

LIST OF PATENTS OWNED BY VOIP-PAL

1) Routing, Billing, and Rating engine (RBR) – producing routing messages for VoIP communications

U.S. Patent issued September 24, 2013, Number 8,542,815

The RBR invention lays the foundation for the remaining inventions. Few inventors working in the VoIP field in the early years were experienced in and understood the discipline and standards at play in traditional telephony, the Publicly Switched Telephone Network (PSTN). Voip-Pal inventors well understood the rigors, standards, and discipline required to move VoIP from the fringes into the mainstream. Rather than disregard hard-won knowledge from decades of building and operating PSTN switches and routers they applied what they knew to an emerging field where experienced practitioners were rare.

The call-to-action for Voip-Pal technology was to find order within chaos. Where PSTN networks were homogeneous, IP networks were and still are heterogeneous with growing diversity. Where PSTN networks were owned and controlled by large conglomerates; IP networks are controlled by no one but fortunately often connect to the Internet.

Routing and metering calls in a controlled environment where you know the location and performance of every point in the network is a simpler problem to solve than the one Voip-Pal technologists solved. Nonetheless, routing and metering calls is a very necessary activity for telecom vendors. In order to address this variability Voip-Pal engineers developed call classification mechanisms to describe and render appropriate treatment for call data regardless of the type of endpoints that are being connected.

Following patterns similar to those used by the giant telecoms, Voip-Pal invented new technology to work over IP networks instead of PSTN networks. The result is:

- VoIP calls are frequently routed and metered in largely the same fashion as PSTN calls even though the networks are dissimilar;
- VoIP calls more frequently integrate near seamlessly with PSTN networks and invisibly to callers;
- VoIP calls are becoming more reliable;
- VoIP calls are more readily controlled, regulated, and monitored thereby overcoming regulatory barriers;
- In spite of their delivery across a publicly visible and available network, VoIP calls do not inherently expose a subscribers network location, structure, or credentials;
- VoIP is steadily migrating from what was the fringes into the mainstream; and
- VoIP implementations are increasingly becoming more like Voip-Pal.

Because they are able to rely on Voip-Pal routing and metering inventions to make VoIP more manageable and reliable; system vendors, network providers, mobile carriers, and others are constantly extending the reach of VoIP.

2) Lawful Intercept (LI) – intercepting VoIP communications and other data communications

U.S. Patent issued April 16, 2013, Number 8,422,507

Lawful Intercept is a revolutionary technology that addresses the national and international demands by governments to enable law agencies the ability to perform scheduled and live intercepts on Digital Voice telephone conversations.

All VoIP service providers may soon need to be in compliance with government regulations regarding Lawful Intercept. This invention presumes the implementation of a Voip-Pal infrastructure. Law enforcement agencies

in most developed countries have long depended upon the ability of telecom networks to monitor call circuits. In the USA this practice has typically involved a court order and wire-tap of one form or another.

Location and device independence are some of the key benefits of VoIP. With this versatility you might imagine that you can never nail down the exact location or even the device in use by a subscriber. Traditional approaches to wiretaps will fall short and less exacting wiretap implementation for VoIP will also leave hints for knowledgeable parties that their account is being monitored.

Where a robust Voip-Pal RBR implementation is operational, the LI invention works seamlessly and efficiently. Some of its key benefits include:

- In spite of the unpredictable nature of VoIP, Voip-Pal enabled subscribers can be monitored without regard to their physical location or device;
- The VoIP Pal LI system completely obscures when a subscriber is being monitored; and
- The surveillance can be established or terminated with ease.

This technology will prove invaluable to government agencies as they seek to thwart crimes and intervene in potential acts of terrorism.

3) Mobile Gateway

U.S. Patent issued January 14, 2014, Number 8,630,234

This patent is designed to allow a single subscriber device to connect automatically to WiFi, WiMax, and other wireless data connections. Those who travel may have experienced the exorbitant fees charged for long-distance calls while roaming on visited cell networks. International travelers typically find these costs to be punitive or even crushing. International fees are frequently charged in dollars per minute, rather than cents, to visiting cell phone users. The Mobile Gateway invention has the potential to provide a much less costly and more convenient alternative for travelling smartphone users.

As with the 911 invention, this innovation relies upon a pool of local phone (DID) numbers being held in reserve by your VoIP provider. It also utilizes a clever smartphone app that detects when a caller is dialing a long-distance number. In a mere instant the smartphone app and VoIP provider tricks the visited cell network by turning long-distance and international calls into local calls. Thus the traveler incurs only local, rather than long-distance or international, calling fees.

For mobile providers this invention creates a sound alternative to VoIP over WiFi. It gives roaming cell phone users the convenience of calling from anywhere a mobile network footprint is, at a cost-level that will preclude seeking out low-cost or even free WiFi calling options.

4) Enhanced 911 – emergency assistance calling for VoIP communications

U.S. Patent issued September 17, 2013, Number 8,537,805

This is a technology that allows for short code/emergency dialing; in other words, the ability to enable true emergency calling solutions to Digital Voice subscribers. The Enhanced 911 technology satisfies the major requirement for the emergency response system, which is the ability to call back the person making an emergency call to 9-1-1 in the event of a dropped connection.

In contrast to traditional terrestrial telephony, among the great advantages of VoIP in our connected world are that calls may be originated from innumerable locations, with a variety of devices, and for minimal cost. These

advantages become inherent disadvantages in emergency situations where emergency responders cannot be sure of one's location or even necessarily how to re-contact those seeking assistance.

Those who have had their cell phones cut-off for non-payment know that among the first things lost are their phone numbers. These numbers become available for reassignment to new subscribers. However, by law their phones must remain operable for placing 911 calls for emergency assistance.

In situations with improvised communications or where those seeking assistance do not have active accounts with an assigned phone numbers (also called DIDs, or Direct Inward Dial numbers) this invention provides emergency callers with temporarily-assigned phone numbers that are given to responders to be used to re-contact those seeking assistance. The invention relies on an innovation utilizing a pool of reserved phone numbers which are temporarily assigned to those reaching out for emergency assistance.

As VoIP becomes increasingly prevalent in our world this invention will increasingly save lives.

5) Advanced Interoperability Solutions – uninterrupted transmission of Internet protocol transmissions during end point changes

U.S. Patent issued March 18, 2014, Number 8,675,566

This patent allows the transfer of in-session digital voice calls between disparate wireless technologies enabling subscribers to roam seamlessly between different WiFi, WiMax, 3G, and 4G cell technologies without losing a call. The patent technology demonstrates the future of Internet voice communication – calls should not be dropped when roaming from one transport provider to another.

Session Initiation Protocol (SIP) and many other key technologies help to facilitate voice calls over IP networks. Further, widely deployed WiFi and cellular data network infrastructure provide IP connectivity in much of the developed and developing worlds. Practically speaking though, VoIP telephony has been geographically limited to wired networks (LANs), such as an in an office, or to WiFi networks within the confines of a single home, office, restaurant, hotel room, or hot spot – just so long as you don't move beyond the limited coverage area of your WiFi connection.

VoIP could not be mobile – until now. Enabled by technology described in the Uninterrupted VoIP patent, VoIP calls can be handed-off from one IP network to another – in a similar fashion to a hand-off of a call from one cell tower to another. The technology in this patent enables calls to persist and be passed from one WiFi/IP network to another, or from a WiFi/IP Network to an LTE/IP network, or HSPA to an LTE network, or to any other kind of IP network that your mobile device might support.

There are several advantages for consumers and vendors of this technology:

- VoIP calls are generally lower cost than PSTN calls – if not free;
- Killer app for smartphones;
- Use a tablet as smart video phone;
- International mobile calls could be made a low or no cost;
- Where you have bad wireless coverage in your home, business, or coffee shop you can use WiFi inside and step out and drive to work without losing or dropping your calls; and
- When wireless is oversubscribed for calls, WiFi makes a great substitute.

6) Allocating Charges for Communications Services

U.S. Patent issued July 8, 2014, Number 8,774,378

This patent is an RBR billing extension and facilitates the PSTN style billing of VoIP calls. In a PSTN connected world the network and communications application are one in the same and they are metered and billed as one product. The network is built for a voice communications application and neither lives without the other. In contrast, where the world is connected with publicly available IP networks (the Internet) voice and other communications applications are built on top of the network. But network infrastructure does not constitute a convenient and readily available voice and video communications infrastructure and doesn't necessarily connect to and become billable through a PSTN network.

VoIP is becoming utilized and deployed where investors have the potential to earn a return on creating a reliable communications application on the top of the Internet and ensuring that it connects to PSTN networks both domestically and internationally. The success of Vonage, MagicJack, OOMA and others show this. But they would not stand even a chance of success if they could not connect to and be billed in conjunction with PSTN networks.

The technology described in this extension of the RBR patent enables business such as the above-mentioned to exist and flourish and will support the creation of applications and infrastructure to support richer and innovative communications systems for decades to come.

As wireless communications companies seek to invest in and create richer communications standards for video communications utilizing VoLTE – everyone will want to have the same functions supported over WiFi and will not want to lose continuity. This technology will allow pure IP communications providers to connect, interact, meter, and bill in conjunction with these wireless providers.