



MeTro.69 protocol validator

in Test we Trust

MeTro.69 is an application designed to validate the TR-069 protocol implemented in CPEs in a fast, simple and reliable way. The solution includes auxiliary tools to provide full testing scenario in routers and LAN devices such as set-top-boxes and VoIP phones.

The Protocol

The TR-069 standard was developed for automatic configuration and management of CPEs by Auto Configuration Servers (ACS) providing visibility across service providers and access to configurations.

CPE Validation

The verification of the TR-069 is a meticulous and complex task that is often carried out manually by experts and ends up being a long, expensive and exhausting process.

Telecom Operators

Due to the continuous evolution of technology, telecommunications companies often have to remotely update the CPE software using the TR-069 protocol. Verifying the implementation of the TR-069 in the CPEs is fundamental so that the Tier 1 operators can carry out their work correctly. If the TR-069 is not working properly the clients will suffer the consequences. They will end up complaining to the Customer Service Departments and finally, it will be necessary to mobilize technicians to solve the problems generated.

Moreover, TR-069 is an Open protocol and providers don't test the CPEs according to the particular needs of the ISP. Therefore it is key to optimize the test process and ideally do it automatically.

"With MeTro.69 testing becomes one of the most optimized processes at the Operator premises"

Automation

The best way to optimize the TR-069 test process is to do it automatically in order to achieve, in this way, faster execution and higher quality results. From now on experts can focus their work to analyze the results instead of devoting their time to repeat every single test manually.

Final reports will be generated systematically using MeTro.69 and all the information will be stored and available for further analysis and revisions.





ACS

MeTro.69 includes an Auto Configuration Server (ACS) that conforms to Broadband Forum (BBF) and has been specifically designed for testing purposes and supports one CPE at a time.

ACS Interface

MeTro.69 has an interface to connect any commercial ACS by means of customized modules. Already included in the product a module to connect a Nokia Motive. Test cases do not need to be modified to connect with alternative ACS.

MeTro.69 is an essential tool for those laboratories willing to speed up their testing process

Scenario

MeTro.69 includes all the tools required to allow the validation of TR-069 implementations in a CPE:

- Proprietary ACS
- HTTP, FTP and STUN server
- Traffic generator
- Traffic generator and analyzer
- Execution engine
- Pass/Fail engine
- Data base for results storage
- Automatic report generator
- Wireshark connection

MeTro.69 guides users to set the correct scenario for the test Plan execution.

All included

MeTro.69 includes most of the tools needed to perform TR-069 tests in a CPE which means that just a laptop would be enough to run tests in a CPE.

Testing Libraries

A Library contains test cases related to a data model. Every expert can execute a standard Test Plan or build their own libraries with customized test cases that could eventually be shared across different users.

Service Oriented Tests

Test cases can be created to verify specific services via TR-069. For example for testing a router:

- Port mapping tests with real traffic to verify if ports have been opened
- Tests related to CPE password
- System configuration test and QoS operation
- LAN configuration tests
- Performance tests
- Ping tests
- CPE configuration files parameters
- CPE performance statistics
- Identification of connected devices
- Configuration changes without reboot
- DHCP configuration tests
- WAN tests
- WiFi configuration tests

Most of the above mentioned tests are included in the standard Libraries, but they can be customized to better adjust to specific cases and users may create customized test cases adapted to their particular needs. It is not necessary to be a SW engineer to build test cases as they are cre-

ated in XML following simple rules. Test are made by three type of blocks:

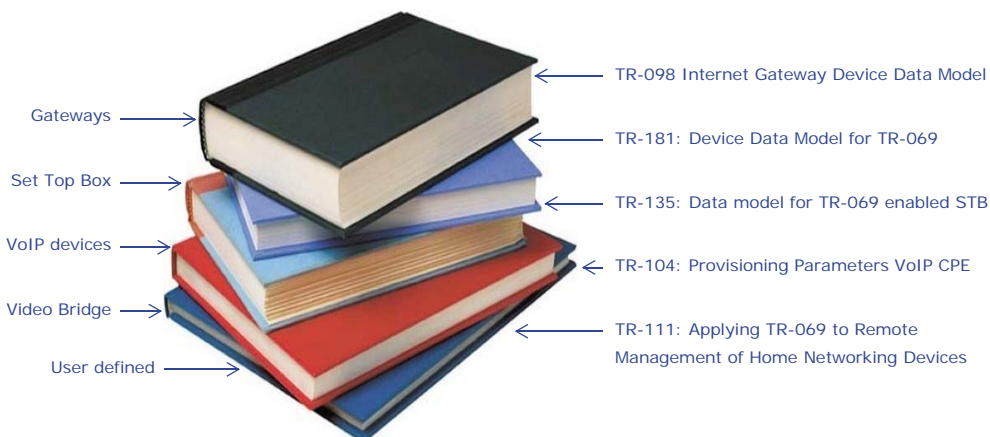
1. **Sessions:** contain RPC methods
2. **Sequences:** allow automatic actions
3. **Requirements:** contain the conditions to pass a test

Execution

MeTro.69 provides real time visibility of the testing process. Users can follow step by step the communication between the ACS and the CPE. The Graphical User Interface (GUI) includes a number of windows to facilitate the interaction and results visualization:

- List of Cases to be executed in the Plan
- ACS logs in a structured way
- Execution details and pass/fail result
- Steps described in the test case
- Summary of Wireshark logs
- Events occurred during the execution

In addition user can stop, start or activate any test case during the execution.



Library of Test Cases

| Description | |
|---------------------|---|
| Tools Included | <ul style="list-style-type: none"> • MeTro.69 proprietary ACS • Script editor • HTTP and FTP server to up/download files • STUN server for testing LAN devices • Traffic Generator and Traffic Analyzer • Execution engine • Pass/Fail engine • Data base for results storage • Wireshark connection |
| ACS Interface | <ul style="list-style-type: none"> • Synchronized with Nokia-Motive ACS (optional) • Alternative ACS supported under demand |
| Functionalities | <ul style="list-style-type: none"> • Automatic and manual execution of tests cases • Log captures • Real time visualization of every test step |
| Libraries | Related with data models TR-098, TR-104, TR-111, TR-135, TR-098-IPV6, and more |
| Test Cases Design | Based in XML |
| Results | <ul style="list-style-type: none"> • Information filtered and ordered to assist debuggers • User customized reports • Automatic report generation in HTML • Data base for results storage • Comparative analysis of Test Plans results |
| Cooperative Testing | <ul style="list-style-type: none"> • Test Plans can be shared • Execution results obtained with one license, can be opened in other PCs maintaining full visibility of the execution |

| Test Plan Information | |
|-----------------------|---|
| Program Variables | List of program variables according to the testing scenario and their values (IPs, host name, current date, etc.) |
| Library Variables | List of library variables defined specifically in the library associated to the Test Plan with edition of variables |
| Scripts | List of scripts that will be executed during the Test Plan execution |
| ACS and CPE status | Conection time, if it is active or not, SN, CR URL, etc |
| Test Plan information | Name, owner, CPE type and SN, library to which it is associated, etc |

| Logs | |
|-------------|---|
| Script Log | Shows messages exchanged between the PC and the CPE during the execution of a script in an automatic test case. Direct communication is established either via telnet, SSH, or RS232 (Available at Execution tab) |
| Traffic Log | Shows traffic messages exchanged with http/ftp servers and traffic generator/analyzer during the Test Plan execution (Available at Servers tab) |
| Stun Log | Shows Traffic logs related to the traffic sent/received by the STUN server during Test Plan execution. Available at Serves tab |
| ACS Log | Shows TR-069 messages exchanged between the CPE and the ACS during the Test Plan execution (Available both at the ACS tab, and at the Execution tab, where they are shown in a friendly and structured way) |
| HTTP Log | Shows ACS sent/received HTTP messages during Test Plan execution (Available at ACS tab) |

| Execution Tab | |
|-----------------------|---|
| Test Plan | List of test cases to run in a CPE. Full Test Plan and status of test cases |
| Test Log | Full test logs captured in a test case execution. Includes RPC methods and Actions |
| Conditions | List of conditions to PASS a test case specifying the values obtained |
| Execution Variables | List of execution variables of the test case and their values |
| Test Report Variables | List of the test Report variables of a test case and their values |
| Script Log | Script logs corresponding to all test cases executed in a Test Plan |
| Text/grid | ACS logs in text/grid view corresponding to the RPC method/Action selected at the test Log window |
| Test Steps | Test steps as they are defined in the .XML library |
| ACS Packets | Sent and received messages by the ACS related to a test case (not only SOAP) |
| CPE Packets | Sent and received messages by the CPE related to a test case (not only SOAP) |
| Execution Details | Real time view of all RPC methods and actions executed in a test case, their results, and specific messages about their execution |
| Test Description | Test case description, aim of the test |
| Error Message | Detailed error messages associated to a test case in case it has failed |
| Notest | Field for the tester to write any comment/note associated to the test case |
| Events | General information about the Test Plan execution in real time: errors, warnings, and other messages associated to it |

