SIMPLIFY SDWAN ADOPTION WITH MANAGED SERVICES

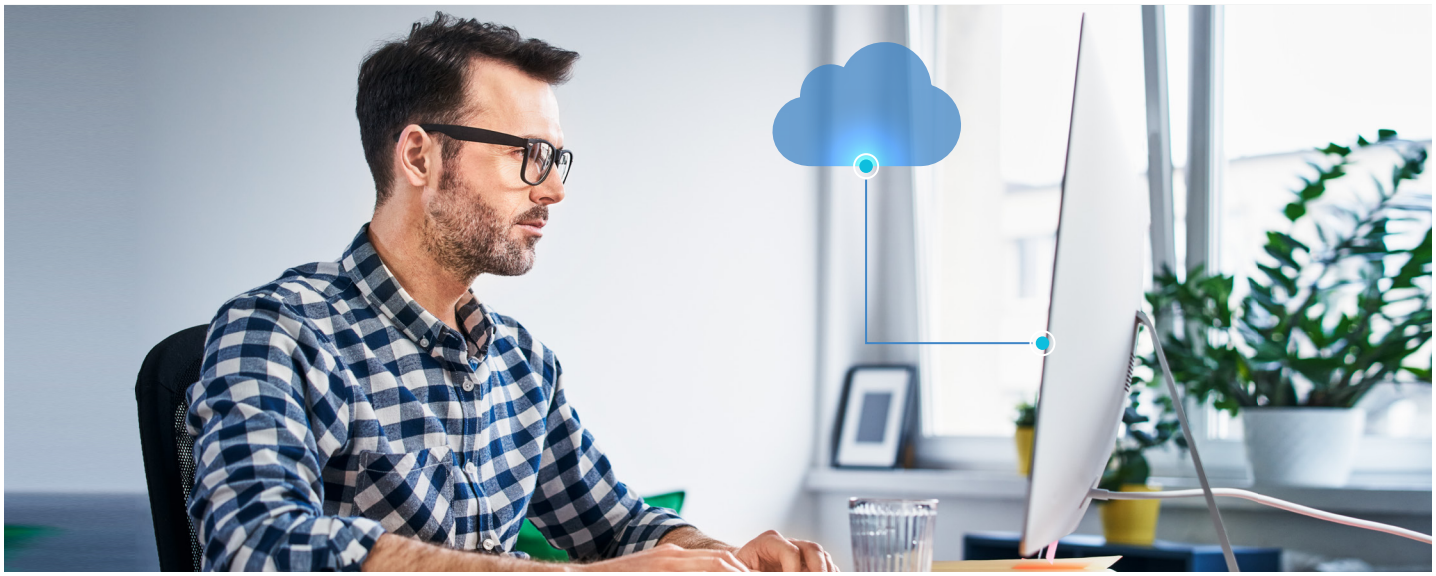


Table of contents

1. Introduction

With the emergence of new technologies and competing business models, today enterprises across the globe expect agility and scalability in IT infrastructure to acquire a competitive edge in their digital transformation journey. Network plays a pivotal role as a digital ecosystem enabler in this journey. Innovation in enterprise network is largely driven by separation of network overlay from the hardware. These innovations are broadly classified as SDWAN (Software Defined Wide Area Network) SDWAN technology is evolving with more capabilities being added to the networks, thereby enhancing their performance and security posture. Today enterprises expect quantifiable benefits from their investments in SDWAN technology: Enterprises look for an improvement of network performance by 50% while realising cost savings by 20% at an average, depending on the deployment architecture that they choose. With more than 50 vendors providing SDWAN overlay technology globally and multiple new vendors from adjacent industries entering the fray, the complexity of choosing the right technology is increasing. Complexity is driven by the need to seamlessly integrate with the customers existing architecture, distributed nature of the deployment and addressing regulatory and performance requirements and proactive management of the network.

Tata Communications approach to SDWAN involves effectively addressing these complexities across the different phases of SDWAN adoption journey to meet the customer objectives:

Network & service design -
Design a scalable, cost-effective network that enhances performance and user experience, while reducing the risk of security threats through our multi-domain expertise

Integration and delivery -
Seamless integration with existing enterprise IT investments and risk-free and time-bound turn up of sites with enhanced visibility through our transition frameworks, capabilities and Platform

Operations -
Simplify management of network infrastructure and ensure enhanced network uptime and visibility for enterprises

In this paper, we call out some of the critical challenges that enterprises face during SDWAN adoption to realise the optimal network performance and savings, while adequately addressing technical, operational, regulatory and implementation challenges, which determine the success of most SDWAN projects. The commonly encountered challenges along the implementation are largely around the complexity regardless of the scale of the project.

Our experience and successful track-record of executing network transformations over the past many years has helped us develop strong capabilities, proprietary tools and a structured approach to enable value creation for our customers. Tata Communications' IZO™ SDWAN provides an **OEM-agnostic solution with strong track record of deployment for customers across various industry verticals** such as manufacturing, banking, retail, aviation etc, enabling their networks to be more adaptable and flexible.

2. Network design and integration

Tata Communications' expertise as a digital ecosystem enabler allows us to methodically address various technical challenges commonly witnessed in large network transformations. Tata Communications has a highly qualified and globally present team of technical architects who are experts in designing flexible and scalable network solutions. Based on our experience undertaking large digital transformation projects, we have identified key challenges that enterprises face at the network design phase:

- Understand business objectives and translate them into enterprise network transformation strategy
- Designing a network architecture that requires seamless integration with the existing IT Infrastructure landscape
- Addressing the cloud application performance concerns
- Weaving the holistic security protection into the network solution
- Regional nuances and country-specific challenges

Tata Communications has invested in building capabilities to seamlessly address these complexities during network transformation.

2.1 Global solution with country-specific design

IZO™ SDWAN is available in over 190 countries across all major continents with direct engagement in each country. We have successfully delivered SDWAN solutions in 100+ countries till date. Our design and delivery experts are well-versed with various geographical nuances and the regulatory environment. Tata Communications has created reusable standardised design templates and infrastructures to address these complexities, which brings in agility in our design and delivery.

Case in point, China. Customer locations in China today have restricted Internet access to Rest of the Word (RoW) sites and resources as the Great Firewall (GF) of China is monitoring all the transit traffic passing through, leading to performance challenges at these egress points. This affects the end user experience due to high probability of packet drop of the encrypted traffic. To address this challenge, we have designed a customised overlay architecture in China region that has been rigorously tested and deployed for multiple customers. This design involves leveraging a private and dedicated NFV node in China. The detailed solution with traffic flows and sample use cases is illustrated in the diagram '**China solution deep-dive and use-cases**' in the Appendix section.

With our global presence that enables us to understand the unique local/regional complexities and our design plus deployment experience that addresses them with standardised solutions (in geographies such as Russia, South America, Middle East etc.), Tata Communications is well positioned to support enterprises with large global footprint in their network transformation journey.

2.2 Comprehensive network security

Tata Communications is a leading digital ecosystem enabler with capability and large portfolio of offerings across multiple domains such as network (WAN and LAN), security, cloud and collaboration etc. Our trained expert resources, supporting enterprises in their network transformations, bring these multi-domain competencies in designing networks that are compatible with our customer's existing IT architecture and tools. One of the key considerations in designing a network in today's environment is to reduce the risk of security threats across the network. Our solution ensures that due consideration is given to platform security while designing the network solution. All the modern security best practices in network transformation are followed to ensure a robust and secure solution for the enterprise.

Adding to our commitment to a secure design, Tata Communications leverages our secure SDWAN controllers which are DDoS protected with 21+ mitigation farms globally with 250+ Gbps of mitigation capacity. We have the capability to further enhance the security requirement with Tata Communications robust security offerings such as cloud based FWaaS, Secure Web Gateways, Cloud SOC services etc.

2.3 Seamless cloud connectivity

Tata Communications provide agile and performant connectivity to more than 100 cloud service providers such as AWS, Azure, GCP etc. We have positioned our SDWAN Cloud Service Gateway at 30 locations distributed across the globe to cater to the connectivity to these different cloud providers. The Cloud Service Gateways also works as regional exit points to Internet and SaaS providers.

With these regional service gateways, we can facilitate agile integration between SDWAN and cloud and internet exit points, thus ensuring better network performance and end-user experience with easier access to cloud services. The architecture is distributed across APAC, Europe, and North America as illustrated further in **Distributed cloud gateways** section in the Appendix.

Section at a glance

Addressing various technical design complexities in network tranformation with:

- Best-fit solution with country-specific designs
- Distributed cloud gateways for seamless access to cloud services
- Security-focused designs
- Better OEM connect

2.4 OEM partnerships and dedicated design labs

Tata Communications works closely with a diverse set of technology vendors. Our engineering team works in tandem with the vendor teams to develop expertise in these technologies so that we can design a robust solution for enterprises and ensure that we identify and resolve any potential complexity expected in customer environment. Our dedicated network labs undertake rigorous testing of any software upgrades/new features, during the pre-release stage so that our customers get a reliable and up to date solution.

Our experts are supported by Tata Communications' State-of-the-art multi-domain labs. This enables us to perform rigorous testing on product upgrades or security patches to ensure seamless experience for customers and also facilitate integration testing with third party solutions to validate any customer specific integration requirement.

3. Transition and delivery

Tata Communications has an unrivalled track record in delivering integrated network solutions to global organisations. We have deployed numerous circuits across the globe within the committed RFS. Some of the key statistics highlighting our global delivery capabilities and global deployments are detailed in the '**Tata Communications delivery key highlights**' section in the Appendix.. The core objective of our delivery teams is to ensure a risk-mitigated transition and on-time successful delivery. Through our legacy with networks, Tata Communications understands and solves the complexities and challenges during delivery. In our experience in deploying large-scale network transformation projects, in deploying few major challenges:

- Transparency and visibility on progress in delivery for the enterprises
- Supply chain fluctuations and other risks snowballing into operational delays
- Ability to leverage existing IT Infrastructure
- Challenges in defining policies and understanding their implications on different applications
- Lack of verification and testing post installation

The key to address the above-described challenges is to work closely with our customers as partners in the network transformation journey through discovery and planning phase. In our experience, we have identified few critical factors to consider during the current network environment discovery that are important to understand prior to project implementation:

Application bandwidth requirements, their traffic flows and priority

Existing LAN configurations in each site

Security service, design and technology/OEM

Traffic routing and protocols

These information are vital to provide a first-time right migration. We make it possible through clear documentation of migration approach and testing plans for the various site types. With our experience in successfully enabling large deployments across industries, Tata Communications can facilitate appropriately in the discovery journey and handle any exceptions that could be expected during the deployments.

Tata Communications delivers projects based on standard principles from Project Management Institute Body of Knowledge (PMBOK). This is augmented by our proven governance structure and communication plan between both the parties which provides complete visibility and allows easy monitoring to ensure a good working partnership. With our extensive experience in deploying SDWAN solution with diverse access technologies, application landscapes and security requirements, we have standardised our best practices and toolkits. This standardisation helps us successfully addresses these complexities and challenges that are common to all SDWAN deployments irrespective of the scale. Some of the key practices which Tata Communications follows for ensuring successful implementation are as follows:

3.1 Test and validate

In Tata Communications delivery approach, **Technical Design Authority (TDA)** plays a key role delivering complex, and bespoke customer solutions. Our TDA ensure a thorough understanding of customer estate, current performance, pain points and future requirements.

Based on the analysis, customised migration document is prepared which considers the site type, criticality, application landscape, traffic routing, security set-up etc. We have proven configuration templates to support multiple common customer requirements. The TDA's role is to ensure all services interoperate and integrate into the customer network environment. TDA leverage our engineering experts to undertake integration testing of key IT infrastructure that are part of the customer IT landscape at our multi-domain labs to identify and resolve any potential challenges.

The key goal is network stability. Relevant testing plans including fail-over tests, QoS tests etc. are developed to achieve this goal. This plan is followed for every site to ensure first-time right deployment across the estate.

3.2 Design and pilot phase

The most critical phase of implementation which determines the success of the overall program is the design and pilot phase. In the design phase, the entire network estate is closely studied to identify unique site types based on site priorities, different application configurations, business requirements etc. This helps in building standard configuration templates and testing plans for every unique site type. Our technical experts and subject matter experts from various domains are involved in this exercise along with the project management team.

These standard templates and plans are tested during pilot site deployments to verify optimal performance as per pre-defined requirements. The pilot sites are selected along with customer ensuring that all possible services, configurations and use cases are covered. This reduces complexities and ensures faster roll-out of subsequent sites.

3.3 Global delivery experts

As can be seen in our delivery team organisation structure in the section **PMO team global locations** in the Appendix. Our teams are aligned to smoothly support global deployments.

We have regional presence of project management resources to coordinate with regional business teams and handle regional nuances and complexities. This is further supported by a **Global Delivery Centre of Excellence** head quartered in India comprising of program managers, delivery managers, transition experts, risk managers, configuration team, IT leads, technical leads etc. Our teams provide flexibility, scalability and agility to support deployments of any size and complexity support for quicker deployment.

We also have various regional partners present across the world to provide the necessary last-mile support in deploying the solution.

Section at a glance

Addressing various implemetation complexities in network transformation with:

- Strong delivery and pilot phase to pre-empt challenges in subsequent roll-out
- Structured migration and testing for minimal business disruption
- Risk-mitigated delivery approach
- End-to-end implementation visibility
- Global delivery capabilities and partner ecosystem

3.4 Risk-mitigated delivery approach

Another key feature is the risk-mitigated delivery approach. The main objective of our risk-mitigated approach is to assess and score the risk-profile parameters in customer's environment to develop a suitable risk mitigation plan to **ensure on-time delivery**. The biggest advantage of this framework is the speedy resolution of anticipated risks before they snowball into operational delays and irreversible cost escalations. The governance structure deployed to have periodic interaction/touch points with the customer helps build much required confidence required for large transformation projects.

3.5 Implementation visibility

In order to provide complete transparency to the project implementation, we have customised **project tracker dashboards and Power BI reports** that are made available to our customers. The project tracker dashboard gives complete visibility of project team, circuit details, circuit delivery dates, RAG status etc. The data from the dashboard can be summarised and made available regularly in form of power BI reports. This ensures easy accessibility, tracking and monitoring of the project implementation end-to-end.

4. Service operations

Customer experience and engagement is one of the core themes of Tata Communications' strategy and we are continuously seeking ways to re-imagine customer experience. Our **NPS score for 2021 is 80** which puts us in the top quartile in the global industry across sectors. This is a clear indicator of our customer centric approach to operations through our capacity and ability to be agile, collaborative, and tenacious while addressing the challenges. The key challenges that customers face during this phase are:

- Predict and proactively solve issues to reduce network downtime
- Determine and resolve the root cause of incidents
- Break-fix support and management of third-party network in monitoring, reporting and follow-ups for resolution
- Management of multiple vendors and service providers related to their network estate

Some of the key pillars of our success with service operation are:

4.1 Service desk

Tata Communications **Multi-Service Desk** with multi-channel access provides enhanced experience to the ongoing operations of customers. It can be accessed via phone, email, customer portal or e-bonding. Some key operations metrics are illustrated in **Tata Communications service support key highlights** section in the Appendix.

Using **ITIL best practices**, the Service Desk supports the successful ongoing operations of customer solutions, in line with their business demands and with minimal impact on business operations, thus ensuring that agreed levels of service quality are maintained.

The Multi-Service Desks operate from Pune and Chennai in India in active-active mode, 24*7. This is supplemented by in-region support through Service Desks in UK and Montreal. The Multi-Service Desks mainly supports English language, however based on customer requirements local language support in French, Spanish, Mandarin etc can also be provided during business hours.

4.2 Tools and technology

Our Multi-Service Desks utilises plethora of tools, technologies and platforms to provide unified visibility and control across multiple technologies.

APIs -
We have a best-in-class API management platform to host service management RESTful APIs that allows for ITSM e-bonding with our customers for processes such as Incident Management, Planned Works and Configuration Management Database. We also use APIs to bond with our partners and suppliers which allows us to resolve issues faster.

Pro-active monitoring and correlation of underlay and overlay events -
Tata Communications provides 24*7 pro-active network monitoring with our in-house propriety engine – TCx. This contains correlation and discovery mechanisms that analyses and corelates the underlay and overlay data to automatically raise tickets in ITSM if a pre-defined threshold is breached. Currently we achieve 95% proactivity ratio for priority one tickets.

Auto-diagnosis with ML -
We have deployed ML-based tools that allows for automatic fault diagnosis and isolation without human intervention, reducing the turn-around time for first level analysis to less than 6 Mins, which helps in faster resolutions of the incidents.

Next-gen self-service customer portal -
Acting as a 'Single Pane of Glass', this intuitive platform provides end-to-end visibility of all services and enables easy access, monitoring and tracking.

4.3 Partner eco-system and third-party management

Tata Communications has a huge ecosystem of partners, suppliers, and OEMs with whom we have share a longstanding relationships. This includes relationship with more than 800+ partners globally. We have developed a detailed on-boarding system for network providers that allows digital integration, easy governance, management and tracking of services. The complete business integration is enabled through our TCx platform that consists of in-house developed tools and capabilities. It includes deployment of APIs, BOTs and ML which helps in automating processes and better handling of ticket transactions with partners.

We currently manage 50,000+ third-party circuits across the globe for different services. This includes end-to-end service management with the help of our monitoring tools that allows us to identify and isolate issues on these circuits as well.

Section at a glance

Showcasing service support capabilities to support large network transformation with:

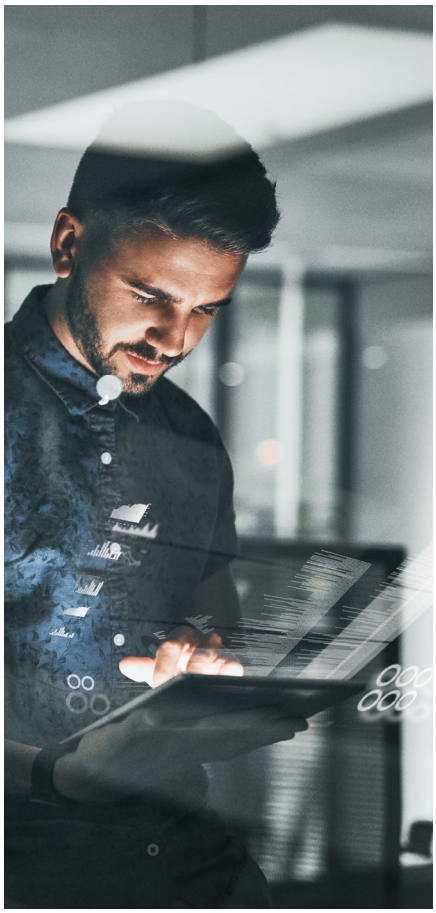
- Multi-service desk and its capabilities
- Tools and technologies leveraged for 24*7 pro-active support
- TCx Platform for complete visibility
- Third-party management
- Global Ecosystem of vendors, suppliers and partners

5. Conclusion

While enterprise network transformation journeys are complex, it is critical to consider multiple dimensions of complexities that may arise. Enterprises require a partner with the right capabilities and experience to solve these complexities and deliver a robust network. This document intends to provide a view of Tata Communications' capabilities, proprietary tools and a structured approach that helps in holistically addressing these complexities involved in a large-scale network transformation.

Our capabilities to deliver these transformations are validated by many reputed Industry Analysts: Being positioned as a Leader in Gartner's 2021 Magic Quadrant for Global Network Services for the eighth consecutive year is one of the reasons why enterprises across multiple industry verticals, including multi-national banks, entrust us with their global network requirements and transformations exclusively.

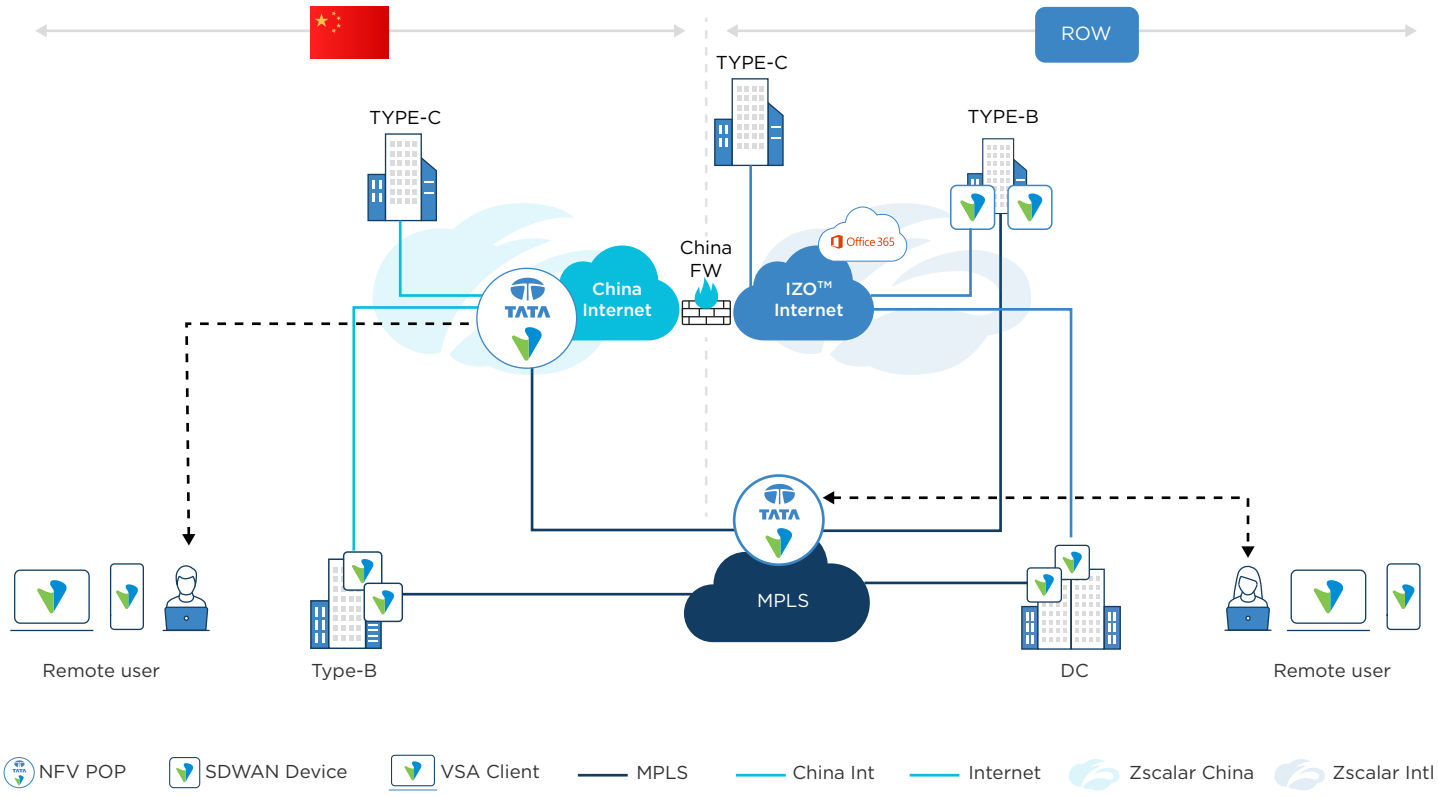
While the objective of the document is to expound the diverse challenges faced by enterprises in this journey, it highlights Tata Communications commitment and drive to deliver value across the different stages of the project lifecycle – technical design, implementation and service support. A combination of all these results in an agile and scalable solution with enhanced return on investments and minimal cost overruns due to optimal network performance, on-time delivery and superlative service support.



6. Appendix

China solution deep-dive and use-cases

The overall solution design for China is illustrated as shown below:



Tata Communications proposes a private and dedicated NFV node in China.

The Dedicated NFV will have the following main functions:

- SDWAN Gateway (CSG)
- Hierarchical controller (HC) – A local copy of controller is installed within the NFV POP for uninterrupted control plane communication. Sites on internet face issues communicating with controller hosted outside China through the Great Firewall
- Private MPLS connect to China region bypassing GF for inter region site to site traffic flows.

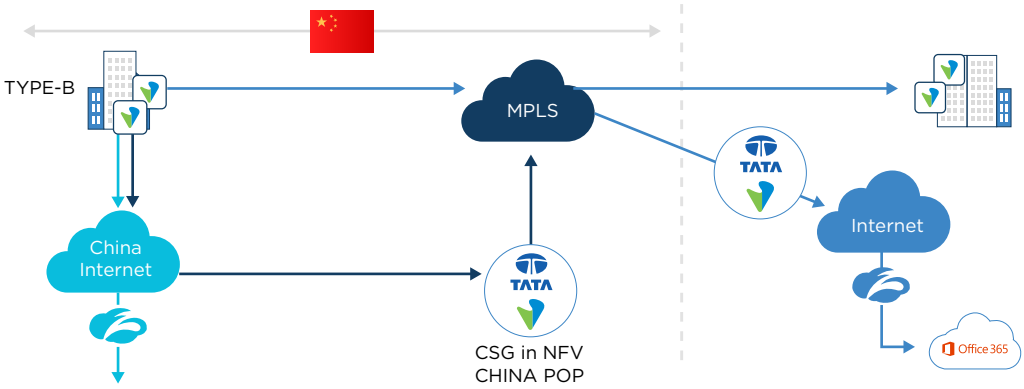
  (Regulatory aspects to be considered)

The following remains the same as ROW design:

- Type B sites and DC – SDWAN device on premise
- Type C connect to Tata Communications' Cloud SDWAN POPs
- Versa remote access for remote users
- Edge security will be provided by the secure SDWAN boxes
- Cloud security for all site types and remote users provided through Secure Web Gateway (Zscaler) solution

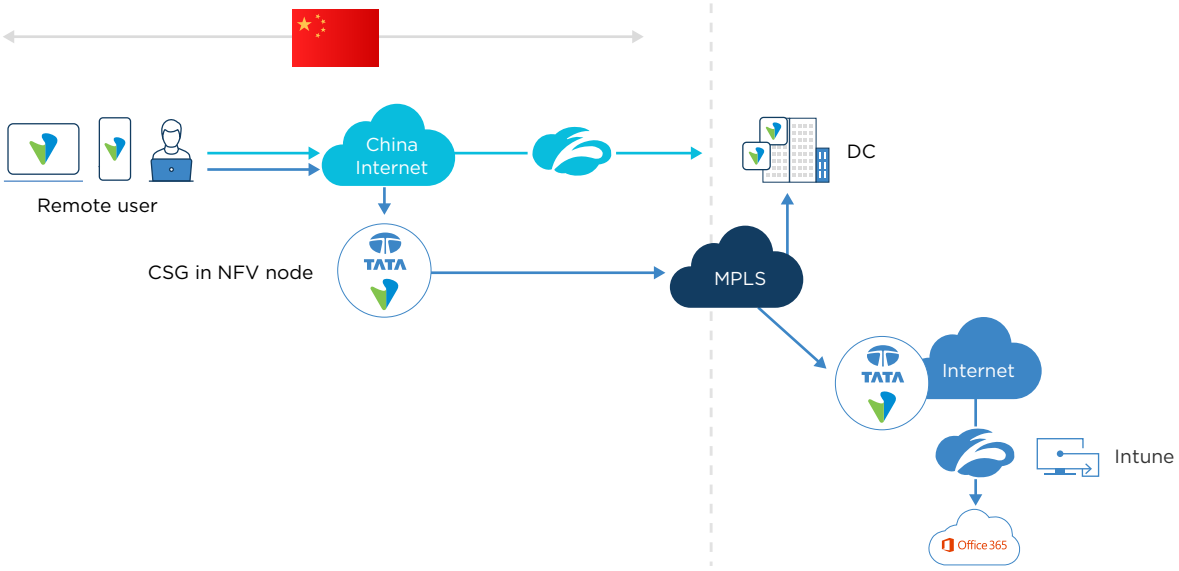
Sample use cases on China site traffic flows

1. China: Traffic flow: DC and type B sites



Source	Destination	Primariy path	Backup path	SDWAN	Security
Site Type B	DC hosted apps	MPLS backed by Internet	Remaining path	On-Premise	SDWAN device
	Cloud apps (private)	MPLS backed by Internet	Remaining path		SDWAN device
	Office 365 & SaaS	MPLS backed by Internet	MPLS + CSG		SDWAN device + SWG worldwide
	Internet browsing	China Internet	MPLS + CSG		SDWAN device + SWG China

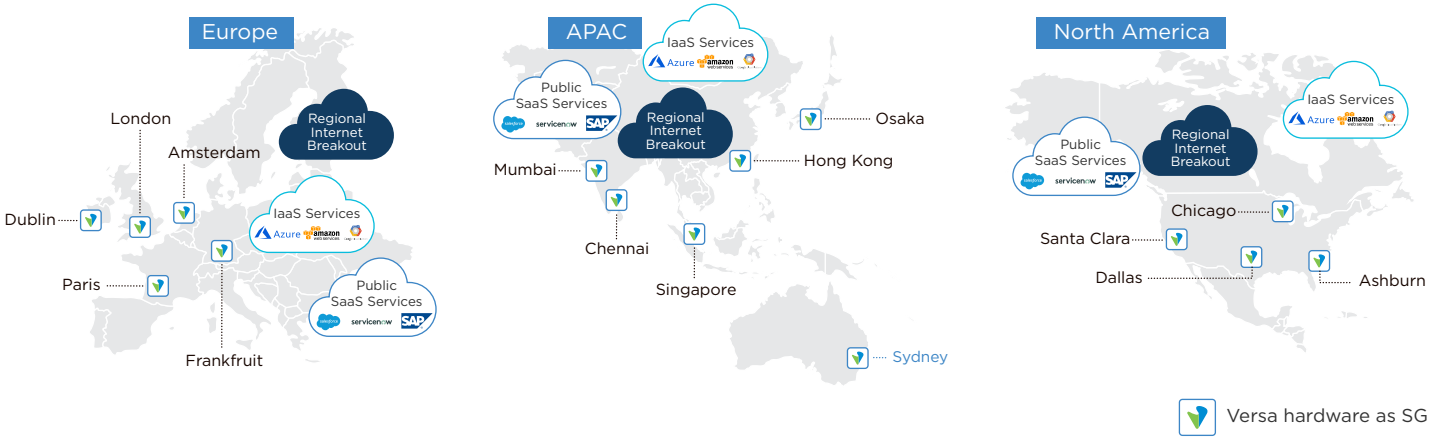
2. China: Traffic flow: remote users



Distributed Cloud Gateways

The SDWAN Overlay is designed considering the service gateways to serve locally for Internet, IaaS and SaaS based traffic. It is essential to select the ideal service gateway locations for a particular customer to provide optimal end user experience. For example, users in North America, when accessing any SaaS application, it would be ideal to steer the traffic via the service gateways in that region for better application experience. Therefore, deliberate care must be given in designing the overall SDWAN solution that fits well for particular customer requirements.

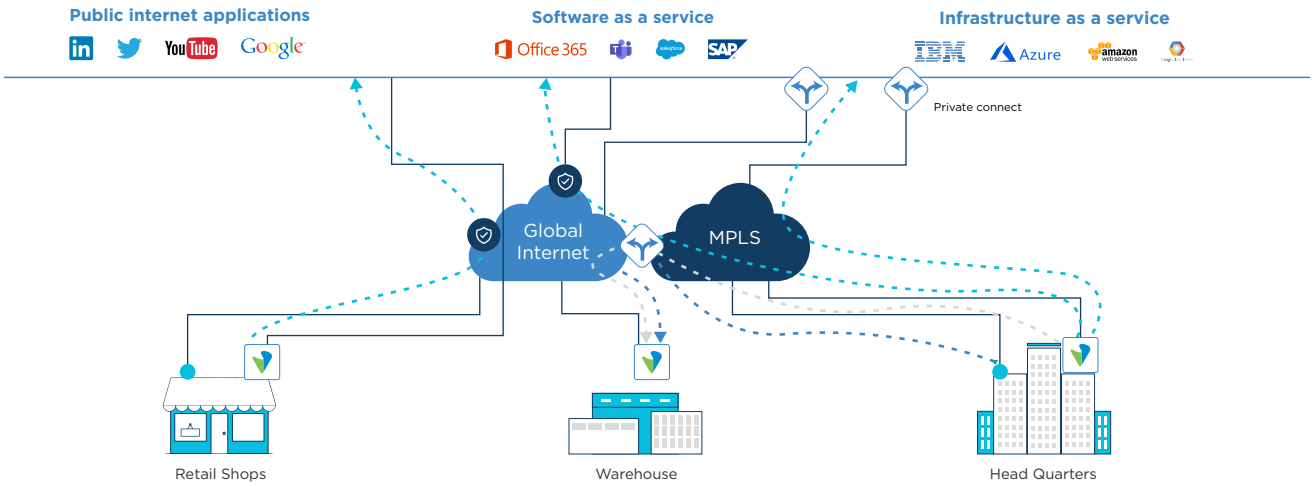
Tata Communications Cloud Service Gateways across 20+ locations is one hop away from major cloud providers and SaaS providers. The gateways across three regions – APAC, Europe and North America are shown below:



Service Gateway Technical Use Case

- Gateway to Cloud Service providers (IZO™ Edge/IZO™ Private Connect)
- Gateway to Regional Internet and SaaS services (direct or via SASE gateways)
- Gateway between SDWAN Select Sites on different underlay platforms
- Gateway to Non SDWAN traditional sites

The diagram given below is a representation of a typical SDWAN customer environment with the traffic flows use cases given above.



LEGENDS Cloud Web Secure Gateway SDWAN Cloud Web Service Gateway GVPN Platform (Traditional Cisco CPE) Versa SDWAN CPE

Tata Communications delivery key highlights

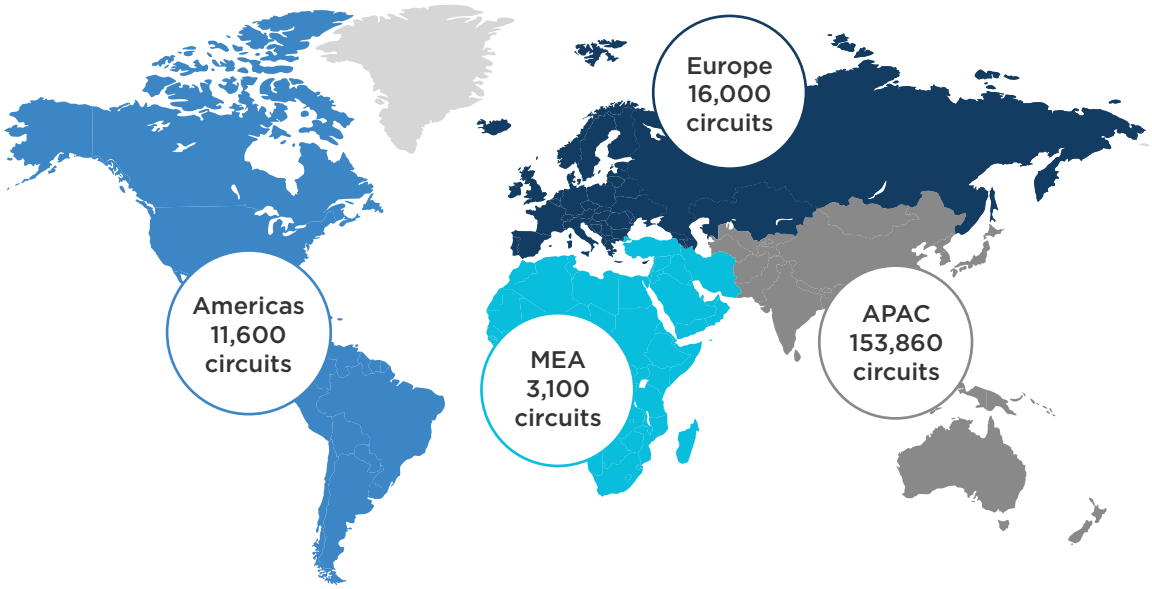
FY21 key highlights

85% Delivery net promoter score

99.8% First-time right deployment

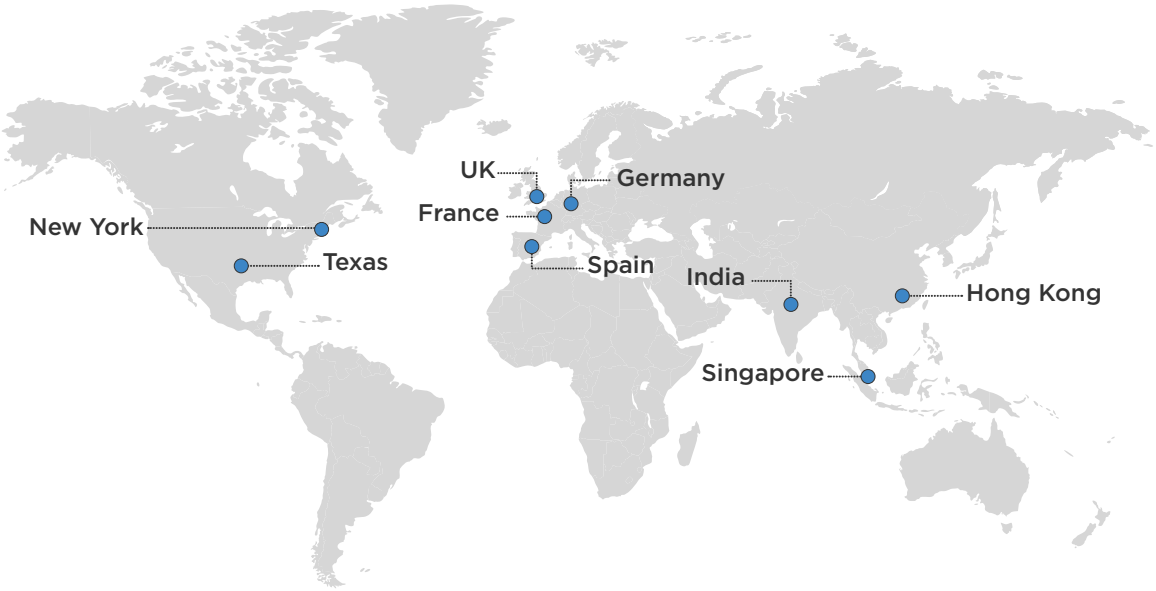
The following diagram demonstrates the total circuits Tata Communications has delivered globally:

Total circuits delivered globally



Following diagram highlights the global presence of the Tata Communications PMO team and location of key personnel on the global map:

PMO team global locations



Tata Communications service support key highlights:

4
Global Service Operations Centers

195+
Countries Served

300+
Network Partners

1500
Change request executed by per month on average

4000+
Technical Service Support Experts

38,000+
CPEs currently managed by the service desk

60,000
Tickets handled by service desk per month on average

95%
Incident identified proactively

95%
Calls responded with 10secs

For more information, visit us at www.tatacommunications.com

Contact us