

nominet[®]

ENUM - Introduction and Impact

Phil Kingsland

Director of Marketing and Communications



enum

free your phone

A service from Nominet

ENUM - Introduction and Impact

Why ENUM?



enum
free your phone
A service from Nominet

ENUM - Introduction and Impact

Communication models



How do you control your receipt of email?

- Advertise which servers receive mail
 - single, global, low-cost directory - the DNS
- Specify priority order for servers
- Control what mail to accept
 - Black lists, white lists, reputation scores etc

Of course, this is the Internet

- Only pay for flat rate access - no per email charge
- Choose whether to connect via ISP or implement ISP-grade infrastructure

Contrast this with the PSTN



Calls in a pre-VoIP world

- Control on incoming calls is via Communications Provider (CP)
 - Limited user call control
 - Call routing and forwarding is managed and charged by the CP
- Pay for rental and call charges

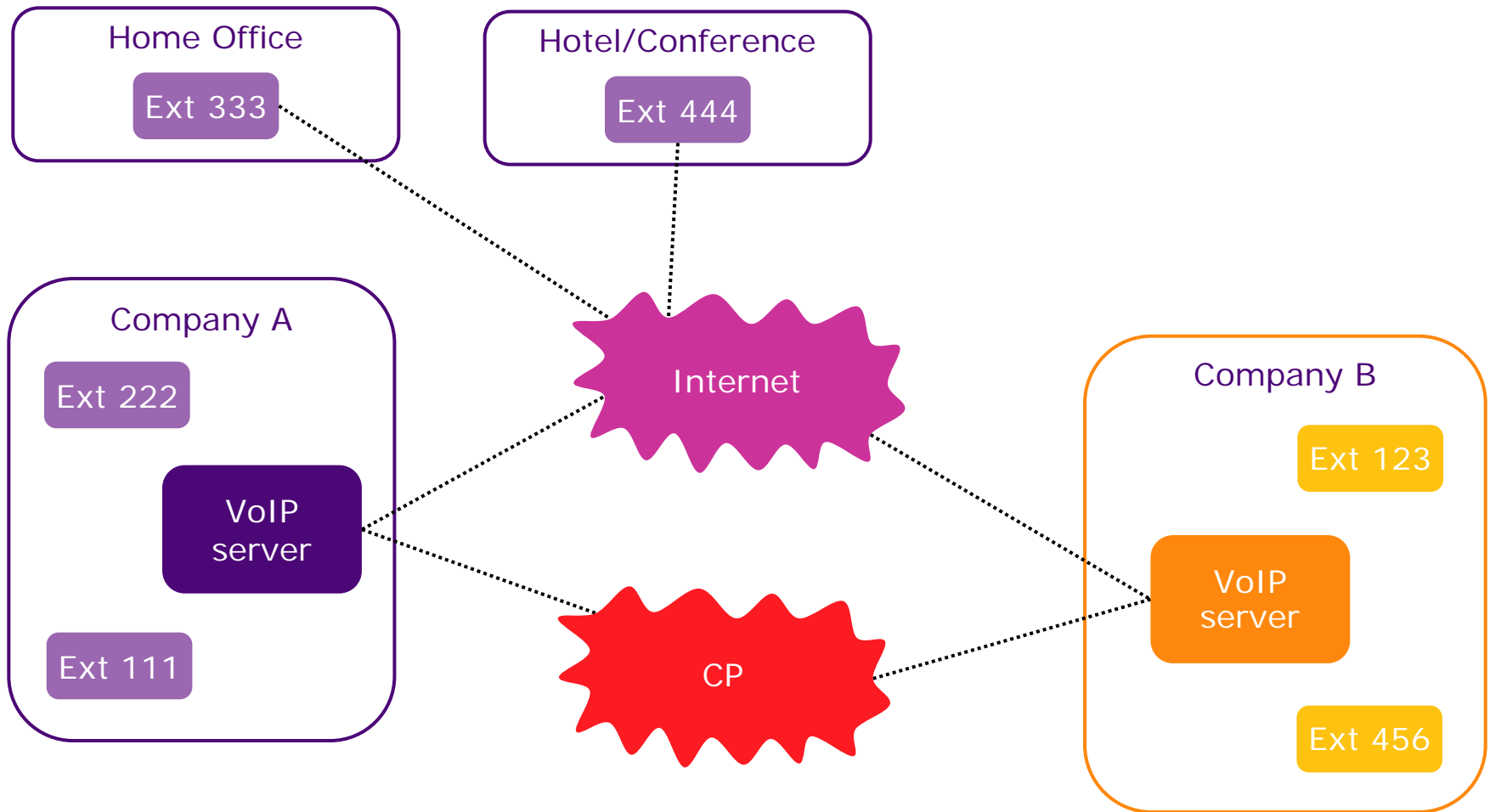


Gives you control of your telephony

- Your callers don't necessarily pay call charges
- You control what incoming calls to accept
 - Black lists, white lists, reputation scores, etc
- You choose how to mix ENUM and ordinary CP services
- You advertise what servers receive calls for what number and with what technology
 - Single global, fault-tolerant directory - DNS
- You choose how to connect your servers to the Internet
 - Locally, hosted, outsourced
- You can change your connectivity as and when you want

ENUM - Introduction and Impact

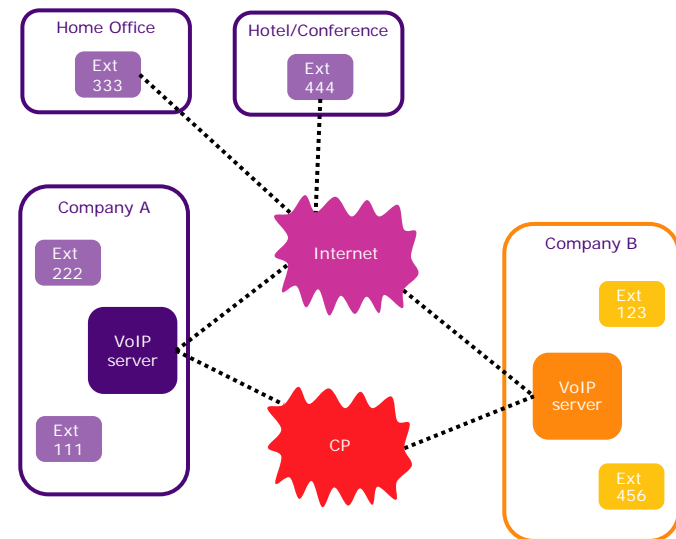
A common scenario



ENUM - Introduction and Impact

A common scenario

- Company A wants to talk VoIP to company B. It needs to know
 - Does B have a VoIP server?
 - What protocols does it support?
 - What is its IP address?
- With that info:
 - call across the Internet
 - no call charges, just line rental
- Without it:
 - has to call via a CP
 - pays call charges
- Can pre-configure server, but does not scale.
- Need one way to look this up, for all telephone numbers.





ENUM is just a part of DNS

- Step 1: turn telephone numbers into domain names:
 - Special domain names to represent numbers
 - 01865 332211 >> 1.1.2.2.3.3.5.6.8.1.4.4.e164.arpa
- Step 2: advertise available services associated with those numbers
 - Special DNS records describe available services
 - What server, what protocol, what addressing
- These domain names and records are not meant to be directly used by people.
 - You still dial the number - device does the rest



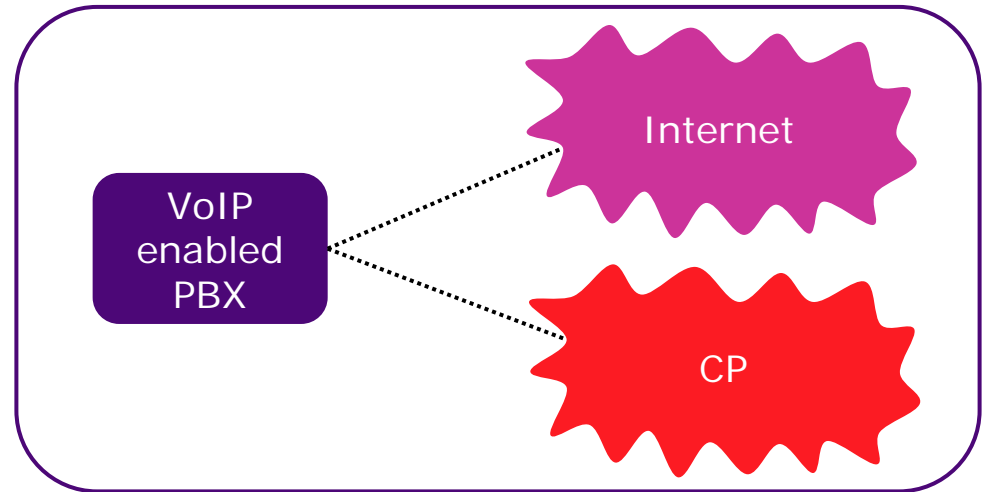
Much like email

- You dial a number, same as before
- A device on your network turns it into a domain name
- Then it looks up the VoIP servers advertised on that domain
- Finds a match for supported VoIP protocol (e.g. SIP)
- Make the calls directly to receiving server across the Internet
- No CP !
- User ENUM is about end user of telephone numbers controlling those numbers

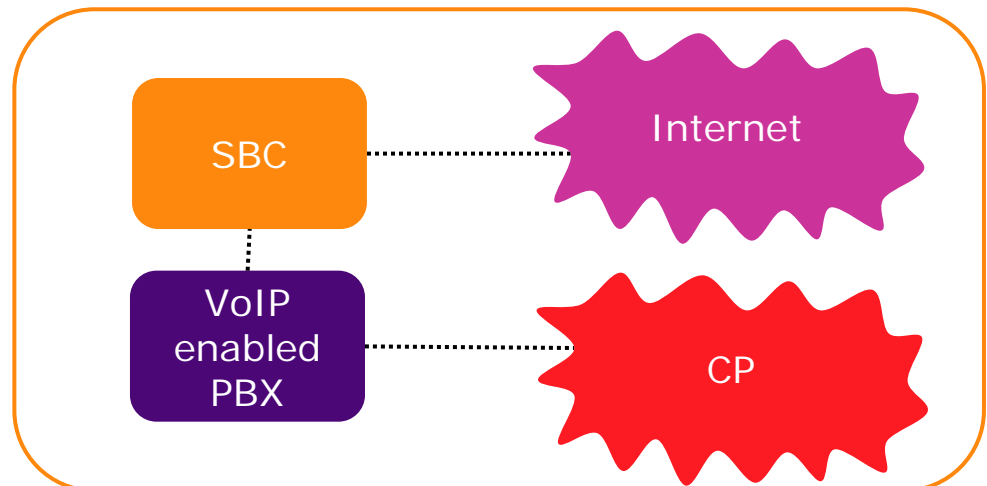
ENUM - Introduction and Impact

Local configurations

- Directly connected VoIP server
 - e.g. Asterisk



- Session Border Controller in front of VoIP server
 - SIP Proxy
 - Mix and match
 - "Enterprise" strategy



ENUM - Introduction and Impact

Impact



enum
free your phone
A service from Nominet



Everyone has heard of 'convergence'

- Convergence of Internet, voice, CPs, ISPs, content
- YouTube, iPlayer having dramatic effect
- CPs move to Next Generation Networks
 - ADSL2+ is 24Mb/s
 - FTTH or just FTTC coming next
- Hosting companies (web, email etc) adding VoIP mix
 - One supplier for my whole SME !
- All services will be supplied over one pipe

ENUM - Introduction and Impact

ENUM and the CP market



Last mile strategy

- You want
 - Customers to switch from PSTN to ADSL
 - Buy more products on top of that - Voice, TV, VoD, even Backup!
 - Control over 'difficult' applications - streaming content, P2P etc
- Customers want
 - Keep their existing telephone number
 - Not feel they're missing out because they don't use Skype
 - Cheaper / free calls

ENUM - Introduction and Impact

More on the last mile



enum
free your phone
A service from Nominet

Further proof of how important it is

- 3G license auctions
 - We all know how much was paid !
- Vodafone and Orange combining mast network
 - How much does it cost to build a new one?
- BT Fusion
 - The cunning plan
- Femto Cells
 - The mobile operators fight back
- Skype
 - A CP using other CPs bandwidth?

ENUM - Introduction and Impact

Impact on VoIP CPs



enum
free your phone
A service from Nominet

- Skype
 - Free call proprietary intra-network
 - Pay for inter-network
 - Skype user name is free - takemeseriously@skype.com
 - But telephone numbers cost money
 - Inside Skype free, outside Skype pay
- Joining up islands of VoIP
- Small providers already interconnect for free
 - Call Sipgate from Gradwell - dial **777 + number
 - Call Iptel from Sipgate - dial 000477 + number
- Lower barrier to entering the market
 - Before ENUM proposition was intra-network savings - requires a huge network
 - After ENUM proposition is inter-phone saving - network independent.

ENUM - Introduction and Impact

Other flavours of ENUM



enum

free your phone

A service from Nominet

ENUM - Introduction and Impact

Infrastructure ENUM



- Private ENUM trees used by a carrier for call routing - no registry involved.
- Very different scale to public DNS
 - Below 10ms response time, always
 - Hundreds of millions of ENUM domains
 - ENUM servers in their data centres
- Very big business at the moment
 - Specialist DNS suppliers
 - Peering exchanges
- Standard being discussed at IETF
 - May designate new tree for this e.g. e164c.arpa
 - May be public tree but private connections



- UK designed central call routing database
 - Every UK telephone number in time (~800m)
 - Queried for every call
 - All major CPs will keep a full copy locally
- Uses ENUM as a core technology
 - Private database not related to user ENUM
- Massive impact on supplier market
 - Huge capital investment by CPs
 - Huge opportunity for vendors - who must support ENUM to take advantage
- Currently suspended whilst Ofcom re-analyse the business case



- Hybrid of Infrastructure and User ENUM - entirely UK specific
- Process
 - Carrier registers block of numbers with Registry
 - Registry checks ownership
 - Registry publishes NAPTR records not NS records
 - Choice of NAPTR records very limited
 - Overwritten by user ENUM registration
- What is it for?
 - Designed to populate user tree quickly
 - New carriers who are entirely IP/Internet based
 - Low cost services from incumbents
- Very low price as bought in bulk.

ENUM - Introduction and Impact

And finally



enum
free your phone
A service from Nominet

Wild ideas

- ENUM doesn't just store VoIP server details
- Can also hold:
 - Alternate telephone number
 - Postal address
 - Email address
 - Instant messaging address
- And all of this can change
 - Change as you move around
 - Change based on the time of day
- Dutch bank even considering using it for secure access !

nominet®

Any Questions?



enum

free your phone

A service from Nominet