

An Introduction to IP Location Technology

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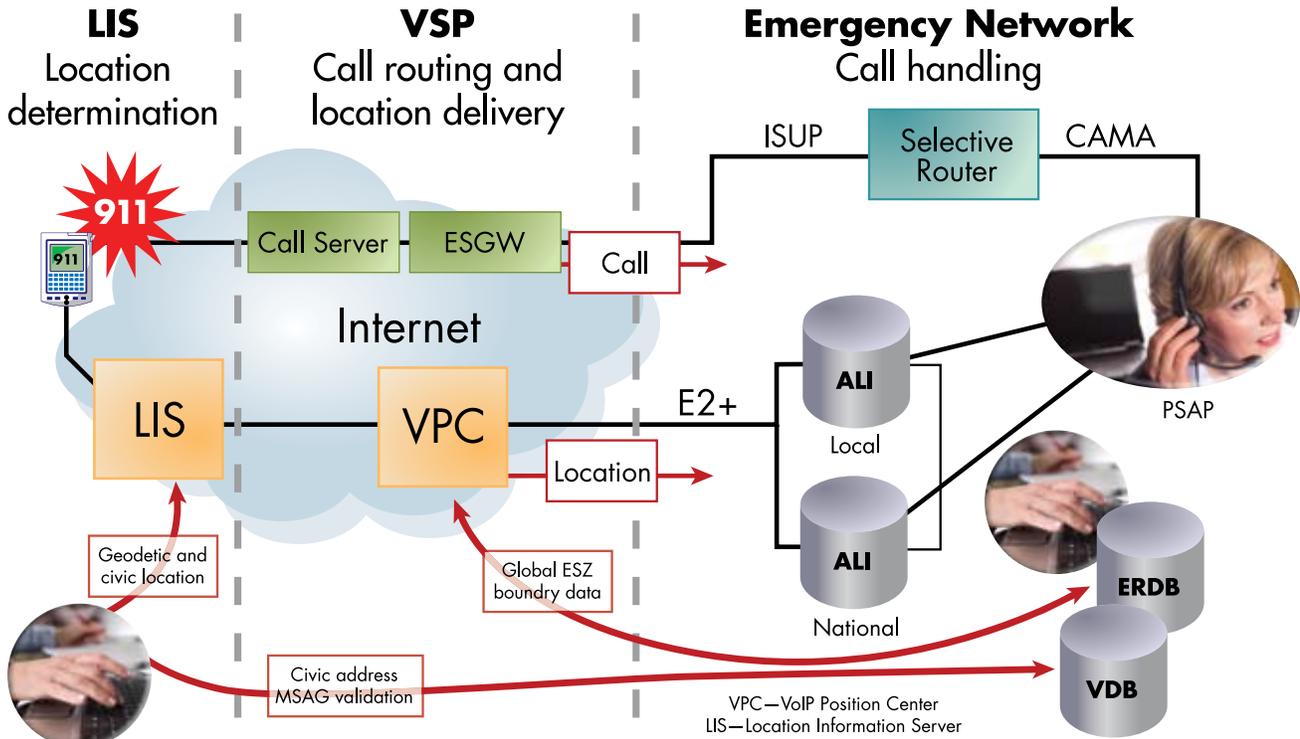
Location Acquisition

Location Information Servers (LIS) for IP networks support the HTTP-Enabled Location Delivery (HELD) protocol, which was designed from the ground up to meet the vigorous requirements of VoIP emergency services. The consistent location acquisition achieved via HELD allows critical functions such as VoIP emergency services to operate reliably, and also enables a whole new world of media-rich, flexible, and interactive IP location-based services.

The US NENA-defined i2 architecture (see below) for supporting VoIP emergency services is gaining traction around the world because it provides a globally applicable and interoperable template for implementing emergency call routing and location delivery to legacy emergency infrastructure. The LIS is a critical functional element of the i2 architecture, as well as future end-to-end IP systems. It is defined as being contained in the access network, and is the provider of the location information to be used for emergency services treatment.

North American Solution for VoIP 911

NENA Defined (i2) Migratory Architecture

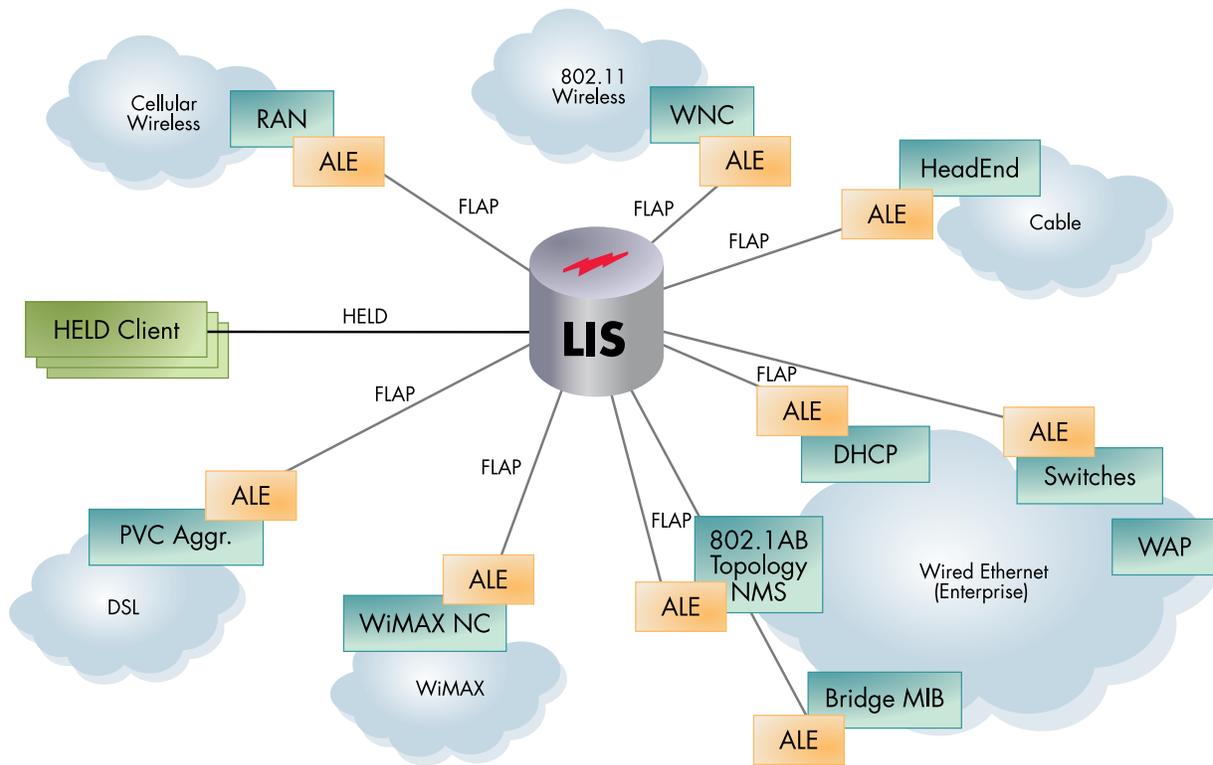


In regional broadband infrastructure operator environments, the LIS function can be deployed in reliable carrier grade form for providers of DSLAM, cable and FTTX access technologies. It can be deployed in ISP suitable packaging with capacities tailored for the small to the mega operators, and with the necessary LIS-gateway functionality to harvest location information from wholesale access infrastructure providers.

The LIS is also extremely valuable in the enterprise environment for supporting emergency calling from geographically distributed enterprise VoIP systems, for hot-desk and mobile workforce management, and to provide precise location information through the public carrier network where the enterprise occupies an extensive campus or multi-building environment.

The LIS and HELD protocol support a wide range of value-added applications beyond emergency use. By implementing the necessary hooks for privacy, device-based measurements, and appropriate levels and quality of service, a broad range of location based applications can be implemented on a common infrastructure.

LIS – the Common Location Server for all Access



The LIS provides a technology-independent interface to allow devices to obtain location in the same way wherever and however they are connected. In calculating the location, the process is highly technology-dependent, although the LIS hides this technology-dependence from client devices. The process of location measurement generally involves obtaining the value of a particular network parameter that corresponds to the device. For example, this could be the ATM permanent virtual circuit applicable to a DSL session, the MAC address of a cable modem, or the Ethernet switch port identifier associated with an enterprise LAN connection.

The Flexible LIS-ALE Protocol (FLAP) defines a standard network and terminal reporting mechanism that allows arbitrary forms of access to communicate with the LIS. A logical access location entity (ALE) is defined as the source of the FLAP reporting. FLAP is XML and hierarchical. FLAP allows new forms of access to be added at any time, and allows vendors to extend their ALE functionality with proprietary features that can offer improved location capabilities and differentiate themselves from competitors.

Location Applications

In addition to emergency service calling, voice services can be enhanced by the utilization of location information, such as offering location-based call routing, billing and call-screening functions.

Beyond voice, Internet services can also be significantly enhanced by location information. Content can be tailored by location, and provide services that, for example, identify the nearest ATMs, restaurants or cinemas. Web-based mapping services can come alive because the retrieved location information allows the addition of the "you are here" element which is often critical in making practical use of map and navigation information. Locating friends and family wherever they are using the Internet also becomes possible. And, from a more serious perspective, national security agencies can utilize operator LIS capabilities to pinpoint the source of threats as they originate on the Internet.

The Andrew Geometrix® LIS Demonstration

The Andrew Geometrix® Location Information Server (LIS) for IP networks provides a generic location server for IP devices with a consistent query interface, regardless of the access network technology utilized. IP devices can obtain location information in the same way regardless of whether they are operating on a residential DSL or cable connection, in a mobile WiMAX network, a public WiFi hotspot, or an enterprise Ethernet network.

Upon request, Andrew can arrange for a customized demonstration of IP location technology and applications. This can be done at Andrew premises or on customer's premises, with the only requirement being access to an Internet connection. A demonstration will also be given at Booth #301 during the WiMAX World 2007 show in Chicago.

The Andrew demonstration network (see below) illustrates how an LIS can function in association with HELD-enabled devices or security applications. The network equipment shown, typical of an enterprise infrastructure, consists of an Ethernet switch, WiFi access points and a residential gateway. The user experience, and client device dependency, is just as it would be in any form of access network, including WiMAX.

The Andrew LIS Demonstration System

