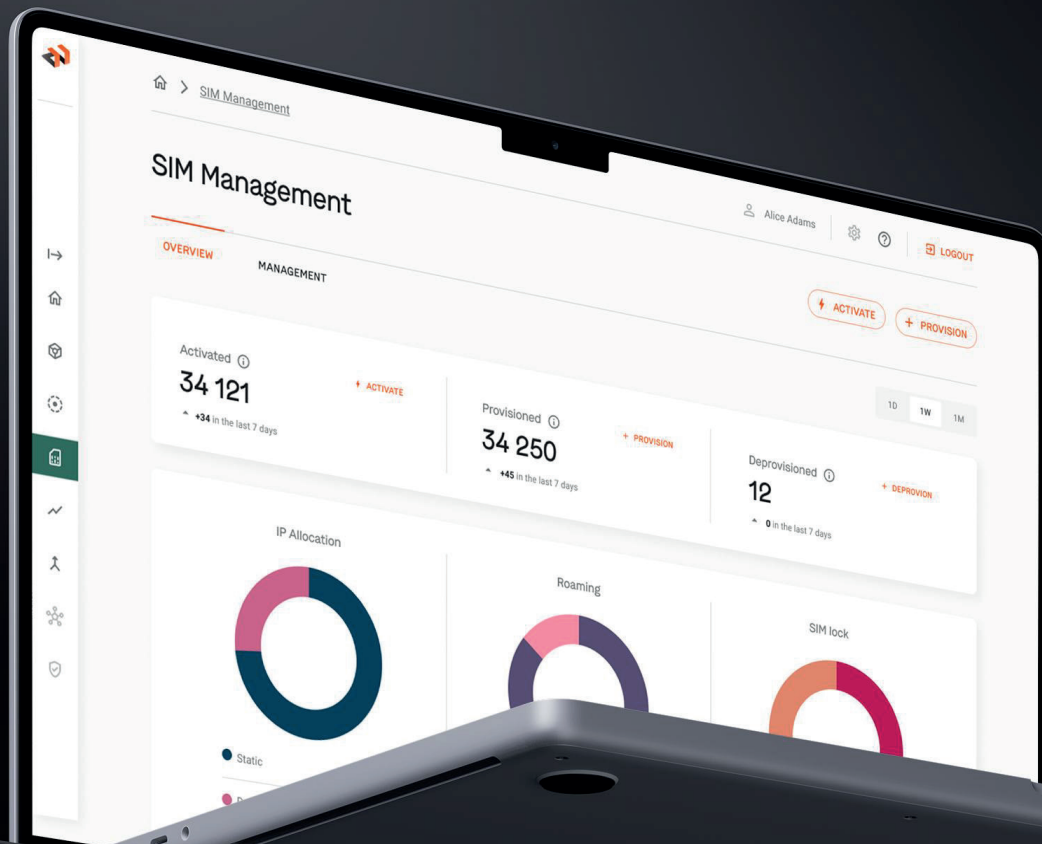




SIM Management and Device Onboarding





SIM Management and Device Onboarding Challenges

As private LTE and 5G networks transition from the pilot stage to fully operational networks, several challenges have emerged in SIM management and device onboarding. For cellular devices, the scale of onboarding new SIM cards in bulk with multiple profiles presents significant difficulties. The lack of automation processes around sim provisioning and activation leads to manual processes prone to human error, requiring meticulous coordination among network, operations, and security teams.

Additionally, there is a notable absence of device context and a lack of SIM-to-device correlation, which complicates the onboarding process and leads to many inefficiencies. This is particularly costly for network teams in terms of manpower, as they cannot delegate the tasks of provisioning and activation to operational teams. Provisioning and activation of SIM cards requires sensitive access to the operational network cellular core. When such access is granted manually, risk is imposed on the operational network. Enterprises rely on manual scripts and procedures, increasing the risk of human error and consuming valuable resources. The complexity inherent in these methods often overwhelms private cellular teams, preventing them from focusing on their core responsibilities

Challenges in Onboarding Cellular Devices:



Scale

Inefficient onboarding large amount of new SIM cards with multiple profiles continuously.



Lack of Automation

Manual, human error prone process.



Responsibility Delegation

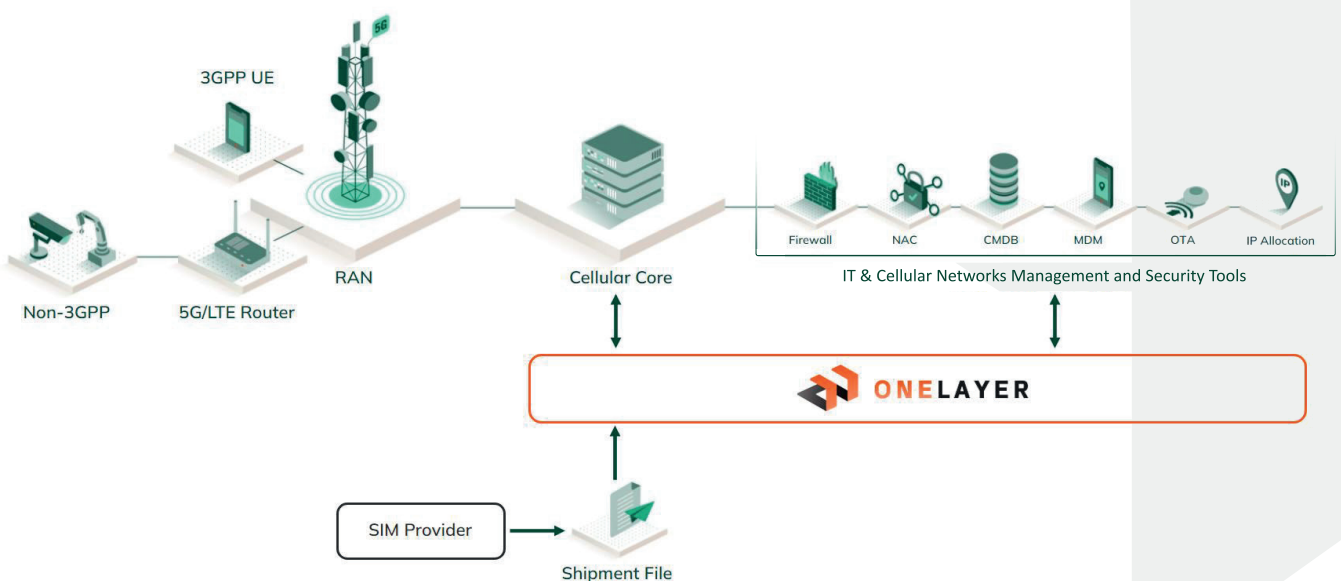
Requires Network, Operations and security teams' involvement and ability to delegate task.



Device context

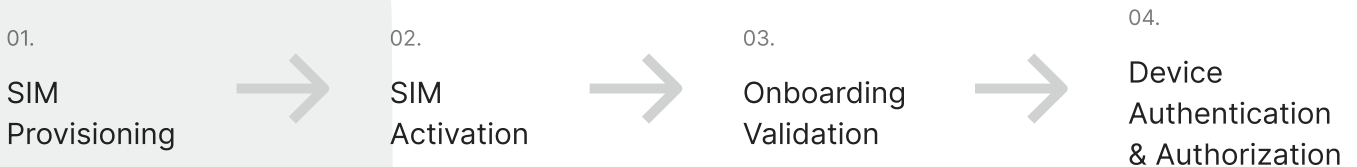
Lack of Device context and SIM to device relationship, e.g., to overcome issues of miscorrelation between SIM profile and device type.

OneLayer Solution High-Level Diagram:



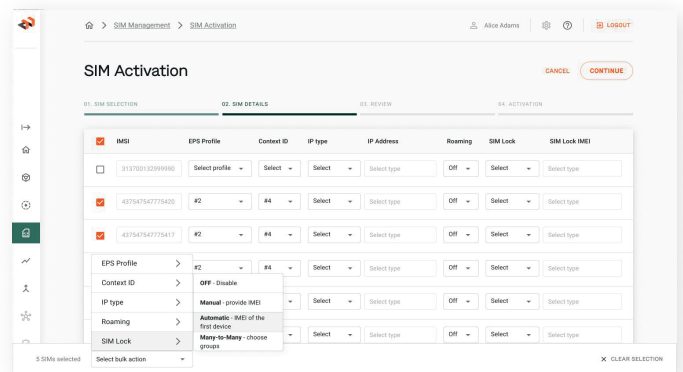
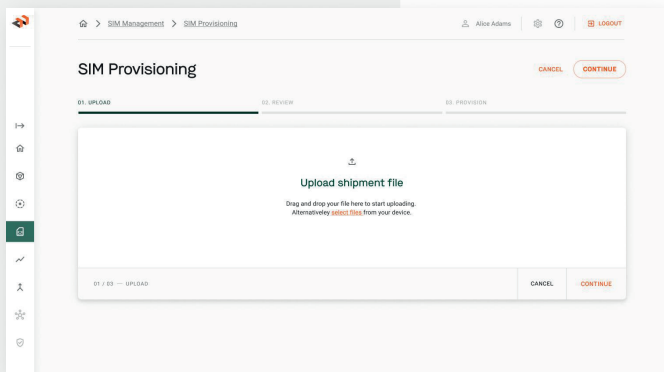


Onboarding Cellular Devices – OneLayer Blueprint



SIM provisioning

OneLayer streamlines SIM provisioning by automating and delegating tasks, leading to increased efficiency and security. Users upload shipment files directly to OneLayer, or OneLayer can integrate with SIM providers to receive the SIM details. By separating provisioning and activation processes, OneLayer enables task delegation to different teams, allowing each step to be completed independently and streamlining workflow for flexible execution. The provisioning phase secures and stores SIM card keys, while the SIM cards are not yet activated. This approach ensures effective and secure SIM management, facilitating the authentication of new SIM cards in the cellular core while enabling assigning the following activation phase to a separate team.

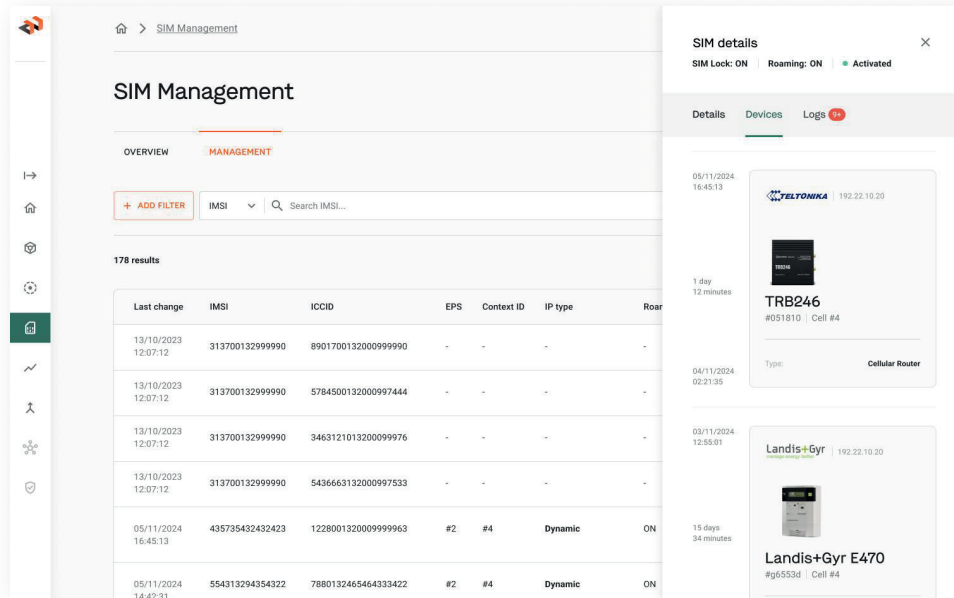


SIM activation

OneLayer automates and manages SIM card activation, tackling the challenges of static IP allocation and SIM management across multiple systems. During the activation phase, the user manages the SIM settings by setting the SIM card profiles, APN, QoS, roaming, IP configurations, and more. By integrating with IP management tools, OneLayer ensures unique IP assignments, overcoming the manual painful processes that exist today and avoiding IP duplication and conflicts.

Additionally, OneLayer enables enterprises to adopt security best practices while enabling operational flexibility through automated SIM-lock capabilities. These include SIM lock upon first attach, which automatically locks the SIM to a device upon initial network communication, many-to-many SIM lock, allowing groups of SIMs to be linked to groups of devices, and by utilizing device fingerprints, OneLayer automates profile adjustments based on device context, supporting seamless SIM exchanges between authorized devices and modifying profiles for APN, QoS, roaming, and IP settings as needed.

The SIM management intuitive interface simplifies management for all skill levels, supporting bulk actions on multiple SIMs to enhance efficiency. Full SIM inventory visibility tracks changes in SIM states and associations, ensuring comprehensive context. It also offers success and failure indications with troubleshooting insights, facilitating efficient and secure activation.



Onboarding process validation

OneLayer streamlines the onboarding process by ensuring that SIM cards that were set with a specific device type profile match the device type. This ensures each device receives the correct profile based on its fingerprint and predefined specifications. For example, a smart meter does not unintentionally gain the privileges meant for a smartphone, maintaining accurate profile assignments across all devices. This automation prevents incorrect SIM configurations and simplifies the allocation process. OneLayer's technology enables adjusting SIM profiles automatically based on device context; it monitors device functionality within the private cellular network and also while roaming to a public network, for example, and monitors device functionality within the cellular network in emergency fallback situations, providing feedback to users.

Device Authentication & Authorization

OneLayer automates the onboarding of cellular devices securely and cost-effectively by implementing a Zero Trust Network Access (ZTNA) approach, activating devices only after successful authentication. By verifying and authorizing cellular devices, such as cellular routers, etc., granting them appropriate network access, and setting segmentation policies, OneLayer ensures secure management and comprehensive network integrity.

OneLayer enhances automation and task delegation by setting policies based on device identity. These policies are automatically configured using a combination of identifier-based (IMEI), fingerprint-based, and certificate-based methods integrated with AAA platforms or CMDB solutions. This strategy assigns relevant teams as step owners, ensuring efficient management and strengthened network security.



Secure and Manage
Private Cellular Devices

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