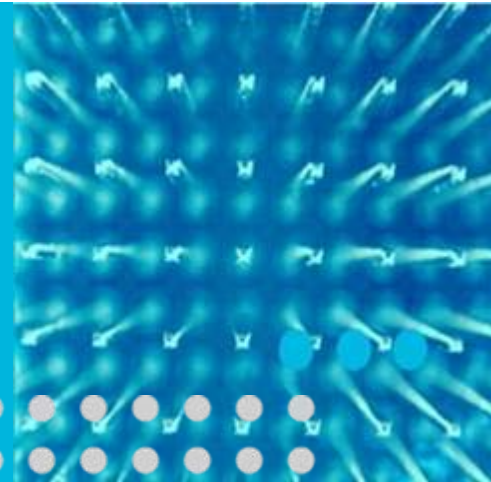


Current Service Provider & Enterprise Use of ENUM



Philippe Levillain
Director Product Management

October 2009





What Type of ENUM?

ENUM in IMS is a form of Private ENUM

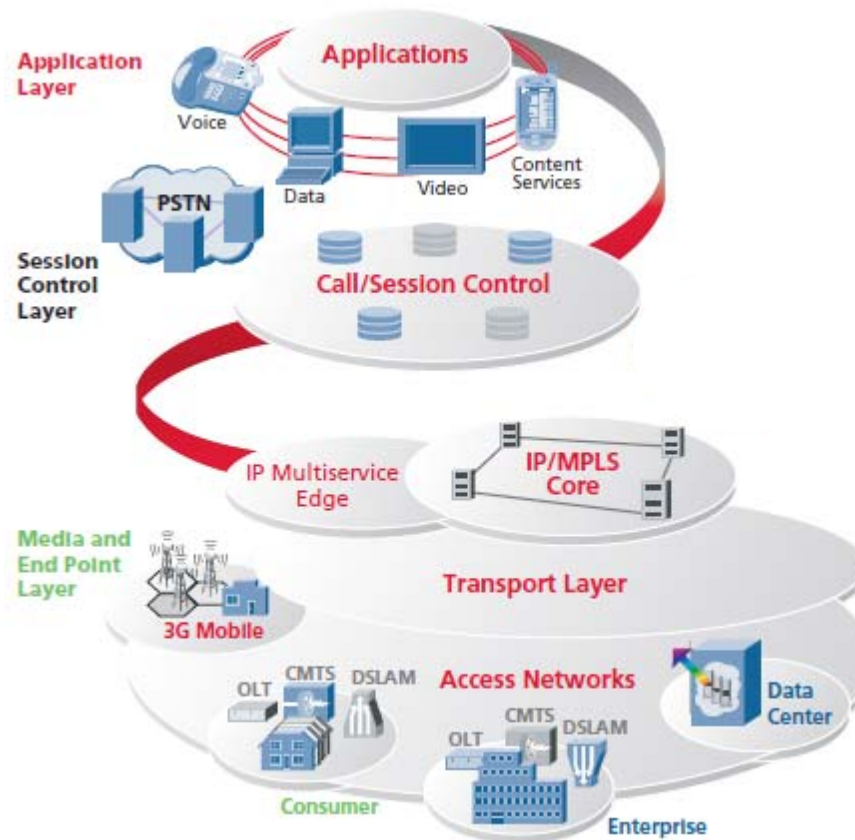
URI in NAPTR RegExp is for Service Provider's (SP's) Device (not End User URI)

NAPTRs may just be for SP's own devices or include other SPs, which would make it Infrastructure/Carrier/Provider ENUM

ENUM NAPTR usage in the enterprise

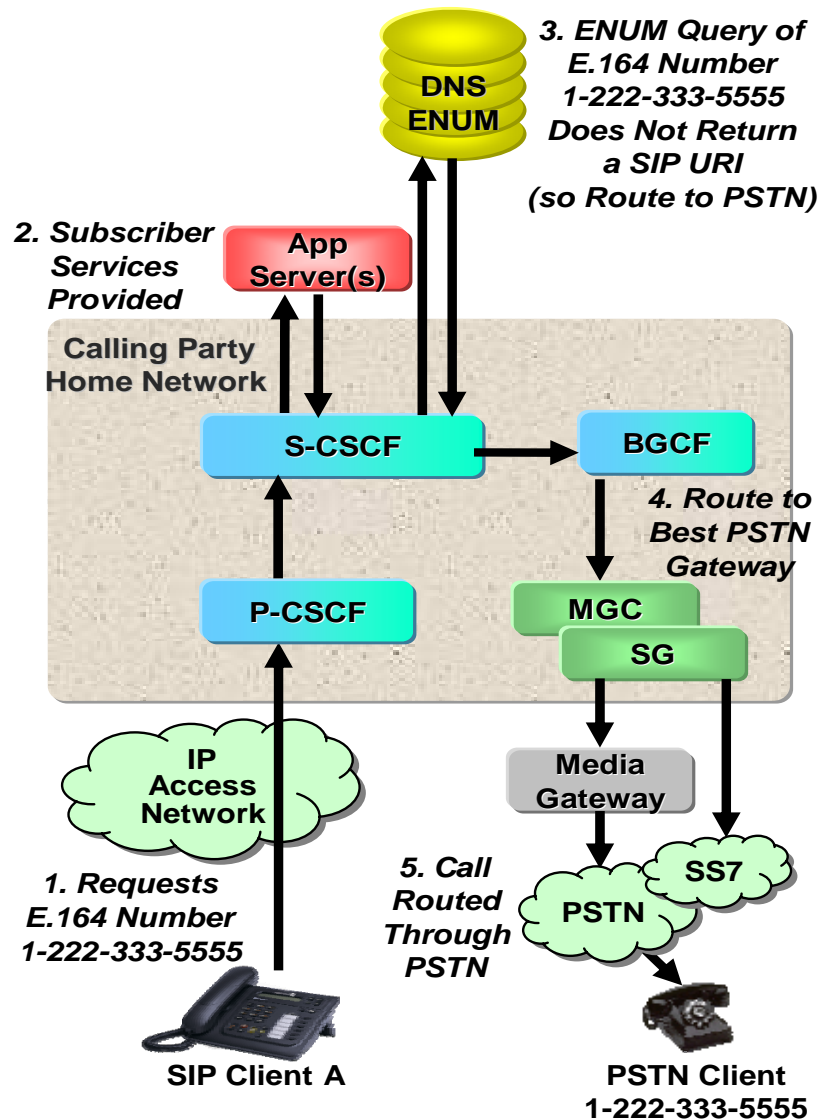


IMS in Brief

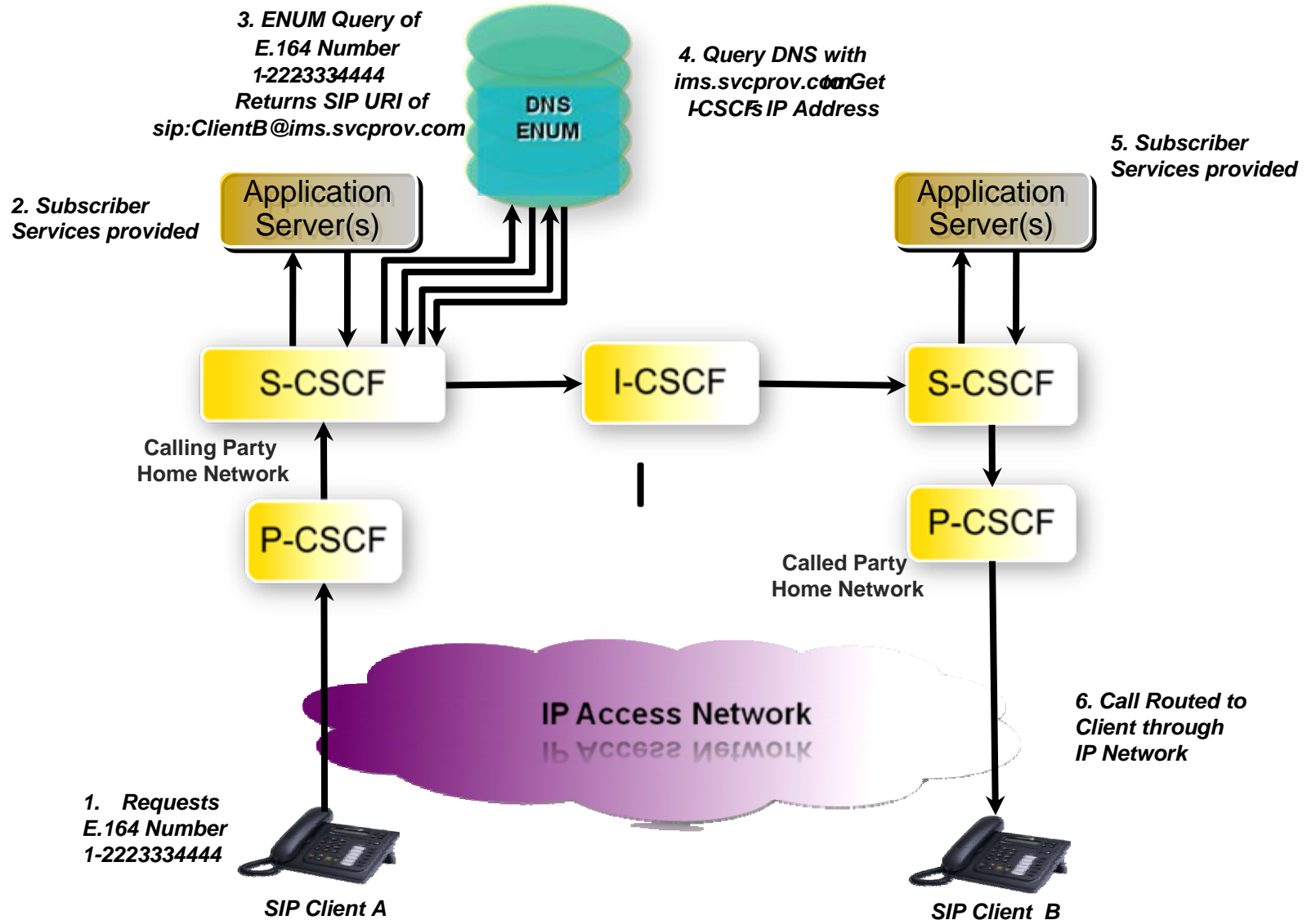


- 3 Layers: Applications, Control, & Transport
- One Core Network for All Types of Access (Wireline, WiMAX, Femtocells, etc.)
- All IP

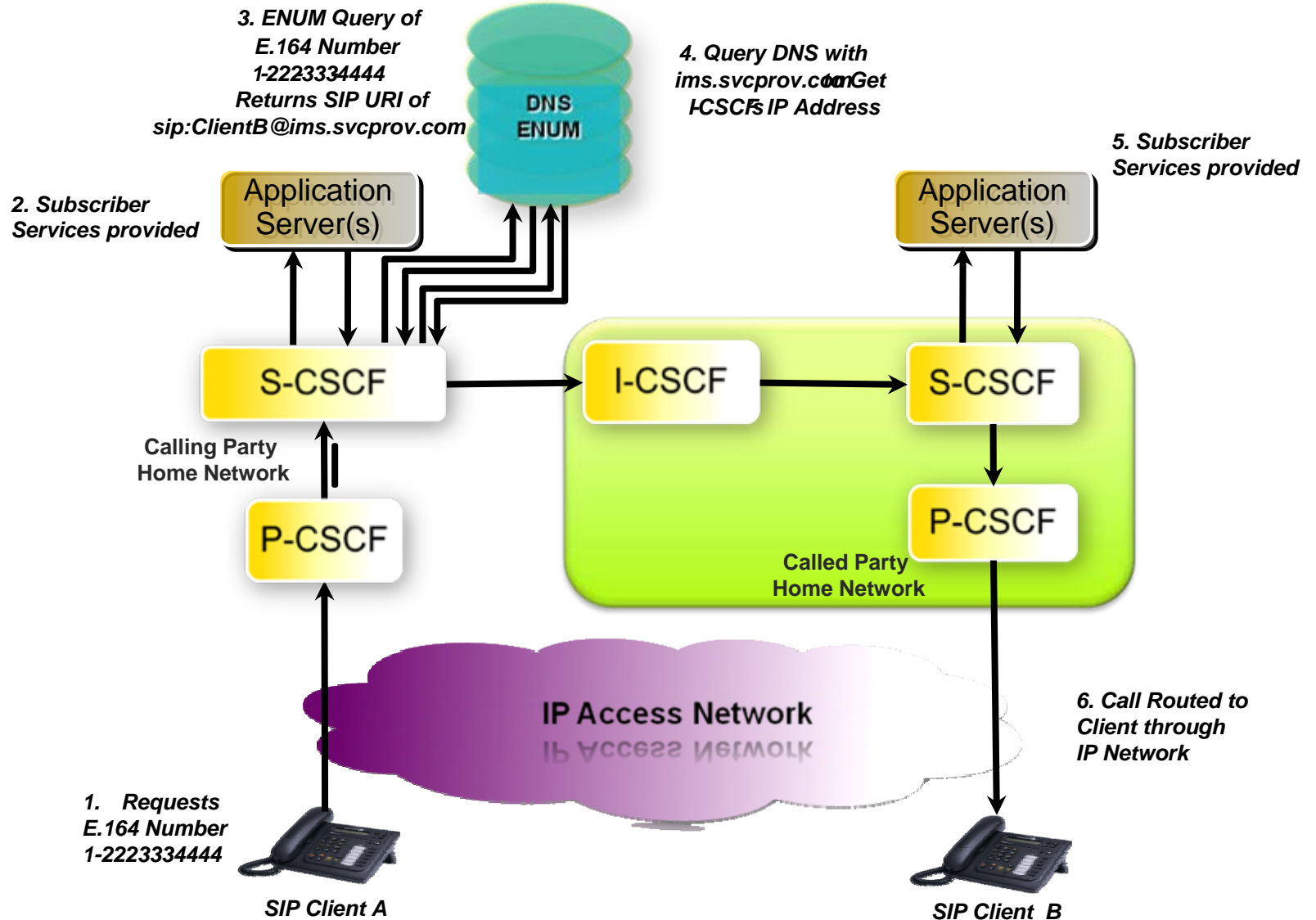
IMS Subscriber-to-PSTN Subscriber Call Set Up



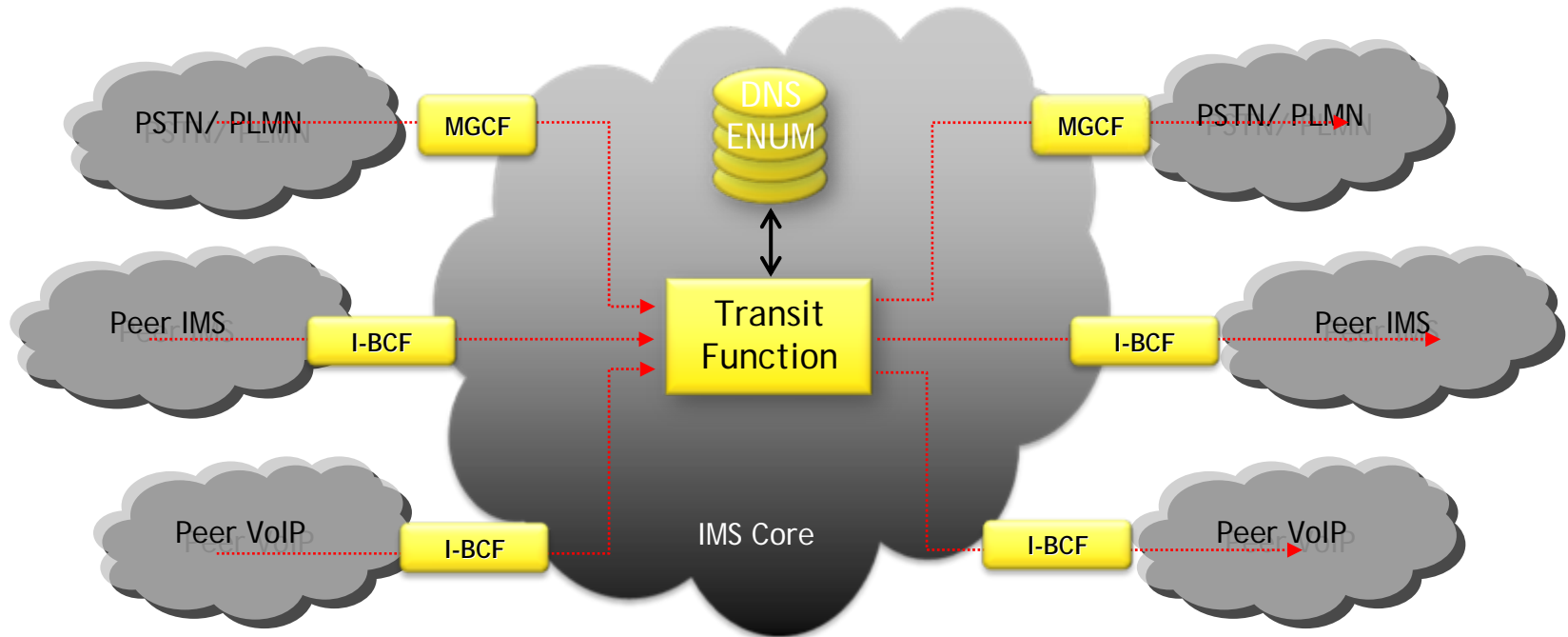
IMS Subscriber-to-IMS Subscriber Call Set Up (same domain)



IMS Subscriber-to-IMS Subscriber Call Set Up (2 domains)

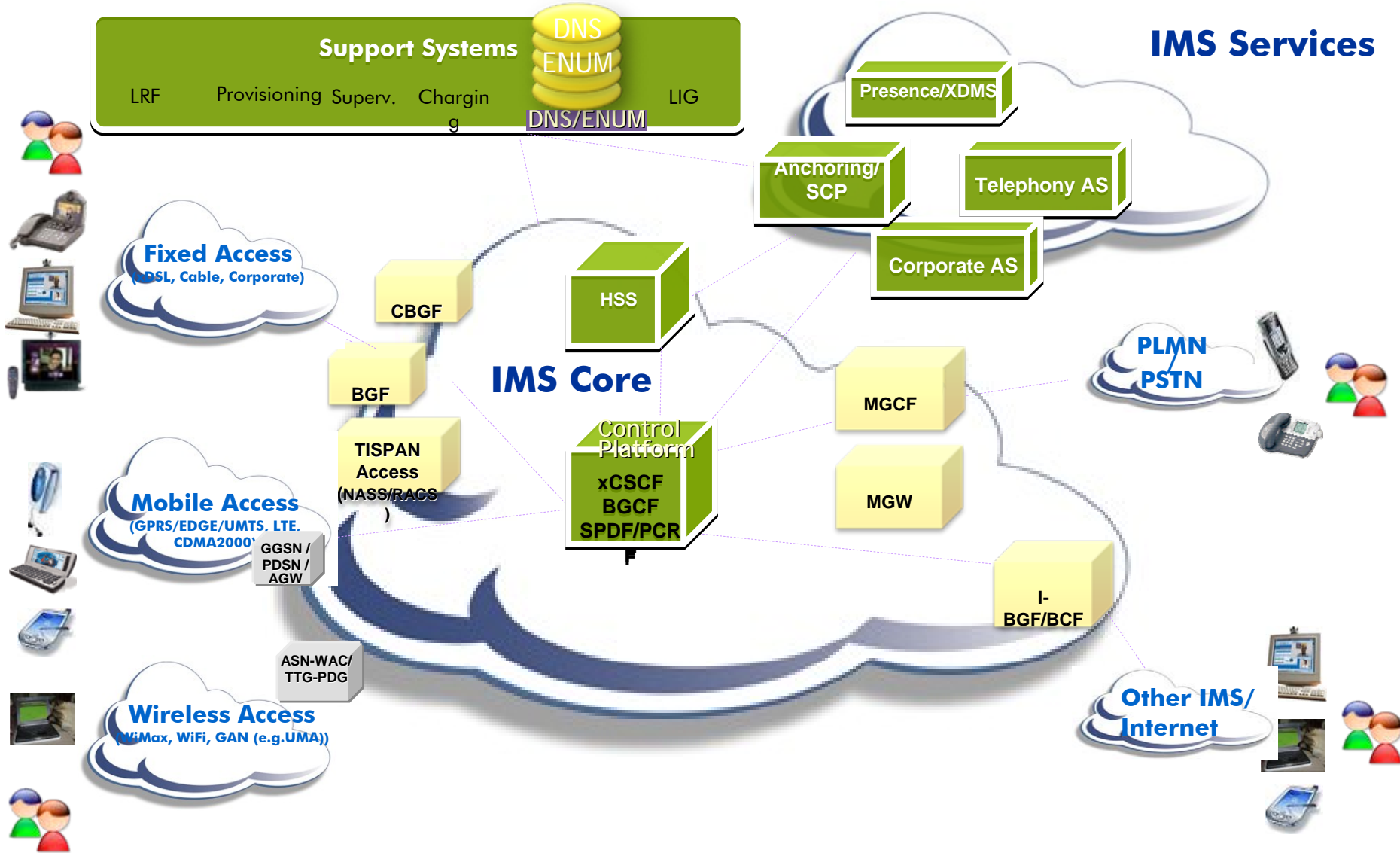


Transit Function Also Performs ENUM Queries



- Transit Function analyzes destination address, & determines where to route call or session
- Transit Function may be implemented with another element, such as I-CSCF

Rich communication suite for mobile service provider



ENUM isn't just an IMS protocol

Enterprises are deploying ENUM today

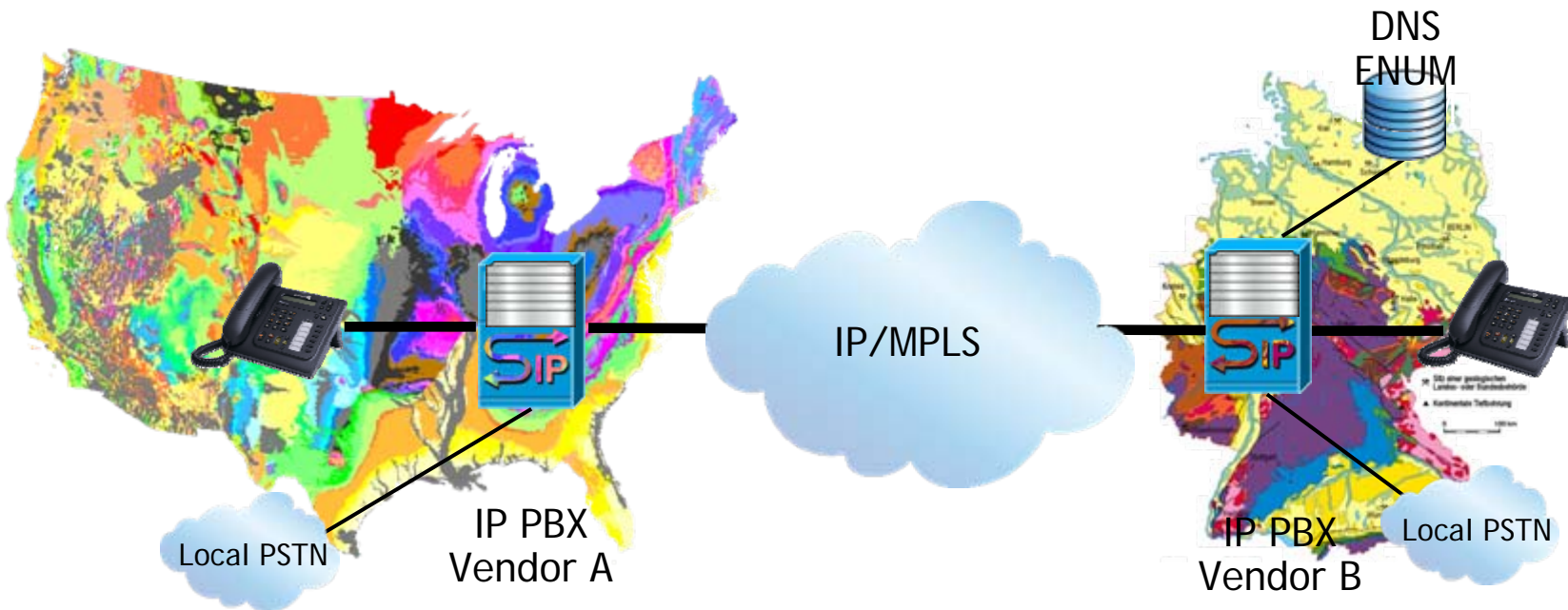
Lots of discussions are happening on ENUM and IMS / NGN

Nevertheless enterprise usage of ENUM is growing



Famous German car manufacturer usage of ENUM

VoIP services, Video service planned



Outcome: using dialing plan prefix
Static configuration
Vendor independency
Portability not worked out

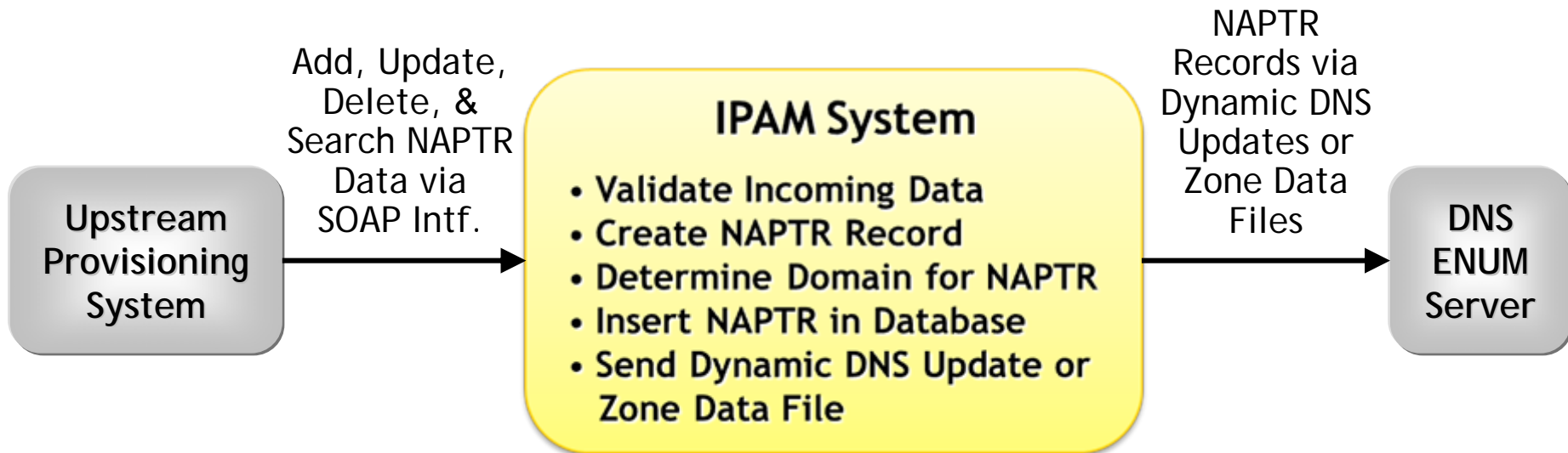
Goal: One Signaling Query for All Call Types

- Include NAPTR records for other service providers
- Single lookup is simple, reduces post-dial delay, and saves money
- RegExp in NAPTR contains npdi parameter for portability-corrected numbers and rn parameter for ported numbers (as per RFC 4694), or routing prefix
- Depending on source of data, sometimes possible to use NAPTR records with wildcards to significantly reduce number of records:
 - Wildcard NAPTR record covers range of mostly non-ported numbers for default SP
 - Single NAPTR record with complete number for ported exception
- URI in RegExp in NAPTR points to:
 - I-CSCF in Called UE Home IMS Network, if call destined for another SP's IMS network
 - Originating SP's BGCF, if call destined for PSTN or circuit switched network
 - Terminating SP's SIP Gateway, if call destined for non-IMS IP network
- Data format and interface from a country-specific authoritative source to provision these NAPTR records will vary

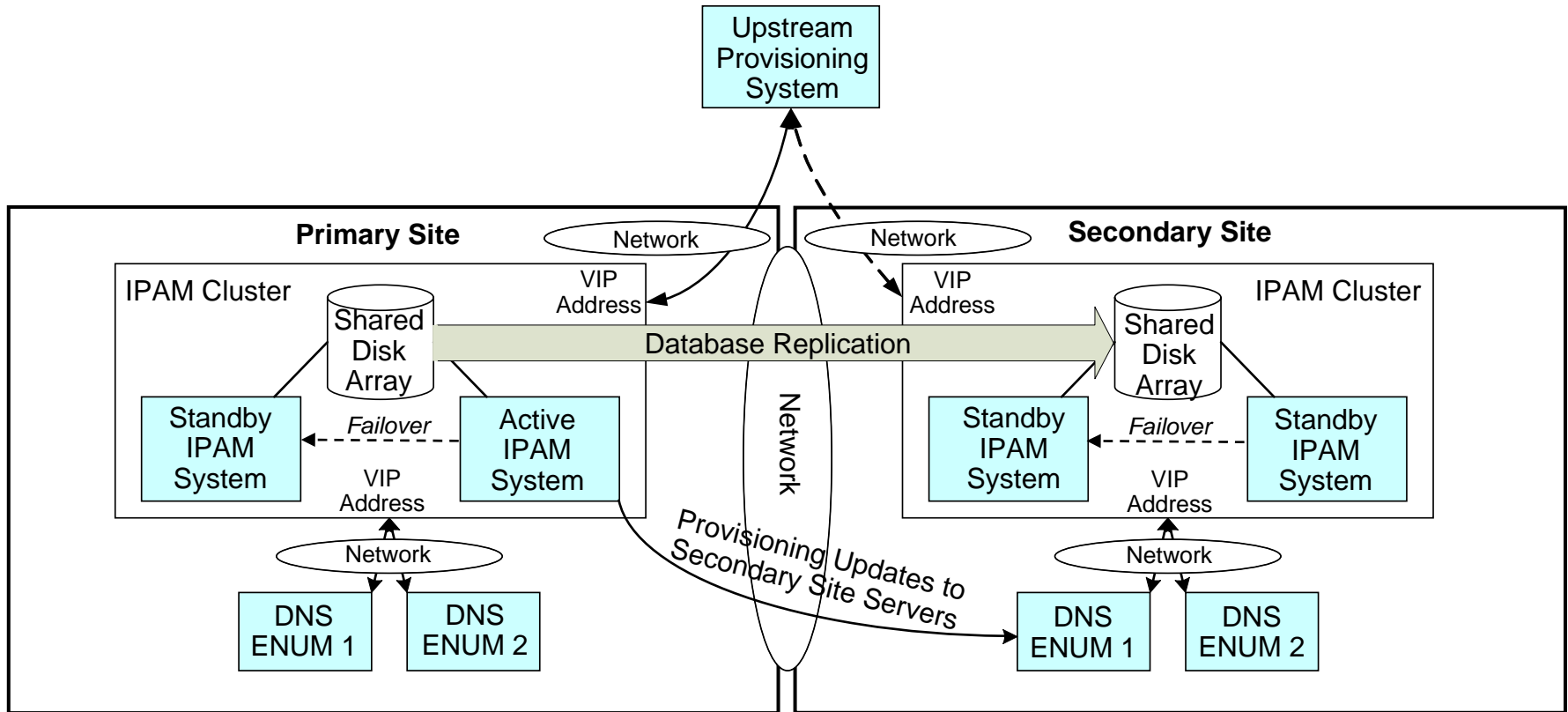
IP Address Management (IPAM) Systems and ENUM

- IPAM Systems:
 - Contain an inventory of networks, subnets, IP addresses, and domains in a database
 - Generate configuration and data files from database, and distribute them to DNS and DHCP servers
 - Etc.
- Best to manage all DNS servers, including ones with NAPTR records, with an IPAM system
- Some ENUM-specialized IPAM functions are needed:
 - Interface from upstream provisioning system to accept data to create large number of NAPTR records
 - Ability to split and merge ENUM domains (for example, 1.2.1.5.3.myenum.com) to manage their size
 - GUI enhancements, NAPTR validation, etc.

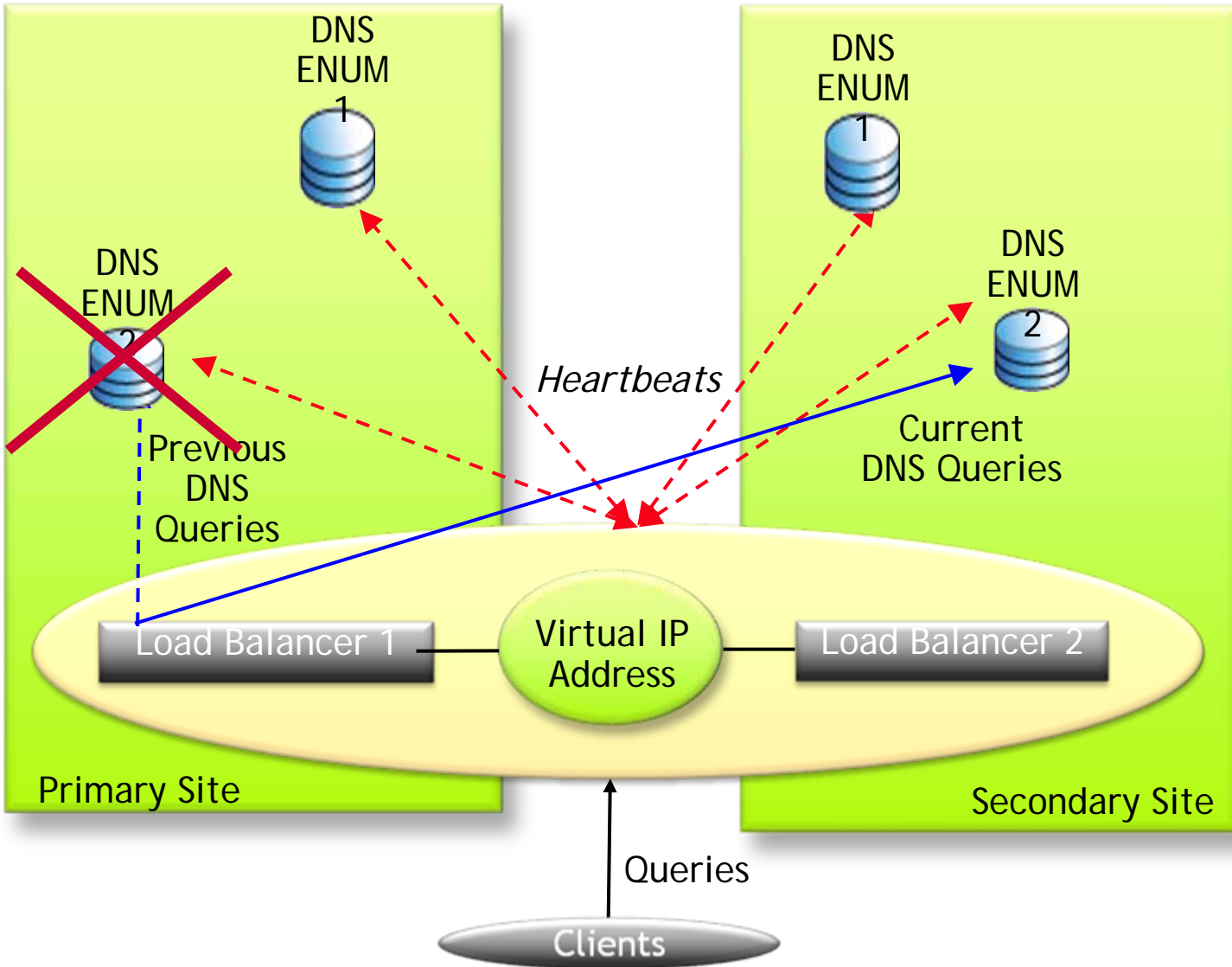
Easier Provisioning of NAPTR records using IPAM



IPAM System with Site & Geographic Redundancy

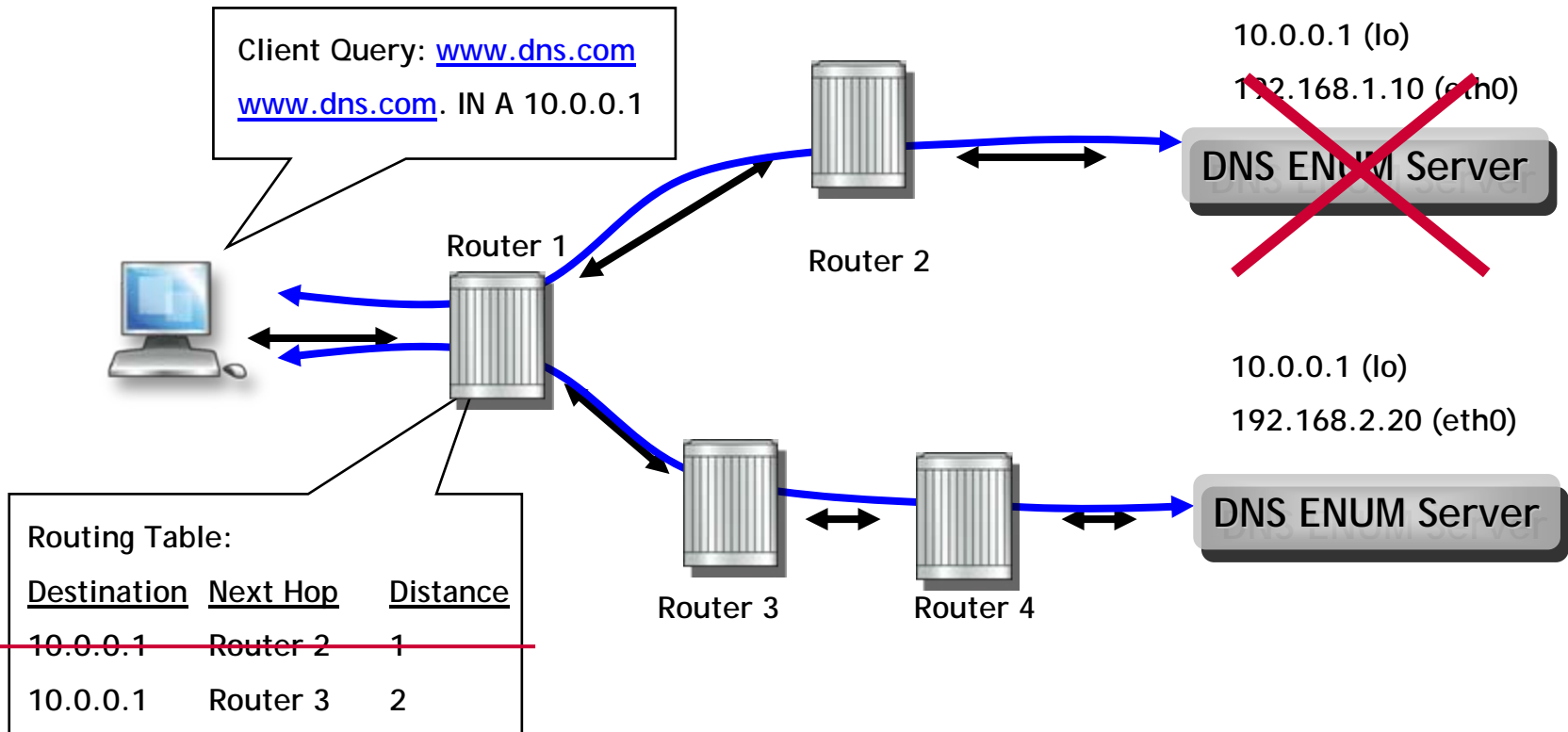


DNS Redundancy with Load Balancer



DNS Redundancy with Anycast

- Multiple Servers Share Same IP Address
- DNS Server Reliability (Failover)
- DNS Service Load Balancing
- Client Transparency
- Distributed Response to DoS Attacks





VitalQIP

Alcatel-Lucent originally built VitalQIP ENUM Manager in 2005, and since then our customers have deployed it in multiple production networks around the world.

Acronyms

BGCF	Breakout Gateway Control Function
I-BCF	Interconnection - Border Control Function
I-CSCF	Interrogating - Call/Session Control Function
IMS	IP Multimedia Subsystem
MGC	Media Gateway Controller
MGCF	Media Gateway Control Function
P-CSCF	Proxy - Call/Session Control Function
PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
S-CSCF	Serving - Call/Session Control Function
SG	Signaling Gateway
SP	Service Provider
SS7	Signaling System 7
UE	User Equipment
VIP	Virtual IP (address)