Backend server setup and launch

Backend server setup

After installation, backend server configuration files are in `/usr/local/FlashphonerWebCallServerOAM/conf` folder:

```
log4j2.properties
wcsoam-core.properties
wcsoam.properties
WCS-OAM.version
wss.jks
```

Where

- `log4j2.properties` - backend server logging configuration
- `wcsoam-core.properties` - backend server JVM configuration
- `wcsoam.properties` - backend server main configuration file
- `WCS-OAM.version` - backend server version
- `wss.jks` - SSL certificate storage

To apply any configuration changes, backend server must be restarted.

Metrics storage DB connection setup

Influx BD connection setup

The following parameter in wcsoam.properties file should be set to allow to store metrics to Influx DB

```
influxdb_enabled=true
```

DB URL should be set for connection setup. By default, if Influx DB is on the same server, URL should be set as

```
influxdb_url=http://localhost:8086
```

DB name and access parameters should also be set

```
influxdb_database=wcs_oam
influxdb_user=root
influxdb_password=root
```

By default, WCS OAM connects to Influx DB via UDP:

```
influxdb_udp=true
influxdb_udp_port=8089
```

In this case, metric values can be lost. To escape loss, metric values can be passed using `HTTP POST` query as follows

```
POST /write?u=root&p=root&db=wcs_oam&rp=default&precision=n&consistency=one
HTTP/1.1

3-5062030c-9def-49c2-a89e-639d664ab806
AUDIO_CODEC=102i,AUDIO_LOST=3795015i,AUDIO_RATE=137776i,AUDIO_SYNC=123432141899i
 1562263828767000000
```

Metrics writing can be switched to HTTP with the following parameter

```
influxdb_udp=false
```

Anyway, metric values are read from Influx DB using `HTTP GET` query as follows

```
GET /query?u=root&p=root&db=wcs_oam&q=SELECT+*+FROM+%221-89dc5510-a198-11e9-
a049-030fe6b5675c%22+order+by+time+desc+limit+10+offset+0 HTTP/1.1
```

Timescale DB connection setup

The following parameter in `wcsoam.properties` file should be set to allow to store metrics to Timescale DB

```
metric_store=timescale
```

DB URL and access parameters should be set for connection setup

```
timescale.url=jdbc:postgresql://127.0.0.1:5432/wcsstat
timescale.username=wcsoam
timescale.password=wcsoam
```

CONNECTION TUNING

Metric values batch size to write to DB can be set with the following parameter

```
timescale_batch_size=1000
```

In this case metrics will be written to DB in batches of 1000 values.

Stream history and data acquisition settings DB connection setup

History storage support is enabled with the following parameter

```
historydb_enabled=true
```

Using H2

H2 embedded database is allowed for debug and testing purposes only, not for production usage

If H2 connection is necessary, add to `wcsoam.properties` file the following:

```
spring.h2.console.enabled=true
spring.datasource.url=jdbc:h2:./wcs_oam
spring.datasource.driver-class-name=org.h2.Driver
spring.datasource.username=sa
spring.datasource.password=
spring.jpa.database-platform=org.hibernate.dialect.H2Dialect
spring.jpa.show-sql=false
spring.jpa.hibernate.ddl-auto=update
```

Using Postgresql

To connect to Postgresql, add to `wcsoam.properties` file the following

```
spring.datasource.url=jdbc:postgresql://127.0.0.1:5432/wcsoam
spring.datasource.driver-class-name=org.postgresql.Driver
spring.datasource.username=wcsoam
spring.datasource.password=wcsoam
spring.jpa.database-platform=org.hibernate.dialect.PostgreSQLDialect
spring.jpa.show-sql=false
spring.jpa.hibernate.ddl-auto=create
spring.jpa.properties.hibernate.enable_lazy_load_no_trans=true
```

Where

- `wcsoam` - database name, user name and password which are set for Posgresql

SQL DB connection tuning

Under high load, it may be necessary to change DB records queue size. It may be done with the following parameter

```
historydb_queue_size=3000
```

By default, queue size is 3000 records.

SQL queries logging

If necessary, SQL queries logging can be enabled for debug purposes using the following parameters in `wcsoam.properties` file

```
logging.level.org.hibernate.SQL=debug
logging.level.org.hibernate.type.descriptor.sql=trace
```

Note that metrics store to TimescaleDB will also be logged in this case.

WCS interaction setup

By default, backend server listens to WCS server connections for metrics acquisition on TCP port 7777. This port can be changed with the following parameter

```
listening_port=7777
```

Connection authentication key should be set with the following parameter

```
security_key=123456789
```

By default, authentication key is set to 123.

Also, backend server connects to WCS server to get published stream data using REST API. WCS port to connect is set with the following parameter

```
wcs_rest_port=8081
```

Client connection setup

SSL configuration

Backend server allows client connections using HTTPS and Secure Websocket. SSL is configured with the following parameters

```
server.ssl.key-store-type=JKS
server.ssl.key-store=file:/usr/local/FlashphonerWebCallServerOAM/conf/wss.jks
server.ssl.key-store-password=password
server.ssl.key-alias=selfsigned
```

Where

- `server.ssl.key-store-type` - SSL certificate storage type; only JKS is supported
- `server.ssl.key-store` - SSL certificate storage location
- `server.ssl.key-store-password` - SSL certificate storage password
- `server.ssl.key-alias` - domain name

By default, backend server is shipped with self-signed certificate. SSL certificate can be imported to backend server SSL storage using keytool in the same way as for WCS server. If

wildcard certificate is used, and backend server is in the same domain with WCS server, WCS SSL storage file can be copied to backend server configuration folder, for example

```
cp -f /usr/local/FlashphonerWebCallServer/conf/wss.jks
/usr/local/FlashphonerWebCallServerOAM/conf/
```

Port configuration

HTTPS port to handle REST queries, WSS connections and for web interface access is set with the following parameter

```
server.port = 8090
```

Backend server starting

Backend server can be started from `/usr/local/FlashphonerWebCallServerOAM/bin` folder

```
cd /usr/local/FlashphonerWebCallServerOAM/bin
./wcsoam start
```

or, if it was installed as system service

```
systemctl start wcsoam
```

Backend server stopping

Backend server can be stopped from `/usr/local/FlashphonerWebCallServerOAM/bin` folder

```
cd /usr/local/FlashphonerWebCallServerOAM/bin
./wcsoam stop
```

or, if it was installed as system service

```
systemctl stop wcsoam
```