ATA Monitoring Service for VoIP Application

March, 2024

GENERAL VISION

Design of a telemetry service with user interface of ATA devices for VoIP applications.

OBJECTIVES

1. Define communication settings for Peplink router based VoIP solution monitoring.
2. Define communication settings for Teltonika router based VoIP solution monitoring.
3. Develop microserver application software for monitoring VoIP solution devices.
4. Design the WebUI to display telemetry variables.
5. Integrate with ATA Grandstream HT80X.

SPECIFICATIONS

- The project aims to develop a telemetry system for monitoring the communication and operational status of a VoIP solution shown below.

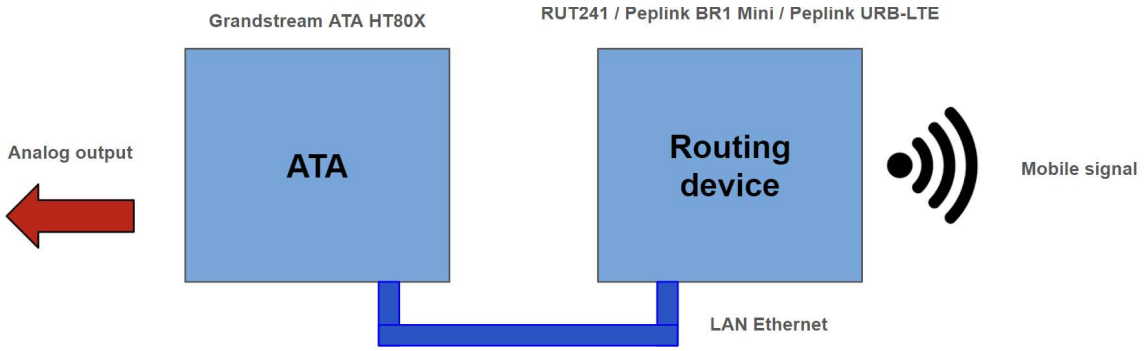

Figure 1. VoIP solution.

- The solution is made up of the Grandstream series ATA, connected to a Teltonika or Peplink brand routing unit.

Figure 2. Peplink URB-LTE router.

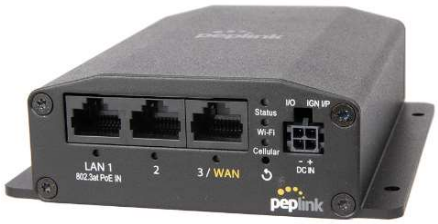

Figure 3. Peplink BR1 Mini router.

Figure 4. Teltonika RUT241 4G-LTE industrial router.

Figure 5. Grandstream ATA HT80X.

- The purpose of the telemetry device is to monitor the network status and operation parameters of the devices arranged on the subnet. The telemetry module will act as a web microserver, so that the polled variables will be displayed through a WebUI accessible from the microserver wireless access point.
- As a hardware element, a solution based on the ESP32 SoC from Espressif Systems is proposed. The device would be integrated into the solution subnet using an Ethernet connection. It is recommended to use an Espressif SoC based board with integrated Ethernet port like the WT32-ETH01. Additionally, an external voltage sensor would be added to measure input power of the solution. For this application it is suggested to use the INA219 voltage sensor.

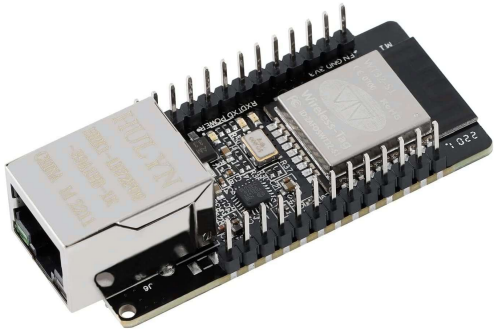

Figure 6. WT32-ETH01 development board.

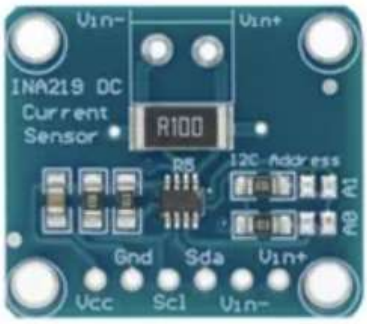

Figure 7. INA219 0-26 V / 0-3 A voltage and current sensor.

- The telemetry variables would be extracted, in principle, through the SNMP monitoring services of the network devices. The variables would be conditioned by the map of variables available in each asset of the solution (to detail the list of parameters readable over SNMP, see the corresponding references).
- A general outline of the proposed solution is seen in Figure 8.

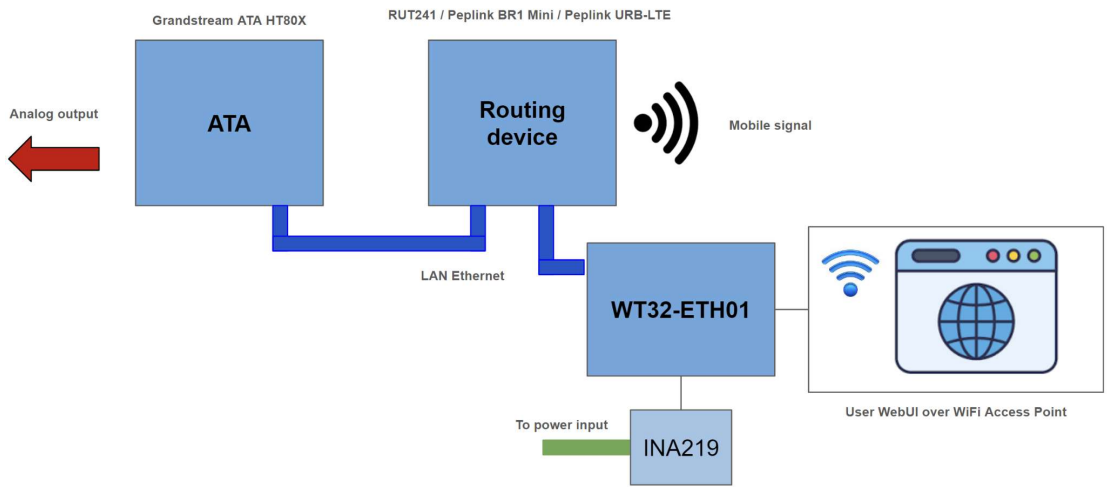

Figure 8. General scheme of VoIP solution with monitoring service.

MILESTONES

1. SNMP communication test with Peplink routers

The operation and configuration of the Peplink routers SNMP agents are validated through a simple connection test with an auxiliary PC application.

2. SNMP communication test with RUT241 Teltonika router

The operation and configuration of the Teltonika RUT241 SNMP agent are validated through a simple connection test with an auxiliary PC application.

3. SNMP communication test with Grandstream ATA HT80X

The operation and configuration of the Grandstream ATA SNMP agent are validated through a simple connection test with an auxiliary PC application.

4. Development and assembly of monitoring unit

The monitoring application is programmed, and the communication and signal acquisition protocols, as well as the microserver over the WiFi link, are fully tested.

5. Integration with VoIP solution

The monitoring system is assembled with the VoIP solution to validate the operation of the telemetry service.