CTE solutions overview

Digitally transform your business with cross border connectivity solutions and services

THE BEST-IN-CLASS TRANSMISSION SOLUTION CONNECTING EUROPE WITH ASIA

中国电信
CHINA TELECOM

中 国 电 信 （ 欧 洲 ） 有 限 公 司
China Telecom (Europe) Ltd.

www.chinatelecomeurope.com

The Best-in-Class Transmission Solution connecting Europe with Asia

As the forces of globalisation become ever stronger, companies are looking for world-class transmission solutions. These solutions need to be future-proof, with sufficient bandwidth, low latency and full diversity to cope with the exponential growth in transactions and data exchange.

At China Telecom, we're paving the future with our Information Silk Road. We have 13 independent terrestrial cables and 5 independent submarine cables that connect Europe with Asia. If you're running big data operations or you need ultra-fast data transmission, we'll help you extend your global presence. Our Global SLA guarantees and excellent after sales service will help your business remain connected throughout any disaster.
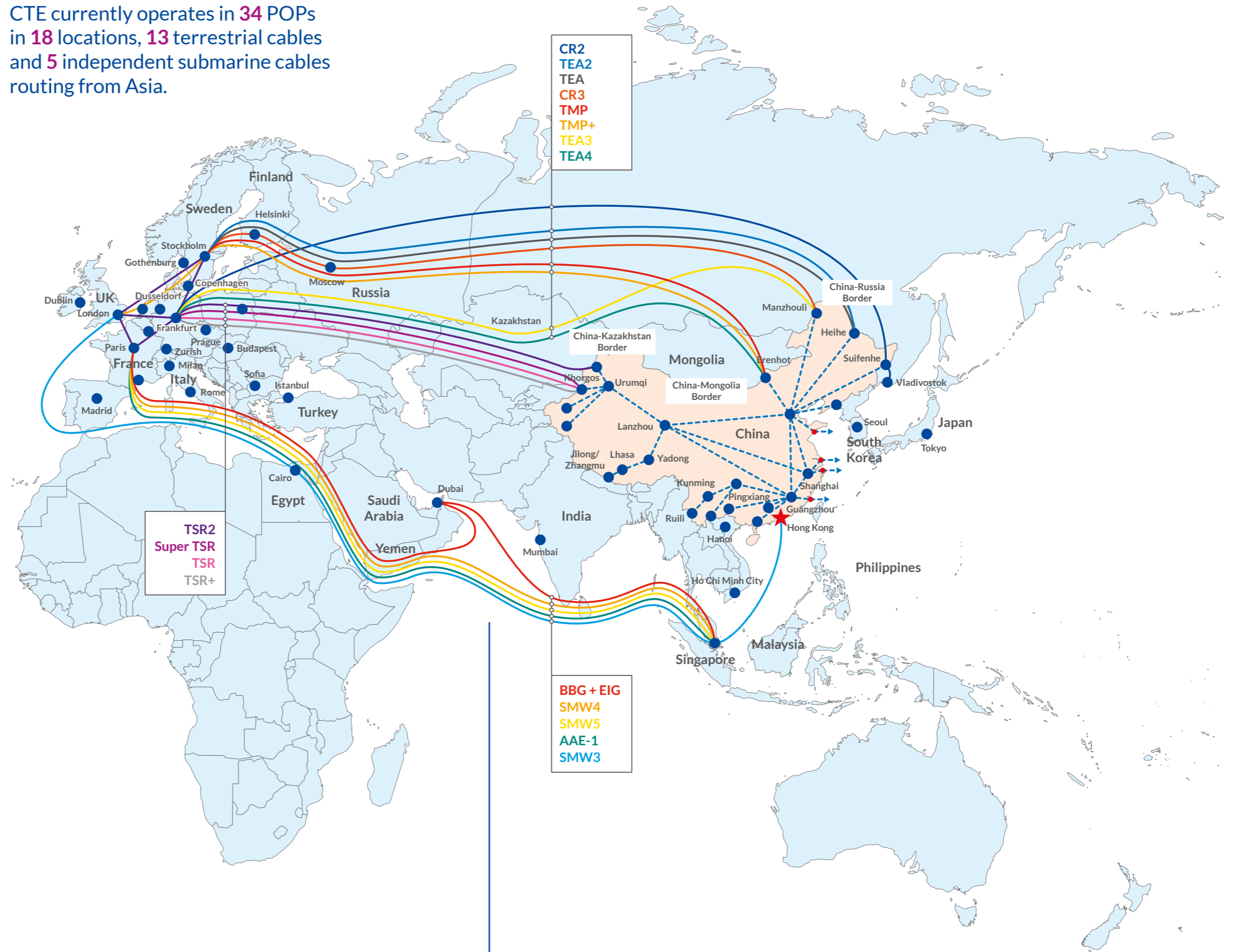
How you Benefit

- Unparalleled service reliability with a high degree of route diversity, ring-structured cable and self-healing protection

- The highest possible level of network security and enhanced manageability

- Additional option for submarine restoration service to circumvent outages caused by unforeseen events

- Highly scalable bandwidth, from E1 (2Mbps) to STM-64 (10Gbps), which can be upgraded as your business grows

- Secure and dedicated L2 connectivity for EoSDH / EoDWDM technologies

- Extraordinary digital bandwidth of up to 800Gbps powered by our DWDM optical fibre systems

- Extremely low latency, supporting time-sensitive applications and short connection lead time

- Network redundancy, offering diversified and fully protected end-to-end network solutions, thanks to our European strategic partnerships

Our Network of 13 Transmission Cables

Route	HK-FRK (Test Latency)	Protection
TMP	169.00	Protected
TMP+	169.19	Protected
TEA	216.00	Protected
TEA2	188.00	Unprotected
TEA3	n/a	Unprotected
TEA4	171.00	Unprotected
CR2	227.00	Protected
CR2 to Vladivostok	HK-VLD 71.00	Unprotected
CR3	179.40	Unprotected
TSR	161.70	Unprotected
TSR+	155.59	Unprotected
STSR	149.17	Unprotected
TSR2	167.90	Unprotected

Why use China Telecom as your best possible partner?

We have the largest communication network in China and an ever-expanding global network. China Telecom is in a unique position to provide businesses with the most cost-effective end-to-end communication solutions. Our Information Silk Road stretches across China, the EMEA region, Asia-Pacific and services the entire globe. Our network has bilateral connectivity to over 100 countries. China Telecom can meet and exceed all your business communication needs, no matter where your data needs to be.

CTE currently operates in 34 POPs in 18 locations, 13 terrestrial cables and 5 independent submarine cables routing from Asia.

CR2
TEA2
TEA
CR3
TMP
TMP+
TEA3
TEA4

TSR2
Super TSR
TSR
TSR+

BBG + EIG
SMW4
SMW5
AAE-1
SMW3

Find out more about the Information Silk Road and our future-proof Transmission Solutions...

www.chinatelecomeurope.com

VPN SOLUTIONS

中国电信
CHINA TELECOM

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China Telecom (Europe) Ltd.

VPN Solutions

Businesses using public networks are increasingly vulnerable to cyberattack. Cybercriminals have an ever-growing range of tools and techniques to hack into your data, and with more and more employees working in virtual offices or telecommuting, it's highly likely that someone will be targeting to steal your data or access your systems right now. Furthermore, many public networks struggle to cope with the loads imposed on them. For example, when you are trying to access a website and continuously receive a buffering sign, or if you've ever taken part in a video conference which jitters, then you'll know that effectiveness and productivity will have a major impact on your business.

China Telecom's VPN services bring you security and reliability – just like a digital private line leased circuit, but for a fraction of the cost. We use our CN2 network to give you connectivity throughout your organisation.

We have two levels of service for VPNs - Layer 3 MPLS and Layer 2 VPLS. We also offer a range of value-added services to help you enhance your network: NetCare proactive monitoring; CPE procurement and leasing options; equipment maintenance outsourcing and system integration; IPSec connectivity for remote or back up solution.

Our global network means that we can ensure secure data transmission throughout your organisation. In particular, we provide 5 levels of Quality of Service (QoS) to prioritise your different applications and provide excellent Service Level Agreements (SLAs) for VOIP, Video and ERP applications.

China Telecom's VPN Overseas POPs

- POP
- POP under construction

Service Specifications

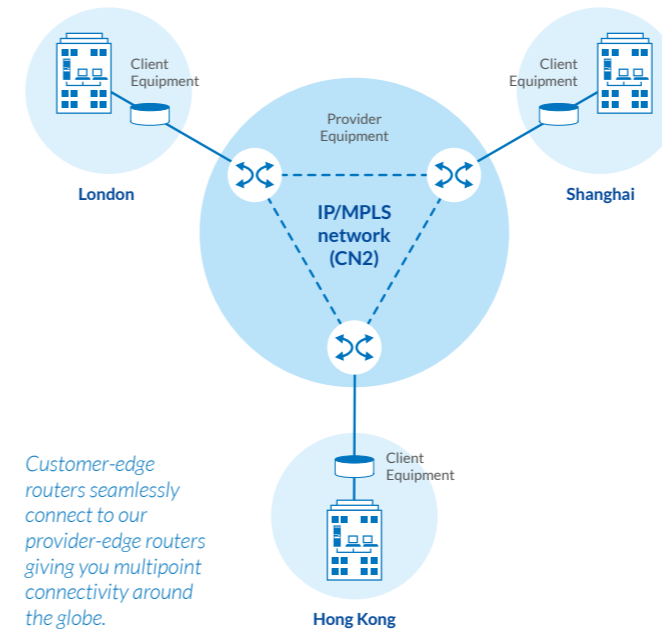| Class	SLA Parameters	Sample Applications
Diamond	Latency + Jitter + Packet Loss	High quality real-time voice (VOIP)
Platinum	Latency + Jitter + Packet Loss	Video conferencing
Gold	Latency + Packet Loss	ERP, interactive messaging
Silver	Latency	Internal server accessing, intranet accessing
Bronze	None	Internet http traffic, email, FTP

Layer 3 MPLS VPN

Customers can benefit from our transmission of data securely and at high-speed with our Multi-Protocol Label Switching technology (MPLS). It is designed specifically for high-end users, offering any-to-any site communications or hub and spoke topology within the VPN. Our service is extremely fast because it can direct data from one network node to the next using our optimised CN2 network.
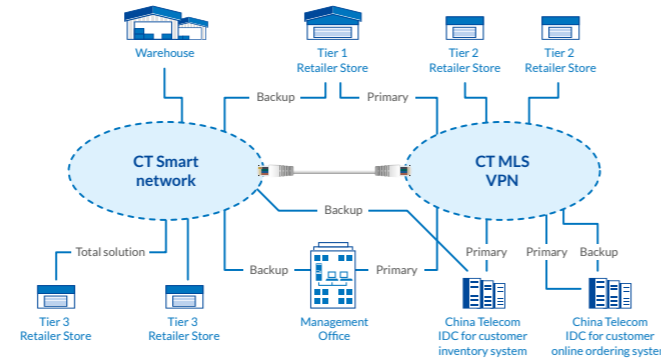
Our Distributed Service Platform comprehensively covers the Asia-Pacific region, North America, South America, Europe, the Middle East and Africa. We combine our own global internet and 3G/4G networks with those of our global partners. This ensures a quick and reliable corporate network for transmitting secure encrypted data. To make this happen, MPLS takes advantage of a Border Gateway Protocol (BGP). This is the routing protocol that makes the internet work by exchanging internet routes between service providers.

Layer 2 VPLS VPN

You can share your core network infrastructure across geographically-dispersed sites using our Layer 2 VPN. The service is independent of the Layer 3 protocol. It is a Virtual Private LAN Service (or VPLS) that provides multipoint–to–multipoint or hub and spoke connectivity with standard Ethernet access interface. With China Telecom as your single supplier, you gain access to a network of over 40 POPs around the world and over 300 backbone nodes in China!

Customer-edge routers seamlessly connect to our provider-edge routers giving you multipoint connectivity around the globe.

With our VPLS, you can efficiently control your WAN routing and eliminate security concerns such as IP route leaking. It effectively supports the seamless extension or interconnection of LANs across metropolitan and wide area networks – all on a cost-effective basis. With our robust CN2 network, any network failure means that traffic is redirected via the best alternative route, minimising any disruption in service. China Telecom is the only VPLS provider in mainland China.

NetCare: Proactive Real-time Network Monitoring

Netcare is the value-added option of a proactive real-time network monitoring service. A comprehensive customer web portal provides our customers with useful information such as network performance, circuit and equipment inventory, bandwidth utilisation statistics and the ability to provide SLA reports – anytime, anywhere – saving your IT department's time and money.

Here is some of the 24/7 real-time information that you could choose to monitor:

- MPLS quality of service
- Customer network IP SLAs – jitter, packet-loss and delays
- Netflow, including source IP, destination IP and protocol monitoring
- Layer 7 flow, including abnormal flow, alarm analysis, notification and fault handling
- VOIP – MO5, jitter, packet-loss and delays.

NetCare's dashboard screens give you real-time network information, 24/7.

China Telecom uses the latest models of Cisco Routers for the CPE. These can be provided with 24x7x2 support or 5x8xNBD depending on the requirements.

## Empower your business to go global

When your business is expanding around the world, you need a trusted partner to keep your communications running smoothly. China Telecom can provide everything you need for your VPN network, on-time and on-budget. We keep the total cost of ownership low with a range of flat rates and free or discounted VPN port charges.

With a dedicated account manager, a project manager and round-the-clock professional customer service support, China Telecom will empower your business with the best communication solutions anywhere.

To learn more about how our VPN services can take you global, please call us on +44 (0)20 7537 7156 or email us at:

emea.marketing@chinatelecomglobal.com

DELIVER CONTENT FAST
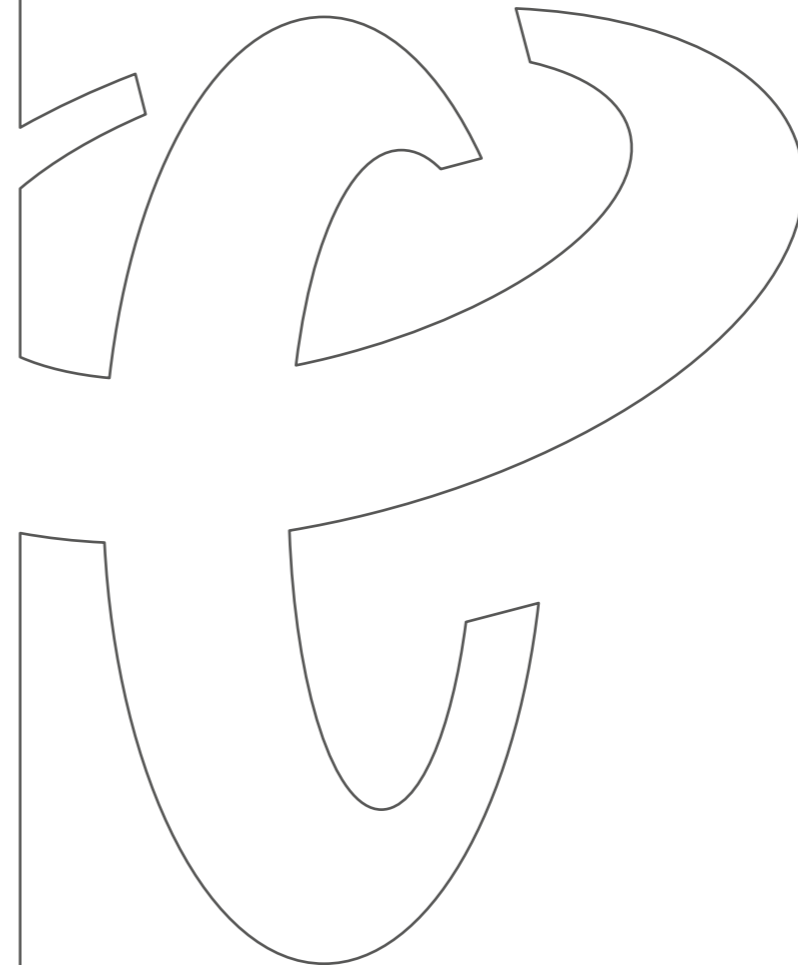
中国电信
CHINA TELECOM

中国电信（欧洲）有限公司
China Telecom (Europe) Ltd.

Deliver content fast, with CDN

Are you facing the challenge of delivering huge libraries of content? Content libraries are growing exponentially – whether you offer video, audio, online games, software downloads, websites or user-generated content. Meanwhile, audiences for live broadcasts, streaming or downloads are growing around the world. Expectations of speed and quality are increasing all the time.

To meet your ever-growing needs, China Telecom Global announces its industry-leading Content Delivery Network (CDN). This utilises our industry-leading internet backbone. Instead of using caching and streaming nodes around the globe, CDN intelligently targets the load to an area much closer to the audience.

How do you benefit?

- **Premium Performance**

  China Telecom Global CDN provides an exceptional end-user experience by committing to deliver your content libraries quickly and efficiently.

- **Customisation**

  We offer you a variety of content delivery solutions and features to support your unique business requirements. Whichever you choose, you'll benefit from our scalable network, international footprint and superior customer service.

- **Value**

  You can choose the optimal blend of price, scalability, feature quality and ease of use to suit your budget and ambitions.

- **End-to-end service**

  Enjoy the simplified and straightforward solution for content delivery; end-to-end support from acquiring broadcast video all the way through to online delivery.

If you're looking to speed up your connection, CDN is the perfect partner for edge distribution, media delivery and website acceleration. You get a high-performance and highly scalable service, all delivered in a simplified and cost-effective manner.

How CDN achieves industry-leading performance

- **Network control**

  We have one of the most connected networks in the world. That means we control the routes and hand traffic off directly to last-mile eyeball-networks without relying on other transit providers and their routing policies.

- **Intelligent routing**

  We select best-path routing based on cost versus quality of service, capacity, visibility into carriers' networks and upstream routing conditions.

- **Direct traffic control**

  We directly manage performance on your network.

- **Strategic network visibility**

  We strategically place CDN nodes in your gateways to give capacity closest to the points at which traffic is exchanged with eyeball-networks or peers - all based on traffic flows and network conditions.

- **Platform intelligence**

  We optimise distance, network congestion and server load to ensure that content is served from optimal CDN nodes, including traffic handed off directly to eyeball-networks or peers.

- **Content analysis**

  We use industry-leading and extremely flexible Content Analytic tools for enhancing business intelligence.

- **Intelligent Traffic Manager (ITM)**

  We can provide numerous policy-driven options for managing CDN traffic across multiple sites and your own data centres.

Deliver a variety of content including:

- Video downloads
- Streaming video (on-demand and live)
- Online games
- Software downloads and patches
- User-generated content (UGC)
- Music and audio downloads
- Websites

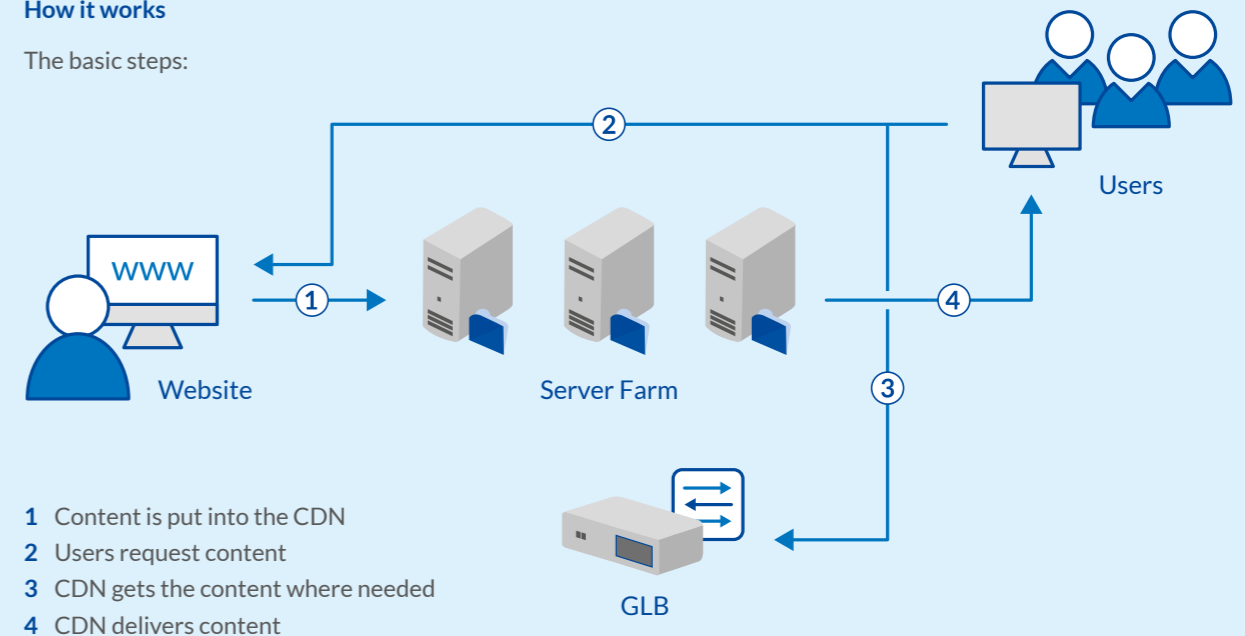### Types of content in the CDN

- **Static Content**

  Highly cacheable content which does not change often, e.g. a company logo. This can be accessed by many users once it is in the CDN cache.

- **Dynamic Content**

  Content that has poor cacheability since it is specific to a user or a group and it changes for each user. Often the content is assembled by the origin server and sent to the CDN in real-time, based on reaching locally-stored user data called a "cookie", e.g. a Netflix Queue. Since the CDN has to retrieve dynamic content from the origin server every time a user asks for it, the only way to speed up dynamic content is to optimize the internet path between the origin server and the requesting CDN cluster.

- **Long Tail Content**

  This is content seldom accessed by end users, causing it to fall out of cache.

What we offer as part of the CDN

- **Storage**

  External File Storage, Original Storage and Cloud Storage to provide large-scale storage requirements.

- **Caching and Download**

  Caching, Download and HTTP Download for widespread deliveries.

- **Streaming**

  Broadcasting Audio & Video Streams, Windows Media, Adobe Flash, Adobe Zeri, Microsoft Smooth and Apple QuickTime for widespread deliveries.

- **Reporting**

  Dashboard for CDN Activities, Media Portal, Content Analytics and Log File Collection to monitor CDN activities and measure effectiveness and reach.

- **Security**

  Content Protection, Geographic IP Filtering, Token Authentication and Secure Sockets Layer (SSL) to prevent or enable deliveries to specific geographies and secure the connection.
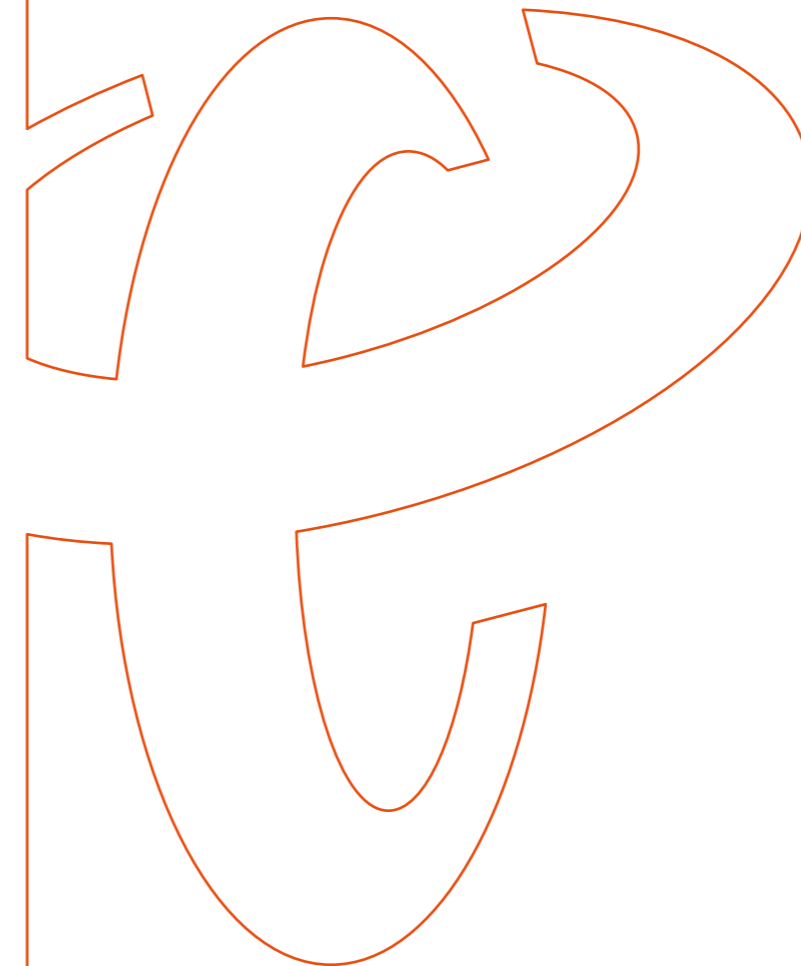
How it works

The basic steps:

1 Content is put into the CDN
2 Users request content
3 CDN gets the content where needed
4 CDN delivers content

Find out more about how China Telecom's CDN can help you deliver content fast at:

www.chinatelecomeurope.com

ICT & MANAGED SERVICES

中国电信（欧洲）有限公司
China Telecom (Europe) Ltd.

China Telecom provides professional ICT services across the globe.

Locations include America, Europe, the Middle East, Africa and Asia-Pacific (including mainland China and Hong Kong). Our powerful team of experts provide a service platform that offers communications solutions, reliable services and a one-stop integrated information system wherever you are in the world.

We offer a vast range of managed services which you can combine to suit your specific needs: WANs, Customer Premises Equipment, Data Centres, Intelligent Buildings, IT Infrastructure, Security and much more.

Managed WAN (Wide Area Network)

Poor network performance and availability can result in lost revenue and reduced employee productivity. Regardless of your organisation's size, a high-quality network is essential. That requires time, effort and focus.

A managed WAN creates a secure environment for inter-office connections without sending traffic over the internet. We help connect multiple network sites across Europe, China and worldwide, with the tools and support your business requires.

The benefits of a managed WAN include reduced costs from sharing resources across sites; LAN-like applications for remote clients; the ability to respond to changing network conditions and prioritise mission-critical applications.

Our commitment is to create high availability network solutions with complete, end-to-end management. Entrust your WAN to our highly-trained multilingual network team, so that you can focus on your business growth initiatives.

Intelligent Building System (IBS)

We integrate computer technology, communication technology and information technology to provide automated management for a variety of properties such as commercial buildings, residential areas, hotels, factories and business parks.

Everyone benefits. Residents and visitors have a safe and comfortable working and living environment. Property managers get a service management platform. Investors see lower operational costs and enhanced profitability levels.

Our engineering services include Building Automation, Office Automation, Communication Automation and Security Automation Systems.

Managed CPE (Customer Premises Equipment)

Running a successful enterprise network requires more than a good combination of technologies. You also need dependable management and administration – in particular, reliable oversight of the performance and operating efficiency of your network routers and switches.

Our low-cost Managed CPE solution means outsourcing router and equipment management to China Telecom Europe. Our engineers can design, build, and maintain your network with flexible, cost-effective management solutions that don't strain your budget or force you to sacrifice performance. We provide customisable solutions for the unique requirements of each site, fully optimising our customer's WAN architecture. These solutions range from onsite hardware maintenance and upgrades, via software configuration changes, all the way up to infrastructure project design and execution.

With Managed CPE, we'll help you get the most value out of your IT and network. You don't have to spend time and money worrying about the performance of your data connections. Our proactive monitoring solution may be able to detect and fix the issues before you notice any downtime.

Internet Express

Internet Express allows your global organisation to access wide-ranging Chinese content. Our business grade internet network provides lower contention ratio to provide better user experience.

Protection against viruses and hacker attacks is built-in. We also offer 24/7 service line support, network monitoring, on-site maintenance (parts and labour), and configuration backup and restore.

Managed IPT (Internet Protocol Telephony)

Our IPT services range from basic phone applications to mobile and video. Our solutions include IP video gateways and IP PBX. We can provide online performance monitoring and calling analysis on a 24/7 basis.

With onsite maintenance (parts and labour), technical support, and configuration backup and restore, our managed IPT can provide a better for service at a low cost.

Data Centre Engineering

We use new technologies and concepts to improve the overall efficiency of your data centre operations – reducing operation, maintenance and energy consumption costs.
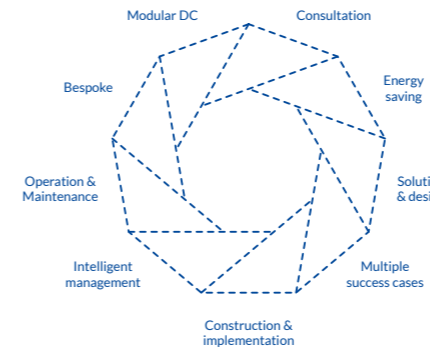
We also implement highly cost-effective data centre engineering protocols, to maximize your data centre's investment value.
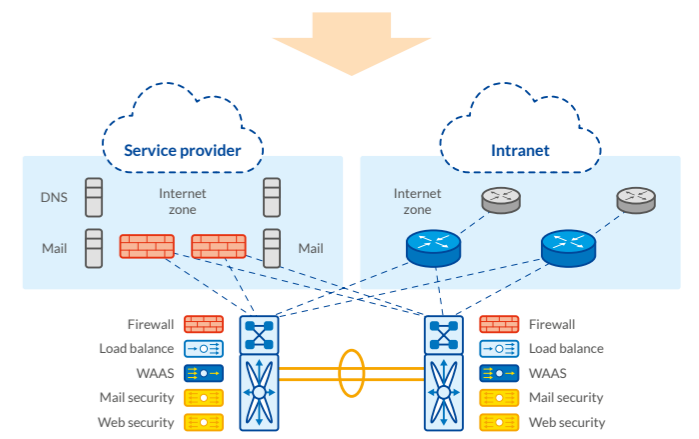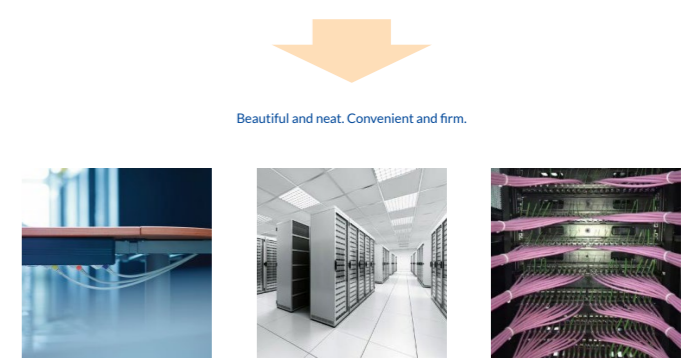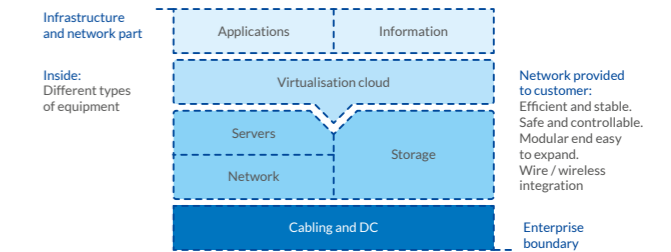
IT Infrastructure Deployment

We provide tailored IT Infrastructure deployment schemes suitable for your business development.

With our rich experience in IT consulting, planning, design, deployment, operation and further optimisation for our global corporate customers, we can deploy best of breed infrastructure that is best for you.

At China Telecom Europe, we provide our customers with the highest standard of managed IT services.

We offer a one-stop global services solution for business consulting, business acceptance, technical support, troubleshooting, billing and accounting services.

Thanks to our expertise in operating carrier-class service networks, our globally distributed technical support centres and local service teams are able to provide you the best managed services and be a trusted partner.

Enterprise server room solution

High flexibility DC solutions

Mini DC
(Single-rack integrated solution)

Small size DC
(6-8 racks)

Middle size DC
(8-20 racks)

Big size DC
(>18 racks)

Enterprise network and IT applications architecture

Beautiful and neat. Convenient and firm.

To learn more, please call us on +44 (0)20 7537 7156 or email us at:

emea.marketing@chinatelecomglobal.com

GLOBAL WAVELENGTH SERVICE

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China Telecom (Europe) Ltd.
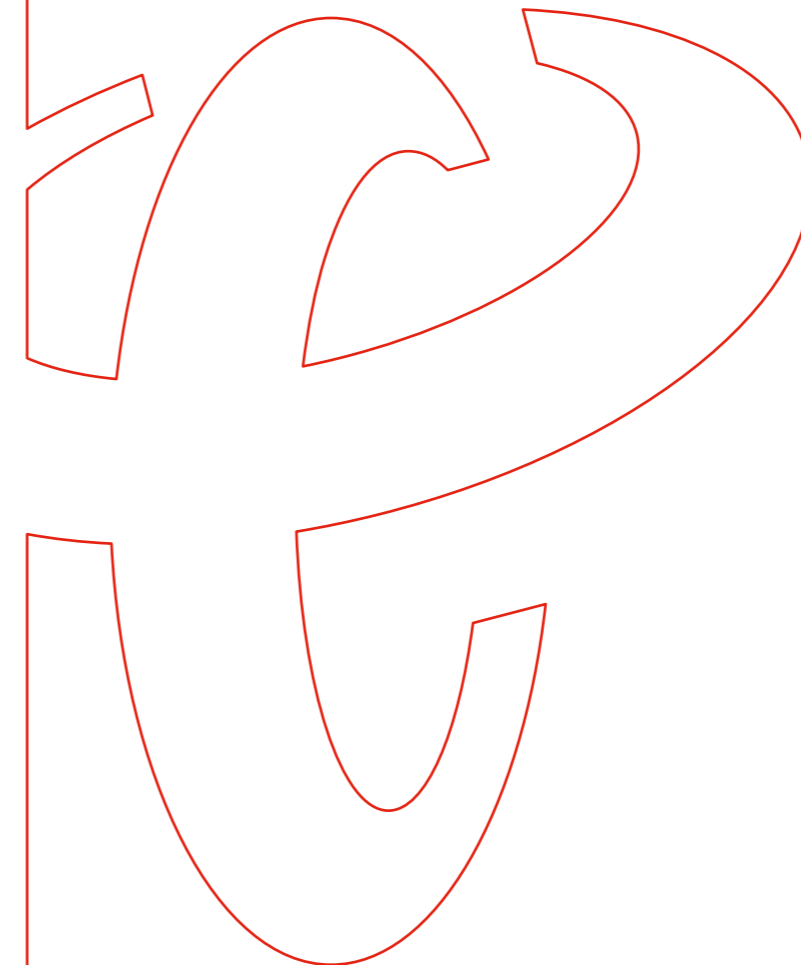
www.chinatelecomeurope.com

China Telecom Europe offers Global Wavelength Services to our worldwide customers with fully transparent circuit transmission.

Our Global Wavelength Services provide top quality large bandwidth data transmission products up to 100Gbps through our Optical Transmission Network (OTN), the first and only optical network connecting China and major countries around the world.

We're now unrivalled as an information hub in the Asia-Pacific Region. Using our far-reaching international land and submarine cable system, with 15 major routes across the Pacific, Europe and Asia, we have established a worldwide high-speed network with backbone bandwidth of more than 7000Gbps.

When you're looking for high-quality, high-volume international data transmission, our Global Wavelength Services deliver low latency, high speed bandwidth up to 100Gbps at competitive rates. We use the power of China Telecom's extensive global transmission network — an enormous land and submarine optical cable data backbone, delivering more than 7000Gbps across the Pacific, Europe and Asia.

With CTE's Global Wavelength Services you get:

- **Extensive coverage**

  China Telecom's International OTN network provides comprehensive coverage to all major cities in mainland China and to international centres including Hong Kong, Singapore, Japan, San Jose, Los Angeles, New York, Seattle, London, Frankfurt and Stockholm.

- **Accelerated speeds**

  We provide reliable data transmission rates in 10Gbps, 40Gbps, or 100Gbps packages, using our state-of-the-art optical networking technology. We support all standard interfaces (OTU2, 10GE LAN, 10GE WAN, OTU4, 100GE).

- **Reliable business protection**

  Our fully redundant, self-healing optical switch ensures high OTN uptime and a consistent, reliable data transmission service.

- **Fast and efficient provision**

  Sophisticated cross-scheduling capabilities allow us to respond quickly to changing customer requirements, including rapid service order delivery and capacity changes.

- **Exceptional emergency recovery**

  Our adaptive, state-of-the-art OTN network provides robust emergency recovery capabilities, delivering exceptional security, protection, and flexibility. Combined with our highly competitive SLA pledge security system, your data has never been better defended.

Global Coverage

China Telecom's International OTN network covers major cities in mainland China and across the globe.
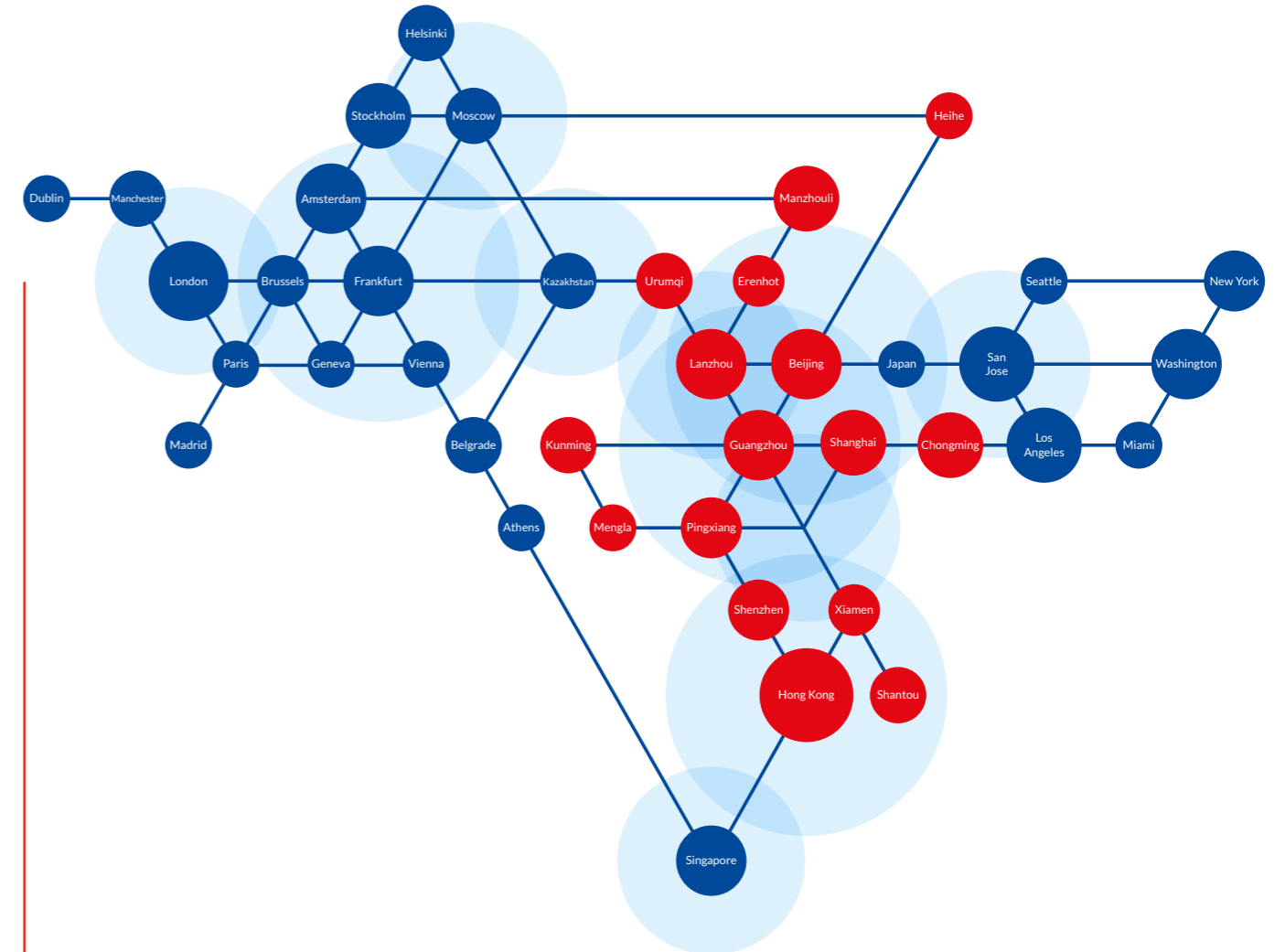
To find out how you can bring the power of worldwide optical data to your doorstep, please call us on +44 (0)20 7537 7156 or email us at:

emea.marketing@chinatelecomglobal.com

China Telecom Europe (CTE)

The demand for high-quality international communications is soaring. Multinational enterprises, carriers, telecommunication service providers and their consumers are all looking for resilience and speed. And the links between China and the West are a crucial element of any new infrastructure.

So we've built an Information Silk Road to link Europe and China. It consists of a world-class portfolio of Voice, Data, IP and ICT solutions, all backed up by superior customer service. We have six state-of-the-art terrestrial routes, enhanced by China Telecom Global's extensive international infrastructure.

Our Information Silk Road is extending across the entire EMEA region … and ultimately the whole world beyond. We're headquartered in London and already we have 18 branches and regions in Europe. We have 176 Points of Presence (POPs) in 33 countries and regions around the world.

CTE's unique heritage gives us an unrivalled knowledge of the Chinese market. We're ideally positioned as the partner of choice for Chinese businesses planning expansion into the European region, and for European businesses looking to tap into China and Asia. Our customers include many Fortune Global 500 companies.

Corporate Background

Our ultimate holding company is China Telecom, one of the world's leaders in integrated telecommunication services. It's the world's largest operator for both broadband and fixed lines, and it owns China's largest internet and optical fibre networks.

The international arm of the business is China Telecom Global Limited (CTG), which is based in Hong Kong. CTG currently has subsidiaries and offices in 26 countries and regions worldwide.

We are a subsidiary of CTG. Our full name is China Telecom (Europe) Limited. In addition to all the resources of our global organization, we also work seamlessly with an elite group of strategic partners to guarantee worldwide accessibility and top-class service capabilities.

Our Commitment to Customers

We serve European multinational enterprises, Chinese enterprises in Europe, carriers, telecom service providers and Europe-based Chinese consumers. Our European-Asia Network consists of more terrestrial and submarine routes than any of our competitors. By linking these to the largest digital network in China, you get superior lower latency, improved resilience and greater diversity – meaning the best possible experience when accessing business applications to and from China.

Best of all, you can get all the services you want from one provider. CTE seamlessly connects your global business to the world's largest single marketplace.

Find out more about how the Information Silk Road could transform your communications.

Head Office

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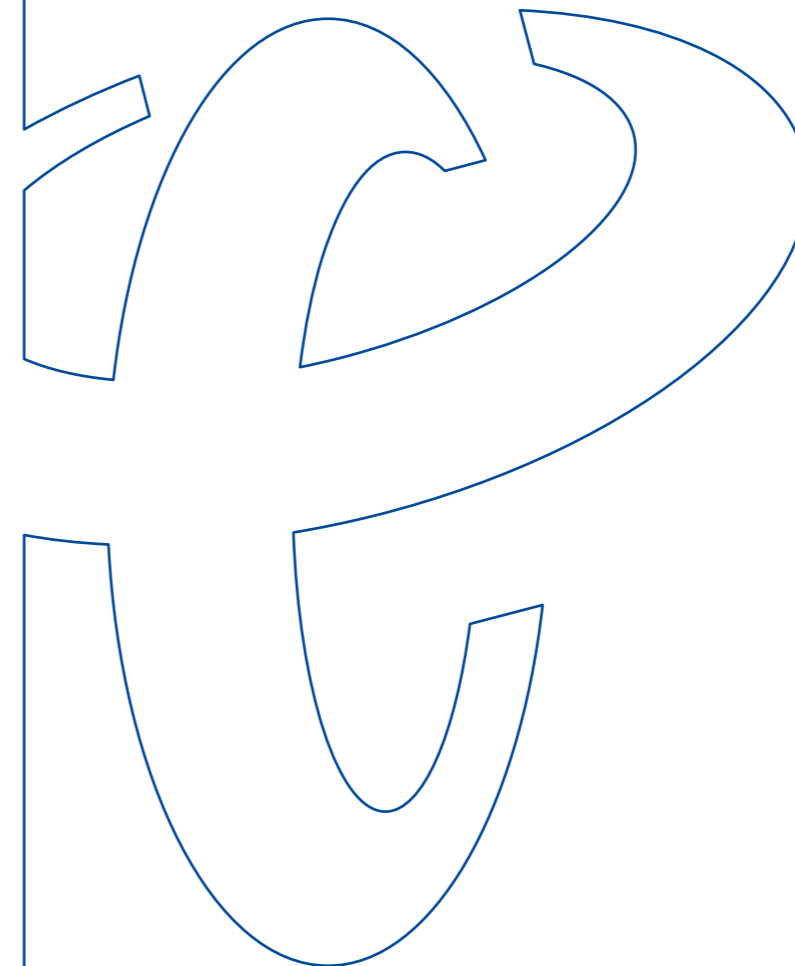
Regional Offices and Support Centres

- France
- Germany
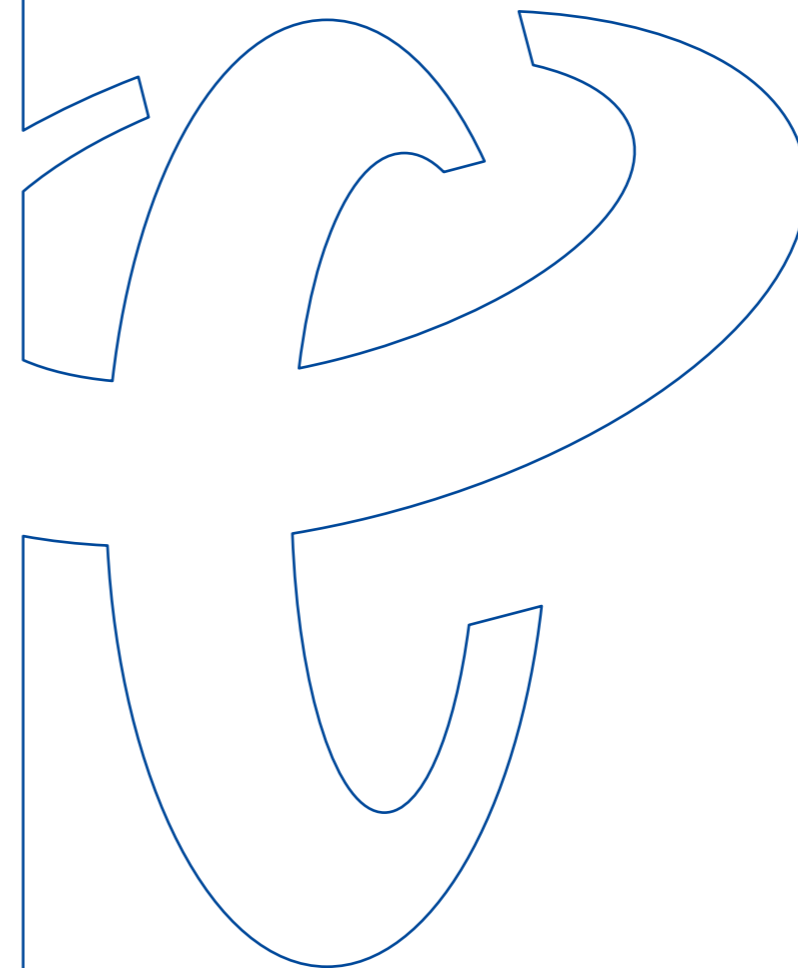- Spain
- Switzerland
- Russia
- Turkey
- Belarus
- Netherlands
- Czech Republic
- Denmark
- Italy
- Sweden
- Luxembourg
- Poland
- Hungary
- Austria
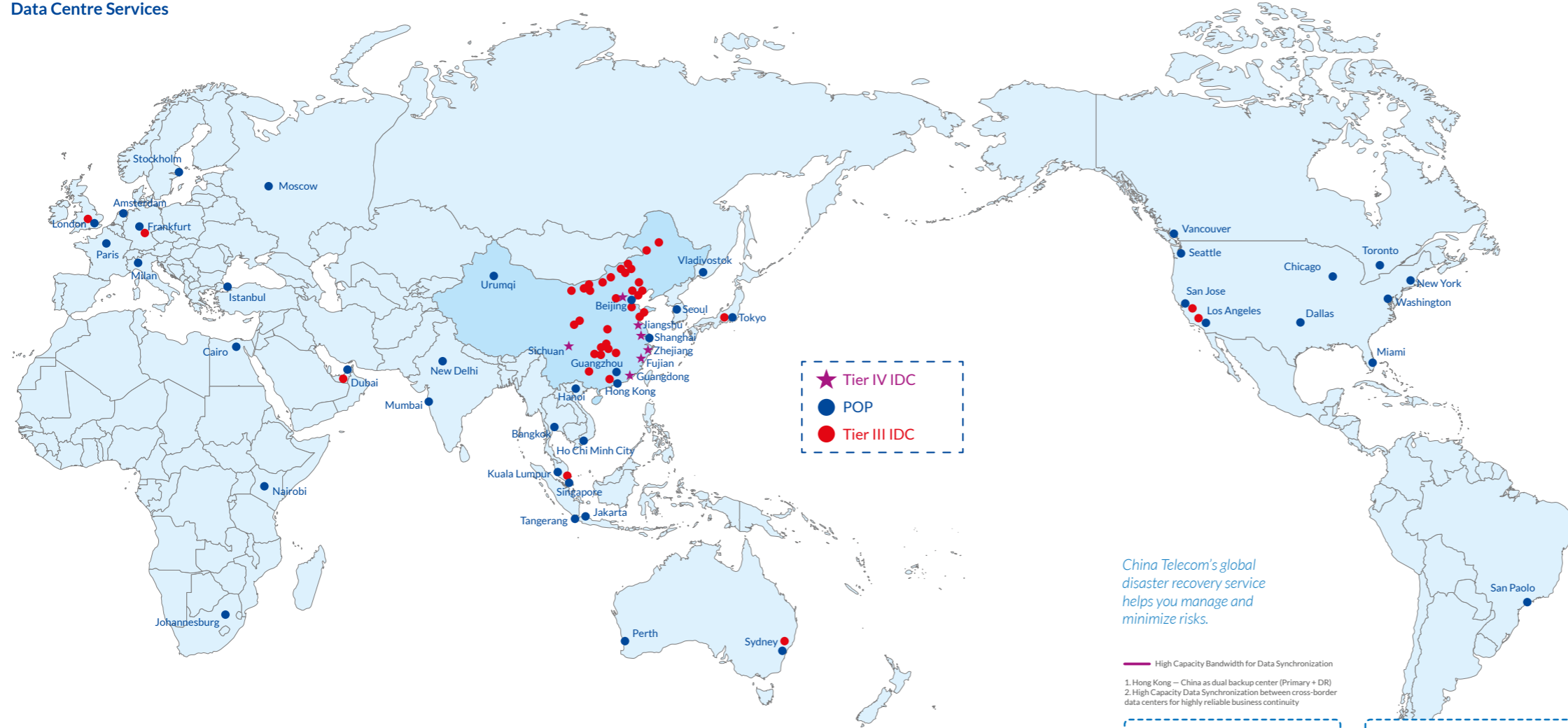- Serbia

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C h i n a   T e l e c o m   (E u r o p e)   L t d .

CHINA TELECOM EUROPE (CTE)

DATA
CENTRE
SERVICES

中国电信（欧洲）有限公司
China Telecom (Europe) Ltd.

Data Centre Services

Legend:
- ★ Tier IV IDC
- ● POP
- ● Tier III IDC

Map labels: Stockholm, Moscow, Amsterdam, Frankfurt, London, Paris, Milan, Istanbul, Urumqi, Vladivostok, Beijing, Seoul, Sichuan, Jiangsu, Shanghai, Zhejiang, Guangzhou, Fujian, Tokyo, Hanoi, Guangdong, Hong Kong, Cairo, New Delhi, Dubai, Mumbai, Bangkok, Ho Chi Minh City, Kuala Lumpur, Singapore, Jakarta, Tangerang, Nairobi, Johannesburg, Perth, Sydney, Vancouver, Seattle, Chicago, Toronto, San Jose, Los Angeles, Dallas, New York, Washington, Miami, San Paolo

China Telecom's global disaster recovery service helps you manage and minimize risks.

— High Capacity Bandwidth for Data Synchronization

1. Hong Kong — China as dual backup center (Primary + DR)
2. High Capacity Data Synchronization between cross-border data centers for highly reliable business continuity

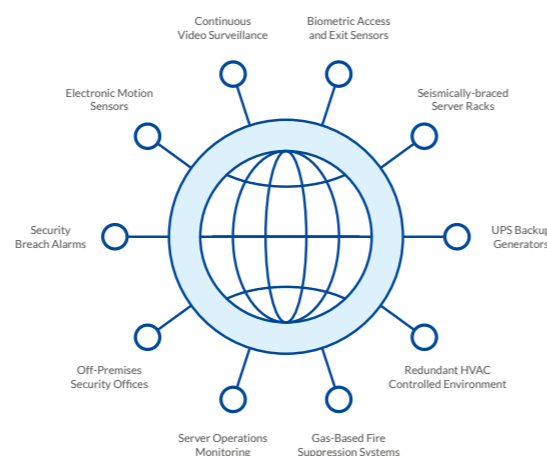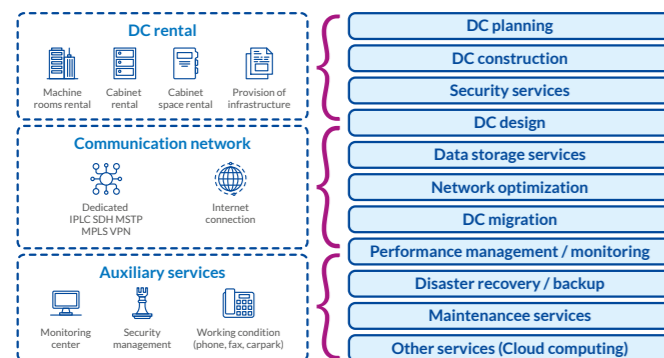
Production Center / Data Recovery Center diagram

Many companies don't want the hassle or expense of running their own data centres, which are costly, complex and time-consuming to build and manage.

China Telecom's Internet Data Centres span the globe, providing secure hosting and high availability. Our additional managed services, such as website hosting and disaster recovery services, make our team an extension of yours.

We provide all the tools, expertise and service excellence necessary for a successful off-site IT infrastructure build. Our facilities are designed and built according to industry best practices for high-performance computing environments. They are protected by the most up-to-date network, storage and physical security technologies.

DC rental
Machine rooms rental | Cabinet rental | Cabinet space rental | Provision of infrastructure

Communication network
Dedicated IPLC SDH MSTP MPLS VPN | Internet connection

Auxiliary services
Monitoring center | Security management | Working condition (phone, fax, carpark)

- DC planning
- DC construction
- Security services
- DC design
- Data storage services
- Network optimization
- DC migration
- Performance management / monitoring
- Disaster recovery / backup
- Maintenance services
- Other services (Cloud computing)

Our data centre and colocation services include:

- Website hosting and virtual hosting
- Internet access
- Cage and rack space for colocation
- IP address space
- Data recovery and disaster protection
- Network management outsourcing
- Security systems including firewall management, anti-virus scans, intrusion detection and Distributed Denial of Service (DDOS) protection
- Systems integration

Continuous Video Surveillance | Biometric Access and Exit Sensors | Seismically-braced Server Racks | UPS Backup Generators | Redundant HVAC Controlled Environment | Gas-Based Fire Suppression Systems | Server Operations Monitoring | Off-Premises Security Offices | Security Breach Alarms | Electronic Motion Sensors

China Telecom provides best-in-class secure IDC operations.

Structured walk-through test | Test via simulation software | Simulation Test | Notification / call tree test | IT DR Test | Dept. Test | Interruption Test | Full Test

With over 600 IDCs in our global network, we have a proven track record of providing a first-class one-stop service. To find out more about how we can free you from the pressures of setting up your own in-house data centre, please call us on +44 (0)20 7537 7156 or email us at:

**emea.marketing@chinatelecomglobal.com**

With China Telecom Europe's Colocation Services you get:

- **Global reach**

  Fully diversified network connections that connect every continent in the world

- **99.99% facility uptime**

  Backed by comprehensive service level agreements (SLAs), 24/7/365 technical support and dedicated NOC-based engineering personnel

- **High performance**

  Up to 100Gbps high speed internet access, and low-latency private line service available. Our high-performance Tier IV facilities are designed with high density power and cooling infrastructures to support the latest generation of servers

- **Full redundancy**

  N+1 redundancy for UPS, generators, power distribution, cooling security and network resilience systems

- **Facility safety**

  All facilities are protected by 24/7 environmental control monitoring and alerts, dry pipe fire suppression systems and global disaster recovery solutions. State-of-the-art security measures, including 24/7 CCTV monitoring and bio-authentication security systems, are in place at all China Telecom data centres
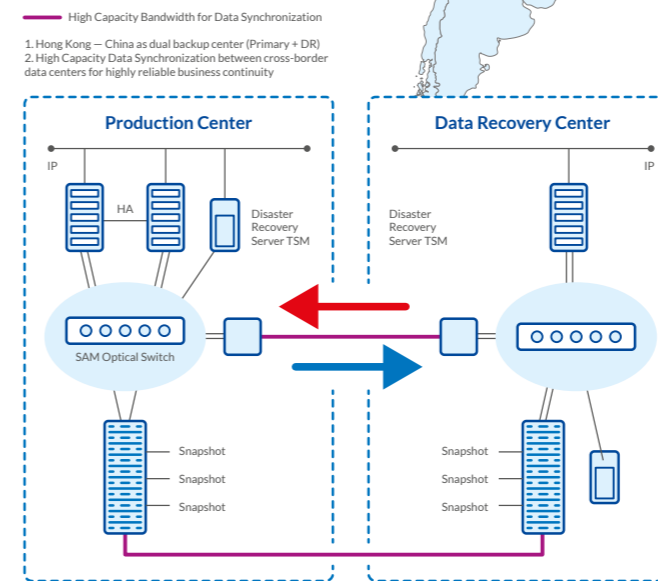
- **Scalable packages**

  Our flexible, highly customisable data centre architectures allow us to deliver the exact service solution you need to meet your specific business requirements

- **Industry certifications and best practices**

  China Telecom remains committed to the highest level of technical excellence and dedicated service. In addition to our five-star global IDCs, we adhere to the industry's best practices, and our data centre engineers hold internationally-recognised certifications such as Cisco Certified International Experts (CCIE) and Cisco Certified Network Professionals (CCNP). China Telecom Europe holds ISO27001 (Information Security Management System) and ISO9000 (two-part quality management system) certification compliance

- **Green energy consumption**

  As part of our commitment to environmental protection, China Telecom has established comprehensive energy efficiency and other green operational policies at all our data centre facilities
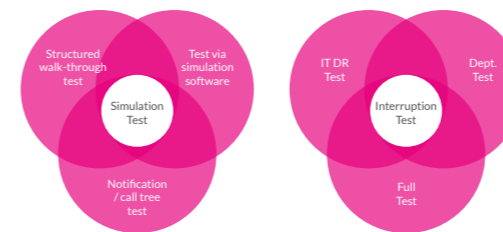
IDC Services in China

China Telecom has over 600 Internet Data Centres across mainland China, from Beijing to Shenzhen and from Shanghai to Guangzhou. Our products and services include:

- Exclusive VIP area cage hosting
- High power density hosting areas
- Multi-carrier network access
- Office seats, business recovery seats and NOC centre
- Managed operation and maintenance services

REACH
THE WORLD
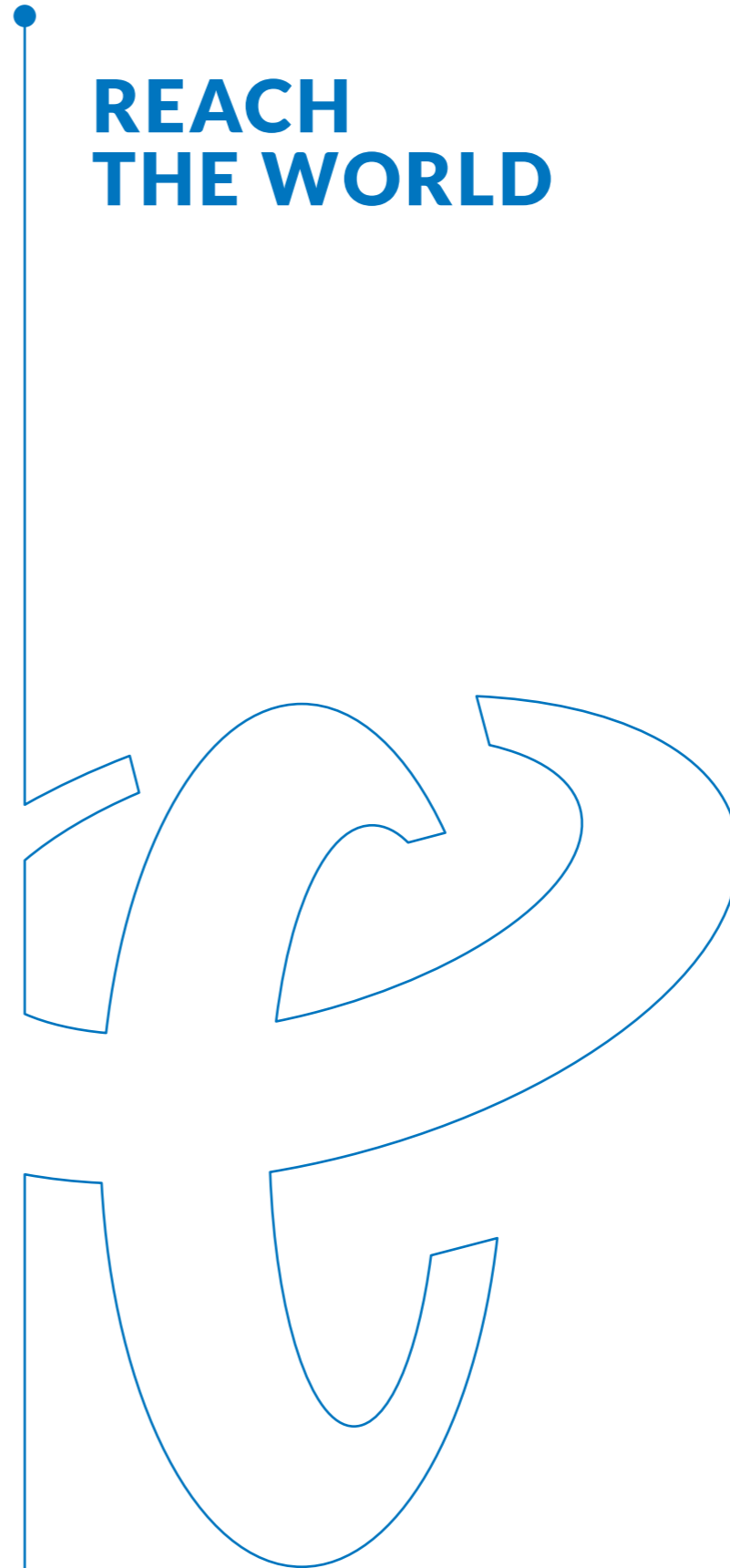
中国电信（欧洲）有限公司
China Telecom (Europe) Ltd.

Corporate Voice Solutions from China Telecom

With international trade reaching record levels, companies of all sizes need to speak across borders. Businesses everywhere – from SMEs to global giants - are looking for international voice telecoms which are straightforward and cost-effective. But traditional providers have been slow – or unwilling – to keep up.

Now you can reach every corner of the world, effortlessly. Our Corporate Voice Solutions are ideal for companies needing a simple and efficient voice infrastructure. With our state-of-the-art soft-switch technology and a variety of intelligent platforms, we provide you with cost-effective ways to handle both internal and external communications.

Read on to find out more about our specific services: our Overseas Enterprise SIP Trunk service, our Global Virtual PBX product, and Cloud Conferencing.

Overseas Enterprise SIP Trunk service

Do you have one or more private telephone networks in your organisation? They're known as Private Branch Exchanges (PBXs). They help you to communicate internally.

We can connect your PBXs to each other and to the outside world. With an IP connection and our overseas soft-switch network, you could reach other branch offices, or customers worldwide, simply by dialling a prefix number together with a phone number. It's simple to use and very cost-effective.
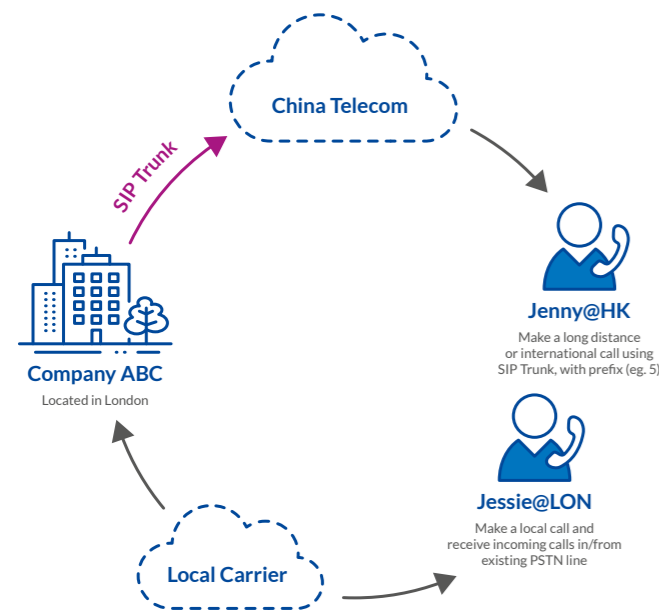
Key features

- Worldwide long distance calls to any location, internal or external*

- Local calls

- Inbound calls from any carrier

*Service Coverage: Currently our Overseas Enterprise SIP Trunk service is available in Hong Kong, Singapore, USA, Canada, United Kingdom and Germany, and outgoing calls can reach around 70 countries.

How you benefit

- Cost effectiveness: There are no hardware or maintenance costs involved, and international calling costs are much lower compared with the traditional model.

- Guaranteed voice quality: Voice quality is significantly improved by CTG's dedicated enterprise network.

- Easy set-up: If you're an existing user of China Telecom's internet access, you can top up with this value-added service directly.

- Great service: CTG provides highly efficient service delivery and speedy one-stop support.

How it works

The Overseas Enterprise SIP Trunk Service uses China Telecom's overseas soft switch network to carry traffic. The network consists of Soft-Switch devices (SS), Trunk Gateways (TG) and a Service Border Controller (SBC).

The SBC is located between the soft-switch core network and the users. It provides SIP service access and interoperability, supports FW/NAT traversal of SIP trunk business, and realises the SIP trunk media transit, bandwidth control, routing and resource control, as well as IP address reporting, QoS implementation etc.

The customer's network must include IP-PBX to communicate all endpoints over an IP network. It also switches calls between VoIP users on local lines while allowing all users to share a number of external phone lines. The IP-PBX can also switch calls between a VoIP user and a user using traditional phone calls, or between two traditional phone calls in the same way a conventional IP-PBX does.
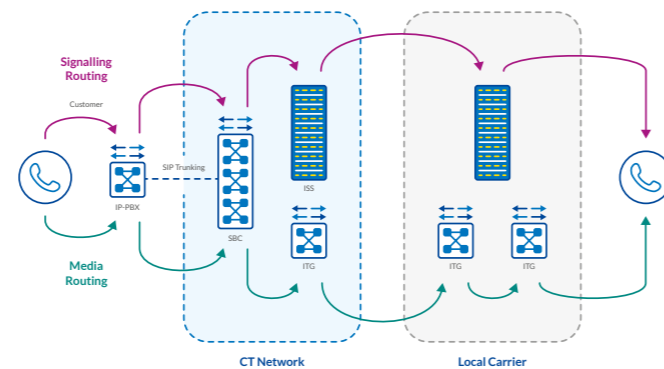
Global Virtual PBX

If you're seeking to save on call charges between offices, you need our Global Virtual PBX service. You can reach your colleagues in world-wide branch offices simply by pressing an extension number. No matter where your offices are, or which fixed-network telecom operator you are using, you can speak to your colleagues as though they were in the next room.

Extensive Coverage
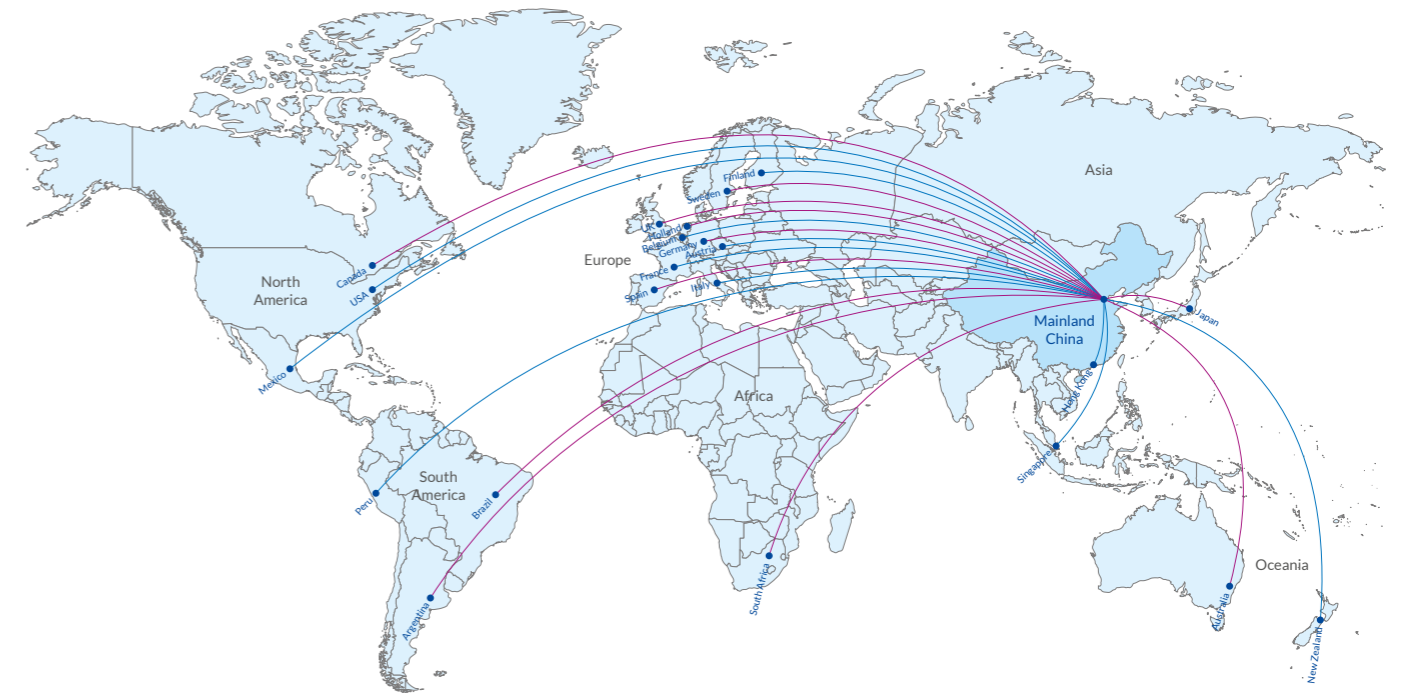
How you benefit

- Cost effectiveness: There's no initial hardware setup cost or maintenance costs. And you'll save on international direct dialling and roaming costs with our very competitive calling rates.

- Enhanced productivity and reputation: Never miss an important call. Our call forwarding service automatically transfers unanswered calls to the number you assigned.

- Easier internal communications: The conference systems and extension calling make it simple for your colleagues to speak to one another.

- Easy set up: You can benefit as soon as you subscribe, as no hardware installation is required. And you can customise your service through the self-service web portal at any time.

Cloud Conferencing

Multinational organisations increasingly need conferencing services on a global basis. Our Cloud Conferencing service allows you to join from anywhere in the globe, using almost any device: fixed phone, mobile phone, SIP terminal or PC terminal. There's no configuration involved, and the participants can be on any telecom network.

To learn more about how our Corporate Voice Solutions help you reach the world (and save money too), visit:

www.chinatelecomeurope.com

How it works

All the host needs to do is send out an access number for invitees. The invitees dial in and are automatically connected to China Telecom's international switching network. This network is responsible for promoting the flow of telephone traffic, and for connecting the calls to the cloud conferencing platform.

The conference access service covers 51 countries and regions and the outgoing conference call service covers 77 countries and regions; it guarantees voice quality for customers through the voice communication network exclusive to China Telecom.
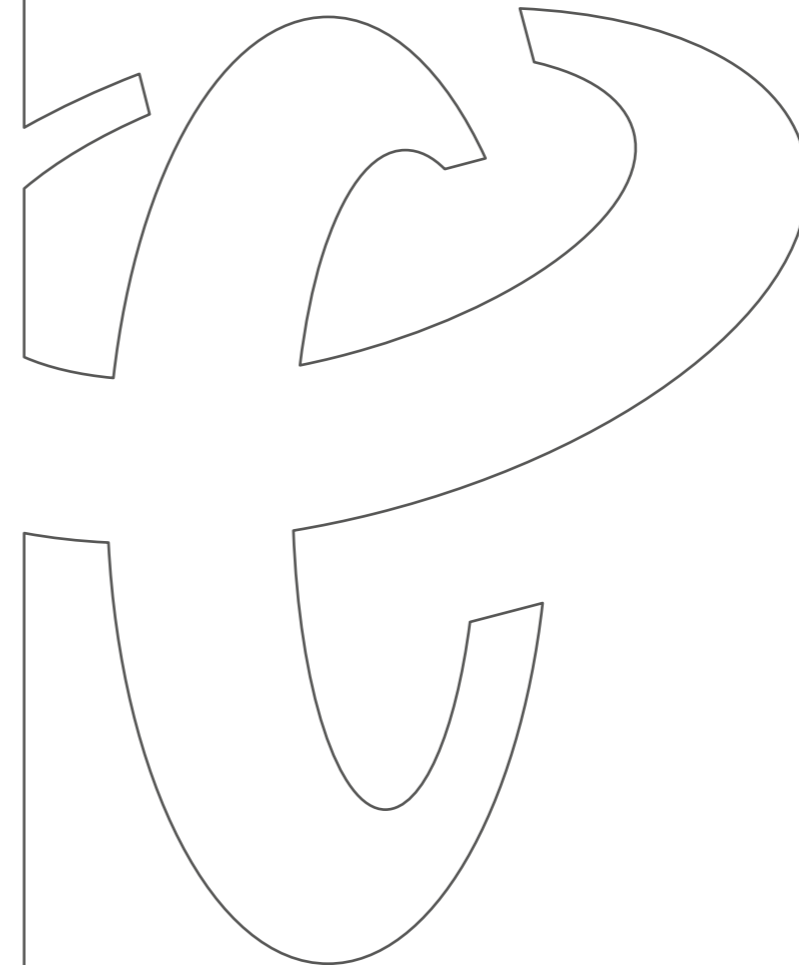

How you benefit

- Unlimited participants with free ITFS connection

- No configuration needed; simple two-step connection

- Free calls using SIP

- Guaranteed voice quality thanks to China Telecom's voice communication network

- Outgoing conference calls with multiple options

GLOBAL CONNECTIVITY SOLUTIONS

中国电信（欧洲）有限公司
China Telecom (Europe) Ltd.

Global Connectivity Solutions

As your organisation expands across the globe, you need robust and flexible communication networks. Security, speed and ability to scale – all of these are crucial to the growth of your business.

At China Telecom Europe, we meet those needs with highly dependable international private lines. We're the leading provider of private network services between Europe and China. We offer more networks than anyone else.

Our Europe-based service teams give you a single point of contact for all your needs: ordering, billing, customer service and operational support. We can rapidly provide you with tailored IPLC and IEPL services at highly competitive prices.
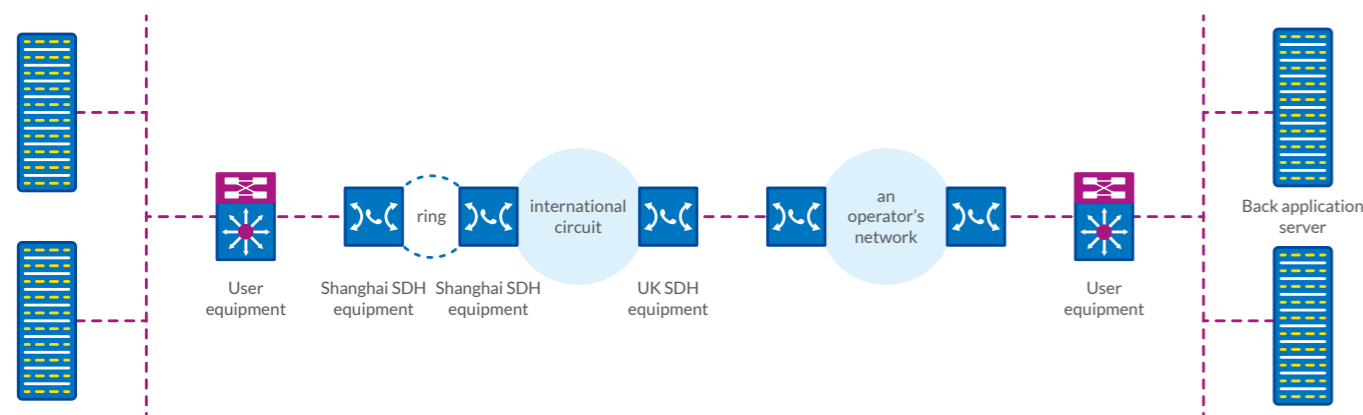
IPLC (International Private Line Circuits)

Our IPLC service is for multinational corporations that need fully managed and dedicated end-to-end, digital connections. It's designed for the demands of industries ranging from banking, finance and securities all the way through to media, web portals and education. IPLC provides you with flexible, high-quality and scalable dedicated connections to your offices, suppliers, and customers around the world. You get transparent data transmission for local area networks, regional data centres, and other mission-critical voice, data and video applications.

With China Telecom Europe's IPLC you get:

- Secure, reliable, end-to-end connections in Europe and China
- Connections that are ideal for international internet access, business data, video conferencing and more
- A fully redundant, self-healing SDH fibre network
- A wide range of circuit speeds, features and Service Level Agreements
- 24/7/365 proactive monitoring and management via our two Network Operation Centres
- A single point of contact for service ordering, billing, customer service and operational support

System Diagram

International Private Line Circuits

China Telecom's worldwide transmission network equips its IPLC service with a number of features such as multiple touting options, main and backup flexibility, high reliability, multi-services carrying and strong management ability.

Key features and benefits

- High reliability and resilience
- SDH protection switching function, capable of ensuring end-to-end dedicated international bandwidth with minimal transmission delay and maximum network security, supporting the applications of a variety of real-time critical tasks
- Resilient system design and network implementation against single point of failure
- Multiple protection technologies incorporated in self-healing and alternative routing capabilities
- Service Level Agreement (SLA) with a comprehensive list of guarantees
- Comprehensive connection options
- Full spectrum of bandwidth options available, ranging from 64K to STM-64
- Variable communication speed: NX64K, 2M, 45M, 155M, 622M, 2.5G, 10G, 100G
- A variety of services: data, video, voice and other business transmissions
- Security, effectiveness and flexibility
- End-to-end physical isolation, customer dedicated bandwidth and protection
- 99.9% or greater network availability in key customer demanding areas
- Clear channel capability catering to a wide range of data types, from time-sensitive applications to high security needs
- One–stop-shop service to facilitate ordering, contracting, provision, billing and management of service
- Expert support
- Real-time network performance monitoring
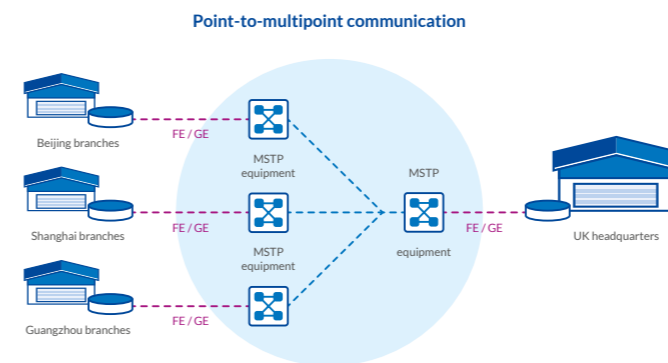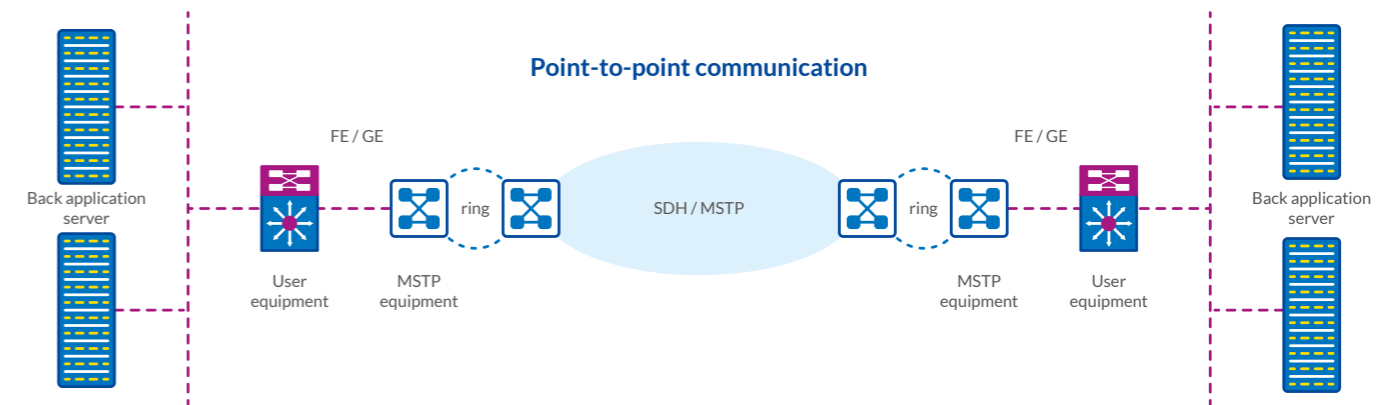- Mean time to repair ≤4 hours

IEPL (International Ethernet Private Lines)

Many of our carrier and enterprise customers need a private network for China, and our suite of fully-managed Ethernet-based network services are developed specifically to meet your demands for performance, speed and security.

IEPL lets you choose dedicated, point-to-point or point-to-multipoint international connectivity both through China Telecom's own POPs and through services offered with our carrier partners around the world. The service offers high flexibility and security for easy LAN extension, WAN connection and high bandwidth or high traffic volume applications.

China Telecom IEPL adopts Ethernet over SDH technology to provide customers with long-distance/transnational Ethernet Private Line service with access rates between 2M and 10G, and allows point-to-point or point-to-multipoint communication.

System Diagram

Point-to-point communication

Point-to-multipoint communication

Focus on growing your business while we take care of the network infrastructure and give you the international support you need. To learn more about China Telecom Europe's private line services, please call us on +44 (0)20 7537 7156 or email us at:

emea.marketing@chinatelecomglobal.com

With China Telecom Europe's IEPL you get:

- Global connectivity from our network of over 33 Submarine cables and high-speed terrestrial links with a total international transmission capacity of 840T, covering 72 countries and regions.
- Fully-managed, international Ethernet-based network and bandwidth services
- An end-to-end China private connectivity service based on our next generation SDH/SoNet Multi Service Transport Platform
- Options for dedicated, point-to-point, or point-to-multipoint connectivity
- Connections through standard Ethernet interfaces (Ethernet, Fast Ethernet, Giga Ethernet, 10GE)
- Easy LAN extension, WAN connection, high bandwidth or high traffic volume applications
- Access rates between 2 Mbps and 100 Gbps

Key features and benefits

- Low latency and high reliability
- With qualifying standard certifications MEF9 and MEF14, we can provide global customers with International Ethernet Private Line services based on their own and other partners' network resources
- Physical isolation between customers and exclusive bandwidth with high security and superior network performance
- Enhanced flexibility and scalability
- Flexible adjustment of bandwidth from 2M to 100 Gbps according to actual requirements
- 99.9% or greater network availability in key demanding areas
- Mean time to repair ≤4 hours
- Cost effectiveness
- Standard and widely applicable Ethernet interface, without new equipment investment, ensuring simple network upgrading and short delivery time.
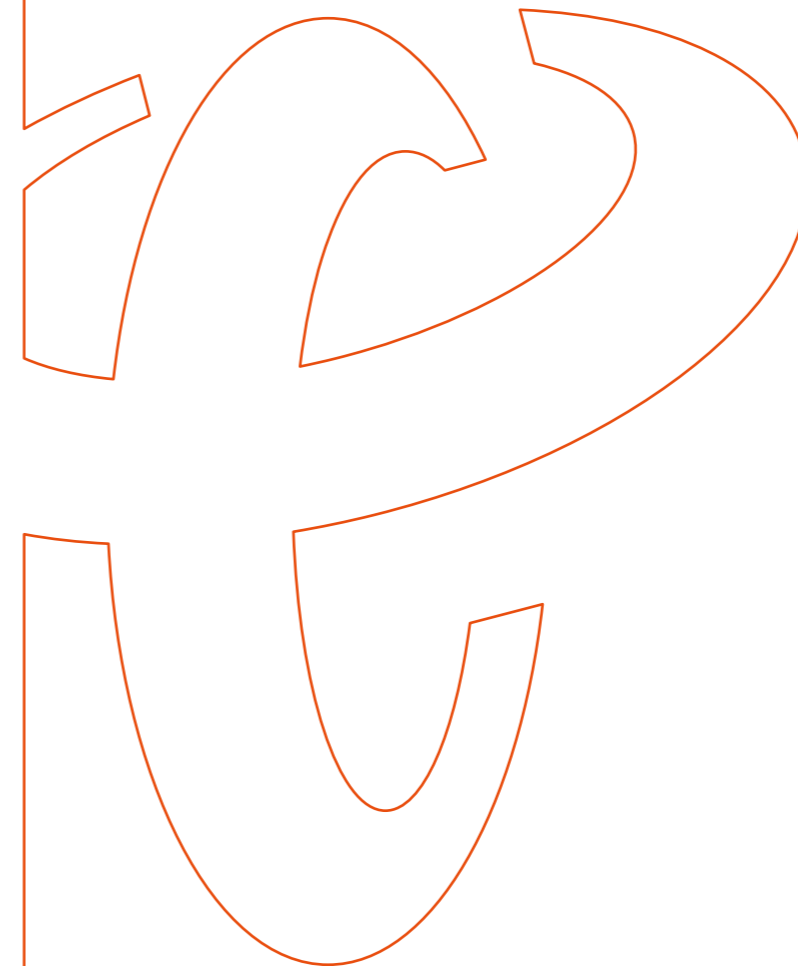
GLOBAL INTERNET SERVICES

中国电信
CHINA TELECOM

中 国 电 信 （ 欧 洲 ） 有 限 公 司
China Telecom (Europe) Ltd.

Global Internet Services

China's economy is vast. It has the world's second largest GDP (close to the US at number one), and the world's largest by purchasing power parity. It also has the world's largest banking sector assets, the world's largest manufacturing base, and the world's fastest growing consumer market. There are more than 800 million internet users in China.

But internet communication between global enterprises and mainland China can be challenging. China Telecom offers a variety of business grade Internet Services to connect with this huge market.

Our four service options

1 ChinaNet Paid-peering provides worldwide telecom operators with one-hop access to China's vast internet resources. That includes 2.3 million websites managed by ChinaNet – this equates to more than 70% of China's total internet content.

   ChinaNet also services millions of users with high-speed video, online trading, real-time chat, search engines and information services. Over 150 million people subscribe to ChinaNet's cable broadband – over half the broadband access market in China. A further 300 million-plus people subscribe to ChinaNet's 3G/4G mobile internet services.

2 China Access gives regional or local ISPs and ICPs cost-effective access to Chinese internet resources. Powered by the extensive interconnection with other telecom operators in China, China Access offers customers a cost-effective internet resources solution. By connecting to ChinaNet (AS4134), customers are able to access Chinese content and millions of internet users in China.

3 Global Transit provides telecom operators with global internet service, backed up by SLA guarantees. Our internet service extends everywhere around the world via CN2 (China Telecom Next Generation Carrier Network AS 4809). There are more than 300 POPs worldwide.

   CN2 offers the highest levels of resiliency and redundancy with low latency. By connecting to CN2, China Telecom provides global telecom operators with differentiated Internet transit services of scalable bandwidth, outstanding connectivity, flexible billing options and rich product features. With a raft of benefits such as light loading, multiple access options and a comprehensive web-based customer information portal, Global Transit is a great solution for telecom operators.

4 Global Internet Access (GIA) provides premium internet access between mainland China and other countries, backed up by SLA guarantees to regional/local ISP/ICP and enterprise customers. With a dedicated path and the lowest latency routes on CN2, GIA provides enterprises with premium quality access to the world's most extensive Chinese Internet Information Centres.

   GIA provides a variety of access options, via China Telecom's CN2 through BGP-4 or static routing with various access speeds on bandwidth ranging from 1M to 100 Gbps, and internet access technologies including dedicated circuits access and optical access.

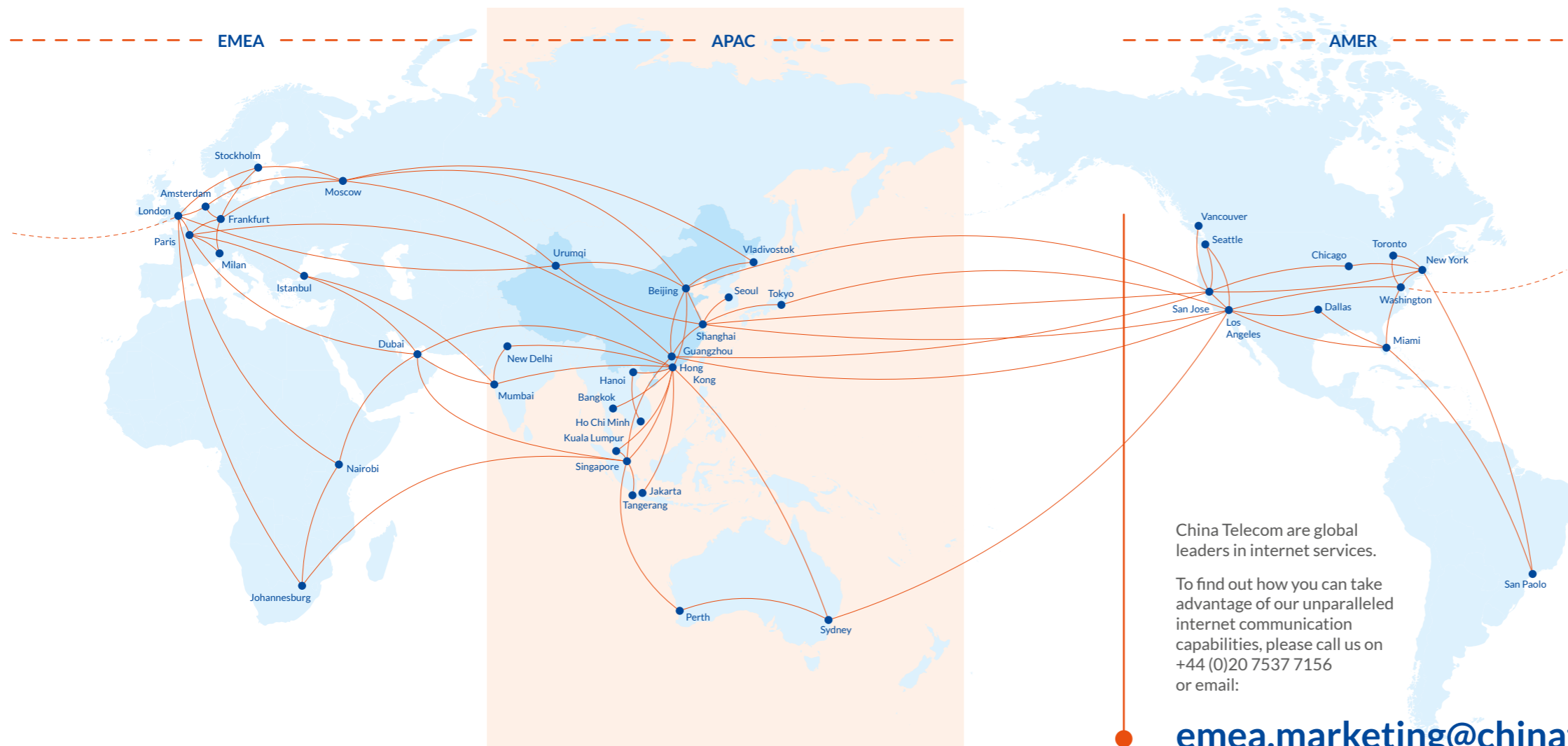## Tailored information and communication solutions

We also provide enterprises with information, connection and transmission, business application support and other value added services such as:

- Plus IDC Services: With access to the Data Centres of China Telecom and our global partners, you can achieve high speed access to both local and global Internet resources

- Plus Managed CPE services: Based on global ICT implementation capabilities, we offer you internet and network terminal equipment integration services

- Plus IP Sec services: With integration of the Global Internet Access Service and IP Sec platform, you can receive a more comprehensive and cost-effective VPN service

- Plus Anti DDoS prevention service: With professional black-hole and cleaning pipe for mitigation of DDoS attacks, we protect your daily business operation from DDoS attacks
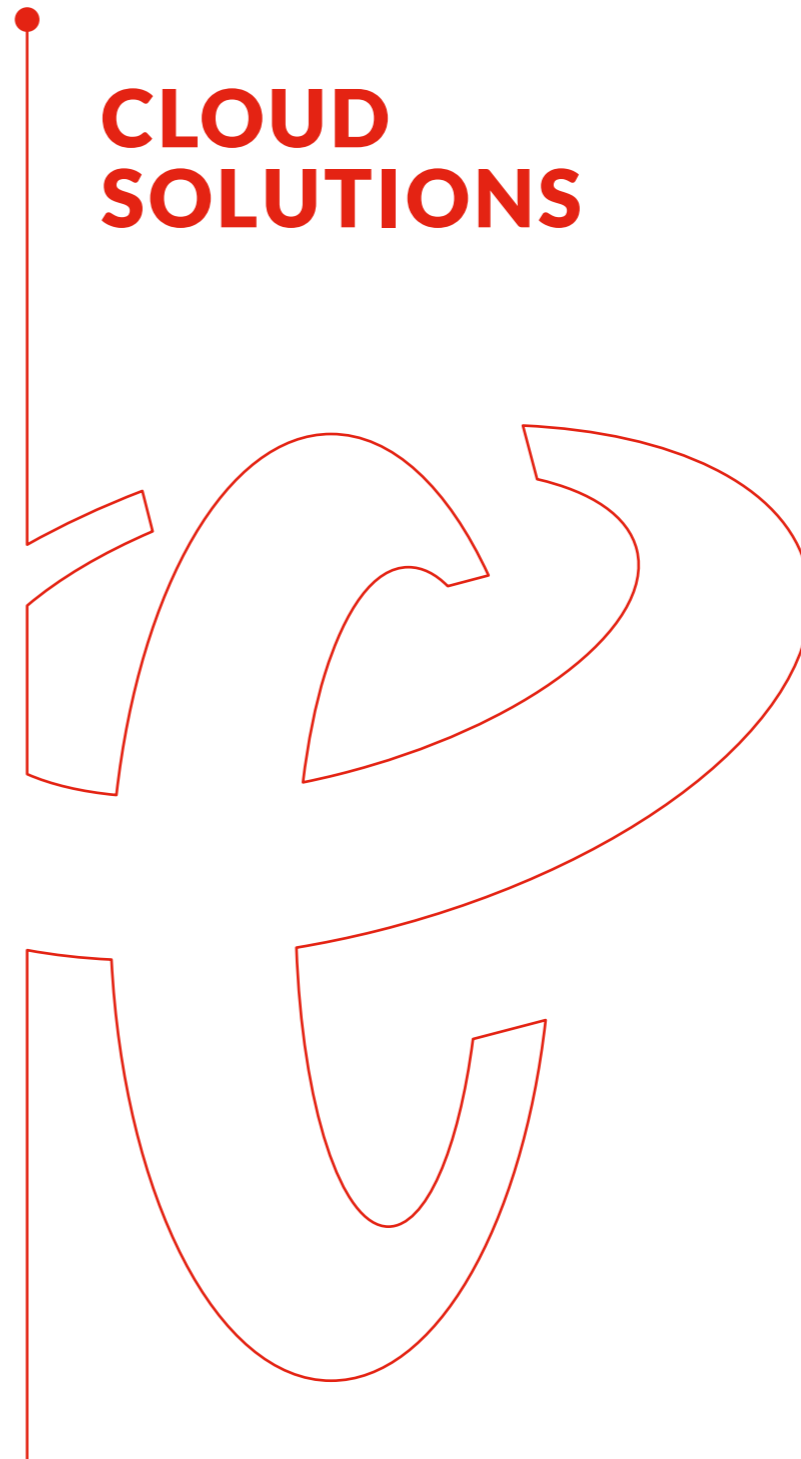
Quality service guarantee

Global Internet Access provides 24/7 performance monitoring services, ensuring network flow and service quality. We also offer the highest SLA in the internet industry, powered by our high-quality internet backbone service.

- Network Availability 99.99%

- Service Availability > 99.9%

- Average Network Latency:

  - Hong Kong - Mainland China < 50 ms

  - Singapore – Mainland China < 80 ms

  - Asia (Intra-Asia) < 150 ms

  - Europe – Asia < 240 ms

  - Transatlantic < 90 ms

  - Transpacific < 130 ms

EMEA   APAC   AMER

Stockholm
Amsterdam
London
Frankfurt
Paris
Moscow
Milan
Istanbul
Dubai
Nairobi
Johannesburg

Urumqi
Vladivostok
Beijing
Seoul Tokyo
New Delhi
Shanghai
Hanoi Guangzhou
Mumbai Hong Kong
Bangkok
Ho Chi Minh
Kuala Lumpur
Singapore
Jakarta
Tangerang
Perth
Sydney

Vancouver
Seattle
Chicago Toronto
New York
San Jose
Los Angeles
Washington
Dallas
Miami
San Paolo

China Telecom are global leaders in internet services.

To find out how you can take advantage of our unparalleled internet communication capabilities, please call us on +44 (0)20 7537 7156 or email:

emea.marketing@chinatelecomglobal.com

CLOUD
SOLUTIONS

中国电信（欧洲）有限公司
China Telecom (Europe) Ltd.

Cloud Solutions

As cloud computing continues to grow, more and more decision-makers are finding that public cloud platforms are putting a strain on their IT architecture. With offices around the globe and a dispersed workforce, they are looking for cloud solutions which offer more control, speed and flexibility.

We offer four types of service to help keep your users connected and your IT assets secure.

Hybrid cloud

Our secure hybrid cloud bridges private and public clouds. It's the perfect solution for enterprise customers, helping you to balance connectivity with other crucial factors like cost and security.

There's no need for delays or costly capital spending. The assets are already in place, and we keep your running costs to a minimum. Enterprise-grade security comes as standard, with integrated monitoring services.
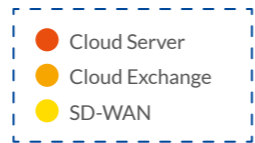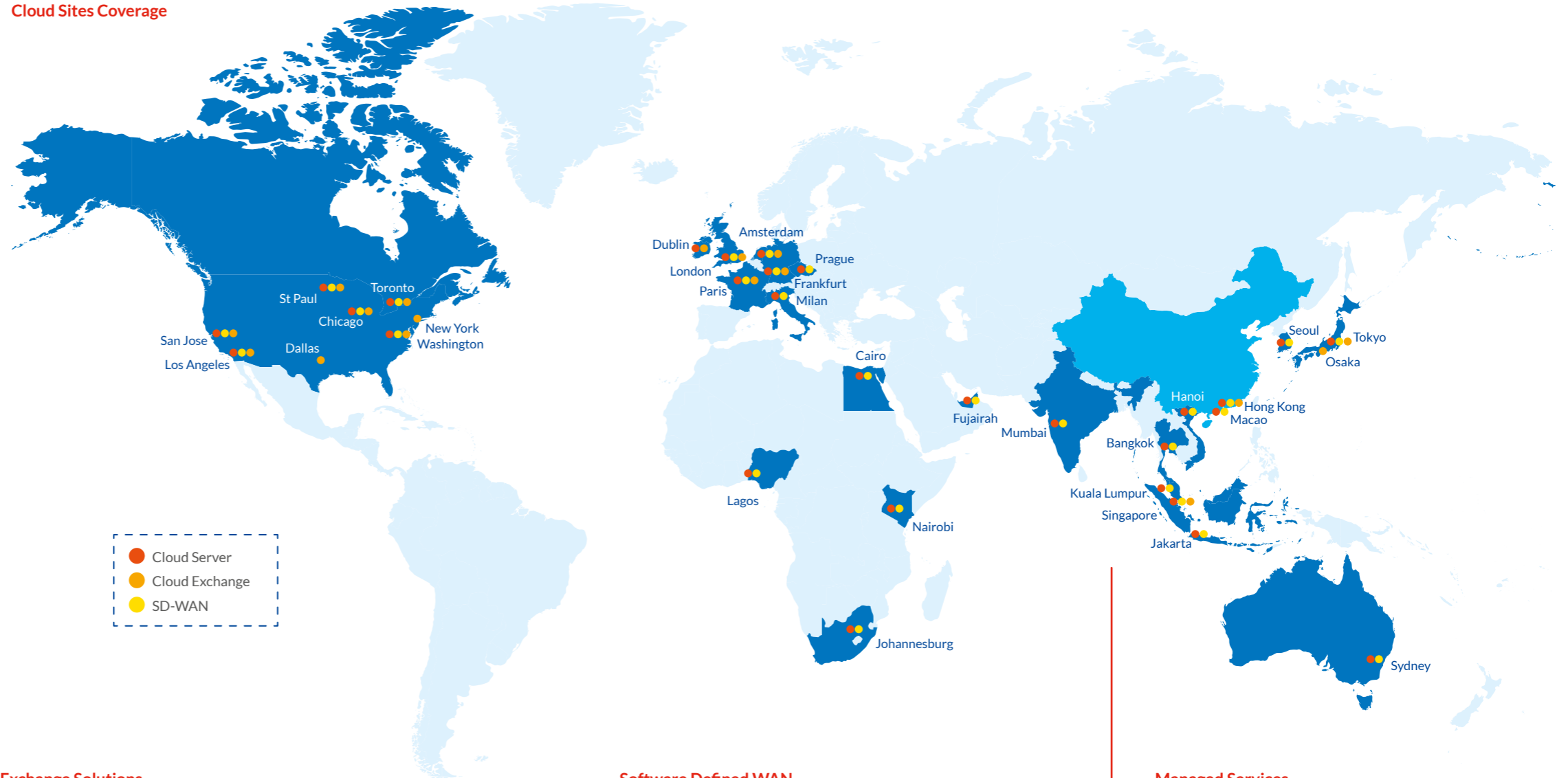
Cloud exchange

This is a single solution that lets you reach multiple public cloud platforms like AliCloud, AWS and Azure. We offer a dedicated network of AWS/Azure gateway nodes in Beijing, Shanghai, Hong Kong, Singapore, Frankfurt, San Jose and Washington, DC.
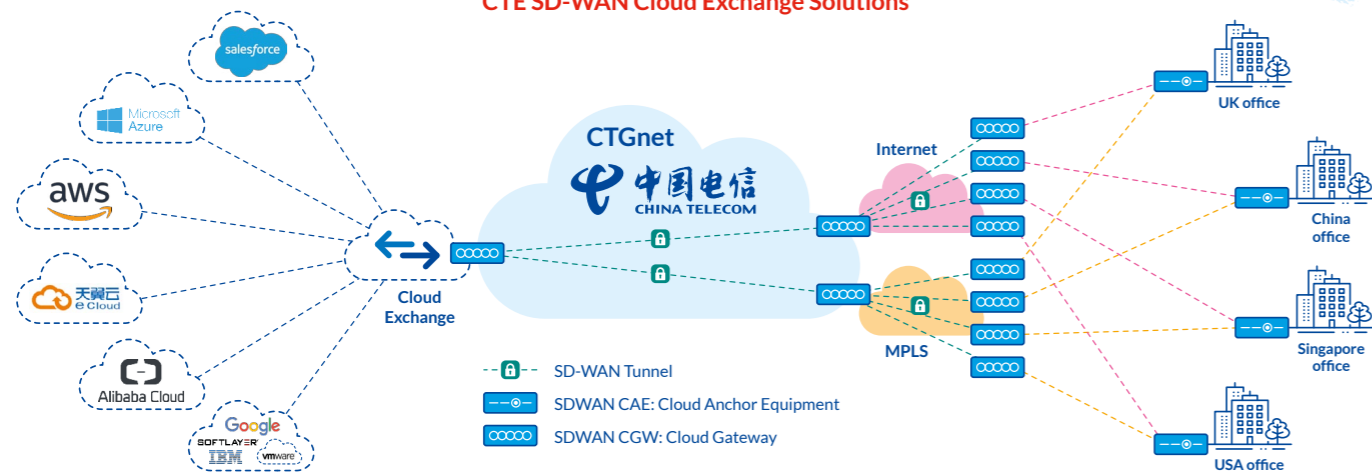
You can establish fast, reliable and secure connections from your offices, data centres or colocation environments around the world. There's great support for connections from MPLS, IEPL and IP. Multiple virtual links can also be set up from a single port.

You only pay for what you use – and you can choose bandwidth speeds from 10Mbps to 1Gbps.

Cloud Sites Coverage

St Paul, Toronto, Chicago, New York, Washington, Dallas, San Jose, Los Angeles

Dublin, London, Paris, Amsterdam, Prague, Frankfurt, Milan, Cairo, Fujairah, Lagos, Nairobi, Johannesburg, Mumbai, Hanoi, Hong Kong, Macao, Bangkok, Kuala Lumpur, Singapore, Jakarta, Seoul, Tokyo, Osaka, Sydney

- ● Cloud Server
- ● Cloud Exchange
- ● SD-WAN

CTE SD-WAN Cloud Exchange Solutions

salesforce, Microsoft Azure, aws, 天翼云 e Cloud, Alibaba Cloud, Google, SOFTLAYER, IBM, vmware

CTGnet 中国电信 CHINA TELECOM

Cloud Exchange

Internet, MPLS

UK office, China office, Singapore office, USA office

- ---● SD-WAN Tunnel
- SDWAN CAE: Cloud Anchor Equipment
- SDWAN CGW: Cloud Gateway

Software Defined WAN

If you are continually migrating services to the cloud, you need a secure, flexible, cheaper integrated connectivity solution.

SD-WANs help you to manage complex connectivity challenges. They're the ideal solution for the Internet of Things – with billions of data dots; and for global logistics operations – with flexible access over a huge area; and for rapidly growing organisations – with ever-changing topologies.

Our SD-WAN service is simple to set up and manage – with automated activation of cloud gateways and terminals. You can change network policies or bandwidth in real time.

It also gives you intelligent routing. The cloud gateways automatically analyse the congestion rate and intelligently routes to the optimum path.

Managed Services

Our additional managed services, such as website hosting, disaster recovery and business continuity services, make our team an extension of yours. With end-to-end multi-lingual support, our customers can benefit from even greater peace of mind. Keep your people, data, applications and data resources connected and working effectively. No delays, no downtime.

To discover more about how our cloud services could transform the way your organisation works, please call us on +44 (0)20 7537 7156 or email:

emea.marketing@chinatelecomglobal.com

EUROPE-ASIA NETWORKS MAP
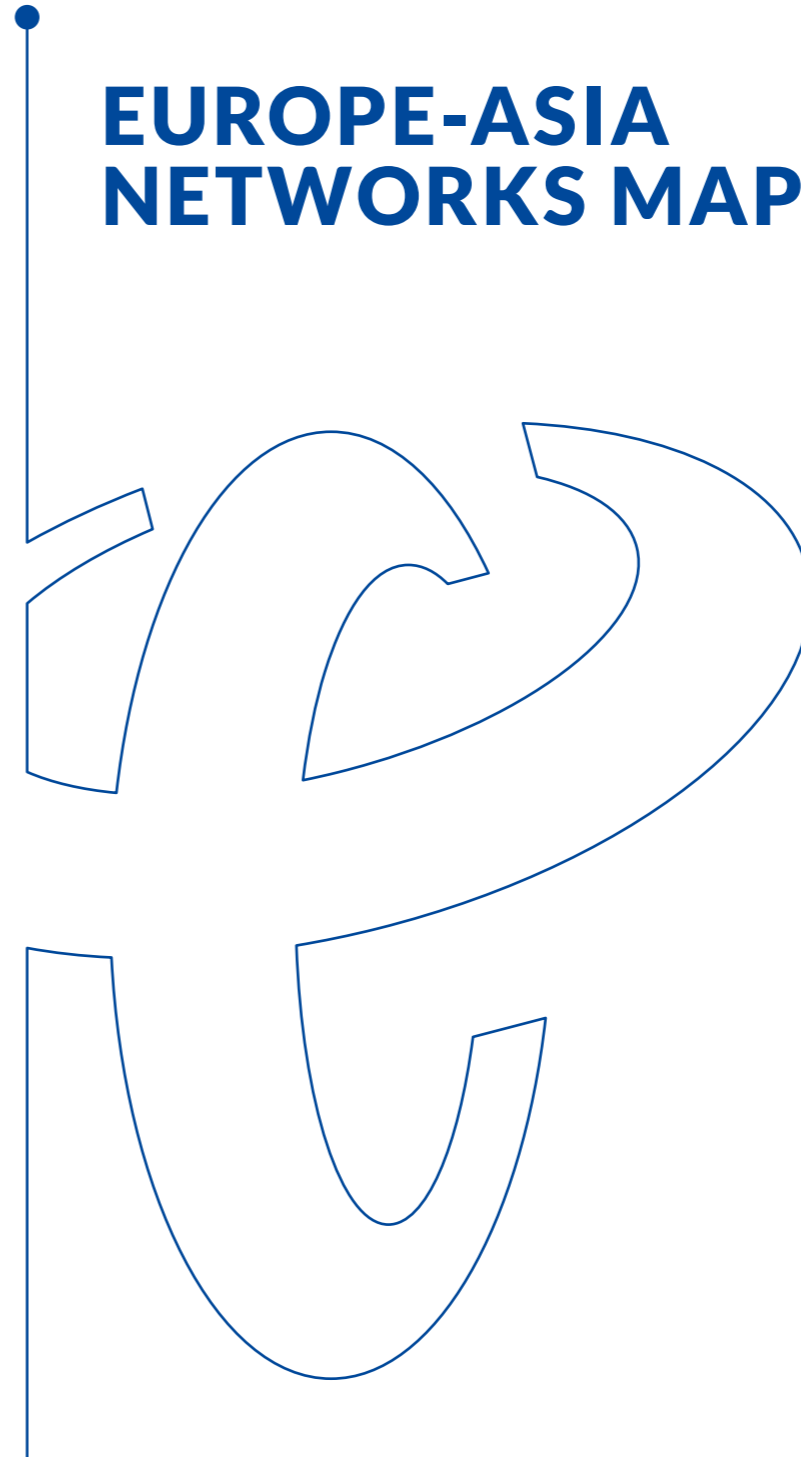
中国电信（欧洲）有限公司
China Telecom (Europe) Ltd.

Europe-Asia Networks Map
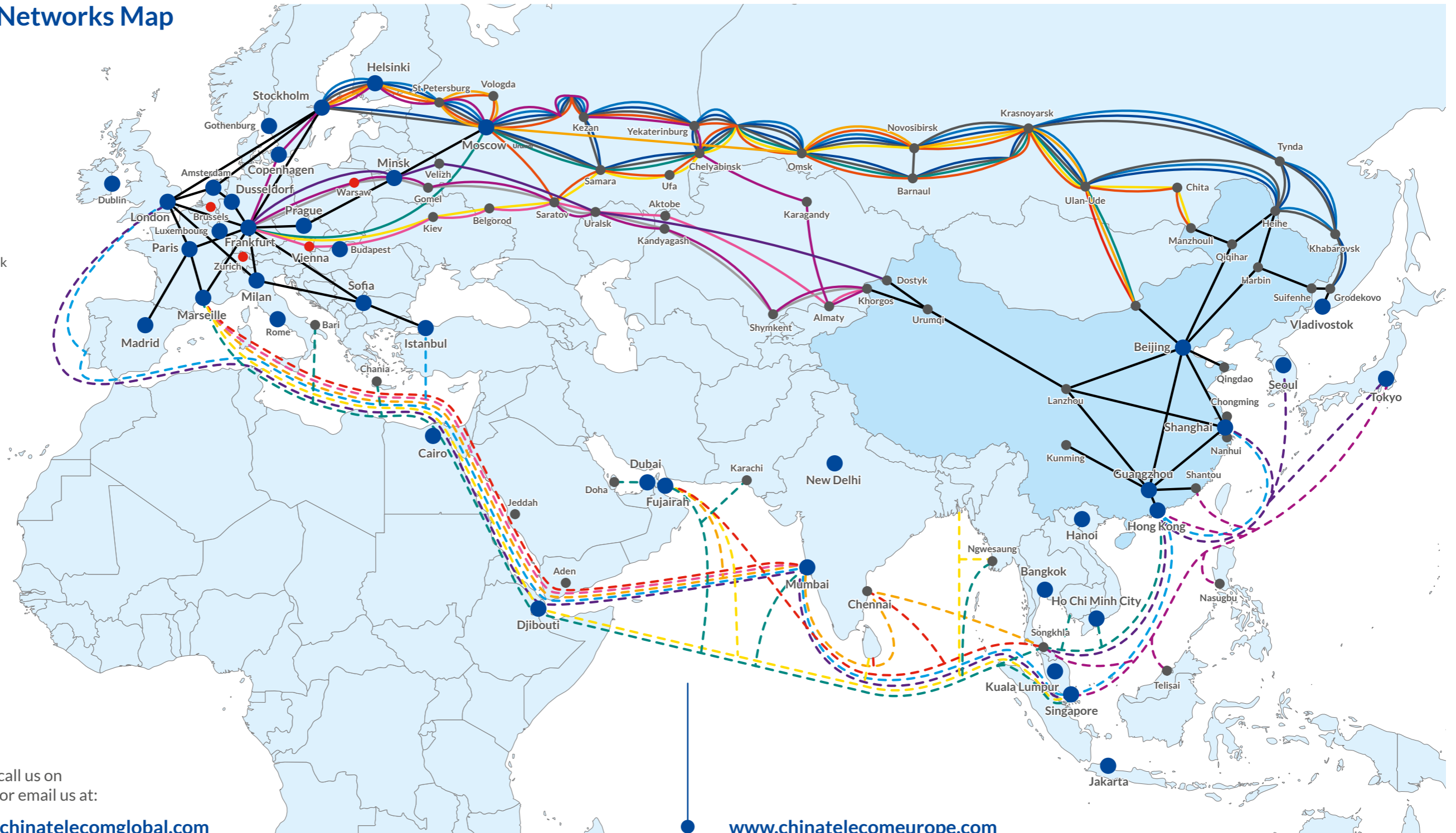
Terrestrial Cables

- —— TEA
- —— TEA2
- —— TEA3
- —— TEA4
- —— TMP
- —— TMP+
- —— CR2
- —— CR2 to Vladivostok
- —— CR3
- —— TSR
- —— TSR+
- —— STSR
- —— TSR2

Submarine Cables

- - - SMW3
- - - SMW4
- - - SMW5
- - - TGN-EA
- - - BBG+EIG
- - - FEA
- - - SJC
- - - AAE-1

● POP

● Extended POP

To learn more, please call us on
+44 (0)20 7537 7156 or email us at:

emea.marketing@chinatelecomglobal.com

www.chinatelecomeurope.com

CTE Key facts

Extensive European-Asia Network – transiting TMP, TEA, TEA2, TEA 4, CR2, TSR, SMW3, SMW4 and SMW5 cable systems

World's largest 4G LTE FDD mobile operator (323 million mobile subscribers)

World's largest broadband operator (150 million subscribers)

Owns and operates China's largest optical fibre network: over 83,000 km long, covering 70% of China's territory and connecting all Chinese cities

Owns and operates ChinaNet, China's largest Internet network

Owns and operates China's largest MPLS VPN network, based on our next-generation, carrier-class, IPv6-capable Internet backbone network

Primary service provider in all 21 southern provinces in China

Owns comprehensive trans-Pacific cable systems, including China-U.S., Japan-U.S., SEA-ME-WE3 in APCN2, SMW3, SMW5, FASTER, Flag, TAE, etc.

International bilateral connectivity to 100+ countries

More than 670,000 professionals employed around the world

Ranked #141 on Fortune's Global 500 in 2019

Contact us today

100% bespoke technology solutions

When you partner with us, everything we do is geared to the specific needs of your business. You get a tailored solution that delivers the performance, flexibility and capabilities you demand. We can help you:

- Get the connectivity solutions that you need to succeed.

- Provide you with ancillary technologies that complete the requirements you have to achieve your business goals.

- Discover our value-added services that help to future-proof your connectivity and ICT needs.

Who is CTE?

For companies who want to grow their businesses or establish a presence in China, or for Chinese enterprises that wish to expand overseas, CTE provides integrated telecoms and communications services.

CTE is a wholly owned subsidiary of China Telecom Global (CTG), the international arm of China Telecom. CTE's unrivalled knowledge of the Chinese market, and regional offices across Europe, make CTE an ideal partner for European and Asian businesses, including European multinational enterprises, Chinese enterprises in Europe, carriers, telecom service providers as well as Europe-based Chinese consumers.

CTE seamlessly connects your global business to the world's largest single marketplace. Our European-Asia Network has more terrestrial and submarine routes than any of our competitors, and domestically China Telecom owns the largest digital network in China. This results in superior lower latency, greater diversity and improved resilience when accessing business applications to and from China. CTE can bring all your international communications needs under one global contract, and give you the peace of mind that comes from knowing you're in the safe hands of industry experts.

Find out more by calling CTE on +44 (0) 20 7537 7156
Or email us at emea.marketing@chinatelecomglobal.com

中国电信
CHINA TELECOM
中 国 电 信 （ 欧 洲 ） 有 限 公 司
China Telecom (Europe) Ltd.

Head Office
United Kingdom

2nd Floor, Bellerive House
3 Muirfield Crescent
London E14 9SZ

Regional offices and support centres

Austria	Belarus	Czech Republic
Denmark	France	Germany
Greece	Hungary	Ireland
Italy	Luxembourg	Netherlands
Poland	Russia	Serbia
Spain	Sweden	Switzerland
Turkey		