ◆ IMSI based storage of user profile.
- ◆ Location update procedures supported.
- ◆ Purge UE procedures supported.
- ◆ Insertion, Deletion and Modification of subscriber data supported.
- ◆ Indication to MME on HSS restart through Reset procedure.

Interfaces Supported

- ◆ S6a interface with MME as per TS 29.272.



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