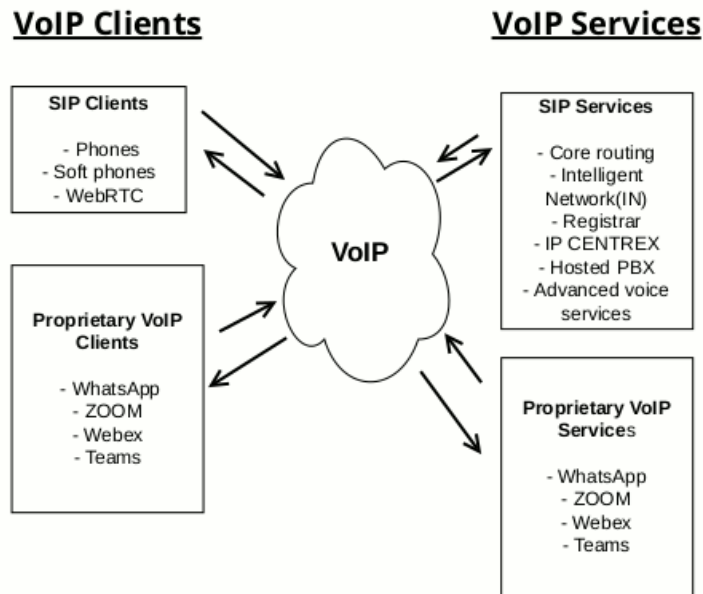


Rise of the Stupid Network Review - May 2024

A review of the current state of the Stupid Network,
first described in David Isenberg's June 1997 article⁴.

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It's been 12 years since the last review¹, when it was reported that not much had changed since 1997. So it is time to examine the state of the telephony market today now that most voice traffic is VoIP.



At the time of the last review, only SKYPE was a significant carrier of non-PSTN phone traffic. SKYPE has been joined by WhatsApp, ZOOM, Webex, Teams and others, and they are all proprietary voice and video communication applications. All of them together taking a portion of personal calls. All are cheap-to-free, offer excellent call quality, and have become the preferred platforms to communicate with people on your personal list of connections.

But what of business calls?

The business usage of voice communication services is largely served by SIP traffic, because SIP, as the de-facto standard, is the means that disparate services, offered by different companies can communicate with one another.

Using the premise that *'income is generated by providing a service that someone else is prepared to pay for'*, this report will examine the business end-points, looking at the service provided and how the service is charged.

Only VoIP Services will be examined because these are what are charged for, the clients are generally provided by the service provider. SIP desk phones and some SIP soft phones are generally paid for by the client.

VoIP Services

IP Network Provision

While not strictly speaking a VoIP service, the IP network itself enables the provision of a chargeable service – **Connection to the Internet.**

Fixed

Fibre to the premises or fibre to the cabinet (copper cable being replaced)

Paid for generally as a monthly subscription, is always on, and there is no extra charge for usage.

Mobile

4G GSM (mobile/cell) connection is an add-on charge, connected if configured, and has a usage cap.

5G GSM Internet connection is always on, and may have unlimited data.

On 5G networks both voice and video call traffic is just data.

Satellite

low orbit, low latency (20-100 milliseconds), high speed - Starlink⁶, OneWeb⁷ – compare IPaccess⁸

high orbit (geostationary) , high latency (600 milliseconds) – Viasat⁹, hughesnet¹⁰

Compared to fixed and mobile connectivity these are relatively expensive, but they do provide Internet access from locations not reached by fixed or mobile services.

The quality and ease of connection to the Internet has enabled the link between VoIP service providers and consumers, and made possible a wide range of new services.

Core Routing

Generally provided by a telecommunication company using systems like those provided by Netaxis⁵. This is the routing service connecting all voice (and possibly video) calls.

The core routing service provides a call connection service to both the service providers own customers as well as other operators' (other licensed operator or olo) customers.

At present this service is usually charged by call duration, but there may be case where a routing charge per call is levied⁴, rather than by duration.

In the United Kingdom this service enabled 202 billion call minutes² in an industry worth 31.8 billion British Pounds in 2022³.

In the past this market was dominated by the incumbent national telecommunications company which generally owned the PSTN network. An all-IP network allows other companies to provide core routing services and compete for a portion of this market. Price will likely be a key differentiator for what is essentially a commodity product. Other value-added-services, like premium rate numbers providing a revenue share, will enable a routing service provider to differentiate their service.

Intelligent Network (IN)^{1 and 4}

Closely related to the core routing function is an advanced routing (Intelligent Networking - IN) service that applies complex routing rules (not unlike PBX type functionality) at the network level, able to route up to 1000 calls/min through a routing plan. When the IN service was bound to the PSTN switches, the network provider was best placed to provide this service. In an all IP network this service can be provided by anyone to anyone on the global IP network.

The Advanced routing service is charged for both at the time the call is made and a periodic rental charge.

British Telecom's (BT) charges¹⁶ are an example of this charging structure – the service provider receiving a per minute charge on the incoming call, plus a quarterly charge on features used in the advanced routing plan. A termination charge may also be levied if applicable.

In 2012 it was estimated that BT's Intelligent Network (IN) services routing the calls to non-geographic services were generating over £180m per year for number-rental (1.5m NGN services @ £10pm) and £120m per year for advanced feature usage (50k plans using 3 node types at BT Inbound Services 2012 prices).

From the perspective of a company routing calls to agents in a (virtual) call-centre an IP-CENTREX/IP-PBX service may be the better option.

When the need is to process large call volumes to a single service number, as in the case of a telethon like Children-in-Need or Eurovision, then an IN service may be required.

IP-CENTREX and hosted PBX

These two types of services on an IP network offer similar functionality.

When voice traffic was carried on the PSTN network the CENTREX service was provided at the network level, whereas a PBX service was generally on-premise with internal cabling to call-centre stations.

The services can now be provided 'in-the-cloud', often by a service provider also providing IP Trunk services.

For what appears to be historical reasons, charging for these services is by features-provided and number of extensions (agents).

The current generation of IP centrex and pbx services are all software applications, may be single or multi-tenant, or hosted on servers provided by companies like AWS and Azure.

This has made all these services comparable in price, and the key differentiator being customer service.

Typical prices range from £12.99/user/month for basic office pbx functionality to £24.99/user/month for a standard call centre¹⁸.

Advanced Voice Services

Companies offering this class of service differentiate by offering:

- custom, bespoke features
- integration with other services
- provide consultancy services on custom integration and custom features.
- specialist skills

These are premium services and can command a premium price.

Processing can be on-premise (may be required for security) or hosted (specialist 24/7 support)

Examples of these service providers include:

- Nice¹¹
- boost.ai¹²
- xcally¹³

Easily customisable services like Asteroute¹⁴ provide the platform for integrating voice channels into projects like marketing campaigns and custom information services. A SMS broadcast can include a link to a web page with WebRTC connecting to a SIP service, integrated with a Large Language Model providing additional information, with the ability to connect the caller to an agent, real or virtual, to close the transaction. A custom AI-backed IVR allows a company to improve their Customer Interactions (CX) and further differentiate their services¹⁷.

Conclusion

It would seem, compared to the 2012 review, that the Stupid Network has risen^{1,4}.

The accessibility to, and quality of, the IP network that is replacing the PSTN network has enabled a plethora of new service offerings from specialist companies providing VoIP services not previously possible.

For a client application or phone to be able to receive incoming calls it need to be locatable. Location enabling services include ENUM services and SIP Registry services. At present these services are provided by VoIP service providers, but there is perhaps an opportunity for a national ENUM service to provide the URI to any participating VoIP service provider¹⁵.

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Glossary of terms

- NGN** **Non Geographic Number** : e.g. 0800, 0845, 087 etc.
or
Next Generation Network
The NGN is that one network transports all information and services (voice, data, and all sorts of media such as video), generally utilising Internet Protocol (IP).
- IVR** **Interactive Voice Response**
A prompt-and-answer process used to collect caller choice in choosing between call routing options.
- IP** **Internet Protocol**
The Internet Protocol is responsible for addressing hosts and routing datagrams (packets) from a source host to the destination host across one or more IP networks.
- GSM** **Global System for Mobile Communications (originally Groupe Spécial Mobile)**
is a standard set of protocols for digital cellular networks used by mobile phones.
- VoIP** Voice over IP also known as Internet telephony
- SIP** Session Initiation Protocol
A protocol used to connect a VoIP caller to a VoIP destination.
- URI** **Uniform Resource Identifier**
In ENUM systems the URI returned will usually be a URL (Uniform Resource Locator) that provides the address of the resource and the protocol used in communication. e.g. sip://[your_extension@the_voip_provider](#)
- ENUM E.164 Telephone Number Mapping**
A system of mapping and retrieving e.164 encoded telephone numbers and SIP URI's. Other termination options for a telephone number are also possible (e.g. PSTN, e-mail)
- ITSP** Internet Telephony Service Provider
- ISP** Internet Service Provider