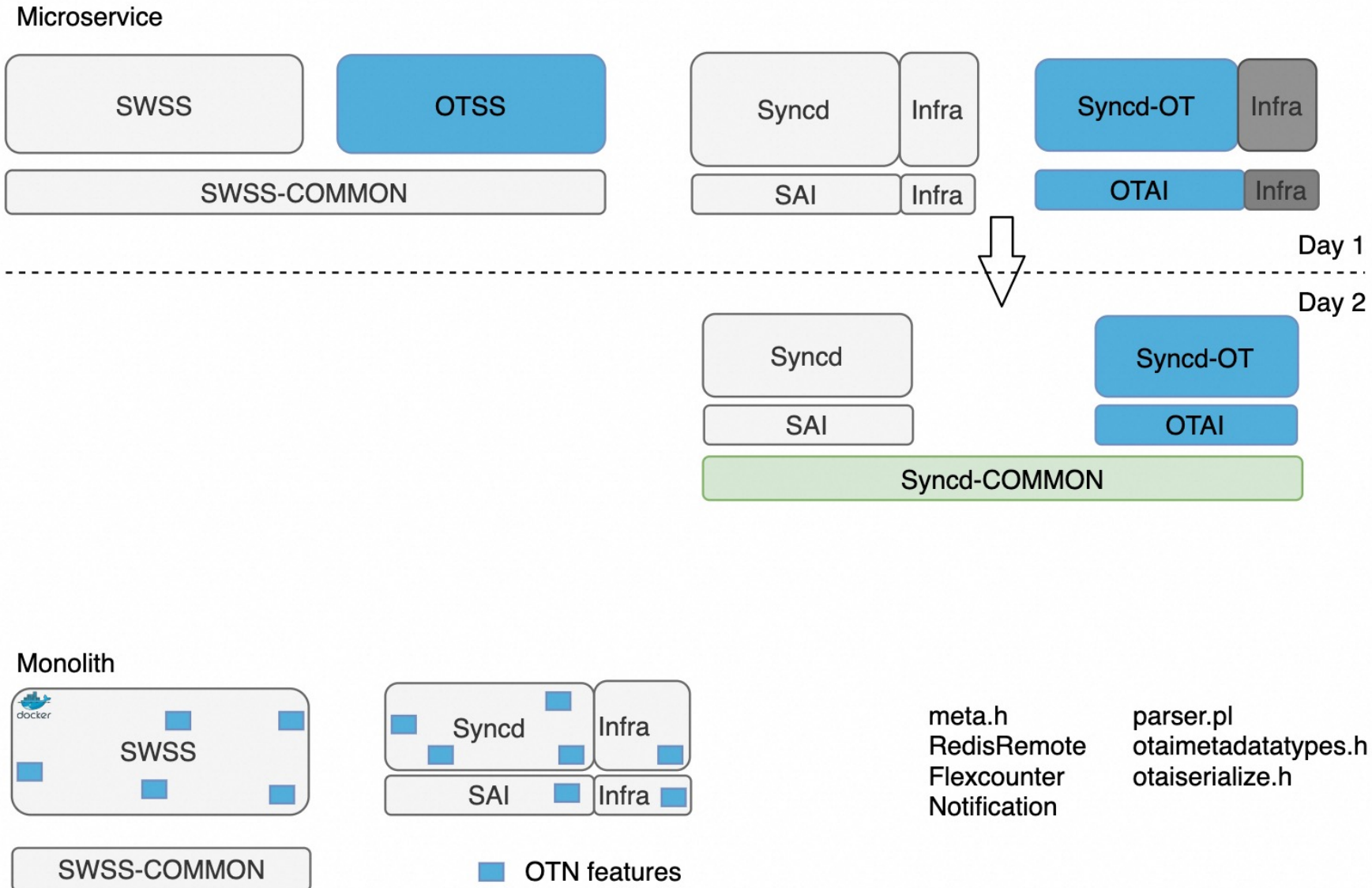


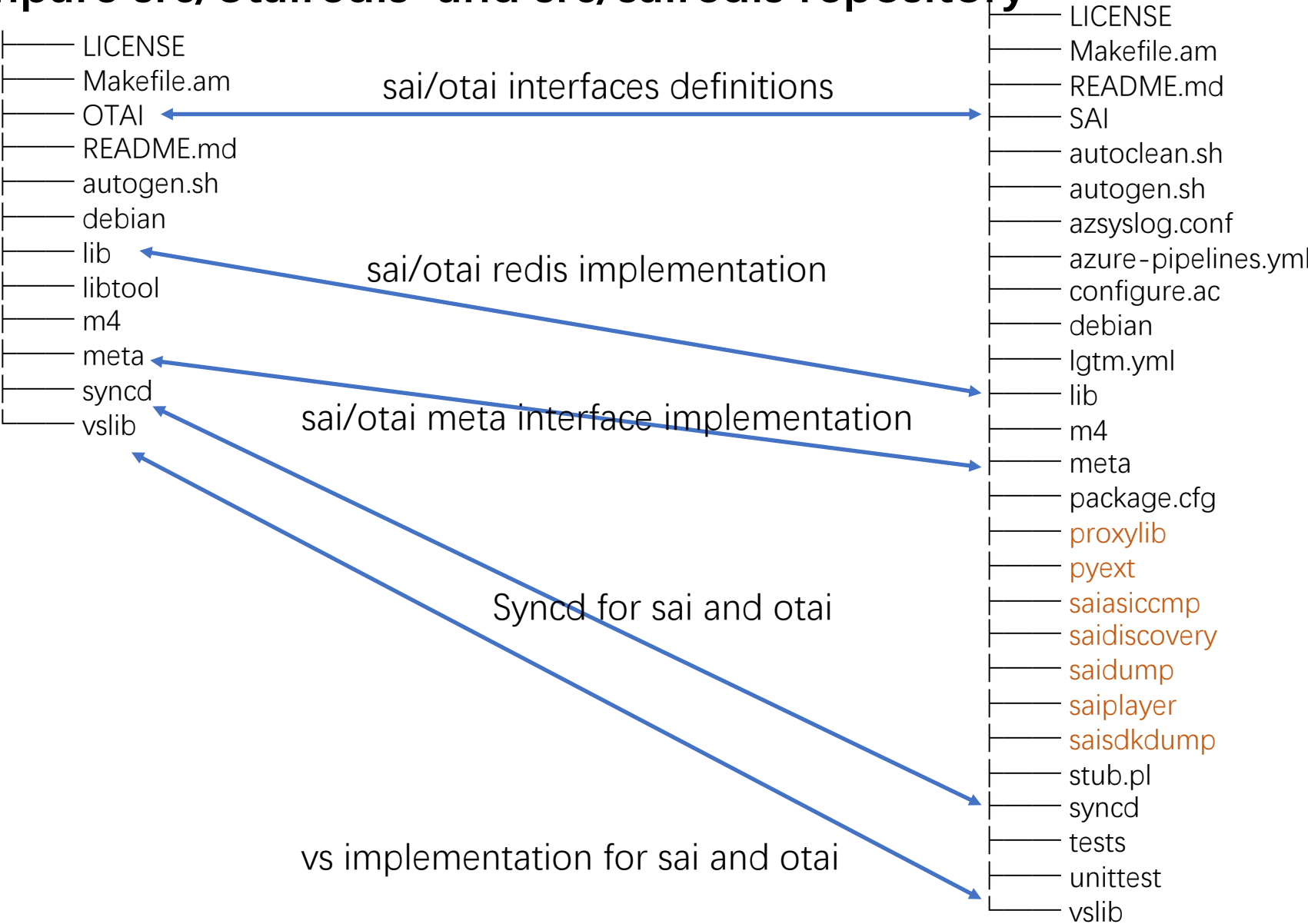
Syncd-ot Source code and architecture overview

Weitang Zheng@Alibaba

Syncd-ot software architectures, Microservice vs Monolithic



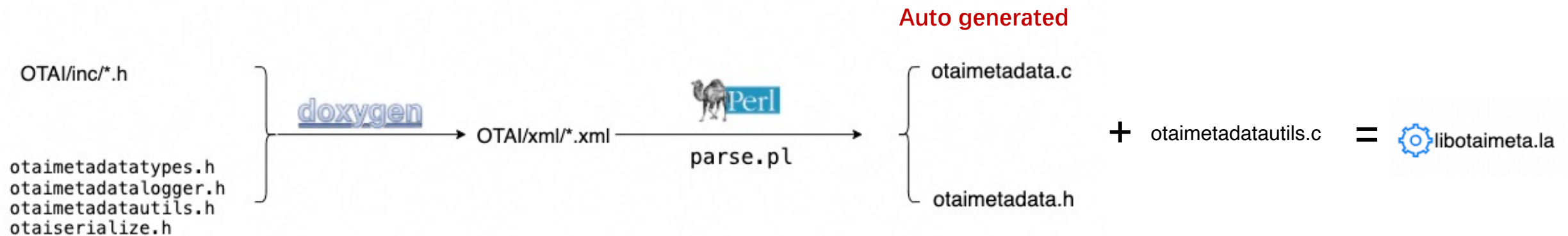
Compare src/otairedis and src/sairedis repository

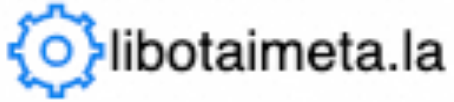


Generate and save OTAI metadata information

- Structure metadata
- Enums metadata
- Union metadata
- Notification metadata
- Apis metadata
- Serializer/ deserializer

src/sonic-otairedis/OTAI/meta





```
/**
 * @brief Port attribute IDs
 */
typedef enum _otai_port_attr_t
{

/**
 * @brief Admin state
 *
 * @type otai_admin_state_t
 * @flags CREATE_AND_SET
 */
    OTAI_PORT_ATTR_ADMIN_STATE,

}
```

attribute



```
/**
 * @brief Output power
 *
 * @type otai_double_t
 * @unit dBm
 * @precision precision2
 * @iscounter false
 */
    OTAI_PORT_STAT_OUTPUT_POWER,
```

statistics



```
const otai_attr_metadata_t* const* const otai_metadata_attr_by_object_type[] = {
.....
otai_metadata_object_type_otai_linecard_attr_t,
otai_metadata_object_type_otai_port_attr_t,
.....
};

const otai_attr_metadata_t* const otai_metadata_object_type_otai_port_attr_t[] = {
.....
&otai_metadata_attr_OTAI_PORT_ATTR_ADMIN_STATE,
.....
};

const otai_attr_metadata_t otai_metadata_attr_OTAI_PORT_ATTR_ADMIN_STATE = {
    .objecttype = OTAI_OBJECT_TYPE_PORT,
    .attrid = OTAI_PORT_ATTR_ADMIN_STATE,
    .attridname = "OTAI_PORT_ATTR_ADMIN_STATE",
    .flags = (otai_attr_flags_t)(OTAI_ATTR_FLAGS_CREATE_AND_SET),
    .enummetadata = &otai_metadata_enum_otai_admin_state_t,
    .ismandatoryoncreate = false,
    .iscreateonly = false,
    .iscreateandset = true,
    .isreadonly = false,
.....
};

const otai_enum_metadata_t otai_metadata_enum_otai_admin_state_t = {
    .name = "otai_admin_state_t",
    .valuescount = 3,
    .values = (const int*)otai_metadata_otai_admin_state_t_enum_values,
    .valuesnames = otai_metadata_otai_admin_state_t_enum_values_names,
};

const otai_stat_metadata_t* const* const otai_metadata_stat_by_object_type[] = {
.....
otai_metadata_stat_object_type_otai_port_stat_t,
};
```



libotaimetadata.la

src/otairedis/meta

OTAI API interface with metadata validation.

Validate all the parameters and returned values(OID, attributes, enums

Validate notification data

Validate OTAI objects hierarchy (delete all children objects first)

Implement all OTAI APIs in RedisRemoteOtaiInterface

src/sonic-otairedis/meta

Meta.h

Meta.cpp

```
otai_status_t Meta::get(
    _In_ otai_object_type_t object_type,
    _In_ otai_object_id_t object_id,
    _In_ uint32_t attr_count,
    _Inout_ otai_attribute_t *attr_list)

otai_status_t Meta::create(
    _In_ otai_object_type_t object_type,
    _Out_ otai_object_id_t* object_id,
    _In_ otai_object_id_t linecard_id,
    _In_ uint32_t attr_count,
    _In_ const otai_attribute_t *attr_list)

otai_status_t Meta::set(
    _In_ otai_object_type_t object_type,
    _In_ otai_object_id_t object_id,
    _In_ const otai_attribute_t *attr)
```

meta_otai_validate_oid

meta_generic_validation_get

m_implementation->get/create/set/remove

meta_generic_validation_post_get



hiredis



swsscommon



libotaimeta.la



libotaimetadata.la

OTAI API implementation between OTSS and Syncd-OT.

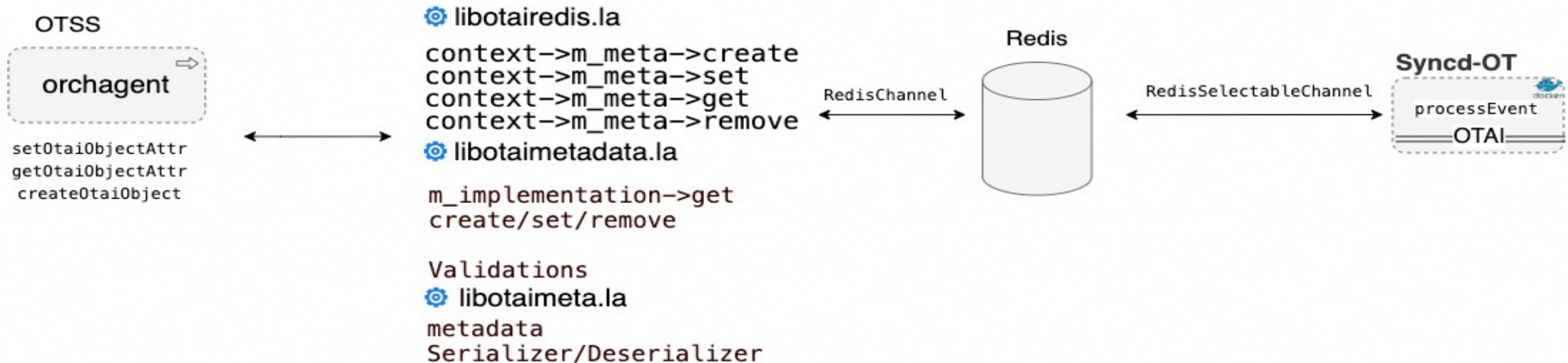
libOtairedis.la implements Otai APIs, Syncd-OT can receive these OTAI CRUD APIs



OTSS and Syncd Interactions

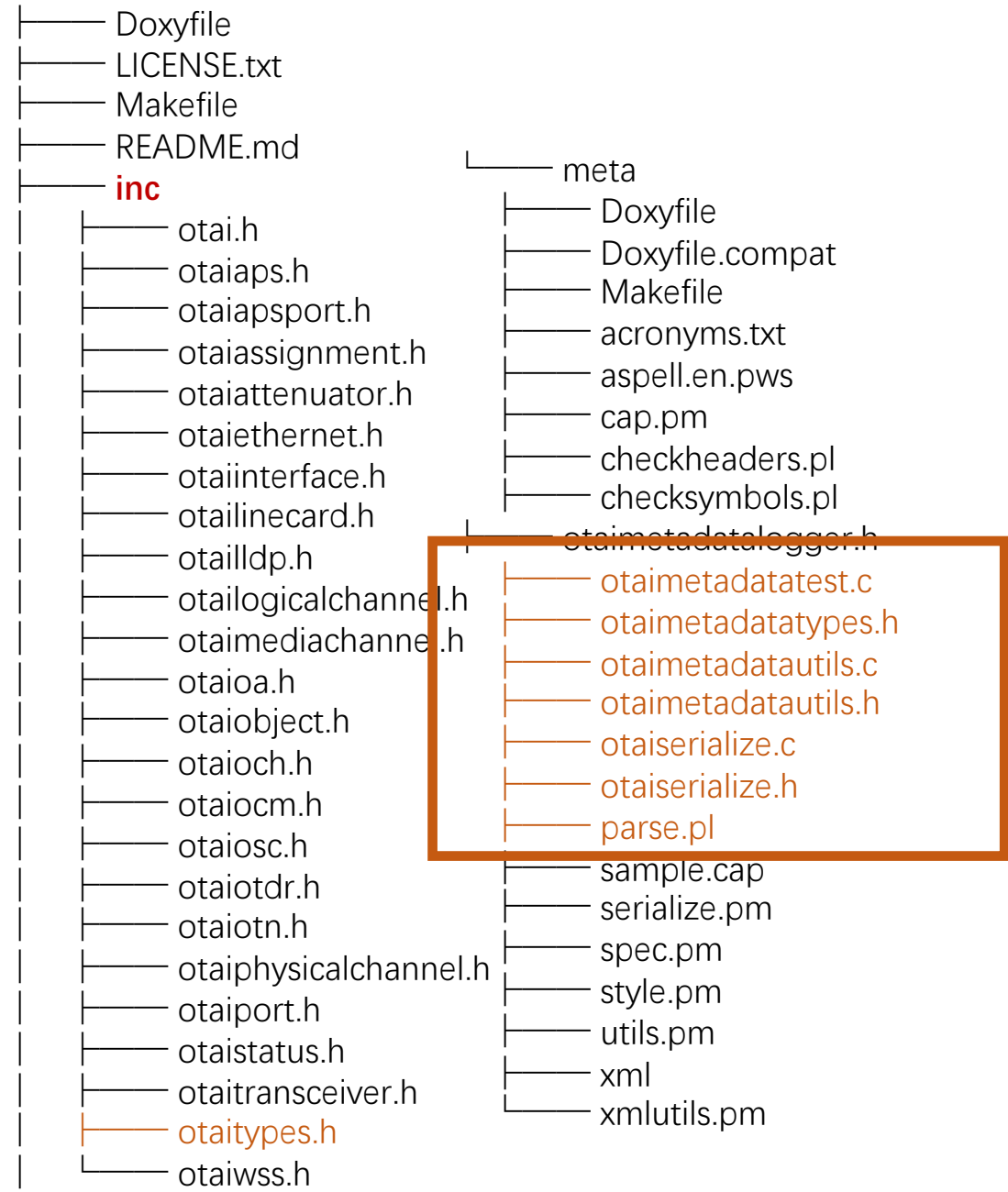
OTSS call libotairedis.la to send CRUD requests to Syncd

It involves libotaimetadata.la and libotaimeta.la for metadata validation and serializer/deserializer

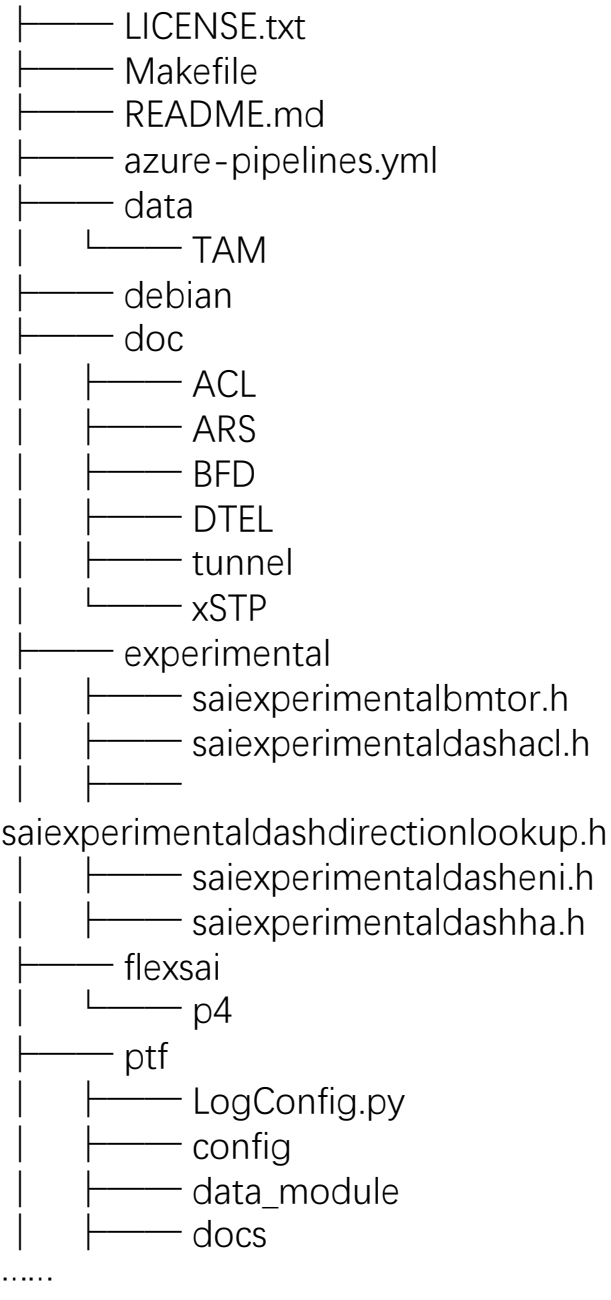


Compare src/otairedis/OTAI and src/sairedis/SAI repository

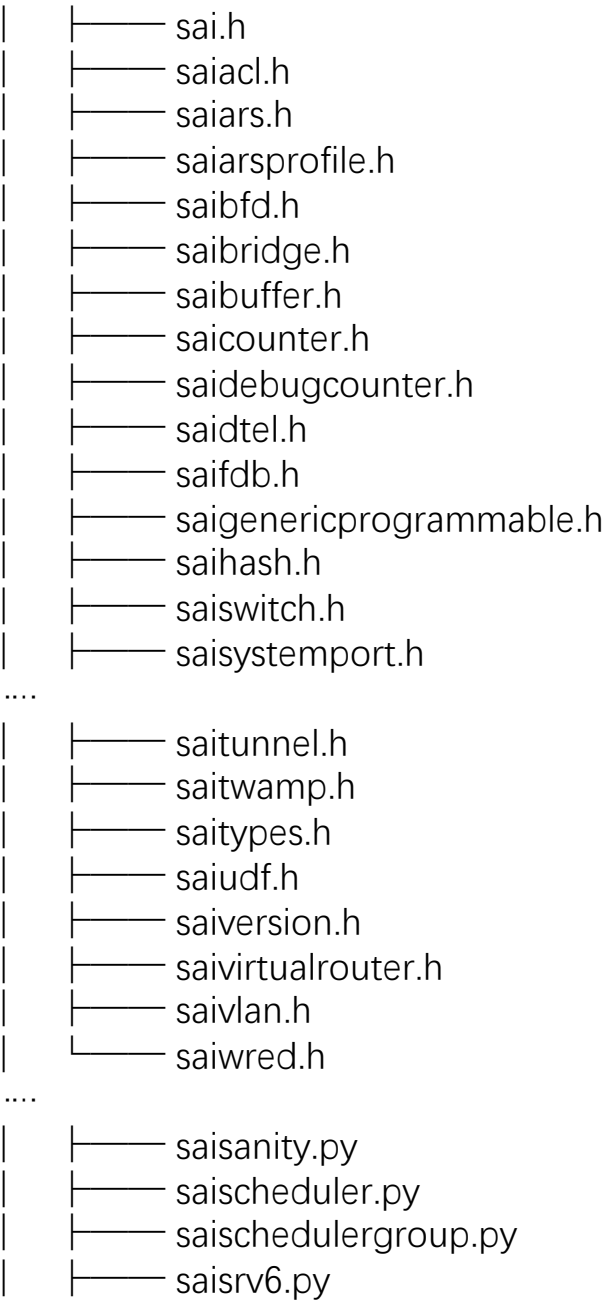
sonic-otairedis/OTAI



sonic-sairedis/SAI



inc



Compare src/otairedis/meta and src/sairedis/meta repository

sonic-otairedis/meta

- AttrKeyMap.cpp
- AttrKeyMap.h
- Globals.cpp
- Globals.h
- Makefile.am
- Meta.cpp
- Meta.h
- MetaKeyHasher.cpp
- MetaKeyHasher.h
- Notification.cpp
- Notification.h
- NotificationFactory.cpp
- NotificationFactory.h
- NotificationLinecardStateChange.cpp
- NotificationLinecardStateChange.h
- NotificationOcmNotify.cpp
- NotificationOcmNotify.h
- OidRefCounter.cpp
- OidRefCounter.h
- OtaiAttrWrapper.cpp
- OtaiAttrWrapper.h
- OtaiAttributeList.cpp
- OtaiAttributeList.h
- OtaiInterface.cpp
- OtaiInterface.h
- OtaiObject.cpp
- OtaiObject.h
- OtaiObjectCollection.cpp
- OtaiObjectCollection.h

sonic-sairedis/meta

- AttrKeyMap.cpp
- AttrKeyMap.h
- DummySailInterface.cpp
- DummySailInterface.h
- Globals.cpp
- Globals.h
- Makefile.am
- Meta.cpp
- Meta.h
- MetaKeyHasher.cpp
- MetaKeyHasher.h
- MetaTestSailInterface.cpp
- MetaTestSailInterface.h
- Notification.cpp
- Notification.h
- NotificationBfdSessionStateChange.cpp
- NotificationBfdSessionStateChange.h
- NotificationFactory.cpp
- NotificationFactory.h
- NotificationFdbEvent.cpp
- NotificationFdbEvent.h
- NotificationNatEvent.cpp
- NotificationNatEvent.h
- NotificationPortHostTxReadyEvent.cpp
- NotificationPortHostTxReadyEvent.h
- NotificationPortStateChange.cpp
- NotificationPortStateChange.h
- NotificationQueuePfcDeadlock.cpp
- NotificationQueuePfcDeadlock.h

- NotificationSwitchAsi
- NotificationSwitchAsi
- NotificationSwitchShu
- NotificationSwitchShu
- NotificationSwitchSta
- NotificationSwitchSta
- NotificationTwampSe
- NotificationTwampSe
- NumberOidIndexGer
- NumberOidIndexGer
- OidRefCounter.cpp
- OidRefCounter.h
- PerformanceIntervalT
- PerformanceIntervalT
- PortRelatedSet.cpp
- PortRelatedSet.h
- RedisSelectableChan
- RedisSelectableChan
- SaiAttrWrapper.cpp
- SaiAttrWrapper.h
- SaiAttributeList.cpp
- SaiAttributeList.h
- SailInterface.cpp
- SailInterface.h
- SaiObject.cpp
- SaiObject.h
- SaiObjectCollection.c
- SaiObjectCollection.h
- SaiSerialize.cpp
- SelectableChannel.cp

Compare src/otairedis/lib and src/sairedis/lib repository

sonic-otairedis/lib

- Channel.cpp
- Channel.h
- Context.cpp
- Context.h
- ContextConfig.cpp
- ContextConfig.h
- ContextConfigContainer.cpp
- ContextConfigContainer.h
- Linecard.cpp
- Linecard.h
- LinecardConfig.cpp
- LinecardConfig.h
- LinecardConfigContainer.cpp
- LinecardConfigContainer.h
- LinecardContainer.cpp
- LinecardContainer.h
- Makefile.am
- OidIndexGenerator.h
- Otai.cpp
- Otai.h
- OtailInternal.h
- Recorder.cpp
- Recorder.h
- RedisChannel.cpp
- RedisChannel.h
- RedisRemoteOtailInterface.cpp
- RedisRemoteOtailInterface.h
- RedisVidIndexGenerator.cpp
- RedisVidIndexGenerator.h

- RemoteOtailInterface.h
- SkipRecordAttrContainer.cpp
- SkipRecordAttrContainer.h
- Utils.cpp
- Utils.h
- VirtualObjectIdManager.cpp
- VirtualObjectIdManager.h
- context_config.json
- otai_redis.h
- otai_redis_aps.cpp
- otai_redis_apsport.cpp
- otai_redis_assignment.cpp
- otai_redis_attenuator.cpp
- otai_redis_ethernet.cpp
- otai_redis_interface.cpp
- otai_redis_interfacequery.cpp
- otai_redis_linecard.cpp
- otai_redis_lldp.cpp
- otai_redis_logicalchannel.cpp
- otai_redis_mediachannel.cpp
- otai_redis_oa.cpp
- otai_redis_och.cpp
- otai_redis_ocm.cpp
- otai_redis_osc.cpp
- otai_redis_otdr.cpp
- otai_redis_otn.cpp
- otai_redis_physicalchannel.cpp
- otai_redis_port.cpp
- otai_redis_transceiver.cpp
- otai_redis_wss.cpp
- otairedis.h

sonic-sairedis/lib

- Channel.cpp
- Channel.h
- ClientConfig.cpp
- ClientConfig.h
- ClientSai.cpp
- ClientSai.h
- ClientServerSai.cpp
- ClientServerSai.h
- Context.cpp
- Context.h
- ContextConfig.cpp
- ContextConfig.h
- ContextConfigContainer.cpp
- ContextConfigContainer.h
- Makefile.am
- OidIndexGenerator.h
- Recorder.cpp
- Recorder.h
- RedisChannel.cpp
- RedisChannel.h
- RedisRemoteSaiInterface.cpp
- RedisRemoteSaiInterface.h
- RedisVidIndexGenerator.cpp
- RedisVidIndexGenerator.h
- RemoteSaiInterface.h
- Sai.cpp
- Sai.h
- SaiInternal.h
- ServerConfig.cpp
- ServerConfig.h
- ServerSai.cpp
- ServerSai.h
- SkipRecordAttrContainer.cpp
- SkipRecordAttrContainer.h
- Switch.cpp
- Switch.h
- SwitchConfig.cpp
- SwitchConfig.h
- SwitchConfigContainer.cpp
- SwitchConfigContainer.h
- SwitchContainer.cpp
- SwitchContainer.h
- Utils.cpp
- Utils.h
- VirtualObjectIdManager.cpp
- VirtualObjectIdManager.h
- ZeroMQChannel.cpp
- ZeroMQChannel.h
- client_config.json
- context_config.json
- sairedis.h
- sairediscommon.h
- tests.cpp

Create Functions in Meta

```
static otai_status_t redis_create_linecard_uniq(
    _Out_ otai_object_id_t *linecard_id,
    _In_ uint32_t attr_count,
    _In_ const otai_attribute_t *attr_list)
```

```
typedef int32_t otai_status_t;
typedef uint64_t otai_object_id_t;
```

```
typedef struct _otai_attribute_t
{
    otai_attr_id_t id;
    otai_attribute_value_t value;
} otai_attribute_t;
```

```
typedef uint32_t otai_attr_id_t;
```

```
typedef union _otai_attribute_value_t
{
    /** @validonly meta->attrvaluetype == OTAI_ATTR_VALUE_TYPE_BOOL */
    bool booldata;

    /** @validonly meta->attrvaluetype == OTAI_ATTR_VALUE_TYPE_CHARDATA */
    char chardata[512];

    /** @validonly meta->attrvaluetype == OTAI_ATTR_VALUE_TYPE_UINT8 */
    otai_uint8_t u8;

```

```
.....
}
```

```
typedef INT32 sai_status_t;
typedef uint64_t sai_object_id_t;
```

Create Function in Meta

```
static otai_status_t redis_create_linecard_uniq(  
_Out_ otai_object_id_t *linecard_id,  
_In_ uint32_t attr_count,  
_In_ const otai_attribute_t *attr_list)
```

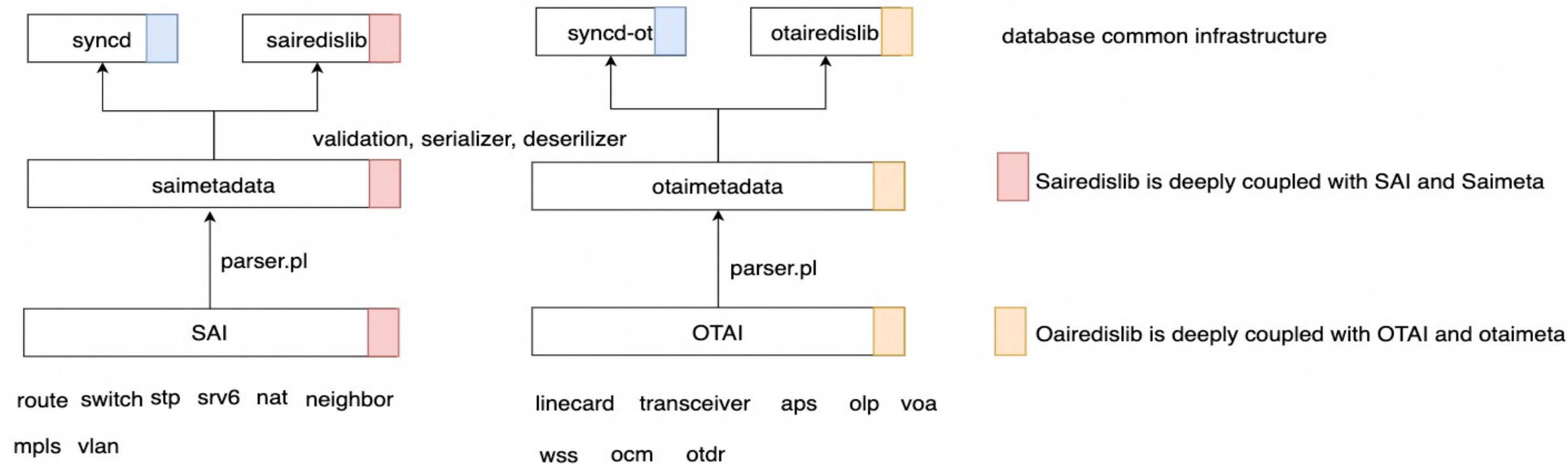
```
    auto status = context->m_meta->create(  
        objectType,  
        objectId,  
        linecardId,  
        attr_count,  
        attr_list);
```

Metadata class is type sensitive, and deeply coupled with SAI and OTAI

```
sai_metadata_all_object_type_infos
```

Option1: OTAI and Sai in different repository

- Move database common infrastructure to SWSS_COMMON
- Two parallel and independent APIs (SAI and OTAI)
Meta/
Lib/
Sai
- OTN group maintenance the OTAI APIs and metadata



Option2: Merge SAI and OTAI

Move database common infrastructure to SWSS_COMMON

Embedded OTN APIs in SAI

Meta/

Lib/

Sai

Different Syncd-ot module and OTSS container

