You connect, you grow
and together we evolve

SPARKLE

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SPARKLE. THE WORLD'S COMMUNICATION PLATFORM

An interactive ecosystem based on a global communications network in constant evolution, whose governance ensures the creation of value for customers, suppliers and partners, every day

A LEADING GLOBAL OPERATOR with an unparalleled experience and know-how in a wide range of diverse markets, Sparkle, with its IP&Data, Cloud & Data Center, Corporate, Mobile and Voice Platforms, actively takes part in the development of worldwide communications, providing the best global connectivity solution to Fixed and Mobile Carriers, ISPs, OTTs, Media & Content Players, Application Service Providers and Multinational Corporations, before they know they need it.
Wholly owned subsidiary of TIM Group, Sparkle operates in the international wholesale and retail multinational corporate businesses and supports the Group's business units for the provisioning of International Services.

At the forefront of technological advances, investing in developing innovative solutions and new infrastructures, Sparkle delivers the most sophisticated communications services with the highest quality and reliability through an unmatched state-of-the-art global network of about 540,000 km of terrestrial fiber and international submarine cables.

With a globally distributed international workforce, Sparkle can count on a presence in 34 countries and a global scale commercial coverage.

○ LEADING OPERATOR

○ GLOBAL NETWORK

○ FULL PORTFOLIO

○ NEW INFRASTRUCTURES

SPARKLE IS COMMITTED TO STRUCTURAL EXPANSION TO SERVE EVER-GROWING EMERGING MARKETS AND NEW BUSINESS SEGMENTS

AMONG THE WORLD'S LEADING INTERNATIONAL SERVICE PROVIDERS, Sparkle ranks in the global top ten for voice traffic as well as for IP, with Sparkle's Tier 1 full IPv6 Global IP Backbone "Seabone" ranking #7 worldwide*. Sparkle is committed to structural expansion with innovative, daring choices and investments to serve ever-growing emerging markets and new business segments. Thanks to its dense, capillary network, Sparkle operates successfully in the multiregional wholesale environment by focusing on different market segments and on geographic areas with high development potential.

○ AMONG THE WORLD'S TOP 10

○ LEADER IN THE MEDITERRANEAN

○ LEADER IN THE AMERICAS

○ INNOVATIVE CLOUD SOLUTIONS

In the Mediterranean Basin, where it maintains its leadership in the IP business, Sparkle continues to significantly develop its Next Generation Data Centers and innovative Cloud solutions with the creation of a new Mediterranean ecosystem and rich marketplace through Palermo's Sicily Hub. While consolidating its global role in the IP market, Sparkle keeps on strengthening its leadership as the Mediterranean and Italy's digital gateway between Africa, the Middle East, Asia and Europe through its long-term investment for the deployment of BlueMed, a submarine multi-fiber cable linking Palermo with Genoa. In the Americas, Sparkle confirms its leading positioning thanks to large-scale infrastructural investments to connect North to South America and the latest enhancement of its Pacific routes with a new fiber pair on Curie submarine cable system connecting Chile to US. In all its operations, and in every market, Sparkle is committed to pursuing the highest level of success and building a shining future as a global and innovative service provider.

*Source: Renesys

Sparkle Products

SPARKLE | IP&DATA *PLATFORM*
YOU CONNECT AND TOGETHER WE EVOLVE

- SPARKLE | Seabone
- SPARKLE | DDoS Protection Service
- SPARKLE | Virtual NAP
- SPARKLE | IXP Connect
- SPARKLE | City2City
- SPARKLE | Site2Site
- SPARKLE | Ethernet Suite
- SPARKLE | Country2Country
- SPARKLE | Restoration

SPARKLE | CLOUD & DATA CENTER *PLATFORM*
YOU GROW AND TOGETHER WE EVOLVE

- SPARKLE | IaaS Suite
- SPARKLE | Backup and Storage as a Service
- SPARKLE | Disaster Recovery as a Service
- SPARKLE | Professional Services
- SPARKLE | MultiCloud Suite
- SPARKLE | YourCloudStore
- SPARKLE | Cloud Tailored Suite
- SPARKLE | Vertical Services
- SPARKLE | Sicily Hub
- SPARKLE | Greece Data Centers
- SPARKLE | Turkey Data Centers
- SPARKLE | Miami Data Center
- SPARKLE | Global Data Center
- SPARKLE | Data Center Connect
- SPARKLE | Cloud Connect

SPARKLE | CORPORATE *PLATFORM*
WE COLLABORATE AND TOGETHER WE EVOLVE

- SPARKLE | Ethernet Suite
- SPARKLE | Carrier MPLS
- SPARKLE | IP VPN Suite
- SPARKLE | SD-WAN
- SPARKLE | Global Connect
- SPARKLE | Data Center Connect
- SPARKLE | Cloud Connect
- SPARKLE | Bandwidth on Demand
- SPARKLE | Outsourcing Solutions
- SPARKLE | Communication Solutions
- SPARKLE | IoT Solutions
- SPARKLE | Media Solutions
- SPARKLE | eHealth Solutions

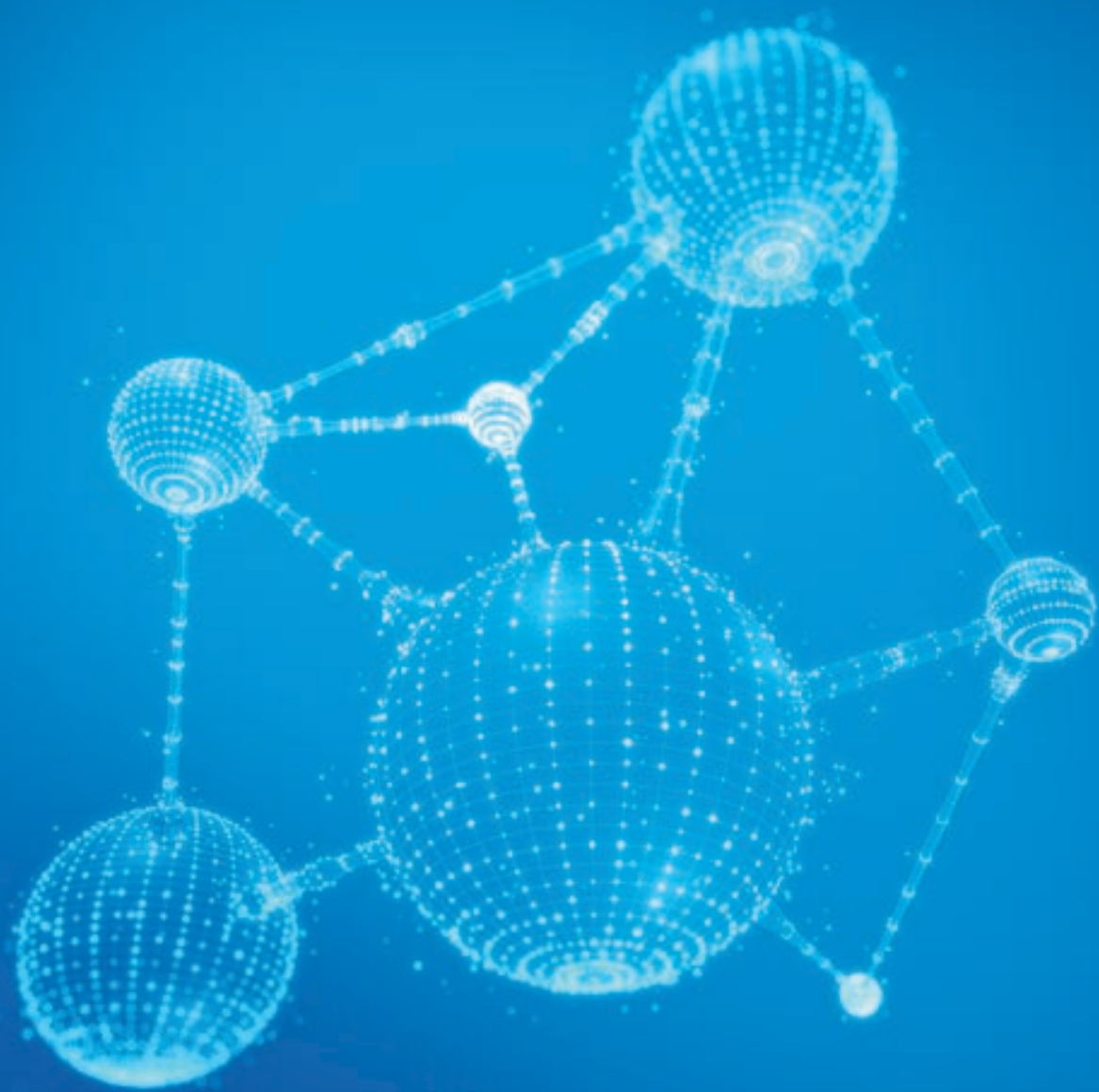## SPARKLE | MOBILE *PLATFORM*
YOU MOVE AND TOGETHER WE EVOLVE

- SPARKLE | IPX
- SPARKLE | GRX
- SPARKLE | Big Data
- SPARKLE | Global Signalling
- SPARKLE | LTE Diameter Signalling
- SPARKLE | Signalling Protection Suite
- SPARKLE | SMS Transit
- SPARKLE | SMS Booster
- SPARKLE | Voice & SMS Express
- SPARKLE | Outbound Roaming Solution
- SPARKLE | VoLTE Transit and Roaming

SPARKLE | VOICE *PLATFORM*
YOU TALK AND TOGETHER WE EVOLVE

- SPARKLE | Best Voice Transit
- SPARKLE | W.A.V.E. Voice Outsourcing
- SPARKLE | IPX
- SPARKLE | High Definition Voice
- SPARKLE | Access Services
- SPARKLE | Barrier Antifraud Services
- SPARKLE | Voice & SMS Express

Sparkle's complete range of solutions is designed to support your business and its growth beyond borders.

IP SERVICES

Sparkle's worldwide Tier 1 Internet backbone grant top-performance and reliable IP solutions thanks to the extensive presence throughout Europe, Latin America and United States, its unique presence in Africa, the Middle East and the Mediterranean Basin, and its continuous expansion in the Asia Pacific. Sparkle IP backbone is the best choice to support the digital growth, ensuring the ideal environment for content, video and data transport.

SPEED RATES
• Up to 100Gbps
 	
PORT INTERFACES
• SDH
• Ethernet
 	
SERVICE FEATURES
• POP Option (IP Port only)
• Facility Option
  (IP Port + facility)
• Bundle Aggregation
• VLAN options
	TECHNICAL OPTIONS
	• IPv4, IPv6 native,
	  Dual Stack IPv4
	  + IPv6
	• Multiple BGP
	  sessions
	
	PROTECTION SOLUTIONS
	• Proactive DDoS service
	• Self DDos
	• BGP Flowspec
		BILLING OPTIONS
		• Flat
		• Burstable
		• Aggregate billing over multiple
		  ports
		
		CARRIER-GRADE SLA
		• Monitored 24x7
		
		SUPPORT & ASSURANCE
		• Customer Service in 4 languages:
		  English, Italian, French, Spanish
		• Self-Caring

● **SPARKLE** | Seabone

Seabone is Sparkle's IP Transit service, a worldwide Tier 1 Internet backbone providing ISPs, content providers and accelerators with top-performance access to the Global Internet. Seabone is one of the **Top 10 global IP players** providing state-of-the-art performance, robustness, reliability and loyalty.
Seabone, the shortest path to the Net, is the best quality IP service and the most cost effective choice.

● **SPARKLE** | DDoS Protection Service

Anti DDoS protection solutions are the Seabone set of services to mitigate and clean the attacks - and so to protect customer network -based on scrubbing centers distributed on our backbone with a significant mitigation throughout that – in case of exceptional large attacks – are supported and enriched by the Arbor could service. These service are available with several options like Proactive DDoS service, where Sparkle SOC proactively notifies Customers of an attack and then applies the Mitigation & Cleaning, Self DDoS, a smart option for customers to self-protect their networks and stop attacks in minutes applying the Mitigation & Cleaning by themselves, and BGP Flowspec, a new mitigation technique to rate-limit or drop the attacks at the edge of the backbone with specific granularity in terms of matching criteria and filtering like source/destination address, packet lengths, ports etc.

● Sparkle|Virtual NAP

Virtual NAP is Sparkle turnkey solution to provide customers with access and EoMPLS transport to the main Internet Exchange Points (IXPs) worldwide, allowing players to easily join main peering community. Virtual NAP is provided in partnership with the major IXPs (LINX, DEC-IX, AMS-IX, MIX, Namex France-IX, NetIX, Equinix, Speed-IX, PIT Chile) in many cities around the world. Virtual NAP is also the perfect solution in bundle with Seabone service, leveraging on a single interconnection port.
Easily add your new POP in the major global IXPs.

CAPACITY SERVICES

Top-performance layer-1 connectivity services, based on Sparkle international proprietary state-of-the-art backbone, allow customers to build up their own international network in a flexible, reliable and cost-effective manner.
Strong capabilities over the most advanced submarine cables like Curie, Seabras-1, SeaMeWe 5, a unique footprint in the Mediterranean basin with MedNautilus system and exclusive bilateral cables, a capillary network in Europe, an extensive backbone in North and South America and a strategic presence in Africa and Asia allow high-speed and reliable connectivity to customers.

WAVELENGTH	PROTECTION AND DIVERSIFICATION	CONTRACT TYPES
• WDM point-to-point circuits	• Unprotected	• Lease
• Bandwidth: up to 100G	• Protected	• ROU/IRU
• OTN, Ethernet and SDH interfaces	• Partially Protected	• Temporary
	• Routing diversification	
PRIVATE LINES		**SUPPORT & ASSURANCE**
• SDH point-to-point circuits	**SLA**	• Customer Service in 4 languages: English, Italian, French, Spanish
• Bandwidth: up to 10 Gbps	• 24x7 Monitoring	
• Ethernet and SDH interfaces	• Monthly availability and Lead Time commitment	• Self-Caring
FIBER SOLUTIONS		
• Dark Fiber		
• Spectrum		

● Sparkle|City2City

City2City is Sparkle best choice to support bandwidth intensive applications as Video, Big Data and Storage across customer's global sites with its efficient optical transport backbone. City2City fulfils customer heavy-duty traffic requirements providing dedicated long-haul capacity between main world's Cloud Data Centers.
Dark Fiber and Spectrum offers, on a tailored basis, complete City2City portfolio for customer requiring huge connectivity to build up their own backbone.
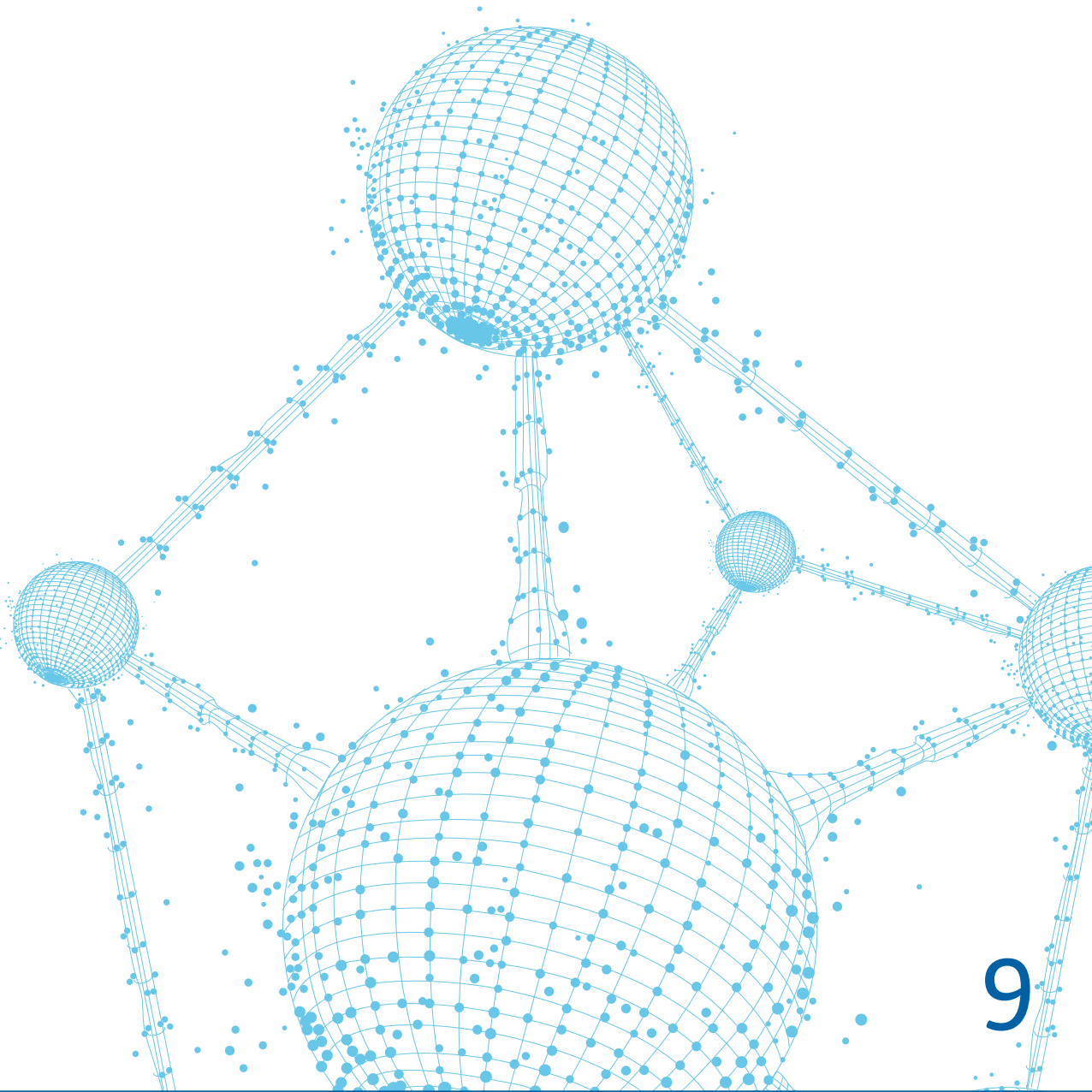**Our Footprint, Your Reach.**

● Sparkle|Site2Site

Site2Site is Sparkle's end-to-end tailored connectivity solution, ensuring flexibility and a secure network worldwide, including many hard-to-reach destinations. Site2Site allows customers to connect their premises using dedicated circuits.
Our Robust Network, Your End-to-End Connectivity.

Capacity portfolio is complemented by **Country2Country** service, Sparkle hard-patched transit solution perfectly suited to meet the interconnection demand between two carriers and **Restoration** service, Sparkle service to guarantee international circuit continuity in the event of submarine cable system faults or planned outages.

☁ SPARKLE | CLOUD & DATA CENTER
PLATFORM

YOU GROW AND TOGETHER WE EVOLVE

Sparkle offers a suite of highly flexible and scalable Cloud and Data Center Solutions through proprietary Data Centers in Palermo, Athens and Istanbul, and on a project basis in a vast number of Data Centers globally.

CLOUD SOLUTIONS

Our Cloud Solutions cater to the ever-growing demand for cost-effective and top security IT managed services and are based on the world's top-performing vendor technologies, providing our customers with top **class integrated IaaS**, **PaaS and SaaS services**.

Thanks to bundled offers with Sparkle's connectivity solutions, our Cloud proposition is particularly effective in serving the needs of customers located in Europe, the Middle East and Africa.

Leveraging TIM Group technical expertise and management know-how, Cloud Solutions support customers in tailoring and optimizing their IT architecture and cost of services. Cloud Solutions offer top security and reliability, easy and fast implementation, a high level of scalability, and great flexibility in service configuration as well as in contractual solutions.

Our Cloud portfolio meets the needs of different customer segments globally, especially in Europe, the Middle East and Africa: corporate customers, carriers and system integrators that support their own customers as well as application providers that want to expand their activities. Sparkle's growth strategy for its Cloud proposition is based on a **partner ecosystem model** with attractive revenue op-portunities for ISVs, value added resellers, system integrators, developers as well as companies having niche application solutions for targeted segments of the market that are suitable for cloud computing business.

For further information please write to cloudsolutions@tisparkle.com

● SPARKLE | IaaS Suite

A suite of highly flexible and scalable IaaS solutions that go from **Enhanced Co-location** and **Physical Hosting** to **Virtual Hosting** services. The solution leverages on Premier Data Centers and on a best-in-class architecture built with the most recent technologies in order to bring to organizations real economic and operational benefits and to guarantee state-of-the-art security, performance and reliability.

● SPARKLE | Backup and Storage as a Service

Sparkle offers cost-effective solutions for enterprises, enabling back-up, restoration and access from anywhere via a hybrid cloud & on-premise storage architecture, including file sync & share and mobile collaboration features.

● SPARKLE|Disaster Recovery as a Service (DRaaS)

A wide range of DRaaS services enabling disaster recovery solutions between customer IT environment and an alternative DR Site on Sparkle DC's cloud infrastructure.

● SPARKLE|MultiCloud Suite

Sparkle provides Cloud services across multiple public and private platforms thanks to a multitenant environment, including an automated management console to target direct and indirect customers. The suite automates every aspect of the cloud and any XaaS services delivery management as well, including service orchestration and subscription management, cloud marketplace, billing automation and reseller management.

● SPARKLE|YourCloudStore

YourCloudStore enables channel partners, including telcos, ISPs, IT system integrators, distributors and VARs as well as ISVs and application providers, to quickly build their own Marketplace specifically designed for the SMB market. Powered by the leading platform Odin Automation, YourCloudStore grows our partner's business and revenues, developing customer loyalty with integrated cloud solutions. Many SaaS APPs are available and ready to use, along with powerful virtual servers, cloud backup solutions, digital marketing services and more. Customer's management Console is available for end customers and developers who benefit from powerful tools tailored precisely for their needs.

● SPARKLE|Vertical Services

Sparkle has developed tailored ICT offers for catering specific customer segments with vertical applications, such as Sparkle ERP Infrastructure Solutions, that is based on a cloud platform that allows enterprises to process high volumes of data in real-time, accelerating business processes and simplifying their own IT environment without the need of any capex investment, using a cloud service available on a monthly subscription, instead.

● SPARKLE|Professional Services

Managed services on Customers' behalf provided on VMware environment leveraging on Sparkle Competence center (mainly in Italy, Greece and Turkey) and on the main public cloud technologies by selected Partners with on-site pre-sale and post-sale specialist support.

● SPARKLE|Cloud Tailored Suite

With Sparkle's Cloud Tailored Services customers can develop their own cloud environment, both private and hybrid, using infrastructures to be hosted at their premises or in DCs or Telehouses, including DRaaS based on the same native platform provided by Sparkle Sicily hub DCs to offer a fully integrated DR-to-cloud solution infrastructure.

● SPARKLE|Cloud Connect

The progressive adoption of cloud computing by corporations has led to an evolution in their network infrastructure needs. In the past, server farms were hosted in-house in proprietary Data Centers, nowadays they tend to virtualize their applications into key-neutral exchange points reached through reliable and secure connectivity.

DATA CENTER SOLUTIONS

● SPARKLE|Sicily Hub

Sicily Hub is Sparkle's open Data Center in Palermo that is becoming the leading IP gravity center in the Mediterranean basin where Content meets ISPs. Located closer to North Africa, the Mediterranean and the Middle East than any other European peering point, Sicily Hub is connected to all cable landing stations in Sicily intercepting most submarine cables crossing the Mediterranean. In the Sicily Hub customers can benefit from Sparkle Tier 1 IP Transit service Seabone, locally endowed with top global content and all top-quality and cost-efficient Sparkle connectivity services with reduced latency and lower bandwidth costs than any other European location.

● SPARKLE|Greece Data Centers

Sparkle Greece co-location sites encompass an area of more than 8000 m2 and are situated in Koropi and Metamorphosis in Attica and in Chania on the island of Crete. We offer a wide range of state-of-the-art services including co-location with first and second level support, networking, managed hosting, cloud services, storage, and disaster recovery.

● SPARKLE|Turkey Data Centers

The data center is located in Yenibosna and is one of the largest and most important open co-location facilities in Turkey. Thanks to its neutrality, it hosts most international and domestic providers. ISP, content and enterprise customers find their home here. The New Generation Data Center platform has been designed to support mission-critical IT systems and to guarantee that data, applications and systems related to a single customer are physically or logically separated from those pertaining to others. The Security Operations Center offers 24/7 network traffic monitoring by identifying potential attacks and responding to threats before any damage is done while Network Operations Center ensures 24/7 full monitoring of network and equipment status.

● SPARKLE|Miami Data Center

Co-location services are provided in NAP of the Americas in one of the most famous and populated facilities in Florida. Sparkle facility is across the proprietary HUB, one of the most important gateways to South America. Customers can benefit from Sparkle's consolidated connectivity and IP services and interconnect to the broad scenario of content and alternative providers collocated in the NAP of the Americas.

● SPARKLE|Global Data Center

A worldwide footprint to collocate customers' equipment in a large project spanning over Sparkle owns DC coverage. The service is provided in partnership with the most important, highest-performing and best interconnected providers in the world.
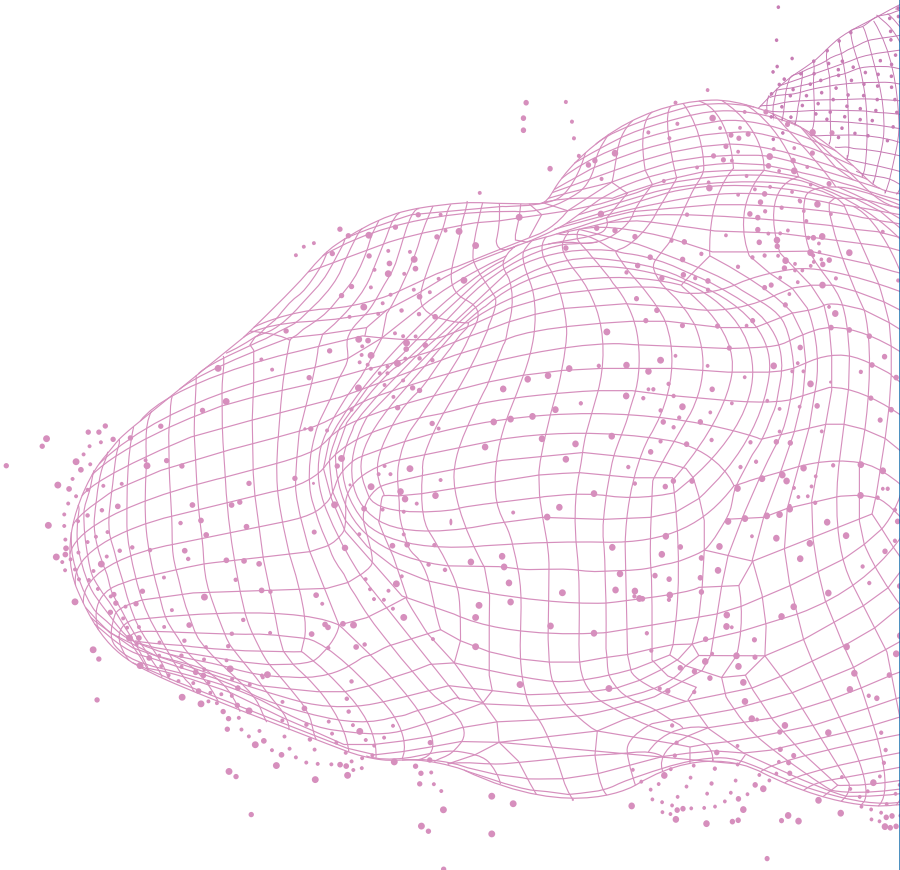
● SPARKLE|Data Center Connect

Sparkle Data Center Connect targets enterprises that need to link data centers globally through cost-effective, high-performing and transparent connectivity.

SECURITY SOLUTIONS

● SPARKLE|Cyber Security Training Platform

Sparkle is moving to address new customers through an innovative platform, it's born to provide a complete security training course for internal and external staff. Company's infrastructure as well as security team will always be up-to-date and ready to protect the own environment from any hackers attack.

Sparkle's wide service portfolio aims to serve corporate customers' needs, including global connectivity and ICT solutions. Services can be provided to enterprises directly or via partners, through a **Global Partner Program**. Partners may serve their customers complementing their own service proposition and coverage through specific solutions provided via NNIs or by means of white label service platforms.

Sparkle Corporate Solutions cater both to business customers as well as to service providers that need to serve their own corporate requirements, including access to the global Cloud ecosystem, focusing on distinctive geographical areas like Italy, the Mediterranean Basin, the Balkans, MEA Countries and Latin America.

NETWORKING SOLUTIONS

Leveraging on the existing Networking Solutions Service Portfolio - Carrier MPLS, IP-VPN Suite and Ethernet Suite - Sparkle has created the following propositions in order to help enterprises to meet their own or their customers' needs:

- **Global Connect**: targets enterprises that have to connect different international data environments through competitive, high-performing and transparent connectivity
- **Cloud Connect**: targets enterprises that need to access the main cloud players in Europe, the Americas and Asia, such as Microsoft Azure and Amazon Web Services (AWS), with a more consistent network than Internet-based connections
- **Data Center Connect**: targets enterprises that need to link data centers worldwide through transparent, high-performing Carrier Ethernet connectivity
- **IXP Connect**: targets enterprises that have to reach Internet Exchange Points worldwide through a flexible, cost-effective, transparent, market-leading network solution
- **Broadcasting Connect**: targets media companies, content distributors, TV platform players and Financial institutes that have specific service attributes and performance requirements.

● **SPARKLE** | Ethernet Suite

Ethernet Suite is an innovative set of Carrier Ethernet solutions that allows customers to connect different international data environments through cost-effective, high-performing and transparent connectivity.

Based on Sparkle's global Metro Ethernet Forum (MEF CE 2.0) certified state-of-the-art Carrier Ethernet backbone, the service offers enhanced flexibility in terms of scalability and cost reduction options compared to other connectivity solutions.

Our flexibility, Your Ethernet solution.

● Sparkle | Bandwidth on Demand

Sparkle's Bandwidth On Demand offer, based on Sparkle Ethernet Suite solution, is the result of Sparkle's leading role in the implementation of Lifecycle Service orchestration (LSO). It caters those customers that are looking for more scalable bandwidth, capacity and network intelligence, allowing a more efficient distribution of traffic volumes as well as transactional data among their own data centers and/or to the major Cloud Players.

● Sparkle | Carrier MPLS

With the implementation of flexible and innovative IP-MPLS standards in Sparkle's global backbone, operators can use Sparkle's unmanaged solution to provide corporate markets with international VPN services. Whether operators need to extend their coverage across the globe or to specific destinations, they will be able to maintain complete control of their customers and of seamless service features across the interconnection.

● Sparkle | IP-VPN Suite

A worldwide integrated offer of Voice, Video & IP/Data services, based on a state-of-the-art IP-MPLS multi-service backbone with differentiated Classes of Services, allows Sparkle to provide highly scalable, differentiated IP services that simplify configuration, management and supply for its customers.
The offer provides high-quality standards for every range of IP VPN last-mile network access capabilities, such as Ethernet, SDH, xDSL, Satellite, 3G/4G and Wi-Fi.

OUTSOURCING SOLUTIONS

● Sparkle | Full Outsourcing

Sparkle Full Outsourcing solution provides customers with a single interface for the provisioning, installation, maintenance and, as an additional option, management of customer networks and devices at a global level. Full Outsourcing is based on the excellent care, assurance and consulting services supplied by the Sparkle Management Center.

● Sparkle | Equipment

Sparkle Equipment solution provides a unique interface for the provisioning, installation and maintenance of networks and devices worldwide.

COMMUNICATION SOLUTIONS

● Sparkle | Conferencing Suite

Conferencing suite responds to an increasing market demand for ease-of-use, professional audio, video quality and communication security. Moreover, it is the ideal solution for verticals such as e-learning, finance or health, increasing productivity and optimizing costs.

● Sparkle | Omnichannel Suite

Sparkle Omnichannel Suite combines Digital Marketing Services and Digital Marketing Tools to implement and manage marketing campaigns focused to: generate new leads for your business, nurture leads in time and convert them into paying customers, engage current customers with relevant content and offers to increase loyalty.

SECURITY SOLUTIONS

● Sparkle|Cyber Security Training Platform

Sparkle is moving to address new customers through an innovative platform, it's born to provide a complete security training course for internal and external staff. Company's infrastructure as well as security team will always be up-to-date and ready to protect the own environment from any hackers attack.

MEDIA SOLUTIONS

● Sparkle|Video Transport

Sparkle offers global video transport services for contribution, distribution and video content management solutions to national and international Media Players including broadcasters, content providers, final diffusion networks and video transport operators.

● Sparkle|Video VAS

Sparkle offers playout and media asset management services together with high-quality diffusion services in Italy to national and international Media Players including broadcasters, content providers, final diffusion networks and video transport operators.

● Sparkle|Broadcasting Connect

Sparkle's Broadcasting Connect is a robust Carrier Ethernet certified connectivity service targeting media companies, content distributors, TV platforms players and Financial institutes with specific service attributes and performance requirements.

● Sparkle|Italian Temporary Services ITS

Sparkle is the ideal partner to coordinate and manage all activities related to the provisioning and installation of temporary voice and data services in Italy in case of exhibitions, congresses, conferences and major political, social and sport events.

eHEALTH SOLUTIONS

Sparkle's comprehensive portfolio of services targets the health ecosystem with a specific focus on Hospitals, Public health departments, Specialized Medical Labs, Pharmacies and Insurance Companies that need to serve their patients and customers.

IoT SOLUTIONS

● Sparkle|IoT Integrator

VALUE PROPOSITION
In the IoT landscape, the Industrial Internet of Things (IIoT) segment is expected to face a huge growth due to its ability to transform industries and open new markets. Nowadays, however, one of the biggest challenges in IoT adoption is to simplify the complexities related to interconnecting things and connecting them to new or existing applications.
The current lack of standard in interfaces, protocols and architectures is slowing down the implementation time of IoT applications in the market.
Sparkle's solution **IoT Catalyst®** tackles the IoT complexity challenge directly by **simplifying**, streamlining and accele-rating **the communication flow between things an other platforms**, legacy applications and third party systems, thus allowing entities like **manufacturing** and u**tility companies** to become part of the new Industry 4.0 paradigm, as well as large **telecommunication companies**, s**ervice providers** and **system integrators** to lead the fourth industrial revolution.

A NEW INNOVATIVE SOLUTION
Sparkle IoT integrator allows to design, implement, protect, and manage the IoT integration logic, guaranteeing **fast and secure integration of any sensor, device, and/or PLC to any application or IoT platform**. It makes it possible to design new IoT Edge Applications, securely store them in a central repository and then select and dispatch them on demand to computation devices installed at the edges of the network.

CUSTOMER BENEFITS
Through our **edge computing platform IoT Catalyst®** and thanks to our expertise as an E2E solution provider, we support our customers in the design, roll-out and operation of their IoT systems, with the final objective of achieving additional control, efficiency and savings in the management of complex networks, infrastructures and industrial plants.

Sparkle's solution can guarantee to customers:
• **a state-of-the-art editor** that allows fast and secure integration of any sensor, device and PLC to any application or IoT Platform
• **unlimited scalability**, machine learning and predictive analytics
• **IoT platform independence**: it is possible to associate any device with one click to any IoT Platform (AWS, MS Azure, ...). Customers are free to change their IoT Platform saving investment at any time

THE ADVANTAGES OF IoT CATALYST®

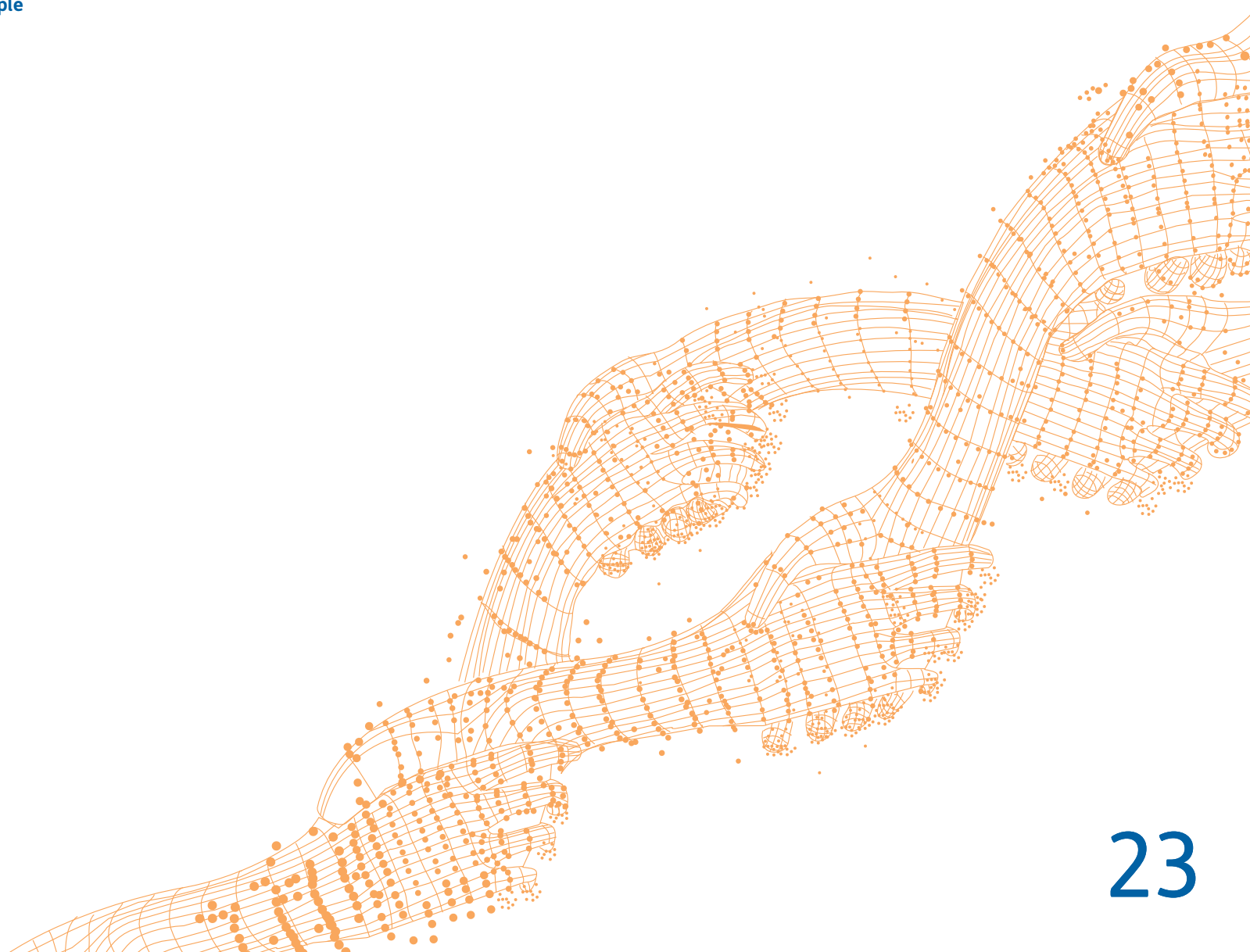**A UNIQUE SOLUTION FOR DIFFERENT NEEDS**

From Industry 4.0 to smart buildings, from connected telco towers to IoT-based energy metering, our solutions can be applied in any case a set of fragmented IoT data requires high-level advisory, architectural design, integration with enterprise systems, project governance and fast application development and delivery.

OPEN ECOSYSTEM PLATFORM INDEPENDENT

Sparkle IoT integrator helps to standardize the communication between "things" and any IoT Platform, thus allowing to create a fast-growing public/private/cooperative ecosystem of supported devices. I**oT Catalyst®** manages the IoT avoiding the risk of over-dependence on IoT solution providers, since it decouples the concept of IoT Domain from that of IoT Platform. **Users can easily create, populate and manage their IoT Domain in an independent way in respect of any IoT Platform.**

IoT ARCHITECTURE DESIGN

IoT architectures - the way things, sensors, servers or cloud infrastructures, data, networks, software and people interact - are the beating heart of smart applications and the point where data become insights, smart decisions and value. **Designing IoT architectures will be simple with our solution**, thanks to our **unique competences as an E2E solution provider**.

Sparkle offers a distinctive portfolio of global services designed to support mobile operators and service providers.

CONNECTIVITY

● **SPARKLE** | **IPX**

HIGH QUALITY AND SECURITY TO SUPPORT YOUR BUSINESS.
Sparkle IP Packet eXchange (IPX) is a next-generation platform that guarantees end-to-end high quality voice and mobile data services. Through a secure and private IP interconnection, IPX is the most efficient way to run different services on a single, converged interconnection. Sparkle has been one of the first service providers in the IPX arena thanks to its long history as a champion of IP technology. As co-founding member of the i3 Forum and regular contributor to the IPX model specifications within GSMA, Sparkle is leading the GSMA NG OCRIG working group and is one of the first service providers to design an IPX solution compliant with both i3 Forum and GSMA specifications. Sparkle's IPX solution is devised for fixed and mobile operators and OTTs, it supports existing and next-generation IP-based services and guarantees a high level of interoperability, security and a global reach to more than 80 networks in 40 countries, through interconnections with both customers and selected peering partners.

SERVICE DESCRIPTION
Sparkle's IPX solution is a secure, integrated IP service platform which enables customers to access high quality voice and mobile data services such as HD Voice, LTE/Diameter (4G), VoLTE, Data Roaming (GRX), Signalling, SMS Transit, SMS/MMS Hubbing and other innovative services including Instant Messaging, Tele Presence and Video share amongst others.

MAIN FEATURES
- Single access to many different services
- Integrated and secure IP interconnection
- Bilateral and hubbing connectivity options
- Differentiation of Classes of Services per product
- Enhanced GRX solutions to support International Data Roaming
- SIGTRAN-based signalling service to enable 2G/3G international roaming
- DIAMETER-based signalling service to enable LTE/4G international roaming
- SMS Transit/Hubbing service
- Voice termination
- E2E voice quality parameters measured and monitored on real traffic, with a full integration of CDRs generated by soft switches and SBCs
- CLI transparency and E2E monitoring, Roaming Traffic support, Originally Called Number (OCN) and Redirecting Number (RDN) support, fax support, break-out to TDM on customer's demand

• Advanced Web-based Reporting on traffic and quality
• Fully compliant with GSMA guidelines

Thanks to its quality and security, Sparkle IPX is also an ideal platform for the exchange of international HD Voice.

⬤ Sparkle|LTE Diameter Signalling

LTE Diameter is Sparkle's solution for a smooth and seamless transition to 4G International Roaming. LTE Diameter Signalling is built on top of secure and QoS enabled IPX Service enabling interoperability and worldwide routing of Diameter messages between mobile operators. LTE Diameter Signalling provides customer with LTE core network topology hiding, limiting exposure to potential security attacks. The LTE Diameter Signalling Service is available per the following service options:
• **Diameter Relay**: Sparkle acts as Diameter Routing Agent (DRA) on the logical connections with the customer's network. Optional adaptation, policing and screening can also be applied to control traffic and protect the customer
• **Interworking Function**: Diameter to MAP and MAP to Diameter conversion
• **Diameter Edge Agent (DEA) hosting**: Sparkle's DEA solution provides the critical functions to make Diameter Signalling flow smoothly from network to network eliminating any CAPEX issues

⬤ Sparkle|Global Signalling

Global Signalling enables International Roaming and SMS Interworking by providing immediate direct reach to all GSM mobile operators worldwide. Sparkle Global Signalling supports SCCP/STP, Sigtran over public internet access and traffic reporting through dedicated web access. Sparkle Global Signalling also includes ITU/ANSI Conversion, a full interoperability solution between GSM ITU and GSM ANSI networks.

⬤ Sparkle|GRX

GRX enables 2G/3G/4G Data Roaming and MMS Interworking by providing immediate direct reach to all GSM mobile operators worldwide.

⬤ Sparkle|Big Data

Big Data provides MNOs with an advanced business intelligence tool that analyzes IN&OUT international roaming based on algorithms which correlate different types of feeds such as Signalling, GRX/IPX, LTE/Diameter, TAP files, Near Real Time files but also custom feeds provided by the customer (e.g. IR21, Handset DB, Customer Segmentation). Big data is a break from current monitoring tools which have a vertical approach focusing on specific services. Analysis insights turn into upselling actions to customer base (ad hoc marketing campaigns, special roaming offers to silent roamers), improved Roaming QoS, permanent roaming detection of M2M/IoT SIM cards and more efficient negotiation of the Roaming Agreement (IOT simulator).

MESSAGING

⬤ Sparkle|SMS Transit

SMS Transit allows customers to deliver Mobile Terminated Messages (SMS-MT) with text and content to more than 1000 mobile operators worldwide via a single IP connection or SS7. Equally, customers are able to receive SMS-MO generated by any individual mobile subscriber, toward dedicated long numbers.

⬤ Sparkle|SMS Firewall

SMS Firewall monitors and blocks fraudulent events on SMS traffic, protecting mobile operators from spoofing, spam, and traffic triangulation. The service is fully compliant with GSMA specifications (IR70 and IR71). Based on a best-in-class platform, Sparkle's solution performs semantic analysis and home routing and can be used as a firewall to prevent fraudulent events against mobile operators and their customer base. A Fully Managed service option is available to address mobile operators seeking a comprehensive solution including: platform as a service, 24/7 business intelligence, traps and monitoring business counseling.

⬤ Sparkle|SMS Booster

SMS Booster is a comprehensive solution designed by Sparkle to allow mobile operators to ride the wave of SMS Application to Person (A2P) business. In a nutshell, Sparkle SMS Booster is a revenue generator solution for mobile operators monetizing all A2P traffic coming from the SMS ecosystem. The rise of social messaging apps is shackling the person-to-person (P2P) SMS market. But the continued growth of SMS revenues over the next few years will be driven by application to person (A2P) messaging. Grey Routes, Sim Boxes and other fraudulent phenomena prevent mobile operators from getting real value from their SMS business.

SERVICE DESCRIPTION
SMS Booster is Sparkle's proposition to mobile operators to:
• Generate new revenue streams from Application 2 Person SMS traffic
• Collect SMS A2P traffic worldwide assigning the proper value to the MNO's termination rate
• Manage the SMS Firewall on a 24/7 basis providing the necessary intelligence and support through a partnership with 365squared, a pioneer in advanced SMS solutions

ADVANTAGES
Value for end users:
• Protect subscriber from spam and fraudulent SMSs
Value for mobile operators:
• New revenue stream from monetization of A2P SMS traffic
• Risk free, Capex and Opex free
• Effort free, while keeping full control of your business
• 99% reduction in calls to customer care regarding spam and fraudulent SMS messages

ENHANCED ROAMING SERVICES

● Sparkle | Outbound Roaming Solution

Outbound Roaming Solution enables mobile operators to piggyback the extensive global roaming footprint of Sparkle's sponsor network - comprising more than 500 operators worldwide - without having to set up multiple bilateral roaming relationships. Sparkle's dual IMSI solution supports all roaming services (Voice, SMS, CAMEL, 2G/3G/4G Data Roaming) and quickly enables new revenue streams for mobile operators.

● Sparkle | Data Clearing Services

Sparkle Data Clearing Service comprises validation, verification, conversion and processing of TAP files as well as reporting the file status to customers. Sparkle Data Clearing Services operate in full accordance with the industry requirements issued by working groups such as GSMA TADIG. In addition to the standard Data Clearing Services, Sparkle's solution includes features such as IOT check, TAP conversion, re-rating & re-pricing. The service suite also offers fraud tools like NRTRDE service and Financial Clearing solutions. Advanced reporting capabilities through a dedicated web portal will be available for each customer and a Business Intelligence tool can also be provided.

● Sparkle | VoLTE Transit and Roaming

Sparkle VoLTE transit service enables high quality transport and termination of IMS -VoLTE and RCS services at international level supporting Mobile Network Operators to launch IMS-based services for their end subscribers.
Through a dedicated I/C on Sparkle's proprietary IPX network, MNOs can leverage the existing footprint of Sparkle's voice termination service, adding IMS-VoLTE enabled networks through the interworking capabilities developed by Sparkle, applicable also to legacy networks in case the recipient network/subscriber is not VoLTE or not under LTE coverage.
Sparkle allows mobile operators to test and launch VoLTE service propositions through a trial program that includes both on-net and off-net tests, the latter through Tier 1 third party international providers and their respective direct mobile customers, designed for VoLTE and VoLTE Roaming interoperability.

MAIN FEATURES
• SIP Messages and RTP media routing and mediation of messages among origin and destination
• Interoperability management of Transcoding, Transrating and Transsizing
• HD Voice capabilities
• Full support on deployment of preferred VoLTE roaming solution (LBO or S8HR)
• High quality transport
• Exploiting IP convergence through voice service
• Network efficiency increase

LATEST PORTFOLIO UPDATES

● Sparkle | Signalling Protection Suite

Signalling Protection Suite is a sophisticated all-in-one package that offers a **complete** portfolio of Protection Services from **audit** to **active prevention** to mobile operators, telco groups and multinational customers in vertical segments.

SERVICE DESCRIPTION
Signalling Protection Suite offers a complete, customizable range of solutions to protect the customer's signalling network from all threats: authentication theft, call and SMS interception, subscriber location tracking, network outage/DoS, fraud and others.
The solution includes three modules:
• **Signalling Security Assessment**: Tailored security audit shows customer's vulnerabilities and potential threats providing detailed reports & recommendations on SS7 (TDM–SIGTRAN) & LTE Diameter
• **Analytics and Detection Tool**: Real-time dashboards for 24H monitoring, providing enhanced visibility and early detection of threats coming from signalling networks
• **Signalling Firewall**: Active prevention with checks on all routed signalling messages applying block, discard or detection on SS7 (TDM-SIGTRAN) & LTE Diameter

MAIN FEATURES
• **Flexible rule engine**: 100% customizable thanks to multitenant approach
• **Reporting & Analytic tools**: real-time threat detection powered by comprehensive dashboards, reports and actionable intelligence with a deep drill-down option for incident investigation and response
• Leverage on other MNOs **lessons learned**, to better prevent attacks from hackers, fraudsters and foreign security services
• **Operational management**: in fully managed service or self-service
• **Full Protection option**: able to collect feeds from other Customer's signalling providers
• **VIP Protection**: priority monitoring to list of high-profile IMSIs
• **Fully compliant to GSMA** guidelines FS.11, FS.19, IR.82, etc

● SPARKLE│Voice & SMS Express

VSE is Sparkle's digital solution which allows carriers, mobile operators and international enterprises with high volumes of international outbound calls (e.g. call centers) to easily send traffic.

Through a very user-friendly self-serve portal, customers can configure their accounts, manage traffic, choose the appropriate quality pricing, monitor billing and manage their own wallet by adding or withdrawing funds at any time.

Through a unique portal for Voice and SMS services customers can terminate any call anywhere in the world through Sparkle's global backbone.
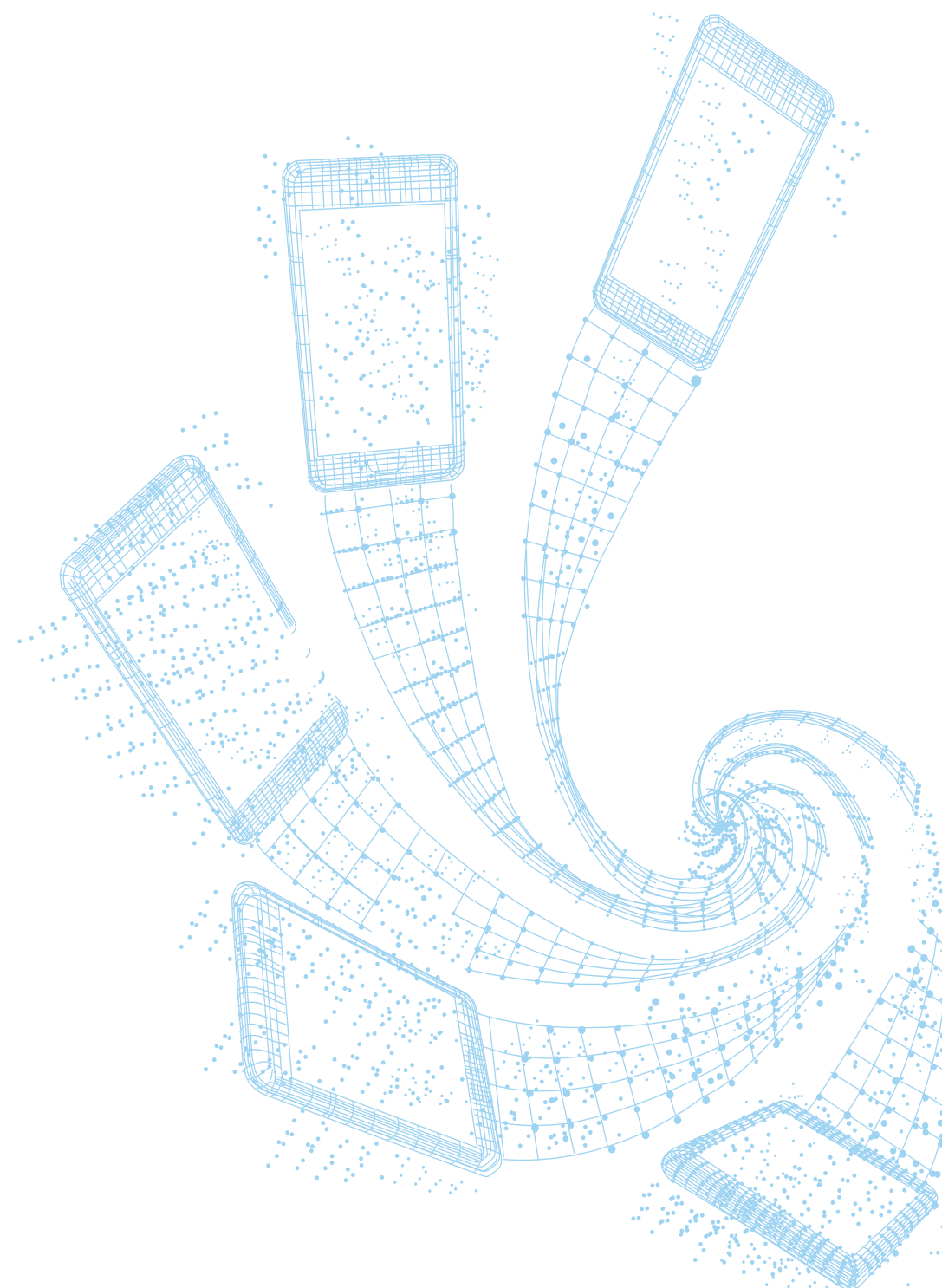
DESCRIPTION

After registering on the Voice & SMS Express website and deposited some funds, customers can access three different modules for sending SMS:
• API interface – an automatic option through an interface which supports multiple programming languages
• Marketing Campaigns - simplest way to activate SMS campaigns: the system requires no expertise, the web portal does it all
• SMPP protocol – customers can interconnect with Sparkle to activate SMS campaign via the web portal in self-provisioning

PRODUCT FEATURES

• Voice & SMS Express provides two different price and quality levels:
  - Silver: best least cost on the market for bulk SMS campaigns
  - Platinum: highest quality solution through selected SMS providers and direct connection to mobile operators
• Euro or USD currency
• 30 SMS per second allowed
• Minimum prepayment of 150 Euro/USD
• Maximum prepayment allowed up to 20.000 Euro/USD
• Real time Reporting

Sparkle's Voice portfolio of services provides carriers, mobile operators and service providers with worldwide voice termination, origination and fraud protection capabilities that guarantee a high-level of network reliability, extensive reach, competitive pricing and efficient routing solutions. Sparkle's competitive advantage is based on strong economies of scale and a robust all-IP state-of-the art NGN network architecture with:

• **Worldwide coverage** comprising more than 500 direct interconnections
• **A full set of products** to effectively meet the full range of customer needs
• Efficient IT platforms with **advanced Least-Cost Routing capabilities**, quality monitoring tools and billing functionalities
• **Dedicated 24/7 customer care** offered in 5 languages (English, French, Spanish, Arabic, Italian)

● **SPARKLE** | Best Voice Transit

Best Voice Transit is designed to efficiently manage the international traffic of global carriers and mobile network operators, as well as fixed, web-based and calling card retail service providers. With approximately 1,000 routing destinations/breakouts, Sparkle Best Voice Transit offers the possibility to combine different routing and pricing options and provide customized solutions that best fit the needs of each of type of customer.

Sparkle Best Voice Transit offer includes three main service options:
• **Standard Offer**: the most economically priced voice transit product with multiple least-cost routing options for a highly competitive service
• **Platinum Offer**: the best ratio of quality to price, offering high quality of service at competitive rates through high usage of direct routes, defined quality KPIs, and CLI to most destinations
• **Diamond Offer**: premium quality voice transit product with highest percentage of direct routing, greatest price stability, CLI guarantees on a regular basis, proactive tests, covering also KPI monitoring. The Diamond offer is designed to meet the needs of both mobile and fixed retail operators with selected features for mobile-to-mobile traffic. Global coverage for roaming termination is also offered, as well as Originally Called Number (OCN) and Re-Directing Number (RDN) transmission for selected destinations

● **SPARKLE** | High Definition Voice

Sparkle HD Voice service allows HD Voice carriers and service providers to interconnect with other HD Voice providers and efficiently route Voice calls in an End-to-End HD environment. Sparkle supports G.722 and AMR-WB codecs enabling customers directly interconnected in VoIP to terminate their HD call internationally.

● Sparkle|Barrier Antifraud Services

Barrier Antifraud Services have been designed to offer operators significant assistance in fighting fraud (see specific description on page 33).

● Sparkle|W.A.V.E. Voice Outsourcing

W.A.V.E. (Wholesale Aggregation of Voice Expertise) is Sparkle's voice outsourcing proposal to carriers, service providers and new market entrants for E2E management of their international voice traffic. Providing customers with the opportunity to fully or partially outsource their non-core international wholesale voce activities, W.A.V.E. enables carriers to cut operating costs, simplify management of international traffic, capitalize on Sparkle's economies of scale and free up internal resources for re-deployment to core business activities, while maintaining real-time control of international voice business. W.A.V.E also offers its customers revenue assurance through services to monitor credit of end-customers' prepaid traffic, as well as fraud management capabilities.

● Sparkle|IPX

Through a single, converged interconnection, service providers and mobile operators can access secure, high quality voice and mobile data services (see specific description on page 34).

● Sparkle|Access Services

International & Universal Toll-Free Services as well as DIDs enable customers to provide their own retail clients with toll-free and local access service in more than 50 countries around the world. Supported by Sparkle's competitive access and superior level of service, carriers and service providers can offer international toll-free access, for Call centers, Audio conferencing, Pre-paid and Post-paid Calling cards and other business services.

● Sparkle|Barrier Antifraud Services

Sparkle Barrier Antifraud Services are a set of solutions designed to support customers against the risk of fraudulent activities, reducing economic as well as reputational impacts. Sparkle Barrier Antifraud Services are effective against fraud propagated on customer's own network as that originating on a supplier's network.

The Barrier solution consists of four components:
- **Blocking**: automatically programmed to engage when customer defined thresholds of interest are exceeded
- **Alerting**: alarms are immediately emailed to the customer when any of the monitored traffic parameters exceed preset thresholds
- **Reporting**: in-depth daily/weekly reporting of metrics under investigation
- **Advising**: ongoing, advanced consultative services

The service offers analytical capabilities for both originating numbers as well as called numbers for a comprehensive view of possible fraud sources.

Two types of Services are available:

Barrier Managed Service
This version of Barrier comprises a series of customer-defined parameters for fraud blocking and alerting facilitated by Sparkle's antifraud team.

Barrier premium Service
Value-added extensive, specialized Reporting and Advising features are added to the Barrier Managed Service Features: periodic conference calls with the Antifraud team member to ensure ongoing, relevant parameters and service satisfaction; daily traffic peak reports, weekly suspicious number reports, alert analysis, and other statistics with the scope of offering customers the full advantage of Sparkle's vast in-house antifraud expertise.

● Sparkle|IPX

HIGH QUALITY AND SECURITY TO SUPPORT YOUR BUSINESS

Sparkle IP Packet eXchange (IPX) is a next-generation platform guaranteeing end-to-end high quality voice and mobile data services. Through a secure, private IP interconnection based on IP, IPX is the most efficient way to run different services on a single, converged interconnection. Sparkle is one of the first service providers in the IPX arena thanks to its long history as a champion of IP technology. As co-founding member of the i3 Forum and regular contributor to the IPX model specifications within GSMA, Sparkle leads the GSMA NG OCRIG GRX IPX working group and is one of the first service providers to design an IPX solution compliant with both i3 Forum and GSMA specifications.
Sparkle IPX solution is devised for fixed and mobile operators and OTTs, it supports existing and next-generation IP-based services and guarantees a high level of interoperability, security and a global reach to more than 80 networks in 40 countries, through interconnections with both customers and selected peering partners.

SERVICE DESCRIPTION
Sparkle IPX solution is a secure, integrated IP service platform which enables customers to access high quality voice and mobile data services such as HD Voice, LTE/Diameter (4G), VoLTE, Data Roaming (GRX), Signalling, SMS Transit, SMS/MMS hubbing and other innovative services including Instant Messaging, Tele Presence and Video share, among others.

MAIN FEATURES
• Unified access to many different services
• Integrated and secure IP interconnection
• Bilateral and hubbing connectivity options
• Differentiation of Classes of Services per product
• Enhanced GRX solutions to support International Data Roaming
• SIGTRAN-based signalling service to enable 2G/3G international roaming
• DIAMETER-based signalling service to enable LTE/4G international roaming
• SMS Transit/Hubbing service
• Voice termination
• E2E voice quality parameters measured and monitored on real traffic, with full integration of CDRs generated by soft switches and SBCs
• CLI transparency and E2E monitoring, Roaming Traffic support, Originally Called Number (OCN) and Redirecting Number (RDN) support, fax support, break-out to TDM on customer demand
• Advanced Web-based Reporting on traffic and quality
• Fully compliant with GSMA guidelines
Thanks to its quality and security, Sparkle IPX is also an ideal platform for the exchange of international HD Voice.

● Sparkle|Voice & SMS Express

VSE is Sparkle's digital solution which allows carriers, mobile operators and international enterprises with high volumes of international outbound calls (e.g. call centers) to easily send traffic.
Through a very user-friendly self-serve portal, customers can configure their accounts, manage traffic, choose the appropriate quality pricing, monitor billing and manage their own wallet by adding or withdrawing funds at any time.
Through a unique portal for Voice and SMS services customers can terminate any call anywhere in the world through Sparkle's global backbone.
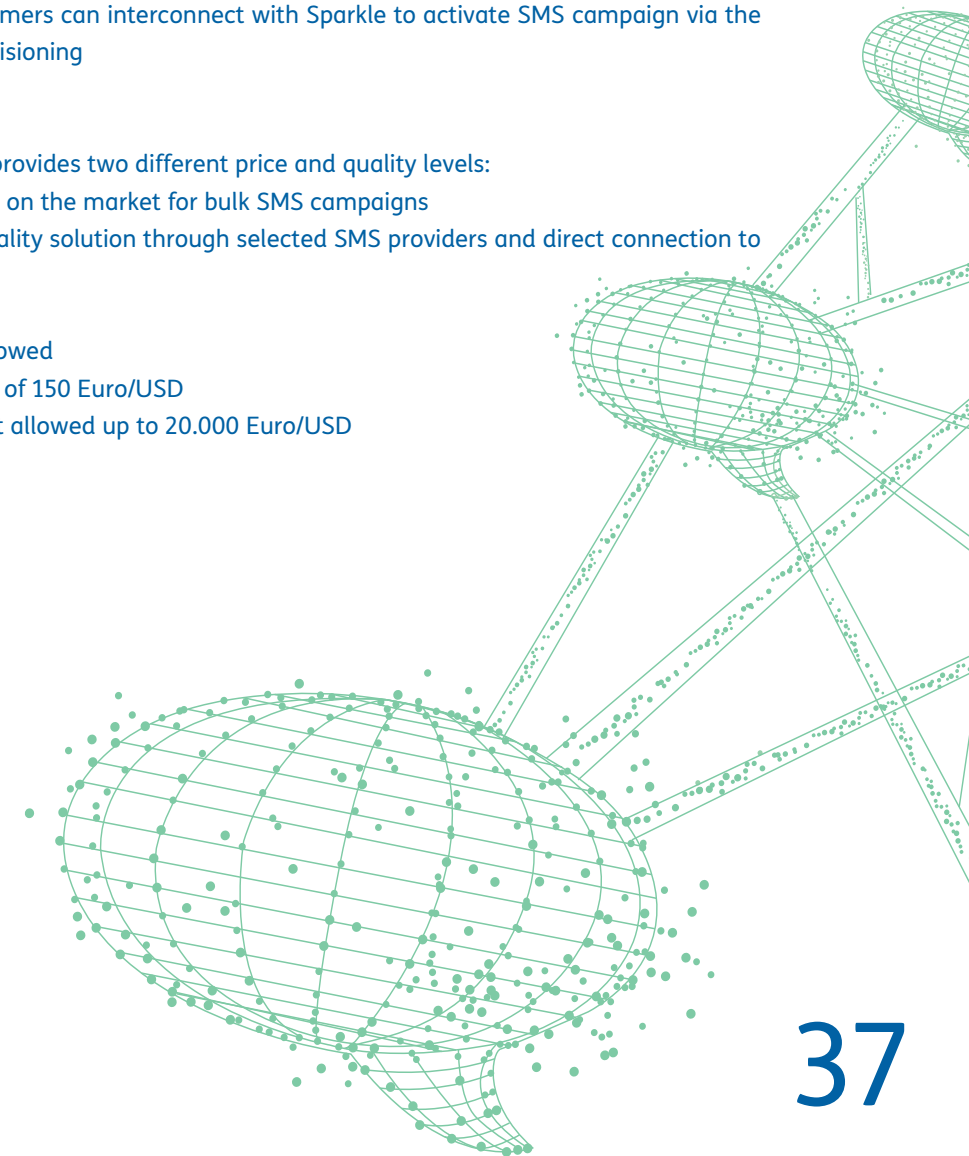
DESCRIPTION
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PRODUCT FEATURES
• Voice & SMS Express provides two different price and quality levels:
  - Silver: best least cost on the market for bulk SMS campaigns
  - Platinum: highest quality solution through selected SMS providers and direct connection to mobile operators
• Euro or USD currency
• 30 SMS per second allowed
• Minimum prepayment of 150 Euro/USD
• Maximum prepayment allowed up to 20.000 Euro/USD
• Real time Reporting

SPARKLE | **Global Satiro Training Program**

YOUR TRAINING OF CHOICE

VALUE PROPOSITION

The Global Satiro training program provides the key competencies required to recognize, strategize and respond quickly and successfully to the ever-changing environment of the international telecommunications market, through a wide range of learning and networking opportunities.

DESCRIPTION

Global Satiro consists of two unique and comprehensive in-class programs in collaboration with TIM HR Services. The program offers the knowledge for an in-depth understanding of the international telecom market and its dynamics as well as all the skills to maximize the value of technology and optimize its overall contribution to the business.
The program features two different in-class training sessions to choose from, depending on the participant's area of interest, whether technical or commercial.

TECHNICAL COURSE
Focuses on advanced Fixed and Mobile Network Technologies, Services and New Applications.

COMMERCIAL COURSE
Focuses on Business and Marketing Management of TLC Services.

Within each type of course, the following topics are covered, providing a comprehensive curriculum:
• Innovation, Change and Emerging Technologies
• Fixed and Mobile Networks technologies and services
• Management and Business Skills
• Market and industry intelligence

ADVANTAGES

The Global Satiro Training courses offer the right balance of knowledge, skills, strategic business analysis, creative thinking and networking to provide a well-rounded learning experience.

WHY SPARKLE

With over 10 years of experience in managing know-how transfer programs, Sparkle has trained around 100 delegates from international telecom operators, supporting them with the implementation of new technologies, the adoption of next generation networks, the development of new services and the globalization of their businesses.

SPARKLE | Global Partner
YOUR CONSULTING OF CHOICE

VALUE PROPOSITION

Global Partner offers structured consulting capabilities by sharing TIM Group's (formerly Telecom Italia Group) key assets and competences. Leveraging on its wide experience with international subsidiaries and customers worldwide, Global Partner's cooperation model is highly pragmatic and flexible and aims to guarantee a timely "back to work" approach.

DESCRIPTION

Unlike traditional consulting firms, Global Partner offers its extensive «hands-on» expertise directly through highly skilled line managers and experts with a multi-cultural approach, leveraging on TIM's solid and cutting-edge business processes throughout the value chain, its in-house development & customization capabilities, its wide portfolio covering all customer segments as well as its wide network of partners worldwide. Main excellence areas include:

LTE & Roaming
Best in class technologies, over €4.5bn investments in ultra-broadband in the next two years and 110 LTE roaming agreements in 60 countries worldwide. VoLTE Roaming to be launched 3Q of 2017.

OTT & Multimedia
Over-The-Top platform enabling delivery of Multimedia Content (VOD, live TV, music, e-books, games) through different devices (Set-Top-Boxes, Smart TVs, Smartphones/Tablets, Web, Windows 10 PCs, Gaming Consoles).

Broadband VAS
Innovative broadband and cloud solutions and modular packages that can be tailored to the stage of digital development to meet customers' growing demand for integration and personalization.

Cloud & Data Center
Highly scalable and flexible IaaS; secure, robust and scalable Cloud Storage, Backup and DRaaS solutions; self-management capabilities for Customers & Partners; advanced SaaS; Colo and Hosting capabilities, fully integrated with Sparkle's network services worldwide; Regional NGDCs (Next Generation DCs) in the Mediterranean.

Digital Agenda & Transformation
Enabling a digital ecosystem that meets social needs in accordance with the key principles of Digital Agendas. Supporting the acceleration of the digitalization process and the development of a digital citizenship by providing smart services in several sectors.

Smart City & IoT
Commitment in promoting sustainability through commercial offering and innovation activities and increasing experience in developing and implementing Smart City Infrastructures, with specific reference to, Mobility, Health, Quality of Life and Energy & Green.

R&D
With over 50 years of experience, TI Lab drives TIM technological innovation through the scouting of new technologies, the development and engineering of services, the design and implementation of application platforms, network platforms and network management systems as well as the testing of equipment, devices and solutions.

ADVANTAGES

Benefits of Global Partner's approach include:
- Revenue increase
- Lower time-to-market
- Improved efficiency
- Better quality of service
- Innovation best practices

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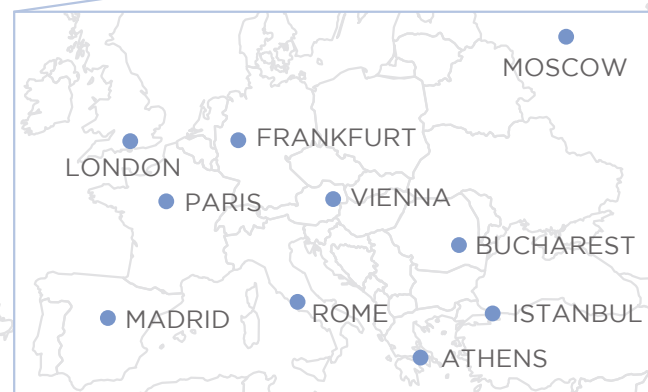F. +55 21 24292550

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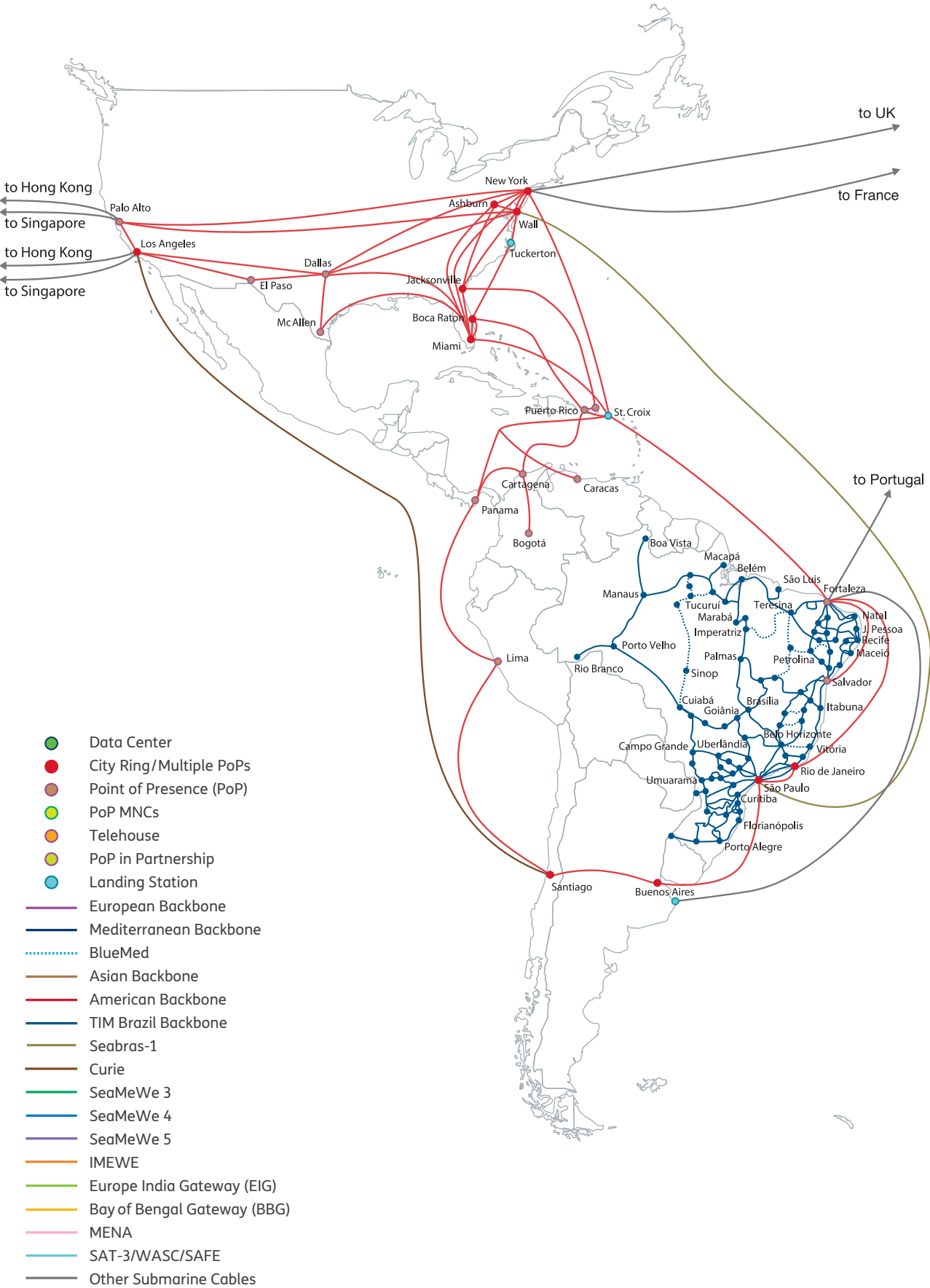T. +91 22 22843790
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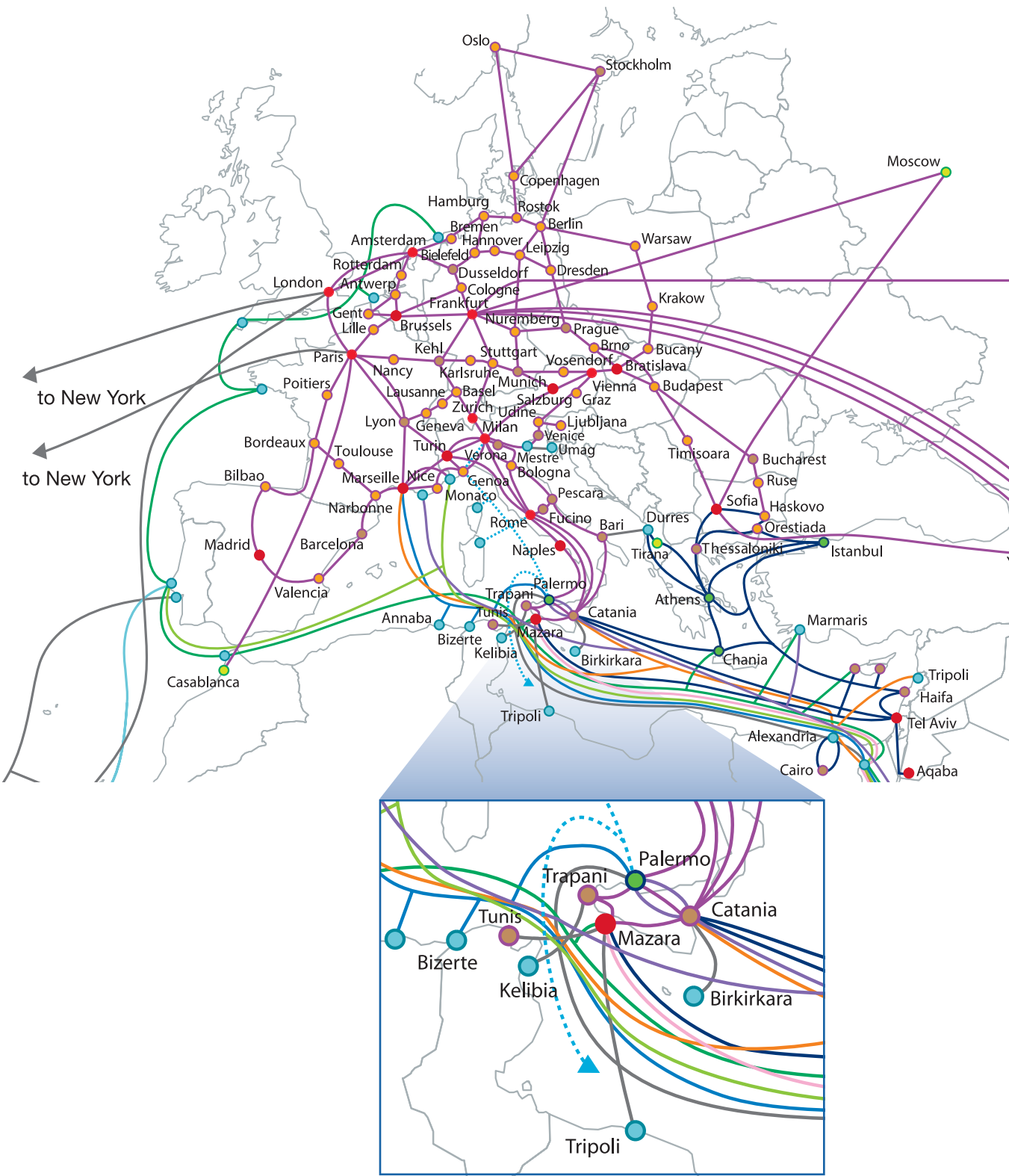F. +65 62358131

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Sparkle Global Backbone

American Backbone

European and Mediterranean Backbone

Legend:
- Data Center
- City Ring / Multiple PoPs
- Point of Presence (PoP)
- PoP MNCs
- Telehouse
- PoP in Partnership
- Landing Station
- European Backbone
- Mediterranean Backbone
- BlueMed
- Asian Backbone
- American Backbone
- TIM Brazil Backbone
- Seabras-1
- Curie
- SeaMeWe 3
- SeaMeWe 4
- SeaMeWe 5
- IMEWE
- Europe India Gateway (EIG)
- Bay of Bengal Gateway (BBG)
- MENA
- SAT-3/WASC/SAFE
- Other Submarine Cables

Europe, Middle East, Africa and Asia Backbone