EuroCloud DEUTSCHLAND | eco

Association of the Cloud Computing Industry

Competence Group

Business Communications

WebRTC in Germany

Facts and Trends

We promote competencies.
We create transparency.

www.eurocloud.de

Publication Details

EuroCloud Deutschland_eco e. V.
Lichtstrasse 43h
50825 Cologne
Phone: +49 221 / 70 00 48 – 0
Fax: +49 221 / 70 00 48 – 111
email: info@eurocloud.de
Web: www.eurocloud.de

Register of Associations:
District Court (Amtsgericht) Cologne – VR 16215

Registered Office:
Cologne

Project Management:
Detlev Artelt, Head of Competence Group
Business Communications at
EuroCloud Deutschland_eco e.V.

Editorial:
aixvox GmbH

Sources:
iconimage - fotolia
puckiillustrations - fotolia
Sergeymansurouru - fotolia
Jakub Jirsak - fotolia
Detlev Artelt - aixvox
olly - fotolia
Disruptive Analysis Q1 2015 WebRTC ReportUpdate
alphaspirit - fotolia
madpixblue - fotolia
EOA - aixvox
mayrum - fotolia
Sergey Nivens - fotolia
Sarah Holmlund - fotolia

Contents

Competence Group
Business Communications

WebRTC in Germany
Facts and Trends

Preface

Dear Readers,

We are experiencing a constant change in our communication behavior, thanks to services from the Internet that enable us to make phone calls, to exchange voice and text messages, and also to jointly work on documents, presentations, and other application data.

In most cases, in order to be able to avail of special functions, we need optimized apps or browser plug-ins for the relevant cloud service. This results in considerable additional work for set-up and activation – quite apart from the security issues that accompany the constant request for updates, amongst other things.

The Web Real-Time Communication (WebRTC) standard offers a collection of communication protocols and interfaces for real-time communication between the browsers of the participating users. In the ideal case, this means that no further applications or plug-ins are necessary, as long as the browsers are set to have the same standardization status.

Telephony is moving into the cloud and the entire communications infrastructure has now been migrated to the Internet Protocol. With the integrative functions of WebRTC, communication in real time will become even easier and we will see many other exciting areas of application in the future.

The EuroCloud Competence Group Business Communications has developed these guidelines to lay the foundations and set out the areas of application and, in so doing, offer an excellent orientation for the use of this innovative technology.

We wish you an enjoyable read and every success in the planning and implementation of your own projects, and would like to thank the team of authors for the comprehensive work put into compiling this guide.

Cologne, 1 March 2018

Andreas Weiss
Director, EuroCloud Deutschland_eco e. V.

What is WebRTC?

The Internet was originally conceived with the goal of transmitting documents. In 1989, researchers at CERN (the European Organization for Nuclear Research) developed a corresponding information network, and in 1992, the first HTML specification appeared. With this, the foundation stone for the rapid advancement of the Internet was laid. Even today, the Internet is mainly used for the transmission of documents: websites, emails, and online files have become an integral part of our daily lives. By the end of the 1990s, it was already possible to use Voice over IP (VoIP) to allow telecommunications to take place on the Internet. Today, telecommunications apps also offer video transmission, thereby opening up the possibility of multimedia real-time communication. In making this leap, the greatest challenge has been the real-time factor. With documents, it is not so bad if transmission is delayed because ultimately, what's important is that they end up being 100 percent available. But when it comes to audio-visual communication, the transmission of the signals in real time is a must. Because nobody wants to hang around for five minutes waiting for their counterpart's response.

Today, modern VoIP solutions are more than capable of offering the option of real-time calls. However, these programs have one crucial disadvantage: The technology on which they are based is to all intents and purposes a "black box", because it comprises without exception of proprietary software. These also represent a certain hurdle for the end user, as they often have to install a client software before use. As such, it is not easy for companies to reach each and every customer with the VoIP solutions they use. Of course, a call from the VoIP program can usually be routed to the normal telephone line. However, this removes some of the major advantages of VoIP, such as being able to switch on a camera or share desktops.

This is where WebRTC comes in and makes real-time video communication available as open source software. This has many advantages: All standard Internet browsers already have a WebRTC interface, which automatically deals with the question of whether the call partner has the same software. The issue of security is not down to trust, because the code is publicly available and is used by numerous development teams. This allows errors and vulnerabilities to be detected and rectified more quickly than with programs that are programmed behind closed doors by only one team.

The Open Source Project

On the one hand, WebRTC stands for its technology, a uniform communication standard; on the other hand, it also represents the open source project from which this technology emerged.

The WebRTC project was launched five years ago by Google and has since enabled real-time communication from the browser, without the need to install additional software or specific programs. This allows users to make phone calls and activate video conferences with just one click in their web browser.

The use of WebRTC is not just confined to the private sphere, but also extends to industry, commerce, and many other areas. In recent years, it is not just customer services and call center industries who have discovered WebRTC for themselves; the possibilities it offers of a seamless, low-threshold form of communication are also being availed of in companies' internal communications, as well as by the medical sector.

Particularly when it comes to the unified communications trend, WebRTC is the perfect complement to and extension of the existing range of communications offerings. Because WebRTC is not just any other video technology – it completely changes the way that video chat is used. However, WebRTC has not yet gained as much ground in the communications sector as one would expect in view of its numerous benefits

Meanwhile, diverse possible applications for WebRTC are in use not only in the private sphere, but also in industry, commerce, and above all in the medical sector.

The Technology

The WebRTC technology comprises of a collection of different APIs and protocols that are brought together in a uniform interface. RTC stands for "Real-Time Communication" and principally includes voice and video, but also any other form of data transmission. The innovation of the technology is that WebRTC makes a media discontinuity – i.e. a change of communication channel – unnecessary.

What is particularly exciting is that the browser essentially becomes the end device. WebRTC provides access to the camera and microphone of the smartphone, tablet, laptop, or PC, so that simple phone calls or group video chats can take place between participants' browsers. As it presently stands, Chrome, Opera, Firefox, and Microsoft Edge already fully support WebRTC. WebRTC's broad browser-side support means that implementing a WebRTC solution does not require expensive investments in a company's technical infrastructure. The necessary technology is available in the company, as well as with partners and customers. So WebRTC is tearing down barriers.

Imagine the following situation:
A customer visiting your website suddenly has a question about a product or service and would like to contact you about it. She calls up the contact page and expects a contact form or, with a little luck, even a telephone number. But she is astonished to discover that, with a simple and uncomplicated click – without the installation of an annoying plug-in – you can offer her a voice connection or even a video chat.

From a technical perspective, WebRTC can now enable this customer experience by combining different protocols and APIs. In this sense, WebRTC is also a specification. This specification is standardized by the W3C and the IETF and also defines the JavaScript API, which enables convenient development of WebRTC applications.

No programming knowledge or extensive technological know-how is required for the practical use of WebRTC. In order to enjoy unlimited real-time communication as a user, it is sufficient to install a compatible web browser – and in most cases, these are in any case already installed on the system.

The necessary speakers and microphone are already fitted in many notebooks and in all smartphones. As a rule, the user therefore does not have to do anything or make an expensive purchase for the purposes of communication. Nonetheless, for greater comfort, using a good headset or a microphone with earphones is to be recommended.

WebRTC thus reduces any hindrances experienced in contact with (new) customers – because any customer wanting to contact a company and not finding a suitable communication channel is quickly out the door again. With WebRTC, the customer is offered a low barrier to communication. WebRTC also decouples users from stationary devices because smartphone browsers are WebRTC-enabled (Safari for iOS and Chrome and Firefox for Android). WebRTC is thus available as a communication channel wherever a stable Internet connection exists.

Regrettably, as of yet, the take-up of the possibilities offered by WebRTC has been sub-optimal. Although there are many applications, some of them experimental – such as shared Netflix streaming via WebRTC – WebRTC is still used relatively rarely in the business environment.

If, however, WebRTC continues to gain acceptance, it will mean a revolution in communication, because hardware, end devices, software, and traditional networks will have served their time. WebRTC offers the potential of a disruptive technology, and as always with such developments: Either you do it yourself, or a competitor will take on the work for you.

Security and Data Protection

Some might consider this an opportune time to rein in this discussion of modern, low-threshold real-time communication and point out the often multiple security vulnerabilities which are incompatible with confidentiality requirements. But this is actually far off the mark, because WebRTC by its nature comes with its own security functions and end-to-end encryption.

The WebRTC connection is protected by the Datagram Transport Layer Security (DTLS) protocol, which is already integrated in the Chrome, Firefox, and Opera browsers. This protects data transmission from manipulation or interception by intelligence services. Video and audio transmission are also additionally protected by the Secure Real-Time Protocol (SRTP). In terms of data protection and security, WebRTC is thus well ahead of conventional VoIP applications such as Skype, streaming, or the sending of emails, which are often beset by security breaches.

End-to-End Encryption

It is now known that even established standards such as the WLAN encryption WPA2 can be hacked. However, it is rarely taken into consideration that decrypting a WLAN password does not necessarily lead to the disclosure of important data.

WebRTC‘s end-to-end encryption makes the transmission of sensitive data secure, even in the case of a corrupted network or an Internet exchange point tapped into by intelligence services, since this data itself is encrypted again.

Imagine someone breaking into your apartment to steal your diary, which he manages to do. However, you were clever and took precautions, because your diary is written in a secret language, which can only be deciphered by those who should be allowed to read it. This is how WebRTC end-to-end encryption works.

Data Protection and Privacy

But does an interface integrated in the browser for the transmission of voice, video, and text not carry the risk that any web app can simply open these channels and thus invade privacy? Users don’t need to worry about this, because the major browser vendors have long since integrated features to deal with this problem. For example, if a website wants to know the user’s location, Google Chrome asks the user to either allow or prohibit the release of this information. This is exactly how it works with WebRTC applications. Whenever such an application wants to access the microphone or camera, the user is asked in advance to allow or prohibit this. This gives the user full control over his or her privacy.

In addition, with the help of small icons, the browser indicates which browser window is currently using which system resource. We are also familiar with this characteristic from other applications – for example, a small speaker icon shows which browser tab is currently playing audio. This is always useful when users want to quickly identify on which page a video has just started playing. In the context of WebRTC, this function is especially advantageous if you want to be absolutely sure that none of your tabs can continue to access the camera or microphone if they're not supposed to.

Session Border Controller

With a Session Border Controller (SBC), an additional protective layer can be added to the WebRTC communication. The SBC is located at the interface between the company's internal communications network and the outside world. The SBC protects against Distributed Denial of Service (DDoS) attacks and spoofing (the operation involving a user intentionally changing his or her identity in the network). In the WebRTC environment, the SBC thus protects its own internal network from external threats and is therefore an indispensable component of a WebRTC-based communication system.

In addition, the SBC can mediate between different protocols, for example between WebRTC and the Session Initiation Protocol (SIP), which is used by almost all VoIP applications. This is how communication across protocol boundaries is possible with the SBC. In this way, the SBC also serves as an enabler for seamless communication. In addition to mediating between the various protocols, it can also assume the task of adapting and transcoding different codecs potentially used by two VoIP networks.

A further important function of the SBC is that it can hide the topology of its own network from the outside world without preventing the possibility of a WebRTC call. The SBC is therefore not only relevant for users who want to use WebRTC, but it is generally more than recommendable for any type of communication system. In combination with the security precautions mentioned above, the SBC is therefore an integral component of communication security.

Detlev Artelt heads the Competence Group Business Communications of EuroCloud Deutschland_eco e.V. He is an acclaimed expert in the modern design of workstations and communication processes which use Internet-based technologies and applications.

Interview with Detlev Artelt

WebRTC stands for Web-Based Real-Time Communication and is part of the new HTML5 standard. This is integrated in almost every current Internet browser in order to make the use of multimedia content on the web even easier. This results in communication on the Internet in real time, not only by voice, but also by image and text. This has the enormous benefit that, in the future, we will only need a browser and Internet access in order to be able to speak to people and companies.

What are the benefits for companies?

A company may not consciously use the WebRTC standard, but instead will make use of services based on it. So, companies may not be out there looking for WebRTC solutions, but more and more products are coming onto the market that support WebRTC. For example, these allow visits to firms' websites and contact with a company representative via video chat with a single click. These benefits will lead companies to adopt this technology.

What is the current status of WebRTC usage in Germany?

As a specialist, I have been following this topic for several years now. Which is why I've also founded the German WebRTC Taskforce together with the eco Association. It's still early, but some powerful solutions are already appearing on the market. The public will get to grips with this topic more and more in the next few years and will take it for granted that the data world will replace the good old telephone. Many applications already support some or all of WebRTC's features, and more are being added on a daily basis.

When and in which areas will WebRTC achieve its final breakthrough?

Customer services will play an important role here, because WebRTC makes it very easy to display problems visually. Instead of having to describe these problems in detail in writing or over the telephone, they will simply be depicted using video. At the same time, there is enormous potential for optimizing the business communication of companies, given that today only an Internet connection is needed for communication.

Since this connection is available almost everywhere, employees can carry out their work in widely dispersed locations and often spare themselves bothersome commuting and long traffic jams. So, all the functionalities offered by WebRTC can significantly improve everyday working life and work-life balance.

What is the current status of WebRTC abroad compared to Germany?

The American market is usually one to two years ahead of us. This is partly due to the fact that solutions in America are not necessarily expected to be of the same quality as in Germany. We Germans often have ourselves to blame for such time-lags due to our high demand for security. But here WebRTC can hold its head up high, because the communication is coded and thus relatively secure.

At the moment, the German market is strongly on the upswing. In my last webinar, I was able to present many solutions from Germany, which are also located in German data centers. As this entire further development of communication services is taking place on the Internet, eco – Association of the Internet Industry is playing an important role here. With the work of the German WebRTC Taskforce, but also on the strength of further publications, we will ease the topic onto the agenda of the decision-makers in medium-sized businesses.

WebRTC and the Cloud

WebRTC and cloud? Without a doubt! CloudRTC is the delivery of WebRTC services from the cloud. This allows developers to use REST APIs and SDKs to easily and quickly integrate real-time communications into existing solutions or to create completely new ones. The exciting thing here is that CloudRTC significantly lowers the hurdle of "chat, voice, and video communication" for developers. Where previously, only highly specialized experts could develop such solutions, in the future the broad mass of developers will be able to innovatively employ WebRTC as a component of applications. There will therefore be a multitude of WebRTC applications on the market in the future that will make communication more flexible through combining traditional forms of communication with WebRTC. This will create a more collaborative and interactive experience for the user.

Looked at from another angle: Nothing makes more sense than bringing WebRTC and the cloud together. After all, the trend for some time now has been towards Unified Communications as a Service (UCaaS). Of course, WebRTC provides the ultimate uniform interface: the browser. However, while communication via WebRTC is peer-to-peer, this doesn't mean that it does not require a server at all! The role the server plays here is to exchange metadata in order to coordinate communication. In addition, the server takes care of the Network Address Translation and makes it possible for communication to take place seamlessly through the firewall.

Given these arguments, the benefits for the user of a WebRTC-based UCaaS are clear: He or she does not have to worry about how the WebRTC connection is established, let alone about stability and performance. In addition, the many benefits of a cloud-hosted communications solution can be combined with WebRTC. Above all, this means high cost savings because the end user does not have to worry about infrastructure or maintenance when using a UCaaS.

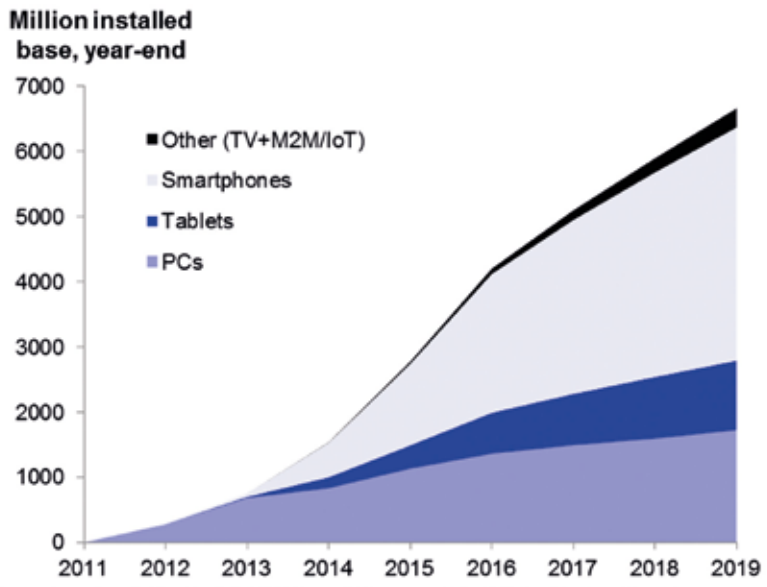
Together, WebRTC and the cloud form a real dream team!

Status and Opportunities

This guide demonstrates that WebRTC has the potential to revolutionize the communications sector. Some companies have already recognized this potential. In Germany, for example, the WebRTC Taskforce has been in existence since September 2014 and aims to bring the topic more to the fore in German-speaking countries.

The global figures speak for themselves: According to a study by Disruptive Analysis, the development is extremely positive. By 2019, six billion end devices are expected to be WebRTC-capable. No other telecommunications product can boast such prevalence. So there are no longer any obstacles to the revolution in communications. The telephone as we know it could soon be a thing of the past.

WebRTC is the ability to communicate with someone in real time as if you were there on location. WebRTC fills a critical gap on the Internet, because real-time communication is made possible by a simple website visit.



Distribution of WebRTC, in terms of devices per year

Source: Disruptive Analysis Q1 2015 WebRTC ReportUpdate

Fields of Application

WebRTC is already being actively used in some fields – for example, customer service websites are using the technology. But WebRTC is also producing benefits for teamwork within companies. The following examples show in which areas WebRTC can be used to advantage. Here, industries with intensive communication and customer advisory services are particularly prominent.

Call Centers and Customer Services

By using WebRTC in the call center field, the agent can work without a telephone/softphone client or other apps. All that is needed is a PC or Mac connected to the Internet, a browser, and a headset. Using a suitable web application, the agent simply logs on to his or her ACD group and can conduct all outgoing and incoming calls via the browser. In this scenario, local PBXs are surplus to requirements, as is the CTI application. Depending on which software is used, the calls can also be stored directly in the cloud and can even be analyzed later with voice software. For example, relevant keywords can be searched for in the call and highlighted – and this with great ease, since these WebRTC solutions run completely on the web right from the outset.

But WebRTC also yields great potential for customer services: At any point on the website, customers can, if required, be offered the option of contacting the company immediately via a suitable channel – and this with just one click, and without any complicated media discontinuity.

The simple addition of a video transmission is especially valuable for customer services. For example, if a customer receives a damaged product, until now he or she had to take a photo first and then often transfer it to his or her PC, from where he/she had to write an email to the support team. The use of different devices has until now been necessary for what should be a simple matter. With the help of WebRTC, this process can be simplified: The customer initiates a call with one click and switches on the camera to quickly and easily show the account manager where the problem is with the product.

.

Collaboration and WebRTC

Companies are using WebRTC not only to improve customer services, but also to optimize internal teamwork – as a tool for efficient collaboration.

Centrally supplying employees working all over the world with a specific set of collaboration software is a challenge in itself. And if external people are also working on a project, the problem becomes far more difficult to resolve. It is no longer a matter of course that all employees are physically located in the same place, such as the company headquarters. Distributed work, mobility, and workplace concepts such as home office have found their way into many companies. This is where WebRTC comes into play because, as already explained, the use of special software, plug-ins or the like is completely unnecessary. Every employee or future employee is bound to have already installed a browser on his or her end device. And it makes no difference if the company provides the hardware or if the employee uses his or her own device.

As such, many companies have discovered for themselves the value of WebRTC for the purpose of collaboration. In addition to efficient and spontaneous communication, the low investment costs naturally speak in favor of using WebRTC for business purposes.

The open standard of the protocol also enables companies to quickly develop individualized apps and make better use of technologies such as WLAN, Lan, Wi-Fi, and 4G, and not only to communicate better within the framework of unified communications solutions, but also to optimize workflows.

At this point, a basic difference between VoIP and WebRTC is worth highlighting: With a WebRTC application, it is mere child's play to archive conversations and, if required, to automatically analyze the audio material with adjacent highlighting of relevant keywords. Of course, this functionality can also be integrated into a VoIP environment and the large providers could offer this as an additional feature. However, with WebRTC, this process does not even require the implementation of new features, but is simply an automatic option.

Trade Fairs and Events

Trade fairs are no longer location-bound, but can be carried out as complete online events. This is an area that is becoming more and more important as digitalization progresses. "Einfach Online Arbeiten" (EOA or "Working Simply Online") is a frontrunner in the field of virtual events. Since 2015, both the congress and the exhibition have been held regularly in the virtual world of the Internet.

Lectures, round tables and discussions are streamed live. Viewers have the opportunity to ask questions or exchange ideas in forums. Here, WebRTC comes into its own in establishing contact between visitors and exhibitors. Visitors "enter" the trade fair stand, look at information material or, with just one click, can talk to the company or chat via video.

Medical Sector

In the English-speaking market, WebRTC is already being employed in a variety of healthcare sector solutions. Using WebRTC, solutions such as Telehealth or Net Medical are allowing telemedicine (i.e. medical consultations), evaluations of patient data, or check-up appointments, to take place via video chat.

At the end of 2015, the German Bundestag passed a law on an e-health package for digital patient records, thus paving the way for telemedicine in Germany. The introduction and use of the digital card will occur in several stages, starting in mid-2018. From this point onwards, it will also be possible to check the master data of the policy-holders online. However, this is only the first small step towards a comprehensive e-health offering.

Since April 2017, online video consultation hours have been available and billable. This lays the foundations for WebRTC to be able to be successfully used in this area.

Financial Sector

Particularly in the financial sector, face-to-face conversations are still accorded a high priority. Making important financial decisions after a consultation with a faceless voice on the telephone is hard for most people, and understandably so. Which is why, if the distance between the financial services provider and the customer is too great and unnecessary travel is to be avoided, consultations using video chat are a good option.

However, alarm bells go off at the very idea of sending highly sensitive information such as personal financial data to the World Wide Web over what might well be an insecure connection. Fortunately, WebRTC is perfectly placed not only to make communication easy, but also to ensure security. The data is encrypted end-to-end and is therefore unreadable even if, despite all security precautions, it is intercepted.

WebRTC and the Future

Is WebRTC the Future of Communication?

WebRTC has the potential to change communication in a groundbreaking way. Instead of having to switch end devices, programs, or apps, you can communicate via voice and image anytime and anywhere, with just one click. Anyone looking into the subject will quickly realize that the benefits of WebRTC can be applied productively in many different fields. Companies like the winners of the annual WebRTC Product of the Year Awards, presented by TMC, are already successfully leveraging the possibilities of the open standard. They are developing WebRTC solutions to provide companies with greater flexibility, adaptability and control in implementing contextual click-to-communicate functionality on websites and in apps.

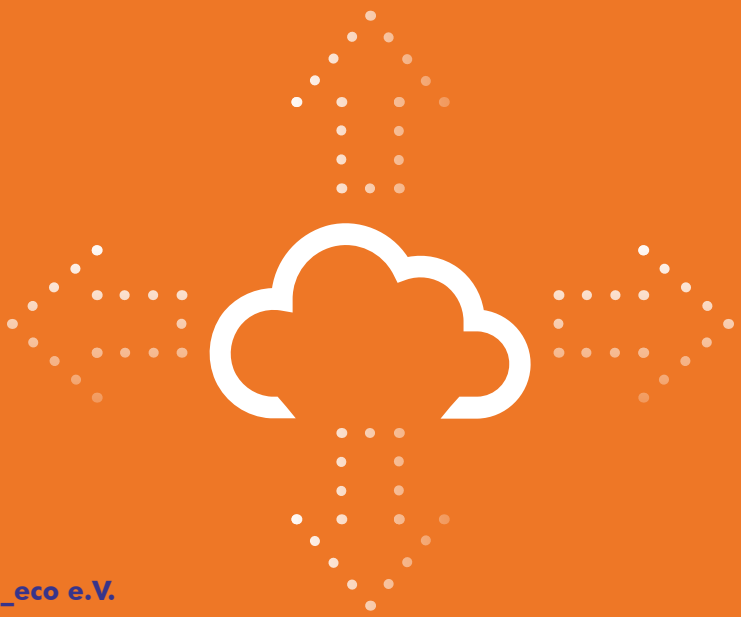
But other companies such as AhoyRTC, innovaphone, Aspect, or Arctic are also offering solutions for using the protocol in call centers. Thanks to the open standard, the customization options here are numerous and can also be implemented individually according to the requirements of the customer, the industry, or the work environment.

So, will WebRTC replace the telephone or the multitude of communication devices and apps in the near future? Most analysts predict a bright future for the standard – above all, the analysis firm Disruptive Analysis, which forecasts an increase in user numbers to reach up to 2.5 billion people by 2019, 500 million of whom will be business users. According to this forecast, the number of WebRTC-enabled end devices will be more than six billion. Analysts at Gartner are just as optimistic. They predict that WebRTC will have a 15 percent share of the professional voice and video communications market in 2019. At the end of 2015, this was still less than one percent.

Looking at the solutions and offers currently available on the market, these predictions appear to be quite realistic, given the steady growth in offers which is to be observed. In the not-too-distant future, not only the classic telephony devices, together with the good old ISDN, will have disappeared; but also the proprietary VoIP solutions accessible only via clients may well be replaced by low-threshold communication via WebRTC.

EuroCloud DEUTSCHLAND | eco

Association of the Cloud Computing Industry



EuroCloud Deutschland_eco e.V.
Lichtstrasse 43h
50825 Cologne
Germany

Phone: +49 221 / 70 00 48 – 0
Fax: +49 221 / 70 00 48 – 111
email: info@eurocloud.de
Web: www.eurocloud.de