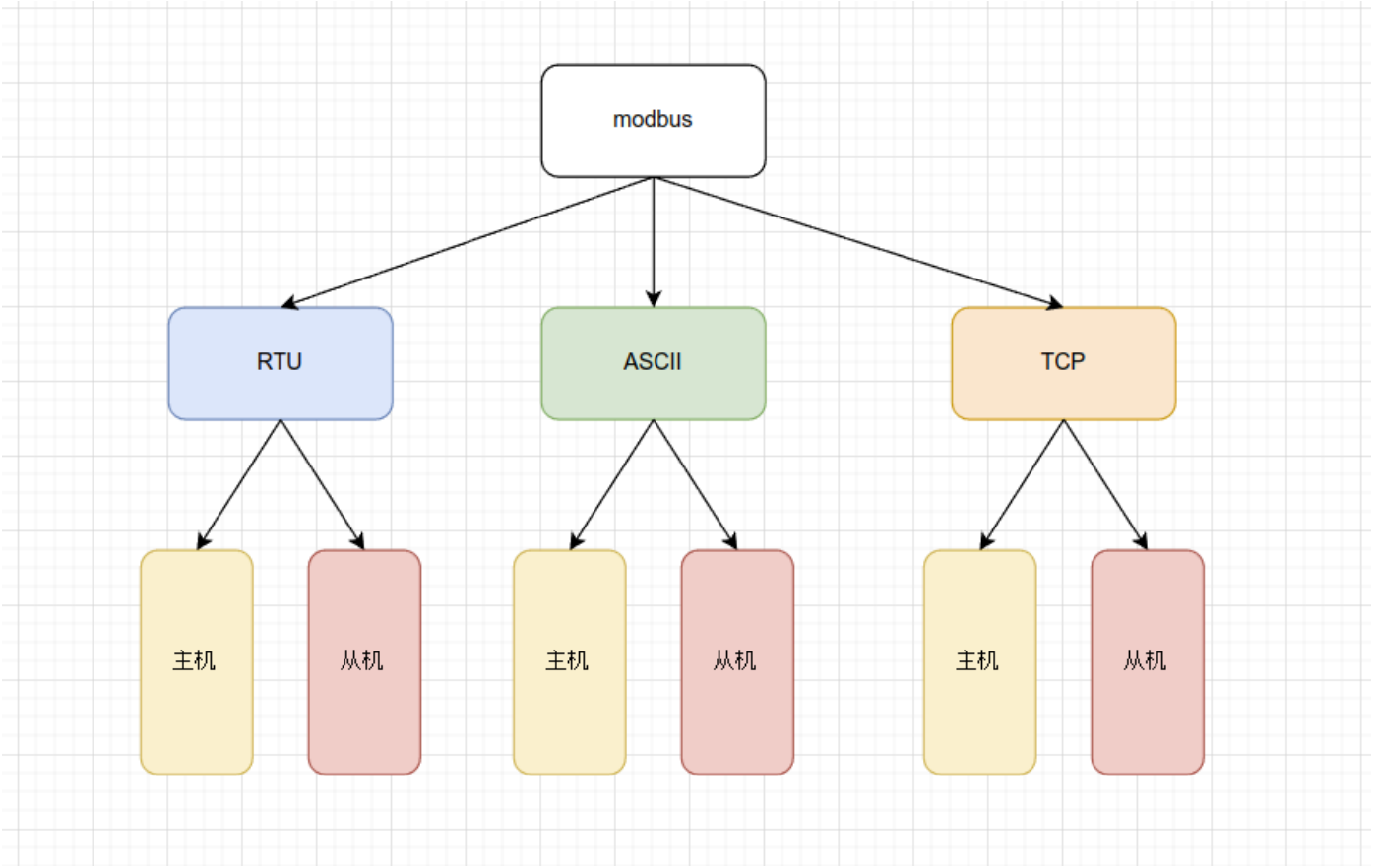
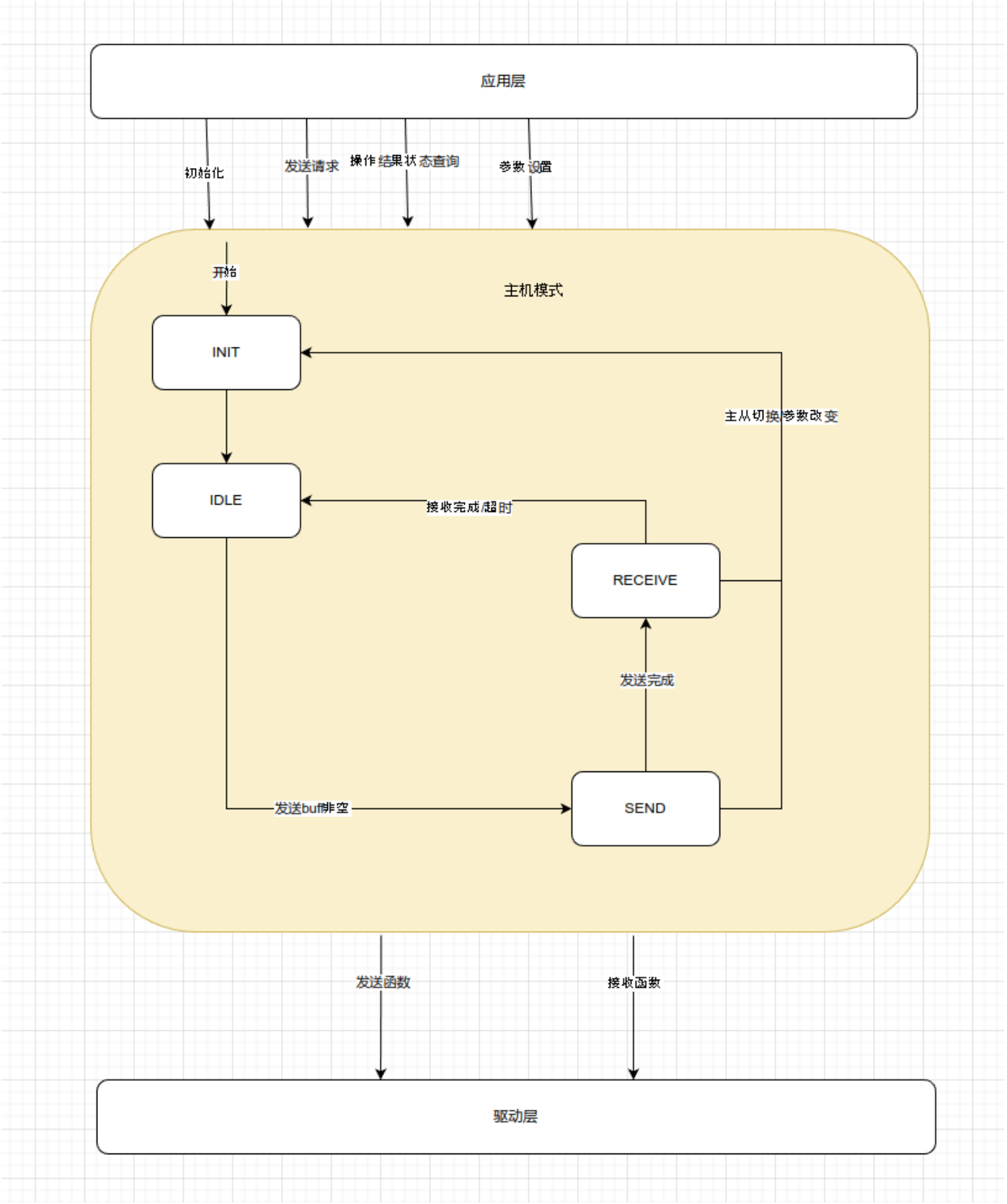
modbus_module 设计概要

1. 代码结构

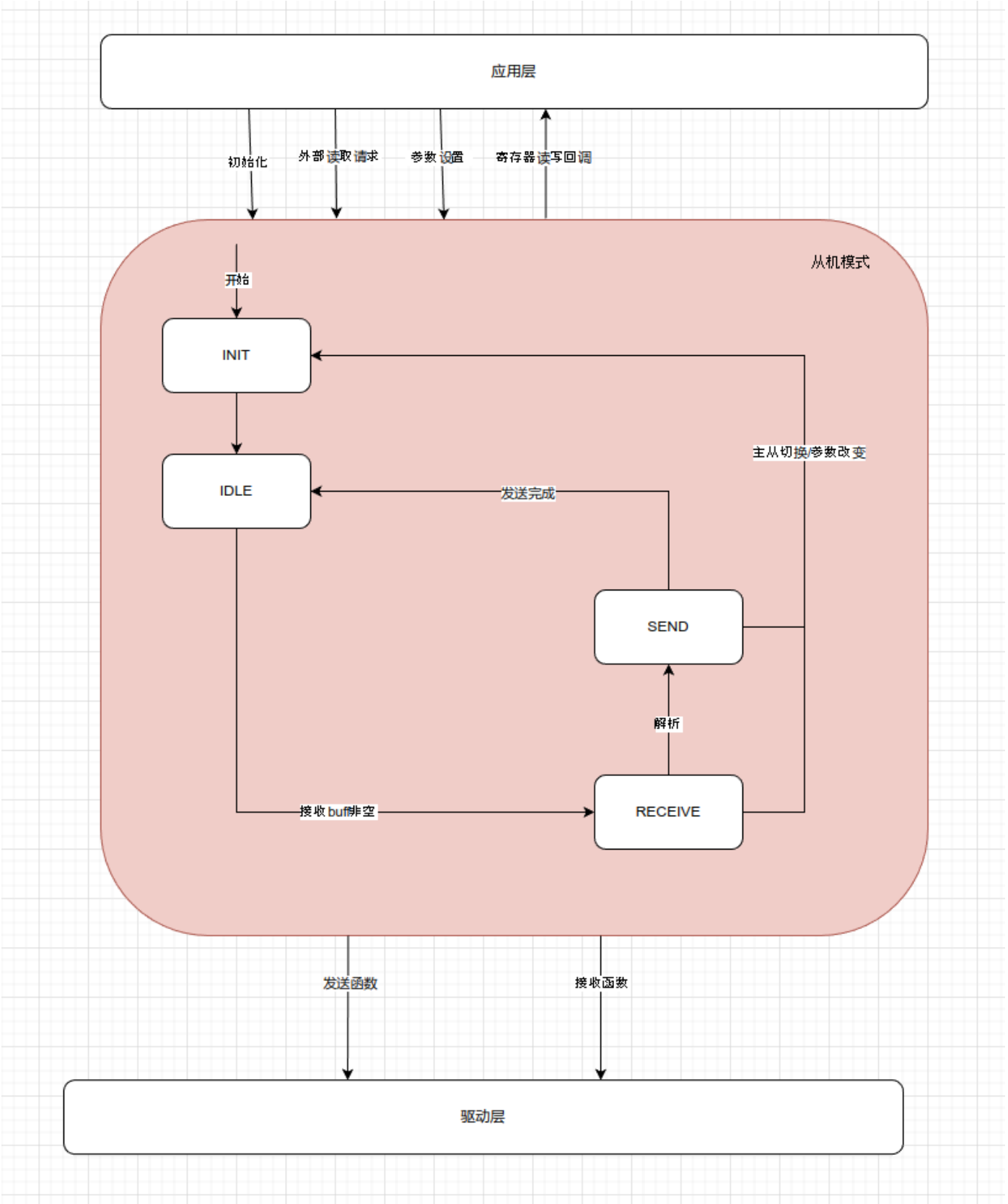
1.1 源码结构



1.2 主机模式


应用层
初始化
发送请求
操作结果
状态查询
参数设置
开始
主机模式
INIT
主从切换/参数改变
IDLE
接收完成/超时
RECEIVE
发送完成
发送buf非空
SEND
发送函数
接收函数
驱动层

1.3 从机模式



2. 数据类型

```
typedef struct Modebus_RTU_Fun_Table
{
    uint8_t fcode;
    int8_t (*request)(stModbus_RTU_Handler *handler, stModbus_RTU_Sender *sender);
    int8_t (*slave_parse)(stModbus_RTU_Handler *handler, uint8_t *buff, uint16_t
len);
```

```
    int8_t (*master_parse)(stModbus_RTU_Handler *handler, uint8_t *buff, uint16_t
len);

}stModebus_RTU_Fun_Table;

typedef struct Modbus_RTU_Handler
{
    uint8_t dev_addr;
    stModbus_RTU_State state, last_state;              // send/receive switch
judge
    emModebus_RTU_Mode mode, last_mode;                // slave/master switch
judge
    uint32_t last_call_tick;
    uint8_t tx_buff[300];
    uint16_t tx_len;
    uint8_t rx_buff[300];
    uint16_t rx_len;
    uint16_t *master_parse_addr;                          // master parse
address(master mode use only)
    uint32_t Master_Wait_Count;                           // master wait recv
time count(master mode use only)
    uint32_t Master_Wait_Recv_Limt;                      // master wait recv
limit(master mode use only)
    stModebus_RTU_Fun_Table *fun_table;                  // callback function
table
    uint8_t fun_table_items;
    int8_t (*send)(uint8_t *buff, uint16_t len);
    int8_t (*recv)(uint8_t *buff, uint16_t *len);
    int8_t reg_map_id;                                        // reserve for
select register map table
    int8_t (*read_input)(stModbus_RTU_InputReader *reader);
    int8_t (*read_hold)(stModbus_RTU_HoldReader *reader);
    int8_t (*write_hold)(stModbus_RTU_HoldWriter *writer);

}stModbus_RTU_Handler;


typedef struct Modbus_RTU_Handler_Attribute
{
    uint8_t dev_addr;
    emModebus_RTU_Mode mode;
    int8_t (*send)(uint8_t *buff, uint16_t len);
    int8_t (*recv)(uint8_t *buff, uint16_t *len);
    int8_t reg_map_id;                                        // reserve for
select register map table
    int8_t (*read_input)(stModbus_RTU_InputReader *reader);
    int8_t (*read_hold)(stModbus_RTU_HoldReader *reader);
    int8_t (*write_hold)(stModbus_RTU_HoldWriter *writer);
    stModebus_RTU_Fun_Table *fun_table;                  // callback function
table
    uint8_t fun_table_items;

}stModbus_RTU_Handler_Attr;
```

3. 接口设计

```
/**
 * @brief  modbus rtu init
 * @param  handler: modbus rtu handler
 * @param  bus: modbus rtu bus
 * @param  attr: modbus rtu handler attr
 *
 * @return 0: success, -1: fail
 */
int8_t modbus_rtu_init(stModbus_RTU_Handler *handler, emModebus_RTU_Bus bus,
stModbus_RTU_Handler_Attr *attr);

void modbus_rtu_run(stModbus_RTU_Handler *handler);

/**
 * @brief 读取寄存器
 * @param bus 总线编号
 * @param dev_addr 设备地址
 * @param reg_addr 寄存器地址
 * @param reg_num 寄存器数量
 * @param reg_data 寄存器数据地址
 *
 * @return 0 成功，-1 失败
 */
int8_t modbus_rtu_read_hold(emModebus_RTU_Bus bus, uint8_t dev_addr, uint16_t
reg_addr, uint16_t reg_num, uint16_t *reg_data);

/**
 * @brief 读取上次操作完成状态
 * @param bus 总线编号
 *
 * @return 0 完成，1 未完成  - 1 失败
 */
int8_t modbus_rtu_opt_status(emModebus_RTU_Bus bus);
```

4. 移植/应用

4.1 回调接口

```
int8_t (*send)(uint8_t *buff, uint16_t len);                    // 驱动层读接口
int8_t (*recv)(uint8_t *buff, uint16_t *len);                    //  驱动层写接口
int8_t reg_map_id;                                             // reserve for select
```

```
register map table
int8_t (*read_input)(stModbus_RTU_InputReader *reader);          //  应用层读输入寄存器回调
int8_t (*read_hold)(stModbus_RTU_HoldReader *reader);            //  应用层读保持寄存器回调
int8_t (*write_hold)(stModbus_RTU_HoldWriter *writer);           //  应用层写保持寄存器回调
```

4.2 移植接口

```
uint32_t modbus_port_get_time_ms();
```