

Location Based Services for Subscribers within Femtocells

- A Case Study

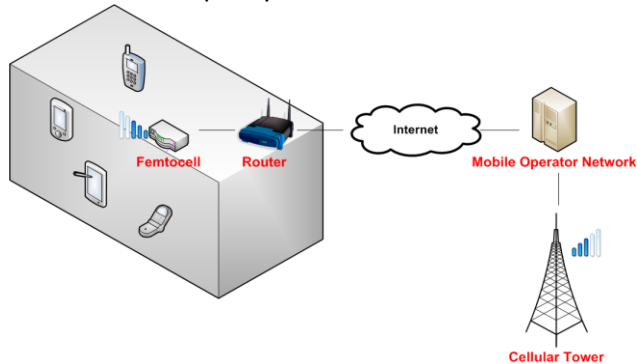


The IP (Internet Protocol) based core of modern mobile networks is a very flexible infrastructure allowing operators to quickly introduce innovative services. But new applications residing in the packet core need to be carefully

designed to co-exist with other applications and network functions. LCN Diameter tool chain allows a leading US service provider to offer location based services to subscribers within Femto Cells.

Customer

The customer is a leading North American telecom service provider who is the process of deploying a very large number of femtocells. Femtocells improve the quality of experience of the subscribers as well as extend the capacity of the mobile network within large buildings like factories and malls.



(Picture courtesy: <http://www.cse.wustl.edu/~davidh/Pages/femtocell.html>)

Challenge

Location of an active mobile device in a cellular network gets computed on a continuous basis. Different methods are used for this. But when a subscriber is within a femtocell, location of the femtocell itself is sufficient to locate the subscriber with good accuracy. Further, femtocells, once installed, stay at the location unless moved by the technician. So its location can be determined during the installation and can be stored in a database for later use.

The challenge was to develop a method to make the location of a femtocell available to the network — so that when a subscriber makes an emergency call, it can be forwarded to the correct destination, and the location of the caller can be made available to the emergency services. This solution has to be reliable, has to be scalable as FC deployments increase. Above all, the application should not introduce new protocols and complexity in to the core network

LCN Solution

Mobile packet core almost exclusively uses Diameter protocol for signalling. Policy control, billing and IMS subsystems generate lot of Diameter traffic. Diameter (IETF RFC 6733) being an extensible protocol, is easily adapted to meet different application needs. Diameter switches and load balancers in the network process all variants of the Diameter PDUs (protocol data units), thus utilizing the existing infrastructure.

LCN Diameter family of products include implementation of RFC 6733 (Diameter protocol), along with libraries implementing various extensions defined by standard bodies like 3GPP and ETSI. These developer products can be used to quickly develop new, standard compliant telecom applications.

LCN E2 Interface is an implementation of ETSI ES 283.035 specification, which defines a protocol for exchanging IP-connectivity data between a repository and an application. For the current application, standard E2 protocol was tweaked to carry the location data. A server application was developed to process Diameter location requests and respond with answers carrying the location data.

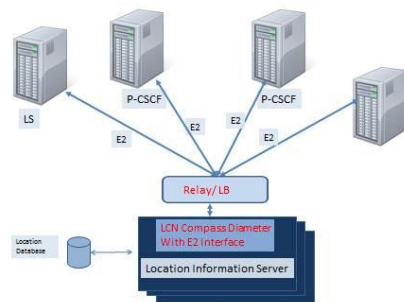


Figure 1 Location Server

The application was deployed with geographic redundancy, using existing Diameter load balancers. P-CSCF's from other vendors like Nokia Networks complete the solution.

The Result

LCN Compass Diameter enabled the customer to meet the new requirements with minimal additional infrastructure. The solution plugged in neatly in to the operating environment, minimizing the operating expenses (opex).

Contact

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