Nokia Home Device Manager

Release 20

Data sheet
For broadband service providers, simplifying CPE management in home networks has become mission-critical — especially for those looking to roll out Wi-Fi® Extenders, small cell, triple-play, and 5G fixed wireless services as well as a whole set of IoT devices. Nokia Home Device Manager (HDM) delivers the key capabilities to help providers succeed.

Key benefits

- Delivers true multi-CPE vendor management solution for both TR-069 and TR-369/USP based devices
- Accelerates introduction and automates mass management of home devices
- Manages device firmware and device app / packages, device certificates
- Seamlessly troubleshoots non-TR-069 or TR-369/USP connected home devices
- Provides fully secure interface for devices and OSS systems
- Offers extensive reporting and monitoring capabilities
- Enables real-time CPE diagnostics and troubleshooting for CSRs
- Provides integrated speed tests and latency measurements of the managed devices

Overview

Automated remote management for Connected Home Devices

HDM handles every task related to customer premises equipment (CPE) management, including zero-touch provisioning, configuration updates, software upgrades, monitoring, as well as problem diagnosis and troubleshooting. It is a CPE-vendor-agnostic system that provides multi-vendor management capabilities based on the Broadband Forum TR-069 standard and TR-369/USP standard. By combining provisioning, maintenance and support features into a single solution, multi-device and multi-protocol approach builds a bridge between legacy devices and the deployment of next-generation equipment into the customer home. With HDM, consumers and providers have the assurance of consistent service delivery, no matter how complex the home network may become.

The solution

Nokia HDM empowers broadband service providers to remotely control and manage CPE, including residential gateways, IP set-top boxes, VoIP adapters, femto access points, cable modems, 5G fixed wireless access devices, and other devices from a variety of different vendors. In addition, HDM has the ability to remotely manage non-TR-069 devices connected to a TR-069 residential gateway or a TR-369/USP device/agent in the connected home network. Large-scale remote management is made possible through a standardized CPE integration layer that allows for a wide choice of CPE supported by the Broadband Forum’s TR-069, TR-369 and associated standards. With HDM, service providers can move forward with next-generation IP offerings while providing customers with a unique and consistent experience across different services.
HDM enables providers to take advantage of:

- Automated activation of complex CPE. HDM provides CD-less, PC-less, zero-touch CPE activation, as well as walled garden, web-driven activation for retail CPE distribution scenarios.
- Carrier-class scalability, security and manageability. HDM has a proven architecture capable of managing many millions of devices simultaneously. It has a powerful, customizable role-based entitlement for user access to application interfaces and objects.
- Dashboard metrics show real-time and historical application, system performance and health.
- Device models accelerate time-to-market of new CPE and triple-play services.
- Powerful network operations capabilities. Large-scale, bulk management of CPE is greatly simplified with policy-based management operations. Administration of CPE firmware images is enabled using a built-in firmware repository and secure file servers for upload and download of software.
- Real-time CPE control and troubleshooting. HDM provides a diagnostic view of the devices inside the customer premises, enabling customer support representatives (CSRs) to access vital device information in real time.

Key features

Policy Creation Environment offers a range of capabilities to the operations department for designing automated device activation, maintenance and upgrade tasks. Policies make use of dynamic device grouping, advanced scheduling, workflow and customizable policy actions include advanced capabilities, such as device models, service tags, dynamic variables and custom function to offer service providers maximum control and flexibility in adapting policies to their specific services and environment.

- Custom Function allow service providers to bundle RPC function with decision logic to execute common tasks. Custom function can be created on the HDM UI and used like regular function.
- Proactive Management Engine enables service providers to proactively monitor and manage devices using policies with customizable event-based queuing controls.
- Fault Management of CPE is carried out using HDM’s Device Alarms capabilities. Alarm types and rules are defined using the Alarm Catalog and may be customized for the particular devices and services offered by the operator. Devices and services are proactively monitored to automatically detect issues and optionally take actions to improve service quality and reliability.

Home Device Manager - Management Console

- Intelligent Workflow Engine (IWE) extends HDM’s proactive management capabilities and enables service providers to define customized service management workflows. The IWE has full access to HDM’s Northbound Interface (NBI), advanced scripting support for workflow and business process automation, and is easily extended to interact with third-party systems such as OSS.
- Device Models are easily created by service providers to describe any CPE’s capabilities, supporting both
standardized and vendor-specific objects. This capability greatly accelerates time-to-market and enables continuity of management practices across all IP-based services and devices from a variety of vendors. HDM is device model agnostic, meaning that it can load any device model and can address any TR-069 device an operator may decide to deploy.

- Service Model NBI provides open integration services into a single, extensible NBI using a service-oriented architecture. The Service Model NBI enables providers to leverage their existing investments and seamlessly tie HDM into the rest of their infrastructure. It ensures that business support system (BSS) and operational support system (OSS) applications — such as those used in the call center, self-service tools, provisioning systems and other applications — have a shared view of the home network.

- The HDM Dashboard is a distributed application that allows operators to view and monitor HDM application statistics in real-time, including trans-action throughput and application health for individual servers or the entire HDM cluster. Time series data is also aggregated and shown using customizable charts and graphs for historical application performance and health.

- HDM Management domains enable segregation of users, devices and management objects into distinct organizational units for multi-tenancy management domains allowing operators to define exclusion rules that govern the availability of firmware images, policy actions and policies for a given domain.

- HDM Firmware Campaign Manager provides multiple firmware campaign management, from selecting devices, firmware, to scheduling and reporting, covering the full life cycle of the device firmware management.

- HDM Network Performance Module is a TR-143 based device speed test and latency measurement tool. It is fully integrated with HDM for testing and measurement data collection. It provides a way for CSR to test device upload and download speed, UDP Echo as well as bulk scheduled tests.

- HDM Reporting supports the definition of custom reports based on information available with HDM and TRM. Commonly used reports are available out-of-the-box. HDM provides a reporting console, which includes dashboard for the HDM and TRM reports.

- HDM Traffic Regulation supports large scaled data collection from the CPEs and sends the collected data to data lake / analytic software using different approaches including Kafka.

- HDM Generic TR-069 Proxy allows bi-directional translation between TR-069 and Telnet. This allows HDM to manage non-TR-069 devices via the Telnet protocol, eliminating the need for separate management systems to accommodate legacy devices.

- Proxied Home LAN Device Management (TR-069 Amendment 4) enables management and provisioning of non-TR-069 devices, such as tablets, smartphones, smart TVs and laptops by proxy through the residential gateway.
Administration and system features

- Built-in and customizable reports for device operations, policy operations and security events
- Application dashboard, graphical view on application, server and cluster performance, including traffic pattern analysis and trending capability

Device support

- Management of TR-069 devices, such as home gateways, WiFi extender, fixed wireless access devices, VoIP phones, STBs, SmallCell devices and cable modems
- Management of LAN devices using TR-069 Am 6 Annex F&G (formerly known as TR-111) and Annex J CWMP Proxy Management
- Management of femto-cells (with femto adaptation layer)
- Support for legacy SNMP and Telnet devices (configuration, data collection, firmware upgrade)
- Support for IPv6 devices (native, dual-stack, 6rd, DS-Lite)

Standards support

Broadband Home standards support, including:

- TR-069 Amendment 6
- TR-369
- TR-098
- TR-104
- TR-106
- TR-181i2a14
- TR-196
- TR-068
- TR-090
- TR-101i2
- TR-110
- TR-122
- TR-124
- TR-126
- TR-128
- TR-131
- TR-133
- TR-135
- TR-140
- TR-142
- TR-143
- TR-157 Amendment 1,2,3,5
- TR-177

Fully compliant with Home Gateway Initiative (HGI) remote CPE management specification
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