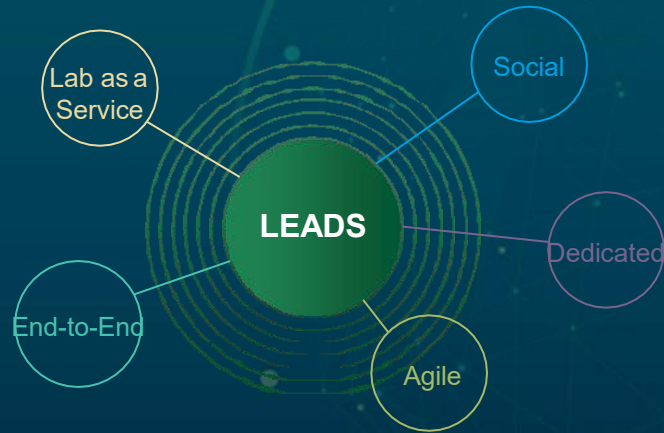


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Huawei LiteOS

The Open Source Operating System for IoT





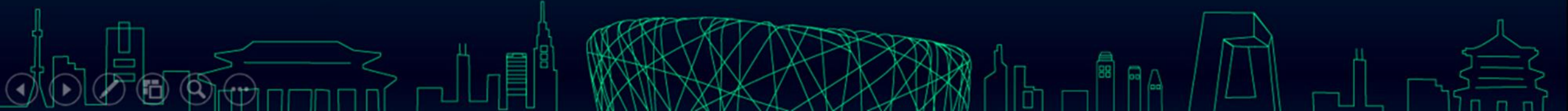
The LEADS concept is redefining Developer experience (DX)

US
\$1 Billion
in 5 YEARS

To develop an open enablement platform, improving developer experience

Dedicate

To develop an open enablement platform, improving developer experience



Huawei LiteOS Enable Things More Intelligent

Huawei LiteOS



[Better Sensing]

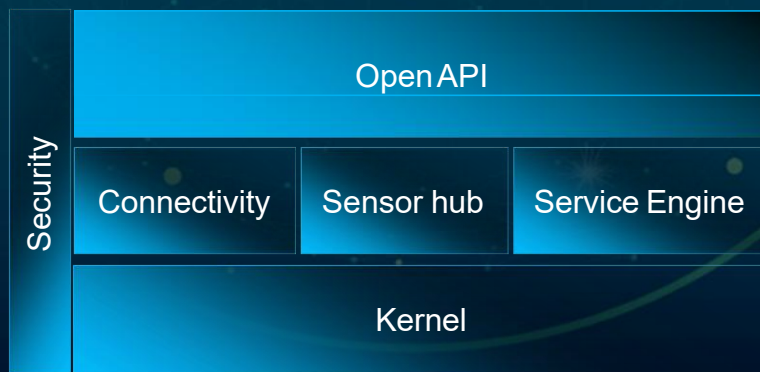
- Small Kernel
- Lower latency
- Lower Consumption

[Better Connecting]

- Multi-protocols supported
- Mesh network

[Simple Developing]

- High-level language for development
- Re-Active programming model

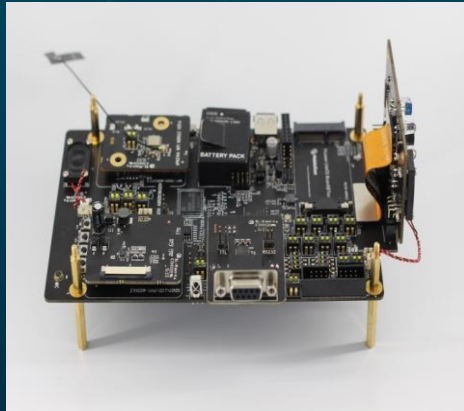


Lightweight Kernel + N Frameworks



Lighter, Lower Power, Faster Response

Smart Camera



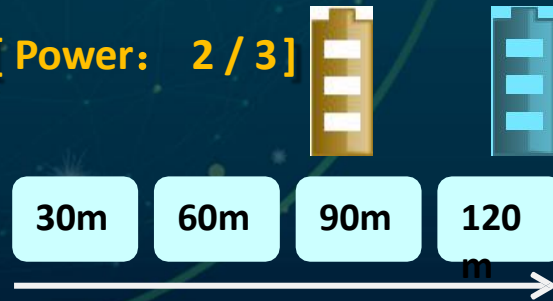
Huawei LiteOS + HiSilicon

[Start-up speed : 1 / 8]



Cold start to the preview:

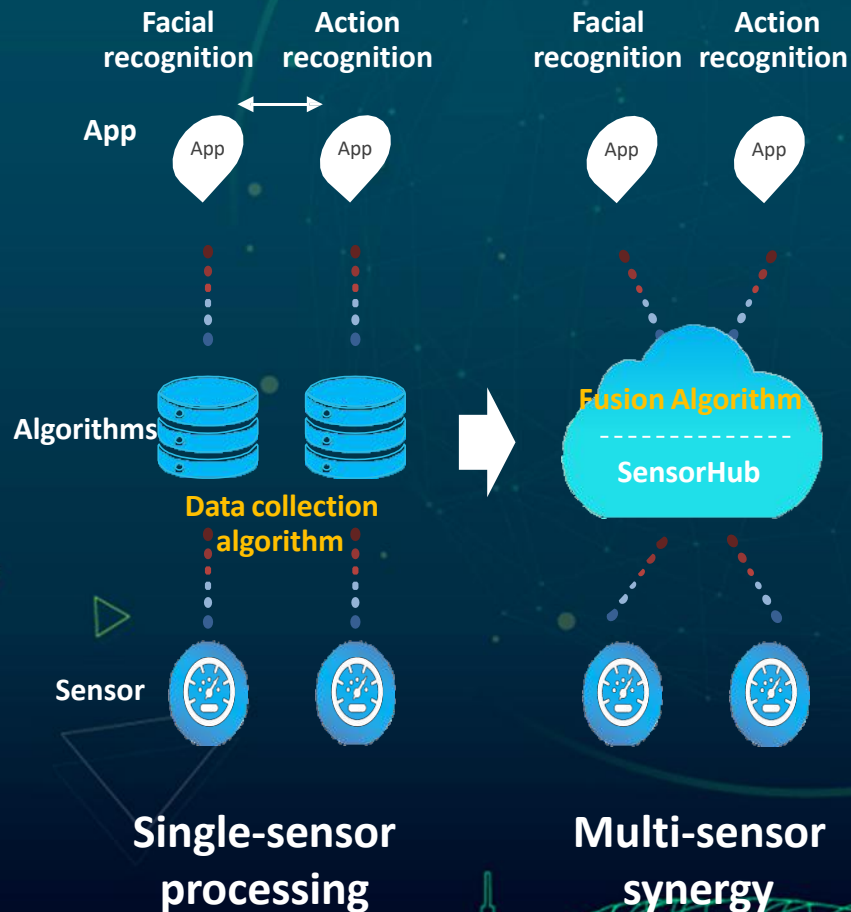
[Power: 2 / 3]



1080p recording scene, 1000mAh battery capacity

Lower Latency, Higher Precision SensorHub Framework Makes Sensors Smarter

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- ↓50% delay
- 2X+ accuracy
- collection algorithm -> fusion algorithm

Better Connecting, Multi-Protocols Supported



- Self healing network
- Mesh Large-scale networking
- Multi-processor support system architecture



An App-framework for IoT, delivers performance and low power like C



FPS: 38 CPU: 5

▶ Frame per sec CPU usage (%)

MapleJS version

VS



FPS: 43 CPU: 3

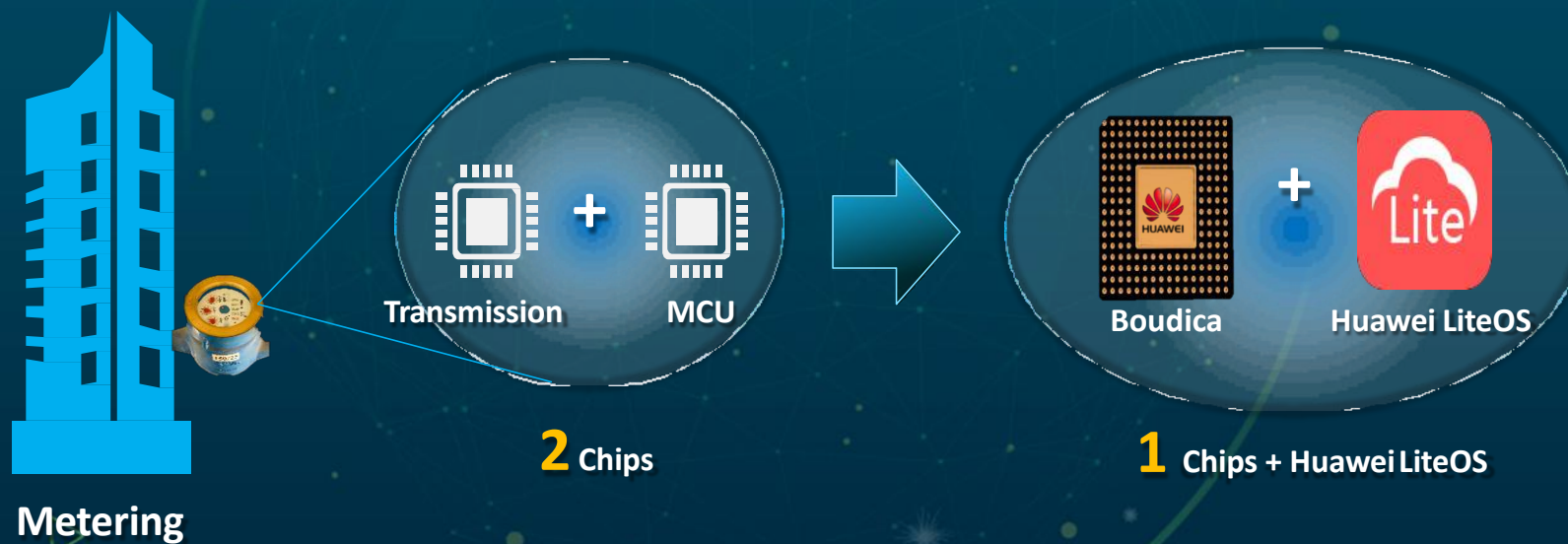
▶ Frame per sec CPU usage (%)

C version



Huawei LiteOS, Reduce Metering Cost

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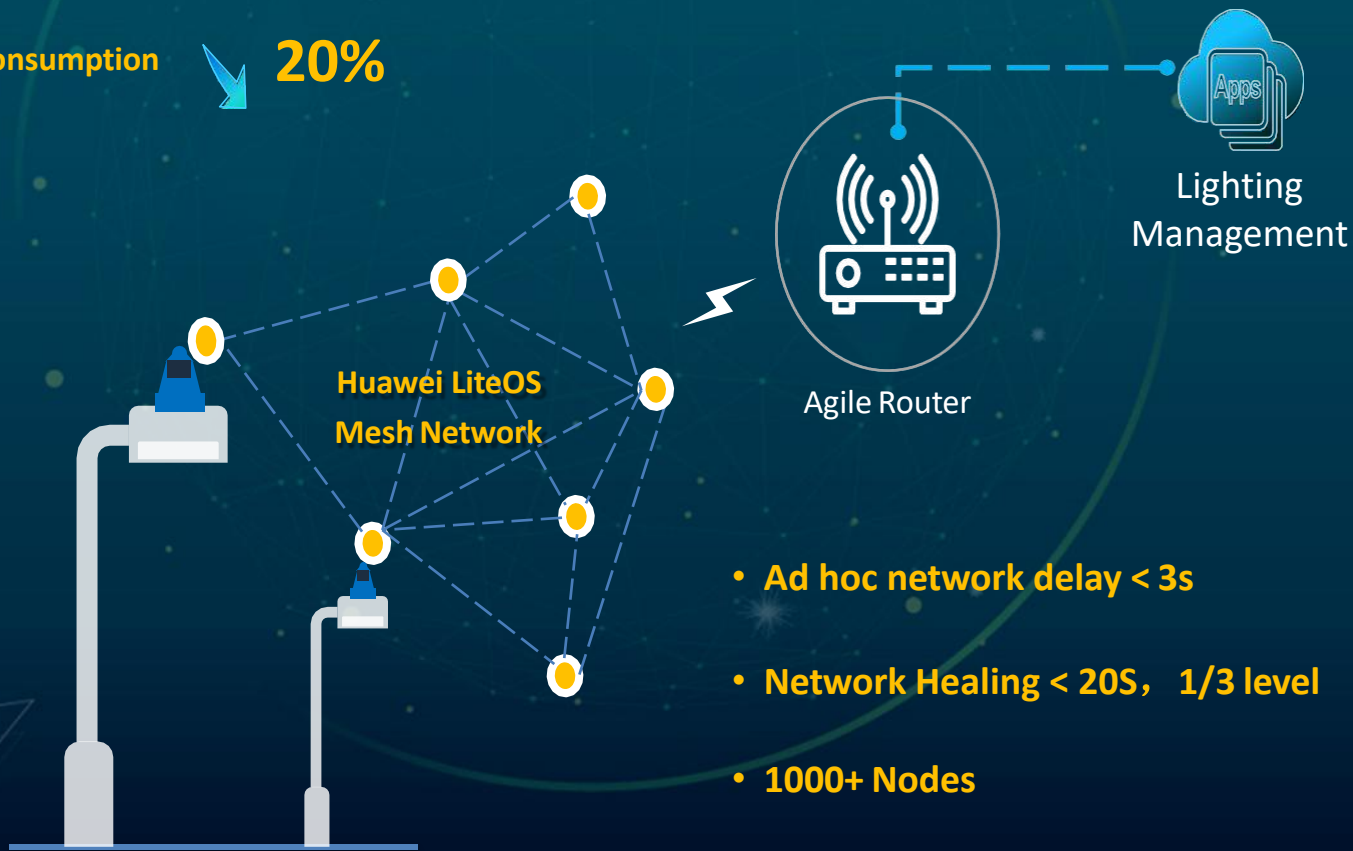
- Huawei LiteOS instead of MCU, reduce cost
- Low power consumption, about 10 years



Huawei LiteOS, Saving Energy For Smart Lighting

Operation cost ↓ 50%

Energy Consumption ↓ 20%



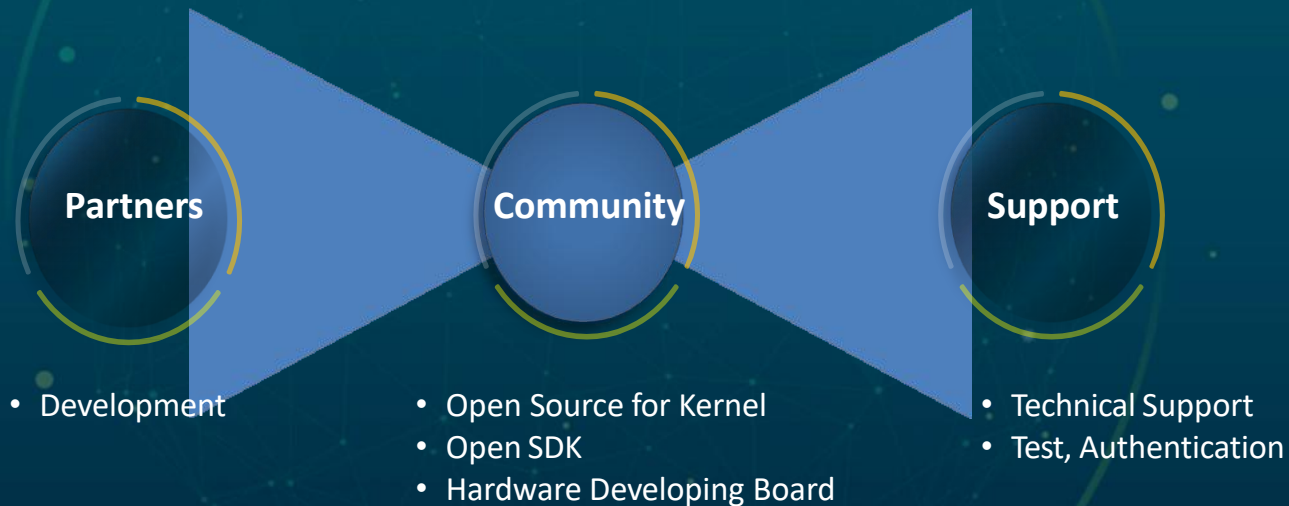
- Ad hoc network delay < 3s
- Network Healing < 20S, 1/3 level
- 1000+ Nodes



Huawei LiteOS Community, Helping Partners Innovating

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Open Source, Commercialized directly



Remote Lab



Open Source/API



Support



IDE



Authentication



How to get Huawei LiteOS ?

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➤ Huawei LiteOS developer community

<http://developer.huawei.com/ict/en/site-iot/product/liteos>

- LiteOS Kernel source code and SDKs
- Developer Guide: video and technical documents
- Evaluation boards introduction

The screenshot displays the Huawei LiteOS developer website interface, divided into two main sections: "Resource Acquisition" and "Quick Experience".

Resource Acquisition:

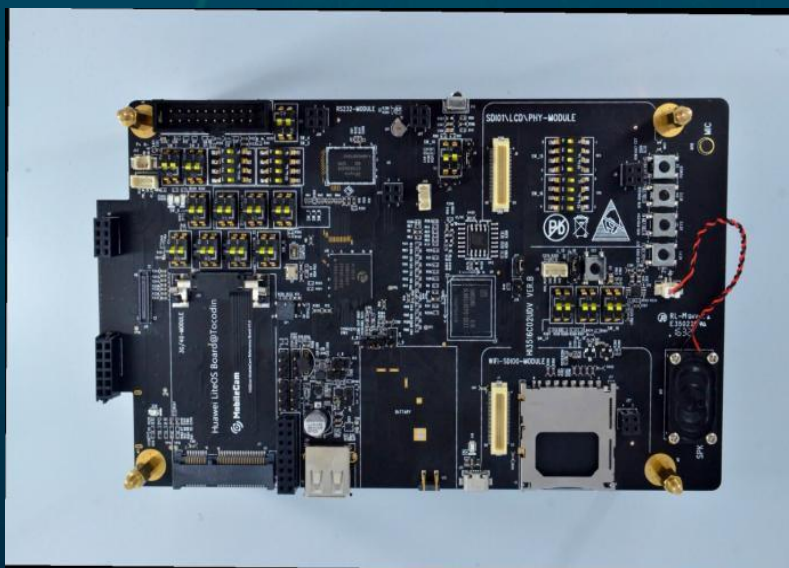
- Set up development environ...:** Accompanied by an image of a green evaluation board with a play button overlay.
- Download source ...:** Includes a document icon, the text "The source code is compiled in an IAR Embedded Workbench, enabling third-party partners to...", and a red "Download" button.
- Download SDK:** Includes a download icon, the text "The Software Development Kit (SDK) runs on HiSilicon MobileCam chipsets and is use...", and two links: "Download Huawei LiteOS HiSilic..." and "Download Huawei LiteOS HiSilic...".
- Download docume...:** Includes a book icon, the text "Huawei LiteOS knowledge base is right here! The API reference, developer guides, and kernel...", and three links: "Guide for Migrating Huawei Lite...", "Guide for Setting Up Huawei Lite...", and "Huawei LiteOS Compiler(IAR)".

Quick Experience:

- Getting Started:** A section with the text "Get started with secondary development to Huawei LiteOS by following the general tips, design framework, step-by-step guidelines, and sample...".
- Acquire hardware resources:** Represented by a download icon.
- Acquire software resources:** Represented by a document icon with a download arrow.
- Set up development environments:** Represented by a document icon with a pencil.
- Connect to TFTP server and serial...:** Represented by a code icon.
- Print a Hello World message:** Represented by a document icon with a checkmark.

Huawei LiteOS MobileCam board introduction

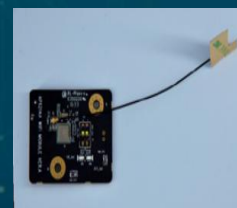
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Mainboard



Sensor Board



WIFI Board



Ethernet Board



LCD Board



UART Board



Contact us

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<http://developer.huawei.com/ict/cn/events/site-iot-workshop2016-liteos>



The banner features the Huawei logo in the top left corner. The main title 'Huawei LiteOS Workshop-北京站' is centered in a large, bold, red font. Below the title, the location '北京海淀区中关村创业大街 39 号 并购咖啡(Binggo Cafe)' and the date '2016/12/17 10:00' are displayed. The background is a blue sky with a network of white nodes and lines, and a stylized cityscape at the bottom with green mountains and a traditional Chinese building. A QR code is located in the bottom right corner, with the Huawei logo and '华为开发者社区' (Huawei Developer Community) text below it.

Huawei LiteOS Workshop-北京站

📍 : 北京海淀区中关村创业大街 39 号 并购咖啡(Binggo Cafe)

🕒 : 2016/12/17 10:00



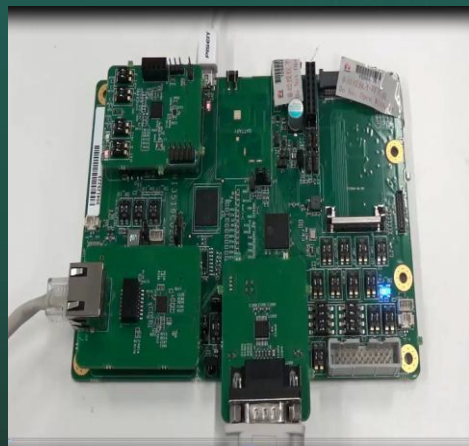
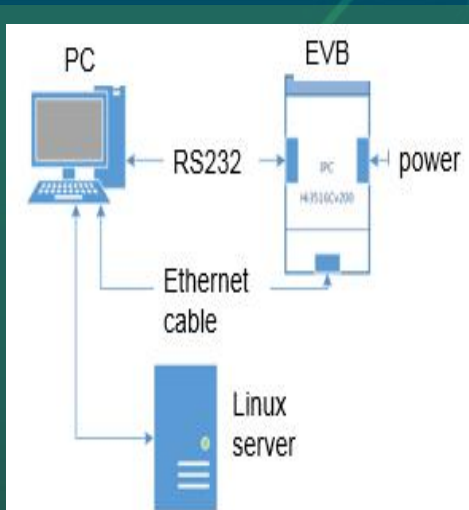
Any questions or suggestions, please feel free to contact us:

- From Huawei LiteOS development community “Development Queries”
- Or sent email to [“liteos@huawei.com”](mailto:liteos@huawei.com)

Q & A



Create a "hello word" task with MobileCam board



Set up hardware environments

```

build 2016/8/23 10:33
compat 2016/8/23 10:33
doc 2016/8/23 10:33
drivers 2016/8/23 10:33
fs 2016/8/23 10:33
kernel 2016/8/23 10:33
lib 2016/8/23 10:34
net 2016/8/23 10:33
out 2016/8/23 10:33
platform 2016/8/23 10:33
sample 2016/8/23 10:33
shell 2016/8/23 10:33
test 2016/8/23 10:33
tools 2016/8/23 10:33
.config 2016/8/17 17:50
config.mk 2016/8/17 17:35
liteos.ld 2016/8/17 17:35
Makefile 2016/8/17 17:54
    
```

Download LiteOS code from community

```

ifeq ($(LOSCFG_COMPAT_POSIX), y)
LITEOS_SCATERLIB += -lposix
LIB_SUBDIRS += compat/posix
LITEOS_INCLUDE += \
-I $(LITEOSTOPIR)/compat/posix/include \
-I $(LITEOSTOPIR)/compat/posix/src

LITEOS_CFLAGS += -DLOSCFG_COMPAT_POSIX
LITEOS_MACRO += -DLOSCFG_COMPAT_POSIX
endif

ifeq ($(LOSCFG_COMPAT_LINUX), y)
LITEOS_SCATERLIB += -llinuxdp
LIB_SUBDIRS += compat/linux
LITEOS_INCLUDE += -I $(LITEOSTOPIR)/compat/linux/include

LITEOS_CFLAGS += -DLOSCFG_COMPAT_LINUX
LITEOS_MACRO += -DLOSCFG_COMPAT_LINUX
endif
    
```

Config compiler like arm- huaweiliteos- linux-gcc on Linux server

Set up software environments

```

__attribute__((weak)) void app_init(void)
{
dprintf("proc fs init \n");
#ifdef LOSCFG_FS_PROC
proc_fs_init();
#endif
#ifdef LOSCFG_SHELL
#ifdef UART_WITHOUTVFS
hi_uartdev_init();
system_console_init(TTY_DEVICE);
#endif
#ifdef LOSCFG_SHELL
extern unsigned int osShellInit(void);
extern void shell_cmd_register(void);
osShellInit();
shell_cmd_register();
#endif
#endif
    
```

Find "app_init," and begin your journey with LiteOS

```

/*Demo interface, create your task there*/
UINT32 user_myhello(VOID)
{
UINT32 uwRet;
TSK_INIT_PARAM_S stInitParam;

stInitParam.pfnTaskEntry = (TSK_ENTRY_FUNC)Example_Task;
stInitParam.usTaskPrio = TSK_PRIOR_HI;
stInitParam.pchName = "hello_liteos";
stInitParam.uwStackSize = 0x400;
stInitParam.uwResved = OS_TSK_DETACHED;
/*Create a task*/
uwRet = LOS_TaskCreate(&g_uwTskHID, &stInitParam);
if (uwRet != LOS_OK)
    
```

Create a new task, compile the project and porting the Bin file to the board.

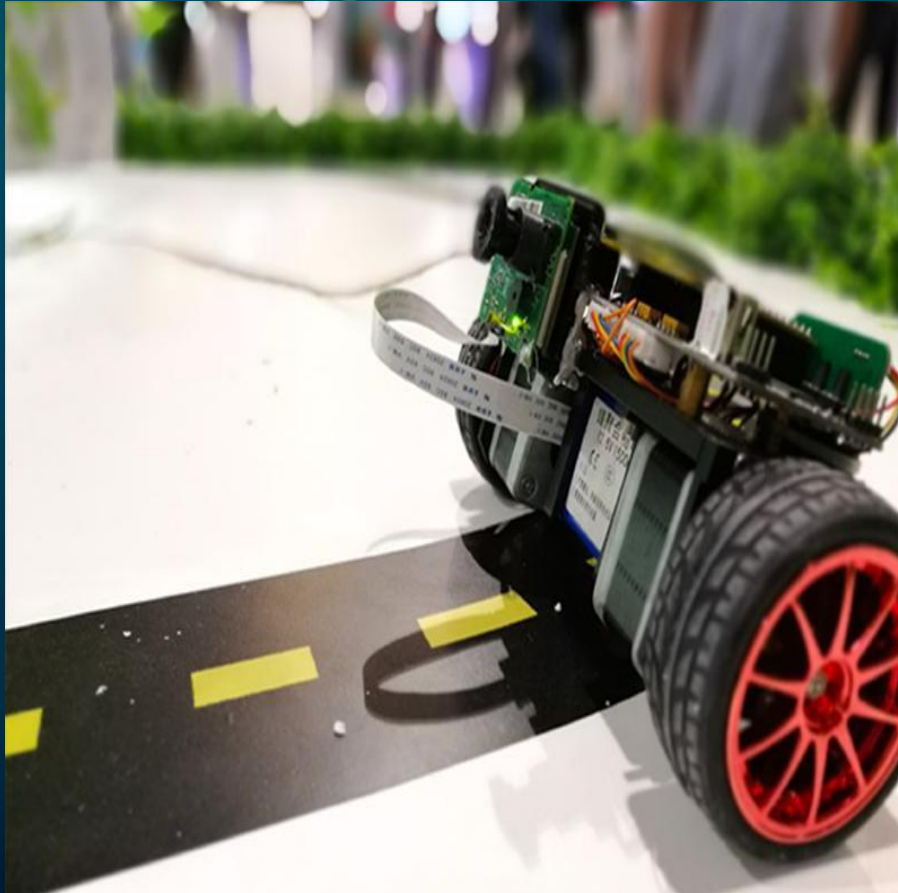
Realize your idea with LiteOS



Run the board and you can find the "hello word" task is created.

LiteOS Demo: Balanced car for video surveillance

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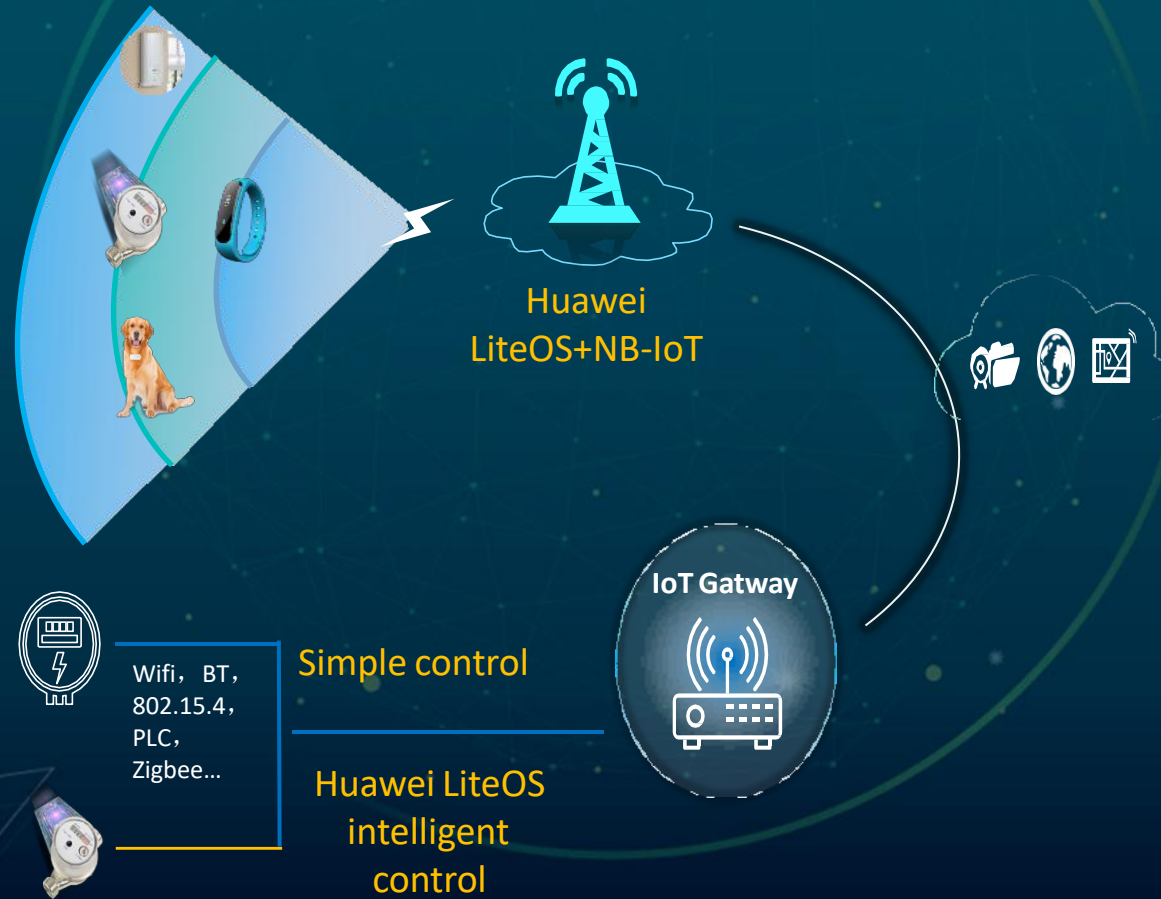


With LiteOS and it's connection SDKs, we can see:

- Seamless connecting(Zero-configuration) to gateway and controller(phone) via WIFI.
- Fast response to the control command.
- Fast development(<2 weeks, 2 people).



Better Connecting, Multi-Protocols Supported



- ✓ Metering app
- ✓ Tracking
- ✓ Lighting
- ✓ ...



Wifi, BT,
802.15.4,
PLC,
Zigbee...

Simple control

Huawei LiteOS
intelligent
control

