Nokia IMPACT device manager

The Nokia IMPACT device manager (IDM) is a converged, cloud-enabled solution that allows enterprises and communications service providers (CSPs) to securely manage network-connected devices through the entire device lifecycle.

Part of the Nokia Customer Care portfolio, the Nokia IDM efficiently and effectively manages a wide range of devices across multiple domains, including mobile, home, machine-to-machine (M2M), converged fixed/mobile, and carrier Wi-Fi®. Its features enable enterprises and CSPs to:

- Detect and identify subscriber devices automatically
- Activate devices and services
- Automate remote provisioning
- Update and repair device configurations remotely
- Perform large-scale or bulk management actions
- Manage device faults
- Manage gateway-connected devices and sensors
- Use a single platform to manage devices across multiple domains and protocols.

Advanced services support

The IDM offers advanced support for mobile services such as voice over Wi-Fi (VoWi-Fi) and voice over LTE (VoLTE) service management, Rich Communication Suite (RCS) client configuration, and enterprise Internet of Things (IoT) device management.
Industry-leading interoperability

The Nokia IDM supports interoperability by leveraging the industry’s largest device library. The device library eliminates factory provisioning costs while ensuring that subscribers have up-to-date service configurations. CSPs and enterprises can obtain insights into subscriber devices through reports and dashboards provided by the Device Portfolio Analyzer (DPA). They can query the library for device attributes relating to individual subscribers using DPA APIs.

End-to-end customer care and device lifecycle management

The IDM supports self-service, agent-assisted care, and automated diagnostics and resolution by integrating device management use cases with service management workflows on the Service Management Platform (SMP). The IDM also enables CSPs and enterprises to manage the complete device lifecycle, including:

- Device certification and on-boarding
- Automated service activation and configuration
- Diagnostics and configuration for trouble resolution
- Device replacement
- Subscriber and network identity changes
- Securing lost or stolen devices via remote lock, wipe and reset
- Service deactivation.

Platform features

- Library of device makes, models, and supported operations (device functions) sourced from Nokia Device Onboarding and Validation (DOV) device OEM interoperability program
- Inventory of device functions and scripts for out-of-the-box device management use cases
- Support for development, use, import and export of custom scripts and device actions
- Diagnostic and care use cases for individual devices
- Automated device configuration based on events such as device registration, bootstrap, alerts, service changes, and result of previous operation
- Support for mass device targeting through bulk campaigns for configuration, software, and firmware updates
- Dashboard and reporting for campaigns
- Job engine that supports flexible sequencing of device operations
- Flexible chaining and de-chaining of device jobs based on job exit tag events and service tag events
- Visualization of automated device job chains
- Inventory of device transaction history
- Device communication logging for troubleshooting
- Lifecycle management for device applications and firmware
- Flexible activation use cases, including support for factory bootstrapped devices and server-initiated bootstrap
- Automated device discovery and zero-touch device activation. Supports optional integration with the SMP and custom integration with service provider BSS/OSS for device approval and provisioning when device is detected
- Walled-garden device activation for TR-069 devices and device reactivation for factory reset or device replacement scenarios
Flexible device notification mechanism that uses SMS, HTTPS, XMPP, GCM, APNS, or e-mail, depending on the device type

Automated IDM cluster deployment in bare metal, virtualized environment and public cloud (AWS)

Container based deployment using Docker/Kubernetes for the OpenStack and VM based environment

High-availability configuration with N+1 JBoss application server and DB server cluster at each site

Geo-redundancy and data replication using Oracle GoldenGate

Flexible database options including Oracle® DB, MariaDB, and AWS Cloud RDS (with Oracle or MariaDB)

Multi-tenant deployment and multi-tenant web-based console for administration

Integration with Nokia automatic device detection for 2G/3G networks (SS7) and LTE network (Diameter) for ADD/ADC solution

Integration with Nokia device portfolio analyzer provides insights into device and subscriber attributes.

Customer benefits

Leverage a single device management system to reduce OPEX and TCO for multiple domains, including IoT/M2M devices/sensors, mobile device/tablet, converged fixed/mobile CPE, TR-069 CPE devices, ONT devices, and ONT IoT gateways

Add new device functions for known and new device makes and models by combining an extensible platform with the Nokia Device Onboarding and Validation (DOV) device library

Add plugins for new device protocols. Protocol plugins and associated device library (metadata) can be deployed on an installed IDM without changing the IDM software

Extend a uniform device management experience across domains and device operating systems, makes and models. The IDM provides a common and consistent API across all device types

Reduce customer calls for device settings with automated device detection and configuration.

Keep devices up to date and avoid support issues and calls by initiating campaigns for configuration and firmware updates

Reduce average handling time (AHT) and improve first call resolution (FCR) by integrating IDM with SMP to extend customer care and self-service to individual devices

Reduce cost by supporting right-first-time device and service provisioning capabilities across a range of devices.

Management platform modules

IoT device manager

Integrated in Nokia IMPACT IoT platform

OMA Lightweight M2M (LWM2M) device management for constrained M2M devices

Management of device/sensors behind IMPACT gateway

Management of Nokia Smart Home ONT gateway connected devices

Adaptation to LAN/PAN connected device protocols such as ZigBee, Belkin, and Meter Reader

TR-069-based M2M device management for TR-069-enabled M2M devices

OMA DM-based M2M device management, e.g., automotive FOTA/SOTA

Support for converged home/M2M devices that use the TR-069 and OMA DM protocols, including LTE home gateways

Device-initiated activation and configuration.

Server-initiated management capabilities, including configuration, diagnostics, and device control
• Support for bulk campaigns for configuration settings, application and software deployment, and firmware updates.

IDM Integrated in IMPACT IoT Platform
• Portal for IoT platform for device and application onboarding
• Multi-tenant role based access control for enterprises
• Application and user authentication for secure access to IoT devices
• Protocol and authentication setup for multiple device protocols - LWM2M, MQTT, NB-IoT, LoRa, and IMPACT gateway connected devices
• Generic gateway, device, and sensor model for read/write/execute/delete of resources supported by devices
• Higher level device management and fault management functions (refer to specific sections in this data sheet).

IoT device/sensor fault management
• Fault management of LAN/PAN devices behind IMPACT gateway
• Fault management policies including fault trigger conditions and fault cease condition
• Automated notification triggered by identified device/sensor faults
• Automated fault remediation triggered by identified device/sensor faults.

Mobile device manager
• Automatic device detection for 2G/3G SS7 network and LTE IP network using Nokia ADD server
• Automatic device configuration, application deployment, and firmware updates using automation rules
• OMA Client Provisioning (OMA CP) for mobile device configuration settings, e.g., internet, MMS, browser

• OMA DM-based device management for OMA DM-capable carrier-branded devices or open-market devices with native OMA DM client
• iOS consumer device configuration using configuration and provisioning profiles
• Android™ consumer device management using Mobile Device Manager (MDM) client
• Microsoft® Windows® device management using OMA DM protocol
• Cellular and Wi-Fi-only tablet device support.

Automatic device detection
• Out-of-the-box integration with Nokia ADD provides solution for ADD/ADC
• SS7-based ADD solution for 2G/3G mobile networks
• Diameter-based ADD solution for LTE networks
• HLR/HSS-based ADD solution for mobile networks. Out-of-the-box integration with Nokia, Ericsson, Huawei, and ZTE.

Device portfolio analyzer
• Out-of-the-box integration with Nokia Device Portfolio Analyzer (DPA)
• API for subscriber/device attribute queries by customer systems
• Marketing insights relating to subscriber devices
• Time range-, device category-, and region-based insights relating to subscriber device population
• Device type trends in the operator network
• Device migration trends in the operator network
• Top X/bottom X device trends in the operator network
• Subscriber loyalty trends relative to device OEMs.

Automatic Device Analyzer
• Configure rules for automatic device analysis and triggers
• Notification to external systems based on subscriber device triggers from subscriber handset changes.
iOS entitlement server
• Carrier entitlement server for iOS devices
• Offers authentication procedures using EAP-AKA over integration with AAA using 3GPP SWm interface or directly to HSS over 3GPP SWx interface
• Support for HA Diameter sessions with AAA or HSS over 3GPP interfaces
• Registration for iOS features, including FaceTime and iMessage
• Support for phone-number retrieval and device update from HSS, either directly (SWx interface) or through AAA (SWm interface) for feature registration requests
• Voice over Wi-Fi (VoWi-Fi) service entitlement and provisioning
• Voice over LTE (VoLTE) service entitlement and provisioning
• Multi-SIM entitlement, eSIM watch activation, and onenumber service provisioning
• Multi-device VoWi-Fi service entitlement and provisioning
• Tethering service entitlement
• Multi-tenant APNS integration
• Multi-tenant AAA integration
• Multi-tenant provisioning system integration
• Out-of-the-box integration with Nokia One-NDS in IMS network
• Out-of-the-box integration with Nokia PKI and other PKIs compliant with 3GPP CMPv2 protocol for SIM-less device VoWi-Fi call-flows that require EAP-TLS support
• Local subscription DB for service entitlement provisioning in IDM ES
• Subscriber service subscription provisioning APIs and workflows for carrier service entitlement
• Customization framework for integration with operator IT systems
• Support for customizable deployment of end-user-facing iPhone menus for carrier VoWi-Fi T&C agreements and emergency-calling-address

• management. Support is provided through an interface with Nokia One-NDS or the carrier’s IT system
• Customizable multi-SIM service and carrier space management websheet
• Out of the box integration with LDAP/OAuth server for end user authentication on the websheets.

RCS auto configuration server
• RCS client configuration using GSMA-specified HTTPS protocol or OMA DM protocol
• Support for native OEM-provided RCS clients and downloadable RCS client
• SIM-based device RCS client configuration
• SIM-based device authentication via MSISDN HTTP header enrichment by mobile core network
• Differentiated RCS client provisioning based on RCS service types supported by MNO, subscriber-specific RCS service subscription
• System wide and per tenant RCS client configuration
• Flexible template for RCS configuration file supports addition and removal of RCS services without a software change.

TR-069 auto configuration server
• TR-069 CPE device management
• Management of TR-069 CPE behind a Network Address Translation (NAT) gateway
• HTTPS/XMPP-based TR-069 connection requests
• Flexible activation scenarios, including walled garden, zero touch, OSS integration for device approval, pre-provisioned server/device scenarios, and unique/default factory bootstrap scenarios
• Automated device configuration during activation
• Normalized device function for different device categories, including internet gateway, Wi-Fi access point, router, modem, VoIP, set-top box, DHCP, and NAT gateway
• Custom scripting function for customized device activation flows and complex automation logic
• Ongoing event-/policy-based device configuration
• Support for bulk configuration and firmware update campaigns
• Device backup and restore.

**Converged TR-069 and mobile auto configuration server**
• Converged fixed and mobile device management for LTE modems, gateways and routers
• Fixed device characteristics supported via TR-069 and corresponding BBF-specified data models
• Mobile device characteristics supported via OMA DM or OMA CP depending on device type.

**ONT device management**
• Residential gateway (TR-069) management for Nokia G-240W-A and G-240W-B series ONT devices
• Lifecycle management for IoT gateway software module on ONT devices using IDM application software inventory
• Extensions to application software management on IDM to enable, disable, and restart the IoT gateway agent on the ONT
• Management of ONT IoT gateway connected devices and sensors.