



A new generation of scalable software-based 4G LTE, 3G and GSM core network solutions with VoLTE / SIP voice, packet data and SMS. Deployable both standalone and with operator interconnect, and architected in alignment with emerging mobile edge computing (MEC) principles.

ECX Core is a fully featured virtualized core for voice and packet data on cellular networks. It can run as a 4G LTE evolved packet core (EPC); as a 3G UMTS or GSM core network; or as all three simultaneously.

ECX Core provides all of the functions required of a 3GPP 4G EPC, specifically the MME, SGW, PGW, PCRF and HSS. It is architected in alignment with mobile edge computing (MEC) principles, with separation between user and control plane functions and advanced features such as S1/X2 handover, dedicated bearers, VoLTE, CS fallback (CSFB), SMS, inter-RAT and SRVCC.

Multi-standard support reduces costs and integration complexity, while the ability to freely choose feature configurations permits powerful new network features, such as mobility between RAN technologies (including WiFi with SRVCC) and SMS over 4G.

An embedded lightweight IMS (IP Multimedia Subsystem) allows support for 4G VoLTE (Voice over LTE) calls without the need for an external IMS network. QoS-managed voice calls can be made from cellular handsets (using the normal handset dial pad) or via SIP and an IP-PBX, where the handset can appear as an

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extension with full access to PBX features. ECX Core supports both integrated P-GW and remote P-GW architectures, allowing data to be placed directly on a local LAN or routed to a central P-GW.

HSS/HLR functionality enables the creation of standalone private networks. Alternatively, ECX Core can interconnect to MNO infrastructure using Diameter-based capabilities or a MAP/M3UA interface, creating a seamless service transition.

In its 3G implementation, ECX Core provides MSC (both Serving and Gateway), HLR, SGSN/GGSN and SMSC functionality, as well as an HNBGW (Home NodeB Gateway), allowing it to directly support 3G small cells that interconnect via Iuh. This enables cellular users to either be directly hosted locally, like DECT replacement users, or allowed to attach as 'in-roamers'.

ECX Core runs on a broad range of hardware, from embedded ARM processors to enterprise CPE and cloud-based servers. It provides the foundation for a range of Quortus products, including ECX Enterprise, ECX Tactical for public safety and emergency service applications, and ECX Sentinel for managed access requirements.

Highlights

- Integrated LTE, 3G UMTS and GSM core network.
 - Embedded IMS / VoLTE
 - Supports picocells, femtocells and macro cells
 - Voice, packet data and SMS support
 - SIP/G.711 UAC support for direct integration with IP-PBXs
 - Optional mobile operator interconnect
 - Scalable from embedded single channel devices to thousands of simultaneous media sessions
 - Split user / control plane architecture enables richer services based on mobile edge computing (MEC)
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Key facts

Integrated 3GPP core elements	HSS/HLR/AuC (for local use), MSC (Gateway and Serving), SMSC and SGSN/GGSN. Iuh femto gateway for UTRAN. Software BSC for GERAN. MME, SGW/PGW and PCRF for LTE.
Supported radio network interfaces	IuCS/IuPS over M3UA/IP for standard RNC or collapsed FAPs. Iap+ (for ip.access Oyster 3G APs). Iuh (RUA/HNBAP) for home node-B compatible APs. Iub (optional embedded RNC) for 'macro' nodeBs. A and Gb over IP, for GSM picocells and femtocells. LTE S1-MME and S1-U.
CN side interfaces	SIP/RTP for voice, Gi (for packet data), M3UA for MAP (opt).
Authentication and ciphering	UMTS and GSM authentication challenge modes. Milenage, XOR and COMP128/1 + 128/2. 3G-SNOW for LTE.
CS/voice services	Calls handset to handset, including any technology to any technology (ie any user to any user on any of 2G, 3G, VoLTE, IMS, SIP). MO and MT Calls between handset and external SIP server. Call transfer (ECT), call hold & retrieve, call waiting. Integrated IMS server for VoLTE support.
SIP support	UAC/UAS, SIP Trunking, SIP-I (ISUP) and IMS. Each attached handset/MSISDN modelled as a SIP client. REGISTER for PBX integration. NOTIFY for message waiting indications. REFER for attended call transfer.
4G LTE, 3G PS/HSPA and EDGE/GPRS data	Embedded SGSN/GGSN for GSM and 3G UMTS. Embedded SGW/PGW for LTE. User IP data dropped directly to local LAN via internal GGSN/PGW. Multiple APNs, QoS classes and PDP address pools. Built-in GGSN NAT to ease IP routing management.
SMS services	Embedded SMSC for store and forward of short messages. Multiple external SMPP interfaces. MWI control and delivery receipt supported.
Secure call support	CSD 9.6k transparent data for secure FNBDT terminals. V.150 modem relay for secure calls over SIP.
Media processing	G.711 (A/mu law), EFR and AMR wideband and narrowband codecs over RTP, G.729. Transcoder-free operation when appropriate. DTMF: In-band, RFC 2833 or SIP INFO messages. Additional voice compression for use over satellites.
Management (OAM) interfaces	Command line tool, SOAP XML interface and web screens and SNMP. Remote syslog output.
Roaming capability	MAP (3GPP 29.002) over M3UA connectivity, C and D interfaces to external HLR and SMSC. SIP with extensions as part of ECX Core. Diameter support for LTE.
Mobile edge computing (MEC)	Split user and control plane architecture in SGW enables edge-based applications
Server hardware	Intel i86 based: HP ProLiant, mini-ITX or Virtual Machines. ARM architecture: OMAP3, ARM9/11, PicoChip ARM. Linux operating system.