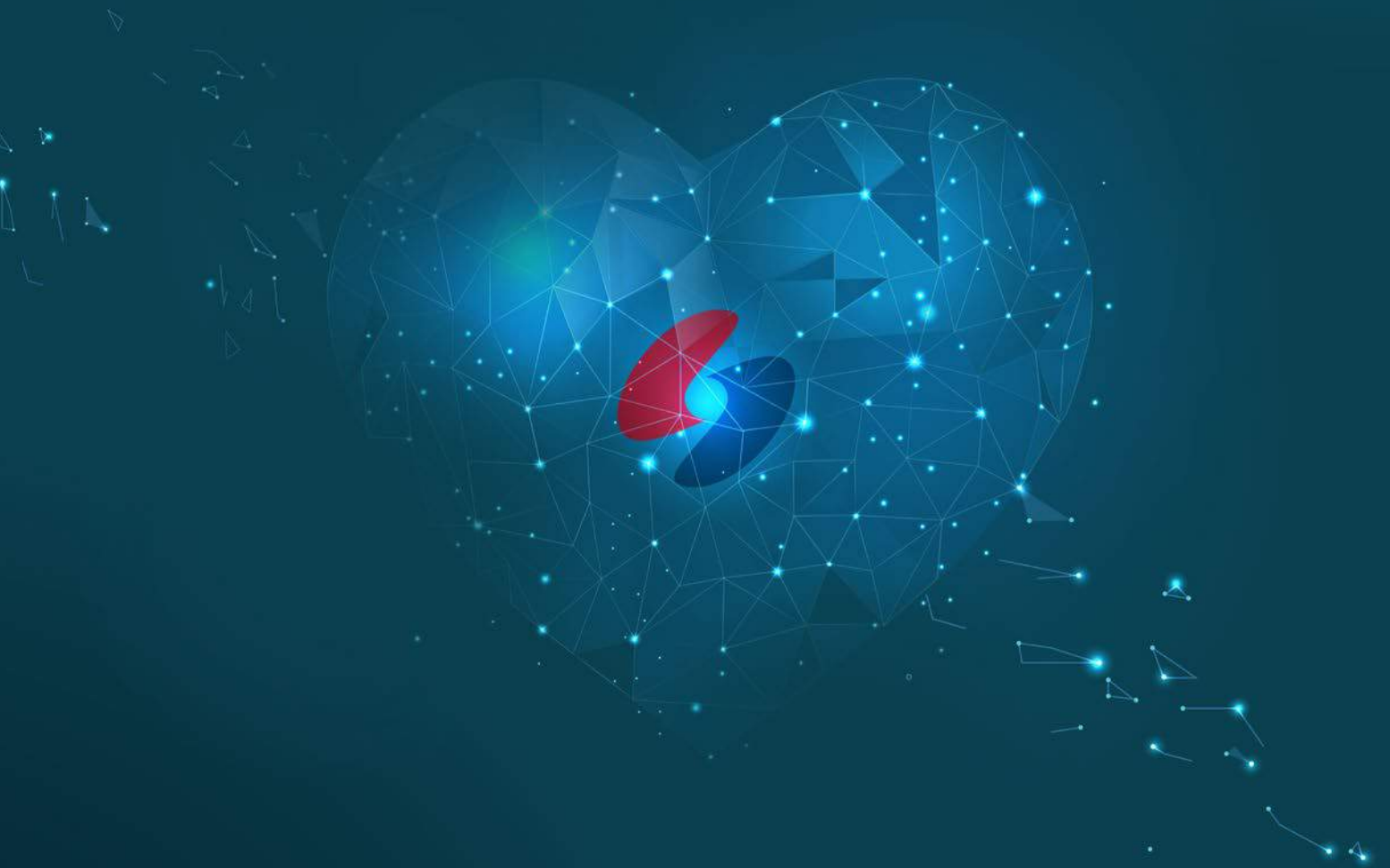




The Heart and Soul of Interconnection



Annual Report 2022



THE HEART AND SOUL OF INTER- CONNECTION



CONTENTS

Message from the CEO	4
A Changing of the Guard	11
Organization & Corporate Governance	15
DE-CIX as an Employer	20
Building the Internet Exchange of the Future	24
Sales Strategy	32
Global and Regional Growth 2022	36
Financial Results 2022	54
Faces of DE-CIX	56
Publication Details	60



Ivo Ivanov

Chief Executive Officer

Message from the CEO

At DE-CIX, being at the forefront of interconnection technology is never all of the story. The story is also about the passion and the spirit of the company.

Therefore, it is a pleasure to present this Annual Report for the year of 2022, where you will find the story of our last year, the story of our journey towards the interconnection platform of the future, and the stories of some of the vibrant group of colleagues that make DE-CIX what it is - the heart and soul of interconnection.

The past year was a year of strong and healthy economic growth and geographical expansion for the company, and a year in which the structure and leadership of the company was put in place for the next decade of growth in digital services and interconnection demand. It was also a year that saw the gradual return to normality after a global health crisis the likes of which most of us have never seen before. I want to thank the entire community of industry players for their part in saving our world during the global Covid-19 pandemic. We, the digital infrastructure industry, brought the world together while the virus kept us all at a distance. With the crisis as a backdrop, the excellent role that this extremely important community plays on a global stage became clearly visible – an essential role in protecting economies, creating prosperity, and improving the quality of people's lives, everywhere.

In 2022, DE-CIX underwent the largest restructuring of its leadership in the history of the company. I am immensely proud to succeed DE-CIX's founder and longtime leader Harald A. Summa as CEO and Chair of the Board. My sincerest thanks go to Harald for his mentorship and for making DE-CIX the great company it is today. With the extension of the management team to four seats, I am pleased to have three great colleagues at my side: CFO Sebastian Seifert, CTO Dr. Thomas King, and CSO Christian Reuter. Together, we will set the course for the next decade of growth.

The following chapters offer you an overview of our current market position, our vision for the long-term transformation of DE-CIX, and the milestones we have achieved in 2022 as a step in this direction.



Global highlights in 2022

In terms of the finances in 2022, DE-CIX was able to continue on track, with global revenues of all company parts growing by 6.67 million to reach 55.38 million Euro. In line with strategic goals, revenues from international activities grew by 41.8 percent in comparison to 2021 and represented 22.7 percent of total revenues in 2021.

11 new locations were announced during 2022, with many of them implemented before the end of the year. Alongside establishing more of our own locations, such as the official openings of DE-CIX Leipzig and DE-CIX Richmond, and the Ready-for-Service at DE-CIX Phoenix, we also expanded through partnerships. We will continue to expand our own locations year for year, but we cannot satisfy the demand of the market alone. Strategic partnerships will support our continued expansion, enabling presence in further markets. Two strategic partner models were instrumental to our expansion in 2022 and will accompany us into the future – these are firstly, our partnerships with other IX operators to share infrastructure and secondly, building and operating DE-CIX as a Service (DaaS) locations for partners. See the strategic partnership models for geographical reach below and find information on the partnership program for reselling DE-CIX services on page 39.

An amazing 30 percent growth in connected bandwidth globally and continuous growth in data traffic characterized the year 2022. Also, peak traffic continued to grow strongly, with our IXs in New York, Madrid, and Mumbai entering the global 1 Terabit per second (Tbit/s) club, now ranging amongst the largest Internet Exchanges on the planet. Hot on their heels, DE-CIX Dallas almost doubled its data traffic throughput to finish the year at 625 Gigabits per second (Gbit/s), UAE-IX powered by DE-CIX in Dubai saw peak traffic rise to almost 400 Gbit/s, and Istanbul passed the 350 Gbit/s mark. Frankfurt, one of the largest IXs in the world, achieved peak traffic exceeding 14 Tbit/s. In terms of enterprise services, the connected capacity to cloud service providers via the DE-CIX Cloud Exchange increased by a factor of five. More on the global and regional highlights can be found in the section “Global Growth in 2022” on page 37 of this report.



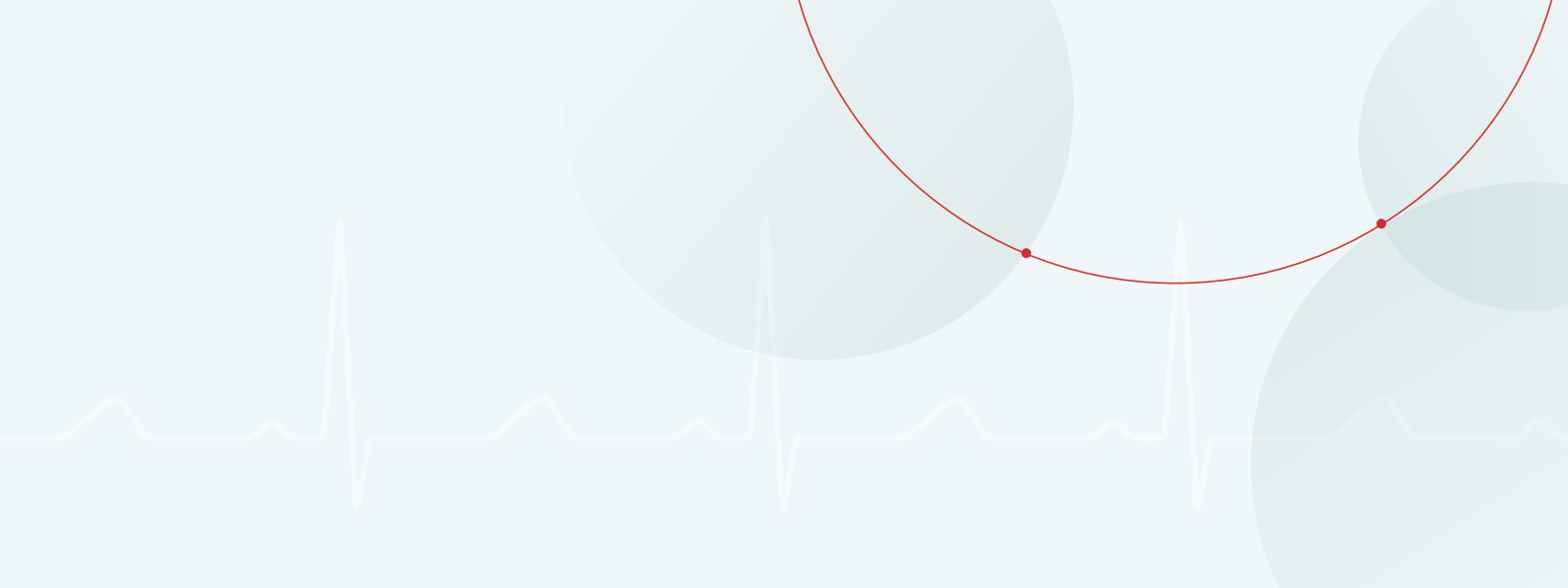
On the technology front, DE-CIX continues to maintain its leading edge in interconnection. Working today to build the Internet Exchange of the future, our technical teams have been active in bringing new sites online, upgrading the platform, and intensifying work on automation. More on building the Next-Generation IX can be found on page 25.

In 2022, DE-CIX was recognized for excellence again through various global and regional awards. In April, we were awarded the DataCloud Global Award in the category of Connectivity Innovator of the Year for DE-CIX as a Service (DaaS). In September, together with our partner Interxion, we won an award from Adigital – the Spanish Digital Economy Association – in the enterprise category, honoring companies that have stood out for their capacity for innovation and integration of technologies. In October, we were again honored as the Best Internet Exchange Provider at the Global Carrier awards.

The DE-CIX Vision: service diversification and strong global expansion

DE-CIX is leading the way to create a fully integrated global interconnection offering. To fulfill this, we are building the next-gen automated and globally distributed IX, and we work closely with various types of partners for mutual benefit and mutual growth. We work with systems integrators, MSPs, cloud partners, and transport partners to support enterprise digitalization wherever these companies are located. DE-CIX strives to broaden its geographical reach in the spirit of glocalization through independent expansion to new markets and through partnerships, and to meet the changing needs of digital business with innovative interconnection services. Neutrality, open standards, and a collaborative approach are key to DE-CIX's DNA and are essential to close the digital divide and support regions in developing their digital ecosystems and economies for the coming decades.

My colleagues on the DE-CIX Board and I, in the new leadership structure established in September 2022, have the ambition to build on the enormous success of DE-CIX over the last 28 years, and take the company to the next level – in the sense of a global geographical presence, in the sense of technical excellence, in the sense of becoming a household name for enterprise digital infrastructure needs, and in the sense of being the interconnection partner of choice for our valued infrastructure partners.




To reach this vision, we are not starting from scratch. We are building on the excellence we have already achieved in all of these areas. We are continuing to follow our two-pronged strategy of geographical densification and service diversification. We are maintaining our independence and neutrality, ensuring the diversity of our ecosystems. And we remain fully committed to our motto: Easy interconnection, anywhere.

The DE-CIX strategy for the next decade of growth

There are three key concepts which define our mission and our vision for the provision of interconnection services in the future. These are “easy”, “anywhere”, and “neutral” – and in the following I will explain why these concepts are not only a part of our success today but are the foundation for our success tomorrow.

Easy interconnection. The promise of easy interconnection is encapsulated in our one-access/many-services model. The growing demand for specialist interconnection services to meet the needs of a changing interconnection market will only increase in the future. There is the need for special forms of cloud connectivity, the need for secure connections and private ecosystems, the need for automated interconnection services, and the need for utmost reliability and resilience, backed by industry-leading Service-Level Agreements (SLAs). Easy interconnection is therefore a promise of specialized services and a premium level of quality. It is the next level of democratization of infrastructure, enabling new market participants to gain control over the digital infrastructure they need.

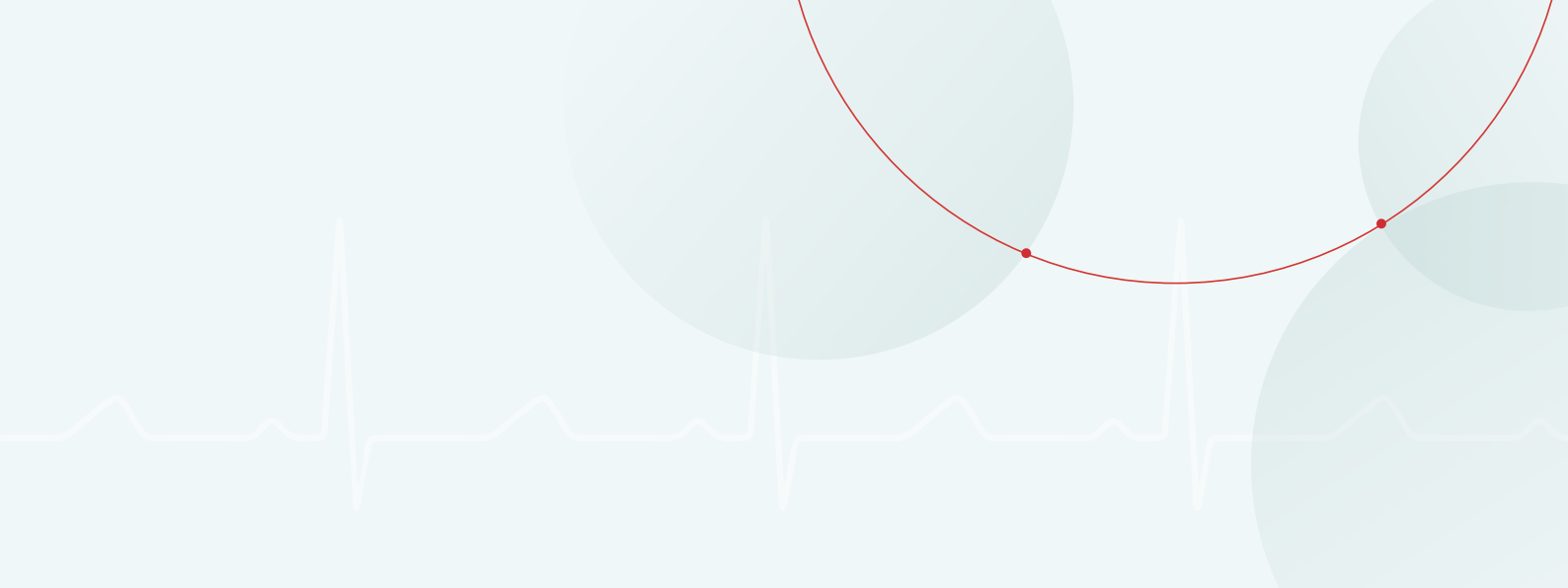
One aspect of this is the one-stop shop. Access to interconnection services should be barrier-free. At DE-CIX, we engage in ongoing automation projects, with our sights set on a fully automatable interconnection platform. This enables customers the flexibility to act in an agile manner according to business priorities. The use of automation and one-stop shop solutions is already in use for DE-CIX-owned infrastructure, but it can also be extended to the interconnection infrastructure of our trusted partners. To make this possible, we are engaged in an ongoing process of standardization, and synchronize closely with our partners. The strategic IX partnerships established in 2022 with selected IX operators from Central Europe (see DE-CIX’s strategic partnership models for geographical reach) offer a glimpse of the potential of this concept.



Anywhere. Why anywhere? Because digital infrastructure is needed everywhere. The growing importance of digitalization is leading to a huge demand for the distribution of infrastructure everywhere. Take, for example, the immersive tactile Internet (aka the metaverse). To make this a reality requires distribution of great infrastructure wherever there are people who want to use these services. Otherwise, the experience of the next-gen Internet will not be possible. To ensure the best experience, data needs to get to its destination fast – regardless of where and what device and which application is being used. It's about physics – about creating the shortest pathways for data to travel. And as a result, it's about geography, the proximity to users, it's about localizing interconnection more and more, and motivating content and applications to get closer to businesses and people. DE-CIX is a key element in this infrastructure distribution. Already operating more than 40 IXs around the world in various models, we will continue building and expanding our own locations in line with our strategic priorities, as well as building and operating IXs for partners, and synchronizing with trusted IX partners to make further locations accessible.

Independent and neutral. The DE-CIX neutrality has been central to our success in the past and will remain so in the future. The strength and diversity of our ecosystems are a direct result of this neutrality. The DE-CIX global ecosystem, encompassing more than 3,200 connected networks and accessible from thousands of data centers in more than 600 cities globally, is the largest data center and carrier neutral ecosystem in the world. This density of digital infrastructure providers creates interconnection gravity, making it an irresistible environment for even more infrastructure partners to choose to join. Due to our neutral shareholder structure, we truly can be everywhere. We have the capacity to work with all manner of data center and network operators, and all benefit from the collaboration because no infrastructure operator alone can hope to achieve the necessary coverage to serve the Internet of the future. The time has come for infrastructure community and alliances, leaving behind the silo-mentality of infrastructure incumbency. Together, we can achieve so much more than each of us working in isolation.

The spirit of DE-CIX. DE-CIX as a company is both dynamic and economically sustainable in the long term. Through our excellence, our innovation, our organizational structure, and our business acumen, we can react in an agile manner according to market needs. Growth in the coming years will be handled



to maximize long-term, socially responsible, and strategically sensible goals. There are many regions around the globe where we have reason to believe in the sustainable and mid- and long-term change and improvement, and we want to be part of this. We operate infrastructure, we interact with the market, and we service the market for one main drive: for the good of the Internet. Because of the billions of users already online and the billions still to come. All deserve access to the Internet in a quality that means they can participate in digital life. They can communicate with one another online, they can educate themselves and get access to digital healthcare services, they can do business online – in short, they can find the world online. And to create an equitable and sustainable digital society for the future, we must enable this.


All the best,

Ivo Ivanov

Chief Executive Officer and Chairman of the Board, DE-CIX

DE-CIX's strategic partnership models for infrastructure reach – everywhere: 2022 milestones

Partnerships with IX operators: DE-CIX is working with IX operators that share our vision and align with our technological and business operations. Using a fully integrated approach, with one-stop shop solutions and automated processes, the partnership model allows customers to flexibly extend their reach to new markets and enables IX operators to enter markets without causing fragmentation of the existing interconnection ecosystem. By technically interconnecting, syncing up on minimum standards, security, processes and services, integrating portals and using the IX-API (developed as open source by DE-CIX together with other leading neutral IX operators), each IX can extend its reach to new markets where it is not physically present to serve their customers – such as multinational enterprises – more effectively.



The approach resembles operator agreements in the airline industry, e.g. Star Alliance or oneworld, with the goal of bringing different communities and regions closer together and supporting them all to grow further. Under one IX contract and with one set of SLAs, customers can now use the integrated portal and API to order ports and services in markets where the IX does not have its own infrastructure. Focusing initially on Europe with more markets to follow in due course, we have so far implemented partnerships with BIX. BG in Sofia (Bulgaria), NIX.CZ in Prague (Czech Republic), Atman in Warsaw (Poland), and InterLAN-IX in Bucharest (Romania). The result: DE-CIX can offer customers an easy way of interconnecting in these markets, and the partner IXs can offer their customers access to the entire DE-CIX ecosystem.

DE-CIX as a Service (DaaS): The DE-CIX as a Service model encompasses the building and operating of IXs for partners. Highlights in 2022 include DE-CIX's entry into Africa, announcing three DaaS IXs together with our valued partners Rack Centre in Lagos, United S.A. in Kinshasa, and LITC in Tripoli. Along with the announcements for DaaS IXs in Baghdad and Aqaba, and the implementation of three white-label edge IXs in the US, this brings the total number of DaaS IXs being built and operated to 12. The most mature of these, UAE-IX powered by DE-CIX in Dubai, demonstrates DE-CIX's ecosystem-building capabilities and the effectiveness of the DaaS model for improving connectivity in remote regions. Now 10 years in operation, UAE-IX has grown to be the leading data center and carrier neutral IX in the GCC region, with close to 100 customers. In 2022, the UAE-IX saw more than 30% growth in traffic to almost 400 Gbit/s, and 50 percent growth in connected capacity, up to 3 terabits capacity. The study "The birth of an international Internet hub: a playbook for developing a digital society", published by DE-CIX in early 2023, investigates the impact of the UAE-IX over the period 2012 to 2022, and firmly establishes that the UAE has become an international Internet hub, with all of the technical and economic benefits that this entails.

The study is available for download at <https://de-cix.net/en/resources/white-papers/the-birth-of-an-international-internet-hub>

A Changing of the Guard





Harald A. Summa

Former Chief Executive
Officer & Member of the
Supervisory Board

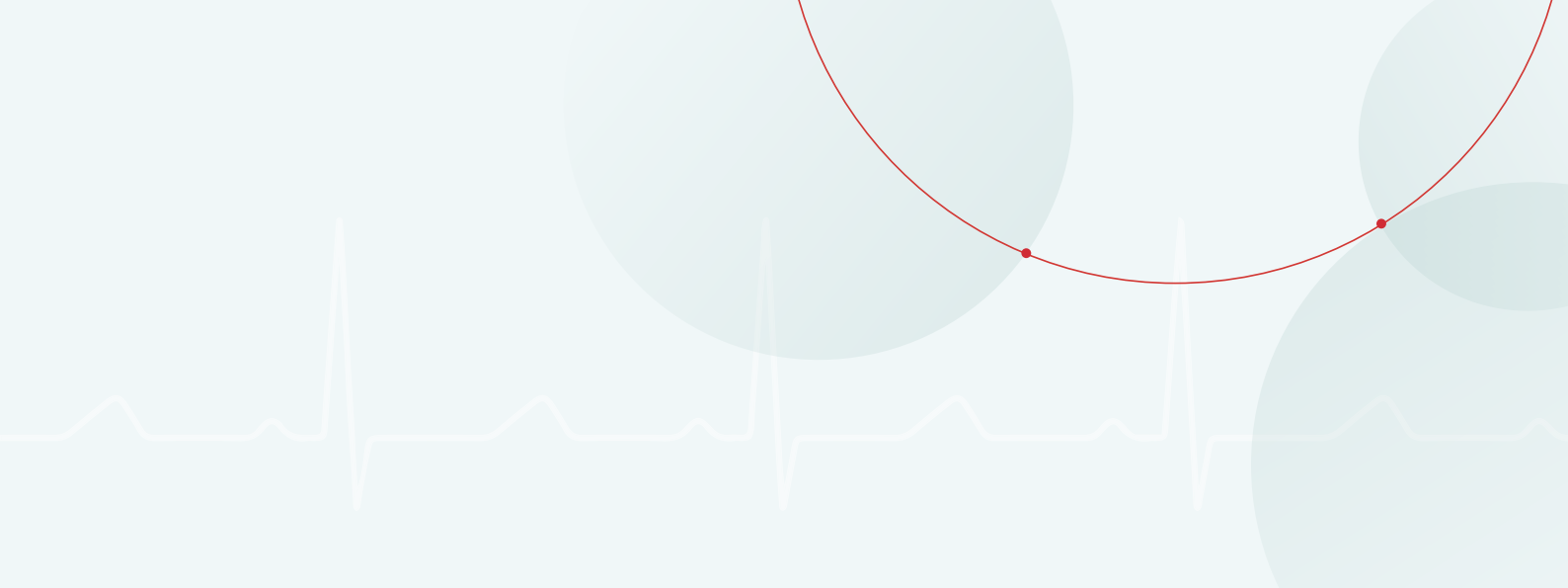
A Changing of the Guard

Internet pioneer Harald A. Summa, who stepped down from the operational business as CEO of DE-CIX in August 2022, reminisces on nearly 30 years at the helm of DE-CIX, and looks forward to an exciting future for the company.

DE-CIX's history all began in 1995 when Arnold Nipper, Andreas Schachtner, and Bernhard Biedermann decided to set up an Internet Exchange in Germany for the small set of Internet service providers around back then. The question they were faced with was how it could be managed neutrally, and by whom.

This is the point when I came into the picture. Just a year earlier, I had founded the Electronic Commerce Forum e.V. (now known as eco, Association of the Internet Industry), which was intended to give the still young Internet scene in Germany a common voice in the public sphere. So it happened that DE-CIX was established as a working group in eco. Here, the organizational and technical rules for the operation of the Internet Exchange were developed. DE-CIX itself was located in Mainzer Landstrasse, Frankfurt, in a former telegram office.

The first years were turbulent and exhausting. Everyone wanted to be at DE-CIX, but there were strict rules for who was allowed to connect to the IX. One of the first employees was Wolfgang Tremmel, now Head of the DE-CIX Academy, who took care of the technology in the early days.



In 2001, DE-CIX moved to a data center operated by Interxion (now Digital Realty), and the first carrier-neutral data center was created. An event that laid the foundation for the development of Frankfurt as the German/European Internet and data center capital. In 2003, the working group in the eco Association became a limited company (GmbH).

The growing spread of the Internet brought DE-CIX steady growth in connected customers and the exchange of Internet traffic. We developed the theory that the Internet traffic brought in from the large providers was extending from West to East. Therefore, a logical step was to bring ISPs from further east to join the IX in Frankfurt. Our forays to the East were accompanied by a young lawyer from eco, Ivo Ivanov, who spoke fluent Russian and enabled ties to be formed from West to East, with Frankfurt in the middle.

Through a study for the regulatory authority of the United Arab Emirates, we deepened our understanding of the mechanisms of Internet traffic and the roles of transport cables and providers, which enabled us to develop a blueprint for the establishment of Internet Exchanges. In 2012, UAE-IX powered by DE-CIX went into operation, now a vibrant international Internet hub.

This blueprint gave us the courage to venture into the USA. Frank Orlowski developed the architecture for our market entry, and lo and behold, it worked. Back then, the technical developments were shaped by Arnold Nipper and Daniel Melzer.

In the following years, the establishment of DE-CIX Internet Exchanges around the globe followed on an annual, quarterly, and monthly rhythm. And the rest is history.



My retirement from operational management and move to the Supervisory Board in August 2022 opened the way for a changing of the guard and the restructuring of the Management Board, so that the company would be well-placed to meet the challenges of the future. While I stepped down from the operative business, I am happy to have taken a position on the Supervisory Board to continue to oversee the further development of DE-CIX. The future of DE-CIX needs a young, dynamic, and experienced management team, as exemplified by the new board, led by CEO Ivo Ivanov, and including CSO Christian Reuter, CTO Dr. Thomas King, and CFO Sebastian Seifert.

DE-CIX currently finds itself in an unprecedented growth phase. I am happy to continue contributing my experience to DE-CIX's ongoing success story within my new role in the Supervisory Board. I would like to thank all the companions, business partners, and above all the entire team for the extraordinarily successful development of DE-CIX in the last few decades. I would also like to thank the many customers of DE-CIX – it is your trust that has enabled DE-CIX to grow to what it is today.

Who would have thought, 25 years ago, that DE-CIX could become one of the drivers of digitalization? And not only in Germany, but globally. Of that I am particularly proud.

Organization & Corporate Governance





The DE-CIX Group AG management team

From left to right: Sebastian Seifert (CFO and Board Member), Dr. Thomas King (CTO and Board Member), Klaus Landefeld (Member of the Supervisory Board), Ivo Ivanov (CEO and Chair of the Board), Felix Höger (Chair of the Supervisory Board), Harald A. Summa (Member of the Supervisory Board), Christian Reuter (CSO and Board Member), Rudolf van Megen (Member of the Supervisory Board)

The DE-CIX Organization & Corporate Governance

Company Structure

DE-CIX Group AG is led by CEO and Chair of the Board Ivo Ivanov. All global DE-CIX activities, financial investments, and company parts are consolidated under the umbrella of the DE-CIX Group AG. eco – Association of the Internet Industry is the sole shareholder of the DE-CIX Group AG.

Executive Leadership and Supervisory Board

In September 2022, DE-CIX restructured its management and extended its executive team. After more than 25 years as CEO and five years as Chair of the DE-CIX Group AG Board, Internet pioneer Harald A. Summa took a seat on the DE-CIX Supervisory Board. His successor as Chair of the Board and CEO is Ivo Ivanov, who was until then the member of the DE-CIX Group AG Board responsible for international business and strategy. In addition, the board was extended by two further positions: Alongside the acting board members Ivo Ivanov and Sebastian Seifert (Chief Financial Officer, DE-CIX Group AG), Chief Technology Officer Dr. Thomas King was appointed a seat on the board. The internationally recognized sales expert Christian Reuter took over the global sales and marketing activities in the newly created position of Chief Sales Officer, and became the fourth member of the board. The DE-CIX Supervisory Board is chaired by Felix Höger, with Klaus Landefeld, Rudolf van Megen, and (as of September 2022) Harald A. Summa as members.



DE-CIX Subsidiaries

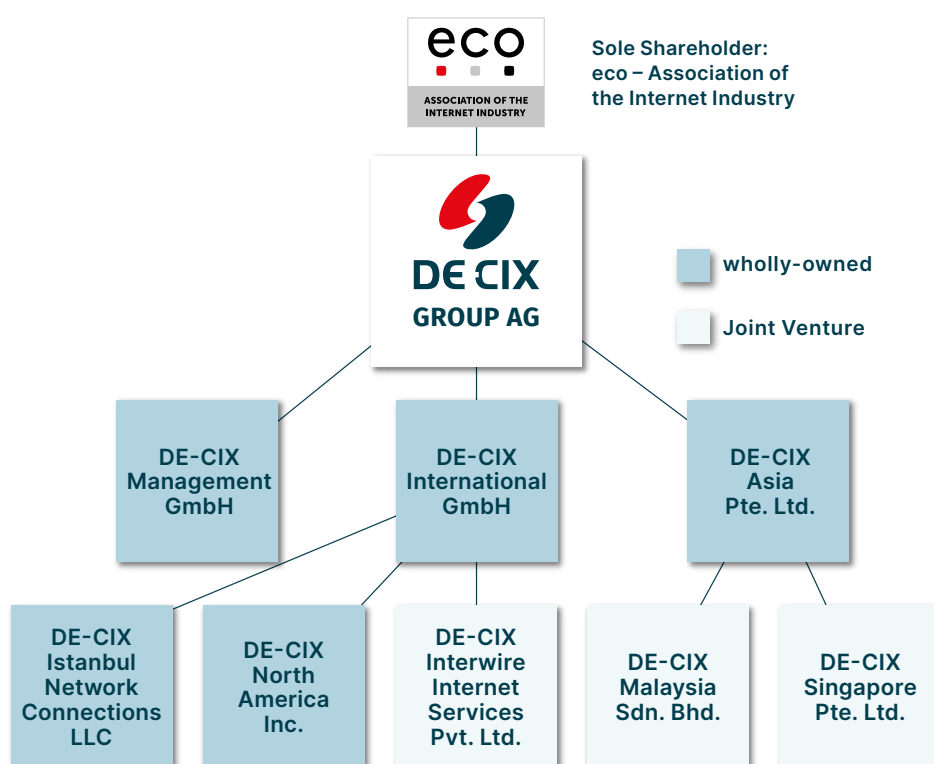
The three wholly-owned DE-CIX Group AG subsidiaries, DE-CIX Management GmbH, DE-CIX International GmbH, and DE-CIX Asia Pte. Ltd., are all led by Ivo Ivanov and Sebastian Seifert as Executive Directors. Their scope of operations, and their respective subsidiaries and joint ventures are structured as follows:

DE-CIX Management GmbH operates the DE-CIX Internet Exchanges in Frankfurt, Hamburg, Munich, Dusseldorf, and Leipzig. The UAE-IX in Dubai, SEECIX in Greece, and Ruhr-CIX in Germany are operated as Managed Services in cooperation with local data center and carrier partners in their respective regions.

DE-CIX International GmbH is responsible for the majority of DE-CIX's international activities, either directly (Barcelona, Madrid, Marseille, Palermo, Lisbon, Kristiansand, Oslo, Esbjerg, Copenhagen, and Helsinki), through subsidiaries in the USA (DE-CIX North America Inc. – operating New York, Dallas, Chicago, Richmond, and Phoenix) and in Turkey (DE-CIX Istanbul Network Connections LLC), or on behalf of local partners as “DE-CIX as a Service” locations in Nigeria (AF-CIX in Lagos for Rack Centre), the Democratic Republic of the Congo (ACIX in Kinshasa for UNITED S.A.) and Libya (in Tripoli for LITC), Iraq (IRAQ-IXP in Baghdad), and Jordan (AqabaIX in Aqaba). The Angola-based angonix has placed its trust in the consultancy services of DE-CIX International. DE-CIX International is also a partner in the joint venture DE-CIX Interwire Internet Services Private Limited, operating the four DE-CIX locations in India: Mumbai, Chennai, Delhi, and Kolkata.

DE-CIX Asia was founded in 2020 to provide an umbrella for the Southeast Asian operations. In Southeast Asia, the joint venture companies DE-CIX Malaysia Sdn. Bhd. and DE-CIX Singapore Pte. Ltd., established as mergers with the Malaysian operator Starwing Technologies Sdn. Bhd., operate the three DE-CIX Internet Exchanges in Kuala Lumpur, Johor Bahru, and Singapore respectively. A further Internet Exchange located in Brunei is operated as a “DE-CIX as a Service” location on behalf of a local telecommunications company.

DE-CIX company structure



In partnership with our customers – the DE-CIX Customer Advisory Boards

The Customer Advisory Boards reflect the customer base, as their members can be seen as representatives of the variety of networks connected to DE-CIX: national and international, small and large ISPs, as well as regional and global content providers. While the Customer Advisory Boards do not have decision-making authority, their members communicate with the DE-CIX management team and help guide the overall direction of DE-CIX. As of today, there are three Customer Advisory Boards supporting DE-CIX in different markets: Germany, North America, and Turkey; more are to be established soon in further regions. The Board of the DE-CIX Management GmbH has five members in order to represent the global customer reach of DE-CIX. One of the Board Members is appointed directly by eco – Association of the Internet Industry. The other four members are elected directly by DE-CIX customers.

Germany: DE-CIX Management GmbH Customer Advisory Board



Falk von Bornstaedt
Senior Strategy
Consultant,
BENOCS GmbH



Malte von dem Hagen
Director Global
Backbone,
GoDaddy



Zaid Kahn
GM, Cloud AI
and Advanced
Systems,
Microsoft



Bernhard Krönung
Managing
Director and
Founder,
regio [.NET]



Klaus Landefeld
Board Member,
eco –
Association of
the Internet
Industry

USA: DE-CIX North America Customer Advisory Board



Scott Brown
President,
Pixel Factory, Inc.



Phil Koblence
COO,
New York Internet –
NYI



Steven Schecter
Senior Manager of
Network Architecture,
Akamai Technologies
Inc.



Carl Williams
IPv6 Hall of Fame
Adjunct Professor,
Temple University

Turkey: DE-CIX Istanbul Network Connections LLC Customer Advisory Board



Cem Çelebiler
CEO,
TurkNet



Çağlar Dabanoğlu
Senior Network
Architect,
Akamai



Serkan Sevim
CEO,
Medianova

DE-CIX as an Employer





Lucia Falkenberg
Chief People Officer


Passionate first mover, people-centered, and at the forefront of technology

DE-CIX, the world's leading operator of Internet Exchanges, reflects the contrasts and diversity that has made the Internet a force for good. Now approaching 30 years in operation and continuing to grow strongly around the globe, the company combines the economic security of a world leader with the agility, mentality, and spirit of a start-up. Always at the cutting edge of technological development in the interconnection sphere, staff have access to state-of-the-art technology, and are supported in their continuing academic and professional development, regardless of what level they have attained when they enter the company. Rapid approval processes for the procurement of technology, short decision-making pathways, individual professional development possibilities, economic resilience even in crisis situations, exciting and meaningful projects, mutual respect within and across teams, and a drive to be the best in the world – these qualities characterize the work in DE-CIX teams the world over.

Where the future of the Internet is made

If you work at DE-CIX, you're doing more than just any old job. You are a co-creator of the Internet of tomorrow, you're building the foundations for digitalization and future wealth, you help to create the prerequisites for innovations in all other sectors – from manufacturing to gaming, from autonomous driving to remote surgery.

At DE-CIX, you are at the heart of the Internet – you contribute to a free and open Internet, to the seamless flow of data on a global level. You are part of a wider community setting the standards and defining the technology of the future. Through your work at DE-CIX, you contribute to narrowing the digital divide and enabling people access to better Internet, wherever they are – access to the services and applications that people in well-connected hubs take for granted, access to education and virtual medical care, and the opportunity to participate in the digital economy.



DE-CIX's IXs around the globe – more than 40 we currently operate, and many more to come – make a real and tangible difference to global Internet performance and access: through the ecosystems that develop around DE-CIX's world-class IXs and the consequent growth in local digital infrastructure, Internet performance and connectivity resilience increase while the cost of connectivity is shown to drop markedly. This makes the Internet not only better, but also more accessible to larger portions of the world's population. Through working at DE-CIX, you have the opportunity to support this continuous outreach to establish IXs in new markets – for the good of the Internet, and for the benefit of people everywhere.

Supporting the specialists of the future

Great emphasis is placed on professional development at DE-CIX, helping our already excellent team to excel in new endeavors for an evolving market. In line with this, there are also plenty of opportunities for career development in an ever-growing organization. We have staff that started at DE-CIX as student assistants who have subsequently made their way up the career ladder to leadership positions. We have also built an exceptional research and development department, and we support our staff to further their research towards academic titles. We foster strong relationships with a range of German universities and research institutes, including the TU Darmstadt and the Goethe University, Frankfurt. The importance of supporting the next generation of network and IT specialists can also be seen in our first sponsorship of an international IT student through the scholarship "Deutschlandstipendium".

A place for everyone

Diversity is also a key characteristic of DE-CIX. With many different nationalities making up our global teams, intercultural interaction also plays a part in the spirit of DE-CIX. With its headquarters in the heart of the Frankfurt East End, DE-CIX brings the world to Frankfurt, and brings the Internet to the world. We offer an agile, intense, and creative working environment, with generous remuneration, cool benefits, and a flourishing community of great minds.

Alone in our headquarters in Frankfurt, colleagues from 35 different countries meet on a regular basis, exchange ideas, and learn one another's languages. Many of these have made the move to Germany for the sole purpose of working at DE-CIX. In addition, with 70 highly qualified female members of staff (around 30% of the workforce) in positions ranging from creative and technical to team leaders and divisional heads, DE-CIX prides itself on being a place where women can feel at home in tech.

As the “oldest startup in the world”, we also have a massive range of ages, from Internet pioneers who saw the very first moments of the modern Internet, to undergraduates who are working at becoming the next generation of networking experts. We at DE-CIX are proud to be part of creating the future of the Internet and being the heart and soul of interconnection.



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UNTERZEICHNET



Building the Internet Exchange of the Future





Dr. Thomas King
Chief Technology Officer

The vision of our next-generation IX

Always at the forefront of technological evolution for the interconnection sector, DE-CIX continues to push boundaries to develop the next-generation Internet Exchange. The future of the design of our interconnection platform will not only include greater levels of programmability, scalability, commercial flexibility, and geographical reach. It will offer simplified technical processes to make interconnection even easier for our customers, as well as ever-increasing security, resilience, and speed of implementation, not to mention high-quality innovative interconnection services with increasingly rich feature sets.

Over the past couple of years we have been working towards this goal, and we will continue to evolve our platform and capabilities in the coming years. On the software level, the overarching goal of our technological innovations is to make it possible for everything done manually today to be automatable, that is, covered by an API or a self-service portal. This will enable customers to adjust their interconnection services within seconds, day or night. On a hardware level, the vision of the next-gen IX is dependent on the timely delivery of much more scalable, reliable, and secure hardware.

Responding to customer needs

The vision of the next-gen IX is also shaped by customer demands. Here, one major goal is the availability of DE-CIX services at locations where we are not present as of today. Therefore, one ongoing task for the technical team is the timely implementation of new locations, enabled sites, and access sites, and the scaling of capacities. Although our delivery of services is already fast, these will be moved to a just-in-time approach, shortening and optimizing them further to provide automated services 24/7. A further increase in the reliability of DE-CIX services and the ease of use are additional areas where we are responding to needs in creating a wholly automated environment and removing burdens from customers in the management of their interconnection services.



Fully-automatable interconnection

The next-gen IX will automate all interconnection services end-to-end, meaning that a customer can place an order or a change request, and it can be provisioned on our infrastructure and be consumable by the customer within seconds. Using the DE-CIX API and the self-service portal, the intention is to make access ports fully manageable for customers and to provide real time monitoring and usage statistics on all of the services, as well as full contract management.

DE-CIX joined forces with other IX operators in 2019, initiating an open consortium to collaborate on the development of the IX-API to support fully end-to-end automated processes and enable the provisioning and configuration of IX services. The IX-API, on which the DE-CIX API is based, also has the potential to strengthen and fully automate our partnerships with other Internet Exchanges if they choose to integrate deeply with us. The goal is to bring these partnerships into the portal so that connectivity to these markets is visible, can be ordered, and can be fully automatically provisioned within seconds, as easily as if they were our own locations.

Even in the next-gen IX, there will inevitably still be manual work involved, for example, in connecting or upgrading a port. This is already being handled today by patch robots in some of the large sites. In order to reduce the manual work involved wherever possible, we will deploy robots in more of the larger locations in the coming years to make every part of interconnection as easy as possible.




Hardware for the next-gen IX

On the hardware level, continual optimization of our platforms is also a focus. Here, we use exclusively the newest, cutting-edge hardware and a redundant design to ensure the greatest levels of resilience and security.

Resilience – For digital business, being able to trust its connectivity infrastructure is essential. Day-to-day operations depend on fail-safe transportation of data – be that customer data, maintenance of systems, analytics, or any other of a myriad of essential data-driven use-cases. Physical redundancy is an essential hallmark of the design of DE-CIX platforms, necessary to support the SLAs we guarantee our customers. The distributed nature of our platforms, accessible in many different geographically dispersed data centers, together with the redundant deployment of our own core and edge network infrastructure, ensures resilience against localized outages. Furthermore, we ensure redundancy and seek the highest levels of diversity on multiple levels: different operators, different cable stretches, and different upstream products.

Equally, we engage in a continual process of renewing hardware and upgrading capacities across our global platform, to keep well ahead of customer demand. As a rule, hardware is upgraded regularly to the newest versions, resulting in new features, larger capacities, and greater resilience – not to mention a significant reduction in power consumption – with each upgrade. Capacities in our network are also regularly expanded, as soon as 60 percent of the existing capacities are reached. The remaining 40 percent free capacity is used to ensure redundancy and free capacity for traffic growth – such as during the first days of the COVID-19 lock-down.

Security – As digital infrastructure and the interconnection of networks becomes increasingly vital across all sectors, it is essential for the hardware of the future to offer encryption on the transport layer – and not only must all devices be capable of being operated more securely, but also secure operations must be easy to execute. Currently, we rely on our connected customers to handle encryption themselves, but this cannot be the way forward. Hardware manufacturers are starting to build functionality into their hardware to enable data streams to be encrypted in line rate. Because they are building encryption into the chips, there is no significant change in latency or data throughput to be expected, which is a significant improvement on other forms of encryption.



With our upcoming hardware renewal cycles, we will be deploying hardware capable of encryption on the transport layer in all locations. We envisage having such hardware deployed at all major locations in the next two years, with all locations covered within the next five years.

In order to fulfill the vision of the next-gen IX, we remain dependent on our suppliers to continue their hardware evolution in line with our growing needs. In particular, our needs for further innovation for the coming years can be broken down into the following points:

- 1. Next-gen scalability** – One essential requirement is hardware that is scaled to the size requirements of each location in terms of total bandwidth and port density. This means hardware needs to scale from small to large IXs, both in terms of the number of connectors per line card and how many line cards fit into a chassis. This scalability then also applies to the port sizes that can be accommodated by each device. Access ports in the range of 1 GE to 10 GE, 100 GE, 400 GE, and on to 800 GE need to be possible for both the small and the very large devices. It can be that a customer at a smaller IX requires a 400 GE connection, whereas even a very large device must still be able to support 1 GE customers. Therefore, scalability and interoperability must be approached across multiple dimensions.
- 2. Standardized operation** – Devices of all sizes must also be operational in a uniform manner, without the need for different know-how and tooling.
- 3. Reliability** – Carrying much more critical data than ever before, digital infrastructure today is facing increasingly stringent reliability and availability requirements. Therefore, regardless of our own highly resilient and fail-safe design, the individual devices must also evolve even further for the reliability requirements of critical use-cases.
- 4. Just-in-time delivery** – The hardware supply chain challenges of the last few years need to be reined in. It has been necessary for us to implement our own warehouse to deal with delivery difficulties, but this cannot be the answer in the long-term. In order for us to meet our own and our customers' expectations of service delivery, we require just-in-time delivery of hardware to be reinstated as the norm.



The year 2022 in technology: Facts & figures – setting the foundations for the next-generation IX

Geographical expansion


The technical team undertakes ongoing support for the expansion of DE-CIX to new locations around the world. In 2022, this included work on DE-CIX-own locations (DE-CIX Leipzig, Germany; DE-CIX Phoenix, North America; and the interconnected ecosystem of Nordic exchanges); the addition of six new premium enabled sites (in Frankfurt, Marseille, Dallas, Phoenix, and Istanbul); work on the implementation of seven DE-CIX as a Service (DaaS) IXs (in North America, Switzerland, and Africa); and the implementation of four IX partnerships (in Central Europe).

Automation

Already back in 2020 and 2021, DE-CIX played a central role in developing the IX-API to enable interconnection automation. In 2022, the IX-API standard underwent a further iteration to enable new key features, most notably statistics, giving API users insights into the amount of traffic exchanged via their connection. The API enables customers to include statistics information in their own management dashboards, and the feature provides customers with information about the performance and efficiency of their connection, which in turn helps with capacity planning and routing design. To make it easier for our customers to use the automation features that DE-CIX provides, we also sponsored the further development of the open source Peering Manager tool, which is now capable of talking to DE-CIX and other IX-API-enabled IXs.

Hardware & software upgrades

In 2022, DE-CIX was the first IX operator in the world to begin preparation for the advent of 800 GE – through upgrading the edge routers at DE-CIX Frankfurt to new Nokia 7750 SR-14 models. The global platform was also upgraded to “Peering LAN 2.0”, and all connections were migrated to EVPN. These migrations took place within nightly maintenance windows during otherwise normal operations to minimize customer impact. DE-CIX is the first Internet Exchange operator globally to use the new version of EVPN with its



associated Proxy ARP/NDP function, which we developed together with Nokia (RFC 9161). This solution removes unnecessary “network noise” which can cause issues on customer routers. The customer feedback tells us that CPU usage on their routers connected to DE-CIX has dropped by as much as 25% due to the elimination of ARP/NDP noise. In addition, during the upgrade of our GlobePEER route service at all our locations (except India) to the current major release of the popular open-source routing software BIRD, we also completely redesigned our configuration to simplify it and to increase scalability while keeping all the benefits of the previous design. Customers will experience even smoother, more reliable, and more secure DE-CIX interconnection platforms as a result. These innovations lay the foundation for even more resilient and seamless operation and a richer feature set in the future.

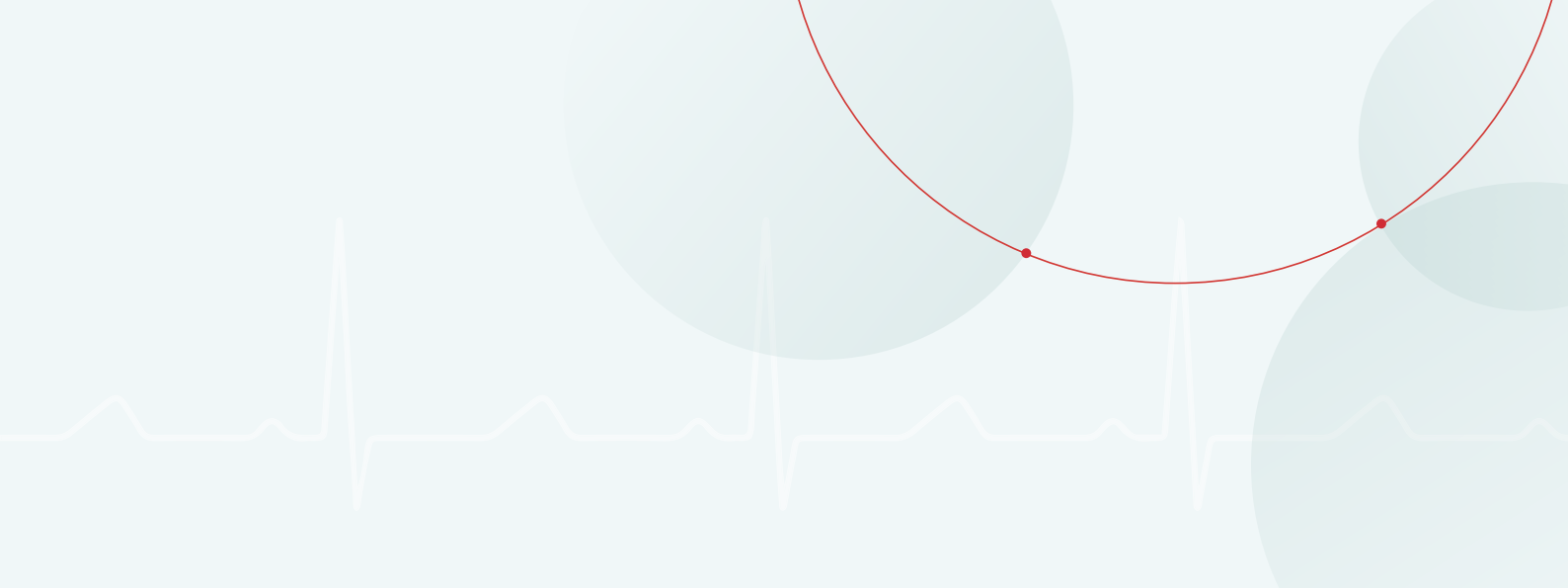
Outlook 2023 and beyond

Ongoing software optimizations – making interconnection easier

Keeping our sights clearly set on our overall goal of a completely automatable IX, in 2023 we will work to enable the commercial framework to be integrated into the DE-CIX API as well as into the self-service portal to enable greater clarity and flexibility of commercial terms.

The whole topic of simplifying maintenance for our customers will be on the agenda in 2023. This will start with creating computer-readable and customer-specific maintenance announcements. This means that customers can, in turn, integrate this into their automation tool chains. In addition, the finalization of the implementation of BGP session culling will enable us to take the burden off our customers when it comes to the preparation for maintenance. With BGP session culling, we can divert the traffic on behalf of customers, to reduce to a bare minimum the work that the customer has when we undertake maintenance on our platform.

Together, these initiatives will push the programmability and automatability of IX operations further.



Automation – next steps

With the release of the DE-CIX API planned for 2023, we will enable more monitoring and statistics information in the self-service portal. In a next step, we will make alarms accessible via the API and the self-service portal. In this way, any traffic anomalies will be detected, and customers will be alerted. In addition, further development of the IX-API will also include maintenance topics as mentioned above.

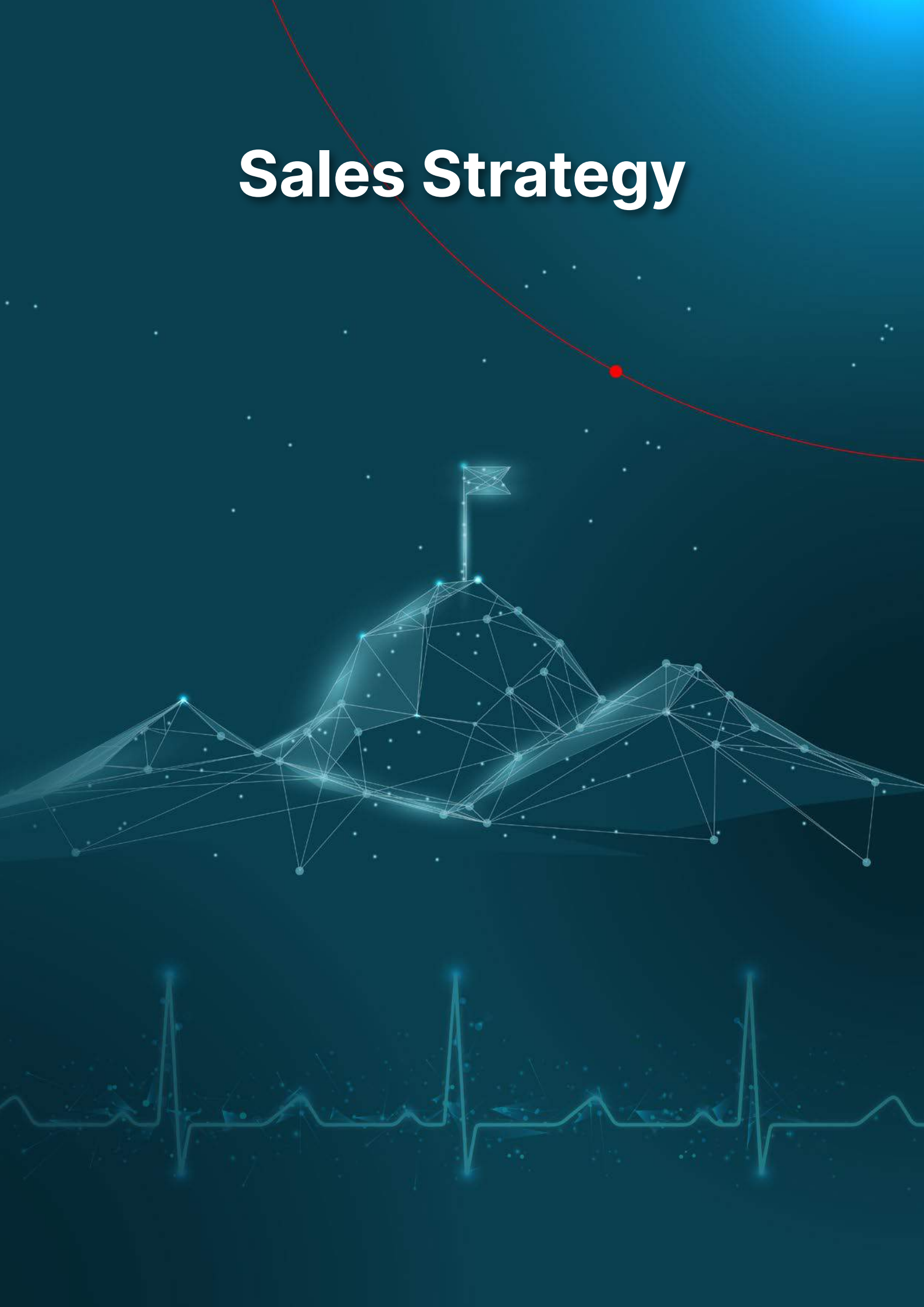
Hardware – preparing for future bandwidth requirements

Having laid the groundwork for 800 GE readiness in 2022 as a first mover in the IX space, we will be upgrading the hardware on our platform in 2023 to offer 800 GE access on a commercial basis. Although we do not actually expect customer uptake in the first year, this will prepare the platform well in advance for customers' increasing bandwidth needs.

Development of interconnection services

From a product perspective, the need for different or more specialized interconnection services continues to grow. One focus for DE-CIX here will remain on cloud connectivity. The Cloud ROUTER, an example of Network Function Virtualization, is already productive in its Beta version, and Version 1 was released in March 2023. The service will be released iteratively with an increasing feature set over time. Beyond this, there are many more network functions conceivable which we will be developing in the coming years. As a result, there will be further development in cloud connectivity services, as well as other interconnection services.

Sales Strategy





Christian Reuter
Chief Sales Officer


Enhancing DE-CIX's customer and partner-centric approach

DE-CIX is the partner of trust for our valued long-term peering community and will remain so into the future. In addition to our traditional peering enablement, we will also go beyond peering as we have known it until now, reflecting the major digitalization trends we see on the market. More and more organizations – organizations that today do not call themselves ISPs or network operators – will also want and need to start peering. Together with our valued partners, we will therefore introduce the great world of peering to more and more participants.

Becoming the trusted interconnection advisor for new sectors

Businesses essentially all operate with three key fundamental KPIs: grow revenue, save costs, and mitigate risk. An enterprise's decision in favor of a given provider and solution will always be based on their need to be able to bring their own products to market and develop revenue streams more quickly. But to reach new target sectors, what is needed is to be able to speak those markets' languages and understand their individual needs. DE-CIX's goal is to clearly align with the organizational and business needs of each sector it works with and understand what is top of mind of the CIOs of today's enterprises. This approach will allow us to quickly reach out to these new target markets, no matter where in the world they are and in which sector they are operating.

Therefore, over the coming years, DE-CIX's already strong partner-centric approach will be taken a step further, transforming the company into a partner-first organization. The beauty of a flourishing partner ecosystem is that partners are truly local – be that in terms of geography, sector, or even specific personas within the target company. These partners live and breathe the conversations with businesses within their own sector, day in and day out, and they can teach us the relevant "languages". In turn, we will be aligning our go-to-market with those of our partners, and leveraging their knowledge, expertise, and reach in order to grow together.



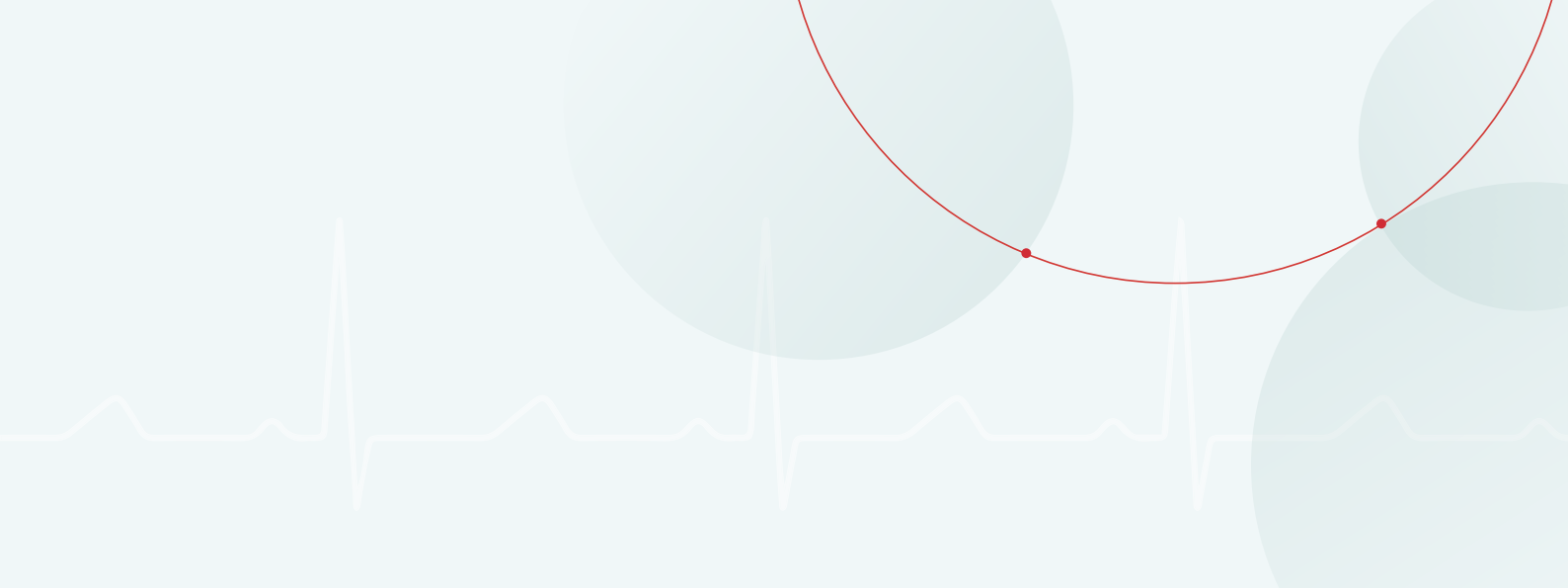
This evolving approach will enable DE-CIX to leverage the success we have enjoyed until now and transform it into strategic investments that will accelerate the company into the next decade of solid growth. We will align the organization to not only support the move into new sectors but also to support further geographical growth – wherever DE-CIX expands to in the future. This will be done in two main ways. Firstly, by better enabling our valuable partners to sell DE-CIX services on our behalf, and secondly, by transforming our sales team into solution advisors for the strategic evolution of customer connectivity, in whatever form is required.

Growing the peering community worldwide and building an even more diverse partner ecosystem

We already have a large number of fantastic sector-specific partners in our flourishing wholesale and data center communities. These communities have been central to the growth that has brought DE-CIX to where we are today in the wholesale market. Now, we have started replicating this success to serve further sectors.

In order to serve enterprise needs across sectors, we have established a strong ecosystem of cloud partners, including not only the large global players, but also regional and use-case/sector-specific providers. Beyond this, reach or transport partners make it possible to serve the connectivity needs of an enterprise holistically. They are an essential enrichment of our partner ecosystem in the US, and the lessons in this environment can be applied equally to other large markets.

To bring us into closer contact with enterprises, we are already working with value-added resellers/MSPs in the German and Spanish markets and intend to broaden the geographical scope of this partner program. Further, the program will be enriched by the inclusion of global systems integrators. We are ensuring support for this evolution by establishing in 2023 a dedicated presales team as an enablement vehicle for our partners, backed up by our inside sales organization.

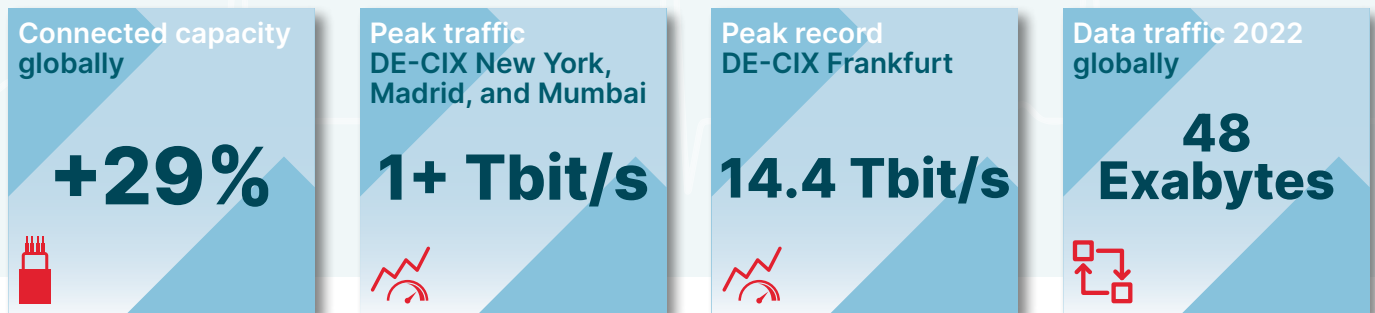


With a strong and clearly defined partner strategy and a corresponding organizational structure, we will be able to serve and enable each of the multiple partner ecosystems we work with in an enhanced way. This will position DE-CIX effectively, ready to manage and conquer the challenges of an ever more global company and ever more specialized service orientation.

While DE-CIX is putting a strong focus on the automation of our platform, we are also aware that automation is not for everyone. Direct interaction with the excellent DE-CIX sales team is an essential channel for organizations as they develop their interconnection strategies. In order for our sellers to provide strategic consultation and act more in the manner of solution advisors, they require an organizational structure that supports this. The first stages of this evolution will be undertaken during 2023. This will give our in-region field resources the ability to focus on and drive strategic development with key accounts. They will thus be able to align more closely with major customers in the wholesale market to build joint go-to-market strategies, and with global enterprise customers to provide solutions to key business initiatives. With these steps and strategic and organizational adjustments to our work with partners and customers of many kinds, DE-CIX is more than ready for the next decade of growth in all sectors where we conduct business, wherever on the planet our services are needed.

Global and Regional Growth 2022





Global Growth in 2022

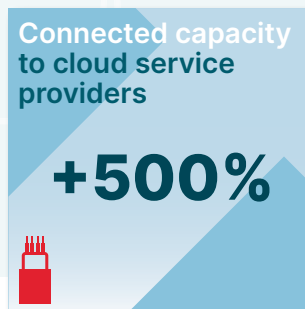
2022 was a year of growth and records for DE-CIX around the globe. A key driver was the increasing demand for higher bandwidth connections to DE-CIX IXs across the entire global ecosystem. This is part of a global trend towards growing data exchange. As modern digital applications become increasingly data-hungry and the data needed to fuel them is sourced from more and more cloud and on-premise sources, the need for interconnection is growing insatiably.

In 2022 this resulted in the connected capacity across the global DE-CIX platforms increasing by almost a third (29%). The number of connected 100 GE ports grew by 30% globally in 2022, while 400 GE ports began gaining commercial traction during the year, with 12 in productive operation at DE-CIX Frankfurt by the end of the year.

Traffic growth

A number of DE-CIX locations achieved new peak data traffic records in 2022: The DE-CIX IXs in New York, Madrid, and Mumbai all passed the magic 1 Tbit/s mark for peak-traffic in 2022. In addition, DE-CIX Dallas almost doubled its data traffic throughput, passing the 500 Gbit/s mark and finishing the year at 625 Gbit/s, while UAE-IX powered by DE-CIX in Dubai, which celebrated its tenth anniversary in November 2022, saw peak traffic rise to almost 400 Gbit/s in the same month. The flagship DE-CIX IX in Frankfurt, Germany, continued to skyrocket, ending the year with a peak traffic record of 14.4 Tbit/s.

December 14, the day of the Soccer World Cup semi-final in Qatar between France and Morocco, saw the highest data throughput of the year at DE-CIX IXs. At around 20:28 Central European Time (CET), in a single minute, 132 terabytes of data flowed through the DE-CIX Internet Exchanges, giving the IXs in New York and Frankfurt new all-time peak traffic records. Such substantial increases in data traffic resulted in a new record for the annual data traffic at the global DE-CIX Internet Exchanges of 48 exabytes – an increase of 25% on the volume in 2021.



Enterprise Services

DE-CIX's modern cloud-focused interconnection services, such as Direct-CLOUD, the Microsoft Azure Peering Service (MAPS), and the Cloud ROUTER (launched in March 2023), as well as the Closed User Group (CUG) and the bundled InterconnectionFLEX, are predominantly tailored for enterprises of various sizes. More and more globally operating enterprises are requesting connectivity on different continents designed for their own specific use-cases, running on DE-CIX's global interconnection platforms and aggregating local networks, with easy, fast, and secure implementation. Together with our trusted connectivity partners, we are able to serve these needs. In this way, an enterprise can create its own global network connectivity, enabling connections to internal production facilities and branch locations, external business partners, and cloud onramps in multiple regions. Beyond this, the API-first nature of DE-CIX's enterprise services enables a level of automation not previously possible for interconnection services. As an example, the IT and provisioning systems of one large enterprise customer alone are responsible for the automated procurement of around 100 cloud connects per year using the DE-CIX API, which is based on the open-standard IX-API.

Through the growth and establishment of cloud onramps in additional data centers, the connected capacity to cloud service providers via the DE-CIX Cloud Exchange increased by 500% to more than 1500 Gbits in 2022. Furthermore, as the Microsoft 365 applications are becoming increasingly relevant, DDoS-protected communications with the Microsoft cloud are becoming business critical, especially for organizations with a large workforce. Our experience shows that around one third of all data traffic of large enterprise customers is exchanged with Microsoft. MAPS offers an excellent way to mitigate the risk of any outages, with guaranteed and dedicated low-latency bandwidth directly to the MS 365 Software as a Service cloud, following stable and predictable data pathways.

Top 3 resellers in 2022



Partner Program

Enterprises can connect to DE-CIX either directly with their own infrastructure or via one of our valued partners. The DE-CIX Partner Program, which enables our partners to easily sell on our interconnection services to their customers, doubled the number of enterprise-facing partners year on year in 2022. In addition, an agreement was signed with a leading North American master agent, Upstack.

The program implemented over 20 partnerships for actively selling MAPS across EMEA, North America, India, and Southeast Asia. The first impressive end customer success stories for MAPS have been recorded, including MAPS shielding a law firm in Germany from the impact of the global Microsoft 365 outage in early 2023. Connected to MAPS through our partner EnBITCon GmbH, the law firm was able to continue using Outlook, Teams, OneDrive, and collaboration tools such as Sharepoint and Dynamics without any interruptions. Due to the premium connection to the Microsoft network, the customer did not experience any impact and was able to provide its services in the usual high quality, without any loss of productivity (Case Study available at <https://www.de-cix.net/en/resources/case-studies/enbitcon>).

Top 3 Reseller Partners

The traditional reseller partnerships that have supported DE-CIX's growth over the history of the company continue to be highly valued for DE-CIX. They make an important contribution to the reach of DE-CIX and simplify access to our portfolio of interconnection services. Our top three resellers in 2022 were:

- Core-Backbone
- GlobeNET (now V.tal)
- Console Connect (by PCCW)



Ed d'Agostino
Vice President
DE-CIX North America

DE-CIX in the regions – 2022

DE-CIX North America – the largest neutral interconnection ecosystem in North America

The largest neutral interconnection ecosystem on the North American continent, DE-CIX North America comprises of the five IXs, New York, Dallas, Chicago, Phoenix, and Richmond, covering the Northeast, Mid-Atlantic, Midwest, and Southwestern regions. All North American exchanges offer remote peering access to the DE-CIX global interconnection ecosystem. Highlights for 2022 include DE-CIX New York – the largest Internet Exchange in the Northeast and the largest data center and carrier neutral Internet Exchange on the east coast – surpassing the 1 Terabit per second (Tbit/s) threshold for peak traffic, rising by 40% and reaching a data throughput of 1.3 Tbit/s at peak times by the end of the year.

As a further milestone, DE-CIX Dallas, the largest carrier and data center neutral Internet Exchange serving the Southwest region, grew to be in the top 15 exchanges in the US. It almost doubled its data traffic throughput in 2022, passing the 500 Gigabit per second (Gbit/s) mark and finishing the year with peak traffic at 625 Gbit/s. Significant growth in this market in 2022 was the result of new partnerships with data center operator Digital Realty and LOGIX Fiber Networks, the largest fiber network provider in Texas, as well as through the enhancement of the IX's cloud connectivity capabilities. The DE-CIX Dallas interconnection and multi-cloud platform now offers direct access to Amazon Web Services (AWS), Google Cloud, and Microsoft Azure solutions, including the Microsoft Azure Peering Service (MAPS).

DE-CIX North America not only saw growth in existing IXs but also celebrated the opening of new locations. After its initial announcement in 2021, DE-CIX Phoenix was ready for service in March 2022. In addition, at the beginning of November, DE-CIX Richmond celebrated its official inauguration.



Highlights for DE-CIX North America

Regional highlights

- The DE-CIX North American ecosystem saw increasing demand for high bandwidth access, resulting in a 46% increase in 100GE ports.
- Overall connected customer capacity increased by 30%.

New York

- DE-CIX New York saw an increase in 100GE Ports of 33%.
- The connected customer capacity grew by 26%.

Dallas

- The number of 100GE ports increased by 23%.
- DE-CIX Dallas almost doubled its data traffic throughput at peak times, reaching 625 Gbit/s by the end of the year.

Chicago

- DE-CIX Chicago saw new demand in high-bandwidth 100GE ports, of which the first 11 were activated in 2022.
- The number of connected networks increased by 33%.

Richmond

- With an increase of 120%, DE-CIX Richmond more than doubled its connected customer bandwidth.

Phoenix

- In its first 9 months of operation, connected customer capacity at DE-CIX Phoenix exceeded 600 Gbits.



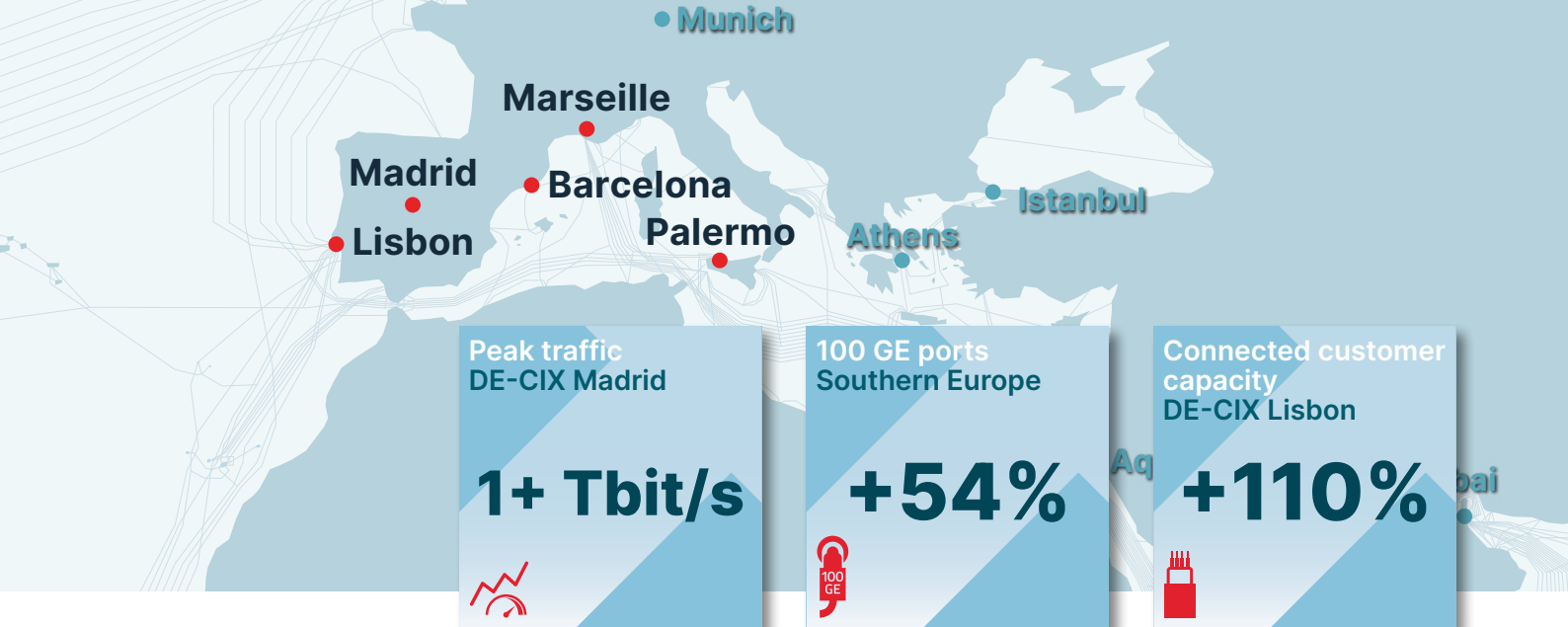
Theresa Bobis
Regional Director
Southern Europe

DE-CIX in Southern Europe – an award-winning interconnection ecosystem

The year 2022 was filled with highlights for the DE-CIX Southern European region. Counting Lisbon, Madrid, Barcelona, Marseille, and Palermo, DE-CIX operates five Internet Exchanges in the region and thus forms the largest neutral interconnection ecosystem in Southern Europe, with 470 connected networks in 13 data centers. Established in 2016 and acknowledged as the flagship DE-CIX IX in Southern Europe, DE-CIX Madrid celebrated a new record in peak data throughput of 1 terabit per second in early September 2022, an increase of close to 140% since early 2020.

The importance of the digital ecosystem around DE-CIX Madrid has also been recognized by the Spanish Association of the Digital Economy, who awarded DE-CIX with one of the Adigital Awards for Madrid at the end of September. The award, in the Enterprise category as a joint application with Digital Realty Spain, honored the work carried out under the „Madrid Digital Hub“ concept.

DE-CIX Southern Europe is also growing beyond the region and strengthening ties and connections with other continents: First announced in 2021, the strategic partnership between DE-CIX and Ellalink, a subsea cable operator, was established in 2022 to achieve a better interconnection between Southern Europe and South America. This partnership paves a new data traffic highway across the Atlantic Ocean. Additionally, on the back of the first anniversary of DE-CIX Barcelona, a strategic partnership with AFR-IX telecom was established. Through this agreement, Barcelona will become a new supplementary gateway for data traffic between Europe and Africa.



Highlights for DE-CIX Southern Europe

Regional highlights

- The interconnection ecosystem of DE-CIX in Southern Europe saw an increase in customer bandwidth of 32%.
- The number of 100GE ports across the regional ecosystem enjoyed significant growth of 54%.

Madrid

- Connected customer capacity at DE-CIX Madrid increased by 36%.
- The number of 100GE ports in Madrid increased by 55%.

Marseille

- Connected customer capacity at DE-CIX Marseille increased by 23%.

Palermo

- DE-CIX Palermo grew by 23% in connected customer capacity.

Lisbon

- DE-CIX Lisbon more than doubled its connected customer capacity, increasing by 110%.

Barcelona

- At DE-CIX Barcelona, the number of connected customers and ASNs both grew by 14%.



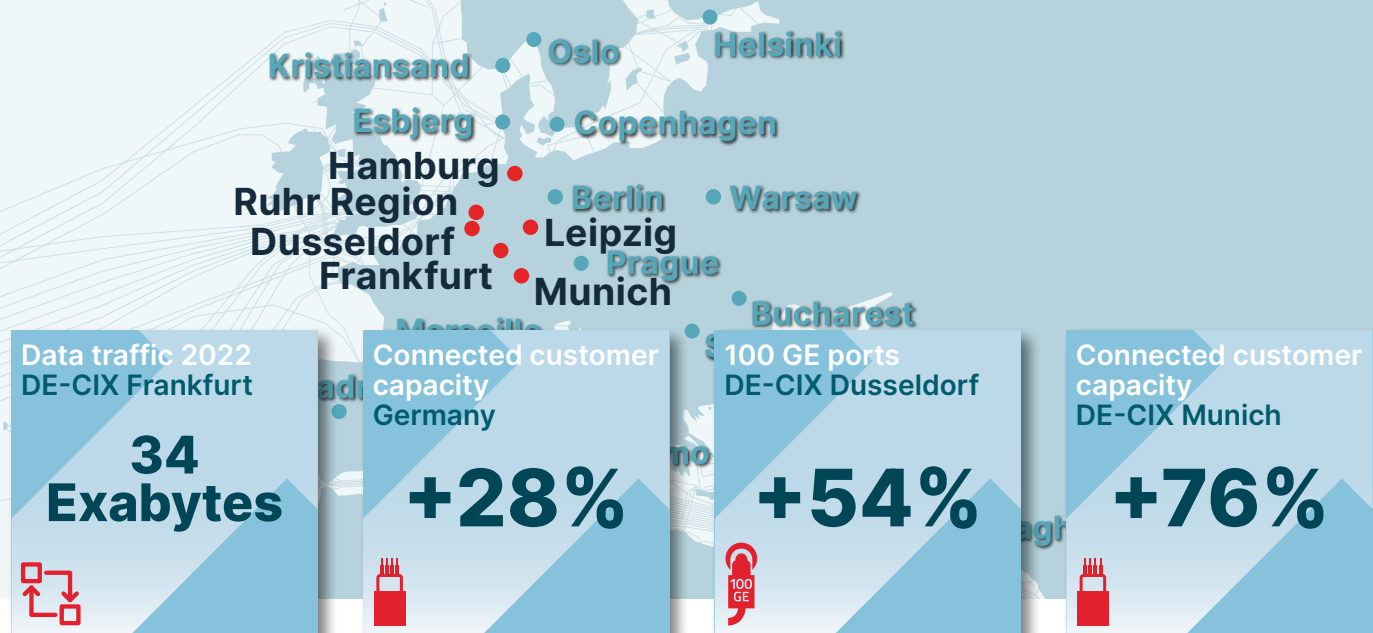
Andreas Sturm
Chief Business
Development Officer

DE-CIX in Germany – Impressive growth in Frankfurt and the regions

DE-CIX Frankfurt is the largest and most important Internet Exchange in Europe, based on network density and data throughput. In 2022, DE-CIX Frankfurt saw four new traffic peaks in a row: The IX crossed the 11 Terabits per second (Tbit/s) benchmark in February, 12 Tbit/s in August, 13 Tbit/s in September, and 14 Tbit/s in December, coinciding with the soccer World Cup semi-final between France and Morocco. This marks an increase in peak traffic at the company's flagship exchange of 33% over the course of the year. Overall, 34 Exabytes of data were exchanged at DE-CIX Frankfurt in 2022. Especially enterprise connectivity to the cloud was an important growth area for DE-CIX in Germany, with the number of cloud connects increasing by 23% year on year.

To better cope with ongoing and forthcoming growth and to future proof the interconnection platform, DE-CIX invested heavily in new hardware over the course of 2022. Together with Nokia, DE-CIX upgraded the award-winning DE-CIX Apollon platform to high-speed 800 GE access technology. With the implementation of new 800 GE ready Nokia line cards, DE-CIX is responding to the steadily growing customer demand for higher bandwidth ports to access the Frankfurt IX, and is the first IX in the world to be 800-GE-ready.

Frankfurt was not the only German location that saw growth and innovation in 2022. All regional DE-CIX Exchanges registered a growing demand for bandwidth and thus increasing numbers of 100 GE ports sold, as well as an overall increase in connected customer capacity. To accommodate the growing demand for regional interconnection, DE-CIX also expanded into a new region in Germany with the announcement and opening of DE-CIX Leipzig, the first Internet Exchange for the German states of Brandenburg, Saxony, Saxony-Anhalt, and Thuringia, in 2022. The new location offers both an opportunity for companies in the region to interconnect locally and a gateway to interconnect remotely with the 1000+ networks at DE-CIX Frankfurt.



Highlights for DE-CIX in Germany

Regional highlights

- The number of 100GE ports at the DE-CIX IXs in Germany increased by 25%.
- The total connected customer capacity in Germany rose by 28%.

Frankfurt

- At DE-CIX Frankfurt, peak data throughput increased by 33% and amounted to 14 Tbit/s in December 2022.
- Connected customer capacity increased by 27%, totaling at 74 Tbits by the end of the year.
- The number of 100GE ports increased by 24%.

Hamburg

- DE-CIX Hamburg saw a 30% increase in 100GE ports.
- Total connected customer capacity rose by 24%.

Dusseldorf

- DE-CIX Dusseldorf saw a significant increase in 100GE ports of 54%.
- The connected customer capacity at DE-CIX Dusseldorf increased by 40%.

Munich

- The number of 100GE ports increased by 50% in Munich.
- DE-CIX Munich saw significant growth in connected customer capacity, rising by 76%.



Bülent Şen
Regional Director
Turkey

DE-CIX Istanbul – cloud & partner ecosystems as drivers of growth

In 2022, the seventh year of operation, DE-CIX Istanbul continued to grow as a neutral interconnection and cloud exchange for Internet service providers, content delivery networks, and enterprises of all sizes from Turkey, the Caucasus region, and the Middle East. The Internet Exchange on the Bosphorus has established itself as a gateway between the Middle East and Europe, and offers access to both the global DE-CIX interconnection ecosystem and the DE-CIX Cloud Exchange with the associated DirectCLOUD ecosystem.

Growth in Turkey is strongly driven by the regional partner ecosystem: More and more enterprises are connecting to DE-CIX via partners such as Turkcell Superonline, TurkTelekom International, Turk.Net, ExodusClouds, and Vodafone. Vodafone Turkey set up a new DE-CIX Point of Presence in its Esenyurt Data Center in 2022, offering enterprise-grade cloud interconnection services alongside the access to the global DE-CIX interconnection ecosystem.



Not only do our partners trust DE-CIX, but Turkish enterprises do as well: For example, the most important and well-known e-commerce companies in Turkey have chosen to connect to DE-CIX Istanbul. Additionally, the Turkish industrial group Borusan uses DE-CIX DirectCLOUD in cooperation with Vodafone Business and Equinix. As a private direct connection bypassing the Internet, DE-CIX DirectCLOUD minimizes downtime and guarantees continuous connection to the chosen cloud service providers. The unique and stable infrastructure reduces latency, allowing fast and effective collaboration in the cloud: The network performance for Borusan has increased by 51%, while latency has been reduced by 60%, from 100 milliseconds to 40-45 milliseconds.

Highlights for DE-CIX Istanbul

- DE-CIX Istanbul saw an increased demand for high bandwidth access to the platform resulting in a 31% increase in 100GE ports.
- The Exchange enjoyed 27% peak traffic growth in 2022, heading towards 400 Gbit/s.
- The total connected customer capacity grew by 25%.
- The number of customers connected increased by 20%.



Marco Brandstaetter
Regional Director
Middle East & India

UAE-IX powered by DE-CIX – 10 years of digital ecosystem building in Dubai

2022 was a very special year for UAE-IX powered by DE-CIX. The first and foremost data center and carrier neutral IX in the Middle East, UAE-IX celebrated its 10th anniversary in November. Since its inception in 2012, the Exchange initiated by the UAE's Telecommunications and Digital Government Regulatory Authority (TDRA) and powered by DE-CIX has enjoyed consistent double-digit annual growth. UAE-IX is housed in two carrier-neutral data centers in Dubai, datamena and Equinix.

In the past 10 years, an extensive digital ecosystem has developed around UAE-IX which has, in turn, helped to establish Dubai as the Gulf Coordination Council (GCC) region's main and an important international Internet hub. While in 2012, 90% of data traffic in the UAE that should have been exchanged locally needed to leave the GCC region to be exchanged in Europe, ten years later, the opposite is the case: in 2022, 90% of local data could be exchanged locally. This boost in local interconnection capacity ultimately resulted in a massive reduction in latency and a performance increase in digital applications.





To continue the success story, the TDRA has started an initiative to interconnect the Internet Exchanges in the UAE. This initiative was completed in 2022 and now interconnects UAE-IX with Etisalat by e&s SmartHub IX, breaking new ground as the first collaboration of its kind ever to be undertaken in the Middle East.

Highlights for UAE-IX

- UAE-IX saw a significant increase of 89% in 100GE ports.
- The total connected customer capacity grew by 53%.
- Data throughput at peak times increased by 39% during the year, with an all-time peak of 392 Gbit/s at the end of 2022.



From left to right: Abou Moustafa, Vice President of Enterprise Business and datamena at du, and Ivo Ivanov, CEO of DE-CIX, cutting the cake for the 10th birthday of UAE-IX powered by DE-CIX.

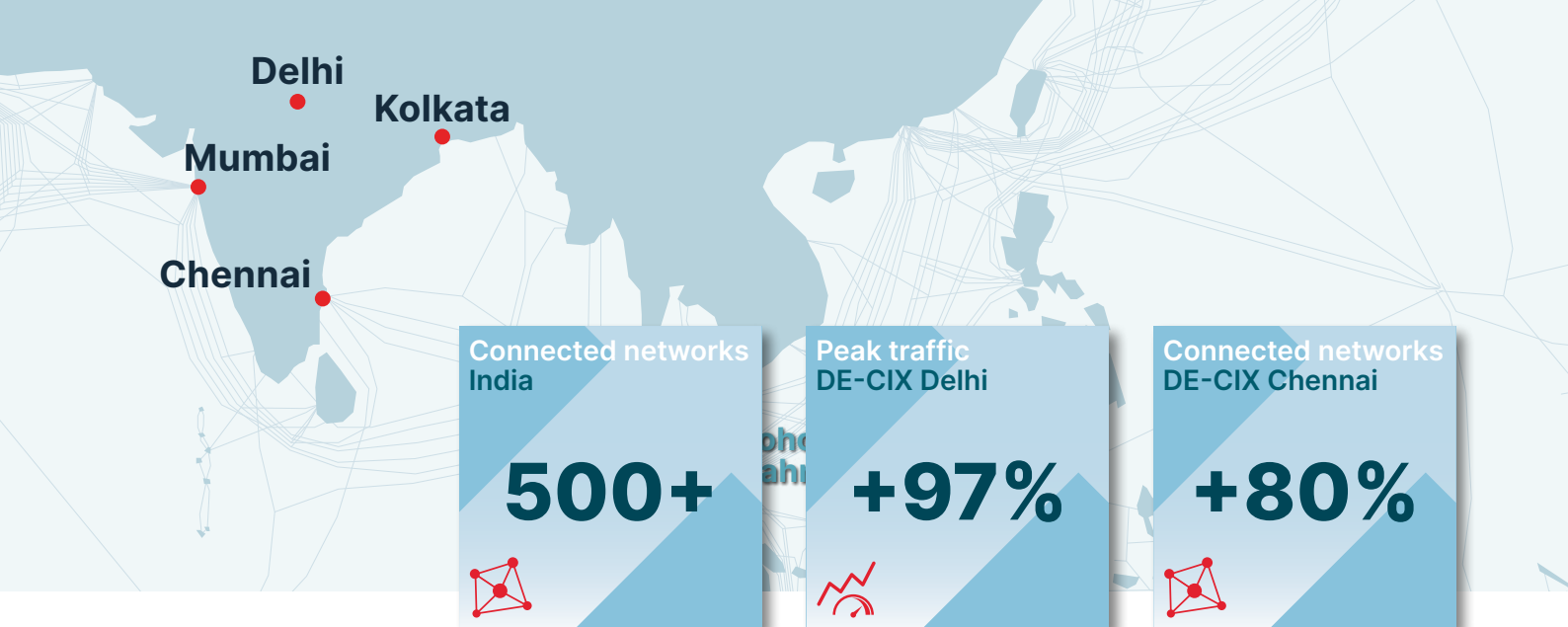


Sudhir Kunder
Senior Vice President,
National Head Sales
DE-CIX Interwire, India

DE-CIX India now interconnects over 500 networks

In 2022, DE-CIX India's carrier and data center neutral IXs in the cities of Mumbai, Delhi, Kolkata, and Chennai continued their great success story with further strong growth. The region's flagship IX, DE-CIX Mumbai, located in the financial capital of India, stands as not only India's, but also the Asia Pacific's largest Internet Exchange. However, growth and demand for interconnection services is not limited to Mumbai: In March 2022 a new milestone was reached with over 500 connected networks across DE-CIX India's four Internet Exchanges.

Partners were also an area of growth for the DE-CIX India ecosystem in 2022: At the beginning of the year, Lightstorm, India's first carrier-neutral network infrastructure platform, announced a partnership with DE-CIX, offering their clients access to DE-CIX from any of the 45+ multi-tenant data centers (MTDC) where Lightstorm has a presence. In February 2022, DE-CIX India established a new point-of-presence (PoP) at Yotta's award-winning NM1 data center in Panvel near Mumbai, offering customers at the data center and the western India region a variety of interconnection services, with the added advantage of reduced latency. Towards the end of 2022, DE-CIX India and AAACloud, a leading provider of Internet services in India, announced a reseller partnership. With this partnership, AAACloud will be able to sell DE-CIX's interconnection services across its Pan-Indian customer base.



Highlights for DE-CIX India

Regional highlights

- The number of connected networks exceeded 500.
- The total connected customer capacity increased by 18% and grew to more than 8 Tbits.

Mumbai

- At the region's flagship IX, data throughput at peak times increased by 18%, reaching 1.1 Tbit/s.

Delhi

- DE-CIX Delhi also saw a massive increase of data throughput at peak times, growing by 97% and amounting to 198 Gbit/s by the end of the year.
- The number of 100GE ports grew by 43%.
- The IX saw a 35% increase in connected networks.

Kolkata

- DE-CIX Kolkata enjoyed increased demand in 2022, with a 25% increase in connected networks.
- Data throughput at peak times skyrocketed in Kolkata, increasing by a factor of 20 on the previous year.

Chennai

- At DE-CIX Chennai, there was 80% growth in connected networks in 2022.
- The connected customer capacity increased by 27%.



Frank Orlowski
Senior Vice President
Corporate Development



Marcus Tan Tee Peng
Regional Director Asia

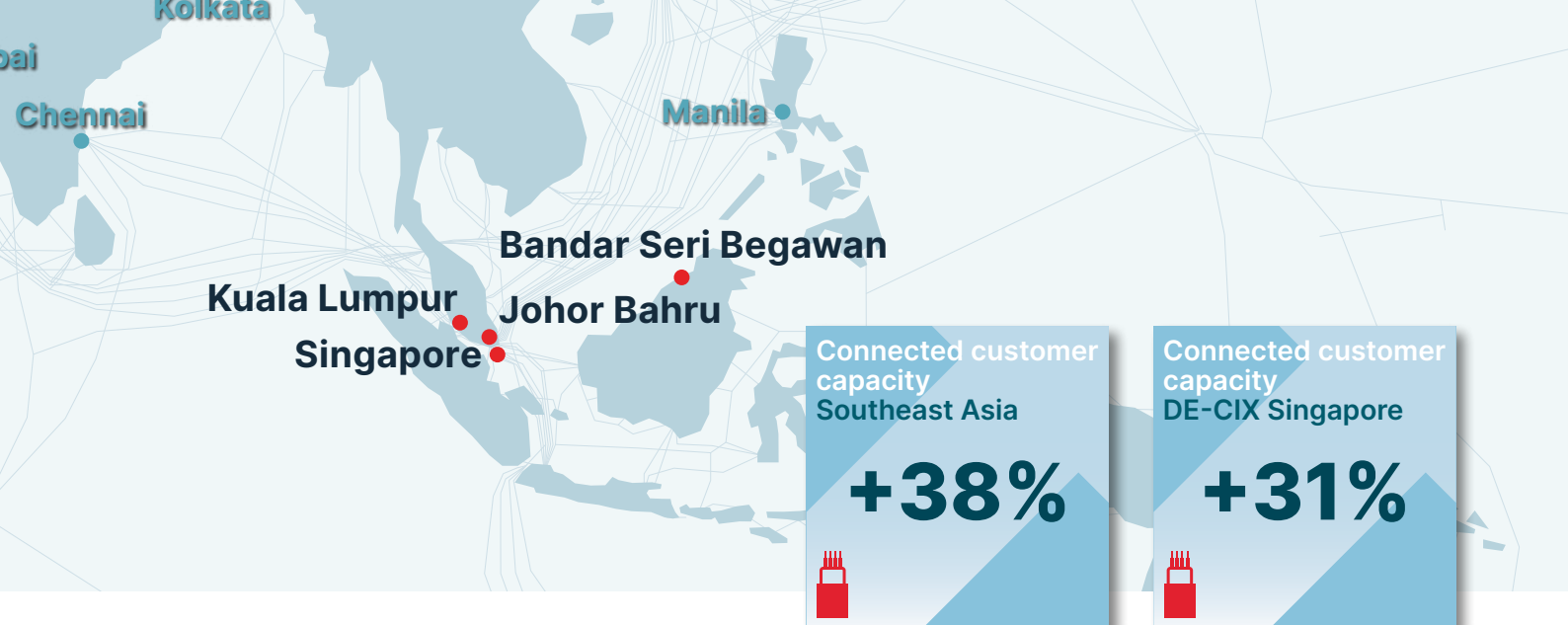
DE-CIX in Southeast Asia: Expanding the reach of the first distributed interconnection platform

The DE-CIX Asia platform is the first distributed Internet Exchange in Southeast Asia, including initially Internet Exchanges in Singapore, Kuala Lumpur, Johor Bahru, and Bandar Seri Begawan in Brunei. In 2022, DE-CIX Malaysia started planning to further grow its footprint across the country.

A cooperation was entered into in 2022 with GetaFIX, the Philippines' largest neutral Internet Exchange, to connect the Philippines as a fourth market to the DE-CIX Asia distributed interconnection ecosystem. The partnership adds a further 40+ networks to the DE-CIX Asia interconnection platform and will allow all 100+ DE-CIX Asia participants to seamlessly interconnect between the Singaporean, Malaysian, Philippine, and Brunei markets. This includes both peering services and the DE-CIX enterprise service DirectCLOUD.

In 2022, DE-CIX signed the first DirectCLOUD partner from the Southeast Asian region, BasicBrix, an IT and cloud solutions provider headquartered in Singapore. This means businesses from the region can now connect to the BasicBrix cloud services directly via the DE-CIX Cloud Exchange, without needing to take a route via the public Internet. DE-CIX also further improved connectivity to the Microsoft Azure and Amazon AWS clouds with new onramps across various markets.

DE-CIX Asia intends to continue its growth trajectory by establishing strategic and long-term partnerships, and is evaluating options for acquisitions in the region.



Highlights for DE-CIX in Southeast Asia

Regional highlights

- The distributed DE-CIX Asia interconnection platform saw an overall growth of 38% in connected customer capacity.
- The number of connected networks on the platform increased by 31%.
- A partnership was entered into with Philippine IX operator GetaFIX to onboard an additional 40+ networks from the Philippines to DE-CIX Asia.

Singapore

- In Singapore, connected customer capacity increased by 31% to over 600 Gbits.

Kuala Lumpur

- Kuala Lumpur saw an increase of 34% in connected customer capacity.

Johor Bahru

- The second Malaysian location, Johor Bahru, nearly doubled its connected customer capacity, growing by 89%.

Bandar Seri Begawan

- Bandar Seri Begawan in Brunei increased its customer capacity by 31%.

Financial Results 2022





Sebastian Seifert
Chief Financial Officer

Financial Results 2022

The DE-CIX Group AG performed very well in the 2022 financial year and was able to achieve an increase in revenues of 13.7 percent through further growth in service utilization and the expansion of their global IX presence.

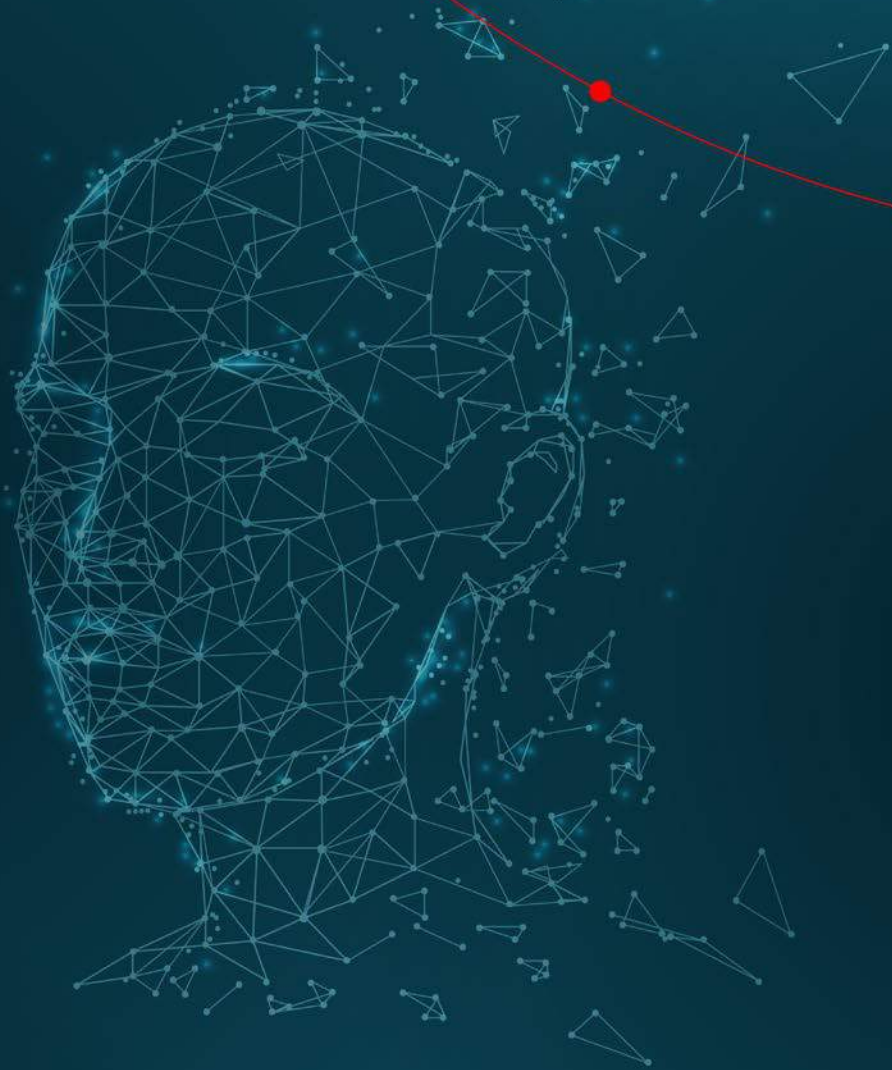
In the consolidated annual financial statement for 2022, the global revenues of all company parts grew by 6.67 million to 55.38 million Euro, in comparison to the previous year's 48.7 million Euro. Revenues from international activities jumped by 41.8 percent in comparison to 2021 and represented 22.7 percent of total revenues in 2022. The EBIT for 2022 amounted to 3.6 million Euro and the EBITDA to 5.16 million Euro. In the 2022 financial year, no use was made of debt capital.

The Profit and Loss statement below provides further details on the consolidated global results of the DE-CIX companies in 2022.

DE-CIX Global Consolidated Profit and Loss Account 2022

In thousands of EUR	2022	2021
Revenue	55,381	48,707
Inventory Change	-2.6	-86.5
Operating Result	55,379	48,620
External Services / Cost of Goods	-933	-365
Gross Income	54,446	48,311
Other Operating Income	2,146	1,842
Personnel Costs	-18,190	-14,970
Depreciation	-1,563	-1,850
Other Operating Costs	-33,244	-29,026
Operating Result/EBIT	3,596	4,307
Financial result	-15.3	-340
EBT	3,580	3,967
Tax	1,474	-1,456
Annual Profit/Loss	2,106	2,511
EBITDA	5,159	6,156

Faces of DE-CIX



Faces of DE-CIX

Close to 250 colleagues from over 40 different nationalities are building the foundation of the company's global success story: A glimpse of some of our "Faces of DE-CIX" and their interesting stories.



"It's a huge, very fast-growing business globally, with a lot of opportunities, but it's also a small family with reachability and approachability!"

Meghna Rai Sharma
Network Service Engineer

→ From New Delhi to Frankfurt – **Meghna Rai Sharma** joined DE-CIX three years ago as a Network Service Engineer. Her team is the first point of contact for all DE-CIX customers. "My team is very international! I enjoy having various cultures and experiences around me." She was born and grew up in Chandigarh: A small city 250 kilometers north of New Delhi. After graduating with a bachelor's degree in Electronics and Communication Engineering, she got picked by a large IT company and got assigned to a networks team – so she started her career in New Delhi as a Network Support Engineer.

"During that time, I noticed that there are still very few women in networks worldwide, which I hope will change in the future. I started working in this field by chance, but now I like it and want to stick with it!"

Soon after moving to Germany, Meghna felt drawn to Frankfurt. "I wanted to experience something other than my own culture, which is why I moved to Europe. I come from a city that's very diverse, and Frankfurt just felt international!" She remembers her first experience at the Frankfurt office positively: colleagues were excited and ready to get things done. After work, Meghna can be found in the gym doing weight training four times a week. She likes to visit her parents in India for a few weeks in the winter and explore Europe in the summer – she tries to experience a new place and culture on each trip.

"The job at DE-CIX just clicked, no question about it!"

Antoinette van der Stouwe
Head of Global Customer Service



→ **Antoinette van der Stouwe** joined DE-CIX in January 2022 as Head of Global Customer Service. The Customer Service team is the first point of communication with customers and provides assistance in all technical matters, day and night. For Antoinette, the key to success is her team's strong communication skills, their willingness to help, and what she calls their "caring gene". "I try to construct an excellent team, leveraging the individual strengths of my employees – that's what I enjoy about my role. I don't see myself as a customer manager, but as a people manager."

Born in the Netherlands, Antoinette moved to Frankfurt 25 years ago, following her heart. The Frankfurt data center scene quickly became her professional home. Antoinette has been familiar with DE-CIX since long before she joined the company. Most recently, she was in touch with DE-CIX through her work in

Customer Success Management at data center operator Interxion (now Digital Realty), a long-time DE-CIX partner.



"It's simply a good feeling working with lovely colleagues in a great working atmosphere – I'm really happy to be a part of DE-CIX!"

Lukas Beckey
Office Manager

→ **Lukas Beckey** joined the Office Management team in August 2022. After completing his training in hotel management and gaining years of experience at the front desk, Lukas was looking for new challenges. Shortly after his first interview with DE-CIX, he met the long-time DE-CIX CEO and Chair of the Board, Harald A. Summa, who was in Frankfurt for a conference and staying at the very hotel where Lukas worked. Of course, Lukas immediately recognized him – a happy coincidence that solidified his plans to give DE-CIX a chance.

Reinforced by his family, Lukas has felt closely connected to Frankfurt for as long as he can remember: "I'm a so called 'Frankfurter Bub': I was born here, grew up here, and completed my schooling and training here." As part of the Office Management team, he and his colleagues take care of everything necessary for day-to-day office life. His responsibilities range from travel management to providing office materials, to facility management. He appreciates the special cohesion, the recognition, and the collegial interaction that also exists outside of his team. "The opportunity to use your individual strengths, to receive helpful feedback, and to have the flexibility to work in areas that most appeal to me is so valuable!"

"DE-CIX is known globally. They are the gold standard – it was very easy to get attached to DE-CIX!"

Kendra Pignotti
US Market Lead for Richmond (Virginia)
and Phoenix (Arizona)



→ **Kendra Pignotti** joined DE-CIX in October 2021 and has been in the telecom industry for more than seven years. Today, she enriches DE-CIX with her work as US Market Lead for Richmond (Virginia) and Phoenix (Arizona). Before entering the world of Internet Exchanges, she worked in various other fields like transportation (more precisely, for DHL) and health care. Kendra's journey into the telecom industry can be attributed to her drive for innovation: Asking herself what the next big thing could be that the world would not be able to live without, her impulsive was: The Internet! "I knew nothing about this industry. And here I am! It's easy to be passionate about where the Internet is going – we're pioneering!"

What Kendra values most in this industry is the unique community: "They want to help people understand the industry and learn about it, and that's not something I've ever found in any other field I've been in." Together with her husband and her stepdaughter, Kendra lives on a golf course in Potomac Falls (Virginia). Besides

reading, she uses golfing to disengage from the world and exercise her mind. Her hobbies therefore are not involved with technology – you won't catch her gaming or on social media in her free time.



"The devil is in the details. And there are a lot of details to consider in my job!"

Wolfgang Tremmel
Head of the DE-CIX Academy

→ **Wolfgang Tremmel** has been with DE-CIX since 2006, making him one of the company's very first employees. As a network engineer, he holds the position of Head of the DE-CIX Academy, and is responsible for educating DE-CIX customers on the world of peering and how the Internet works. Among other things, Wolfgang spends his time designing and creating training videos to share his knowledge and ideas. An Internet pioneer, he has been a part of the industry since 1994: "I got to know DE-CIX and the peering world from the customer's point of view, and switched to the other side of the business in 2006. Seeing the world through the customer's eyes has always helped me a lot."

Even in his private life, the tinkering instinct that got him into the industry has never left him. Whether he's working with electronics, microcontrollers, or his camera. Wolfgang uses photography as an opportunity to get out into the countryside, and combines the subsequent editing of his pictures with his love of details. He likes to remember the times when the company was in its infancy: "Back then, when I started here almost 20 years ago, nobody would have thought that DE-CIX would become so big one day. What a success story!"

"Working at DE-CIX is really exciting and motivates me – knowing my work is contributing to making the world connected!"

Sevinc Isik
Network Service Engineer



→ **Sevinc Isik** joined DE-CIX in September 2022 as a Network Service Engineer supporting the customer service team. Before moving from Turkey to Germany she studied at Kocaeli University at the Faculty of Electronics and Telecommunications Engineering. During the pandemic she worked remotely from her hometown, Fethiye, for more than five years for Nokia as an IP/MPLS Technical Support Engineer and had DE-CIX as a customer: "I knew at some point I would want to work with DE-CIX. It was always a dream for me to get work experience in Europe and have the chance to get to know new cultures."

Sevinc has been interested in technology since high school and is happy to be part of the telecom industry with DE-CIX. She appreciates the positive relationship with her team and feels supported by her more experienced colleagues. "I love the fact that I work in a multicultural company. I have colleagues from all over the world!"

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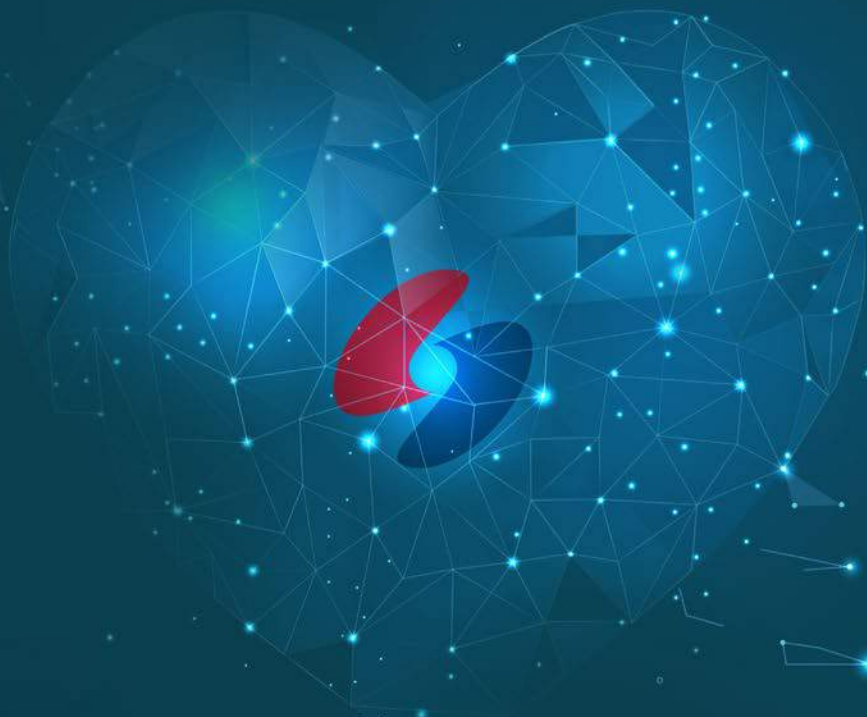
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