

MOBILITY SERVICES

LAUNCH 5G ROAMING WITH A TRUSTED PARTNER

ACCELERATE YOUR MOVE TO 5G ROAMING, IMPROVE YOUR SUBSCRIBERS ROAMING EXPERIENCE, AND SIMPLIFY OPERATIONS WITH TATA COMMUNICATIONS ROAMING SERVICES



PROTECTING YOUR MOBILE NETWORK INVESTMENT

Deploying a new generation roaming service is an expensive undertaking both in terms of time and effort, especially when you consider the need to maintain 3G / 4G network combinations for several years as your subscribers migrate to 5G.

Tata Communications 5G Roaming Service streamlines roaming interconnect arrangements between 5G ready mobile network operators. Our solution replaces the need for hundreds of meshed peered associations with a single, manageable centralised interconnect point for signalling and roaming.

SIMPLIFY THE MOVE TO 5G ROAMING, WHILE KEEPING YOUR COSTS UNDER CONTROL

Our 5G roaming service is built to simplify and efficiently add roaming relationships with connectivity to hundreds of roaming partners, throughout the world. We solve network management complexity by greatly reducing the number of network peer associations to only two, thus minimising your cost of roaming operations. Routing and transport become simple and straightforward, benefiting from Tata Communications' Diameter Signalling Exchange (DSX) and IPX Connect, hosted on our industry-leading global IPX network.

Key Benefits:

Reduce risk, cost and time to market with a managed service approach.

Ensure success with seamless provisioning and rapid trouble shooting via end-to-end inter operator connectivity testing

Improve reliability and reduce cost and risk with fewer roaming associations required with LTE and 5G partner networks

Improve roamer satisfaction with quality and availability backed by robust SLAs, 24x7 support desk, proactive monitoring and global network with industry leading uptime

Guarantee easier partner service compatibility and subscriber QoE with support of protocol inter-operability between current and legacy transports

IMPROVE YOUR SUBSCRIBERS ROAMING EXPERIENCE

Network quality and resilience is crucial. Every hour of downtime in a roaming service means the potential loss of hundreds or thousands of customers to your competitors. Carrier-grade reliability is achieved through Diameter routing mated pair node technology with concurrent local and geographical redundancy. Through our topology hiding feature, security and availability are enhanced as our service architecture hides the 5G core network from external security IP threats and DDoS attacks. Combined with proactive monitoring, 24x7 technical support and carrier class availability, your subscribers receive resiliency, uptime and performance - safeguarding against any signalling storm that could result in service deterioration or potential network failure.

FAST TIME TO MARKET

Tata Communications offers you a means to fast-track your 5G roaming service deployment, streamline 5G roaming connectivity cost effectively, and quickly scale roaming operations as the number of roaming partners multiply. You can reduce time to market with single end-to-end service management and delivery for Voice, SMS, Data roaming and mobile signalling, including provisioning, end-to-end inter-operator connectivity testing, and troubleshooting.

TATA COMMUNICATIONS ROAMING SERVICE

Comprising our Diameter Signalling eXchange (DSX) platform and IPX Connect service for international roaming. We provide an integrated roaming solution for subscriber mobility management, authentication (S6), policy control (S9), and payload transport (S8) between your network and hundreds of roaming partners. Tata Communications provides an all-in-one offer supporting legacy 2G/3G through 4G/LTE and 5G roaming, all within one solution framework, providing you with a scalable upgrade path to 5G-NSA and 5G-SA, along with the ability to support multiple roaming services across a single managed carrier-grade IPX connection.

TATA COMMUNICATIONS ROAMING ADVANTAGE

Using Tata Communications global IPX network with its market-leading reliability, service availability and reach ensures you work with a partner with decades of mobile roaming experience. Tata Communications roaming service is backed by the experience of operating the world's largest mobile signalling on-net network for critical applications for mobile network operators worldwide. Roaming partners are continually being added, further expanding the global reach for your 5G roaming subscribers. Tata Communications operates the largest cable submarine system providing a solid and unparalleled backbone for IPX and LTE Roaming. You benefit from Tata Communications' ability to configure IPX network services to specific requirements, with the added benefit of being able to quickly add capacity as needed. With full visibility of both the application and physical network layers, Tata Communications can quickly and effectively troubleshoot and resolve issues.

TATA COMMUNICATIONS 5G ROAMING LAB

Tata Communications' cloud-based 5G roaming lab has been established in Frankfurt for you to run POCs for your 5G-SA roaming interconnects. The lab is deployed with a SEPP (Signalling Edge Protection Proxy) network node, for interconnection between MNOs. SEPP is used in mobile networks, to provide security and protection for signalling traffic. The primary purpose of a SEPP is to protect signalling interfaces from various types of attacks and unauthorised access. SEPP works on HTTP/2 protocol which is widely used in 5G technology.

Accessing the Tata Communications lab, as a 5G network-ready MNO you can test a range of 5G Roaming use cases, including 5G Registration, 5G internet browsing etc, with secured HTTP2 over TLS signalling protocol. You can test Inter PLMN HTTP2 Signalling message forwarding for both inbound and outbound 5G Roaming customers in the lab before launching commercial traffic, thus avoiding 5G roaming service-related issues after the commercial launch of 5G-SA Roaming with your roaming partners.

VISIBILITY AND CONTROL WITH ROAMPULSE

Roampulse helps you manage and assure subscribers and services across your mobile network, with end-to-end visibility of customer experience, helping identify opportunities to reduce cost of operations and improve customer experience.

Mobile network data is captured in real-time, pushed through mediation for conditioning, and served to the Roampulse service assurance and troubleshooting applications. Our probing solutions, (both physical and virtual), derive detailed insights at subscriber, device, service, and network-level, from underlying 2G through to 5G networks.

Combining a comprehensive network view, with dependable workflows, using Roampulse helps you to reduce troubleshooting complexity and costs while building a more business-focused approach to managing your mobile roaming business and your subscriber roaming experience.

MANAGED STEERING OF ROAMING

To deliver a consistently excellent service to your 5G roaming customers, you have to invest in managing and executing your roaming agreements - all the way from testing and implementing services through to steering of roaming.

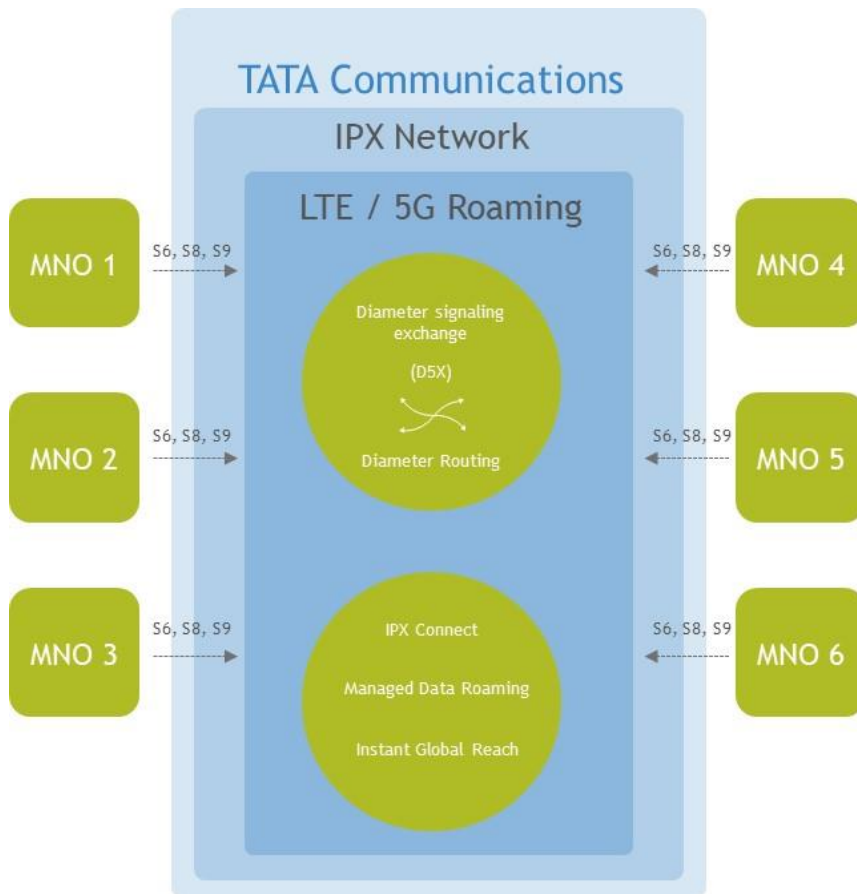
Our Managed Roaming Service lets you simplify your steering strategy and operational overheads while introducing introduce efficiencies into your processes. Tata Communications' managed, turnkey and cloud-based solution is delivered over a fully redundant, carrier-grade infrastructure, hosted on our Diameter signalling network and supported by a global team of signalling and roaming experts.

DATA ROAMING BOOST

Mobile roaming revenue is under pressure. Locally purchased SIM usage, Wi-Fi and Multi-IMSI solutions erode the roaming revenue base. In future eSIM profile switching will have an impact as more handsets are released supporting eSIM. Customer expectations for borderless mobility service are rising with their need to stay connected anytime, anywhere. Profit margins are under pressure from competition, regulatory mandates and price erosion.

Tata Communications' Data Roaming Boost lets you expand your roaming revenue by offering a superior "roam like at home" user experience at a lower cost. By reducing the unnecessary backhaul and associated latency, the service reduces churn, promotes roamer engagement and grows revenue with targeted service packages.

TATA COMMUNICATIONS LTE AND 5G ROAMING SERVICE OVERVIEW



Key Features:

Support S6, S8, S9 interfaces

Load balancing & congestion control

Inter-working across different Diameter Agent implementations

Underpinned by global IPX network

Real-time monitoring of Diameter signalling traffic and reports on roaming service

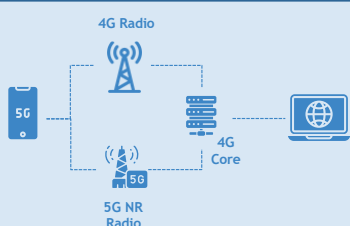
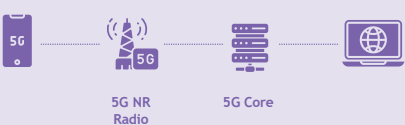
Flexible QoS supporting mix of up to 6 classes of service

Conforms to all GSMA IR88, IR77, and IR34, 3GPP TS 29.272

Combining Diameter Signaling Exchange (DSX) with Tata Communications IPX Connect:

- Available from 74 On-Net PoPs in 40 Countries
- Service levels exceeding requirements of GSMA IR.34
- Full compliance with all relevant GSMA PRDs (IR.88, IR.77 etc.)
- Network topology hiding, removes external security threats
- Inter-working capabilities include Diameter signalling manipulation
- Includes traffic congestion control & load balancing, for enhanced QoE

TATA COMMUNICATIONS 5G ROAMING SERVICES OVERVIEW

5G NSA - Non-Standalone		
	MNO Challenges <ul style="list-style-type: none"> Acquire licenses for 5G Implement 5G Radios and increase bandwidth to support 5G No need to sign new agreements for roaming, existing LTE roaming agreements can continue 	Our solutions for scalable implementation <ul style="list-style-type: none"> Plug and play solution as same roaming architecture to LTE Increase bandwidth to support additional 5G usage
5G SA - Stand Alone		
	MNO Challenges <ul style="list-style-type: none"> Implement new core for 5G Identify new providers for 5G SA Signaling Sign new agreements for 5G roaming, Conduct new tests for 5G SA roaming 	Our solutions for scalable implementation <ul style="list-style-type: none"> Implement new signaling protocol to support 5G Hosted SEPP deployment Evolving Roaming hub solution to manage and support 5G agreements Increase IPX bandwidth Set up peering to support 5G SA

ABOUT TATA COMMUNICATIONS

A part of the Tata Group, we are a global digital ecosystem enabler powering today's fast-growing digital economy in more than 190 countries and territories. Leading with trust, we enable the digital transformation of our enterprise customers globally with a range of mobile, MVNE, IoT, CX, unified communications, cloud, security international voice and data services.

Tata Communication has been providing mobile roaming services for many years and is a leading carrier of 2G/3G/4G/5G Roaming Signalling Services in 200+ countries and territories. Worldwide access to ~600 MNOs for data and voice services provides a natural edge to TATA Communications' roaming credentials. Our 5G Cloud-based testing centre in Frankfurt helps our MNO partners test and implement 5G Roaming Proof Of Concepts and Roaming use cases. In addition to the 5G Roaming lab, the recent release of our VoLTE Interworking Solution adds VoLTE Roaming and Interworking capabilities to enable Voice and SMS services for Inbound Roamers of MNOs shutting down 2G-3G networks.