

innovaphone Solutions

Examples for VoIP solutions from innovaphone AG



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innovaphone in practice
**Immerse yourself
in the world of
innovaphone and
let yourself be
inspired...**

innovaphone 

PURE IP-TELEPHONY

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Let yourself be inspired...



innovaphone AG is an independent supplier of IP telephony solutions. Many years of development has enabled innovaphone to have a wide range of technically sound products that have been proven time and again in practical applications. The products range from simple telephones over large gateways to variously applicable software solutions. They can be joined together to make customised solutions. This is especially valid for IT environments which have grown over years to become very different heterogeneous environments. You will find here valuable information as well as some selected and representative scenarios in order to give to you an idea of the variety of potential solutions.

Standard conformity

All innovaphone solution components are constantly based on the two manufacturer neutral signalling standards H.323/H.450 and SIP. Standard conformity brings three substantial advantages for users:

:: Manufacturer independence: VoIP gateways from innovaphone can be combined with any VoIP terminals which are also standard based. Furthermore the solutions are especially suitable for integration in heterogeneous telephony environments – both traditional based as well as IP based.

:: Smooth migration: A gradual transfer from fixed line telephony to "Voice over IP" is possible as all solution steps are standard conform. This so-called "smooth migration" scenario enables existing PBXs to be used further. The usual features (e.g. Caller name display, call back on busy, call re-routing) remain also in the pan-technology internetworking. Connecting the „innovaphone PBX“ to the traditional PBX takes place using ISDN-Protocol QSIG.

:: Protection of investment: Standard conformity enables manufacturer independence and the option of a „smooth“ technology change over . Together these mean economically highest protection of investment for the user.

:: Scalability: innovaphone products are always extendable for new and larger systems without having to exchange the investment already put in.

Availability

The VoIP gateways as a basis for the innovaphone PBX are „stand alone boxes“ which work in the company network completely independent of servers and PC software. This means availability is excellent and fail safety of the “innovaphone PBX“ is ensured. All that is needed to make a phone call is electricity and a functional switch. In addition each device can be configured redundantly in a local or wide area network so that automatic takeover will take place should one device fail for some reason. This is the only way to guarantee maximum availability of the system. In addition almost all innovaphone PBX products have two separate ethernet connectors for redundant networks and they also nearly all support "Power over LAN" if required.

Scalability and flexibility

All the scenarios you can possibly think of can be realised with innovaphone's VoIP solutions – from connection of individual home offices to complex enterprise scenarios with 20000 users. innovaphone can play off its special strengths with the realisation of solution scenarios across all locations.

Just browse through our solutions catalogue and let yourself be inspired by the scenarios. Should you need further information, then just call us: +49 7031-730090 or write us an email to info@innovaphone.com. Further information can also be found under www.innovaphone.com. You can also register there for our monthly newsletter. The innovaphone team hopes you will enjoy the inspiration!

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Trunking

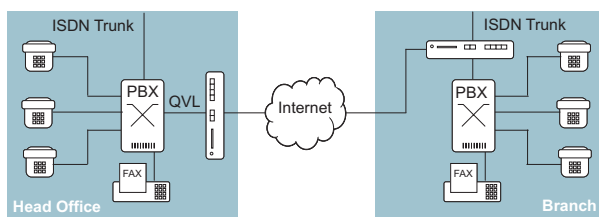


innovaphone has special advantages for businesses with multiple locations. Data connections which are often already available can be used to reroute internal calls between locations, thus reducing costs directly and veritably for internal calls. This kind of solution is often installed as it is simple to implement and is quickly amortised. The innovaphone PBX has particular strengths concerning interconnection of heterogeneous telephone systems over IP. The telephony connection between two locations

using IP-WAN connections is called a trunking scenario. Usually a VoIP gateway on each end routes the transfer. It does not matter whether the telephone system (PBX) is a traditional PBX or a VoIP PBX. Also the type of IP connection can vary from a leased line with high band width to VPN over internet.

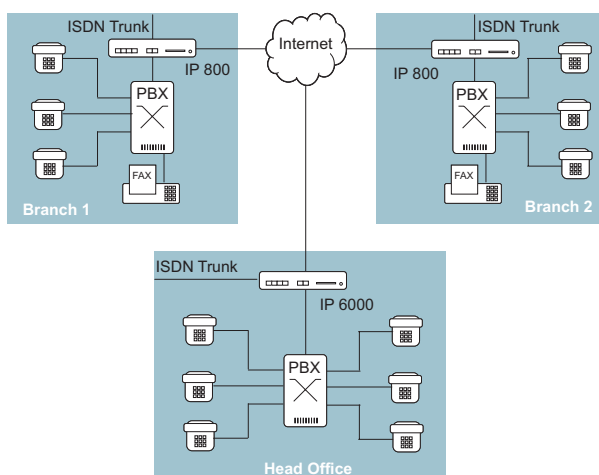
Connection of various PBXs

The innovaphone gateways are connected if possible free ISDN interfaces on the PBX. The systems features are tunnelled through the IP network and remain available for co-generic PBXs. innovaphone offers an elegant solution for differing PBXs in a heterogeneous network. The PBXs are coupled using QSig protocol thus enabling the most important features to be available on PBXs beyond the various locations.



Example loop through

Should a PBX no longer have any free ISDN interfaces, then it is possible to connect the innovaphone gateways to the outside line. No system reconfiguration is necessary for this solution.



EXPERT OPINION



Cor Heide, CEO, Tiptel b.v.:

"In many VoIP projects, we start with the Trunking concept from Innovaphone. By connecting several locations, customers are saving money on their telephone costs immediately, which sounds appealing to everybody. Through the Trunking concept, customers can slowly change to a complete VoIP PABX, so they have the time to let the technology gain their trust before making major investments."

Remote connection to an outside line

In addition to being able to reach subscribers in other locations, it is also possible to get an outside line from a remote connection. The subscriber dials a prefix to be connected to the other gateway. Access to an outside line is obtained through dialling 0. Thus international and long-distance calling costs can be reduced by pre-selecting the number of the closest internal location to the call destination. However it is also possible to redirect calls to other outside lines should the local outside line fail. The loss is hardly noticeable for the location.

Smooth migration

PBX trunking is the first step to smooth migration from traditional telephony to new VoIP technology. In the next step after interconnecting traditional PBXs, then it is possible without making changes to the existing installation, for these systems to be extended easily and quickly to include IP telephones. Gateways are already installed forming the foundation. Besides extending for further VoIP subscribers, it is possible for branch offices to be gradually converted to the new technology. Due to the fact that the gateways also form the hardware platform carrying the innovaphone PBX system software, the possibilities of IP technology can be fully utilised.

Free scalability solution

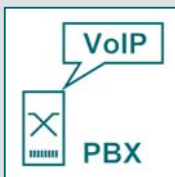
innovaphone provides several gateways to interconnect PBXs. The IP 800 provides up to 4 ISDN BRI interfaces to

the traditional PBX and the IP 6000 has up to 2 PRI interfaces. Additional gateways can be connected to the PBX as needed, making the system freely scalable. As soon as one particular gateway does not have a channel available, the connection is forwarded to the next gateway.

High port density

innovaphone gateways are both space-saving and cost effective pieces of equipment. Two gateways can be accommodated in one height unit of a 19" rack using a special installation frame. In the case of the IP 6000 this means up to 60 channels in just approximately 4cm.

Smooth migration



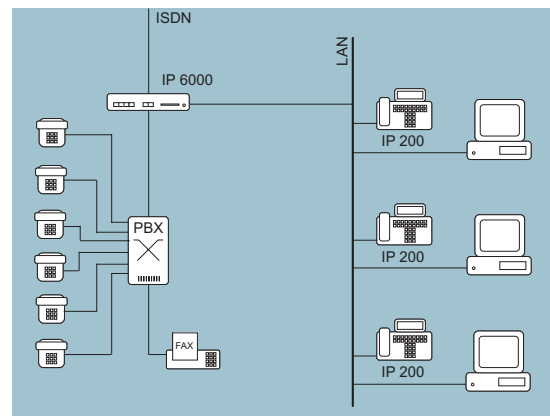
It is seldom the case that a complete PBX is to be replaced. It is usually much more economically viable and makes more sense to use the existing PBX for as long as possible. innovaphone's solution is ideal to enable smooth migration from traditional telephony to a VoIP solution. Migration takes place in various steps which can be designed individually and can fit to the customer's wishes.

Trunking

In many installations with different branch offices, migration begins with interconnecting traditional PBX systems over IP routes (Trunking). This step has the advantage that a VoIP gateway already exists for further extension at the location, but it doesn't make further steps necessary.

PBX extension

A choice needs to be made as soon as a traditional PBX needs to be extended for further telephone extensions: either another investment in the PBX by extending the current system, wiring new extensions and having an external service engineer come to configure everything - or extending the traditional PBX with modern VoIP technology. The solution from innovaphone even provides the possibility to extend the system without making any changes to the PBX. The new phone numbers are recognised by the gateway and are delivered over the network (LAN) instead of to the outside line thanks to the loop through of the VoIP gateway (eg IP800) in front of the PBX's outside line access.



Instead of getting rid of the old PBX it can be extended step by step with VoIP technology from innovaphone. No new modules need to be bought for the PBX and no adjustments need to be made for the existing telephone system. Usually it is not even necessary to wire new work desks – because usually the network is already in place.

Replacement PBX

Now it is possible to extend subscribers or for subscribers to be taken from the traditional side to the VoIP side as necessary. Besides telephones it is also possible to integrate existing fax machines and analogue telephones by using various IP adapters. In addition door openers can be integrated using such an adapter and break time music can be played (using an external CD Rom drive).

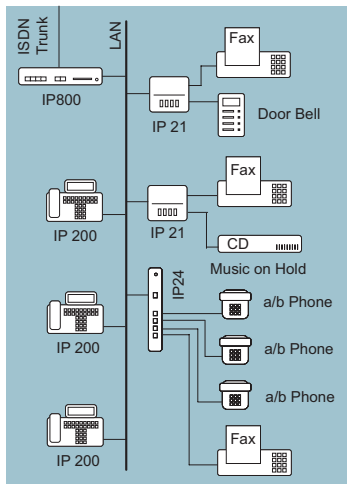
By activating the innovaphone PBX on the VoIP gateway, additional functionalities become available. Waiting queues can be configured, attendant station can be set up

EXPERT OPINION

Tarmo Reineberg, Elion:

"Many of our customers are currently discovering Voice over IP technology, however they are still reserved in making decisions. Soft migration reduces the investment risk and enables confidence in the new technology to be built up gradually. The innovaphone product line provides numerous standard interfaces. This is one advantage for integration in different customer environments."





and (using different interfaces) software solutions for voice mail, fax, CTI and UMS can be linked to your system. At some point the migration will be so advanced that the traditional PBX is no longer needed. The PBX can then be turned off and innovaphone's PBX can take over all the functions in the new technology.

Branch enterprises



Companies with a distinctive branch structure often have a number of PBXs with differing technologies and from different manufacturers. Generally it is much too expensive and most uneconomic to install the same telephony comforts in all branches using traditional telephony. This results in modern branch enterprises having to employ a high number of qualified engineers. Furthermore nearly all maintenance work must be done on-site. VoIP technology promises major improvements here.

Applications available across all locations

Software solutions on the PBX such as CTI, voice mail, fax and unified messaging can be used in the same way in all locations including mobile and home offices with innovaphone's IP telephony. Also administrative and above all accounting for all locations can be done centrally quickly and easily.

Fail-safe

The technically mature location concept ensures branch offices are in the position to substitute each other should a failure or overload occur. Thus remote outside lines can be used should the location's own outside lines be busy. Also complete PBXs can be set up in a redundant security concept throughout the branch office locations. The different locations of the innovaphone PBX work completely autarkic and remain functional should the IP connection fail between connections. The calls are always routed via the local exchange line.

Administration

Customers who install innovaphone's PBX in various locations have enormous advantages. The first is it becomes apparent that central administration has huge advantages. The existing IP connections don't even need to dial

in separately. The administrator can e.g. configure a subscriber – the subscriber will be set up in this certain location entirely according to the entry in the field „location“.

Master-Slave relationship

The location concept for innovaphone's PBX allocates a master PBX in every configuration. Each subscriber and his location is known there. Should one subscriber be called from a location other than his own where he is configured, then the local PBX passes the call on to the central PBX. The call is then forwarded to the subscriber - either directly or over a further location. A back up version for the local PBX automatically exists through the master function of the central exchange. Should the local PBX fail and the IP connection to the central exchange remains then the central exchange can immediately take over the work of the local PBX.

Telephone numbering plan

The innovaphone PBX can either be configured so that a joint call numbering plan is used for all locations or so that each location uses its own separate but complete call numbering plan. Of course a lot more subscribers can be addressed using separate call numbering plans. The locations should be addressable using a prefix. The different

EXPERT OPINION

Ben Ravani, CEO, Sherwin:



"As regulations ease up and usage of VoIP being discussed by different companies of the Middle East, companies from financial segment to Government Branches and more, have started to put together requirements that Innovaphone Branch Enterprise rich feature set offering meets all of the top requirements of such companies. To name a few of these feature sets are:

- Scales seamlessly so new branches are brought online easily and quickly.
- Ensures reliability so every call gets through.
- Redundant PBX System will perform a failover and immediately will takeover the functions of the PBX without loss.
- Branch offices being in a position to substitute each other should a failure or overload occur.
- Customers no longer need to dial a different numbers for different locations to reach the resources they need. Callers will dial one number and will be directed to the right place for their needs."

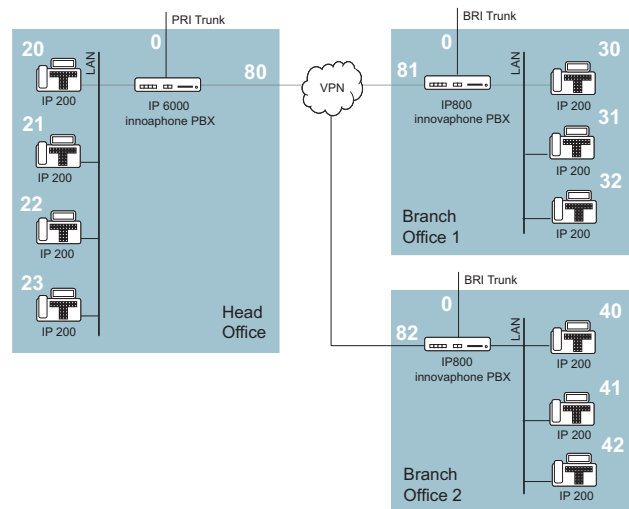
prefixes also provide the possibility for a simple least cost routing. The IP route can be used with the prefix until dialing the outside line in the designated local exchange area (e.g. as shown in the graphic with prefix „81“ and „0“ in Branch Office 1 network).

Multiple registration

Further advantages arise from multiple registration. A registration can take place to another innovaphone PBX from every terminal. Thus it is possible to build groups

which are located across the branches. For example one can register to the hotline group from a remote location and accept calls to this hotline number.

The scenario shows three different locations which are inter-connected by internet and VPN. The locations share a common call number plan. However they still have a prefix so that it is possible to reach the other locations' local exchange lines. This enables telephone 42 to directly call telephone 21. The telephone can get an outside line by dialling 0 and the telephone can use the outside line of the central exchange by dialling 80 0.



Home office



The innovaphone PBX is ideal to integrate home offices into the company's PBX. All that is needed for a home office is simply a DSL flat rate connection and an IP Telephone such as the IP200.

Location independent system telephones

IP Telephones need an ethernet connection with Internet Protocol (TCP/IP) for connection to a PBX. As long as a bandwidth of about 20 kbit/s (and/or 80 kbit/s for highest requirements) is available, then these are location independent. Thus it is easy to install individual remotely located telephones of the PBX such as for example on the road at a WLAN hotspot, in small branch offices and even in a home office.



Router inclusive

The innovaphone IP telephones IP110, IP200 and IP230 offer special characteristics for use in home offices. By operating one's own DSL access with the protocol PPPoE a separate router is not needed. The telephone sets up a tunnelled connection (VPN) for security to the company network and logs automatically onto the PBX. The administrator can already pre-configure the telephone in the company so that the co-worker only needs to plug it into the DSL modem and connect it to the electricity. The connections are automatically set up and immediately usable.

Remote administration

The telephone remains reachable for the administrator. He can change the settings, remotely install new firmware and help with configuration. He also receives the data for central billing through the central log on and can analyse them. The co-worker only need to bring the administrator the telephone should the DSL or VPN connections no longer work.

Computer connection

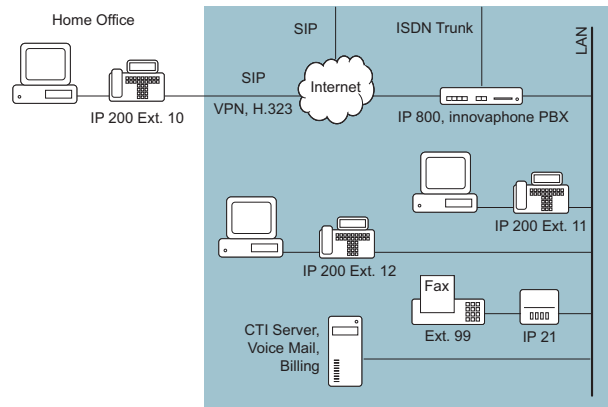
All innovaphone telephones have an internal 2 port switch for ethernet. A computer can also use the connections set up via this interface. Both internet access and the tunnel into the company are available for the computer. If necessary the router function on the telephone can put a higher priority on voice transmission than on the computer connection, thus guaranteeing constant voice quality.

Complete integration

Internal telephone connections with the co-worker at his home office remain completely free apart from DSL costs. Furthermore the co-worker can freely use all functions of the PBX. Everything is available - from simple switching and three person conferencing to group functionalities and manager - assistant functionalities. Even software support such as CTI, voice mail, unified messaging or special software such as call center is completely available at the home office computer.

Positive customer relationships

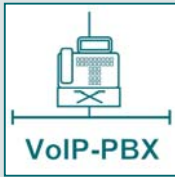
The receiver of the call does not know where the co-worker is currently as the telephone number of the co-worker at his home office is a company number. The company telephone number is transmitted also during out-going calls. The home office working place is thus almost as effective as in the company office.



Full functionality at home office

The scenario shows the innovaphone PBX based on a gateway IP800 in the headquarters of a company. There the extension numbers 11 and 12 have been given for the telephones already installed. An outside line is also available using the gateway IP800. A co-worker is configured at his home office under extension 10. He has all possibilities available just like if he was in the office as he is connected to the company network over IP and VPN. Furthermore the home worker can connect his computer to the internal switch on the IP200 telephone and use the connections available. Concerning communication the home office is thus perfect!

Branch offices

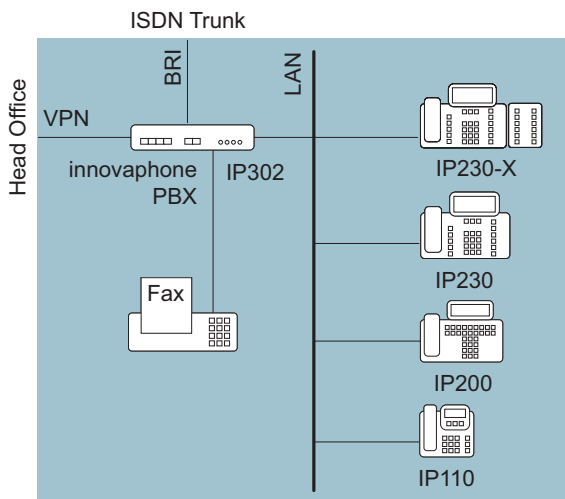


subscribers.

The branches can be interconnected with innovaphone technology in different ways according to their size. For the smallest branches the individual telephones can be registered directly on to head office's telephone system. That corresponds pretty much to the scenario of a home working place for several people. Large branches will be surely equipped with their own innovaphone PBX on a VoIP gateway dimensioned accordingly. innovaphone offers several tailored solutions for branches with up to 50

Distributed Systems

Telephone systems from innovaphone are particularly suitable for integration into a distributed system as described in the diagram below. At the same time mutual replacement in accordance with the redundancy concept is possible, which indeed raises failsafety, which should be seen as a whole, to a maximum.



In this example the telephone system IP302 is connected to the internet over a DSL connection and maintains a VPN connection to the company head office. The subscribers in the local network can make all company internal calls in this way without producing extra costs.

External connection

The telephone system's VoIP gateway can be used for external calls. Two external calls can take place at the same time over the ISDN connection. The company's head office exchange line which is still available over the existing IP connection can be used should further external calls be necessary. Alternatively the system can also be further extended by an unlimited number of VoIP gateways.

VoIP Gateway

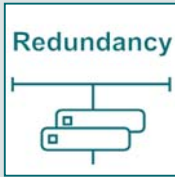
The gateway components integrated into the IP302 connect all telephone system subscribers over an ISDN basic access interface to the public network. The innovaphone PBX software is activated using licenses - successively for the respective number of subscribers. It is recommended to use the small gateways for up to 50 subscribers.



Standards and interfaces

Like all products from innovaphone these products are also based completely on standard protocols and interfaces, so that interoperability is ensured to other H.323 or SIP based VoIP components and other standard based products in the network. Also connection of software solutions takes place over standardised protocols and interfaces. Thus different CTI applications can be integrated into the telephone system over the integrated TAPI or XML interface. Any tariff solution can be supplied with the necessary data via CDR (call detail record) which is automatically generated.

Redundancy



gateway.

The innovaphone PBX works on the autarkic hardware of innovaphone's VoIP gateways. The hardware environment is extremely robust and has a low fallout risk as no moving parts such as hard disks or fans were used in construction. The software works on an operating system which has been especially developed for this hardware. The operating system is thus very lean and fast. There are no superfluous and unknown functions which means maximum security also for the software part of the

Additional security

Failure security can additionally be improved with a second redundant PBX system. A second system is set up next to the active system which can perform an automatic failover and immediately take over the function of the PBX without loss in the case of failure. The particular advantages of the innovaphone PBX are the fact that the redundant systems can be installed anywhere and that the redundant system can be actively in use. However if necessary the systems can be replaced without losses.

Connection

Both the gateway IP800 and the gateway IP6000 are prepared for the forwarding of the ISDN outside line. The redundant PBX works on a gateway that is as identical in construction as possible and is connected to the outside lines forwarded by the first gateway. A so-called power-off loop guarantees that the redundant PBX remains connected to the exchange line in case of a fault or in case of complete fallout of the first gateway.

Functionality

The redundant PBX registers itself with the active PBX and checks its availability regularly. All user data is replicated at the same time using LDAP protocol. This ensures that both systems are always uptodate with each other. The redundant PBX does not accept registrations for the

subscribers in the network, as long as the active PBX is available and thus also does not need any licenses.

As soon as the redundant PBX no longer has a connection to the active PBX, it takes over all activities and thus also the registrations of the terminals. If a terminal is now active in any way, then it automatically logs itself on again - and the innovaphone PBX subscriber does not notice anything about the failure.

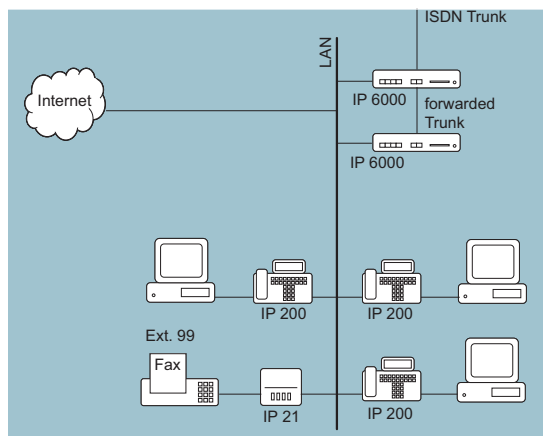
Various locations

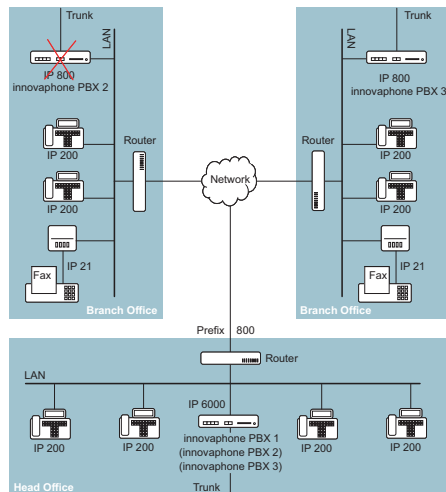
In many situations already several installations of the innovaphone PBX have been connected at different locations. The innovaphone PBX offers a very elegant solution for increased security for distributed PBX systems through redundancy. The head office PBX can be configured over the existing IP connection as a redundantly working PBX for the branches. As in the first example the active PBXs are observed by the head office PBX. In case of a loss of the system this PBX then takes over the registrations and the telephones remain functional. Only the exchange lines cannot be forwarded on to head office. Incoming calls to the branch will no longer work. Nothing changes for outgoing calls. Also access to the exchange line is changed over by registration to head office's PBX. Redialling, directory entries and CTI solutions continue to function as before.

Cost savings

The enormous advantage of the redundant PBX from different locations lies in the costs. The redundancy costs only one registration (license) at the branch's PBX due to the fact that the component installations are already available. The result is however very high reliability of the telephone system.

The innovaphone PBX 1 is simultaneously the redundant working PBX for PBX 2 and PBX 3 in the branch offices. If the innovaphone PBX 2 should fail, then the regi-





strations from this branch office are taken over by PBX 1. Out-going calls from this branch office should then begin with the prefix 800 and then one can get a local outside line in head office's local area network by dialing „0“ as usual.

It is clearly visible that failsafety is available for several other telephone systems through the currently active innovaphone PBX1. This enables additional security at a minimum cost.

Callcenter



A telephone system which is used in a call centre must support specific features. Software integration is a major part of this, which enables necessary Customer Relation Management as well as CTI.

Interfaces

IP based telephone systems have the advantage that they no longer have to overcome media disruption during software integration. Hardware interfaces (CSTA, IDN etc.) are not necessary because both systems work on the same network. Also the so-called bottle neck is no longer a limitation which comes from bandwidth at the interface card being too narrow.

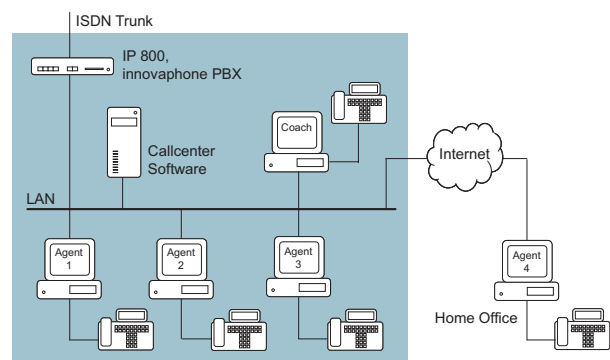
Compatibility

The innovaphone PBX is characterised by the multitude of different standard interfaces. The relevant call centre solutions can be connected in several different ways. Thus there are solutions which directly use protocol H.323 and communicate in this way with the telephone system. Microsoft TAPI and ISDN-CAPI are available for standard solutions. Individual solutions which are tailored for the innovaphone PBX use the XML-SOAP interface.

Mobility

Maximum flexibility is given by the combination with solutions for home offices and other locations. Freelancers can be connected flexibly to their work stations, the company's own hotline can be switched to your home office. In

extreme cases it is possible to switch 24 hour hotlines to employees spread across the world who then always work during their day time.



Terminals

Co-workers in call centres like to use high quality headsets which are comfortable to wear. The telephones IP200 and IP230 have operating possibilities and interfaces for various headsets. The solution with the innovaphone Softwarephone is even more flexible concerning headset choice. In this case all solutions can be connected to the computer using the sound card or USB interface – including modern wireless head sets over Bluetooth or DECT.

Headset interface

The first innovaphone telephones already have the modern interface for headsets according to the technical guidelines for cordless telephone headsets (DHSG). The headset interface enables call disconnection and call pickup via a button on the headset itself. Thus the complicated and fragile handset pickup mechanism is no longer necessary. In addition this interface also supports the functions of volume setting and muting.



Mobility



Mobile telephoning at the work place is often desired and in many cases also often necessary. This is the only way to be constantly reachable: during a discussion in the next room or also in the smoker's area. The telephone system must be extended to include mobile terminals in order for this to be possible. DECT technology is state of the art - however what lies closer to an IP-based telephone system than to change over to Wireless LAN (WLAN).

IP-DECT

The digital DECT technology is very mature: the ranges, voice quality and interception security correspond as far as possible to current requirements. innovaphone AG has several IP DECT systems available to integrate this technology into the IP-based telephone system. They are connected with the innovaphone PBX via IP and provide DECT coverage within its range. Three differently equipped models are available as terminals.

Connection to the innovaphone PBX

The telephones log on using the DECT system. The administration of the mobile subscribers is however done by the innovaphone PBX. Thus the mobile telephones can be configured in parallel to the fixed line telephones. The subscriber can use the advantages of the fixed telephone when at his desk and can still use his telephone number when away from his desk. The mobile telephone on its own can be configured as an extension number for subscribers who are constantly on the road.

Voice over WLAN

Over the last years wireless networks Wireless LAN (WLAN) have developed quickly. It saves wiring and provides more flexibility. Also the security concerns discussed in the beginning have been technically solved. Now it is up to the administrator to install the fitting technology in his network. The newest extensions of WLAN standards also

EXPERT OPINION



Håkan Åkner, NAB Solutions:

"Our vision is to build flexible meeting places for business people, and with our IP Centrex solution that has a mobile connection we can offer just that. No other product out there today could do this as well as innovaphone."

make reasonable voice transmission possible.

innovaphone solution

The new standards finally give innovaphone the chance to design a WLAN telephone that can satisfy the requirements in the business area without proprietary extensions. The telephone can use all features of the innovaphone PBX as the telephone is directly connected to the IP network (without DECT-Gateway). Here are a few tips in order for the current WLAN to comply with Voice over Wireless requirements:

:: The dimension of WLAN in the computer network is planned so that all intended work stations are sufficiently catered for. However later it should be possible to make telephone calls everywhere. Think about the lighting in the meeting rooms, smoking areas, kitchen area and further places.

:: The WLAN cells should have sufficient overlapping for handover between WLAN cells to take place without inter-

ruption. Mobility actually means one can move freely.

:: In order for capacity to be improved especially during standby time of the telephone, then it must be able as necessary to turn off users currently not in use. Due to IP networks being very "chatty", the WLAN access points need an appropriate spoofing technology, which only delivers the packages which are really necessary to the telephone. They are defined in the Wireless Multimedia Extensions of the IEEE Standards 802.11e.

Differences in mobile technologies

The answer about the suitable technology is essentially based on two conditions. If the WLAN network is to be newly set up, then it can be directly laid out for the new voice requirements. If a system should be established however at short notice or should a DECT solution exist already, then the IP DECT solution should be favoured. The second consideration is functionality. Should all features of the innovaphone PBX be also necessary for mobile telephones then it is probably better to choose the new Voice over WLAN technology.

GSM Extension

The innovaphone PBX can configure the known mobile subscribers with their GSM number to an internal number using a simple telephone number mapping. This mapping enables several immediate advantages to be used:

:: The mobile phone tariff can be chosen so that a home number with a less expensive call charge can be used. This home number is then the number of the company head office. When the mobile employee telephones using the company number then he can be recognised through his mapped number. His calls will be recorded and the „busy“ signal will appear when the subscriber telephones using his mobile phone.

:: The mobile subscriber is directly reachable for all PBX subscribers under his mapped extension number. The favourable tariff also applies for this direction.

:: If the mobile subscriber makes a call over the office exchange line into the public network, then his connecting costs include the favourable home tariff and the fixed network connection, which in many cases is still less expensive than a direct connection in the fixed network.

Some mobile telephones can set up a separate calling card number, which is set up in front of each telephone number. If the number of the company's head office is entered here, then the subscriber can continue to use the numbers stored in the phone.

Functionality can be extended again by using auxiliary software. Then also control over DTMF tones is possible. This enables the mobile subscriber to use also functions such as call back, call forward and conference calls.

Compact PBX



State-of-the-art technology, high availability and an almost endless number of feature combinations are also possible with small, reasonably priced telephone systems. innovaphone provide solutions which have been specially designed for systems with up to 50 subscribers.

Well-proven robust technology

Complex systems which have been proven time over and which are mapped onto small solutions are always attractive due to their stability and functionality. Thus the compact PBX IP302 is the result of many years of intensive development. We have also reverted to a small stainless steel housing without a fan.

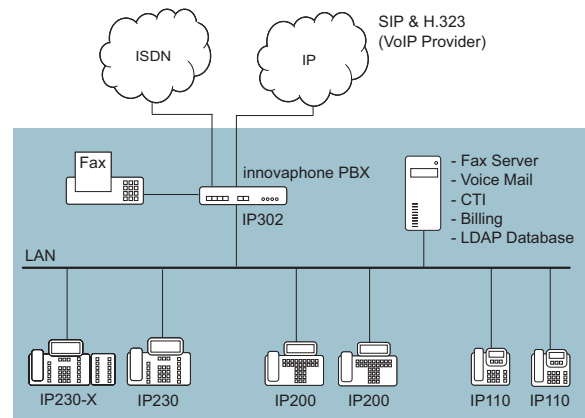
Traditional and modern connections simultaneously

The PBX provides different ways of connecting publically. Besides the ISDN interface to the traditional telephone network, the PBX provides at the same time access to one or more VoIP providers. The connections are switched to outside lines using the SIP protocol converter whilst the high-capacity protocol H.323 continues to work internally. In addition the ENUM protocol provides number resolution

on the internet. Of course also the compact PBX from innovaphone can be integrated in an extensive system as a sub-PBX.

Fax connection included

The term compact PBX is based among other things on the fact that the IP302 PBX provides 2 connections for fax machines or other analogue terminals. Thus the interference-prone installation of separate, analogue terminal adapters (ATA) is not necessary.



IP Centrex



It is thanks to VoIP technology that it is very simple to outsource the entire telephone system to a provider. The subscribers work on the already existing IP connections without any technical losses. Companies with a branch office structure are especially winners if the provider makes the telephone system available to all locations.

Customer advantages

The advantage of central solutions lies in the fact that no telephone system is physically necessary at the customer's premises as it is realised centrally from ISP. This enables cost savings not only in investment costs, but also in particular cost savings for the relevant service agreements and software upgrades. Further advantages for the customer are:

- :: a real scalable solution
- :: no numeric limitation of subscriber connections
- :: minimal investment
- :: minimal technology commitment
- :: own service personnel is not needed
- :: no room needed for the telephone system
- :: no insurance needed for the telephone system equipment
- :: Concentration on core competence, no telephone system ballast
- :: less expenditure in „non-core competences“
- :: homogeneous telephone system solution throughout locations without additional cost
- :: little capital commitment
- :: continuous actualisation of the system by the carrier

innovaphone PBX

The innovaphone PBX is excellently suitable for carrier solutions. The consequent implementation of VoIP standards H.323 and SIP means it is able to be integrated in various environments with the provider as well as with the customer. Features such as call forward, group functionalities, three person conferencing and call back on busy enhance productivity for the customer. Server solutions such as voice mail, fax and unified messaging extend further the provider's features spectrum. Solutions for improved fail safety through redundancy or maximum flexibility through the location concept offer more service possibilities. The system is rounded off with a software for a tariff solution to ensure exact and detailed billing.

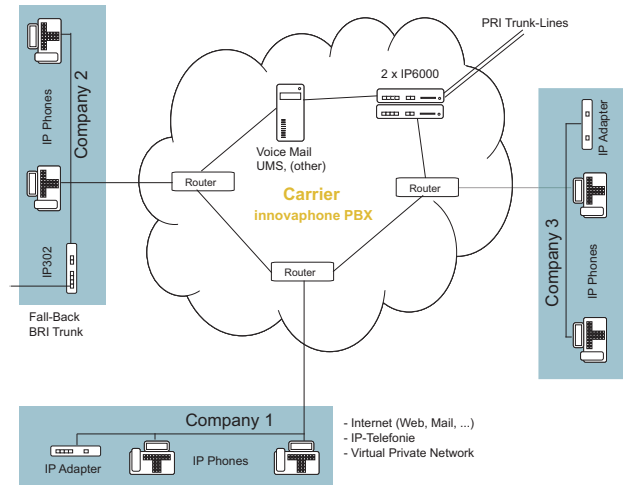
EXPERT OPINION



Marc Benoist, VoIP Telecom:

"Voice over IP is currently one of the technologies with the strongest growth. However customers always have mixed feelings about new technologies. What makes more sense than to leave the risk to the provider, who knows all about the subject and can deal with the special characteristics? Therefore many of our customers make use of the possibility we offer to have their telephone system run by us as IP Centrex. All possibilities for extension and change remain open for the customer thanks to the flexible innovaphone PBX product configuration."

The example shows schematically a centrally installed innovaphone PBX which could be set up at an internet service provider. The PBX works on an IP6000 and provides the features for the customer. The tariff software for billing works on an additional server. In addition solutions for voice mail or UMS can be installed there. The customers are connected to the system over the service provider's back bone. They only use a data connection to the service provider. IP telephones as well as VoIP adapters for terminals which are not VoIP compatible are to be found at the customer end.



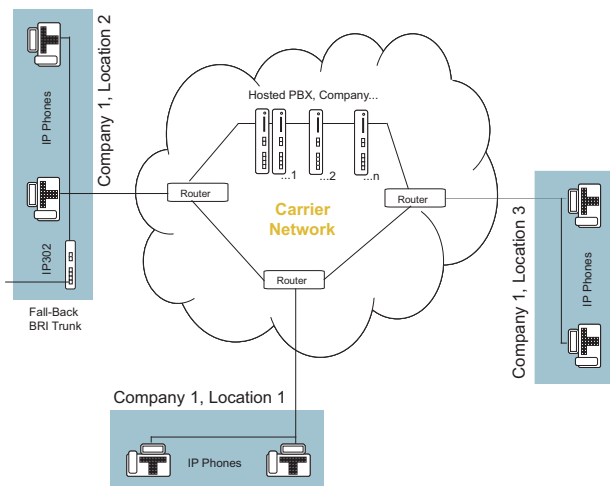
Hosted PBX



Many companies face the task of improving voice and data communication and optimising costs at the same time. Almost all middle sized companies run a telephone system in their own premises and almost every second company has a dedicated employee to administrate it.

PBX Outsourcing

As with all outsourcing projects, the technology which is not a part of the core business is outsourced to a specialised service provider. A proven combination of self administration and Provider service, as it has already been known from web hosting for a long time.



Secure environment

Usually a provider has the best conditions for operating devices such as air-conditioned server rooms, uninterruptible power supply and 19" racks. Ideal conditions for installing the telephone system's central device.

Managed PBX

The administration can be divided between the owner and the operator of the telephone system as desired and depending on state of training. In this way allocation of calling numbers, group administration and user settings can also be administrated by the owner, while the provider ensures the technology works reliably. The trained provider ensures the connections to the branch offices and to the public network and takes over all further administration work for the telephone system.

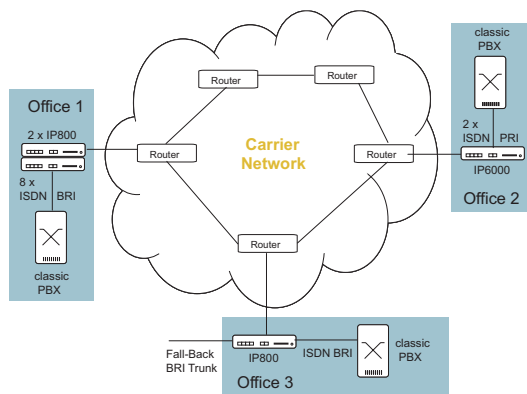
Media Gateways



Every service provider needs appropriate interconnections to other telephone networks for voice service. In Europe these are mainly interconnections to ISDN. These interconnections are realised using media gateways. In best case the gateways are divided in different local networks in order to keep calling costs low.

Unlimited scalability

The Media Gateways from innovaphone are available in different sizes from one ISDN connection to several primary rate interfaces. All these gateways can in addition be installed more than once. With a multiple installation they build a logical unit so that network interconnections of any size are possible.



High port density

The innovaphone gateways are prepared to be built into a 19" rack. Space in the rack is precious and must be used effectively. Two gateways can be fit next to each other and use thus just one height unit. In the case of the high-end gateway IP6000 120 channels can be fit into just one 19" height unit.

Potential for further services

A distinctive feature of innovaphone Media Gateways is that it is possible to extend the gateways to a complete telephone system simply through uploading a PBX license. Thus operator solutions can be extended simply and easily from media gateways to hosted PBX solutions.

Messaging



Email, fax, Voice Mail, SMS and other forms of electronic messages are vital for every modern enterprise. Currently "Unified Messaging" solutions take over the necessary interaction between the mail server and the telephone system.

Interfaces

Unified Messaging solutions thus have their interface in both directions. The connection to the required mail system is simply possible using the mail protocol SMTP. However as an integrated solution is often needed, then the solution tailored to the respective mail system must be implemented. Almost any messaging solution compatible to the mail system can be used because the interface to the telephone system is to a large extent standardised and the innovaphone PBX supports all common interfaces.

Partner program

As a manufacturer of standard-conform VoIP solutions, innovaphone constantly regards solutions of other manufacturers in this field. Solutions can be marked with a seal of approval "innovaphone recommended product" and can be registered in the innovaphone 3rd party compatibility list once they have proven themselves to be compatible with the innovaphone systems in our laboratory.

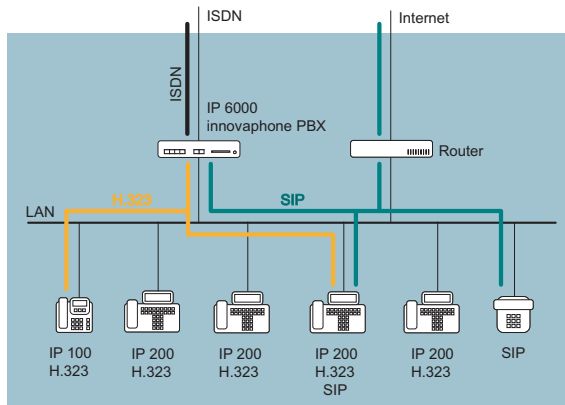
Interfaces



The innovaphone PBX offers a multitude of software interfaces so that the entire communication environment does not have to be changed after conversion of the telephone system to VoIP technology. The most important interfaces will be briefly introduced here.

Example

SIP telephones can also be integrated internally into the PBX environment thanks to SIP support. In the diagram the right hand telephone is registered on the innovaphone PBX as SIP compatible terminal. The telephone can set up connections to SIP and H.323 compatible devices as well as over ISDN due to the PBX protocol conversion.



The left-hand telephone in the diagram is a pure H.323 terminal registered to the innovaphone PBX. Using a prefix the telephone can either set up a connection to a SIP based receiving station in the internet or directly over ISDN. All that is needed to set up connections to SIP compatible receiving stations is simply the name with the appropriate mail address.

Control

Often different interfaces are favoured to control the innovaphone PBX. Thus the Microsoft Telephony API (TAPI) serves as interface for many CTI applications. Fax, Voice Mail and generally Unified Messaging are often connected over the ISDN interface CAPI. XML-SOAP provides most functions for solutions especially tailored to the innovaphone PBX. It thus enables an individual extension which can be quickly and easily realised on a widespread interface by anyone.

Database access

Access to telephone directories can take place directly to the data base using IP based telephones. The data base protocol LDAP is available on both the PBX and on the telephones. The system telephone IP200 even has an alpha numeric keypad integrated for functions such as dial by name using the database.

End devices with headset interface

The IP230 is the first innovaphone telephone to support the interface for headsets according to the technical guidelines for wireless telephone headsets (DHSG). This headset interface enables improved telephone control using the headset. Thus it is possible for example for call pickup and hook on to take place using a button on the headset. That is particularly attractive for those using wireless headsets. The popularity of the new interface is quickly spreading in the market. Leading manufacturers of headset solutions already support this interface.

EXPERT OPINION



Sören Erlandsson, Cobs:

"We are depending on flexible and open architecture, and innovaphone can provide us with one piece of the puzzle so we can provide innovative solutions for our vertical markets. With the flexible SOAP interface there are almost unlimited options to tailor made the solution for our customers. Our partnership with innovaphone will help us to stay ahead of our competitors in our preferred markets."

Billing

Telephone system billing has been done using Call Detail Record (CDR) already since earlier generations. Also the innovaphone PBX writes these data, which can be evaluated by all CDR applications.