

# Box config schema

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## 专用名词解释

edge: 指网关

tag: 工业数据

device: 产生实际数据的源 plc | sensor | io

```
{
  "definitions": {
    "type": "object",
    "properties": {
      "id": {
        "type": "string",
        "description": "盒子的ID,唯一标识",
        "examples": ["ABCDEDS9u2342"]
      },
      "name": {
        "type": "string",
        "description": "盒子可被用户识别的名称",
        "examples": ["一号焊接机"]
      },
      "edgeModel": {
        "type": "object",
        "description": "盒子自身数据模型",
        "properties": {
          "signalStrength": {
            "type": "number",
            "description": "网络信号强度",
            "default": 0,
            "examples": [25]
          },
          "cellular": {
            "type": "object",
            "description": "网络运营商信息",
            "properties": {
              "carrier": {
                "type": "string",
                "description": "网络运营商名称",
                "examples": ["China Mobile"]
              },
              "simNumber": {
                "type": "string",
                "description": "SIM卡手机号",
                "examples": ["13305758888"]
              }
            }
          },
          "icid": { "type": "string" },
          "networkMode": { "type": "string" },

```

```
    "networkModeSub": { "type": "string" },
    "lac": { "type": "number" },
    "mcc": { "type": "number" },
    "cid": { "type": "number" }
  }
},
"interfaces": {
  "type": "object",
  "description": "盒子网络接口信息",
  "properties": {
    "[key: string]": {
      "type": "object",
      "description": "网卡key的接口信息",
      "properties": {
        "ipv4": {
          "type": "object",
          "properties": {
            "mac": { "type": "string" },
            "vendor": { "type": "string" },
            "netmask": { "type": "string" },
            "gateway": { "type": "string" }
          }
        },
        "ipv6": {
          "type": "object",
          "properties": {
            "mac": { "type": "string" },
            "vendor": { "type": "string" }
          }
        }
      }
    }
  }
},
"serialPorts": {
  "type": "array",
  "items": { "type": "string" },
  "description": "串口名称列表"
},
"defaultRoute": {
  "type": "string",
  "description": "默认route"
}
},
"location": {
  "type": "object",
  "description": "盒子地理位置信息",
  "properties": {
    "longitude": { "type": "number" },
    "latitude": { "type": "number" },
    "radius": { "type": "number" },
    "address": { "type": "string" }
  }
},
"cpu": {
```

```

    "type": "object",
    "description": "盒子CPU信息",
    "properties": {
      "type": { "type": "string" },
      "usage": { "type": "number" },
      "temperature": { "type": "number" }
    }
  },
  "memory": {
    "type": "object",
    "description": "盒子内存信息",
    "properties": {
      "type": { "type": "string" },
      "usage": { "type": "number" },
      "temperature": { "type": "number" }
    }
  }
},
"extModel": {
  "type": "object",
  "description": "盒子连接工业设备/传感器模型",
  "properties": {
    "devices": {
      "type": "object",
      "description": "工业设备/传感器节点",
      "properties": {
        "[key: string]": {
          "type": "object",
          "description": "工业设备/传感器Key定义",
          "properties": {
            "protocol": {
              "type": "string",
              "description": "工业设备/传感器协议",
              "enum": [
                "s7",
                "modbusTCP",
                "modbusRTU",
                "cip",
                "hitachi",
                "idec"
              ]
            },
            "s7Param": {
              "type": "object",
              "properties": {
                "slot": {
                  "type": "number"
                },
                "rack": {
                  "type": "number"
                }
              }
            }
          }
        }
      }
    }
  },

```

```
"modbusParam": {
  "type": "object",
  "properties": {
    "endianness": {
      "type": "string",
      "description": "数据端序",
      "enum": ["big-endian", "little-endian"]
    }
  }
},
"devInterface": {
  "type": "object",
  "description": "工业设备/传感器通信接口",
  "properties": {
    "type": {
      "type": "string",
      "description": "接口",
      "enum": ["UDP", "TCP", "serial"]
    }
  },
  "serialParam": {
    "type": "object",
    "properties": {
      "port": {"type": "string"},
      "baudRate": {
        "type": "number",
        "description": "波特率",
        "enum": [1200, 2400, 4800, 9600, 14400, 19200, 38400,
57600, 115200]
      }
    },
    "parity": {
      "type": "string",
      "example": ["none", "even", "odd", "mark", "space"]
    },
    "dataBits": {
      "type": "number",
      "enum": [5, 6, 7, 8]
    },
    "stopBits": {
      "type": "number",
      "enum": [1, 1.5, 2]
    },
    "rs": {
      "type": "string",
      "example": ["rs232", "rs422", "rs485"]
    },
    "stationNumber": {
      "type": "number"
    }
  }
},
"networkParam": {
  "type": "object",
  "properties": {
    "port": {
```

```

        "type": "number",
        "description": "工业设备/传感器端口"
    },
    "address": {
        "type": "string",
        "description": "工业设备/传感器地址",
        "example": ["192.168.0.1"]
    }
}
}
},
"cycle": {
    "type": "number",
    "description": "工业设备/传感器扫描周期 ms"
},
"timeout": { "type": "number" },
"description": {"type": "string"}
}
}
},
"tags": {
    "type": "object",
    "description": "工业数据定义",
    "properties": {
        "[key: string]": {
            "type": "object",
            "description": "工业数据名Key定义",
            "properties": {
                "device": {
                    "type": "string",
                    "description": "数据来源于哪个工业设备/传感器"
                },
                "address": {
                    "type": "string",
                    "description": "数据在工业设备/传感器中的地址",
                    "examples": ["MW900"]
                },
                "datatype": {
                    "type": "string",
                    "description": "数据类型",
                    "enum": [
                        "BOOL",
                        "INT16",
                        "INT32",
                        "INT64",
                        "REAL32",
                        "REAL64",
                        "WORD",
                        "DWORD",
                        "BYTE"
                    ]
                }
            }
        }
    }
},

```

```

        "description": {
            "type": "string",
            "description": "数据描述"
        },
        "unit": { "type": "string", "description": "数据单位" }
    }
}
},
"alarms": {
    "type": "object",
    "description": "设备报警定义",
    "properties": {
        "[key: string]": {
            "type": "object",
            "description": "设备报警Key定义",
            "properties": {
                "text": { "type": "string" },
                "source": { "type": "string" },
                "threshold": { "type": "string" },
                "operator": {
                    "type": "string",
                    "enum": [ ">", ">=", "==", "!=", "<=", "<" ]
                },
                "deadband": { "type": "number" },
                "deadbandMode": {
                    "type": "string",
                    "enum": [ "abs", "percentage" ]
                },
                "delay": { "type": "number" }
            }
        }
    }
}
}
}
}
}
}
}
}
}
}
}

```

## QA

### Q: 云端如何获取盒子连接设备拓扑结构

A: 盒子上传设备模型数据

### Q: 如何避免数据伪造

A: 模型认证, 云端接收的工业数据与盒子模型进行校验来判断数据真伪

Q

Q: 数据请求模式, 云端是否需要主动向盒子请求数据

Q: 云端对盒子的数据请求的模型, 如请求盒子以 1min 为间隔发送数据, 是否还会有数据取消发送命令

Q: 多个数据请求方对盒子同时请求数据的时候, 服务如何进行优化处理