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VoIP Caller Location Implications for ISPs

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UKNOF 13 - 28/05/2009

Things we need to know

- What’s the problem?
- Why is it an ISP problem?
- How do we make it work?

What's the problem?

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- VoIP originated calls to 999 increasing - now at 100k per annum
- Dispatch requires the caller location, as quickly and as reliably as possible
- Some callers are unable to give their location
  - They may not know it
  - They may be under duress
  - They may have speaking difficulties
- Users move house or are nomadic - static DBs no use

The Regulatory Position

- General Conditions of Entitlement
  - Rules for all Communications Providers (CA2003)
- GC 4, Paragraph 2:

  The Communications Provider shall, to the extent technically feasible, make Caller Location Information for all calls to the emergency call numbers "112" and "999" available to the Emergency Organisations handling those calls.

Why is it an ISP problem?

- Ofcom's (unofficial) position - ISPs carrying VoIP are bound by GC4 even if they're not providing the VoIP services
- ITSPs don't know where their customers are most of the time
- ISPs (generally) do know where their lines or services are delivered
- So - ask the ISP network where the caller is!

Proposed Interim Architecture

- ITSP receives outbound 999 call on service platform
- Forwards the call over SS7 (or to another ITSP)
- Simultaneously forwards the public IP and port of the VoIP signaling session to the Emergency Handling Authority
- EHA looks up which ISP is responsible for the IP address
- Sends that ISP a location request
- EHA routes the call to the appropriate agency and displays the caller's location
- All in a few hundred milliseconds…

Standardisation Work

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- NICC Standards Ltd
  - UK proposed architecture - near completion
- IETF
  - “HELD” protocol
    - Describes a “LIS” - Location Information Server
    - Serves “PIDF-LO” XML location objects
  - “LIS discovery”
    - Given an IP address which LIS is responsible for it?

LIS Discovery

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- Two Mechanisms:
  - Using BGP4
    - Use dynamic route collector to identify serving ASN based on route prefix
    - Use a static table from ASN -> LIS URI
  - Reverse DNS
    - Put NAPTR records in `in-addr.arpa.`
    - Allows enterprise-level delegation
- Reverse DNS preferred, with BGP4 as the fallback

Commercial and Policy Implications

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- It'll cost money
- Are there revenue opportunities?
  - Location based searches - where's the nearest Pizza Hut?
  - Geo-location based advertising - would Google pay for accurate customer location information?
- What are the privacy implications?
  - Can you sell customers' information to third parties?

Longer Term

- VoIP devices ask the network for their own location and deliver it in-band straight to the EHA in SIP headers
- In most cases this still requires the IP access network to tell the device where it is
- There’s apparently no getting away from the need for ISPs to be involved

How can we help?

- Track the IETF standards
- Be prepared - think about how you could identify your users' locations
  - SID into RADIUS?
  - CRM / OSS?
- Join NICC
  - Responsible for UK NGN interconnect standards, etc
  - Dominated by large CPs
  - Needs more ISPs and ITSPs