Next-Generation Emergency Services
Emergency Communications over IP

Richard L. Barnes
BBN Technologies
IETF GEOPRIV Secretary
Emergency Services Workshop Program Chair

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Outline

- What are Emergency Communications (EC)?
  - Citizen-to-Authority Communication
  - Authority-to-Citizen Communication
- Why EC over IP?
- How might EC over IP work?
  - Examples
- What is required to do EC over IP?
  - Location via standard interfaces
  - QoS, priority, acces
- Who's working on EC over IP?
- How can you learn more about EC over IP?

What is Emergency Communication?

- **Citizen-to-Authority**
  - Calls routed to the nearest police/fire/medical Public Safety Answering Point (PSAP)
  - 1-1-2, et al. in Europe (and on GSM phones anywhere!)
  - 9-9-9, 9-9-8, 9-9-7 in UAE
  - 9-1-1 in North America
- **Authority-to-Citizen**
  - Wide-scale warnings about emergency events
  - Often targeted to users based on their location
  - Earthquake, tsunami, hurricane, etc
- **Both of these functions are important parts of the PSTN, and will need to be replicated in Next Generation (IP-based) networks**

Why EC over IP?

- A growing number of devices support IP
  - iPhone, 3GPP, Blackberry, etc
- People are using IP devices in more and more places
  - Hotels, coffee shops, convention centers, etc
- VoIP and Real-Time Text Messaging are growing
  - Skype, Google Talk, Vonage, etc

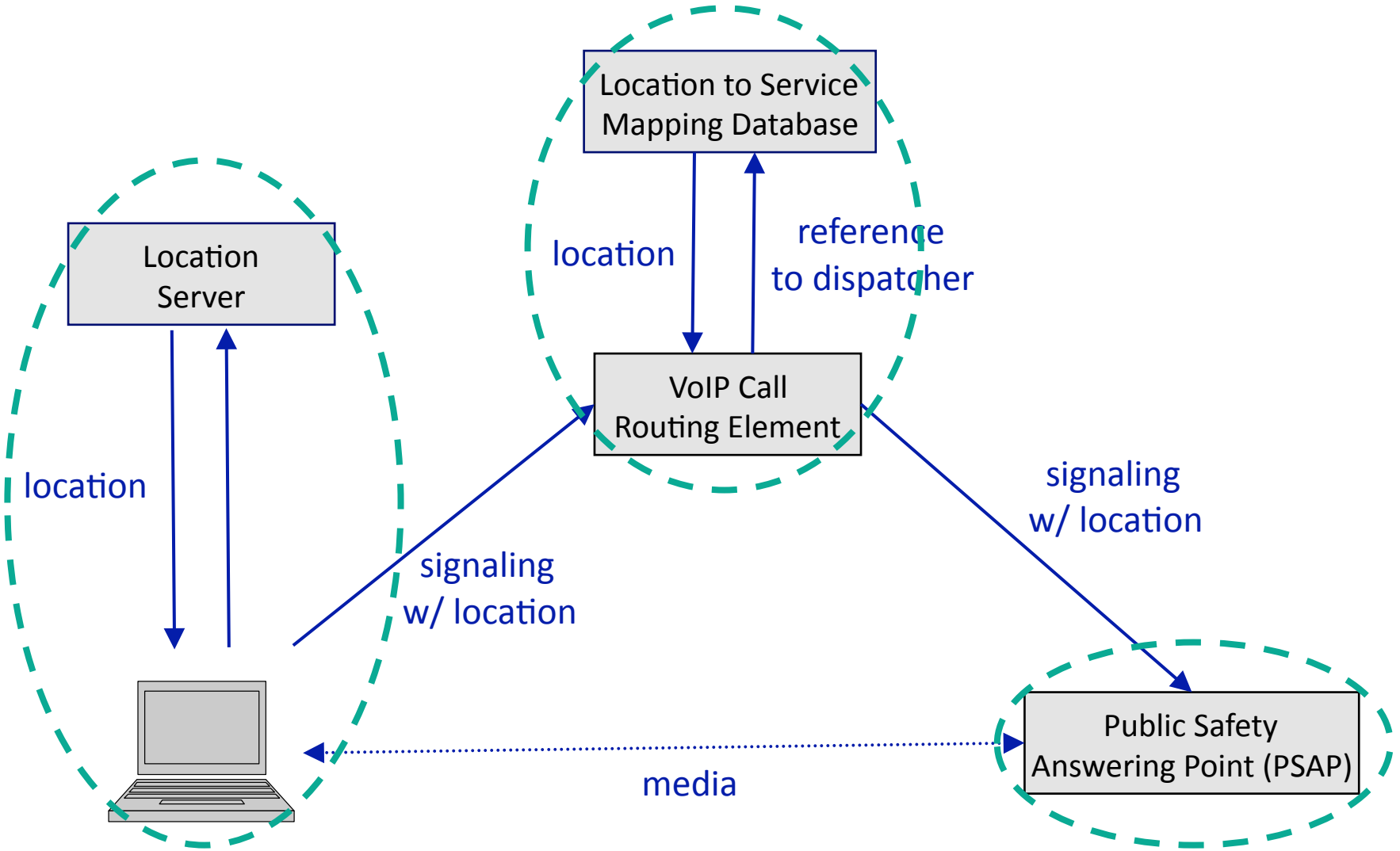
- Goal: Any IP-device on any network can request help or receive warnings anywhere on the Internet – anywhere in the world

Citizen-to-Authority Example (by value)

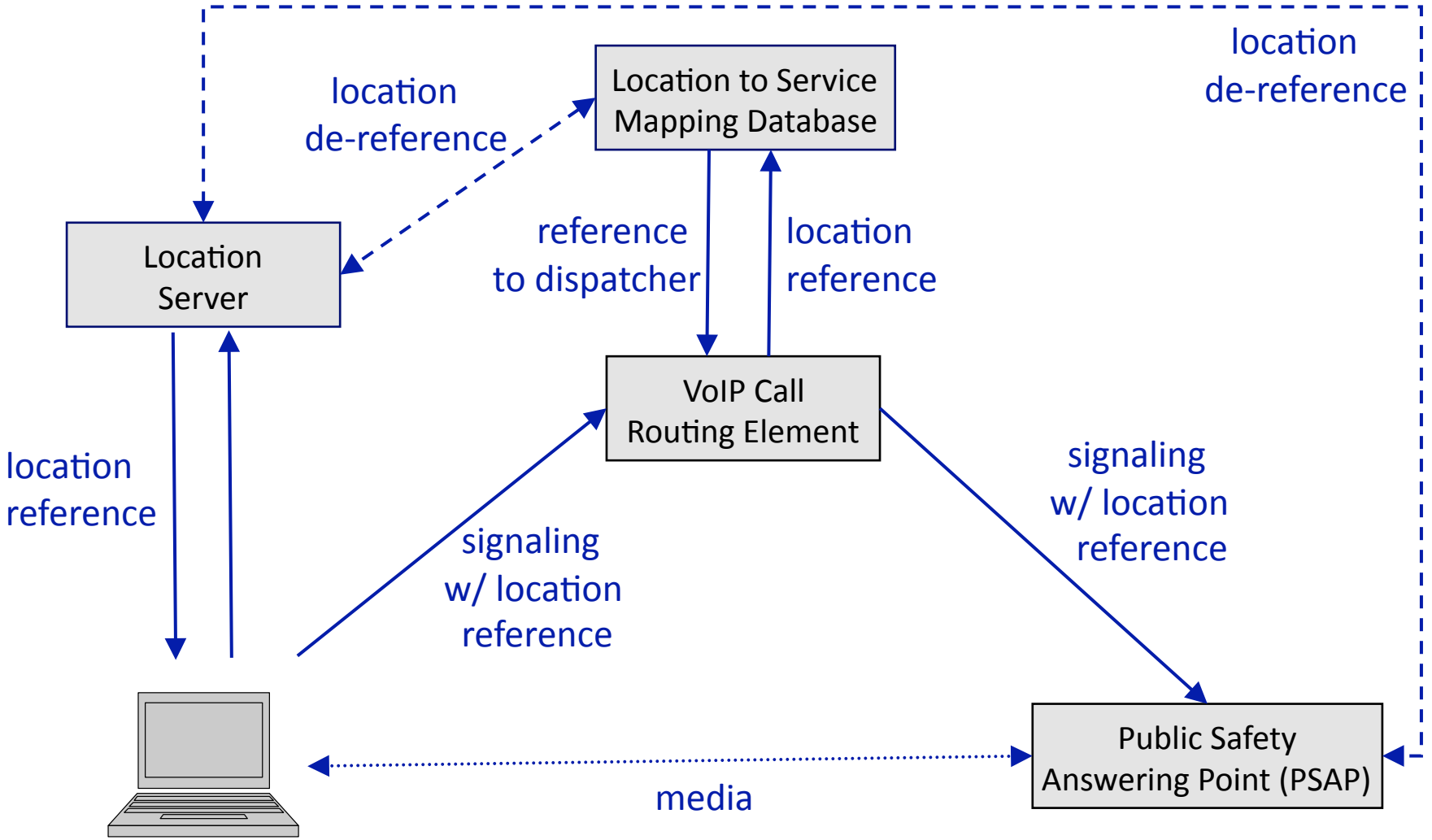
Locate the caller

Route the call

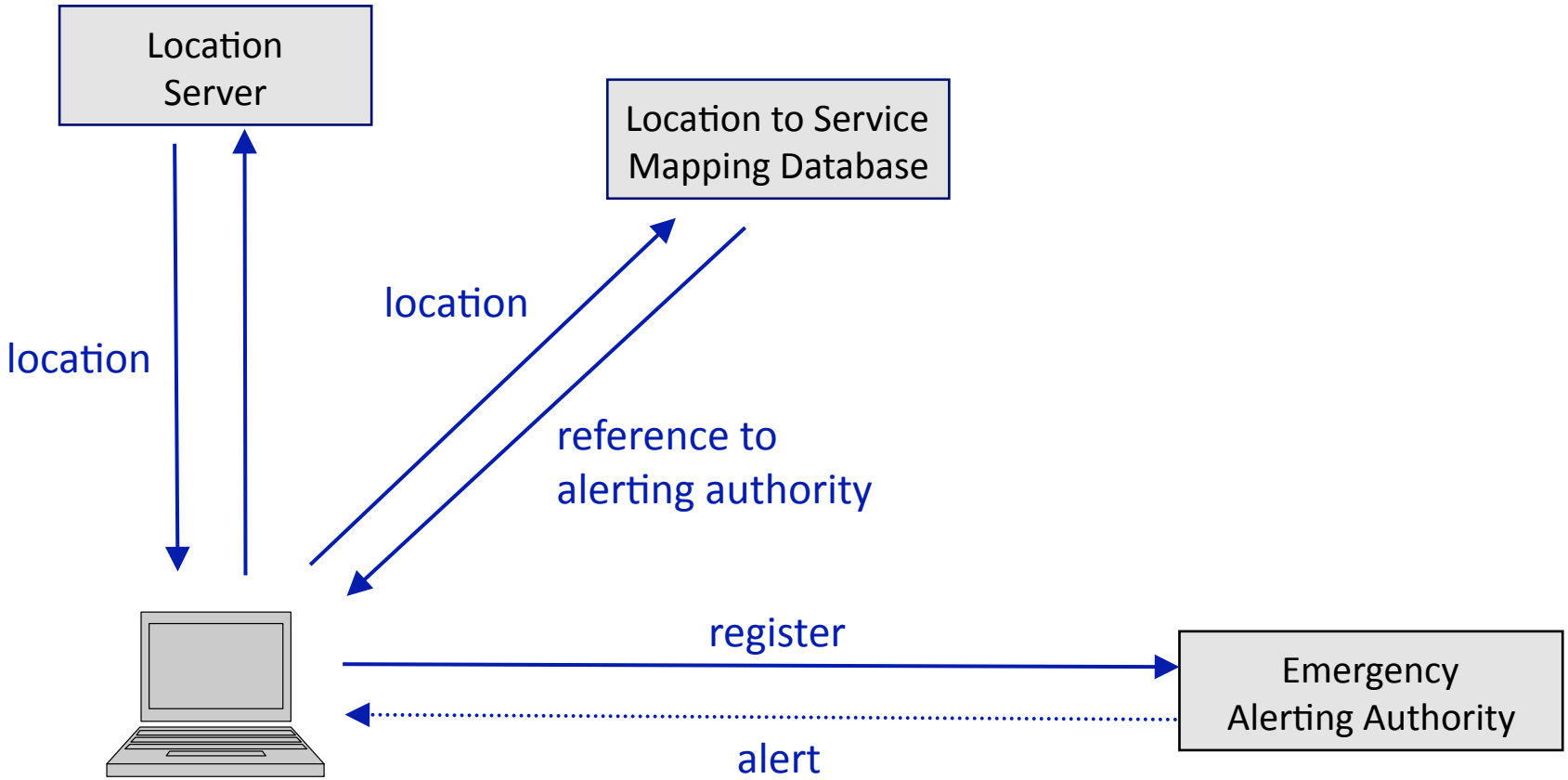
Deliver the call



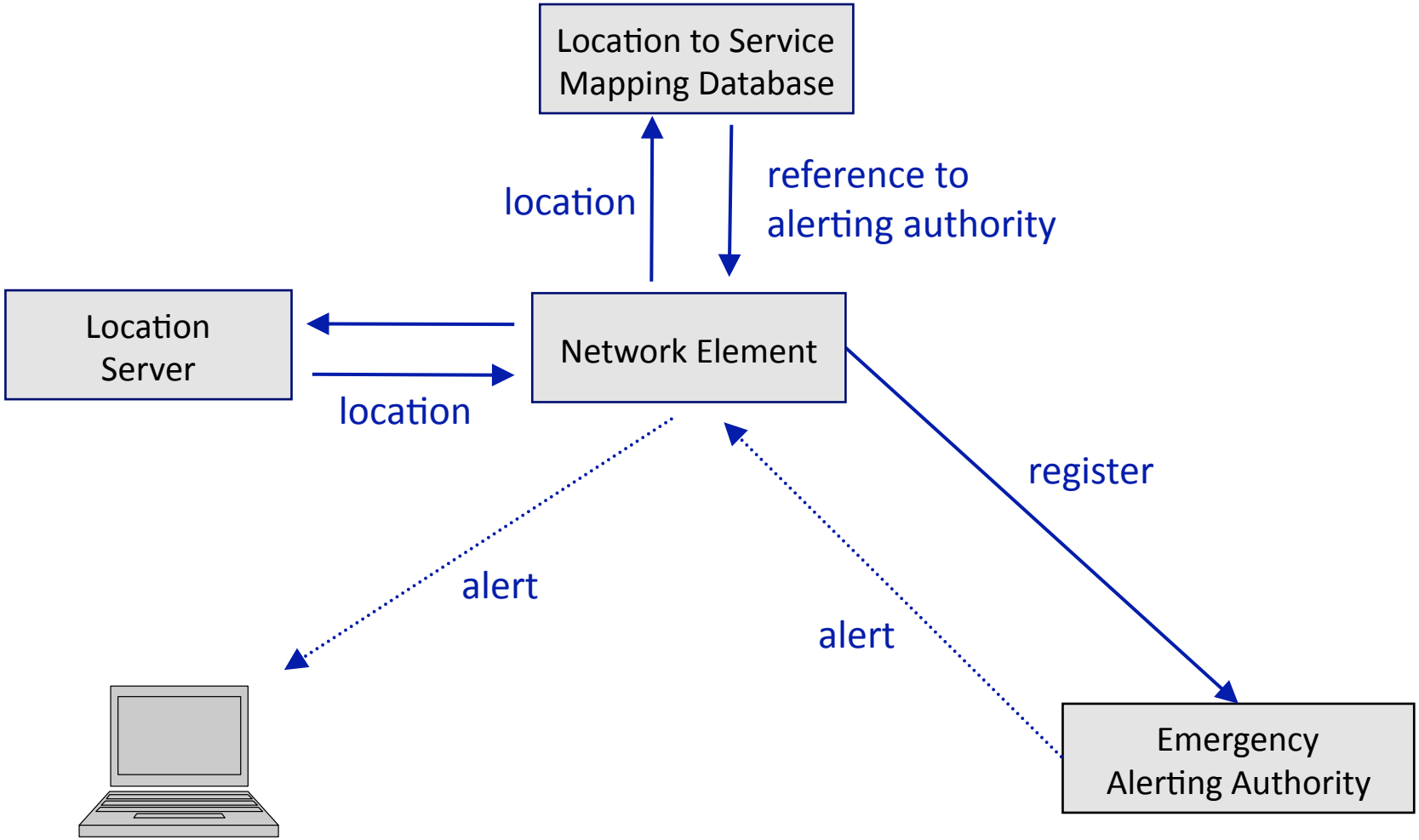
Citizen-to-Authority Example (by reference)



Authority-to-Citizen Example (Notional)



Authority-to-Citizen Example (Notional)



What's required for EC over IP?

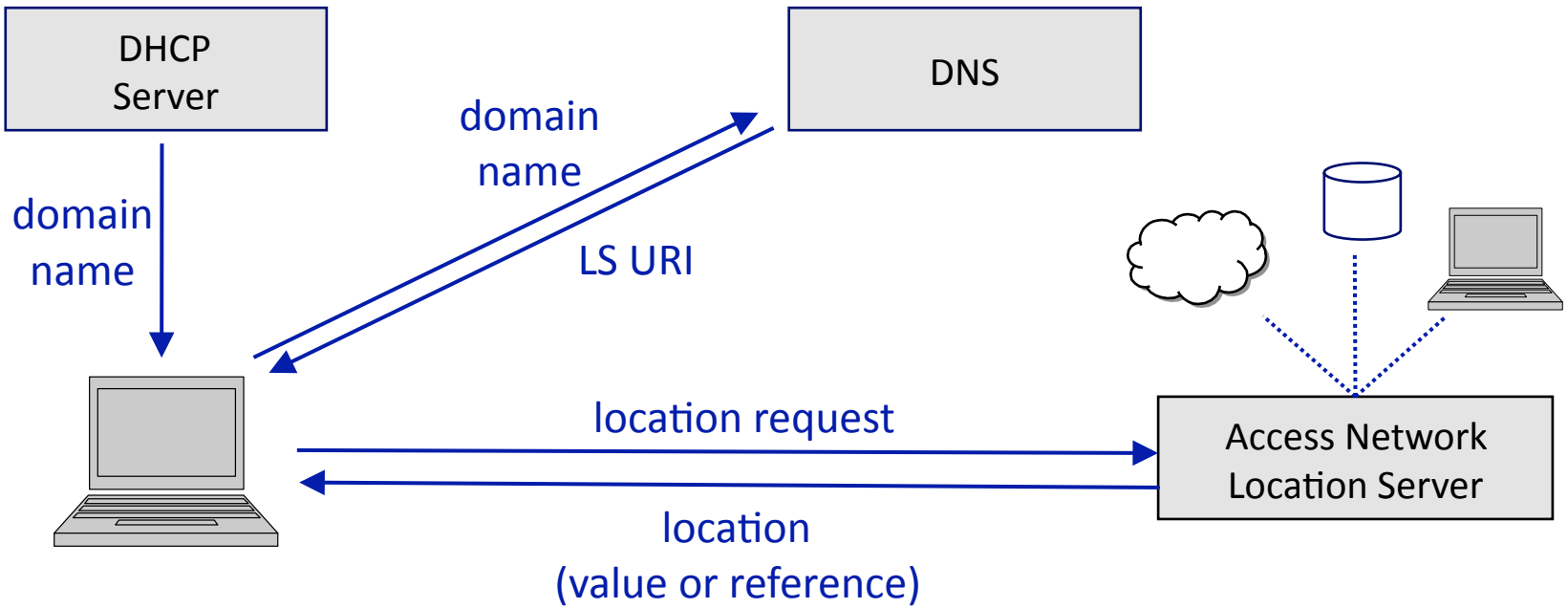
- **Basic Requirements**
  - **Location of callers via standard interfaces**
  - **Location-to-service translation database**
  - **Emergency services reachable over IP**
- **Possible additional requirements in certain jurisdictions**
  - **Ability of non-registered devices to make emergency calls**
  - **QoS to prioritize emergency calls**

Requirement: Caller location information

- Location is required at many points:
  - Routing emergency calls to the correct PSAP
  - Directing responders to the emergency
  - Determining which emergency alerts to deliver
- Access network has a key role in locating a device, since it's the only IP entity that has a physical relationship to the caller
  - Network topology data to locate wired devices
  - Base-station ID, GPS assist, or trilateration to locate wireless devices
- Access networks will need to "location-enable" their networks
  - Create functions to determine the location of their subscribers
  - Provide location information to users and/or PSAPs
- Good News: Other non-emergency services are also driving location
  - Location-based advertising
  - "How do I get to the nearest grocery store?"
  - "Which of my buddies are nearby?"

Standard interfaces for location

- **Standards bodies have defined a small number of mechanisms for the network to tell an endpoint either its location or a reference to its location**
  - **E.g. DHCP, HELD, SUPL/MLP, etc**
- **An access network needs to provide location (or location references) via one of these mechanisms**



Who's working on EC over IP?

- **Standards Bodies: Creating standard interfaces and architectures**
  - General IP architecture: IETF
  - Network-specifics: 3GPP, 3GPP2, OMA, WiMAX, ETSI TISPAN
  - Data exchange formats: OGC, OASIS
- **Regulators: Creating regulations that makes sense for VoIP**
  - EC Information Society, DE BNetzA, NO NPT, UK OFCOM, US DoT/FCC/NIST, et al.
- **Network operators: Enabling emergency calling in real networks**
  - BT, DT, FT, et al.
  - Mainly from the PSTN perspective, need more IP networks
- **Emergency services operators:**
  - UK, US IN, AT, et al.

Emergency Services Workshops

- Every 6 months since October 2006
  - Just held ESW5, 21-23 Oct 2008 in Vienna, Austria
  - Next workshop to be held in Spring 2009 (location TBD)
- Broad participation from Europe and North America
  - Standards Developers
  - Regulators
  - Network Operators (mainly telecoms, not ISPs!)
  - Emergency Services Operators
- Goals:
  - Standards alignment between standards bodies
  - Coordination among all participants in deployment of EC over IP

How can you learn more?

- **Contact me:**

  rbarnes@bbn.com

- **ESW website:**

  http://www.emergency-services-coordination.info/

- **ESW mailing list:**

  es-coordination@lists.cs.columbia.edu

Thank you!

Richard Barnes

<rbarnes@bbn.com>

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