



Location-Based Services (LBS) Overview

Global Leader of End-to-End Location-Based Services

We provide a comprehensive location-based services (LBS) solution that includes platforms, applications and operational support.

Operators, enterprises, and end consumers benefit from our location platforms ability to accurately generate and distribute location information.

Our solutions include active and passive location systems, location-middleware, intelligent routers, mediation gateways, A-GNSS data services, location APIs and operations reporting services. Our virtualized platform allows operators to quickly and easily deploy an end-to-end location solution that optimizes location results while Our

3GPP and OMA standards-based location application interface provides location information to applications deployed by mobile network operators, enterprise, M2M, and IoT.

Over two decades of experience providing precise device location solutions to companies around the world.



Location Accuracy

A strength of the Comtech location solution is our accuracy and performance, which is obtained through various interconnected location methods and technologies.

We support 2G, 3G, 4G, 5G, and Wi-Fi networks, across Control Plane and Secure User Plane (SUPL) environments. Our solutions enable position determination to be done either by the end user device, or by the Comtech location solution itself. Different position determination methods can be used simultaneously, according to the environment and operating conditions. Comtech solutions are able to hybridize multiple position determination capabilities to maximize accuracy and yield. Furthermore, our location solutions are capable of validating device-based hybrid locations and integrating them within the flow of location information.

Whether cellular signal-based, terrestrial beacon, Wi-Fi, A-GNSS, handset-sensors or hybrid location, our available methods cater to different network configurations and business environments. Our solution supports the location of devices in tunnel, and various outdoor and indoor environments.

Comtech has been at the forefront of location solutions for two decades, and our complete suite is backed by our extensive know-how and expertise.

- Precise location available
- Interconnected positioning methods
- Meeting budget requirements
- Customizable solutions
- Scalable & flexible solutions
- Years of experience
- Uncompromised quality
- Virtualized

Technologies

Our **Gateway Mobile Location Center (GMLC)** module is a 3GPP standards-based control plane system that interfaces with your core network to provide a mobile stations' location and can interface with emergency, lawful interception and commercial LCS clients. The Comtech GMLC can support today 2G, 3G, 4G, and 5G networks, and deployed by itself can be used to provide a coarse location (Cell ID) solution. It is the most cost-effective way to add basic LBS to your value added services.

The **Serving Mobile Location Server (SMLC)** is a standards-based location server for 2G (SMLC), 3G (SAS), 4G (E-SMLC), 5G (LMF). It provides the industry's widest array of location technologies based on Assisted-GNSS, Cell ID, Enhanced Cell-ID, Round Trip Time, Downlink Time Difference of Arrival (OTDOA), Terrestrial Beacons, Wi-Fi, handset-sensors, and other signals of opportunity. These location technologies allow you to locate a mobile no matter where it is located – indoors or outdoors, dense-urban or rural areas.

The **Secure User Plane Location Server (SUPL)** is the most accurate and proven server in the industry. The user plane architecture means a fast and cost-effective deployment of LBS services for any network that supports data services—no complicated SIGTRAN or SS7 integration required. The Comtech SUPL server provides a state-of-the-art OMA standards-compliant location server that enables precise and sophisticated location-based services for both mobile operators and OEMs.

The **Location Mediation Gateway (LMG)** receives and aggregates subscriber location event reports from wireless operator's 3G and 4G core networks. The LMG then provides the required events to configured application servers as an encrypted stream. The LMG exposes rich data which is used for multiples use cases such as Safety and Security, Marketing/Location Based Advertising, Asset Management, etc. The LMG does not require network probes, as it leverages standards-based integration model towards mobile operator circuit and packet switched networks.

Location Retrieval Function (LRF) – An IMS node that provides routing and location determination coordination functions for services in the IMS domain, for example Voice over IP. The Comtech LRF supports Cellular, Wi-Fi, Wireline routing.

Wide Area Reference Network (WARN) – A service that provides A-GNSS assistance data to devices or services that require it for A-GNSS based location determination. Comtech WARN supports GPS, GLONASS, and BeiDou, Galileo, QZSS, and NavIC (future.)



Our operations and reporting services provide you with an easy to understand snapshot of location system performance. By providing you with a view of how location technologies perform in various parts of your network, it allows you to see where to focus your optimization and troubleshooting efforts. Furthermore, our analytics tools point out potential errors and improvements in your Base Station Almanac allowing you to further optimize location system performance.

Ultimate Flexibility

We put our profound know-how and location expertise to work for you.

By partnering with Comtech, you can meet regulatory mandates, increase safety and security of your customers and increase ARPU from new and existing customers while reducing customer churn. We support the integration of your existing applications and enable new ones with high-accuracy location information.

Performance and Reliability

Comtech has invested heavily to ensure our location solutions are robust and reliable, supporting the carrier grade needs of our customers. Comtech solutions are designed to be available 99.999% of the time. Our aim is to set the benchmark of service excellence and product reliability across the industry.

Whether turnkey in-network or virtual in-network, Comtech's LBS solutions are designed to meet your individual needs.

Comtech solutions are supported for deployments in public or private virtual environments including OpenStack and VMWare.

Benefits

- Flexible solutions - in-network, hosted, virtual or API
- Seamless integration
- OpEx efficient
- Enable application integration
- Precise location
- Standards compliant
- 2G, 3G, 4G, and 5G
- Easy to deploy
- High system uptime and reliability
- Application interface capable

About Us

The Location Technologies group of Comtech Telecommunications Corp. is a leading provider of precise device location, mapping, public safety, and messaging solutions. Sold around the world to mobile network operators, government agencies, and Fortune 150 enterprises, our platforms allow you to locate, map, track, and message.

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