

DOCSIS provisioning

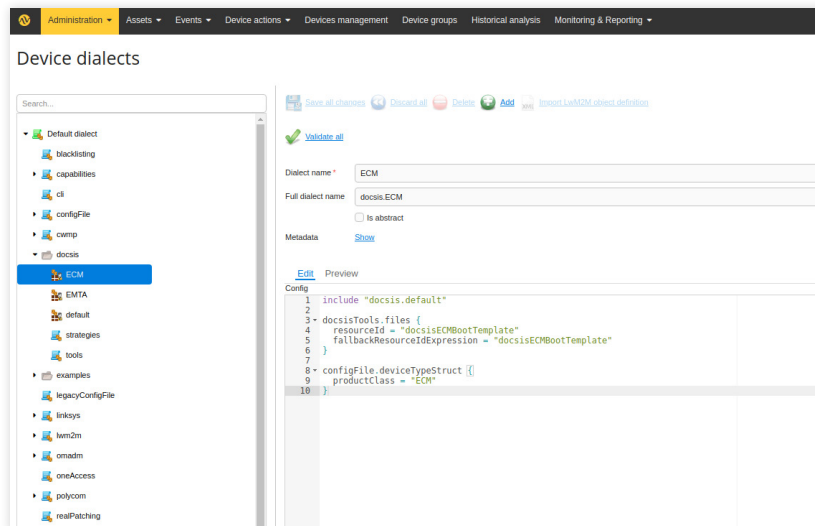
DOCSIS

DOCSIS is a set of standards intended for data modems interconnected in a cable network built using hybrid fiber-coaxial cables. The network has a typical tree structure of a passive network with a single root mastering the communication inside the network—CMTS. Network traffic is separated into sub-networks to enhance security as well as enable easier application of quality and service-related parameters.

MANAGEMENT

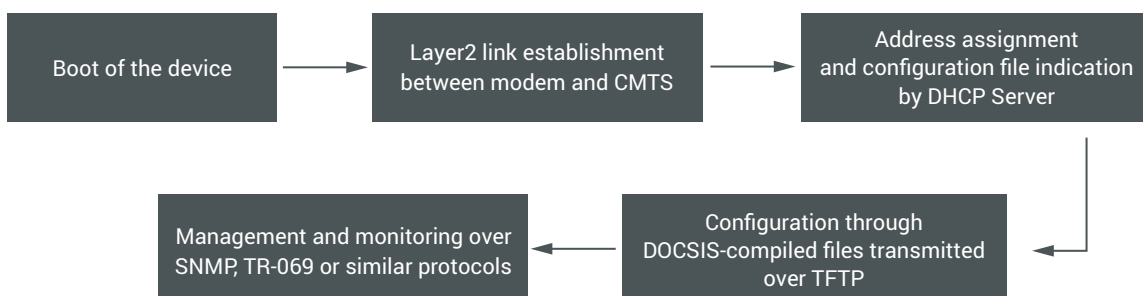
The management in DOCSIS standards is divided into two parts—Layer2 and Layer3 OSI-ISO. The exchange on Layer2 is similar in nature to auto-negotiation, well-known from the Ethernet network, and is performed between the modem and CMTS.

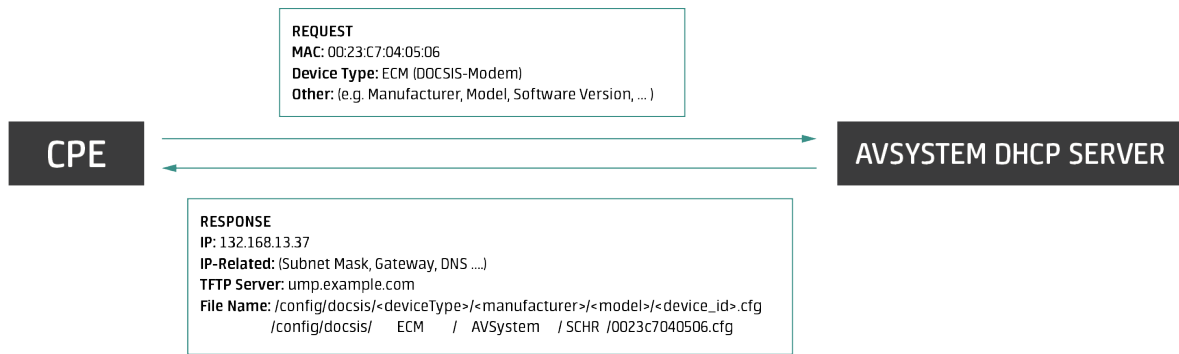
Unified Device Management Platform is a Layer3 management and monitoring tool in the DOCSIS network.



FLOW OF INFORMATION

DOCSIS devices are part of a strict service lifecycle consisting of:





DHCP

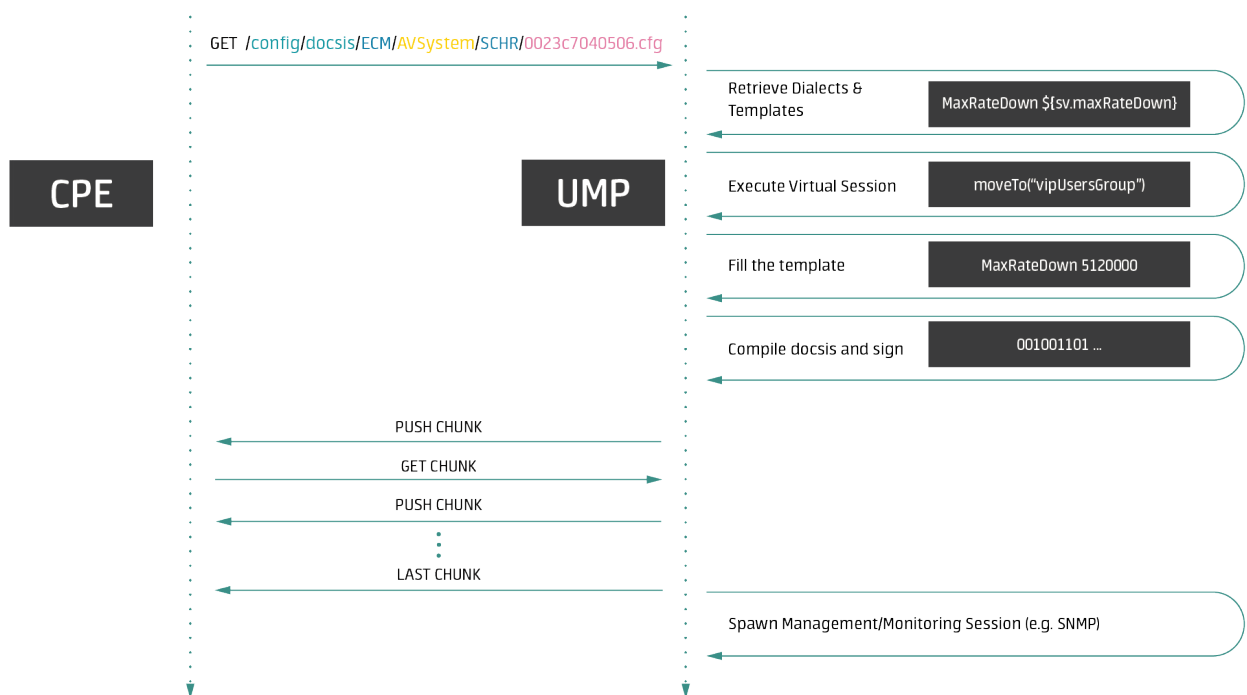
Lifecycle management starts with a DHCP request sent from the end device in order to establish IP connectivity. At this stage of the service lifecycle, most of the modems perform DHCP requests only on their management interfaces.

What makes AVSystem’s approach unique is that it can either provide the AVSystem DHCP server or servers to provide better data flow and security, or operate in the existing environment with minimum requirements against existing DHCP infrastructure. The only requirement the existing DHCP server needs to meet is the ability to generate the proper device-dependent filename based on a pre-configured expression/pattern.

DOCSIS TFTP

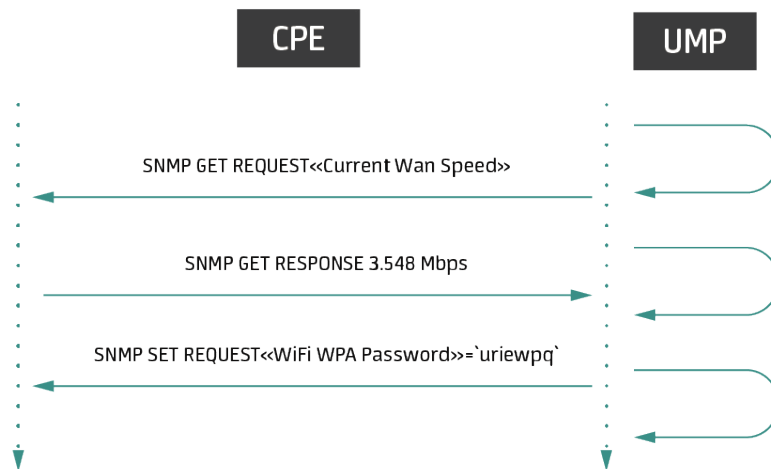
After the initial exchange, an IP address is assigned to the device and it proceeds to a further stage of provisioning—contacting the DOCSIS Configuration Server.

The exchange between the gateway and the server is performed via TFTP. The file used for configuration is based on a dynamic text template filled with the personalized data, compiled to a DOCSIS binary format and signed for security with the key delivered earlier by CMTS. This process finalizes the initial modem configuration.



AVSYSTEM UNIFIED DEVICE MANAGEMENT PLATFORM

- Uses multiple independent dialects and templates
- Fills the template using a unique expression engine allowing fast deployment and subsequent modification
- Compiles files internally
- Supports CPEs with multiple internal components (e.g. modem/router/MTA)
- All templates and dialects can be easily registered through the system GUI without the need for restarting the system



MONITORING AND MAINTENANCE (I.E. SNMP)

After the initial configuration, DOCSIS CPEs are still reachable by the management platform through some management protocol (typically SNMP). This enables hands-on maintenance and support for the client, execution of certain ad-hoc configuration operations as well as access to multiple parts of higher-layer functionalities (i.e. execution of Smart Workflow Operations).

Typically available components:

- Configuration of the uplink
- Configuration of the built-in access point and switch
- Configuration of the local router and home gateway components
- Configuration of the built-in SIP ATA and Video components.

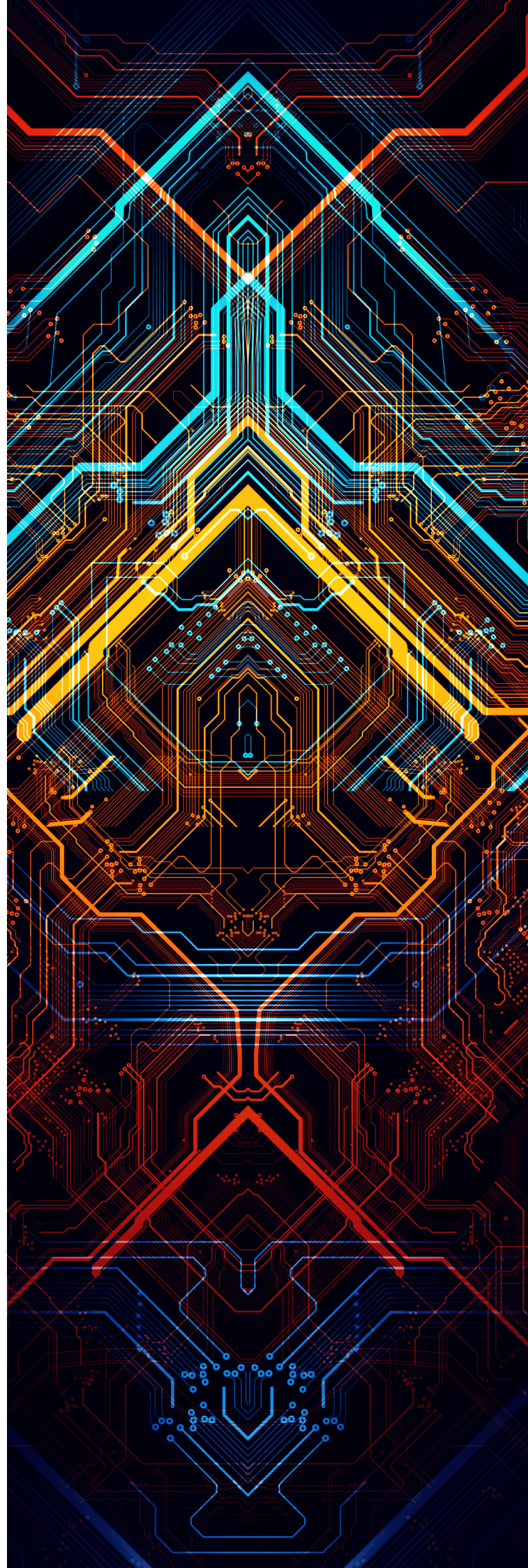
Typical administrative flows:

- Reboot
- Factory Reset
- Firmware Upgrade

Monitoring of a device behavior in scale is provided after the selection of relevant parameters on a per model basis.

SUMMARY

AVSystem's DOCSIS Provisioning solution provides Internet service providers and enterprises with a **versatile management and monitoring tool**. The solution handles management of DOCSIS devices over many protocols including SNMP, TR-069 and others. What's more, it is highly compatible and can work with both AVSystem's DHCP as well as already existing DHCP infrastructure. Since the module is an addition to the UMP platform, it allows for **great acceleration of deployments** thanks to platform's comprehensive GUI and robust built-in mechanisms (such as independent dialects and templates). All this adds up to a **powerful and easy-to-use maintenance of DOCSIS devices** throughout their entire life-cycle.





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