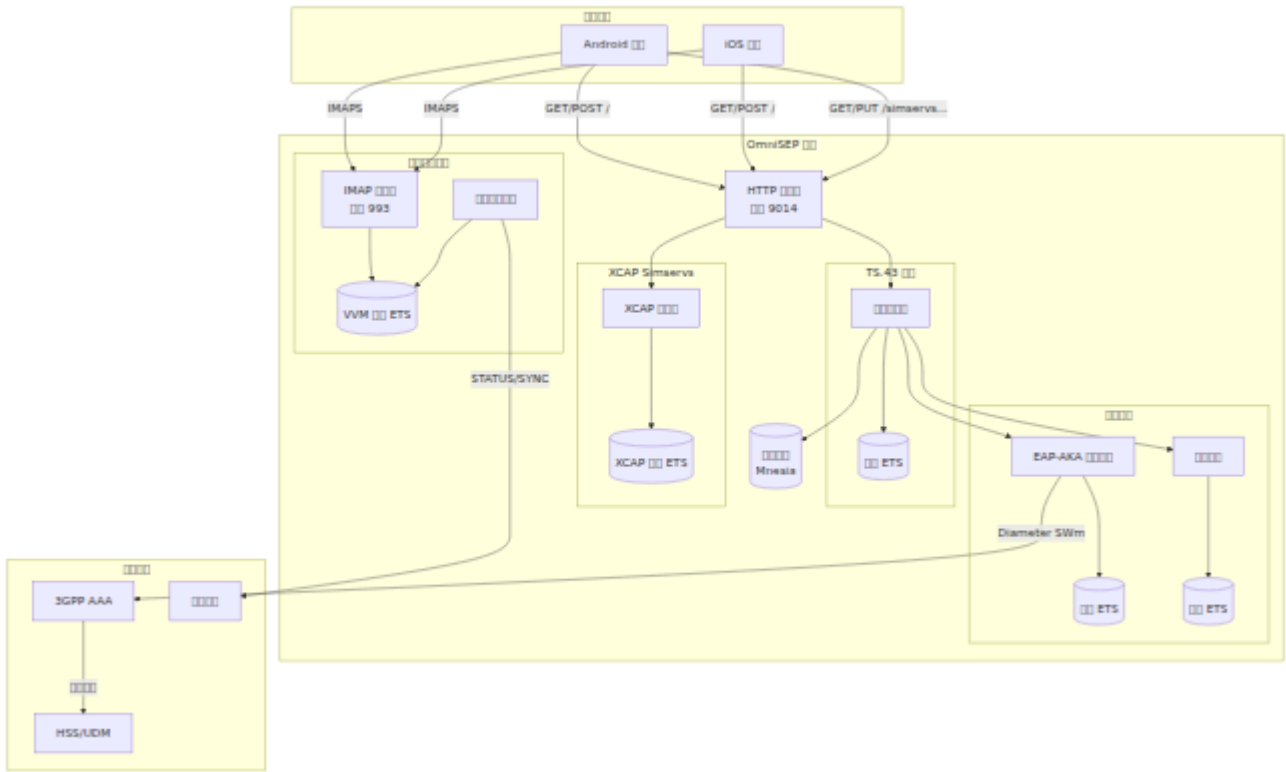


□□□□



□□□□□

TS.43 □□□□

□□ GSMA TS.43 □□□□□□□□

API ID	API	API
ap2003	VoLTE	VoLTE/VoNR
ap2004	VoWiFi	WiFi
ap2005	SMSoIP	IP SMS
ap2006	ODSA	
ap2009	ODSA	
ap2010		
ap2012		DCB
ap2016		

XCAP

ETSI TS 183 023 IMS

API	API	API
	CFU,CFB,CFNA,CFNRC	ETSI TS 183 004
		ETSI TS 183 023
		ETSI TS 183 023
OIP/OIR		ETSI TS 183 023

OMTP VVM v1.3 GSMA TS.46

プロトコル	標準	規格
IMAP	RFC 3501	RFC 3501
SMTP	SYNC/STATUS	OMTP VVM v1.3
3GPP	TS.46	GSMA TS.46
OMTP	OMTP VVM v1.3	OMTP VVM v1.3

API

GET /health

API

GET /api/activity GET /api/entitlements/{imsi} GET /api/xcap/{msisdtn}

XCAP Simserve

GET /simserve.ngn.etsi.org/users/{sip}/simserve.xml PUT /simserve.ngn.etsi.org/users/{sip}/simserve.xml DELETE /simserve.ngn.etsi.org/users/{sip}/simserve.xml/{path}

TS-43

GET / POST /

URI	Method
/	GET/POST
/simservs.ngn.etsi.org/users/{sip}/simservs.xml	GET/PUT
/simservs.ngn.etsi.org/users/{sip}/simservs.xml/~/~/{xpath}	GET/PUT
/api/activity	GET
/api/entitlements/{imsi}	GET/POST
/api/xcap/{msisdn}	GET/POST
/health	GET

Web UI

OmniSEP Web Phoenix LiveView UI
<http://<host>:9014/>

XCAP Simservs

	/	
	/entitlements	IMSI TS.43
	/sessions	EAP-AKA
	/activity	TS.43
XCAP	/xcap	XCAP Simservs HSS
Diameter	/diameter	Diameter
	/logs	

- 支持 HTTP 支持 EAP-AKA VVM 支持
- 支持 XCAP 支持
- 支持 ETS 支持
- 支持

支持 5 支持

XCAP 支持

XCAP 支持

- 支持 MSISDN 支持
- 支持 OIP/OIR 支持
- 支持 Diameter Sh 支持 HSS 支持
- 支持 HSS
- 支持 IP 支持

支持

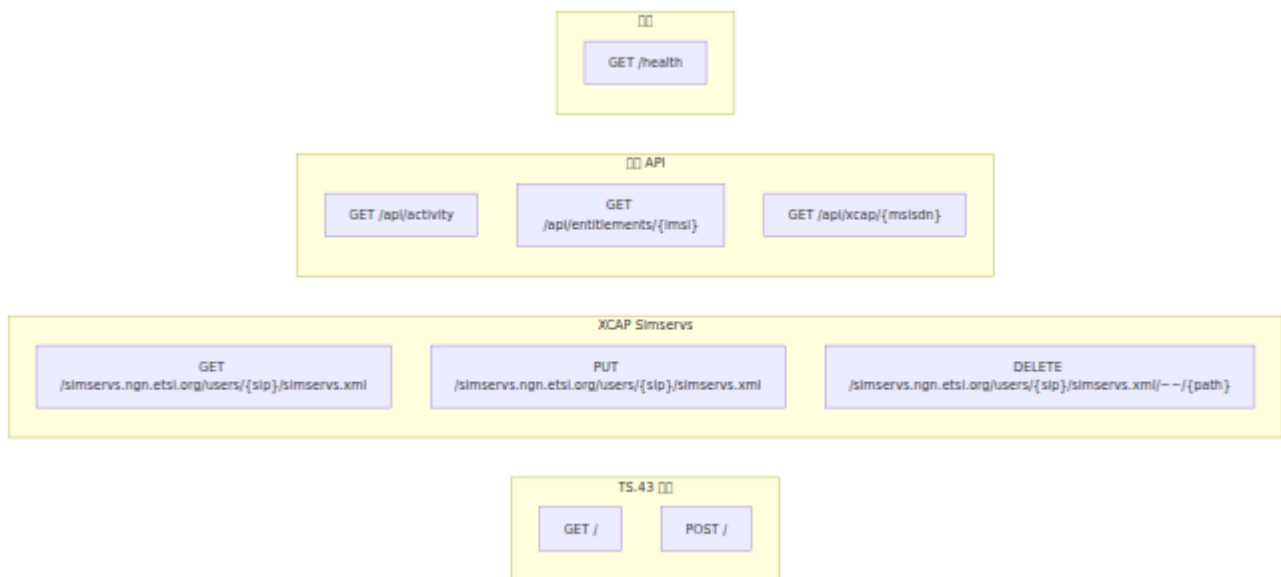
支持

支持 XCAP 支持/支持

支持

- XCAP EAP
- IMSI MSISDN ID IP
- /
- HTTP

- EAP-AKA
-



□□□□□□

□□□□

```
# config/config.exs
import Config

config :omni_sep,
  http_port: 9014,
  http_ip: {0, 0, 0, 0},
  server_fqdn: "sep.mnc001.mcc001.pub.3gppnetwork.org",
  entitlement_version: "2.0"

# □□□□□□□□□□
config :omni_sep, :default_entitlements,
  vowifi: %{
    entitlement_status: 1,
    addr_status: 2,
    tc_status: 2,
    prov_status: 1
  },
  volte: %{
    entries: [
      %{access_type: 1, home_roaming_nw_type: 1,
entitlement_status: 1}
    ]
  }

# □□□□
config :omni_sep, :token,
  validity_seconds: 86400,
  signing_secret: "your-production-secret-here"

# EAP-AKA □□
config :omni_sep, :eap_aka,
  enabled: true,
  session_timeout_ms: 30_000
```

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□□□□

□□□

□□□□□

1. □□□□□
2. □□ □□□□ □□□□□□
3. □□ □□□□ □□□□□□

□□□□□

1. TS.43 □□ □□ VoWiFi/VoLTE □□
2. XCAP Sirmservs □□□□□□/□□

□□□□□

1. □□□□□□ □□□□□□
2. □□ □□□□ □□□□□□

□□□

GSMA TS.43□

- TS.43 □□ - □□□□□□□□□□
- □□□□ GSMA TS.43

ETSI XCAP□

- XCAP Sirmservs - □□□□□□
- □□□
 - ETSI TS 183 023 - XCAP □□
 - ETSI TS 183 004 - □□□□
 - RFC 4825 - XCAP □□

OmniSEP □□□□

OmniSEP □□□□□□□□□□□□□□

□□

- HTTP □□□□□
- □□□□
- □□□□
- □□□□
- EAP-AKA □□
- Diameter □□
- □□□□□□
- □□□□□□

□□□□



HTTP □□□□□

□□□□□□□ HTTP □□□

```
config :omni_sep,  
    http_port: 9014,  
    http_ip: {0, 0, 0, 0},  
    server_fqdn: "sep.mnc001.mcc001.pub.3gppnetwork.org",  
    entitlement_version: "2.0"
```

□□

□□	□ □	□ □	□□	□□
http_port	□ □	□	9014	HTTP □□□ TCP □□□□□□□□□□ 443 □ TLS
http_ip	□ □	□	{0, 0, 0, 0}	□□□□ IP □□□ {0,0,0,0} □□□□□□□□□□
server_fqdn	□ □ □	□	-	□□□□□□□□□□□□□□ aes.mnc<MNC>.mcc<MCC>.pub. □□ GSMA TS.43 □ 2.1 □□
entitlement_version	□ □ □	□	"2.0"	TS.43 □□□□□ Android □□□□□□ "2.0"□

FQDN □□

□□□ FQDN □□ 3GPP □□□□□

aes.mnc<MNC>.mcc<MCC>.pub.3gppnetwork.org

名前	説明	値
aes	暗号化方式	aes
mnc<MNC>	ネットワークID (MNC)	mnc001
mcc<MCC>	ネットワークID (MCC)	mcc310
pub.3gppnetwork.org	3GPP ネットワーク	-

ネットワークID (MCC) 310、ネットワークID (MNC) 410、AT&T

```
aes.mnc410.mcc310.pub.3gppnetwork.org
```

設定

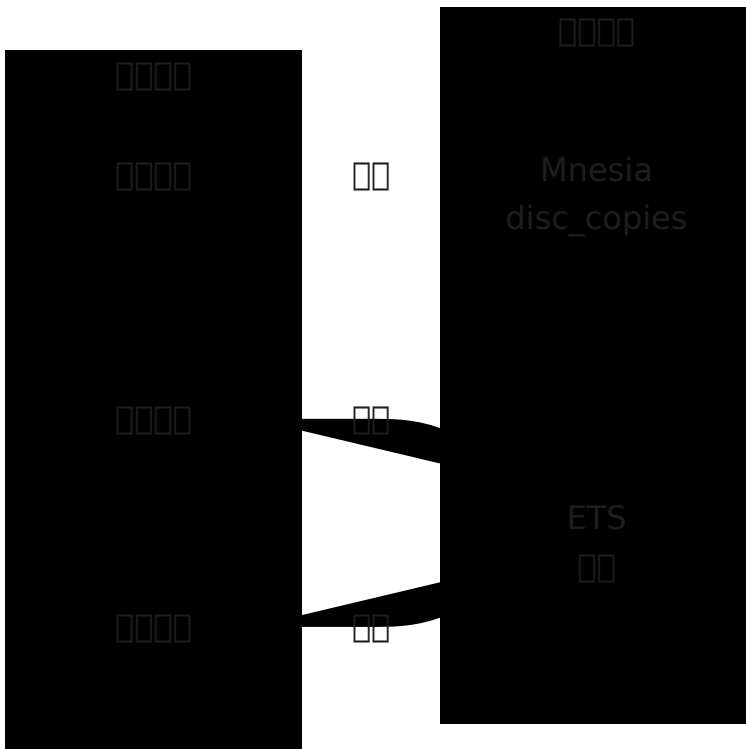
Mnesia データディレクトリを設定

```
config :omni_sep, :storage,
      data_dir: "priv/data"
```

設定

名前	タイプ	デフォルト	値	説明
data_dir	文字列		"priv/data"	Mnesia データディレクトリを設定

□□□□



Mnesia □

□□□□□□□ Mnesia `disc_copies` □□□□□□□

□	□□	□□□
<code>activity</code>	□□□□□□□□□□	Mnesia disc_copies
<code>activity_by_imsi</code>	IMSI □□□□□□□□	Mnesia disc_copies
<code>activity_by_terminal</code>	□□ ID □□	Mnesia disc_copies

目次

```
priv/data/  
└─ mnesia/  
   └─ schema.DAT          # Mnesia 目録  
   └─ activity.DCD       # 目録  
   └─ activity.DCL       # 目録  
   └─ activity_by_imsi.DCD  
   └─ activity_by_imsi.DCL  
   └─ activity_by_terminal.DCD  
   └─ activity_by_terminal.DCL  
   └─ DECISION_TAB.LOG  
   └─ LATEST.LOG
```

目次

目次

1. 目録
2. 目録
3. 目録 Mnesia 目録
4. 目録 Mnesia 目録

```
# config/prod.exs  
config :omni_sep, :storage,  
  data_dir: "/var/lib/omni_sep/data"
```

目次

目次

```

config :omni_sep, :default_entitlements,
# VoWiFi (ap2004) [][]
vowifi: %{
  entitlement_status: 1,          # []
  addr_status: 2,                # [][]
  tc_status: 2,                  # [][]
  prov_status: 1,                # [][]
  service_flow_url: "",
  service_flow_user_data: "",
  message_for_incompatible: "[] [] VoWiFi [] []"
},

# [] [] [] [] [] (ap2003) [] []
volte: %{
  entries: [
    %{
      access_type: 1,             # 4G/LTE
      home_roaming_nw_type: 1,   # [] [] [] []
      entitlement_status: 1      # []
    },
    %{
      access_type: 2,             # 5G/NR
      home_roaming_nw_type: 1,   # [] [] [] []
      entitlement_status: 1,      # []
      network_voice_irat_capability: "EPS-Fallback"
    }
  ]
},

# SMSoIP (ap2005) [] []
smsoip: %{
  entitlement_status: 1          # []
},

# [] [] [] [] (ap2010) [] []
data_plan: %{
  entitlement_status: 1
},

# [] [] [] [] [] (ap2012) [] []
dcb: %{
  entitlement_status: 0,         # [] [] [] []
  tc_status: 2                  # [] []
}

```

```
},
```

```
# 0000 (ap2016) 000
```

```
satmode: %{
```

```
  entitlement_status: 0
```

```
  # 0000
```

```
}
```

VoWiFi (ap2004)

項目	型番	説明	備考
entitlement_status	0 1	0=有効, 1=無効 2=保留, 3=エラー	有効/無効
addr_status	0 1	0=有効, 1=無効 2=保留, 3=エラー	有効/無効/保留/エラー
tc_status	0 1	0=有効, 1=無効 2=保留, 3=エラー	有効/無効/保留/エラー
prov_status	0 1	0=有効, 1=無効 2=保留, 3=エラー	有効/無効
service_flow_url	0 1 2	URL	有効 URL 無効 URL 保留 URL
service_flow_user_data	0 1 2	-	有効 無効 保留
message_for_incompatible	0 1 2	-	0 entitlement_status=2 有効/無効/保留

VoLTE (ap2003)

VoLTE (ap2003) の項目一覧

名称	数据类型	枚举值	描述
access_type	枚举	1=4G/LTE, 2=5G/NR	接入类型
home_roaming_nw_type	枚举	1=本地网络, 2=漫游, 3=未知	本地漫游网络类型
entitlement_status	枚举	0=未知, 1=有效	权益状态
network_voice_irat_capability	枚举	"EPS-Fallback", "VoNR"	5G 网络语音能力

枚举值

枚举值	名称	描述
0	未知	未知
1	有效	权益有效
2	漫游	漫游网络
3	未知	未知

配置项

配置项名称

```
config :omni_sep, :token,
  validity_seconds: 86400,
  signing_secret: "change_me_in_production"
```

□□

□□	□□	□ □	□□	□□
<code>validity_seconds</code>	□□	□	86400	□□□□□□□□□□□□ 24 □□□
<code>signing_secret</code>	□□ □	□	-	□□□□□□□□□□□□□□□□□□□□ □□□□ 32 □ □□□□□□□□□□□□

□□□□□□

- □□□□□□□□□□ `signing_secret`
- □□□□□□
- □□□□□□□□□□□□□□□□

```
# config/prod.exs
config :omni_sep, :token,
  signing_secret: System.get_env("OMNI_SEP_TOKEN_SECRET")
```

EAP-AKA □□

□□□□□□□□□□ EAP-AKA □□□□□□□□

```
config :omni_sep, :eap_aka,
  enabled: true,
  session_timeout_ms: 30_000
```



```
config :diameter_ex, :diameter,
  service_name: :omni_sep_aaa,
  listen_ip: {127, 0, 0, 1},
  listen_port: 3868,
  host: "omnisep.example.com",
  realm: "example.com",
  product_name: "OmniSep",
  vendor_id: 10415,
  auth_application_ids: [16777265],
  acct_application_ids: [],
  supported_vendor_ids: [10415],
  request_timeout: 5000,
  allow_undefined_peers_to_connect: true,
  peer_selection_algorithm: :round_robin,
  control_module: OmniSep.Diameter.Control,
  processor_module: OmniSep.Diameter.Processor,
  applications: [
    %{
      alias: :swm,
      dictionary: :diameter_gen_base_rfc6733,
      module: OmniSep.Diameter.Swm
    }
  ],
  peers: [
    %{
      host: "aaa01.example.com",
      ip: "192.168.1.10",
      port: 3868,
      transport: :tcp
    }
  ]
]
```

□□□□

□□	□ □	□ □	□□	□□
service_name	□ □	□	-	□□□□□□□□
host	□ □ □	□	-	Diameter Origin-Host□□□□□□□□ FQDN□□□ RFC 6733□
realm	□ □ □	□	-	Diameter Origin-Realm□□□□□□□□ RFC 6733□
vendor_id	□ □	□	10415	3GPP □□□ ID□□□□ 3GPP TS 29.230□
auth_application_ids	□ □	□	-	□□□□□□□□□□ ID □ □□SWm □ 16777265□
request_timeout	□ □	□	5000	□□□□□□□□□□
peer_selection_algorithm	□ □	□	:round_robin	□□□□ □□:round_robin □ :failover

listen

Option	Type	Value	Description
<code>listen_ip</code>	string	<code>{127, 0, 0, 1}</code>	Diameter IP
<code>listen_port</code>	uint16_t	3868	Diameter RFC 6733

peers

`peers` list of peers

Option	Type	Value	Description
<code>host</code>	string	-	Diameter Origin-Host
<code>ip</code>	string	-	TCP/SCTP IP
<code>port</code>	uint16_t	3868	Diameter
<code>transport</code>	string	<code>:tcp</code>	<code>:tcp</code> or <code>:sctp</code>

SWm

SWm ID 16777265 EAP-AKA 3GPP TS 29.273

Code	Length	Description
DER	268	Diameter-EAP-Request - EAP AAA
DEA	268	Diameter-EAP-Answer - AAA EAP

配置

Diameter OmniSEP 配置

- EAP-AKA 配置
- IMSI 与 EAP_ID 配置
- 配置
- 配置

配置

配置

```
config :omni_sep, :activity,  
  max_records_per_subscriber: 1000,  
  retention_seconds: 2_592_000
```

表

配置	配置	配置	配置
max_records_per_subscriber	配置	1000	配置
retention_seconds	配置	2592000	配置 30 配置

配置

配置

欄名	説明
imsi	IMSI
terminal_id	IMEI/ID
timestamp	時刻
client_ip	クライアント IP
user_agent	HTTP User-Agent
app_ids	アプリケーション ID
auth_method	EAP-AKA, TOKEN
response_code	HTTP レスポンスコード

設定

例

```
# config/dev.exs
import Config

config :omni_sep,
  http_port: 9014

config :omni_sep, :eap_aka,
  enabled: true # EAP-AKA - AAA 対応

config :logger, :console,
  level: :debug
```



```
# config/prod.exs
import Config

config :omni_sep,
  http_port: 9014,
  http_ip: {0, 0, 0, 0},
  server_fqdn: System.get_env("OMNI_SEP_FQDN")

config :omni_sep, :token,
  validity_seconds: 86400,
  signing_secret: System.get_env("OMNI_SEP_TOKEN_SECRET")

config :diameter_ex, :diameter,
  host: System.get_env("DIAMETER_HOST"),
  realm: System.get_env("DIAMETER_REALM"),
  peers: [
    %{
      host: System.get_env("AAA_PEER_HOST"),
      ip: System.get_env("AAA_PEER_IP"),
      port: 3868,
      transport: :tcp
    }
  ]

config :logger, :console,
  level: :info
```

□□□□

□□	□□
OMNI_SEP_FQDN	TS.43 □□□□ FQDN
OMNI_SEP_TOKEN_SECRET	□□□□□□
DIAMETER_HOST	Diameter Origin-Host
DIAMETER_REALM	Diameter Origin-Realm
AAA_PEER_HOST	AAA □□□□□□
AAA_PEER_IP	AAA □□□ IP □□

□□□□

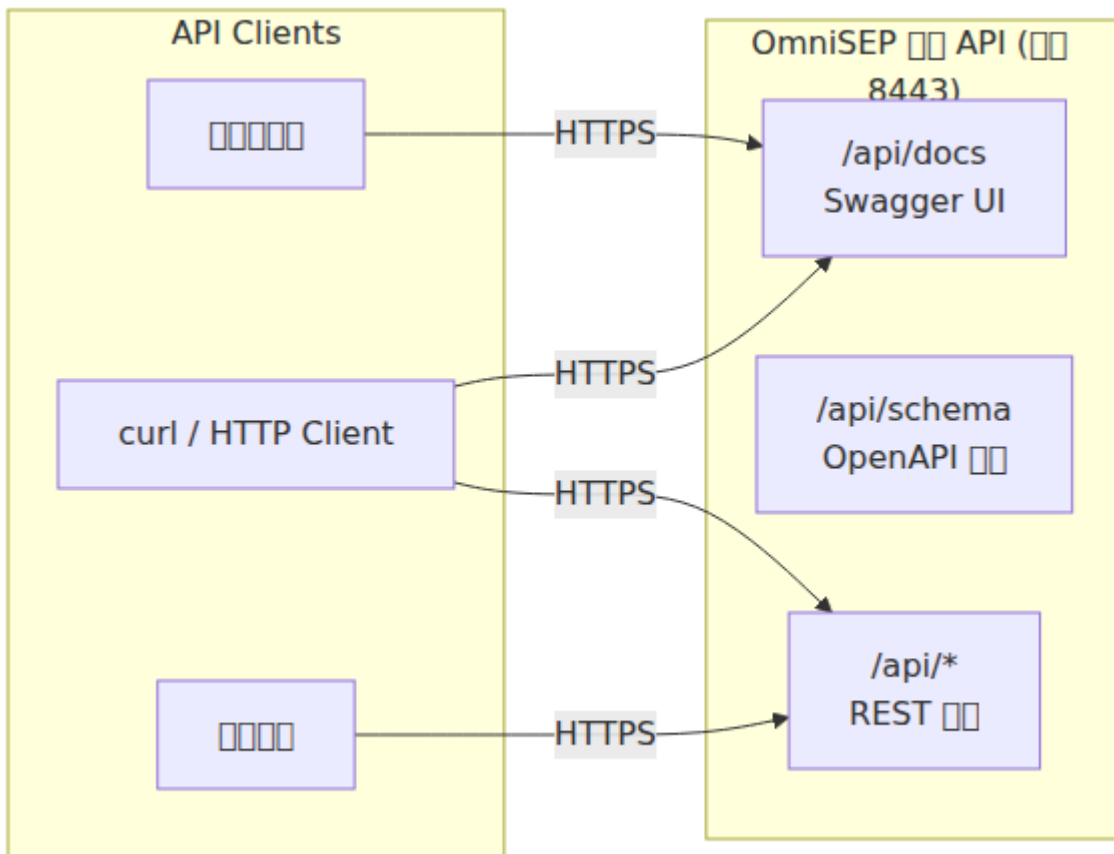
```
config :logger, :console,
  format: "$time $metadata[$level] $message\n",
  metadata: [:request_id, :imsi, :terminal_id]
```

□□□	□□
request_id	□□□□□□□□□□UUID□
imsi	□□□ IMSI□□□□□□□□□□
terminal_id	□□□□□□□□ ID

API

OmniSEP RESTful API는 HTTPS 8443 포트로 JSON 데이터를 Swagger/OpenAPI로 제공합니다.

API



API

URI	Method	Description
<code>/api/docs</code>	GET	Swagger UI API
<code>/api/schema</code>	GET	OpenAPI 3.0 JSON
<code>/api/status</code>	GET	
<code>/api/activity</code>	GET	
<code>/api/activity/:id</code>	GET	
<code>/api/entitlements</code>	GET	
<code>/api/entitlements/:id</code>	GET, DELETE	IMSI
<code>/api/sessions</code>	GET	EAP-AKA
<code>/api/sessions/:id</code>	GET, DELETE	
<code>/api/tokens</code>	GET	
<code>/api/tokens/:id</code>	GET, DELETE	
<code>/api/diameter</code>	GET	Diameter
<code>/api/xcap</code>	GET	XCAP Sirmservs
<code>/api/xcap/:id</code>	GET, DELETE	MSISDN

API

API HTTP TLS 8443 -



```
{
  "status": "ok",
  "application": "OmniSEP",
  "version": "1.0.0",
  "uptime": "2d 5h 32m",
  "uptime_seconds": 193920,
  "memory": {
    "total_mb": 118.3,
    "processes_mb": 42.9,
    "ets_mb": 3.4
  },
  "storage": {
    "custom_entitlements": 12,
    "xcap_profiles": 45,
    "eap_aka_sessions": 3,
    "active_tokens": 8,
    "activity_records": 1267
  },
  "services": {
    "http_port": 80,
    "eap_aka_enabled": true,
    "vvm_enabled": false
  },
  "timestamp": "2026-04-11T10:35:24.794331Z"
}
```

□□□□

□□	□□	□□
status	□□□	□□□□□□□□ "ok"
application	□□□	□□□□□□
version	□□□	□□□□□□
uptime	□□□	□□□□□□□□□□ "2d 5h 32m" □
uptime_seconds	□□	□□□□□□□□□□
memory.total_mb	□□□	□ BEAM □□□□□□□□□□□□□□
memory.processes_mb	□□□	Erlang □□□□□□□□
memory.ets_mb	□□□	ETS □□□□□□□□
storage.custom_entitlements	□□	□□□□□□□□□□□□□□
storage.xcap_profiles	□□	□□□ XCAP Sirmservs □□□□□□□□
storage.eap_aka_sessions	□□	□□□ EAP-AKA □□□□□□□□□□
storage.active_tokens	□□	□□□□□□□□□□□□
storage.activity_records	□□	□□□□□□□□□□
services.http_port	□□	□□□□□□□ HTTP □□
services.eap_aka_enabled	□□□	EAP-AKA □□□□□□□□□□
services.vvm_enabled	□□□	□□□□□□□□□□□□
timestamp	□□□	□□□□□□□□□□ ISO 8601□

API

TS.43 XCAP EAP-AKA

API

```
GET /api/activity
```

```
# 50
curl -sk https://localhost:8443/api/activity

#
curl -sk "https://localhost:8443/api/activity?page=2&limit=25"

#
curl -sk "https://localhost:8443/api/activity?type=entitlement_query"

# IMSI
curl -sk "https://localhost:8443/api/activity?query=001010555"
```

API

API	API	API	API
limit	API	50	API 1000
page	API	1	API
type	API	"all"	API
query	API	-	API IMSI MSISDN ID API IP API

API

□	□□
all	□□□□□□□□□□
entitlement_query	TS.43 □□□□
xcap	XCAP Simservs □□
eap_challenge	EAP-AKA □□□□
eap_response	EAP-AKA □□□□
token_auth	□□□□□□□□

□□

```
{
  "count": 25,
  "total": 1267,
  "page": 1,
  "page_size": 25,
  "activities": [
    {
      "id": "72420db8-c328-46bd-9878-2a9f3f0d2b88",
      "timestamp": "2026-03-09T04:19:19.461325Z",
      "request_type": "entitlement_query",
      "request_method": "GET",
      "request_path": "/",
      "imsi": "00101055555558",
      "msisdn": null,
      "terminal_id": "terminal_001",
      "terminal_vendor": "Samsung",
      "terminal_model": "SM-S928B",
      "terminal_sw_version": "1.0",
      "client_ip": "10.0.0.1",
      "user_agent": "SEC TS.43/2.0",
      "auth_method": "EAP-AKA",
      "response_status": 200,
      "response_code": 200,
      "app_ids": ["ap2004"],
      "request_headers": {},
      "request_body": null,
      "response_body": null,
      "response_summary": {}
    }
  ]
}
```

□□□□

欄名	データ型	制約
count	整数	非NULL
total	整数	非NULL
page	整数	非NULL
page_size	整数	非NULL
activities	文字列	非NULL

制約

欄名	型別	説明
id	TEXT	一意な ID (UUID)
timestamp	TEXT	ISO 8601 形式の日時
request_type	TEXT	リクエストの種類
request_method	TEXT	HTTP メソッド (GET, POST, PUT, DELETE)
request_path	TEXT	HTTP リクエストパス
imsi	TEXT	IMSI (International Mobile Subscriber Identity)
msisdn	TEXT	MSISDN (Mobile Station International Subscriber Directory Number)
terminal_id	TEXT	端末 ID / IMEI
terminal_vendor	TEXT	端末メーカー
terminal_model	TEXT	端末モデル
terminal_sw_version	TEXT	端末ソフトウェアバージョン
client_ip	TEXT	クライアント IP アドレス
user_agent	TEXT	HTTP User-Agent
auth_method	TEXT	認証方法 (EAP-AKA, TOKEN)
response_status	TEXT	HTTP レスポンスステータス
response_code	TEXT	HTTP レスポンスコード
app_ids	TEXT	アプリケーション ID (例: ["ap2004"])
request_headers	TEXT	HTTP リクエストヘッダ

Field	Type	Description
request_body	String	HTTP Request
response_body	String	HTTP Response
response_summary	String	Summary of response

Request

```
GET /api/activity/:id
```

```
curl -sk https://localhost:8443/api/activity/72420db8-c328-46bd-9878-2a9f3f0d2b88
```

Response: 404

Request

TS.43

Request

```
GET /api/entitlements
```

```
# curl -sk https://localhost:8443/api/entitlements
# curl -sk "https://localhost:8443/api/entitlements?query=31038"
```

Response

操作	参数	返回值	说明
query	IMSI	-	根据 IMSI 查询 entitlements

返回

```
{
  "count": 2,
  "entitlements": [
    {
      "imsi": "310380100000001",
      "app_ids": ["ap2003", "ap2004"],
      "services": ["VoLTE/VoNR", "VoWiFi"]
    },
    {
      "imsi": "310380100000042",
      "app_ids": ["ap2004", "ap2005"],
      "services": ["VoWiFi", "SMSoIP"]
    }
  ]
}
```

IMEI ID

IMEI ID	IMEI
ap2003	VoLTE/VoNR
ap2004	VoWiFi
ap2005	SMSoIP
ap2006	ODSA Companion
ap2009	ODSA Primary
ap2010	IMEI
ap2012	DCBIMEI
ap2016	IMEI

API

```
GET /api/entitlements/:imsi
```

```
curl -sk https://localhost:8443/api/entitlements/310380100000001
```

IMEI

```
{
  "imsi": "310380100000001",
  "entitlements": {
    "ap2003": {
      "service_name": "VoLTE/VoNR",
      "data": {
        "entries": [
          {
            "access_type": 1,
            "home_roaming_nw_type": 1,
            "entitlement_status": 1
          }
        ]
      }
    },
    "ap2004": {
      "service_name": "VoWiFi",
      "data": {
        "entitlement_status": 1,
        "addr_status": 2,
        "tc_status": 2,
        "prov_status": 1
      }
    }
  }
}
```

IMSI 310380100000001 404

DELETE

DELETE /api/entitlements/:imsi

```
curl -sk -X DELETE
https://localhost:8443/api/entitlements/310380100000001
```

DELETE /api/entitlements/:imsi

{}

상태	설명
pending	이벤트 발생 시 Diameter 세션이 생성된 상태
challenge_sent	EAP-AKA 인증을 위한 도전(Challenge)이 전송된 상태
authenticated	인증이 성공적으로 완료된 상태
failed	인증이 실패한 상태
completed	세션이 종료된 상태

GET /api/sessions/:id

```
GET /api/sessions/:id
```

```
curl -sk https://localhost:8443/api/sessions/a1b2c3d4-e5f6-7890-
abcd-ef1234567890
```

응답: 404

DELETE /api/sessions/:id

```
DELETE /api/sessions/:id
```

```
curl -sk -X DELETE https://localhost:8443/api/sessions/a1b2c3d4-
e5f6-7890-abcd-ef1234567890
```

응답: 200

GET

```
{
  "status": "ok",
  "session_id": "a1b2c3d4-e5f6-7890-abcd-ef1234567890"
}
```

□□

□□□□□□□□□□□□□□□□□□□□ EAP-AKA □□□□□□□□□□□□□□□□□□□□

□□□□

```
GET /api/tokens
```

```
curl -sk https://localhost:8443/api/tokens
```

□□

```
{
  "count": 1,
  "tokens": [
    {
      "token_id": "f8e7d6c5-b4a3-2190-fedc-ba0987654321",
      "imsi": "310380100000001",
      "created_at": 1712834400,
      "expires_at": 1712920800,
      "expires_in_seconds": 72340,
      "validity": 86400,
      "terminal_id": "terminal_001",
      "app_name": null,
      "auth_method": "EAP-AKA"
    }
  ]
}
```

□□□□

欄名	型	説明
token_id	string	トークンID
imsi	string	IMSI
created_at	datetime	Unix 時刻
expires_at	datetime	Unix 時刻
expires_in_seconds	integer	有効期限 (秒)
validity	string	有効期限の範囲
terminal_id	string	端末ID
app_name	string	アプリケーション名
auth_method	string	認証方法 (例: "EAP-AKA")

GET

```
GET /api/tokens/:id
```

```
curl -sk https://localhost:8443/api/tokens/f8e7d6c5-b4a3-2190-fedc-ba0987654321
```

HTTP ステータスコード: 404

DELETE

```
DELETE /api/tokens/:id
```


□□

```
{
  "status": "configured",
  "connected_count": 1,
  "disconnected_count": 0,
  "peers": [
    {
      "host": "dra01.epc.mnc380.mcc313.3gppnetwork.org",
      "status": "Connected",
      "ip": "10.179.2.233",
      "port": 3868,
      "transport": "tcp",
      "connection_initiation": "OmniSEP -> Peer",
      "realm": "epc.mnc380.mcc313.3gppnetwork.org",
      "product_name": "OmniDRA",
      "application_ids": {}
    }
  ]
}
```

□□□□

□□	□ □	□□
status	□ □ □	Diameter □ □□ "configured" □ "not_configured" □ □ "no_peers"
connected_count	□ □	□□□□□□□□
disconnected_count	□ □	□□□□□□□□
peers	□ □	□□□□□□□□□□□□

□□□□□

□□	□□	□□
host	□□ □	□□□□ Diameter Origin-Host
status	□□ □	□□□□□ "Connected" □ "Disconnected" □ "Unknown"
ip	□□ □	□□□ IP □□
port	□□	□□□ Diameter □□
transport	□□ □	□□□□□ "tcp" □ "sctp" □
connection_initiation	□□ □	□□□□□□□□ "OmniSEP -> Peer" □
realm	□□ □	□□□□ Diameter □□
product_name	□□ □	□□□□□□□□□□
application_ids	□□	□□□□□□ Diameter □□□□ ID

Diameter

State	Description
configured	Diameter peer is configured
not_configured	Diameter peer is not configured for EAP-AKA
no_peers	No Diameter peers are configured

XCAP

XCAP is used to retrieve XCAP data from the Simservs database.

Usage:

```
GET /api/xcap
```

```
# Example
curl -sk https://localhost:8443/api/xcap

# MSISDN
curl -sk "https://localhost:8443/api/xcap?query=61400"
```

Example:

Field	Type	Value	Description
query	String	-	MSISDN to query

...

```
{
  "count": 1,
  "profiles": [
    {
      "msisdn": "61400000001",
      "profile": {
        "originating_identity_presentation": {"active": true},
        "originating_identity_presentation_restriction":
{"active": false},
        "communication_waiting": {"active": true},
        "communication_diversion": {
          "active": true,
          "rules": []
        },
        "incoming_communication_barring": {"active": false},
        "outgoing_communication_barring": {"active": false}
      }
    }
  ]
}
```

□□□□□□

```
GET /api/xcap/:msisdn
```

```
curl -sk https://localhost:8443/api/xcap/61400000001
```

□□□□ MSISDN □□□□□□□□□□ 404 □

□□□□□□

```
DELETE /api/xcap/:msisdn
```

```
curl -sk -X DELETE https://localhost:8443/api/xcap/61400000001
```

XXXXXXXX XCAP XXXXXXXXXXXXXXXXXXXX HSS XXXXXXXX

XX

```
{  
  "status": "ok",  
  "msisdn": "61400000001"  
}
```

XXXXX

XXXXXXXXXXXXXXXXXXXX

```
{  
  "error": "XXXXXXXX"  
}
```

HTTP XXXX

XX	XX
200	XX
404	XXXXXX
422	XXXXXXXXXXXXXXXXXXXX

XX

XX API XXXXX `config.exe` XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

配置文件 (config.exs)

```
config :api_ex,  
  api: %{  
    port: 8443,  
    listen_ip: "0.0.0.0",  
    product_name: "OmniSEP",  
    title: "API - OmniSEP",  
    hostname: "localhost",  
    enable_tls: true,  
    tls_cert_path: "priv/cert/omnitouch.crt",  
    tls_key_path: "priv/cert/omnitouch.pem",  
    routes: [...]  
  }
```

配置文件 (runtime.exs)

配置 IP 和 TLS 证书路径

```
config :api_ex,  
  api: %{  
    port: 8443,  
    listen_ip: "0.0.0.0",  
    enable_tls: true,  
    tls_cert_path: "priv/cert/omnitouch.crt",  
    tls_key_path: "priv/cert/omnitouch.pem"  
  }
```

設定

項目	型	値	説明
port	整数	8443	API の HTTPS ポート
listen_ip	文字列	"0.0.0.0"	IP アドレスを指定する IP アドレス
product_name	文字列	"OmniSEP"	API の Swagger UI の名前
title	文字列	"API - OmniSEP"	Swagger UI のタイトル
hostname	文字列	"localhost"	OpenAPI のホスト名
enable_tls	ブール値	true	TLS を有効にするかどうか true
tls_cert_path	文字列	"priv/cert/omnitouch.crt"	TLS の証明書ファイル
tls_key_path	文字列	"priv/cert/omnitouch.pem"	TLS の秘密鍵ファイル
routes	文字列	-	API のルート

□□□□

□□□□□
□□

HTTP

OmniSEP
HTTP :80
TS.43 + XCAP

HTTPS :8443
□□ API

□□□□
NMS / □□□

HTTPS

□□	□□	□□
80□□□□□	HTTP	□□□□□□ TS.43 □□□ XCAP
8443□□□□□	HTTPS	□□ API□□□□□
3868	TCP	Diameter□SWm □□□ AAA/DRA□

OmniSEP □□□□□□

OmniSEP □□□□□□□□□□□□□□□□

□□

- □□□□
- TS.43 □□□□
- XCAP Sirmservs □□
- □□□□
- □□□□
- □□□□

□□□□

□□□□□□□□ OmniSEP □□□□□□□□□□□□□□□□ TS.43 □□□□□□ XCAP □□□□

□□□

- □□□□□□□□□□ XCAP□□□□□□□□ EAP □□□□

- IMSI/MSISDN/ID / IP
- HTTP GET/PUT/POST/DELETE
-

- IP
- HTTP XCAP
- IMSI/MSISDN
- ID User-Agent
- XCAP
- User-Agent
- Content-Type/If-Match/3GPP
- XCAP XML
- HTTP


```
GET /api/entitlements/<imsi>
```

4. 删除 entitlements

```
DELETE /api/entitlements/<imsi>/<app_id>
```

返回结果

返回 HTTP 400 错误信息“无效”

原因

- 不支持 TS.43 格式
- 不支持
- URL 无效

返回

参数	说明
terminal_id	IMEI 15 位
terminal_vendor	4 位
terminal_model	10 位
terminal_sw_version	
entitlement_version	“2.0”
app	ID

返回

1. 无效
2. 无效

3. Android User-Agent

```
PRD-TS43 term-<vendor>/<model> client-IMS-Entitlement/1.0 OS-Android/<version>
```

HTTP 406

HTTP 406

- entitlement_version
-

1.

```
config :omni_sep,  
  entitlement_version: "2.0"
```

2. Android "2.0"

3.

XCAP Simservs

HTTP 404

XCAP GET 404

-
- SIP URI
- MSISDN

□□□□

1. □□□□□ SIP URI □□□

```
/simservs.ngn.etsi.org/users/sip:+  
<msisdn>@<domain>/simservs.xml
```

2. □□□□ API □□□□□□□□□□

```
GET /api/xcap/<msisdn>
```

3. □□□□□□□□□□

```
POST /api/xcap/<msisdn>  
Content-Type: application/json  
  
{  
  "oip": {"active": true},  
  "oir": {"active": true, "default_behaviour": "presentation-  
not-restricted"},  
  "no_reply_timer": 20,  
  "call_forwarding": {},  
  "call_barring_incoming": {},  
  "call_barring_outgoing": {}  
}
```

ETag □□□□ HTTP 412 □

□□□PUT □ DELETE □□□□ HTTP 412 □□□□□□

□□□□□

- □□□□□□□□□ ETag
- □□□□□□□□□□
- □□□□□□□ ETag

□□□□□

1. ETag

```
GET /simservs.ngn.etsi.org/users/<sip_uri>/simservs.xml
```

2. If-Match ETag

```
PUT /simservs.ngn.etsi.org/users/<sip_uri>/simservs.xml
If-Match: "<etag_value>"
Content-Type: application/xcap-el+xml

<simservs>...</simservs>
```

3. If-Match

XML HTTP 400

PUT HTTP 400

- XML
-
-

()	<code>http://uri.etsi.org/ngn/params/xml/simservs/xcap</code>
cp	<code>urn:ietf:params:xml:ns:common-policy</code>

1. XML

2.

```
<simservs
xmlns="http://uri.etsi.org/ngn/params/xml/simservs/xcap"
xmlns:cp="urn:ietf:params:xml:ns:common-policy">
```

3. ETSI TS 183 023

-
-
-

1. communication-diversion

```
<communication-diversion active="true">
```

2.

```
<cp:rule id="cfb">
  <cp:conditions>
    <busy/>
  </cp:conditions>
  <cp:actions>
    <forward-to>
      <target>tel:+15557654321</target>
    </forward-to>
  </cp:actions>
</cp:rule>
```

3. ID

Call ID	Call State	Call Duration
cfu	()	000
cfb	busy	00
cfna	no-answer	0000
cfnrc	not-reachable	000
cfnl	not-logged-in	000

4. Call ID tel: URI Call ID E.164 Call

0000

EAP-AKA Call ID

Call ID EAP_ID Call ID

Call ID

- Call ID EAP-AKA
- EAP_ID Call ID
- Diameter Call ID

Call ID

1. Call EAP-AKA Call ID

```
config :omni_sep, :eap_aka,
  enabled: true
```

2. Call EAP_ID Call ID NAI

```
0<IMSI>@nai.epc.mnc<MNC>.mcc<MCC>.3gppnetwork.org
```

```
0310410123456789@nai.epc.mnc410.mcc310.3gppnetwork.org
```

3. Diameter

4.

HTTP 511

HTTP 511

-
-
-

1.

```
config :omni_sep, :token,  
  validity_seconds: 86400 # 24
```

2.

3. EAP-AKA

4. signing_secret

-

- `signing_secret`
- `token`

配置

1. 配置 `signing_secret`

```
config :omni_sep, :token,  
      signing_secret: System.get_env("OMNI_SEP_TOKEN_SECRET")
```

2. 配置

3. 配置

配置

配置

配置

配置

- `token`
- `signing_secret`
- `secret_key_base`

配置

1. 配置

```
curl http://<host>:9014/health
```

2. 配置

```
config :omni_sep,  
  http_port: 9014,  
  http_ip: {0, 0, 0, 0}
```

3. `netstat -tlnp`

4. `grep 9014`

```
netstat -tlnp | grep 9014
```

`netstat -tlnp`

`grep /health` `200`

`netstat`

- `netstat`
- `netstat`
- `netstat`
- Mnesia `netstat`

`netstat`

1. `netstat`

2. `netstat`

- Mnesia `netstat`
- ETS `netstat`XCAP `netstat`

3. `netstat` Mnesia `netstat`

```
ls -la priv/data/mnesia/
```

4. `netstat` Mnesia `netstat`

5. `netstat`

配置

配置

配置

- Diameter 配置
- 配置
- 配置

配置

1. 配置 Diameter 配置

```
config :diameter_ex, :diameter,  
  request_timeout: 5000 # 5 秒
```

2. 配置

3. 配置 ETS 配置

4. 配置

配置

配置

配置

配置

- Mnesia 配置
- 配置 Mnesia 配置
- 配置

配置

1. 列出目录内容

```
ls -la priv/data/mnesia/
```

2. 列出 Mnesia 目录下的 .DCL 文件 - 列出文件内容

```
ls -la priv/data/mnesia/*.DCL
```

3. 列出 Mnesia 进程

```
# 列出 kill -9 SIGTERM  
kill -TERM <pid>
```

4. 查看磁盘空间

```
df -h priv/data/
```

Mnesia 清理

清理 Mnesia 数据库

步骤

- 列出目录内容
- 列出文件
- Erlang 进程

清理

1. 列出 Mnesia 目录

2. 清理 Mnesia 数据库

```
rm -rf priv/data/mnesia/*  
# 列出文件 - 列出文件内容
```

3. Mnesia 启动

```
:mnesia.stop()
:mnesia.start()
:mnesia.wait_for_tables([:activity, :activity_by_imsi,
:activity_by_terminal], 30000)
```

启动 Mnesia

启动 Mnesia

启动 Mnesia

- 启动 Mnesia
- 启动 Mnesia
- 启动 Mnesia

启动 Mnesia

1. 启动 Mnesia

```
config :omni_sep, :activity,
  max_records_per_subscriber: 1000, # 启动 Mnesia
  retention_seconds: 2_592_000      # 30 启动 Mnesia
```

2. 启动 Mnesia

```
ls -lh priv/data/mnesia/activity.*
```

3. 启动 Mnesia

□□□□

□□□□

```
curl -s http://localhost:9014/health | jq
```

□□□□

```
{
  "status": "ok",
  "service": "omni-sep",
  "version": "0.1.0",
  "services": ["entitlements", "xcap"]
}
```

□□□□□□

```
# □□□□□□□□
curl "http://localhost:9014/api/activity?imsi=<imsi>&limit=10"
```

```
# □□□□□
curl "http://localhost:9014/api/activity?terminal_id=
<imei>&limit=10"
```

```
# □□□□□□□□
curl "http://localhost:9014/api/activity?from=<unix_ts>&to=
<unix_ts>"
```

□□□□

```
# □□□□□□  
curl http://localhost:9014/api/entitlements/<imsi>  
  
# □□□□□□  
curl -X POST http://localhost:9014/api/entitlements/<imsi> \  
-H "Content-Type: application/json" \  
-d '{"app_id": "ap2004", "entitlement": {"entitlement_status":  
1}}'
```

XCAP □□□□□□

```
# □□□□□□  
curl http://localhost:9014/api/xcap/<msisdn>  
  
# □□□□□□ simservs □□  
curl "http://localhost:9014/simservs.ngn.etsi.org/users/sip:+  
<msisdn>@domain/simservs.xml"
```

□□□□

□□□□□□

□□	□□
[info] GET / ...	□□□□□□
[info] POST / ...	□□□ POST □□□EAP □□□□
[warning] Missing parameters	□□□□□□
[error] EAP session timeout	EAP-AKA □□□□□□
[debug] Token validated	□□□□□□

□□□□□□

```
# config/dev.exs □ runtime
config :logger, :console,
  level: :debug,
  metadata: [:request_id, :imsi, :terminal_id]
```

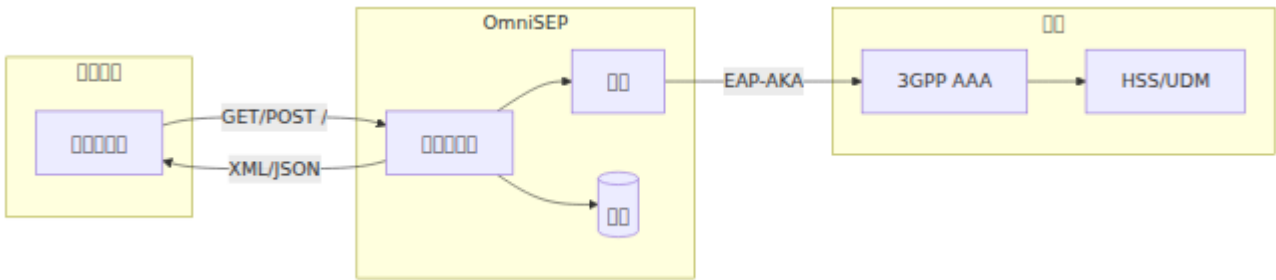
□□□□

□□□□□□□□□□□□□□□□

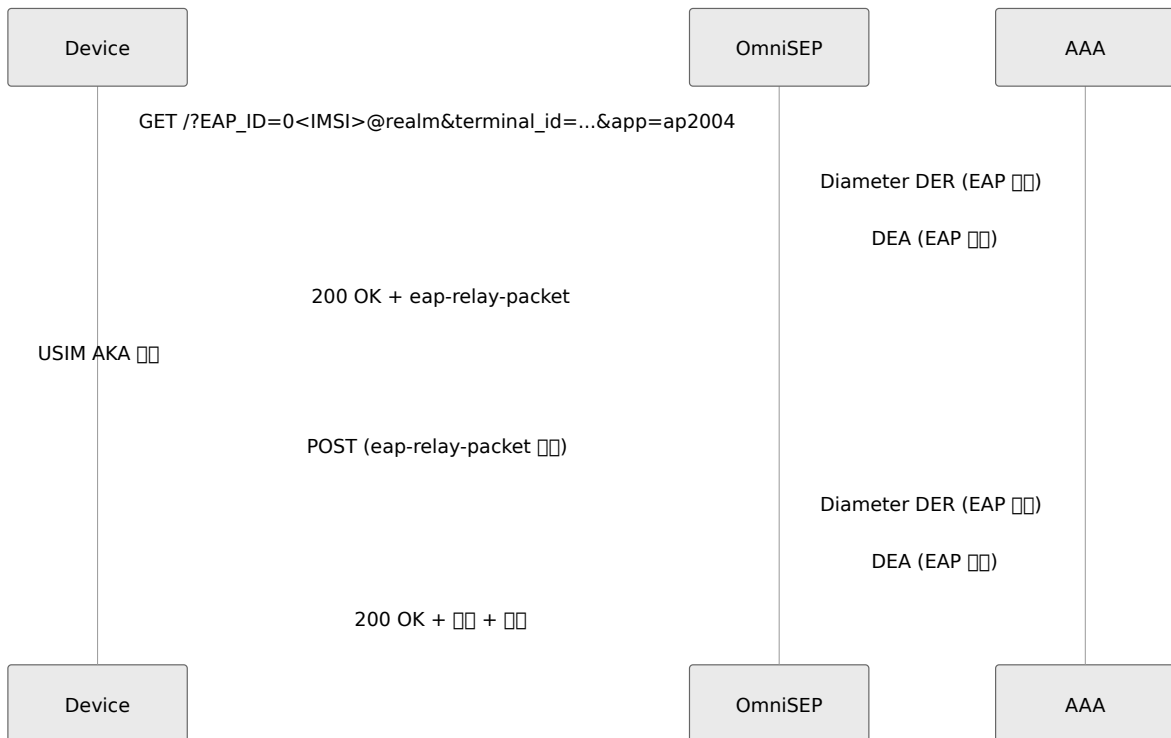
□□	□□
TS.43	GSMA TS.43
XCAP	RFC 4825
Simservs	ETSI TS 183 023
EAP-AKA	RFC 4187
Diameter	RFC 6733

TS.43

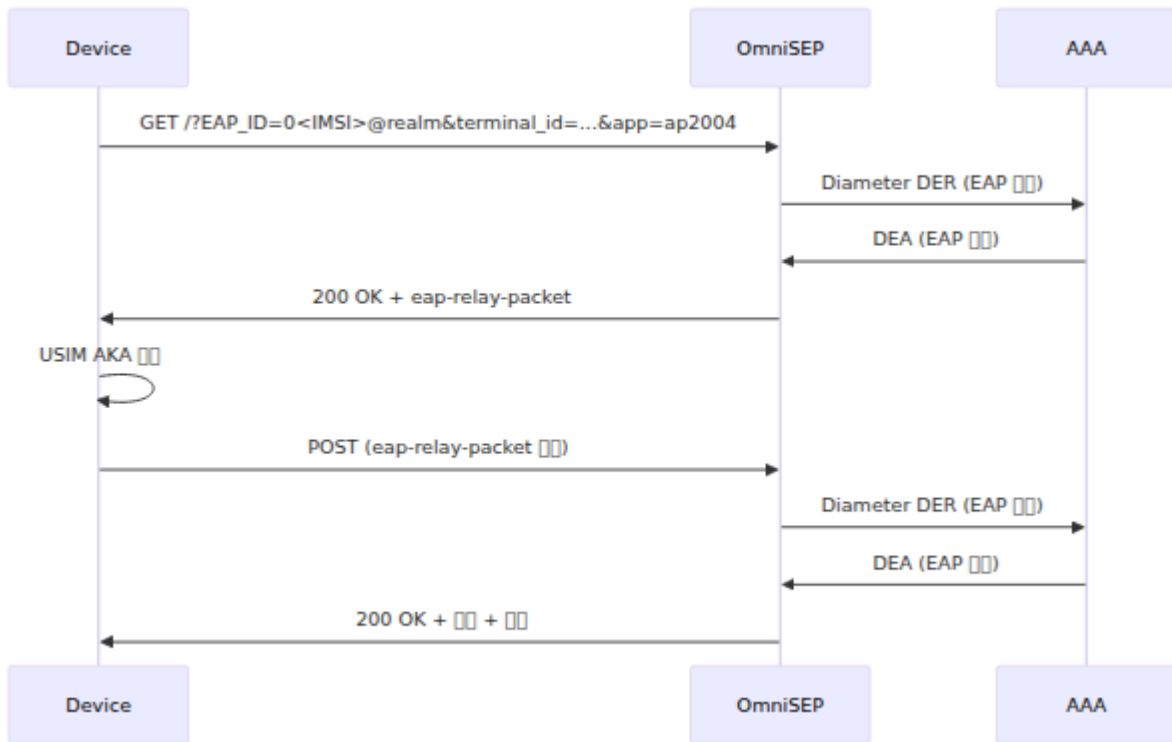
OmniSEP GSMA TS.43 VoWiFi VoLTE SMS



(EAP-AKA)



Sequence Diagram (EAP)



HTTP

Request

Method	Path	Content-Type
GET	/	
POST	/	application/json

终端信息

名称	数据类型	描述
terminal_id	字符串	IMEI 15 位数字
terminal_vendor	字符串	RCC.14 4 位数字
terminal_model	字符串	RCC.14 10 位数字
terminal_sw_version	字符串	RCC.14 20 位数字
entitlement_version	字符串	"2.0"
app	字符串/列表	ID(s)

认证信息

认证失败原因

名称	描述
EAP_ID	EAP-AKA NAI: 0<IMSI>@nai.epc.mnc<MNC>.mcc<MCC>.3gppnetv
token	认证失败原因
temporary_token	认证失败原因
operator_token	认证失败原因

요청

필드	길이	설명
IMSI	15	token 값 포함
app_name	10	응용 프로그램 이름
app_version	10	응용 프로그램 버전
notif_action	1	0=SMS, 1=GCM, 2=FCM
notif_token	10	알림 토큰
vers	1	API 버전

응답

응답은 GET 요청

```
GET /?  
terminal_id=123456789012345&terminal_vendor=Goog&terminal_model=Pixel
```

응답은 EAP-AKA POST 요청

```
{  
  "terminal_id": "123456789012345",  
  "terminal_vendor": "Goog",  
  "terminal_model": "Pixel8",  
  "terminal_sw_version": "14.0",  
  "entitlement_version": "2.0",  
  "app": "[ap2003,ap2004]",  
  "EAP_ID":  
  "0310410123456789@nai.epc.mnc410.mcc310.3gppnetwork.org"  
}
```

□□□□

Accept □

Accept □	□□□□
text/vnd.wap.connectivity-xml	XML□□□□
application/json	JSON
application/vnd.gsma.eap-relay.v1.0+json	EAP relay JSON

XML □□

```
<?xml version="1.0"?>
<wap-provisioningdoc version="1.1">
  <characteristic type="VERS">
    <parm name="version" value="2"/>
    <parm name="validity" value="86400"/>
  </characteristic>
  <characteristic type="TOKEN">
    <parm name="token" value="eyJ0eXAi..."/>
    <parm name="validity" value="86400"/>
  </characteristic>
  <characteristic type="APPLICATION">
    <parm name="AppID" value="ap2004"/>
    <characteristic type="ap2004">
      <parm name="EntitlementStatus" value="1"/>
      <parm name="AddrStatus" value="2"/>
      <parm name="TC_Status" value="2"/>
      <parm name="ProvStatus" value="1"/>
    </characteristic>
  </characteristic>
</wap-provisioningdoc>
```

JSON ☐☐

```
{
  "Vers": {
    "version": "2",
    "validity": "86400"
  },
  "Token": {
    "token": "eyJ0eXAi...",
    "validity": "86400"
  },
  "ap2004": {
    "EntitlementStatus": "1",
    "AddrStatus": "2",
    "TC_Status": "2",
    "ProvStatus": "1"
  }
}
```

EAP ☐☐☐☐

☐ EAP-AKA ☐☐☐☐☐☐☐☐

```
{
  "eap-relay-packet": "AQEALBcBAAAn..."
}
```

□□ ID

□□□□□

□□ ID	□□	□□
ap2003	□□□□□□□□VoLTE/VoNR□	TS.43 □ 4 □
ap2004	□□□□ WiFi□VoWiFi□	TS.43 □ 3 □
ap2005	□□□□ IP	TS.43 □ 5 □
ap2006	ODSA □□	TS.43 □ 6 □
ap2009	ODSA □□	TS.43 □ 6 □
ap2010	□□□□□□	TS.43 □ 7 □
ap2011	□□□□□□□□	TS.43 □ 8 □
ap2012	□□□□□□□□	TS.43 □ 9 □
ap2013	□□□□□□	TS.43 □ 10 □
ap2014	□□□□□□	TS.43 □ 11 □
ap2016	□□□□	TS.43 □ 12 □

VoWiFi (ap2004) 表

項目	型	範囲	説明
EntitlementStatus	型	0-3	権限ステータス
AddrStatus	型	0-3	E911 緊急サービス
TC_Status	型	0-3	TC ステータス
ProvStatus	型	0-3	プロバイダステータス
ServiceFlow_URL	URL	URL	サービスフロー URL
ServiceFlow_UserData	型	-	サービスフローユーザデータ

表

値	EntitlementStatus	AddrStatus/TC_Status/ProvStatus
0	型	型
1	型	型
2	型	型
3	型	型

VoLTE (ap2003) 表

VoLTE 表

項目	状態	値	説明
AccessType	00	1=LTE, 2=NR	000000
HomeRoamingNWType	00	1-3	0000
EntitlementStatus	00	0-1	00000
NetworkVoiceIRATCapability	000	-	00000000 5G

HomeRoamingNWType 00

値	説明
1	00000
2	000
3	000

00000

HTTP 状態	状態	説明
400	0000	000000
403	00	0000
406	0000	00000000
511	000000	00000000 EAP-AKA

□□□□□□

```
HTTP/1.1 400 Bad Request
Content-Type: text/plain
```

```
Bad Request: Missing parameters ["terminal_id"]
```

□□□□□□

□□□□□□□□

□□□□ API □◆◆□□□□□□□□□□

```
POST /api/entitlements/{imsi}
Content-Type: application/json
```

```
{
  "app_id": "ap2004",
  "entitlement": {
    "entitlement_status": 0,
    "addr_status": 1,
    "tc_status": 1,
    "prov_status": 0,
    "service_flow_url": "https://activate.example.com/vowifi",
    "message_for_incompatible": "VoWiFi □□□□□□"
  }
}
```

□□□□

```
GET /api/entitlements/{imsi}
```

□□□□□□□□□□□□□□

```

{
  "imsi": "310410123456789",
  "entitlements": {
    "ap2004": {
      "entitlement_status": 1,
      "addr_status": 2,
      "tc_status": 2,
      "prov_status": 1
    }
  }
}

```

□□□□

□□□□□□□□□□□□□□□□

□□□□

```

GET /api/activity?
imsi=310410123456789&from=1704067200&to=1704153600&limit=100

```

□□	□□	□□
imsi	□□□	□□□ IMSI □□
terminal_id	□□□	□□□□□ ID □□
from	□□	□□□□□□ Unix □□□
to	□□	□□□□□□ Unix □□□
limit	□□	□□□□□□□□
offset	□□	□□□□□□

□□□□

```
{
  "id": "550e8400-e29b-41d4-a716-446655440000",
  "timestamp": "2024-01-15T10:30:00Z",
  "imsi": "310410123456789",
  "terminal_id": "123456789012345",
  "terminal_vendor": "Google",
  "terminal_model": "Pixel8",
  "app_ids": ["ap2003", "ap2004"],
  "client_ip": "192.168.1.100",
  "user_agent": "PRD-TS43 Goog/Pixel8 client-IMS-Entitlement/1.0
OS-Android/14.0",
  "auth_method": "TOKEN",
  "response_code": 200
}
```

Android □□□□□□

OmniSEP □□□ Android AOSP `service_entitlement` □□□□□□□

□□□□□□

Android □□□□□□□□□□□□

```
PRD-TS43 term-<vendor>/<model> <client_ts43>/<app_version> OS-
Android/<sw_version>
```

□□□

```
PRD-TS43 term-Google/Pixel8 client-IMS-Entitlement/1.0 OS-
Android/14.0
```

□□□□ ID

Android □ POST □□□□□□□□□□□□□□□□ ID□

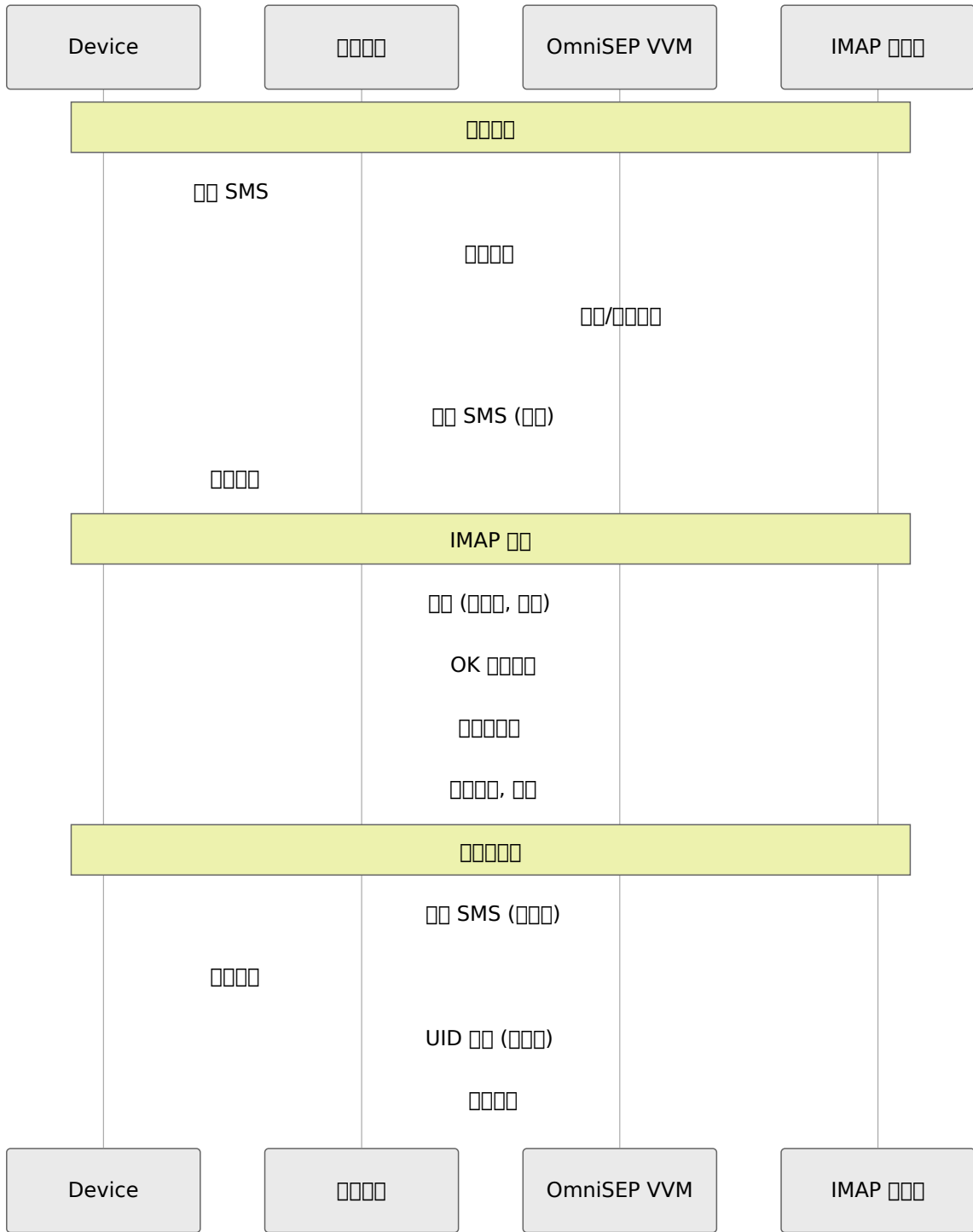
```
{  
  "app": "[ap2003,ap2004]"  
}
```

OmniSEP 配置

- "ap2003,ap2004" - 設定
- "[ap2003,ap2004]" - 設定Android 設定
- ["ap2003", "ap2004"] - JSON 設定

設定

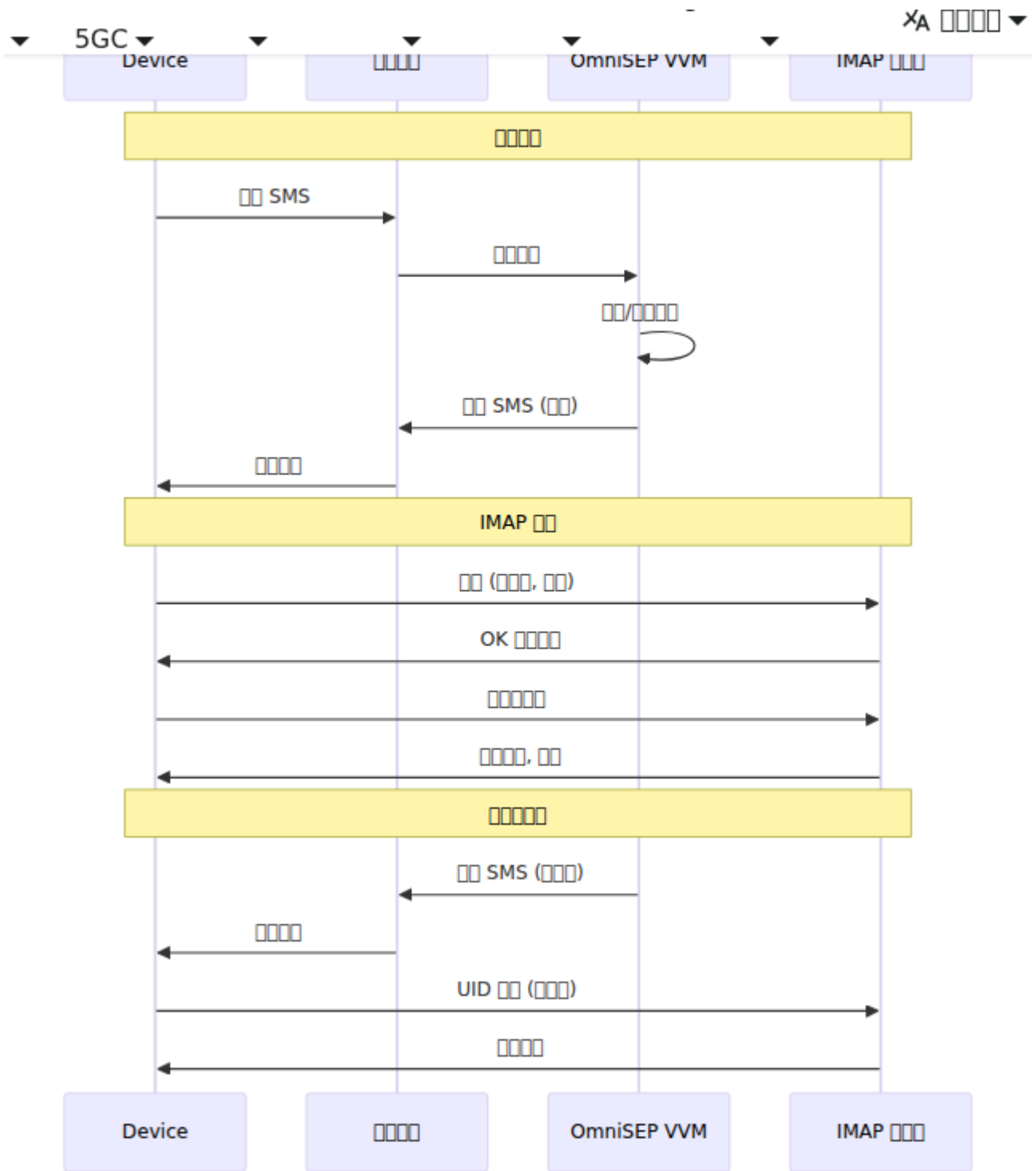
項目	設定
GSMA TS.43	設定
GSMA RCC.14	IMS 設定
3GPP TS 33.220	設定 (GBA)
3GPP TS 29.273	EPS AAA 設定 (SWm)



□□□□

VVM □□□□ OMTP □□□□□□□□□□□□

□□	□□	□□
□□	U	□□□□□□□□□□
□	N	□□□□□□□□□□□□□□□□
□□	R	□□□□□□□□
□□□	P	□□□□□□□□□□□□□□
□□□	B	□□□□□□□□



□□□□

□□□□ (□□□□□□□□)

□□□□□□□□ IMAP □□□

```
//VVM:STATUS:st=R;rc=0;srv=vvm.example.com;ipt=993;spt=587;u=5050100015;pm=N;gm=N;vtc=A
```

項目	説明
st	ステータス (R=成功, B=失敗, N=未定義, P=エラー, U=未定義)
rc	エラーコード (0=成功)
srv	IMAP サーバ名
ipt	IMAP ポート番号
spt	SMTP ポート番号 (ポート)
u	ユーザー名 (IMSI)
pw	パスワード
tui	TUI かどうか
dn	ドメイン名 (ドメイン)
lang	言語
g_len	グループ名
vs_len	バージョン名
pw_len	PIN の長さ
pm	パスワード PIN (Y/N)
gm	グループ名 (G=成功, V=失敗, B=未定義, N=未定義)
vtc	バージョン (A=成功, D=失敗, B=未定義, N=未定義)

URI (URI)

URI

```
//VVM:SYNC:ev=NM;id=123;c=5;t=v;s=+61400123456;dt=15/01/2024 10:30+0000;l=30
```

URI	URI
ev	URI (NM=URI, MBU=URI, GU=URI)
id	URI ID
c	URI
t	URI (v=URI, o=URI, f=URI, i=URI, e=ECC)
s	URI
dt	URI
l	URI

URI (URI)

URI VVM

```
Activate:pv=11;ct=samsung.SM-A536E.13
```

URI	URI
pv	URI
ct	URI (vendor.model.os_version)

□□□□ (□□□□□□□□)



□□□□□□ VVM□

Deactivate:pv=11

IMAP □□□

VVM IMAP □□□□□□□□□□□□□□ IMAP4rev1 (RFC 3501) □□□□

□□□□□

□□	□□
CAPABILITY	□□□□□□□
LOGIN	□□□□□/□□□□□□□□
LOGOUT	□□□□
SELECT	□□□   (□□□, □□□, □□□)
EXAMINE	□□□□□□□□□
LIST	□□□□□□
STATUS	□□□□□□ (□□□□)
FETCH	□□□□□□
UID FETCH	□ UID □□
STORE	□□□□□□
UID STORE	□ UID □□□□
SEARCH	□□□□
UID SEARCH	□ UID □□
COPY	□□□□□□□□□
EXPUNGE	□□□□□□□□□
CLOSE	□□□□□□□
GETQUOTAROOT	□□□□□□

NOOP	

NOOP

IMAP4rev1 AUTH=PLAIN AUTH=LOGIN UIDPLUS MOVE QUOTA

NOOP

NOOP	

NOOP

NOOP RFC 5322 NOOP MIME NOOP



☐☐ **VVM**

```
# config/config.exs
config :omni_sep, :vvm,
  enabled: true,

  # IMAP ☐☐☐☐
  imap_port: 993,
  imap_ssl: true,
  imap_server: "vvm.example.com",
  imap_cert: "priv/cert/server.crt",
  imap_key: "priv/cert/server.key",

  # TUI (☐☐☐☐☐☐) ☐☐
  tui_number: "*86",

  # ☐☐☐☐
  sms_source_number: "+614000000000",
  sms_gateway: "https://sms-gateway.example.com/api/send",

  # PIN ☐☐
  min_pin_length: 4,
  max_pin_length: 15,

  # ☐☐☐☐☐
  default_max_messages: 100,
  default_storage_limit_kb: 50_000,
  default_max_greeting_seconds: 60
```

□□□□

□□	□ □	□ □	□□□	□□
<code>enabled</code>	□ □	□	false	□□ VVM □ □
<code>imap_port</code>	□ □	□	993	IMAP □□□ □□
<code>imap_ssl</code>	□ □	□	true	□□ IMAP □□□ TLS
<code>imap_server</code>	□ □ □	□	-	IMAP □□□ □□□ (□□□ SMS □□□)
<code>imap_cert</code>	□ □ □	□	priv/cert/server.crt	TLS □□□□
<code>imap_key</code>	□ □ □	□	priv/cert/server.key	TLS □□□□
<code>smtp_port</code>	□ □	□	587	SMTP □□ (□□□□)
<code>tui_number</code>	□ □ □	□	*86	□□□□□□□□ TUI □□□□
<code>sms_source_number</code>	□ □ □	□	-	VVM □□□ □□□□□

項目	種別	単位	初期値	説明
<code>sms_gateway</code>	文字列		nil	SMS送信に使用するHTTPプロキシのURL
<code>min_pin_length</code>	整数		4	PINコードの最小桁数
<code>max_pin_length</code>	整数		15	PINコードの最大桁数
<code>default_max_messages</code>	整数		100	受信メッセージのデフォルト最大数
<code>default_storage_limit_kb</code>	整数		50000	受信メッセージのデフォルト最大ストレージ制限 (KB)
<code>default_max_greeting_seconds</code>	整数		60	受信メッセージのデフォルト最大挨拶時間 (秒)

設定例

以下はIMAPとTLSを有効にするための設定例です。

```
# config/dev.exs
config :omni_sep, :vmm,
  enabled: true,
  imap_port: 1430,
  imap_ssl: false,
  imap_server: "localhost",
  tui_number: "*86",
  sms_source_number: "+61400000000"
```

□□□□

```
# config/prod.exs
config :omni_sep, :vvm,
  enabled: true,
  imap_port: 993,
  imap_ssl: true,
  imap_server: "vvm.carrier.example.com",
  imap_cert: "/etc/omnisep/certs/vvm.crt",
  imap_key: "/etc/omnisep/certs/vvm.key",
  tui_number: "*86",
  sms_source_number: "+61400000001",
  sms_gateway: "https://smsc.carrier.example.com/api/v1/send"
```

□□

IMAP □□□□

□□: vvm_imap_sessions_total

□□: □□□

□□: VVM IMAP □□□□

□□:

- result - □□□□: success, auth_failed, timeout

□□: vvm_imap_active_sessions

□□: □□□

□□: □□□□□ IMAP □□□□

□□: vvm_imap_commands_total

□□: □□□

□□: □□□ IMAP □□□□

□□:

- command - IMAP □□: LOGIN, SELECT, FETCH, □□
- result - □□□□: ok, no, bad

消息

接口: vvm_messages_total

接口: 消息

接口: VVM 消息

接口:

- operation - 操作: deposit, read, delete, move

接口: vvm_messages_stored

接口: 消息

接口: 消息

接口: vvm_message_duration_seconds

接口: 消息

接口: 消息

接口: 5, 10, 15, 30, 60, 120, 180, 300

短信

接口: vvm_sms_total

接口: 短信

接口: VVM 短信

接口:

- type - 类型: status, sync, activate, deactivate
- result - 结果: success, failed, no_gateway

账户

接口: vvm_accounts_total

接口: 账户

接口: VVM 账户

接口:

- operation - 操作: create, activate, deactivate, update
- result - 结果: success, error

API IMAP

VVM

“”

:

-
- SMSC
- VVM

:

1. sms_gateway
- 2.
3. VVM enabled: true
4. vvm_sms_total{type="status"}

IMAP

SMS

:

- /
- TLS
- IMAP

:

1. SMS
2. TLS
3. IMAP

4. `telnet/openssl` `openssl s_client -connect vvm.example.com:993`

□□□□□

□□: □□□□□□□□□□□□□□

□□□□:

- □□□□ SMS
- IMAP □□□□
- □□□□□□

□□□□:

1. `vvm_sms_total{type="sync"}` □◆◆◆◆
2. □□□□□□□□□□
3. `vvm_messages_total{operation="deposit"}` □□□□□□□
4. □□ IMAP □□□□□□□□□□□□

□□□□□□

□□: □□□□□□□□□□

□□□□:

1. □□□□□□: `default_storage_limit_kb`, `default_max_messages`
2. `vvm_messages_stored` □□□
3. □□□□□□□□□□□□
4. □□□□□□: `get_greetings/1` □□□□□□

□□□□□

- **OMTP VVM** □□ **v1.3** - □□□□□□□□□□□□
- **GSMA TS.46** - □□□□□□□□□□□□
- **RFC 3501** - IMAP4rev1 □□
- **RFC 5322** - □□□□□□□□

XCAP 介面 (Simservs)

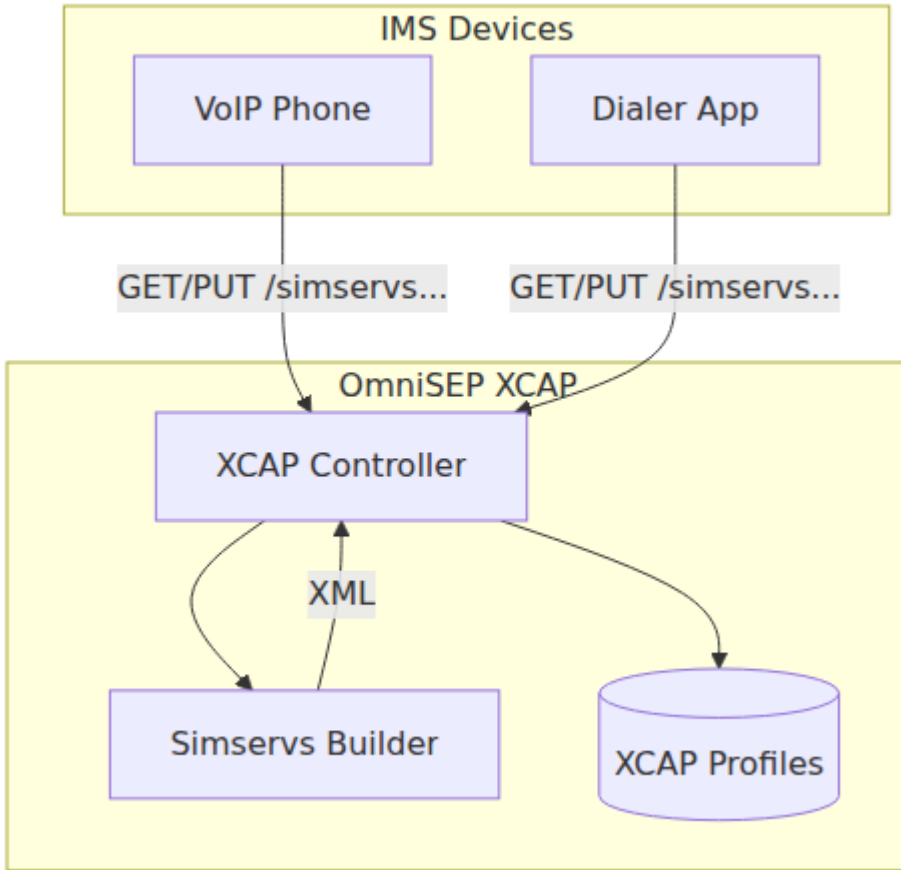
OmniSEP 符合 ETSI TS 183 023 XCAP (XML 介面) 與 IMS 介面

UI

XCAP Simservs Web 介面

功能

- MSISDN 查詢
- Diameter Sh 與 HSS 查詢
- 2 種查詢
◦ OIP/OIR 查詢 (查詢)
◦ 查詢
- HSS 查詢/更新
- 查詢



Simservs

simservs  ETSI TS 183 023 



HTTP

XCAP URL

```
/simservs.ngn.etsi.org/users/{sip_uri}/simservs.xml[/~/~/{xpath}]
```

Placeholder	Description	Example
{sip_uri}	MSISDN or SIP URI	sip:+15551234567@ims.example.com
{xpath}	XPath expression (string)	simservs/communication-diversion

□□

□□	□□
GET	<code>/simservs.ngn.etsi.org/users/{sip}/simservs.xml</code>
PUT	<code>/simservs.ngn.etsi.org/users/{sip}/simservs.xml</code>
GET	<code>/simservs.ngn.etsi.org/users/{sip}/simservs.xml/~~/simservs.</code>
PUT	<code>/simservs.ngn.etsi.org/users/{sip}/simservs.xml/~~/simservs.</code>
DELETE	<code>/simservs.ngn.etsi.org/users/{sip}/simservs.xml/~~/simservs.</code>

□□□□

Content-Type	□□
application/xcap-el+xml	XCAP □□□□
application/xml	□□ XML

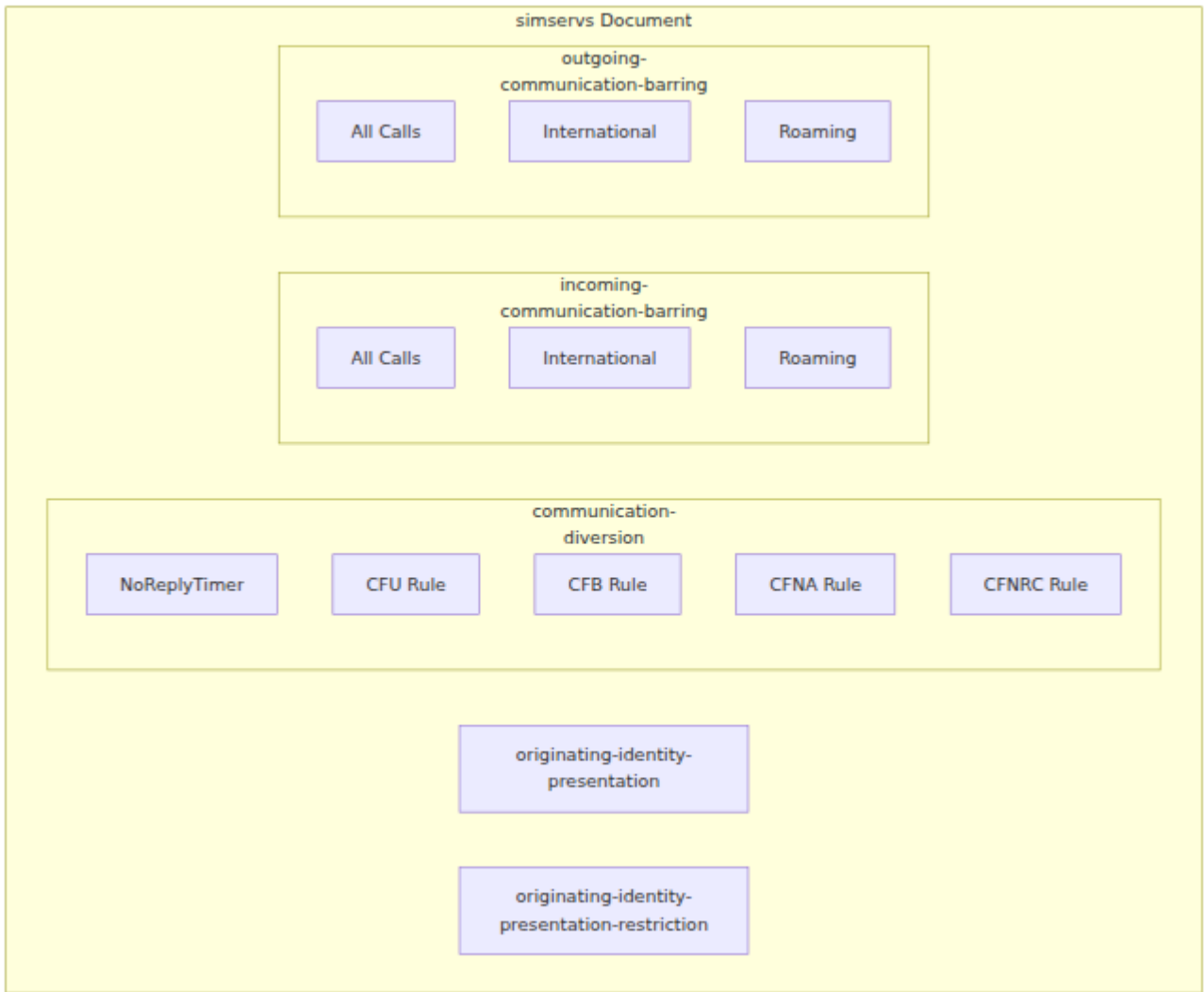
ETag □□

OmniSEP □□□ [RFC 4825](#) □□ ETag □□□□□□

□□	□□
ETag	□□□□□□□□□□
If-Match	□□□□ (PUT/DELETE)
If-None-Match	□□ GET (304 Not Modified)

□□□□

OmniSEP □□□□□□□□□□□□□□□□ ETS □□□□□ HSS □□□



□□□

□	□	□	□□
xcap_profiles	IMSI	{profile_map, etag}	□□□□□□□□
xcap_by_msisdn	MSISDN	IMSI	XCAP □□□□□□□□

□□□□

□□□□ (GET)

1. □□□□□□ ETS □□
2. □□□□□□□□□□ Diameter Sh □ HSS □□

3. HSS
4. HSS

PUT

1. ETag
- 2.
3. ETag
4. HSS

ETag

ETags MD5

```
ETag = MD5(erlang:term_to_binary(profile))[0:16]
```

"a1b2c3d4e5f6g7h8"

16

ETS read_concurrency	
GenServer	
ETag	

3GPP TS 24.623

-
- OIR presentation-not-restricted

- NoReplyTimer 20
- /

HSS

	Diameter	
	Sh UDR (User-Data-Request)	
	Sh PUR (Profile-Update-Request)	PUT

HSS

Simservs XML ☐☐

☐☐☐☐☐☐

```
<?xml version="1.0" encoding="UTF-8"?>
<simservs xmlns="http://uri.etsi.org/ngn/params/xml/simservs/xcap"
          xmlns:cp="urn:ietf:params:xml:ns:common-policy">

  <originating-identity-presentation active="true"/>

  <originating-identity-presentation-restriction active="true">
    <default-behaviour>presentation-not-restricted</default-
behaviour>
  </originating-identity-presentation-restriction>

  <communication-diversion active="true">
    <NoReplyTimer>20</NoReplyTimer>
    <cp:ruleset>
      <cp:rule id="cfb">
        <cp:conditions>
          <busy/>
        </cp:conditions>
        <cp:actions>
          <forward-to>
            <target>tel:+15557654321</target>
            <notify-caller>>false</notify-caller>
          </forward-to>
        </cp:actions>
      </cp:rule>
    </cp:ruleset>
  </communication-diversion>

  <incoming-communication-barring active="false">
    <cp:ruleset/>
  </incoming-communication-barring>

  <outgoing-communication-barring active="false">
    <cp:ruleset/>
  </outgoing-communication-barring>

</simservs>
```

□□□□

□□	□□□□	□□
(default)	<code>http://uri.etsi.org/ngn/params/xml/simservs/xcap</code>	ETSI Simservs
cp	<code>urn:ietf:params:xml:ns:common-policy</code>	RFC 4745 □□ □□

□□

□□□□ (OIP)

□□□□□□□□□□□□□□

```
<originating-identity-presentation active="true"/>
```

□□	□□	□□
<code>active</code>	□□□	□□□□/□□

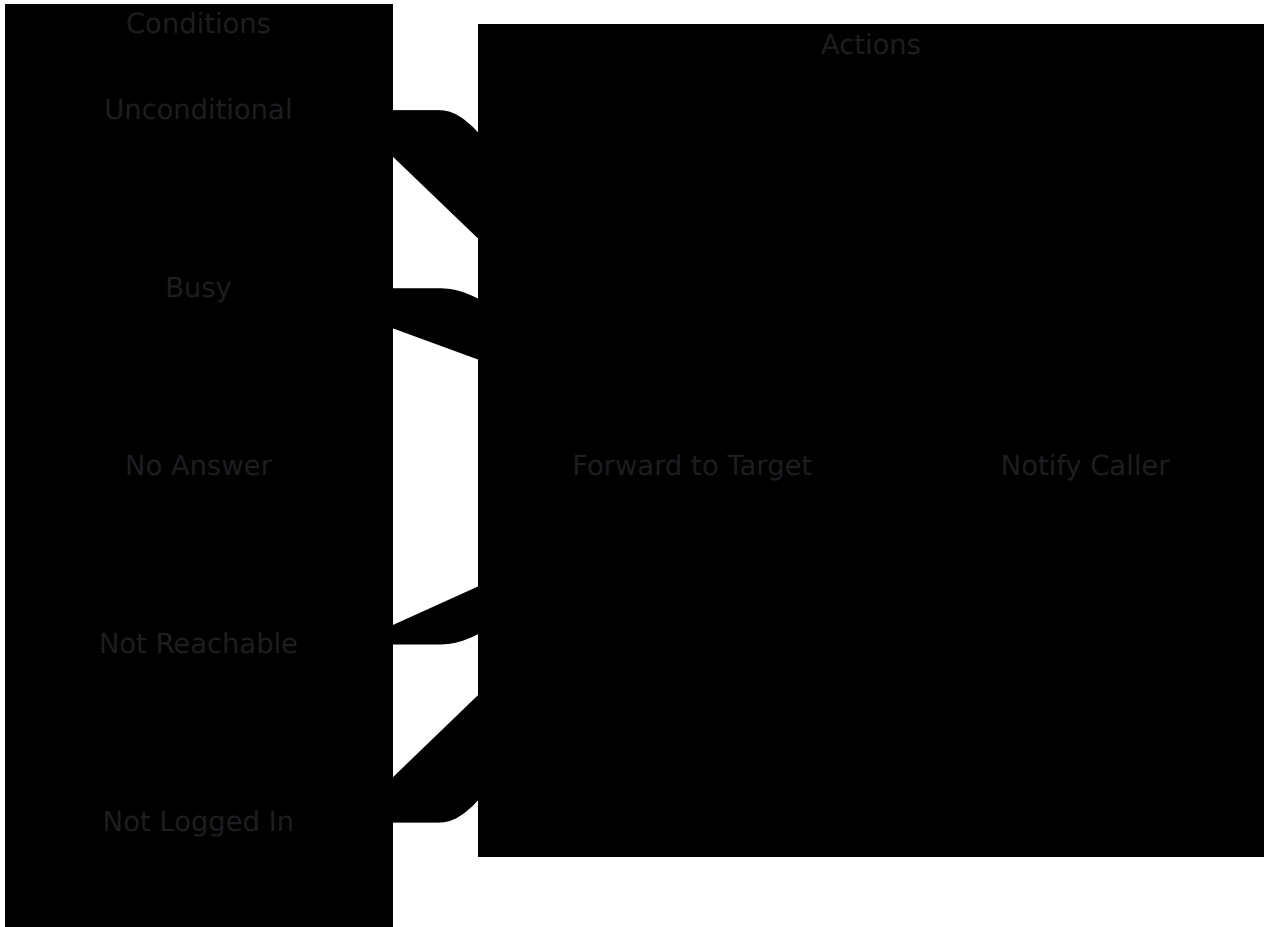
□□□□□□ (OIR)

□□□□□□□□

```
<originating-identity-presentation-restriction active="true">  
  <default-behaviour>presentation-not-restricted</default-behaviour>  
</originating-identity-presentation-restriction>
```

☐☐	☐	☐☐
default-behaviour	presentation-restricted, presentation-not-restricted	☐☐☐☐☐ ☐☐☐

☐☐☐☐ (☐☐☐☐)



☐☐☐☐

ID	状態	説明
cfu	()	通話中 - 通話中
cfb	busy	通話中
cfna	no-answer	通話中 (NoReplyTimer)
cfnc	not-reachable	通話中
cfnl	not-logged-in	通話中

通話中

```

<communication-diversion active="true">
  <NoReplyTimer>20</NoReplyTimer>
  <cp:ruleset>
    <cp:rule id="cfna">
      <cp:conditions>
        <no-answer/>
      </cp:conditions>
      <cp:actions>
        <forward-to>
          <target>tel:+15557654321</target>
          <notify-caller>>false</notify-caller>
        </forward-to>
      </cp:actions>
    </cp:rule>
  </cp:ruleset>
</communication-diversion>

```

URI	URI	URI
NoReplyTimer	URI	CFNA (1-300)
cp:rule/@id	URI	(cfu, cfb, cfna, cfnc, cfnl)
target	tel: URI	
notify-caller	URI	

URI

tel: URI RFC 3966

tel:+15557654321;phone-context=ims.mnc001.mcc310.3gppnetwork.org

URI	URI
tel:	URI
+15557654321	E.164
phone-context	IMS ()

```
<incoming-communication-barring active="true">
  <cp:ruleset>
    <cp:rule id="international">
      <cp:conditions>
        <international/>
      </cp:conditions>
      <cp:actions>
        <allow>>false</allow>
      </cp:actions>
    </cp:rule>
  </cp:ruleset>
</incoming-communication-barring>
```

□□□□

```
<outgoing-communication-barring active="true">
  <cp:ruleset>
    <cp:rule id="international">
      <cp:conditions>
        <international/>
      </cp:conditions>
      <cp:actions>
        <allow>>false</allow>
      </cp:actions>
    </cp:rule>
  </cp:ruleset>
</outgoing-communication-barring>
```

□□□□□□

API ID	API	API
all	()	
international	international	
international-exHC	international-exHC	
roaming	roaming	

API

Simservs

```
GET
/simservs.ngn.etsi.org/users/sip:+15551234567@ims.example.com/simservs
Accept: application/xcap-el+xml
```

Response

```
HTTP/1.1 200 OK
Content-Type: application/xcap-el+xml
ETag: "a1b2c3d4e5f6g7h8"

<?xml version="1.0" encoding="UTF-8"?>
<simservs
xmlns="http://uri.etsi.org/ngn/params/xml/simservs/xcap"...>
  ...
</simservs>
```

□□□□□□□□

GET

/simservs.ngn.etsi.org/users/sip:+15551234567@ims.example.com/simserv
diversion

□□□□□□□□

PUT

/simservs.ngn.etsi.org/users/sip:+15551234567@ims.example.com/simserv
diversion/cp:ruleset/cfb

Content-Type: application/xcap-el+xml

If-Match: "a1b2c3d4e5f6g7h8"

```
<cp:rule id="cfb">
  <cp:conditions>
    <busy/>
  </cp:conditions>
  <cp:actions>
    <forward-to>
      <target>tel:+15557654321</target>
      <notify-caller>>false</notify-caller>
    </forward-to>
  </cp:actions>
</cp:rule>
```

□□□□□□□□

DELETE

/simservs.ngn.etsi.org/users/sip:+15551234567@ims.example.com/simserv
diversion/cp:ruleset/cfb

If-Match: "a1b2c3d4e5f6g7h8"

PUT NoReplyTimer

```
PUT
/simservs.ngn.etsi.org/users/sip:+15551234567@ims.example.com/simserv
diversion/NoReplyTimer
Content-Type: application/xcap-el+xml

25
```

JSON API

JSON API

GET

```
GET /api/xcap/15551234567
```

JSON

```
{
  "oip": { "active": true },
  "oir": {
    "active": true,
    "default_behaviour": "presentation-not-restricted"
  },
  "no_reply_timer": 20,
  "call_forwarding": {
    "cfb": {
      "enabled": true,
      "target": "tel:+15557654321",
      "condition": "busy"
    }
  },
  "call_barring_incoming": {},
  "call_barring_outgoing": {}
}
```

Request

POST /api/xcap/15551234567
Content-Type: application/json

```
{  
  "no_reply_timer": 25,  
  "call_forwarding": {  
    "cfna": {  
      "enabled": true,  
      "target": "tel:+15559876543",  
      "condition": "no-answer"  
    }  
  }  
}
```

Response

Response Headers

Header	Value
OIP	0
OIR	presentation-not-restricted
NoReplyTimer	20
Cache-Control	no-cache
Content-Type	application/json
ETag	W/"15551234567"

□□□□

HTTP □□	□□
200	□□
304	□□□ (If-None-Match □□)
400	□□□□ - □□□ XML □□□
404	□□□ - □□□□□□□□
405	□□□□□
409	□□ - □□□□
412	□□□□□□ - ETag □□□

□□□□□□

```
<?xml version="1.0" encoding="UTF-8"?>
<xcap-error xmlns="urn:ietf:params:xml:ns:xcap-error">
  <error-element>Element not found: simservs/unknown</error-
element>
</xcap-error>
```

□□□□

□□	□□
ETSI TS 183 023	NGN Siversvs □ XCAP □□
ETSI TS 183 004	□□□□ (CDIV)
RFC 4825	XCAP □□
RFC 4745	□□□□
RFC 3966	tel: URI
3GPP TS 24.623	XCAP □□ Ut □□