



VoIP & Internet Telephony

Peter Gradwell

www.gradwell.com

01225 800 800

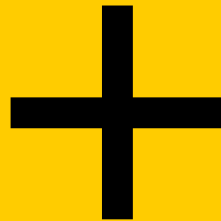
3-3a Gloucester St, Bath, BA1 2SE

Gradwell dot com Ltd



- Founded 1998 whilst at University
 - 7 Staff
 - Bath, Bristol, 'op north'
 - We operate the BCS lifetime email service @bcs.org.uk
 - This seminar is test marketing!
- Peter Gradwell
 - Industry Involvement in domain names (co.uk)
 - Now moved onto OFCOM
 - Still a part time academic

VoIP
Voice over IP
Internet Telephony
IP Phones

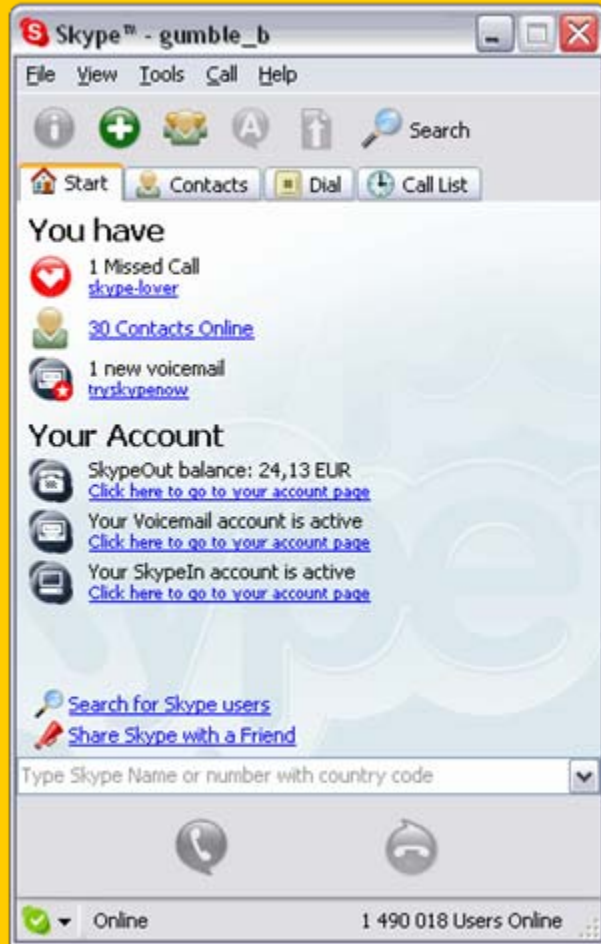


Internet Rules Apply

- Distance isn't an issue
- Pay for what you use, rather than how long you use it for
- Plug-in “anywhere”



Different Types of VoIP <g>



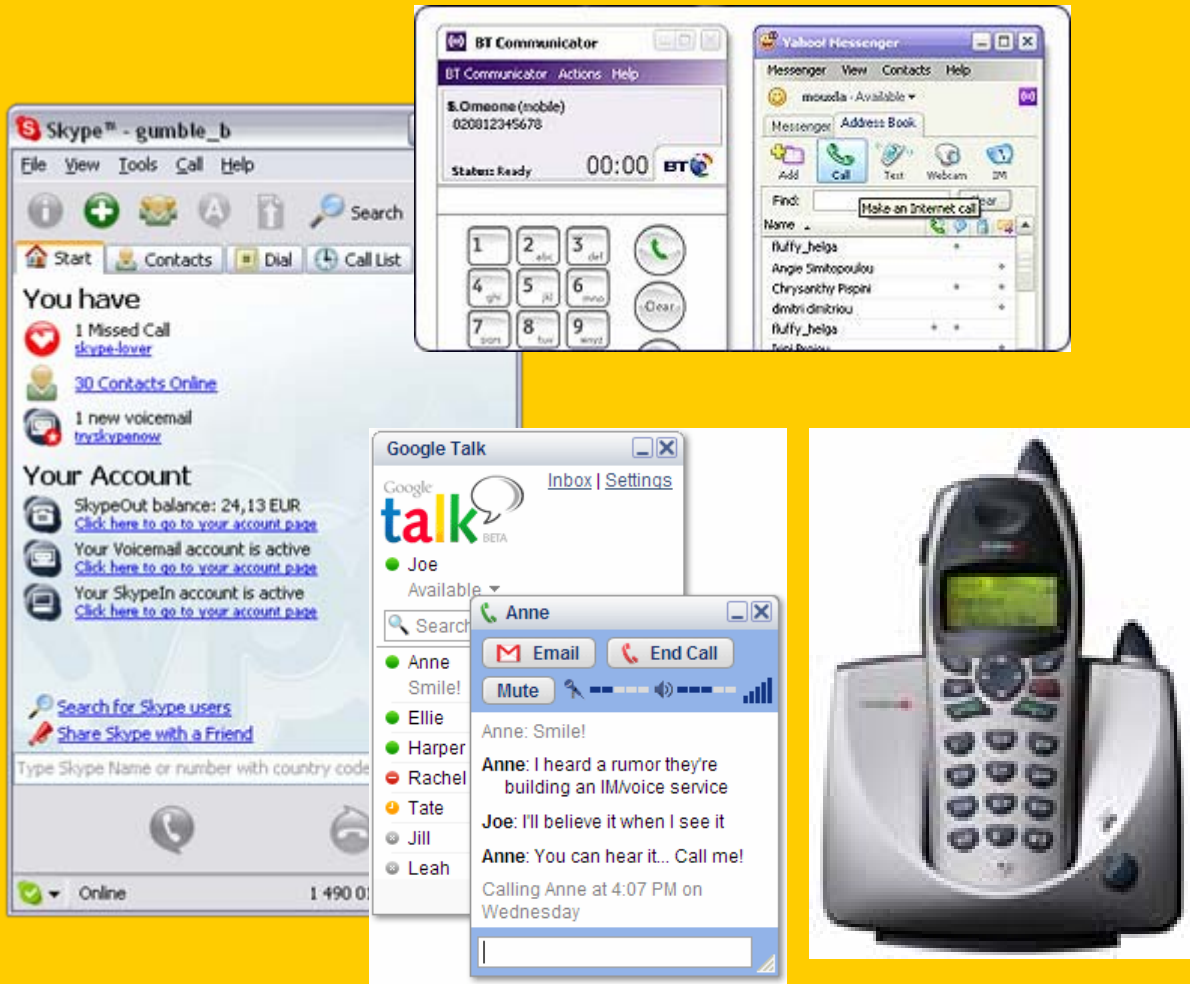
Consumer Services



- No line rental
- Unlimited Calling
- VoiceMail
- “Adaptor”
- or “Softphone”



Messaging + Talk



- Software Phones
- Can provide World Wide Phone numbers
- “Dual Phone” makes it “real”

Big Business / PBX Replacement

- Businesses with >10 people
- Multiple Sites – Free Calls
- Existing PBX Infrastructure



- Anyone with a multi-site corporate network does this already



IP Centrex

- “PBX In the Sky”
 - Multiple Sites, Multiple Countries
- Small Business Phone Systems
- One phone on each desk
- Each phone has a dedicated number (DDI)
- Call routing is done centrally
- Everyone is on the same “system”



IP Centrex - Gradwell



- Has a “phone number”
- Make & Receive Calls to PSTN
- It can “look” like a phone
- Works across multiple internet connections



Clever Numbers



- A Londoner can have an Edinburgh Phone Number
- Work from your spanish villa, whilst in Birmingham
- An Englishman in Madrid can call a Chinese distributor with a US phone number (for free!)

How does it work?



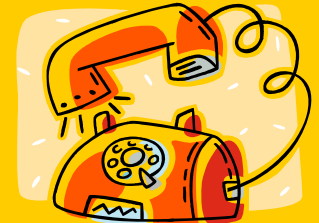
SIP Servers
PSTN to SIP Gateways

BT
Interconnect

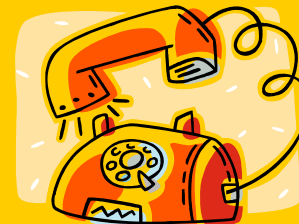
Copper
Interconnect

MCI
Wholesale

Internet



SIP phone



SIP phone



SIP phones have **user names & passwords** and login to the SIP gateway

SIP INVITE Message



- U 2006/01/19 15:20:21.576783 **193.111.200.12:5082 -> 193.111.200.67:5060**
- INVITE sip:01772624123@lon-pbx-1.gradwell.net SIP/2.0.
- To: <**sip:017726241223@lon-pbx-1.gradwell.net**>.
- From: Mark<**sip:2044123@lon-pbx-1.gradwell.net**>;tag=e4b18b05.
- Call-ID: 0610079e3ba17c673f602ceb79c4aed3.
- Allow: INVITE, ACK, CANCEL, OPTIONS, BYE, REFER, NOTIFY, MESSAGE, SUBSCRIBE, INFO.
- User-Agent: eyeBeam release 3004w stamp 16863.

ENUM / Peering



- Phone numbers as domain names
- 01225 800 810 becomes
 - 0.1.8.0.0.8.5.2.2.1.4.4.e164.arpa.
- When I look this up I find
 - TEL: 079700NNNNN
 - SIP: 1000200@sip.gradwell.net
- I can now choose to route the call over SIP
- Coming to a BT phone number late 2006...

Universal Numbers?



- Can you dial sip:peter@gradwell.com
- Yes – just do a lookup for the ENUM Records on gradwell.com and make a call to “peter”.
- Peter = 1000200

Set it up yourself!

- Home SOHO PBX
- www.asterisk.org
- Asteriskathome.sourceforge.net
- ISDN / POTS Cards
- DUNDI – Intelligent Local Routing



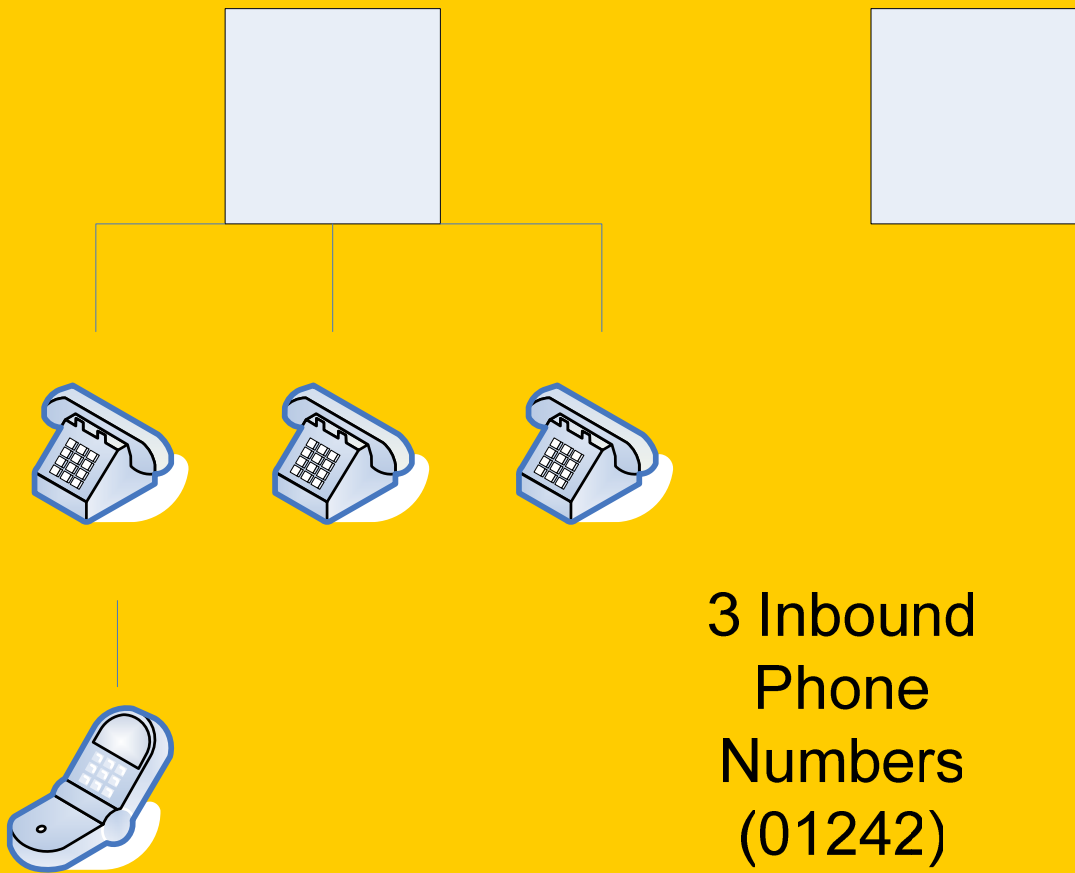
Marketing Consultancy



- 4, growing to 8 staff
- On the road lots
 - SMS
 - VoiceMail
- Mobile – so use of Software Phone
- Adopted VoIP due to Quick Setup & Flexibility



Marketing Consultancy Setup <g>



3 Inbound
Phone
Numbers
(01242)

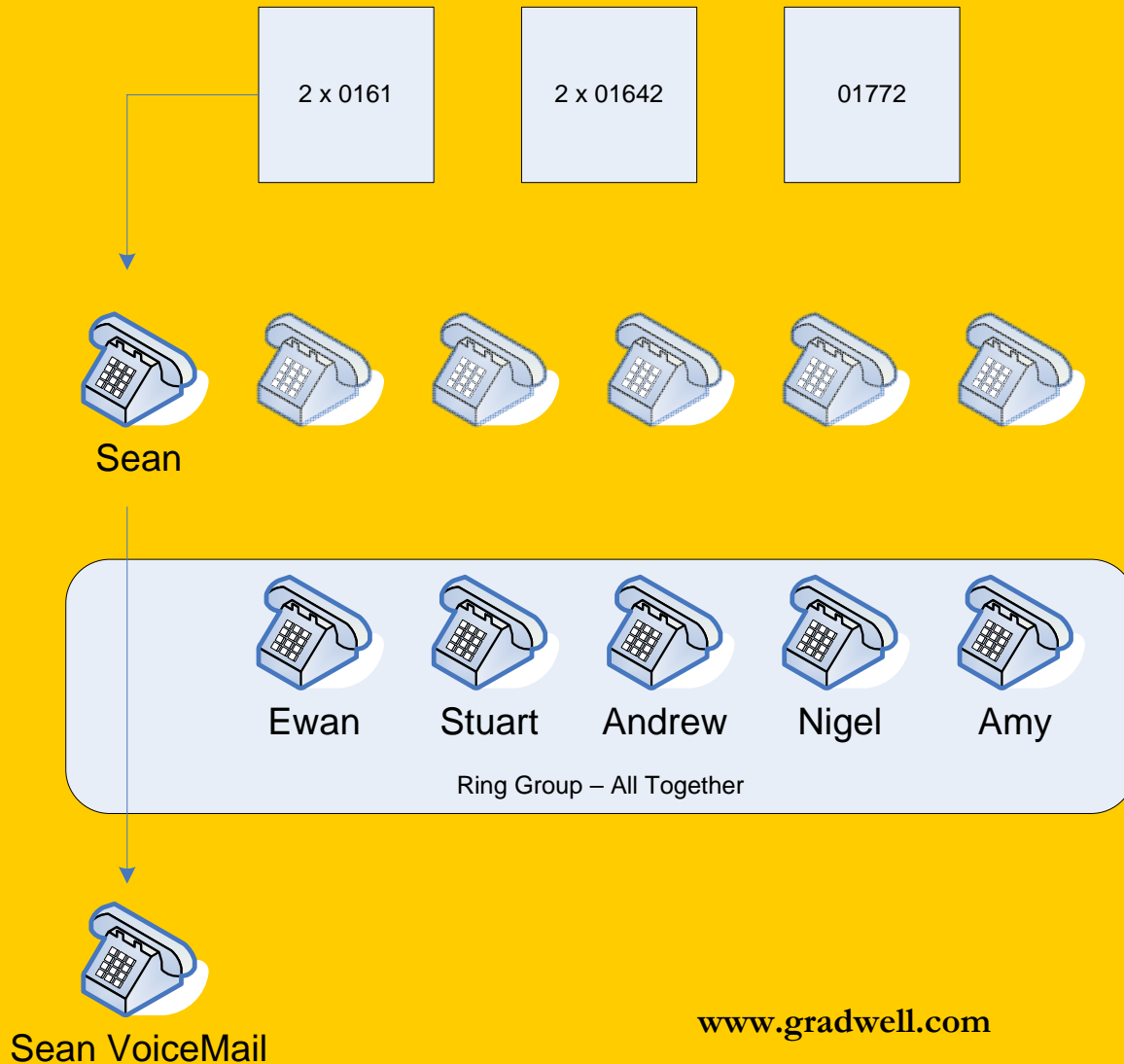
- Main Phone Number routes to all after a “welcome” message
- Mobile divert displays the caller id of the original caller

IT Consultancy

- 4 staff working from home
- Use of “virtual numbers”
- Intelligent Routing
- SMS and VoiceMail
- Call Transfer
- Ad-Hoc 3 Way Conferencing



IT Consultancy Setup



- Individual DDI routes:
 - Phone
 - Everyone
 - Voicemail

Tech Support Setup



IVR Menu 201 8577

Name

Email

Message on answer:

Message on invalid/no response:

Actions

Digit	Action	Delete
1	201 8575 (Group) Support team@incite-ict.com	<input type="checkbox"/>
2	201 8576 (Group) Team team@incite-ict.com	<input type="checkbox"/>
3	201 8570 (Ext) Ryan Cole ryan.cole@incite-ict.com	<input type="checkbox"/>
4	201 8571 (Ext) Matthew Slight matthew.slight@incite-ict.com	<input type="checkbox"/>
5	201 8573 (Ext) Anish Deriwala anish.deriwala@incite-ict.com	<input type="checkbox"/>

My Extensions

Number	Name	Email	Online
201 8570	Ryan Cole	ryan.cole@incite-ict.co	yes
201 8571	Matthew Slight	matthew.slight@incite-i	yes
201 8573	Anish Deriwala	anish.deriwala@incite-i	yes

Extension	Days Enabled							Time Range		Order	Delay	Allow VM	Delete
	Su	M	Tu	W	Th	F	Sa	Start	End				
201 8573 (Ext) Anish Deriwala (anish.deriwala@incite-ict.com)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0:00	23:59	1	20	<input type="checkbox"/>	<input type="checkbox"/>
201 8570 (Ext) Ryan Cole (ryan.cole@incite-ict.com)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0:00	23:59	1		<input type="checkbox"/>	<input type="checkbox"/>
201 8571 (Ext) Matthew Slight (matthew.slight@incite-ict.com)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0:00	23:59	1		<input type="checkbox"/>	<input type="checkbox"/>
Add New Member	<input type="text" value="-"/>												

Does it save money?



- “On-Net” calls are free – Call Other VoIP Users
- Calls are as cheap, if not cheaper (1.25ppm)
- Service is based on line rental (£7/month)
- £100 a handset on the desk
- Remove ISDN, but add bandwidth

Saving Money on Calls

Does VoIP == Free Calls?



- Many Brands are moving to “unmetered” call bundles – e.g. Wanadoo
- All “internal” calls are free
- Calls between VoIP subscribers are free
- Calls across VoIP networks are free (peering, DUNDI)

- Price discounting is best done by Big Telcos with volume
- Wholesale call costs are a bit “funny”
- New York is cheaper than Edinburgh

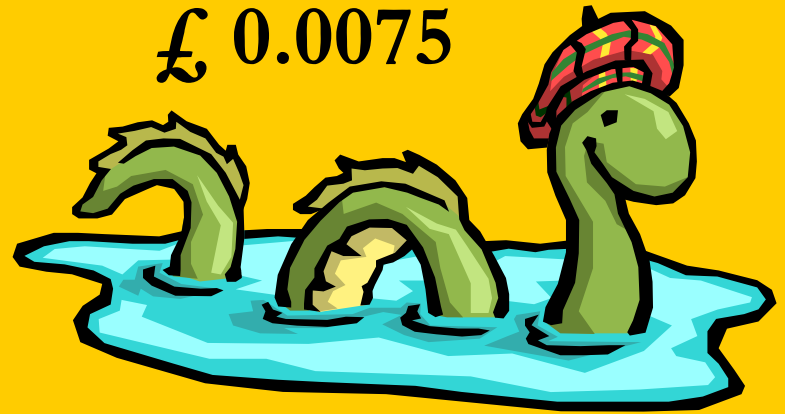
Call Costs Example

<g>



New York
£ 0.0066

Scotland
£ 0.0075



Gradwell: NY: 1.5ppm
BT: NY: 15ppm

UK: 1.25ppm
UK: 3ppm

Significant Benefits



- Big Offices – costs are on a par
- Much more flexible
- Supports better ways of working
 - Divert my office phone to my mobile

Does it work?



- Quality
 - Busy broadband users get poor quality
 - 3 to 4 concurrent calls on ADSL
 - Some manufacturers have variable implementations
 - A call is **80kbps**, ADSL upstream is **256kbps**
 - Some customers have 10 phones and spend 5 hours a day on phone

Does it work? (2)



- Can be fiddly to setup
 - Firewalls
 - Routers
 - Broadband
 - Getting the right combination
- We are approaching 24 months operational experience
- Moving very fast

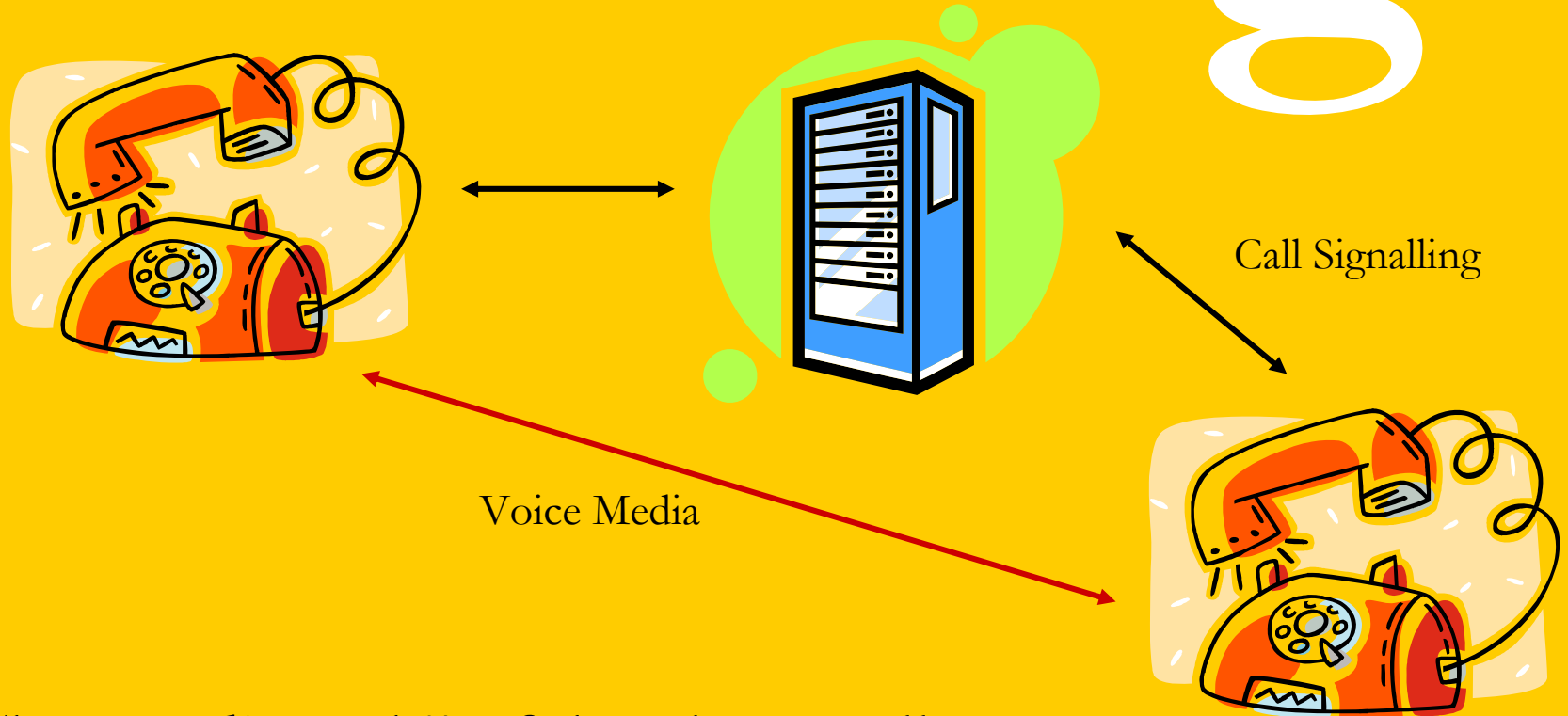
Government

- 999
- Interception
- Quality
- Phone Numbers

www.itspa.org.uk



Interception of VoIP

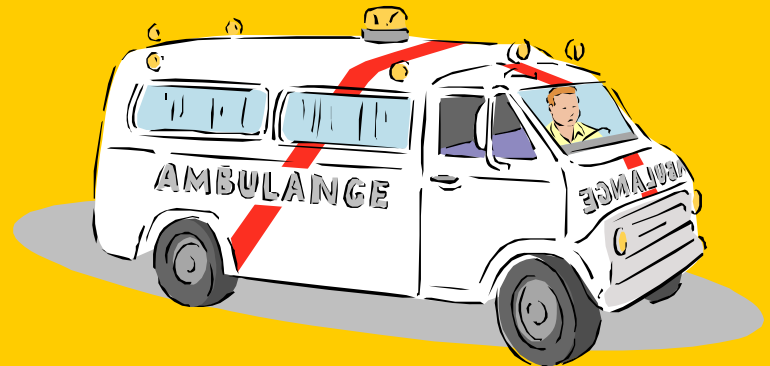


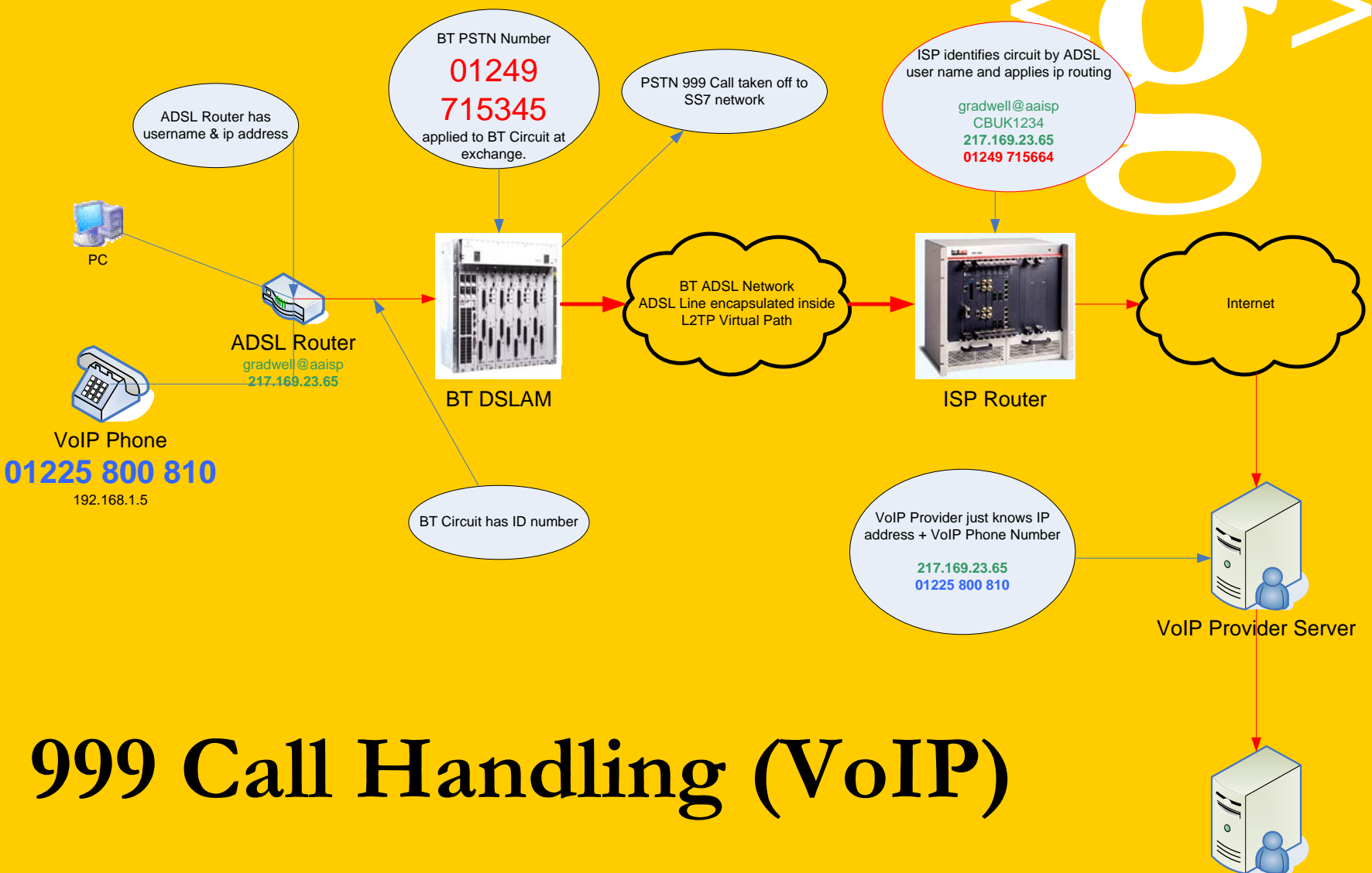
The “media path” of the phone call can by-pass the VoIP Provider

999 Call Handling (Normal)



Emergency
Location
Information
Interface
www.nicc.org.uk





999 Call Handling (VoIP)

Where Next?

- US & European Numbers
- Better Quality + Handsets
- Ease of Use

- “Triple Play” – Line Rental, Broadband, Calls



Conclusions

- Most gain is the call handling flexibility
- Inter-site call costs
- Good deals will cut call costs – especially for consumers
- Plenty of technical issues left!
(But it does now work!)



Homework!



- 10 Things You Need to Know Email
- Register for Free Trial
- View the phones

<http://www.gradwell.com/voip/>

please let us know



if we can
be of assistance

www.gradwell.com/voip

01225 800 800

info@gradwell.com