NuMaker - MA35D1
Integrated Demonstration

Agenda

- Overview
- H.264 Video Playback
- ML People Counting
- 2D Accelerator
- Data Security
- Key Word Spotting by RTP M4
- VoIP
- APP Installation
- Q&A

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Overview

Main Menu

Video Playback	Display mp4 videos via VC8000 h.264 decoder
ML People Counting	Camera preview with people counting
2D-Accelerator	Animated tiles permutation changes on the screen
Data Security	Certification check in OP-TEE
KWS by RTP M4	Key Word Spotting via RTP M4
VoIP	Voice over Internet Protocol with h.264 streaming

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H.264 Video Playback

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H.264 Video Playback

H.264 Video Playback

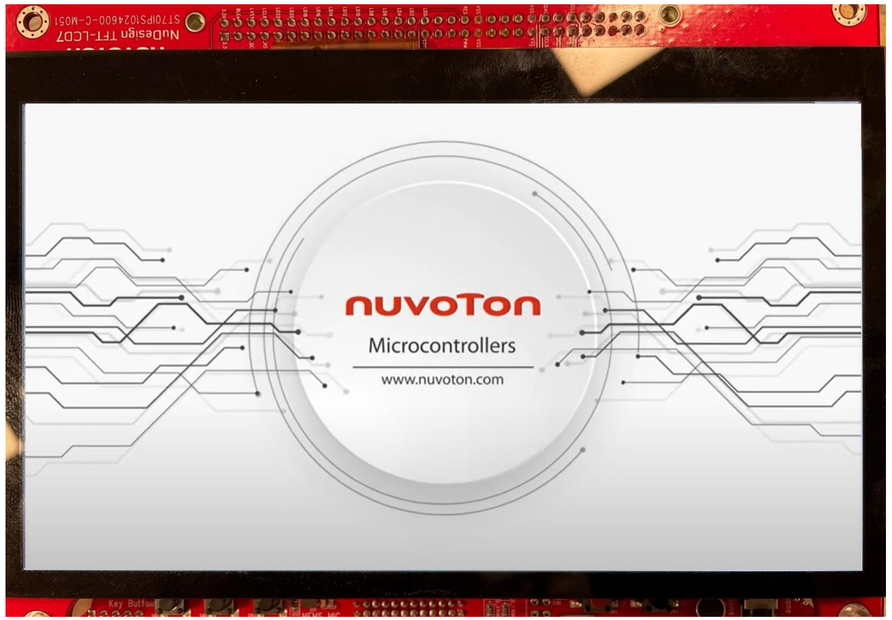
1. Demonstrate MA35D1's ability to display mp4 videos via VC8000 h.264 decoder
2. Use Gstreamer to display 720p videos in full screen
3. GStreamer command

> gst-launch-1.0 filesrc location=/opt/video_mp4.mp4 ! qtdemux name=demux demux.audio_0 ! queue ! decodebin ! audioconvert ! audioresample ! autoaudiosink demux.video_0 ! queue ! decodebin ! nufbdevsink fb=0 width=1024 height=600 x-pos=0 y-pos=0 ! fakesink

4. Required files: ma35d1-vc8000.ko, libgstnufbdevsink.so
5. Performance:

1080P: 30fps

720P: 60fps



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ML People Counting

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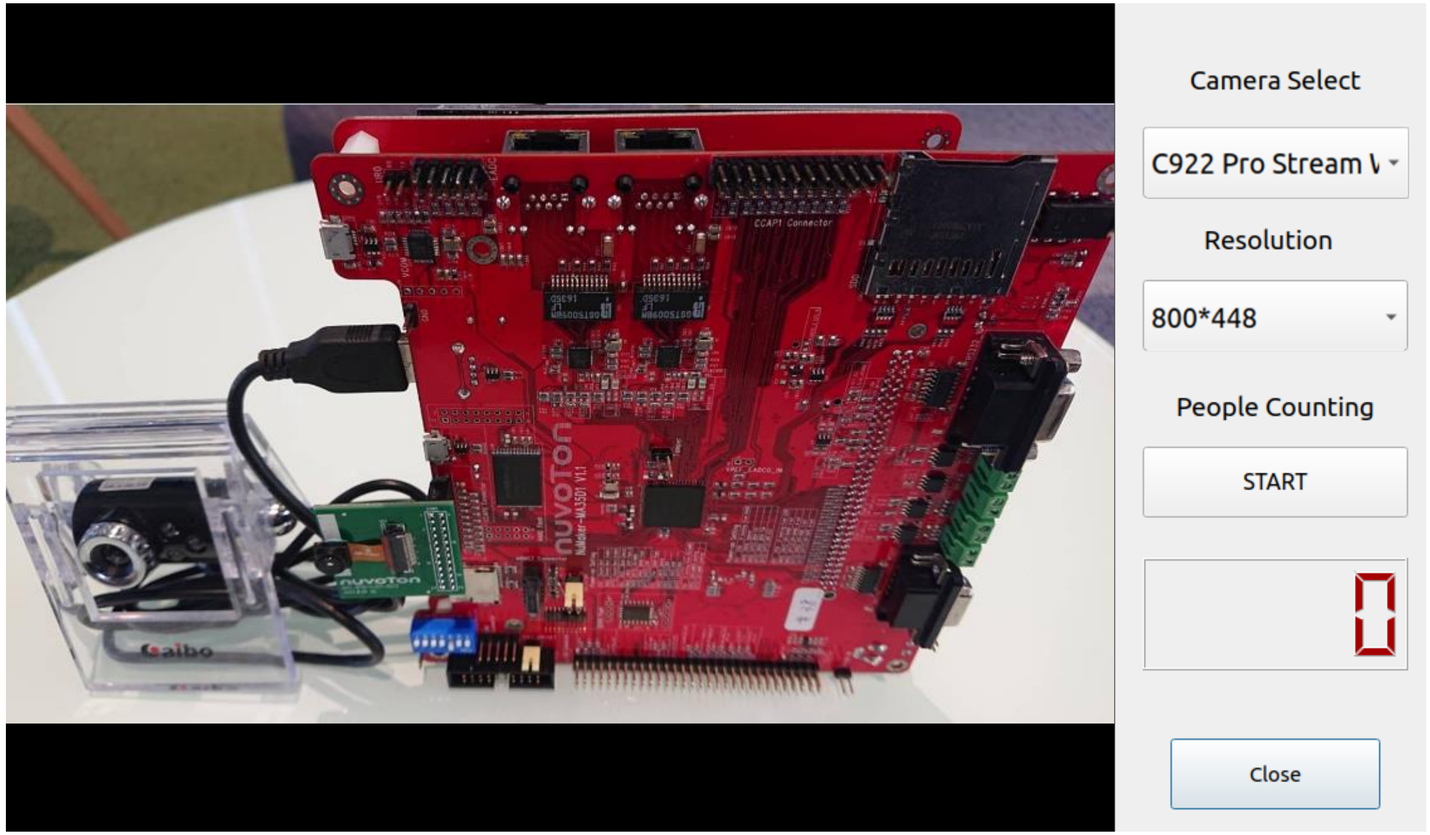
ML People Counting

Camera Control

Control Options:

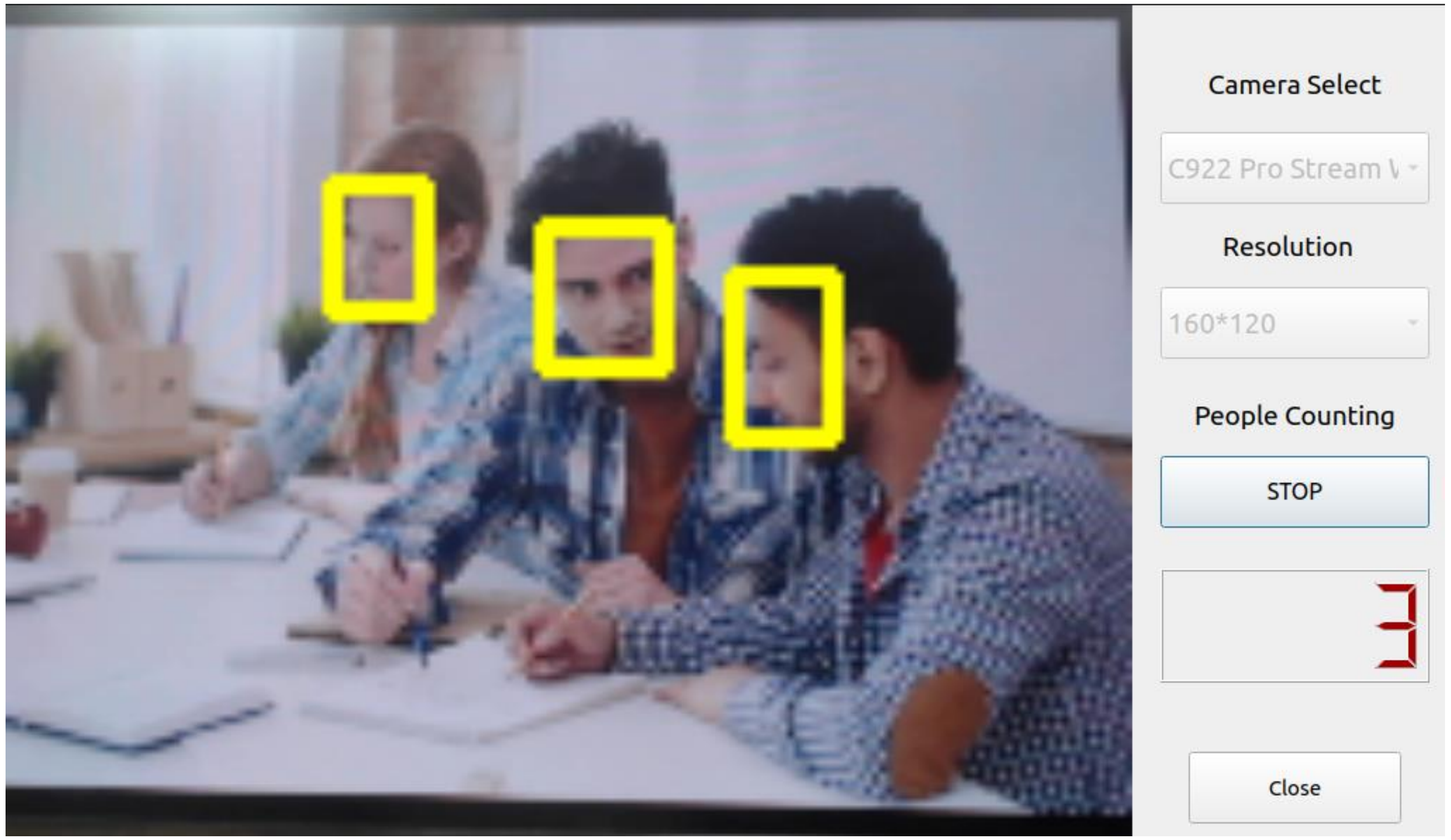
- Support UVC cameras & CMOS sensor(Himax m1055)
- Support camera inputs switch & resolution switch



People Counting

Control Options:

- Click “People Counter” to start people counting
- Based on OpenCV
- Fix resolution and FPS



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2D Accelerator

2D Acclerator

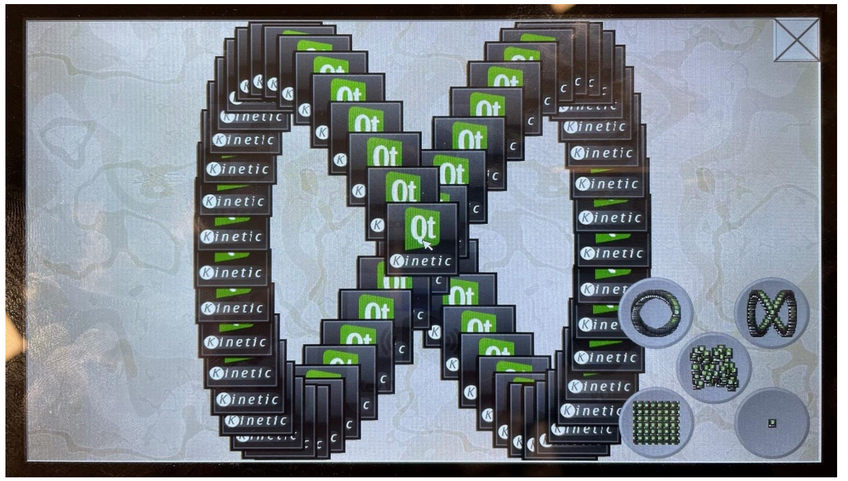
Image Programming and System Boot

- 2D hardware acceleration engine through DirectFB
    1. Draw Rectangle
    2. Fill Rectangle
    3. Bit Blit
- The Linux Command to start a Qt application with DirectFB

```
~# ./Qt_APP -platform directfb
```

- The Linux Command to start a Qt application runs on framebuffer 1

```
~# ./Qt_APP -platform linuxfb:fb=/dev/fb1
```



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Data Security

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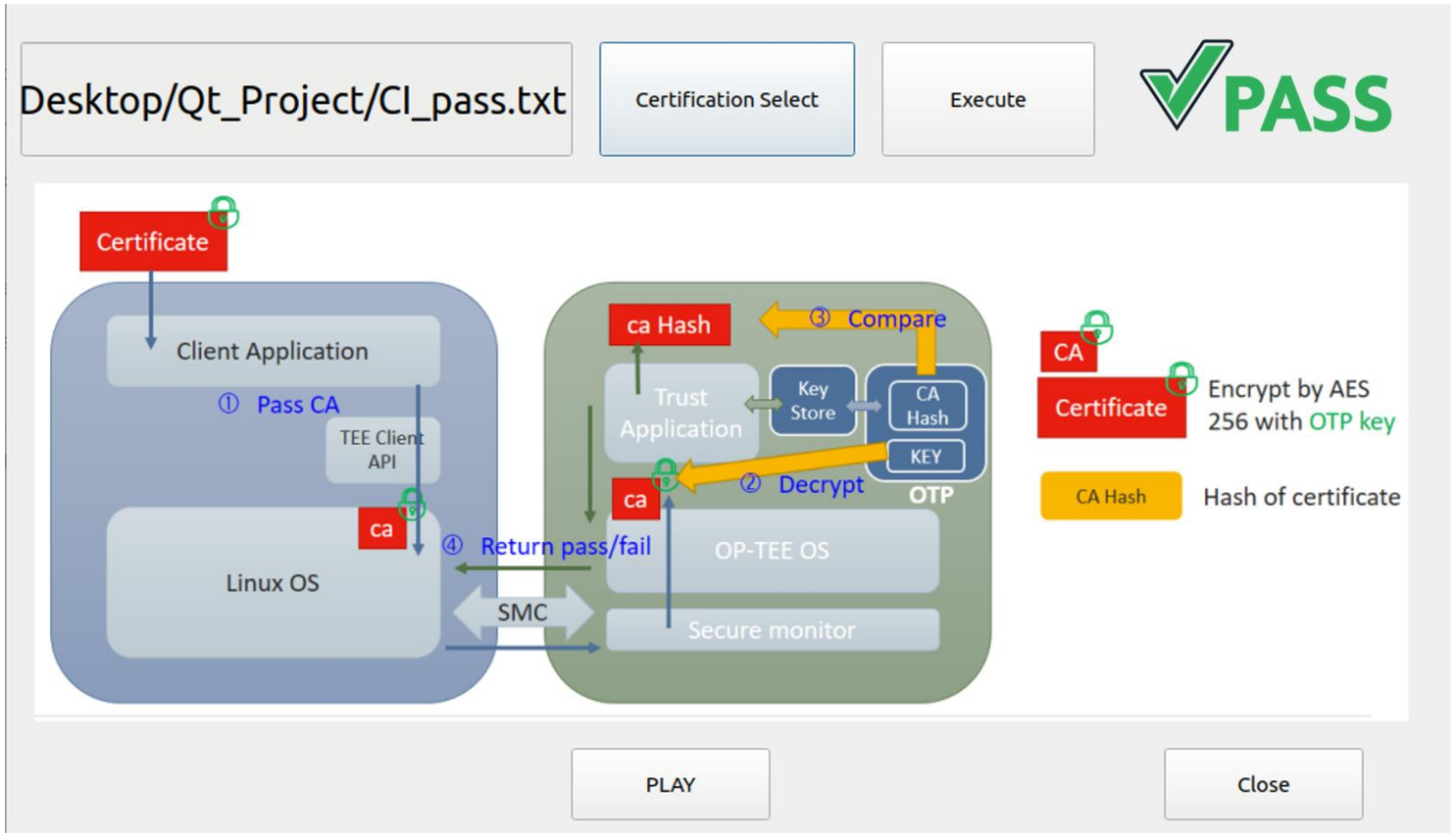
Data Security

Introduction

- Use a secure key(SW key) to restore the protected data
- Secure key is encrypted by OTP key in OP-TEE

- Click “Certification Select” and select the certifications
- The result will be shown on right-top side
- A images loops helps users to understand the process



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Key Word Spotting by RTP M4

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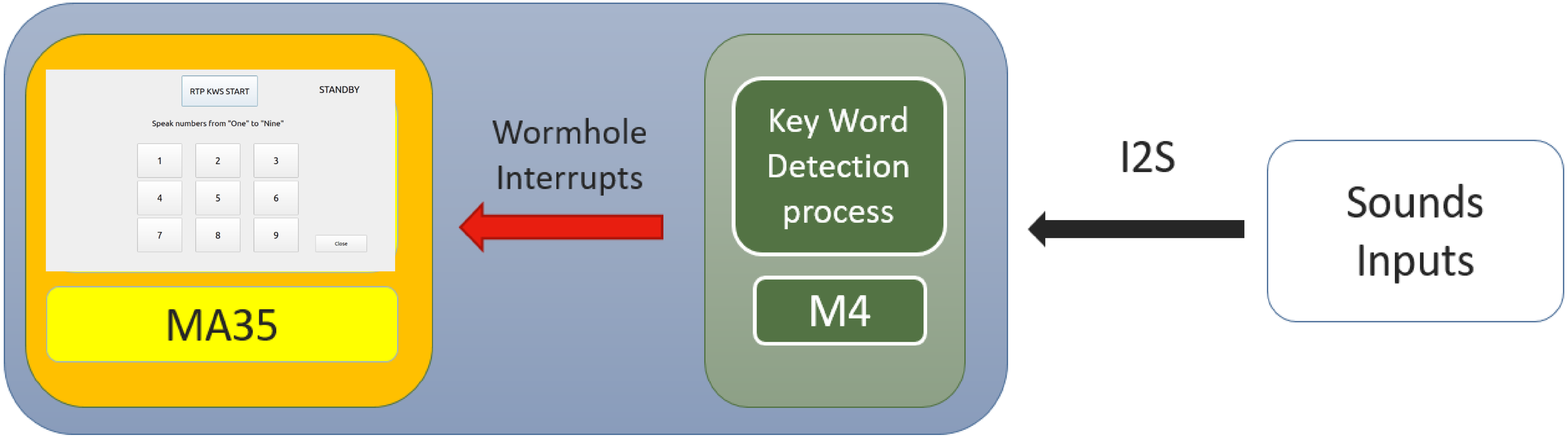
Key Word Spotting by RTP M4

Introduction

- MA35 Load KWS FW to RTP via Linux Rpmsg
- M4 starts to await a wakeup keyword
- If RTP gets a wakeup keyword, RTP reports the number to MA35 and MA35 will show the result on LCD panel

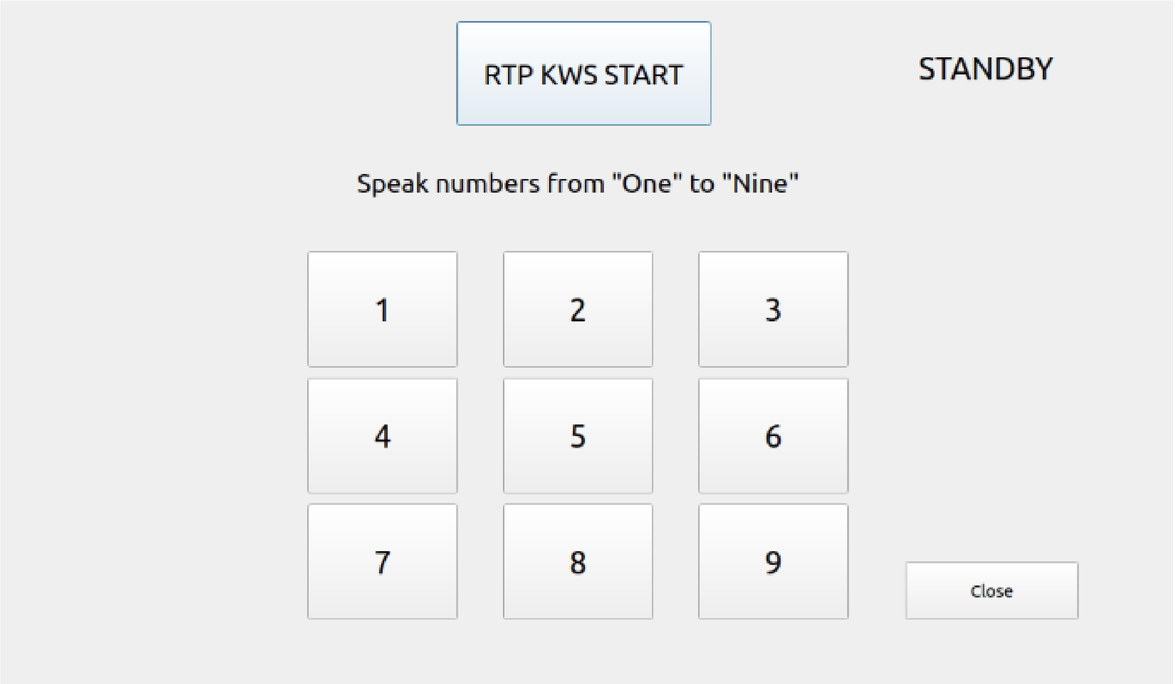


Demo

1. Clock “RTP KWS START” to start KWS
2. The RTP status is on top-right side

   STANDBY means that RTP is ready for listening key words.

   TRIGGERING mean that RTP is collecting and analyzing audio data.
3. If the result is within 1 to 9, the corresponding number will be enlarged.



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VoIP

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VoIP


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H.264
Video Playback
ML People counting
2D Accelerator
Data Security
Key Word Spotting
by RTP M4
VOIP

Demo

Mobile phone

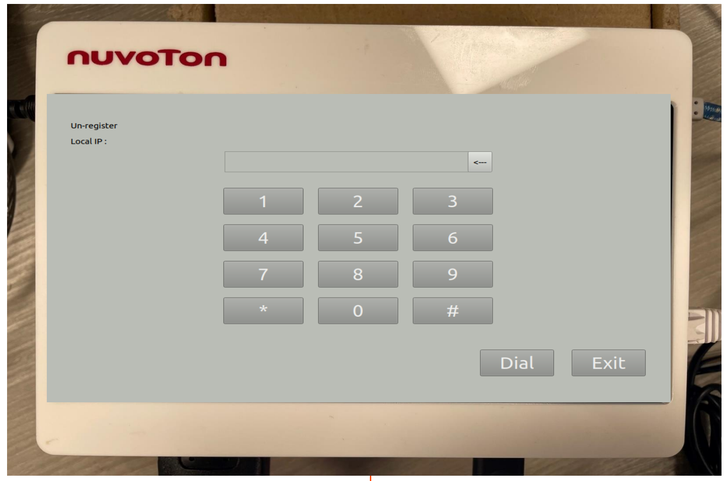
PC

Laptop

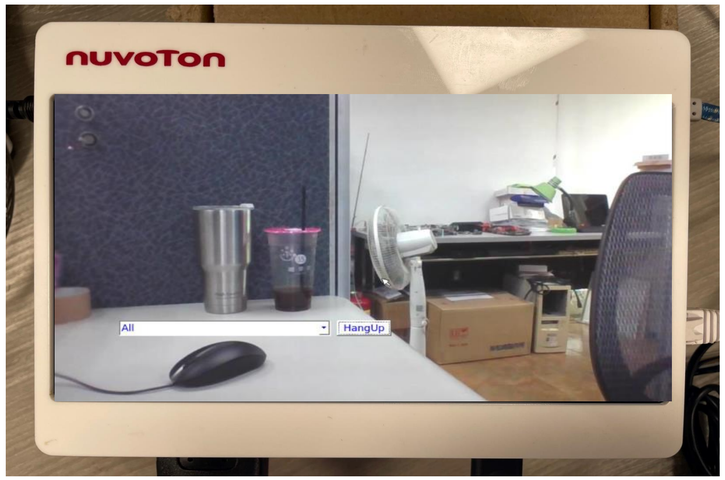
Linphone

SIP

Standby



Talking



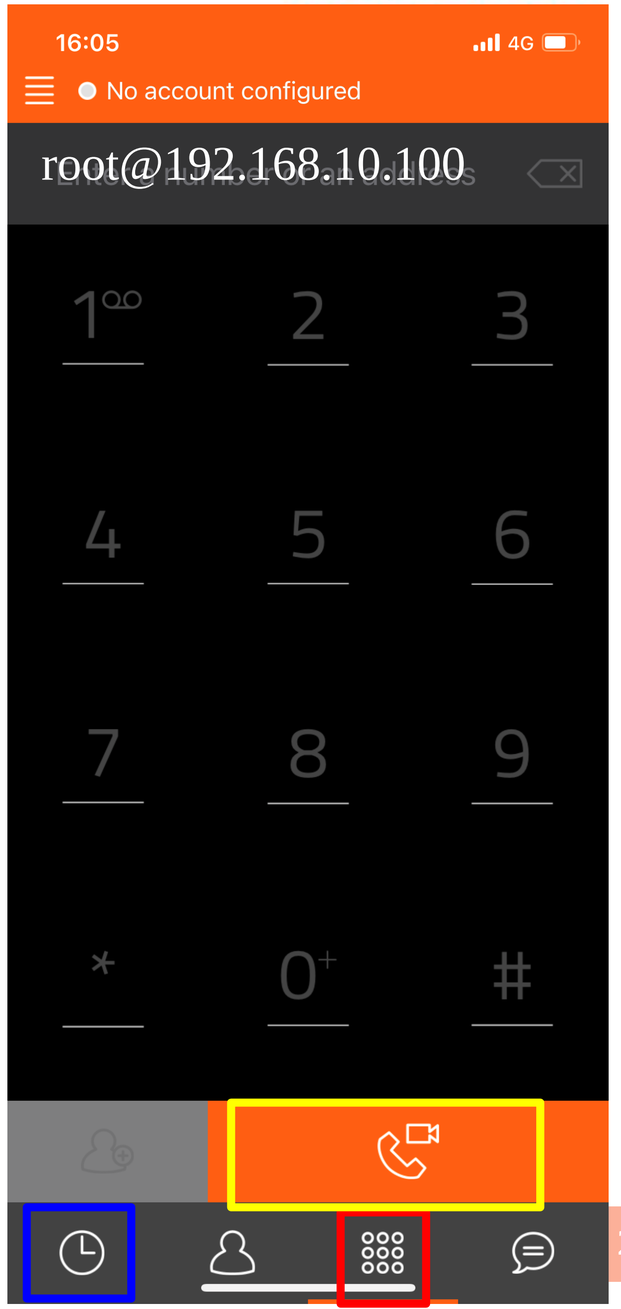
Ethernet Port 1

Wi-Fi Router

LINPHONE Setting

1. Connect MA35 Ethernet port 1 with Wi-Fi router
2. Open LINPHONE APP on PC/Mobile phone
3. Make sure that MA35 and PC/Mobile phone are under the same network
4. Go to “Settings” and configure video->codec to H.264
5. Typing MA35 Local IP : root@192.168.10.100 ， click yellow fame to call MA35

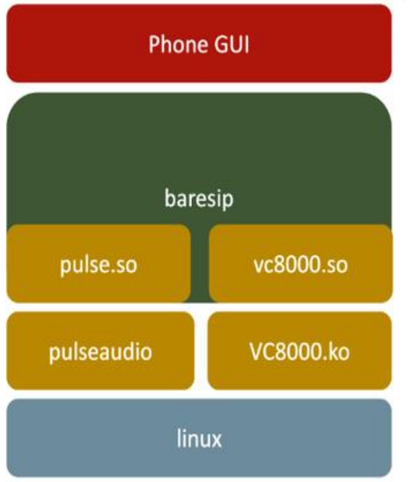
   (Red frame for typing IP, blue frame for the records)

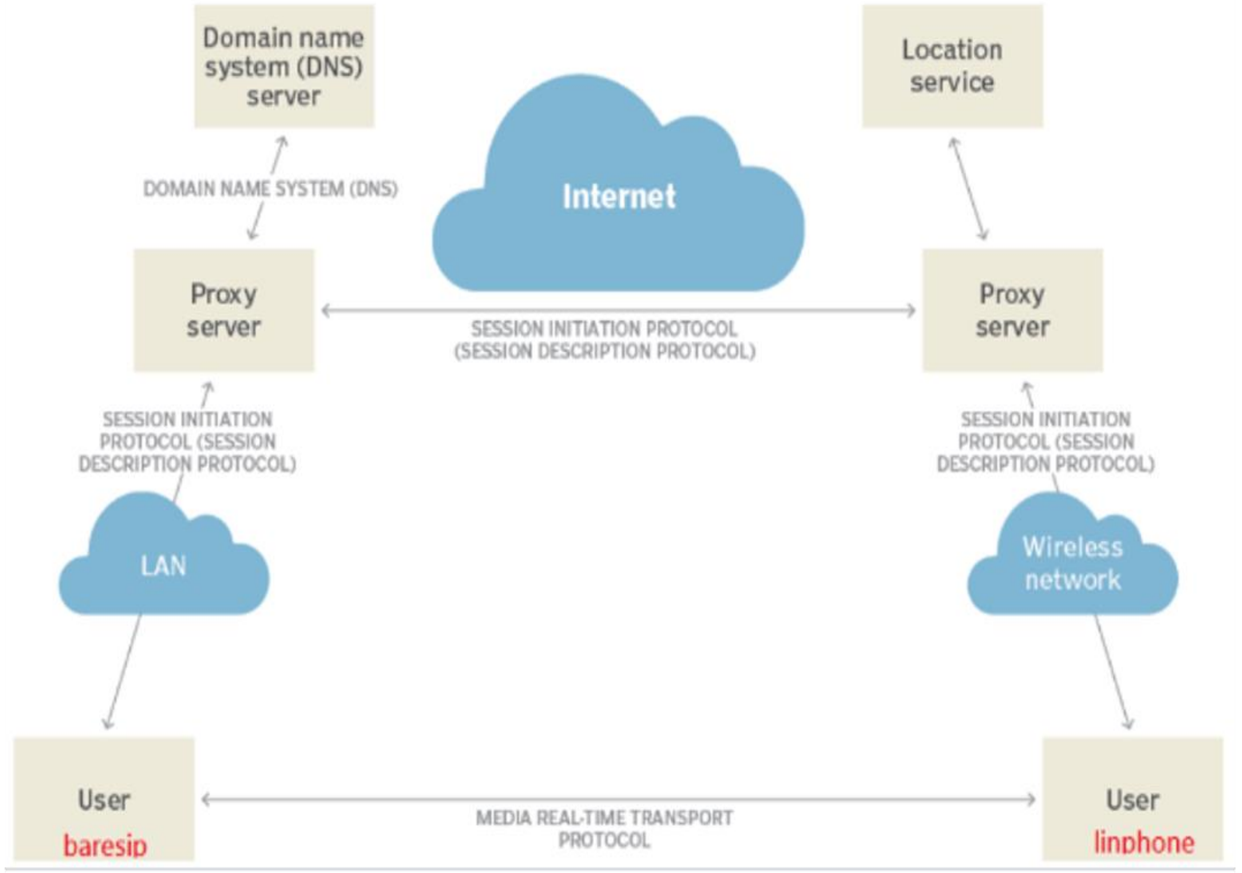


Resource

- H.264 Hardware decode and streaming on framebuffer 0
- Qt GUI on framebuffer 1 and use source over mode to overlay in framebuffer 0
- WebRTC AEC3 support(software AEC)
- Source code : https://github.com/OpenNuvoton/SIP-phone.git

Architecture





APP Installation

- Download **MA35_demo.zip** from
  \\nuvoton.com\prjshare\MCU_FAE\MA35D1(TC5814)\Embedded Demonstration\

- Build:

  Refer to Compile_Environment folder to enable Yocto libraries and Kernel configurations for MA35D1_Demo

- Run:

  1. Copy "MA35D1_Demo_rootfs" to target root filesystem.
  2. On EVB rootfs, Go to /opt/baresip/ and run install script
     #./target_baresip_install.sh
  3. Execute APP
     #./opt/MA35D1_DEMO

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Q&A

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Resourse

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Forum

NuForum English
http://forum.nuvoton.com/

牛卧堂 Simplified Chinese
http://www.nuvoton-MCU.com

21ic 中国电子网 .com Simplified Chinese
http://bbs.21ic.com/iclist-187-1.html

BSP Updates

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Thank You