

The market researchers all agree: Voice over IP – abbreviated to VoIP and also known as Internet telephony – is definitely on the advance on a world-wide scale, especially in Europe and in the US. Nevertheless, prejudices and clichés regarding this technology remain widespread. Therefore, we have written this “guidebook” to help both corporate decision makers and end users to separate fact from fiction – to bring light into the perceived darkness that so often overshadows voice over IP.

VoIP



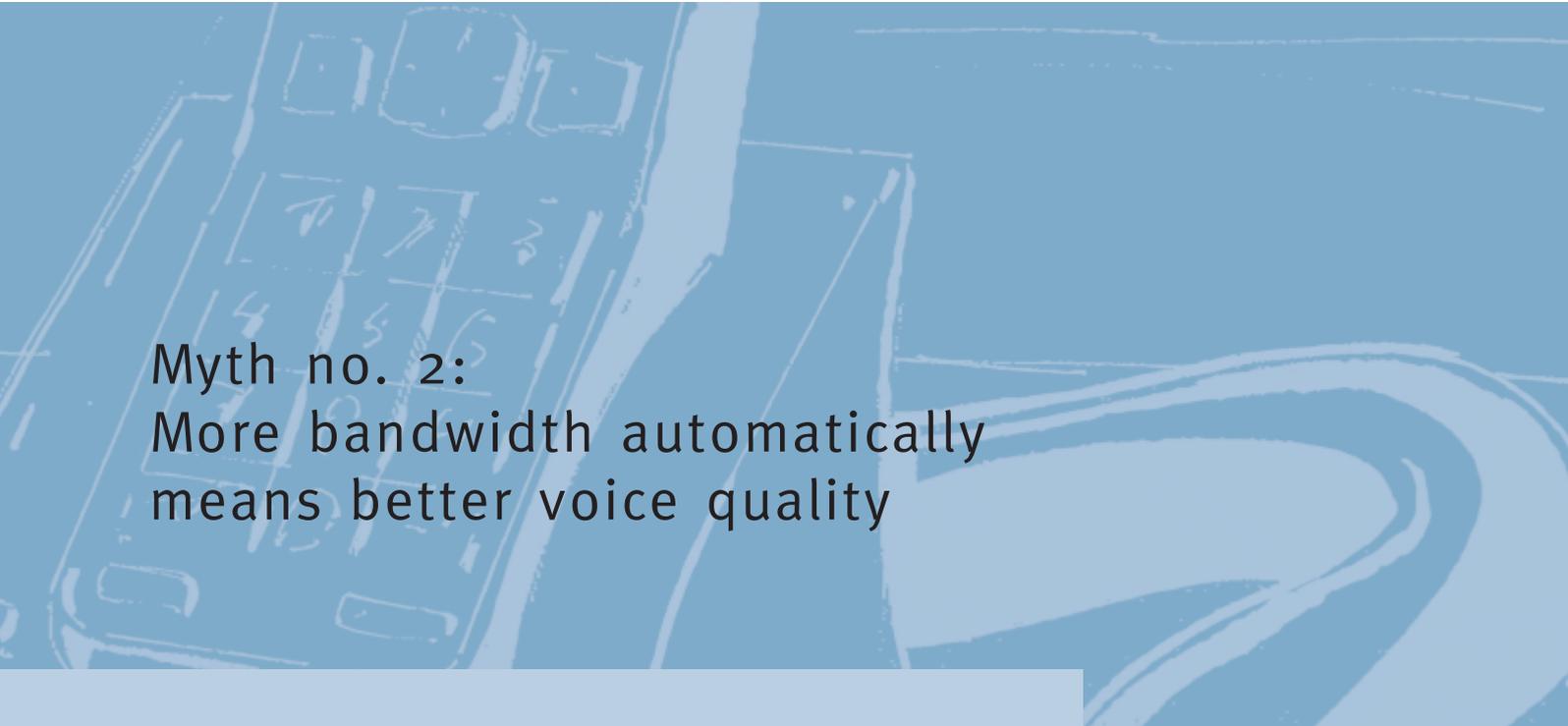
Myth no. 1: VoIP voice quality is substandard

The fact is that there is no longer any noticeable difference in voice quality between conventional switched calls and VoIP calls. Many long-distance calls are already routed via VoIP channels – and nobody even notices. At present, however, there are still certain situations that can indeed influence the voice quality. For example, placing a second call while one call is already in progress may be impossible, or deliver only poor-quality results in some systems. This problem can be overcome, however: Faster data speeds and the dedicated VoIP unit that is built into Infineon's chips guarantee superb voice quality even if several calls are placed concurrently. New technologies, such as telephony with HD sound, even provide FM radio quality, which is far superior to any other call experiences to date.



1 myth





Myth no. 2: More bandwidth automatically means better voice quality

Not necessarily. New high-speed access technologies can also have negative side effects. Fast data rates, such as ADSL at 16,000 kbps, VDSL (25, 50 and 100 Mbps) and PON (100 Mbps) support new applications such as Internet television (IP TV) that place huge demands in terms of data capacity and connection quality. On top of this, more and more users these days hook an assortment of devices up to each other – PCs, notebooks, set-top boxes and media servers, for example – over their wireless home networks (WLANs). And then there is the fact that integrating cordless telephony base stations into the gateway now also allows multiple calls to be placed simultaneously. All these developments place a heavier burden on the data flow through the gateway to meet the high quality requirements of VoIP.

It is sufficient to impair voice quality for many existing legacy systems deployed in the field, using only one of the above application scenarios. By contrast, VoIP chips from Infineon that are already deployed in a variety of VoIP systems, feature two separate, independent cores – one for voice and one for data – to guarantee optimal voice quality at all times.

myth



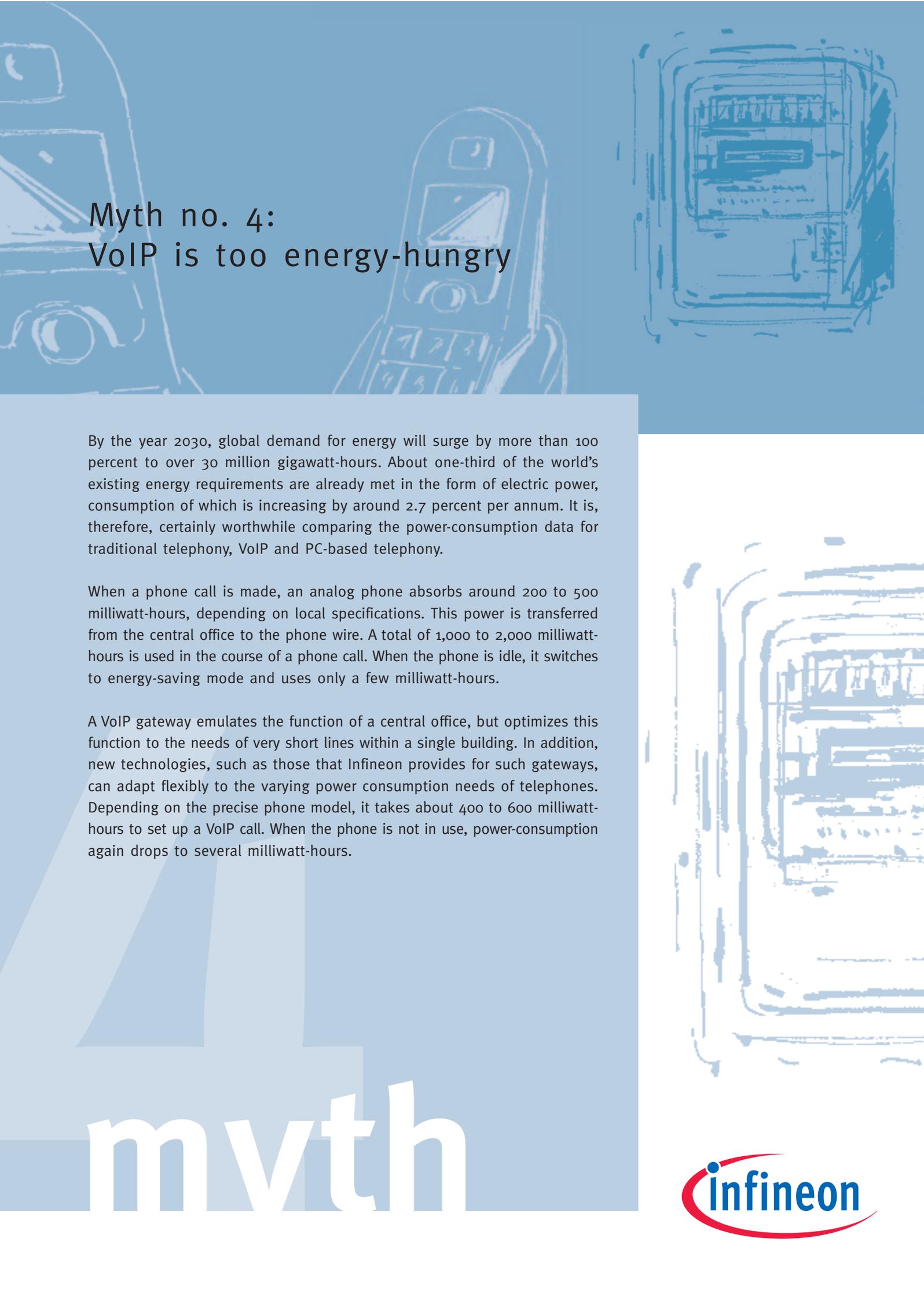
Myth no. 3: VoIP doesn't pay for itself

A confusing array of tariffs and cost factors does not make it easy for private or corporate users to see their way through the VoIP jungle. End users who already have broadband Internet access can nevertheless reap substantial savings by using VoIP instead of conventional landline telephony. Calls that remain within one's own network or corresponding partner networks, and are routed via the Internet, are completely free of charge. With some providers, this is also true for calls placed into the regular network. For people who spend a lot of time on the phone, the potential savings are very attractive indeed. Prices for international calls and to mobile networks vary greatly, from free-of-charge to the same rate offered by the traditional telecom provider. However, since the prices and tariffs for VoIP are in a constant state of flux, further price cuts are to be expected in the months ahead.

In the corporate segment, too, both the price of VoIP phones and the rates available vary very considerably. Having said that, 50 percent of all new phones sold in the world today are already VoIP-enabled – and the number is rising constantly. For many companies, simpler wiring is one of the main incentives to switch to VoIP, as Ethernet installations do away with the tangle of phone wires that were needed in the past. Superior computer-telephony integration (CTI) capabilities are a further consideration that should be weighed carefully when examining whether a new telephone system will pay for itself. Accordingly, enterprises would do well to bear in mind the wider spectrum of VoIP applications when comparing costs and benefits.

myth





Myth no. 4: VoIP is too energy-hungry

By the year 2030, global demand for energy will surge by more than 100 percent to over 30 million gigawatt-hours. About one-third of the world's existing energy requirements are already met in the form of electric power, consumption of which is increasing by around 2.7 percent per annum. It is, therefore, certainly worthwhile comparing the power-consumption data for traditional telephony, VoIP and PC-based telephony.

When a phone call is made, an analog phone absorbs around 200 to 500 milliwatt-hours, depending on local specifications. This power is transferred from the central office to the phone wire. A total of 1,000 to 2,000 milliwatt-hours is used in the course of a phone call. When the phone is idle, it switches to energy-saving mode and uses only a few milliwatt-hours.

A VoIP gateway emulates the function of a central office, but optimizes this function to the needs of very short lines within a single building. In addition, new technologies, such as those that Infineon provides for such gateways, can adapt flexibly to the varying power consumption needs of telephones. Depending on the precise phone model, it takes about 400 to 600 milliwatt-hours to set up a VoIP call. When the phone is not in use, power-consumption again drops to several milliwatt-hours.

myth





PC-based telephony and other VoIP offerings for PCs tell a different story, however. If a caller is working on the PC while talking over PC-based telephony, the additional power requirement remains minimal. For private users, however, this is almost never the case, so all the power channeled into the PC is used for PC-based telephony alone. And that can be as much as 250 watt-hours for a desktop PC or 30 to 40 watt-hours for a notebook. If PC-based telephony is used only for outbound calls, the costs incurred remain within reasonable limits. At a rate of 15 cents per kilowatt-hour, the charge is about 4 cents per hour. However, if the PC is left running around the clock to cover inbound calls as well, this alone can add up to an electricity bill of as much as 300 USD per annum. Aware of this, some PC-based telephony operators are now also selling WiFi phones that use just 1.5 watt-hours during a call and around 150 milliwatt-hours in standby mode.

myth



Myth no. 5: VoIP phones are not yet truly interoperable

Especially in Europe, but also in most countries, the interoperability of VoIP is not really an issue any more, although some proprietary service providers remain, especially in North America. Clear specifications exist for pure voice data links (RTP), so every device is compatible with every other device. Within the existing standards, certain permitted options regarding the signaling stack (SIP is the most widely used VoIP signaling for CPE) can still lead to slight discrepancies between providers. In recent years, however, system vendors have optimized their software versions to the extent that most can now be used in combination with any provider. Standardization committees in particular, such as ETSI, are working hard to iron out the few remaining inconsistencies.

Infineon supplies its customers with a software package that is already fitted in some commercially available systems. At our fully automated interoperability laboratory, we rigorously test this software in 24/7 operation with more than 100 different types of VoIP equipment, to guarantee maximum compatibility for this technology.

myth



Myth no. 6: VoIP is full of security loopholes

Whether VoIP easily allows eavesdropping is a subject that repeatedly generates heated debate. “Call hijacking” – i.e., the illegal use of user accounts – is another such issue.

Let us first address the issue of eavesdropping. There are three locations at which outside parties could “listen in” on a call: in the building where the phone is situated; somewhere along the line that links this building to the central office; and somewhere in the long-distance network.

Within a building, most users work either with analog POTS or cordless phones. From a technical point of view, it is very easy to intercept calls made to or from analog phones: Switching a second phone in parallel is all it takes. To do this, however, the eavesdropper would have to gain access to the building and to the telephone wires. The situation is exactly the same with traditional telephony using POTS phones. Therefore it is not true that VoIP makes it easier for someone to intercept a call.

The easiest place to intercept a call unnoticed is on the link between the building and the public network. Along this line, it is very easy to eavesdrop on traditional analog phone calls. ISDN – mainly used in Europe – makes it much more difficult. And VoIP, whose data packets are transmitted via ADSL2+ and VDSL2 lines, makes it virtually impossible. At this point, VoIP is thus far more secure than other technologies.

At the third point – the long-distance network – providers take very strict measures to safeguard their networks. Unauthorized access is, therefore, not possible here.

myth





Corporate and private users should also ensure that their gateway is protected by a firewall. Where WiFi phones are used, usage of phones compliant with the WPA2 security standard is strongly advised, as the most critical element would be an unprotected Ethernet link (LAN and WLAN).

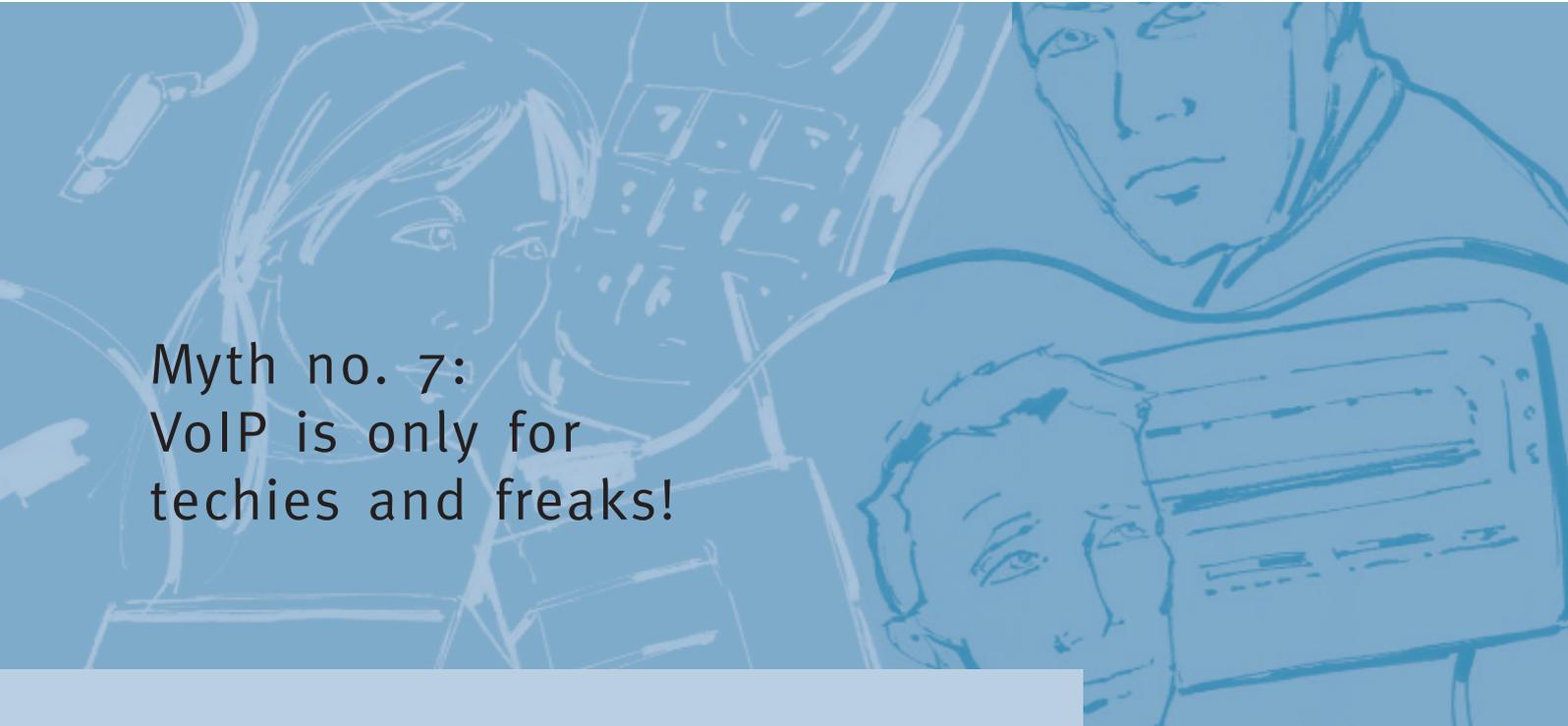
Corporate networks naturally require stricter security. Yet existing wiring is often Ethernet-based and can thus be scanned using tools that are freely available. In response, special options admitted in the VoIP standard – such as Secure RTP (SRTP) – can be deployed. Since all VoIP chips from Infineon (be they for corporate customers or end users) are fitted with this technology. This encryption facility can be used simply by upgrading the software. As a result, intercepting calls is practically impossible.

At present, users authenticate themselves only by signing on to the VoIP provider with a user ID and a password. Any unauthorized person who gains access to these two data items can, therefore, theoretically set up calls from other VoIP phones and effectively “hijack” calls at other people’s expense. However, there are as yet no known cases where this has happened. Moreover, the fact that VoIP is integrated into the gateways/IADs prevents spyware programs from intercepting user data – unlike on PCs, for example. There is also a technical tool to make authentication more secure: the Secure RTP (SRTP) standard, which covers both encryption and authentication. Modern gateways fitted with chips from Infineon can have this advanced technology slotted in very easily by means of software upgrades.



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Myth no. 7: VoIP is only for techies and freaks!

In terms of user-friendliness, the VoIP phones currently available on the market vary considerably. To make it easier for end customers to install and use these devices, a new standard has been formulated (DSL Forum TR-69 Device Management) that lets operators use a single application to configure even heterogeneous telephone landscapes. Ideally, users do not have to bother about setting up their VoIP phone at all – and are, therefore, less likely to end up with configuration errors. This technology thus delivers tremendous benefits to end users and carriers alike. In addition to the actual communication chips, Infineon also supplies customers with a complete software package with integrated TR-69 functionality.



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Our semiconductor and system solutions for broadband communication have made Infineon Technologies a leader on the world market.

Infineon's high-tech solutions make life easier – providing safety and security, making connections and bringing enjoyment.

What's more, since many of these solutions increase energy efficiency, they can protect the environment and save money. Millions of people all over the world use our products everyday – while driving a car or riding on a train, making phone calls or working at the computer.

Infineon chips are at work when we watch TV, play video games, surf the Internet or make cash withdrawals. That is why technologies from Infineon are not merely innovative and leading in their field – they are first and foremost **technologies for life.**

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