Developers guide

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The intended audience for this document are software architects, designers and developers aiming to implement an integration between their system/solution and the Global Payments Marketplace.

Markets and endpoint locations

Global Payments Marketplace (GPM) is operated as a multi-market solution, where each market is supported with a separate set of endpoints. Endpoint locations that correspond to markets are:

Market	Base endpoint	SSO/IdP realm	Status
Czech Republic	https://mygp.cz	mygp-cz	live
Slovakia	https://mygp.sk	mygp-sk	live
Austria	https://mygp.at	mygp-at	live
Romania	https://mygp.ro	mygp-ro	live

Following purpose-specific endpoint locations are supported besides the market-bound endpoint locations listed above:

Market	Base endpoint	SSO/IdP realm	Status
Global	https://mygp.global	mygp-global	live

Locales

Due to multi-market deployment, GMP supports multiple locales (languages and formatting conventions):

Locale	Status
cs-CZ	live
sk-SK	live
en-US	live
de-AT	live
ro-RO	live

Environments

Once an endpoint location is live, it supports following types of environments:

- **Live** environment is running production workloads and is connected with real users and customer data. Access to live environment is granted to systems and applications that have passed through the QA and verification process.

- **Uat2** environment is a staging environments for workloads that are being subject to QA and verification process before deployment to production. It normally runs the same version of Marketplace system as production, except during the deployment transition window when it receives a version designated for deployment to production.
- **Uat1** environment is an integration environment provided to facilitate development and integration of partner solutions. It normally runs a version of Marketplace system that is ahead of production.

URL conventions for environments

URLs provided across all endpoint locations follow a common convention that is based on combination of base endpoint and the type of the environment.

Environment/location specific URL for the marketplace portal is defined as:

- <base endpoint> for live environment
- uat2.<base endpoint> for UAT2 environment
- uat1.<base endpoint> for UAT1 environment

Example: marketplace portal in UAT1 environment for Czech Republic is accessible at https://uat1.mygp.cz

Single sign-on for users

This section discusses the single sign-on (SSO) integration between a partner web site and GP marketplace SSO, where partner web site is taking the role of **relying party** and Global Payments Marketplace (GPM) SSO is acting as the **identity provider**. It provides an overview and information about following SSO integration scenarios and use cases:

- Generic user authentication with OpenID Connect (OIDC)
- User authentication with home-realm discovery
- Simple user authentication scenario with browser redirect initiated from marketplace

Integration with single sign-on can be used for authentication of end users (GP customers or people working for GP customers) and internal users (e.g. telesales or sales support agents). OpenID Connect is used as the principal integration protocol for authentication of user access to GPM and connected 3rd party applications.

GPM is a multi-market solution where each market is using a dedicated SSO realm that handles specific market localisation (mainly language). Whenever the relying party requires an access token that is issued for specific user identity it must first initiate home-realm discovery request to receive back the destination URL for the SSO authentication request (through the **auth_url** property).

Generic user authentication with OpenID Connect

This use case is relevant for **relying parties** (applications or systems seeking to authenticate users through GPM SSO) that do not need to authenticate users in the context of their business contracts with GP. This means that identity of the user is important, but company/contract information is not relevant. E.g. when relying party wants to authenticate internal users.

Detailed specification of authorisation code flow is available in the OpenID Connect documentation.

Prerequisites for integration

Before the 3rd party partner can start using OIDC authentication function, the partner must be in possession of a marketplace partner account and a 3rd party application must be registered with the partner account.

The 3rd party application can then be approved and configured for OIDC authentication with following parameters:

- list of valid OIDC redirect (callback) URLs.
- base URL of application (where users can be redirected back in case of failed authentication attempt)

Once this configuration is completed, the home-realm-discovery function is activated for the application and partner is issued with SSO generated client id and client secret parameters that are required to perform OIDC authentication operations.

In order to complete SSO integration, the 3rd party application must implement features described in the next sections.

Authentication request

Authentication request is performed as a HTTP GET redirect request from the 3rd party web site to the OIDC authorisation request endpoint of the SSO. The redirect is performed with assistance of the user agent (normally a web browser).

```
HTTP/1.1 302 Found
Location: https://mygp.global/auth/realms/mygp-global/protocol/openid-connect/auth?
          response_type=code
          &scope=openid
          &client_id=example-client-id
          &state=af0ifjsldkj
          &redirect_uri=https%3A%2F%2Fclient.example.org%2Fcb
```

Authorisation code callback

Authorisation code callback is performed as a HTTP GET redirect request from the SSO web site back to the 3rd party web site. The redirect performed with assistance of the user agent (normally a web browser) and carries information that is relevant for the verification of submitted data as well as conversion of authorisation code into ID or access token.

```
HTTP/1.1 302 Found
Location: https://client.example.org/cb?
          code=SplxlOBeZQQYbYS6WxSbIA
          &state=af0ifjsldkj
```

Authorisation code conversion

Authorisation code conversion is performed as a back-channel HTTP POST request issed from 3rd party web site towards the SSO token endpoint URL. This is a direct HTTP request from 3rd party back-end to the SSO token endpoint.

```
POST /auth/realms/mygp-global/protocol/openid-connect/token HTTP/1.1
Host: mygp.global
Content-Type: application/x-www-form-urlencoded
Authorization: Basic example-client-secret

grant_type=authorization_code
 &code=SplxlOBeZQQYbYS6WxSbIA
 &redirect_uri=https%3A%2F%2Fclient.example.org%2Fcb
```

Response returned by the SSO token endpoint will carry a JSON object with requestd ID or access token.

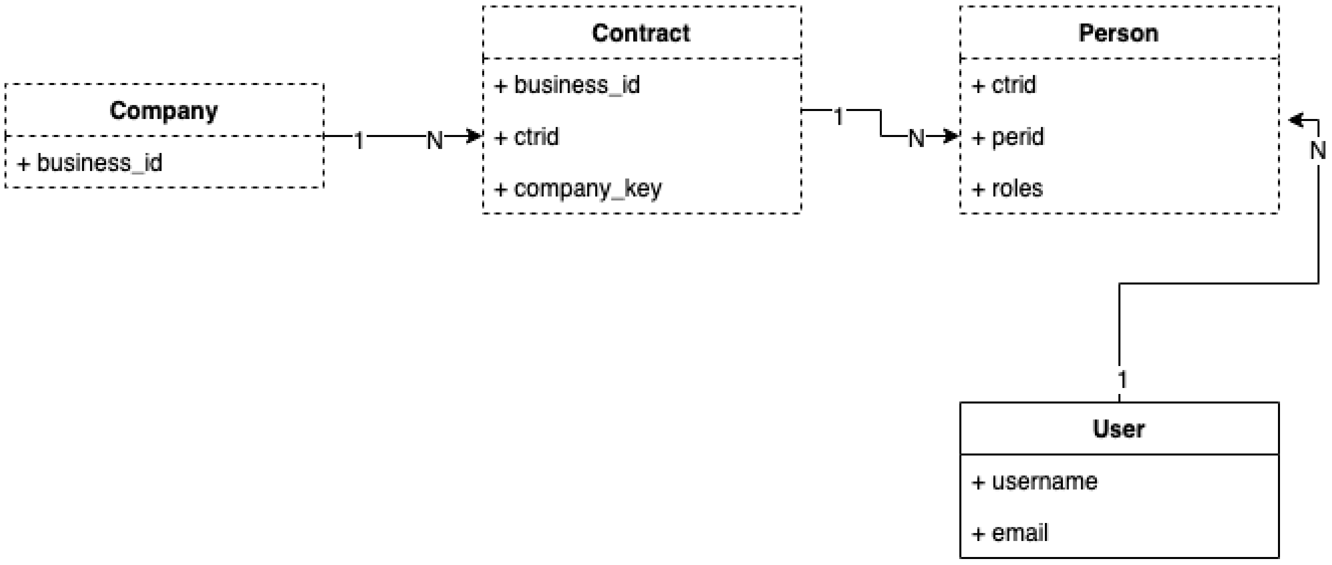
```
HTTP/1.1 200 OK
Content-Type: application/json
Cache-Control: no-store
Pragma: no-cache

{
  "id_token": "eyJhbGciOiJSUzI1NiIsImtpZCI6IjFlOWdkazcifQ.ewogImlzc
    yI6ICJodHRwOi8vc2VydmVyLmV4YW1wbGUuY29tIiwKICJzdWIiOiAiMjQ4Mjg5
    NzYxMDAxIiwKICJhdWQiOiAiczZCaGRSa3F0MyIsCiAibm9uY2UiOiAibi0wUzZ
    fV3pBMk1qIiwKICJleHAiOiAxMzExMjgxOTcwLAogImlhdCI6IDEzMTEyODA5Nz
    AKfQ.ggW8hZ1EuVLuxNuuIJKX_V8a_OMXzR0EHR9R6jgdqrOOF4daGU96Sr_P6q
    Jp6IcmD3HP99Obi1PRs-cwh3LO-p146waJ8IhehcwL7F09JdijmBqkvPeB2T9CJ
    NqeGpe-gccMg4vfKjkM8FcGvnzZUN4_KSP0aAp1tOJ1zZwgjxqGByKHiOtX7Tpd
    QyHE5lcMiKPXfEIQILVq0pc_E2DzL7emopWoaoZTF_m0_N0YzFC6g6EJbOEoRoS
    K5hoDalrcvRYLSrQAZZKflyuVCyixEoV9GfNQC3_osjzw2PAithfubEEBLuVVk4
    XUVrWOLrLl0nx7RkKU8NXNHq-rvKMzqg"
  "access_token": "SlAV32hkKG",
  "token_type": "Bearer",
  "expires_in": 3600,
}
```

User authentication with home-realm discovery

Home-realm discovery is a means to discover (at runtime) appropriate endpoints and parameters to initiate OIDC authentication as well as qualify the business context of the authentication, such as the business ID (e.g. IČO) for the company the user is authenticating for. This use case is relevant for authentication of end users (GP customers or people working for GP customers), where the relying party requires information about exact company/contract the end user has selected for authentication.

While the need for more narrow qualification of the business context will vary from one SSO client use case to another the general need for this qualification can be understood from the following data model:



An individual SSO user account can be related - indirectly via the Person entity - to more than one contract and company and for some (even most) use cases it is important for the relying party (SSO client) to know the exact contract (or company) that the user is performing the authentication for.

The purpose of home-realm discovery function is to perform business context qualification in advance of OIDC authentication to the relying 3rd party system or application. The scope of qualification includes:

- market (CZ, SK, etc),
- business_id or company_key.

Provisioning and activation

Before the 3rd party partner can start using the home-realm discovery function, the partner must be in possession od a marketplace partner account and a 3rd party application must be registered with the partner account.

The 3rd party application can then be approved and configured for home-realm discovery with following parameters:

- market mapping policy (none or required),

- company mapping policy (none, business_id or company_key),
- alternative user name mapping policy (none or omsuid),
- home-realm-discovery callback URL (exact URL),
- secret key (used to encrypt and decrypt response data),
- list of valid OIDC redirect (callback) URLs.

Once this configuration is completed the home-realm-discovery function is activated for the application and partner is issued with SSO generated client id and client secret parameters that are required to perform OIDC authentication operations.

Home-realm discovery request

A home-realm discovery request is initiated by the 3rd party application with a HTTP GET redirect request that **must** be executed through the user agent (such as web browser).

The redirect URL must be formatted as:

- **https://uat1.mygp.global/discovery?state={?state}&cauth={?cauth}** for development system
- **https://uat2.mygp.global/discovery?state={?state}&cauth={?cauth}** for pre-production system
- **https://mygp.global/discovery?state={?state}&cauth={?cauth}** for live system

Query string parameters:

- **state** is an arbitrary string produced by the 3rd pary app that is used to uniqely identify the request (i.e. prevent browser or an intermediary proxy to return cached response) as well as to link the request with the response received later through the callback. **Maximum allowed length is 64 characters**.
- **cauth** must contain the application key ID that was assigned to the 3rd party app; this ID is used by the server to identify the 3rd party app and associated configuration parameters (including shared key). The parameter is generated as a random string (e.g. `xYDEb7SjeGlGhx0w`) that is safe to be passed in the URL.

```
state = 'bcd6da3ab4a814ddf8798fed4e12cf02bcdca838fe92127bb4c03899a7bb2210'
cauth = 'xYDEb7SjeGlGhx0w'

# Resulting home realm request URL
https://mygp.global/discovery?state=bcd6da3ab4a814ddf8798fed4e12cf02bcdca838fe92127bb4
c03899a7bb2210&cauth=xYDEb7SjeGlGhx0w
```

Home-realm discovery callback

3rd party application must implement a home-realm discovery callback endpoint where the marketplace SSO will redirect user agent when the discovery and business context qualification process is completed. The redirect is executed as as a HTTP form POST request (executed by the user agent - web browser - on behalf of the authenticating user) and the request body contains transactional parameters that the 3rd party app can use to decrypt the response.

```
POST /app/specific/callback/path?state={?state} HTTP/1.1
Host: www.relying-party.com
Content-Type: application/x-www-form-urlencoded
Content-Length: 581

x-cbc-iv=c89899de29096e31f993974bf608fd40&x-
claims=uR6T5zovuWglcse70cNEUwFZHrt%2BJVfmakqXFvGJQ4%2FK%2BhuLxlzWCIqk1euBXU6jk9wNFJRte
OG1RPHcc0WTaO5JMGvYWmepjjBnIOwB2lORWGj4ORs9bwpT3cv0Mmm1HjOqsEvpMYORWOD8tZUqNW7gzhi8Z8s
AAmleeJ8GRQh4MQAbBWv%2B1B0UV0RXT7p%2Bn5XEirTceYw4NPJTWHE8e4dCKoJjpqOwIq375Tb2rfC6zGgoB
RYllgEWIOcH7b3QNHjW2GGX8WhPfCiGqR9CLIxv2tAo2hDoypPtDvWq5rYgecPL6szjbq23SAWHiP5NxlKlDA0
dWg1pwel3N4uRAV%2Bk5dG1Ru2%2BgXQQTg12n0k4JzuRH1nOwV0NoqNJ7ALg8dfN%2FT2psxpf%2BAEhaeGV9
heRNFmXc5TWKlwIl1BNbNqxjoiWdlIDTIcpiWYaEF3t8Co7g%2B6GhMWLtzzrAAkS4RsKGKLLrduIGMfHDpBju
TDdAOzHa%2FjZ%2Fw3PEUUQBrnO
```

Query string parameters:

- **state** is set to the value provided by the 3rd party application with the initial home-realm discovert request. 3rd party app **must** perform a correlation validation for the value and reject any requests that do not pass this validation.

Request body parameters:

- **x-cbc-iv** contains the value for initialisation vector, which is represented as a 32-characters hexadecimal string. The value `c89899de29096e31f993974bf608fd40` corresponds to the byte array [c8, 98, 99, …, fd, 40].
- **x-claims** contains encrypted JSON object with claims. The value of the field is base64 encoded and encrypted with AES-256 CSB algorithm.

Structure of JSON claims object:

```
{
    'state': '{?state}',
    'business_id': '098765432112',
    'company_key': '23b1d7bcdb6fc513ba0edd8957943b6c30425948',
    'sso_subid': '19260239-2340-43ef-b49b-ad585b39eb07',
    'sso_username': 'mpuser1',
    'alt_username': 'sp67347384',
    'given_name': 'User 1',
    'family_name': 'MPL',
    'market': 'cz',
    'auth_url': 'https://sso.mygp.cz/auth/realms/mygp-cz'
}
```

- **state** must match the value of state parameter provided in the query string
- **business_id** (IČO)

- **company_key**
- **sso_subid** is the unique and permanent ID assigned by the SSO to the user account
- **sso_username** username that was used for authentication to SSO
- **alt_username** alternative application specific username
- **given_name**
- **family_name**
- **market** two letter code of the country/market
- **auth_url** used for SSO authentication request

Encryption algorithm and management of secrets

The data submitted with the home-realm discovery callback will be encrypted using AES-256 algorithm using CBC block mode with PKCS#7 padding. The content (JSON text) will be converted to UTF-8 prior to encryption.

The value for IV, which will be initialised with random data for each request, will be provided to the relying party though the `x-csb-iv` field in the HTTP POST request body.

The encryption key will be unique and specific to the **cauth**. Both **cauth** and **encryption key** will be generated when the app account will be registered in the system and will be provided to the partner in a password-protected ZIP file. Both secrets can be rotated independently of one another (e.g. encryption key can be rotated without changing cauth and vice versa).

Example:

```
# 16-byte IV
IV = "732b7cfbeaf99313"

# 32-byte / 256-bit key
key = "c5ce45f758a361a24d43079fdcefbf5b"

# JSON data serialized to string
input = "{\n    'state': '{?state}',\n    'business_id': '098765432112',\n
'company_key': '23b1d7bcdb6fc513ba0edd8957943b6c30425948',\n    'sso_subid':
'19260239-2340-43ef-b49b-ad585b39eb07',\n    'sso_username': 'mpuser1',\n
'alt_username': 'sp67347384',\n    'given_name': 'User 1',\n    'family_name':
'MPL',\n    'market': 'cz',\n    'auth_url': 'https://sso.mygp.cz/auth/realms/mygp-
cz'\n}"

# Base64 encoded encrypted output
b64_output =
"tNDhDA8NLjDF1nNULNJe6gVlXABzJ3ScqoZWBpPbcQL/BuFqLfJiJCH2+DFyWf9RykOsAei8v/+5NBAxF0J10
NHYRiV6yvlm8L3xK6qKtrGPgnfqritEjVjlJUK/mlzb8fZIDXMoWeVZbZ9PCdV+BiHXUeWUt3cQ0ARHfAKkcsb
Jls7iR9i6WCc7MaiYrT533Kq24XLI01LH24dpAUIC/JyN81iArjykB6DZkuxNCoXPrMgYeVL2uHG4iIrtj30yl
+Ob7MyCAXuth+/+ldDcyX57EfAJlvfcwyAIQpxsnD61HsemyVuWAQ7iz9EGrNHt02l/xZYQI0LweADA6X+HEJK
ZWVl4cIc0+vWRA2LFd0ybTe0cy3djRmyk4h+n5b0QEnjeMjb1sWtf2Yxqhbs3iesLLgQtvj+R5t+SoskaS7Dto
8ny5i/oc9NGhLoeBjRPAtPAafDTM69x9WP7dlZmOqPgssE05rSQQ2UUTrB/HNDZK/8JRHvUbz7vbJi1/ubR"
```

External references:

- Advanced Encryption Standard
- AES256 encrypt & decrypt online

Rotation of secrets

Relying application can have fore than one pair of secrets (key_id and secret_key) active at the same time and can (freely) choose which secret will/should be used for the request. The selection of the key is communicated with the `cauth` (mandatory) parameter in the initial home-realm discovery request.

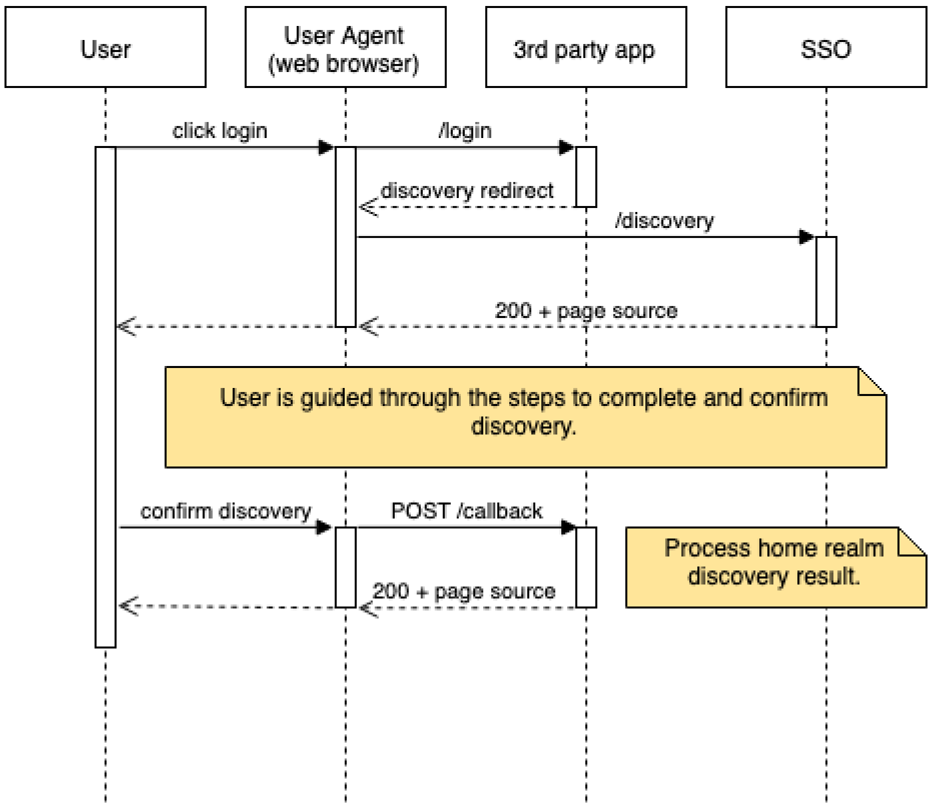
Rotation of the secrets can be performed with the following steps:

1. Application is configured to use `current-secret` pair. All discovery requests are initiated and performed with this secret pair.
2. New secret pair - `new-secret` - is created on the marketplace for the application. This does not have impact on incoming discovery requests.
3. New secret pair is configured in the application. All discovery requests initiated after that change are performed with the new secret pair.
4. After a period of time, the old `current-secret` will be deactivated on the marketplace and any requests submitted with that `cauth` key id will be rejected.

Important to note is that home realm discovery request started before step #3 will be performed using the `current-secret` pair. It is therefore possible that callback requests will arrive after #3 that will carry request body encrypted with the old secret. **Application logic should be able to successfully process such callback requests.**

Simple authentication scenario (login initiated from 3rd party site)

This scenario is applicable for 3rd party applications that use marketplace SSO strictly for the purpose of user identification and **DO NOT** call any marketplace APIs on behalf of the user.



Once the processing of the HTTP POST request submitted to the **callback** endpoint is completed successfully, the identity of the user should be treated as verified and valid and authenticated application session can be started for the user.

Simple authentication scenario (redirect initiated from marketplace)

Partner web sites that integrate with GPM SSO must implement a dedicated landing page, which will be used on the marketplace portal to redirect users to the partner web site. For 3rd party web sites that employ the "simple authentication scenario" the behavior of this landing page must be almost identical to the behavior of the home-realm discovery callback endpoint with the exception of **state** parameter that - in this scenario - will not be set.

```
POST /app/specific/landing-page/path HTTP/1.1
Host: www.relying-party.com
Content-Type: application/x-www-form-urlencoded
Content-Length: 581

x-cauth=xYDEb7SjeGlGhx0w&x-cbc-iv=c89899de29096e31f993974bf608fd40&x-
claims=uR6T5zovuWglcse70cNEUwFZHrt%2BJVfmakqXFvGJQ4%2FK%2BhuLxlzWCIqk1euBXU6jk9wNFJRte
OG1RPHcc0WTaO5JMGvYWmepjjBnIOwB2lORWGj4ORs9bwpT3cv0Mmm1HjOqsEvpMYORWOD8tZUqNW7gzhi8Z8s
AAmleeJ8GRQh4MQAbBWv%2B1B0UV0RXT7p%2Bn5XEirTceYw4NPJTWHE8e4dCKoJjpqOwIq375Tb2rfC6zGgoB
RYllgEWIOcH7b3QNHjW2GGX8WhPfCiGqR9CLIxv2tAo2hDoypPtDvWq5rYgecPL6szjbq23SAWHiP5NxlKlDA0
dWg1pwel3N4uRAV%2Bk5dG1Ru2%2BgXQQTg12n0k4JzuRH1nOwV0NoqNJ7ALg8dfN%2FT2psxpf%2BAEhaeGV9
heRNFmXc5TWKlwIl1BNbNqxjoiWdlIDTIcpiWYaEF3t8Co7g%2B6GhMWLtzzrAAkS4RsKGKLLrduIGMfHDpBju
TDdAOzHa%2FjZ%2Fw3PEUUQBrnO
```

Request body structure (with decrypted example):

```
{
    'business_id': '098765432112',
    'company_key': '23b1d7bcdb6fc513ba0edd8957943b6c30425948',
    'sso_subid': '19260239-2340-43ef-b49b-ad585b39eb07',
    'sso_username': 'mpuser1',
    'alt_username': 'sp67347384',
    'given_name': 'User 1',
    'family_name': 'MPL',
    'market': 'cz',
    'auth_url': 'https://sso.mygp.cz/auth/realms/mygp-cz'
}
```

Submitted data will be encrypted using the encryption key indicated with the `` `x-cauth `` parameter. **If the application will maintain multiple active secrets, then the oldest active secret will be used for encryption.**

Custom claims

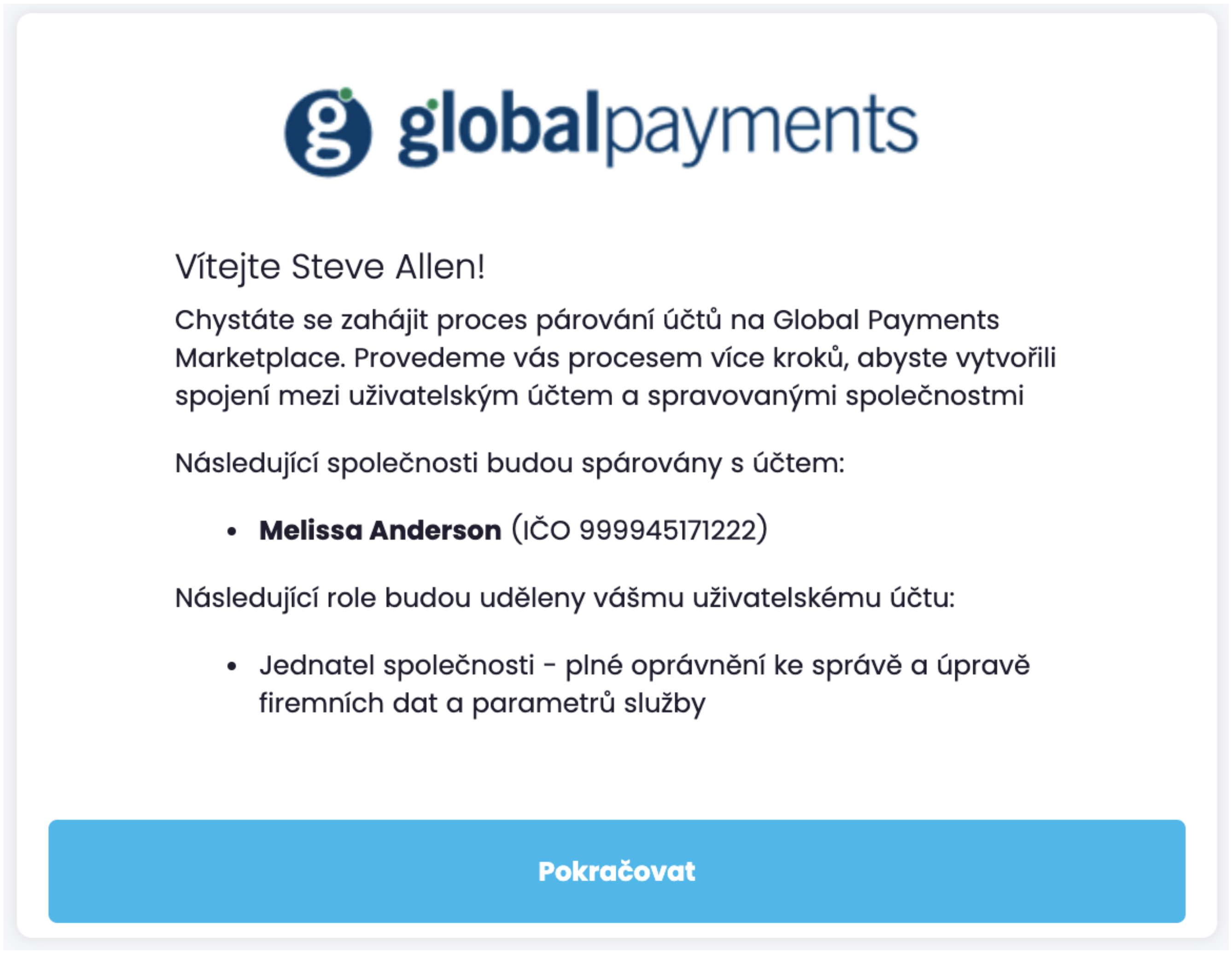
The claims set prepared by the home realm discovery component can include custom claims that can be used by the receiving application to modify and improve customer experience.

Name	Domain	Example	Description
channel	string	mygp.cz	Identifies domain name for the submitting channel (portal).
language	string	cz	Identifies preferred language (of the user).

Registration and pairing of user accounts

Customer data is not automatically paired with user accounts. This linking in performed through user account registration and pairing process. The process is initiated by opening a unique URL link that is (normally) provided to users through e-mail and may take the form similar to `https://uat1.mygp.cz/onboarding/QwZN0_clk4ItotzKS1UQCsIHsh8zugoy`.

Step 1 - open invitation link


Vítejte Steve Allen!

Chystáte se zahájit proces párování účtů na Global Payments Marketplace. Provedeme vás procesem více kroků, abyste vytvořili spojení mezi uživatelským účtem a spravovanými společnostmi

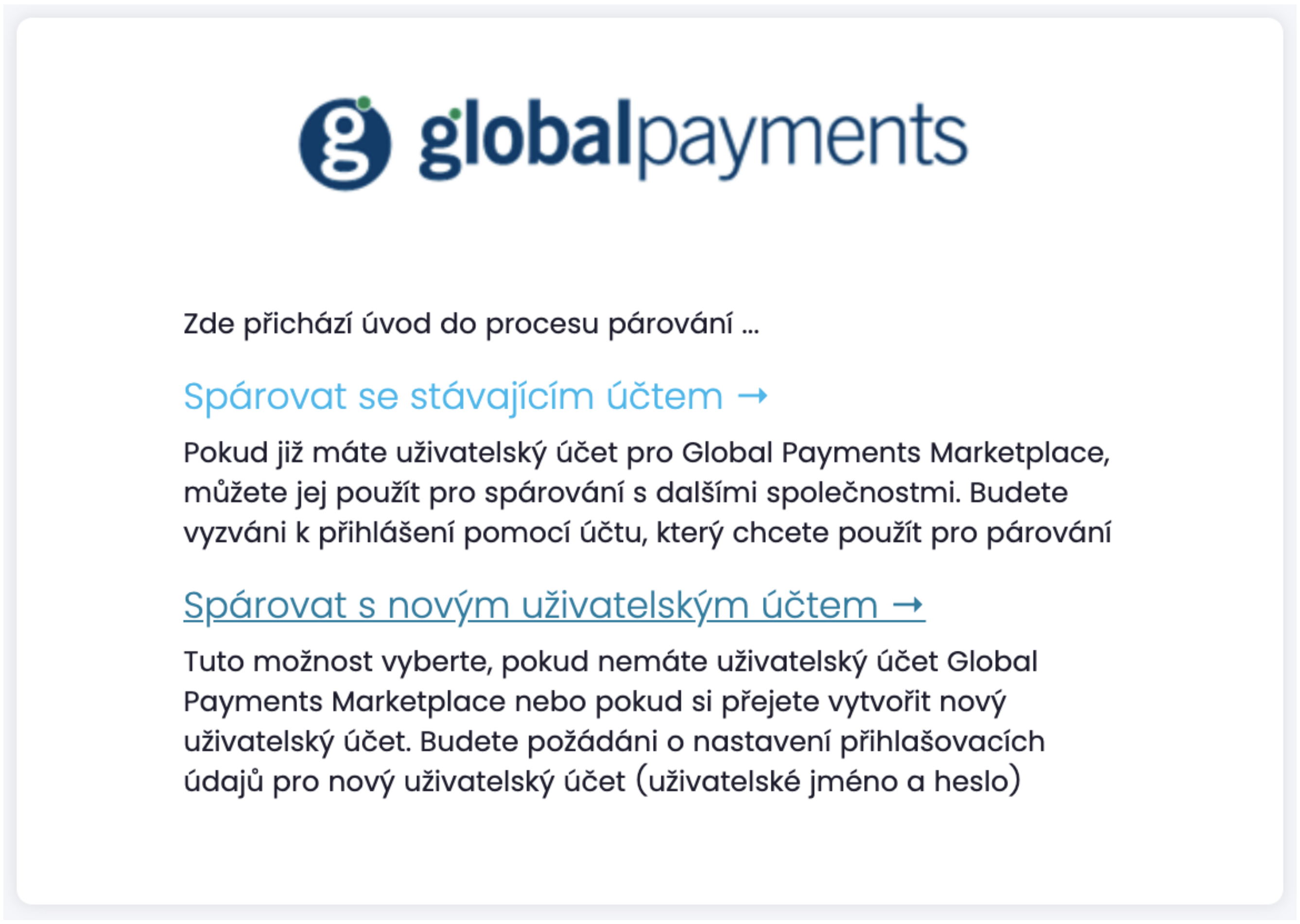
Následující společnosti budou spárovány s účtem:

- **Melissa Anderson** (IČO 999945171222)

Následující role budou uděleny vášmu uživatelskému účtu:

- Jednatel společnosti - plné oprávnění ke správě a úpravě firemních dat a parametrů služby

Step 2 -choose account pairing mode (new vs existing)[]


Zde přichází úvod do procesu párování ...

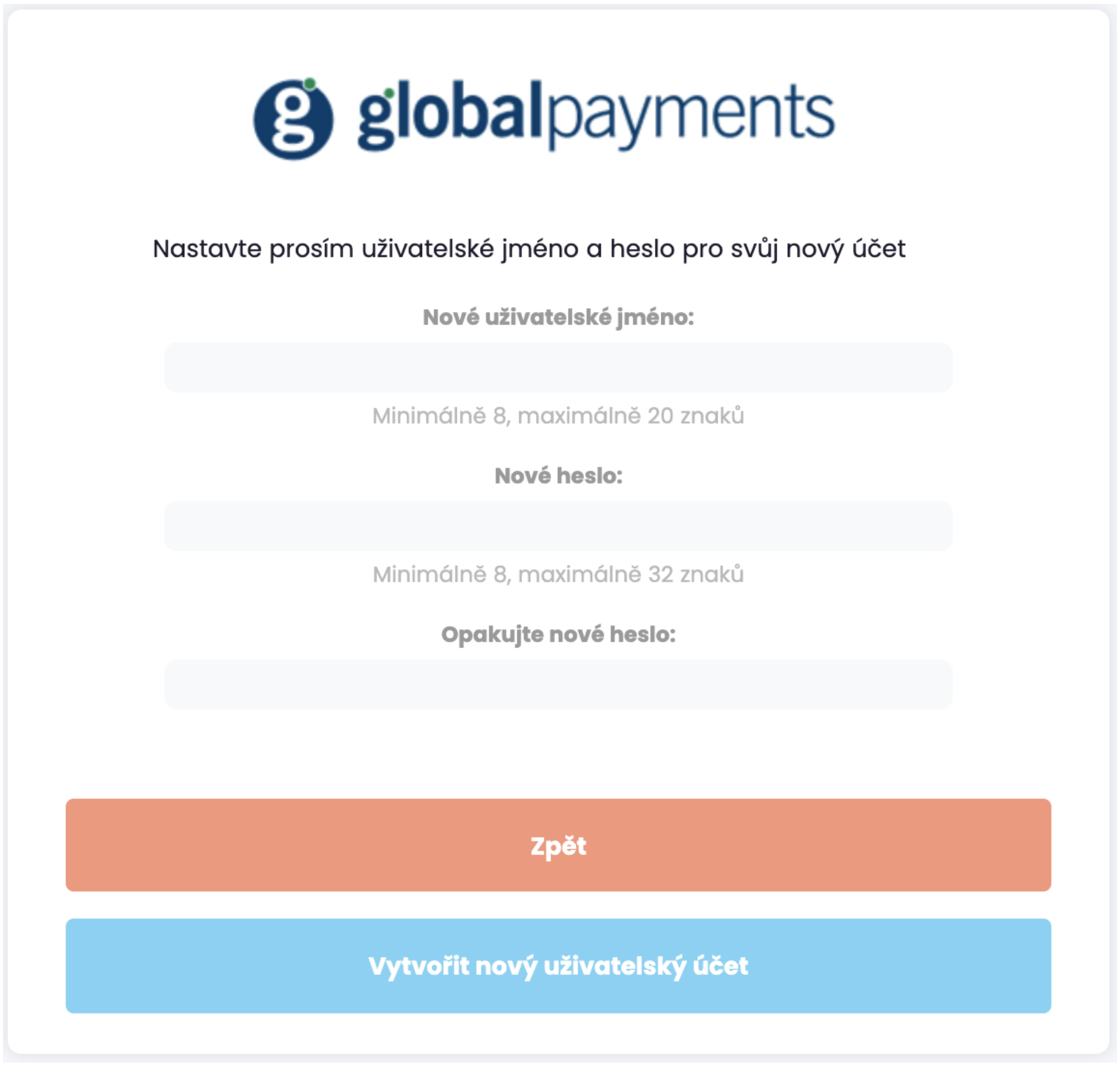
Spárovat se stávajícím účtem →

Pokud již máte uživatelský účet pro Global Payments Marketplace, můžete jej použít pro spárování s dalšími společnostmi. Budete vyzváni k přihlášení pomocí účtu, který chcete použít pro párování

Spárovat s novým uživatelským účtem →

Tuto možnost vyberte, pokud nemáte uživatelský účet Global Payments Marketplace nebo pokud si přejete vytvořit nový uživatelský účet. Budete požádáni o nastavení přihlašovacích údajů pro nový uživatelský účet (uživatelské jméno a heslo)

Step 3 - set credentials for new user account



Nastavte prosím uživatelské jméno a heslo pro svůj nový účet

Nové uživatelské jméno:

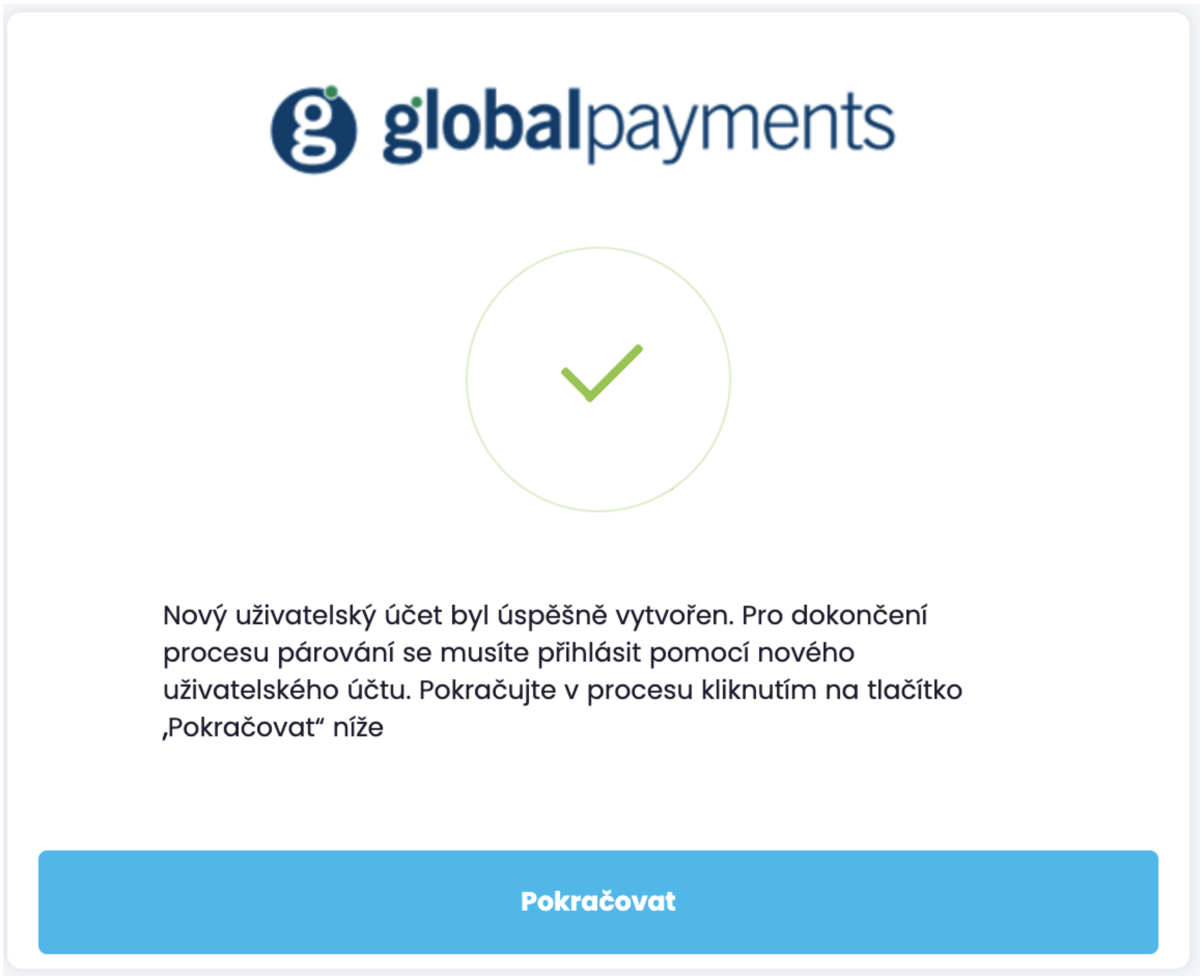
Minimálně 8, maximálně 20 znaků

Nové heslo:

Minimálně 8, maximálně 32 znaků

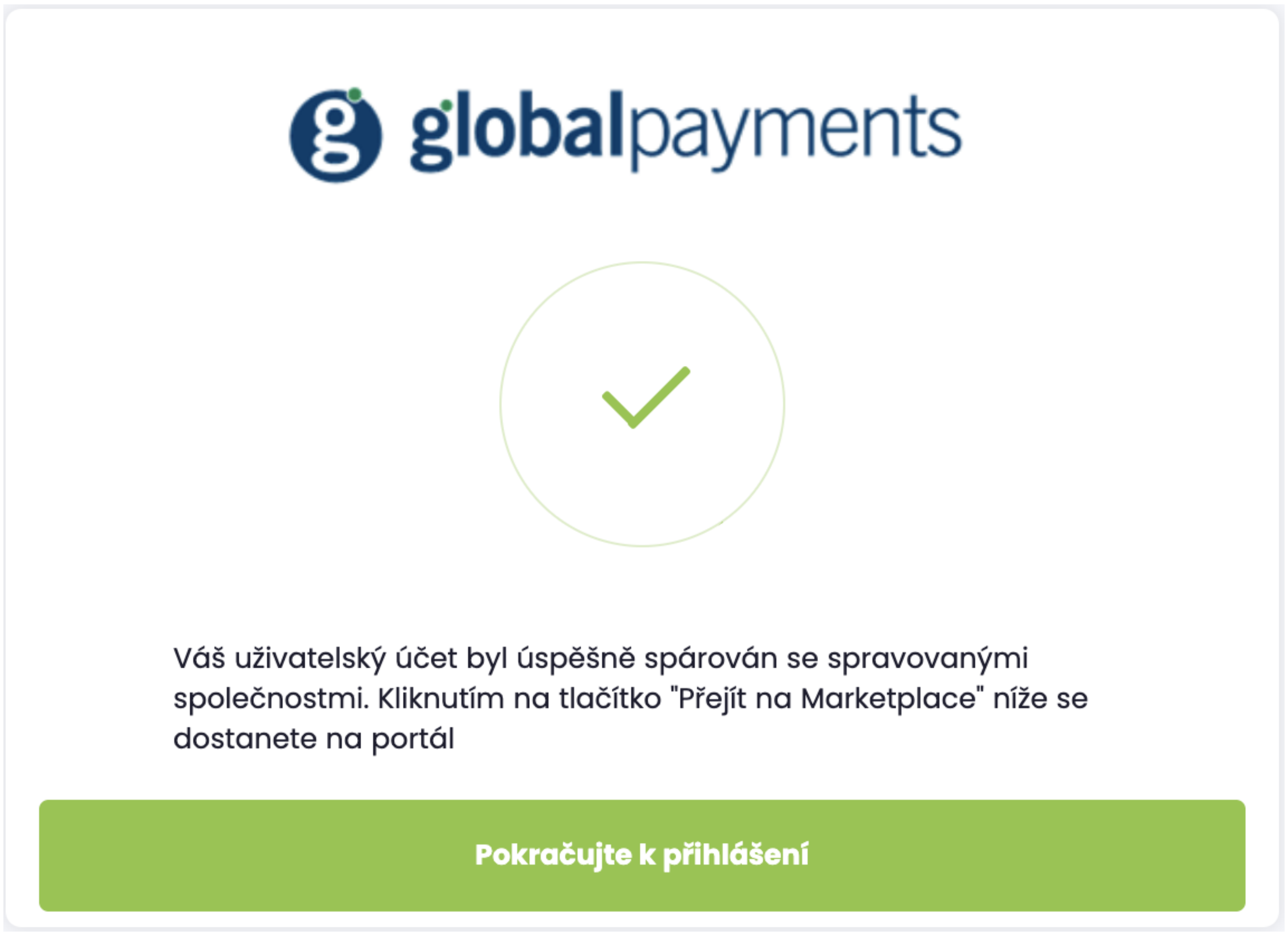
Opakujte nové heslo:

Step 4 - receive confirmation that new user account was created

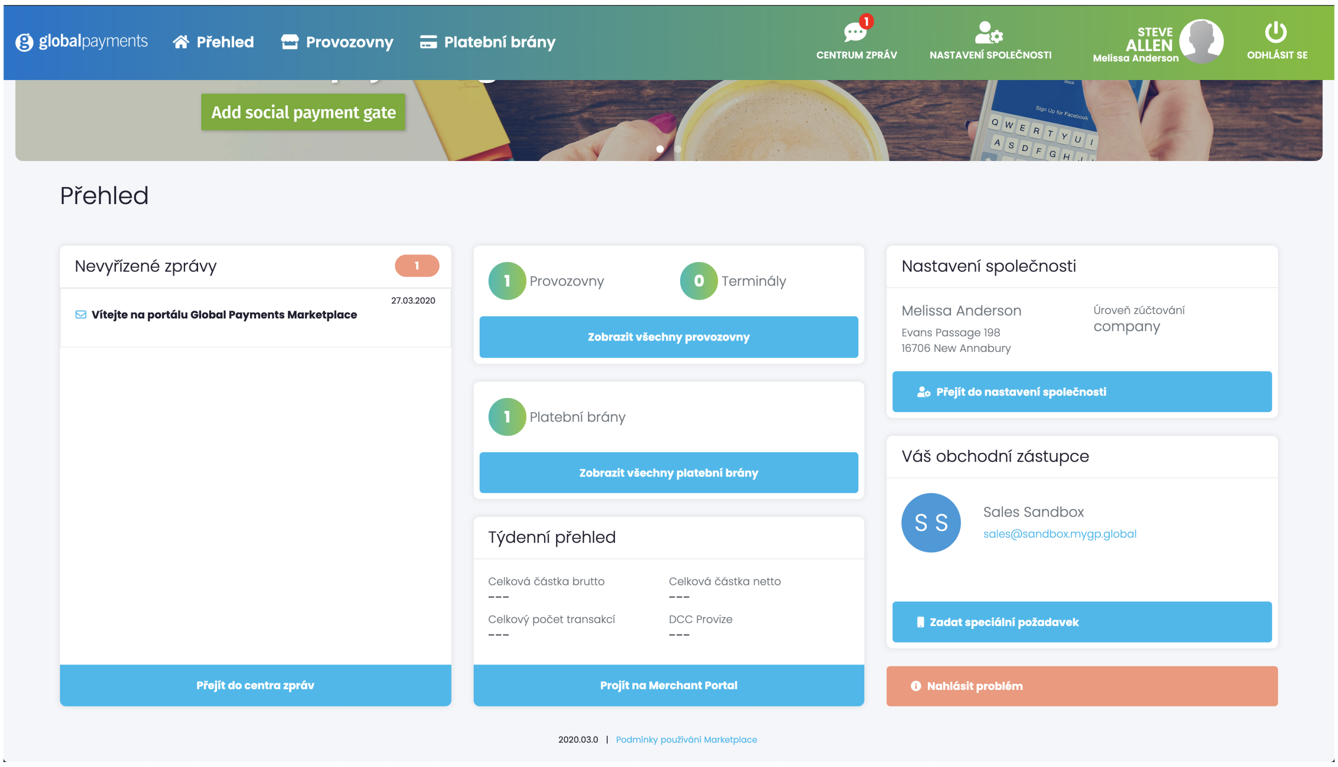


Nový uživatelský účet byl úspěšně vytvořen. Pro dokončení procesu párování se musíte přihlásit pomocí nového uživatelského účtu. Pokračujte v procesu kliknutím na tlačítko „Pokračovat“ níže

Step 5 - confirm successful login with new user account


Váš uživatelský účet byl úspěšně spárován se spravovanými společnostmi. Kliknutím na tlačítko "Přejít na Marketplace" níže se dostanete na portál

Step 6 - open GPM portal



Přehled

Nevyřízené zprávy 1

27.03.2020
Vítejte na portálu Global Payments Marketplace

1 Provozovny 0 Terminály

Zobrazit všechny provozovny

1 Platební brány

Zobrazit všechny platební brány

Týdenní přehled

Celková částka brutto	Celková částka netto
---	---
Celkový počet transakcí	DCC Provize
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2020.03.0 | Podmínky používání Marketplace

Marketplace APIs

Request endpoints

URL schema for marketplace APIs is extending the baseline schema described in section "Markets and endpoint locations". Root URL for marketplace API resources is derived from base endpoint as https://{env-prefix}-api.{base-domain}.

Example: root URL of marketplace API resources in Uat1 environment for market in Czech Republic is https://uat1-api.mygp.cz.

Versioning

URL schema is further extended with API version information. Clients **must** explicitly select desired API version by starting the API request path with `/v{N}` prefix.

Example: URL for API v1 example resources in Uat1 environment for market in Czech Republic is https://uat1-api.mygp.cz/v1/examples.

Request correlation

Request and response correlation between GPM and 3rd party system (regardless of which side is submitting the request) is carried via the `RequestID` HTTP header. Initiating party is expected to generate a **random UUID** for the request ID and passing it to the receiving party with the RequestID` HTTP request header.

The receiving party is expected to replay the value in the HTTP response header returned to the initiating party.

The purpose of the `RequestID` header is to facilitate location of relevant information (log records) in the process of troubleshooting issues across both systems.

Request authentication

All Marketplace APIs use a **bearer token authentication scheme** supported by OIDC issued JWTs for authentication and authorization of requests. Depending on the type of resource and operation the clients are required to provide an appropriate access token with each request:

- Service account access token identifies the system issuing the request. Such access tokens are typically obtained using the client credentials grant.
- User account access token identifies the user who initiated the action that resulted in the API request. Such access tokens are typically obtained using the authorization code (web) flow and require user's participation facilitated through a user agent (e.g. web browser, mobile application, etc).

OpenID Connect client credentials flow must be used by the initiating party to obtain an access token (JWT) and passed it in the **Authorization** header of the HTTP request.

A SSO client account is required to implement and operate API authentication. Client account is defined with following properties (also known as client credentials):

- client id
- client secret

Both properties are required for processing of OIDC transactions and must be treated as sensitive information. If any of these parameters become compromised, you are obliged to rotate the secrets. **For this reason it is important to think about rotation of secrets when you design the integration solution.**

Before making a request to the API endpoint, the requesting party (API client) must obtain an access token from the relevant identity provider service. **Make note** that every endpoint location provides a corresponding OIDC identity provider endpoints and that unless otherwise stated, the client must authenticate an API request with the access token issued by the identity provider service from the same endpoint location (e.g. API request sent to https://api.mygp.global must be authenticated with an access token issued by https://mygp.global identity provider service).

Obtaining access token with client credentials grant

This grant type is used for machine-to-machine authentication, where API requests are made under the identity of the requesting system rather than the (end-)user.

The grant type is executed as a single HTTP POST request to the OIDC token URL.

```
POST /auth/realms/mygp-global/protocol/openid-connect/token HTTP/1.1
Host: mygp.global
Content-Type: application/x-www-form-urlencoded

grant_type=client_credentials
&client_id=my-app-client-id
&client_secret=ae58c8d1-0d8e-4a15-ac21-76164a3860d9
```

Access and refresh tokens (in JWT form) are returned in the response body.

```
{
    "access_token":"eyJhbGciOiJSUzI1NiIsInR5cCIgOiAiSliwia2l...k0Q_LshbwqYxIGNyg",
    "expires_in": 900,
    "refresh_expires_in":14400,
    "refresh_token":"eyJhbGciOiJIUzI1NiIsInR5cCIAiSld...oDbGUhirkNjVa1ImyK4z60-5HxZo",
    "token_type":"bearer",
    "not-before-policy":1535638531,
    "session_state":"988af955-cc4c-44ba-99d8-43a8dbe5b581",
    "scope":""
}
```

The various properties returned in the JSON object are:

- **token_type** defines the type of token(s) returned in the request; it is expected to be **bearer** which makes it usable as an authentication credential when making API requests.

- **access_token** contains a string value that represents a JWT encoded access token.
- **expires_in** defines the time-to-live (TTL) period for the access token; the value represents the length of TTL period in seconds. Once the access token expires it can no longer be used for authenticating API requests and the client must obtain fresh access token. Access tokens are generally short-lived.
- **refresh_token** contains a string value that represents a JWT encoded refresh token. Refresh token can be used by the client to obtain a fresh access token using the **refresh token** grant type (see bellow).
- **refresh_expires_in** defines the TTL period for the refresh token in seconds. Once the refresh token expires it can no longer be used for obtaining fresh access tokens.

Obtaining access token with refresh token grant

If client is in possession of a valid refresh token, then it can use the refresh token grant requests to obtain fresh access tokens.

If client secret was used to obtain initial refresh token, then the **client_secret** parameter **must** also be included in the refresh token grant request!

```
POST /auth/realms/mygp-global/protocol/openid-connect/token HTTP/1.1
Host: mygp.global
Content-Type: application/x-www-form-urlencoded

grant_type=refresh_token
&client_id=my-app-client-id
&client_secret=ae58c8d1-0d8e-4a15-ac21-76164a3860d9
&refresh_token=eyJhbGciOiJIUzI1NiIsInR5cCIAiSld...oDbGUhirkNjVa1ImyK4z60-5HxZo
```

The structure of the response body (JSON) is the same as for client credentials grant.

Frequency of access token retrieval

SSO OpenID Connect token endpoint has throttling policy applied that is designed to prevent (D)DoS attacks, meaning that client should carefully manage access tokens and reuse them while they are still valid.

Requesting new access tokens with high frequency may result in client receiving rate-limit rejections.

Passing access token with API request

Access tokens are passed in the **Authorization** HTTP request header when making API requests for protected resources. Header value must be composed of the token type (**Bearer**) and JWT string, which must be separated by a single space (ASCII code 32).

```
PUT /subscriptions/{subscription_id} HTTP/1.1
Host: api.mygp.global
Content-Type: application/json
Content-Length: 581
Authorization: Bearer eyJhbGciOiJSUzI1NiIsInR5cCIgOiAiSliwia2l...k0Q_LshbwqYxIGNyg
RequestId: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    ...
}
```

JWT token validation

Applications and systems that support the described bearer token authentication scheme **must** ensure that all tokens received through incoming HTTP requests are correctly validated to prevent malicious attackers to obtain access to sensitive data. Most available JWT libraries support this validation out-of-the-box. The validation checklist should include:

- verification of signing algorithm (`alg`)
- verification of JWT cryptographic signature
- verification of issuer (`iss`)
- verification of expiration time (`exp`)
- verification of not before constraint (`nbf`)

Keys required to (re-)calculate JWT cryptographic signature can be downloaded from the publicly available OIDC endpoints. The URL pattern for these URLs is **<base-endpoint>/auth/realms/<location-realm>/protocol/openid-connect/certs**, where **base-endpoint** and **location-realm** must be substituted according to market and environment.

Examples:

Base endpoint	SSO/IdP realm	URL
https://mygp.cz	mygp-cz	https://mygp.cz/auth/realms/mygp-cz/protocol/openid-connect/certs
https://uat2.mygp.sk	mygp-sk	https://uat2.mygp.sk/auth/realms/mygp-sk/protocol/openid-connect/certs
https://uat1.mygp.at	mygp-at	https://uat1.mygp.at/auth/realms/mygp-at/protocol/openid-connect/certs

Validation of JWT bearer tokens can also be delegated to a middleware functions at the application boundary. Most API management systems support validation of OIDC bearer tokens out of the box (e.g. https://tyk.io/docs/basic-config-and-security/security/your-apis/openid-connect/). Alternatively it is also possible to use client adapters provided by Keycloak.

For additional details and step-by-step guide consult "Validate JSON Web Tokens" article or Section

7.2. of the JWT RFC.

User profile information API

This chapter describes APIs available to partner systems to access extended information about users.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the user profile was retrieved successfully
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but there is no business selected

```
GET /user-profiles/self HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "business_id": "7587485784",
    "first_name": "Joe",
    "last_name": "Grizzly",
    "email": "joe.grizzly@example.org"
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Merchant information API

This chapter describes APIs available to partner systems to access information about merchants and the setup of acquiring services.

Companies

This API is used to retrieve representation/data for specific merchant company.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the company was retrieved successfully

- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but the company was not found for the requested business ID

Response body structure for HTTP response codes 20x:

```
GET /companies/{business_id} HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "business_id": "7587485784",
    "company_name": "Global Payments s.r.o.",
    "registered_address": {
        "street": "V Olšinách",
        "house": "626/80",
        "city": "Praha",
        "zip_code": "10 100 00",
        "country_code": "CZ"
    },
    "activated": "2018-05-12",
    "updated": "2020-09-27T10:16:12"
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Company List

This API is used to retrieve list of active companies on market.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the company list was retrieved successfully
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but there is no business selected

Response body structure for HTTP response codes 20x:

```
GET /companies HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "count": 2
    "next": null,
    "previous": null,
    "results": [
        {
            "business_id" : "7587485784",
            "company_name" : "Happy Koala Ltd.",
            "activated" : "2019-07-01",
            "updated" : "2019-07-01T01:00:00",
            "self" : "https://mygp.global/v1/companies/7587485784"
        },
        {
            "business_id" : "9387485321",
            "company_name" : "Shark Koala Ltd.",
            "activated" : "2019-07-01",
            "updated" : "2019-07-01T01:00:00",
            "self" : "https://mygp.global/v1/companies/9387485321"
        }
    ]
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Locations

This API is used to retrieve representation/data for specific merchant location.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the location was retrieved successfully
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but failed to retrieve data because:
    - location was not found for the requested MID

    - location was found but no company was found for that location
- 409 - request is valid but multiple locations were found for the requested MID

Response body structure for HTTP response codes 20x:

```
GET /locations/{mid} HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "mid": "88587548578",
    "business_id": "7587485784",
    "location_type": "outlet",
    "location_name": "Main Street Shop",
    "address": {
        "street": "V Olšinách",
        "house": "626/80",
        "city": "Praha",
        "zip_code": "10 100 00",
        "country_code": "CZ"
    },
    "activated": "2018-05-12",
    "updated": "2020-09-27T10:16:12"
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Location List

This API is used to retrieve list of locations for a specific company.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the location list was retrieved successfully
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but the business ID was not found

Response body structure for HTTP response codes 20x:

```
GET /companies/{business_id}/locations HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "count": 2
    "next": null,
    "previous": null,
    "results": [
        {
            "mid" : "7587485784",
            "location_name" : "Main Street Shop",
            "location_type" : "outlet",
            "activated" : "2019-07-01",
            "updated" : "2019-07-01T01:00:00",
            "self" : "https://mygp.global/v1/locations/7587485784"
        },
        {
            "mid" : "6357485222",
            "location_name" : "www.mainstreetshop.com",
            "location_type" : "ecommerce",
            "activated" : "2019-07-01",
            "updated" : "2019-07-01T01:00:00",
            "self" : "https://mygp.global/v1/locations/6357485222"
        }
    ]
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Terminals

This API is used to retrieve representation/data for specific merchant terminal.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the terminal was retrieved successfully
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but failed to retrieve data because:

    - terminal was not found for the requested terminal number
        - terminal was found but no location was found for that terminal
            - location was found but no company was found for that location
- 409 - request is valid but multiple terminals were found for the requested terminal number

Response body structure for HTTP response codes 20x:

```
GET /terminals/{terminal_number} HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "terminal_number": "12345678",
    "mid": "88587548578",
    "business_id": "7587485784",
    "terminal_type": "ICT220DTINTCL_ETH",
    "receipt_rows": [
        "receipt row #1",
        "receipt row #2",
        "receipt row #3
    ],
    "activated": "2018-05-12",
    "updated": "2020-09-27T10:16:12"
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Terminal List

This API is used to retrieve list of terminal for specific a location.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the terminal list was retrieved successfully
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but the MID was not found
- 409 - request is valid but multiple MIDs were found for a specific location

Response body structure for HTTP response codes 20x:

```
GET  /locations/{mid}/terminals HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "count": 2
    "next": null,
    "previous": null,
    "results": [
        {
            "terminal_number" : "1234567891",
            "terminal_type" : "ICT220DTINTCL_ETH",
            "created" : "2019-07-01",
            "modified" : "2019-07-01T01:00:00",
            "self" : "https://mygp.global/v1/terminals/1234567891"
        },
        {
            "terminal_number" : "1234567892",
            "terminal_type" : "ICT220DTINTCL_ETH",
            "created" : "2019-10-12",
            "modified" : "2019-11-03T08:35:13",
            "self" : "https://mygp.global/v1/terminals/1234567892"
        }
    ]
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Subscription List

This API is used to retrieve list of subscriptions for a specific company.

The API can replay with one of the following HTTP status codes:

- 200 - request is valid and the location list was retrieved successfully
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - request is valid but the business ID was not found

Response body structure for HTTP response codes 20x:

```
GET /companies/{business_id}/subscriptions HTTP/1.1
Host: mygp.global
Content-Type: application/json
Authorization: Bearer <JWT>

{
    "count": 2
    "next": null,
    "previous": null,
    "results": [
        {
            "id" : "adcaac2d-26c0-4728-b2a9-4286bbd3e324",
            "status" : "ACTIVE",
            "created" : "2019-07-02T01:00:00.000Z",
            "modified" : "2019-07-02T01:00:00.000Z",
            "offer_id" : "6d5a1ef3-57fb-4739-abe7-fb1ecdac84af"
        },
        {
            "id" : "fed2bd00-77f4-4346-a950-08d094c2a446",
            "status" : "ACTIVE",
            "created" : "2019-07-01T01:00:00.000Z",
            "modified" : "2019-07-01T01:00:00.000Z",
            "offer_id" : "645211e9-98db-48d7-a16c-768eb1d3db4a"
        }
    ]
}
```

Response body structure for HTTP response codes 40x:

```
{
    "code": "40x",
    "message": "name of the error",
    "description": "description details of the error",
}
```

Subscription management API

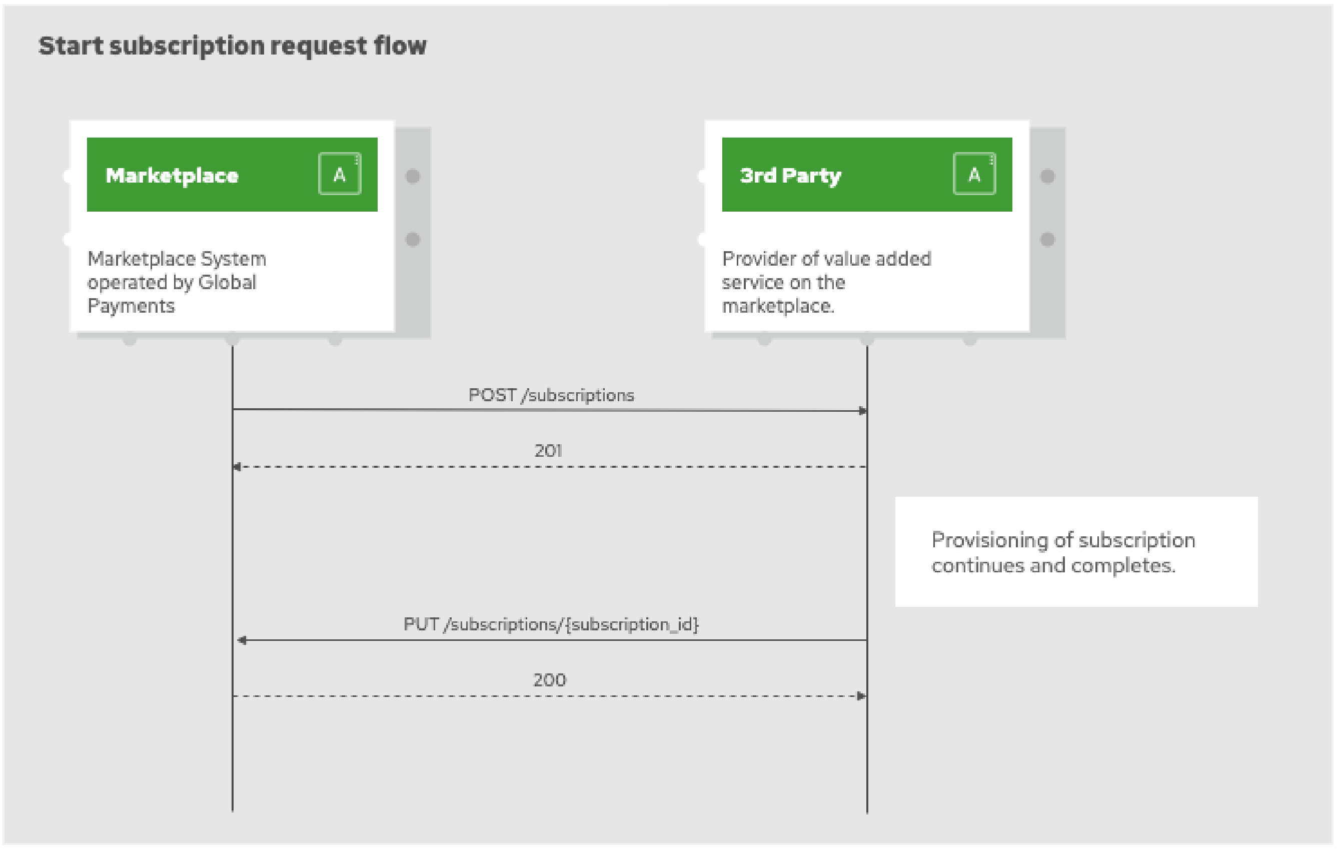
This chapter describes integration interfaces designed to facilitate integration of subscription lifecycle management between Global Payments Marketplace (GPM or marketplace) system and 3rd party system providing the service.

Lifecycle events originated from marketplace

Events discussed in this section originate in the GPM system and are submitted to the 3rd party systems in the form of HTTP requests (API calls).

Start subscription

Request to start new subscription is submitted as a HTTP POST request to the `/subscriptions` endpoint on the 3rd party system.


Start subscription request flow
Marketplace
A
Marketplace System operated by Global Payments
3rd Party
A
Provider of value added service on the marketplace.
POST /subscriptions
201
Provisioning of subscription continues and completes.
PUT /subscriptions/{subscription_id}
200

Key parameters in the request body:

Parameter	Type	Description
market	string	Indicates customer market using a two-letter country code (ISO 3166-1 alpha-2)
business_id	string	Contains the permanent company ID under which the company is doing business.E.g. Czech Republic and Slovakia the business_id corresponds to IČO. The length of the field varies between markets.
company_key	string	Company key that can be used with different GPM APIs to identify particular company. The length of the field is 40 characters.
offer_id	string/uuid	Contains pre-agreed UUID string identifying specific service offer that should be used for requested activation. Offer ID is provided in thr UUID format. It is created and assigned by the GPM system and shared with the partner. Example: 0001001-0003-0001-000000000001

Parameter	Type	Description
capabilities	list of strings	Contains list of optional service capabilities that should be activated as part of the request. Capabilities are identified with pre-agreed identifiers shared between GPM and the partner. List may be empty if service does not support any optional capabilities or customer did not select any.
outlets	list of strings	Contains list of outlet IDs that should be connected to the new service instance. This property can be empty if there were no outlets selected for subscription or even omitted if target service does not require this information.
gateways	list of strings	Contains list of gateway IDs that should be connected to the new service instance. This property can be empty if there were no gateways selected for subscription or even omitted if target service does not require this information.

Request body structure example:

```
POST /subscriptions HTTP/1.1
Host: www.3rd-party.com
Content-Type: application/json
Content-Length: 328
Authorization: Bearer <JWT>
RequestId: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    "market":"CZ",
    "business_id":"098765432112",
    "customer_key":"23b1d7bcdb6fc513ba0edd8957943b6c30425948",
    "offer_id":"3BE2B9E5-4C5C-4ED3-9F93-925DD77C0214",
    "capabilities":[
        "<CAPID01>",
        "<CAPID02>"
    ],
    "outlets":[
        "<MID01>",
        "<MID02>",
        "<MID03>"
    ],
    "gateways":[
        "<MID11>",
        "<MID12>",
        "<MID13>"
    ]
}
```

3rd party system is expected to reply with one of the following HTTP status codes:

- 200 - new subscription was created and is ready for use
- 201 - request was accepted and subscription is in the process of being provisioned
- 400 - request did not pass validation on 3rd party system
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 422 - request is valid but cannot be accepted due to a conflict on the 3rd party system
- 5xx - technical problem on 3rd party system

Response body structure for HTTP response codes 20x:

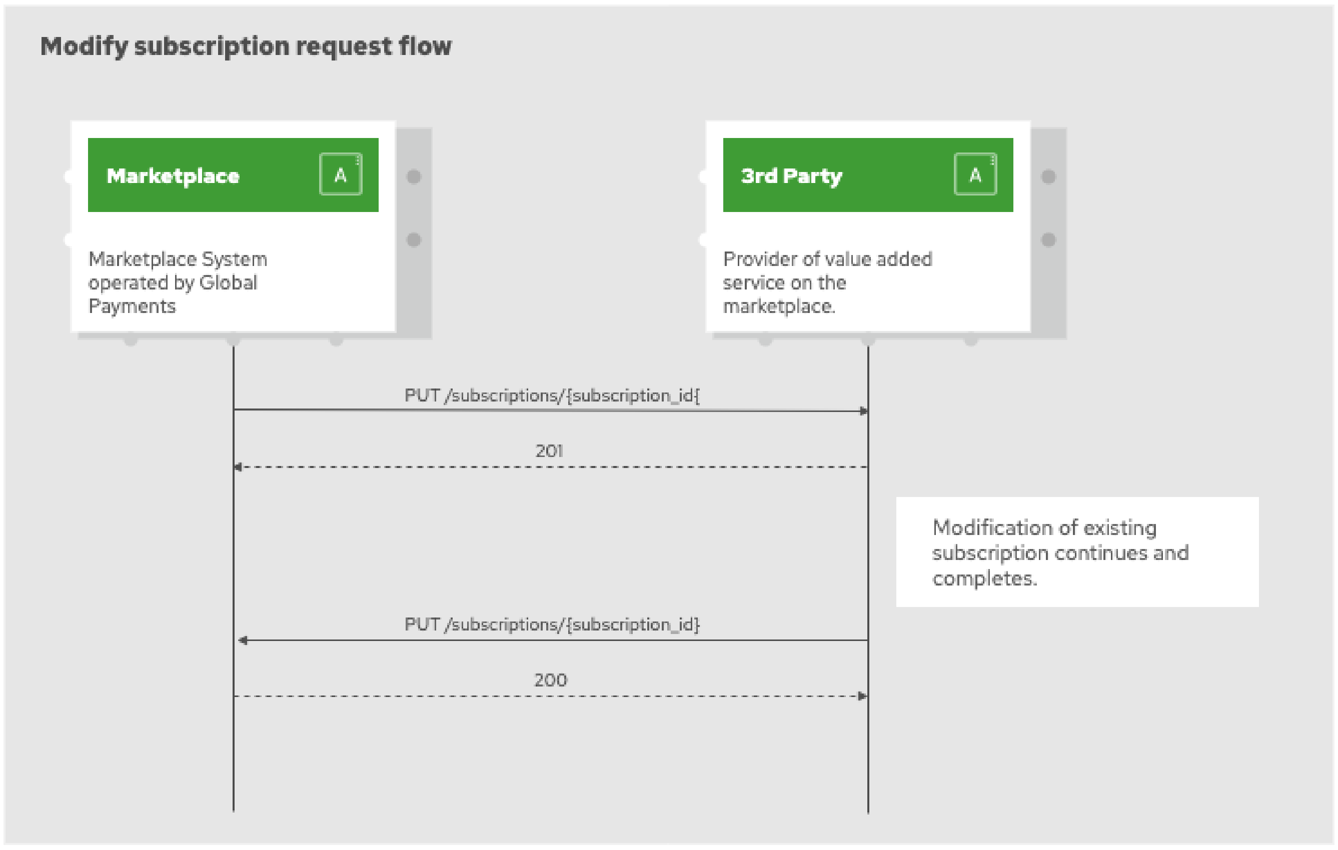
```
RequestID: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'subscription_id': '{random subscription uuid}',
    'attributes': {
        '<name>': '<value>'
    }
}
```

Response body structure for HTTP response codes 40x:

```
RequestID: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'reason': 'Short description of the reason.',
    'details': {
        '<name>': '<value>'
    }
}
```

Update subscription

Request to modify existing subscription is submitted as a HTTP PUT request to the `/subscriptions/{subscription_id}` endpoint on the 3rd party system.


Modify subscription request flow
Marketplace
A
Marketplace System operated by Global Payments
3rd Party
A
Provider of value added service on the marketplace.
PUT /subscriptions/{subscription_id{
201
Modification of existing subscription continues and completes.
PUT /subscriptions/{subscription_id}
200

Request body structure example:

```
PUT /subscriptions/{subscription_id} HTTP/1.1
Host: www.3rd-party.com
Content-Type: application/json
Content-Length: 581
Authorization: Bearer <JWT>
RequestId: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'offer_id': '3BE2B9E5-4C5C-4ED3-9F93-925DD77C0214',
    'capabilities': [
        '<CAPID01>',
        '<CAPID02>',
        '<CAPID03>'
    ],
    'outlets': [
        '<MID01>',
        '<MID03>'
    ],
    'gateways': [
        '<MID11>',
        '<MID12>'
    ]
}
```

3rd party system is expected to reply with one of the following HTTP status codes:

- 200 - subscription was found, updated and is ready for use
- 201 - request for modification was accepted and subscription is in the process of being updated
- 400 - request did not pass validation on 3rd party system
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - target subscription record could not be located/retrieved by the 3rd party system
- 422 - request is valid but cannot be accepted due to a conflict on the 3rd party system
- 5xx - technical problem on 3rd party system

Response body structure for HTTP response codes 20x:

```
RequestID: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'subscription_id': '{subscription_id}',
    'attributes': {
        '<name>': '<value>'
    }
}
```

Response body structure for HTTP response codes 40x:

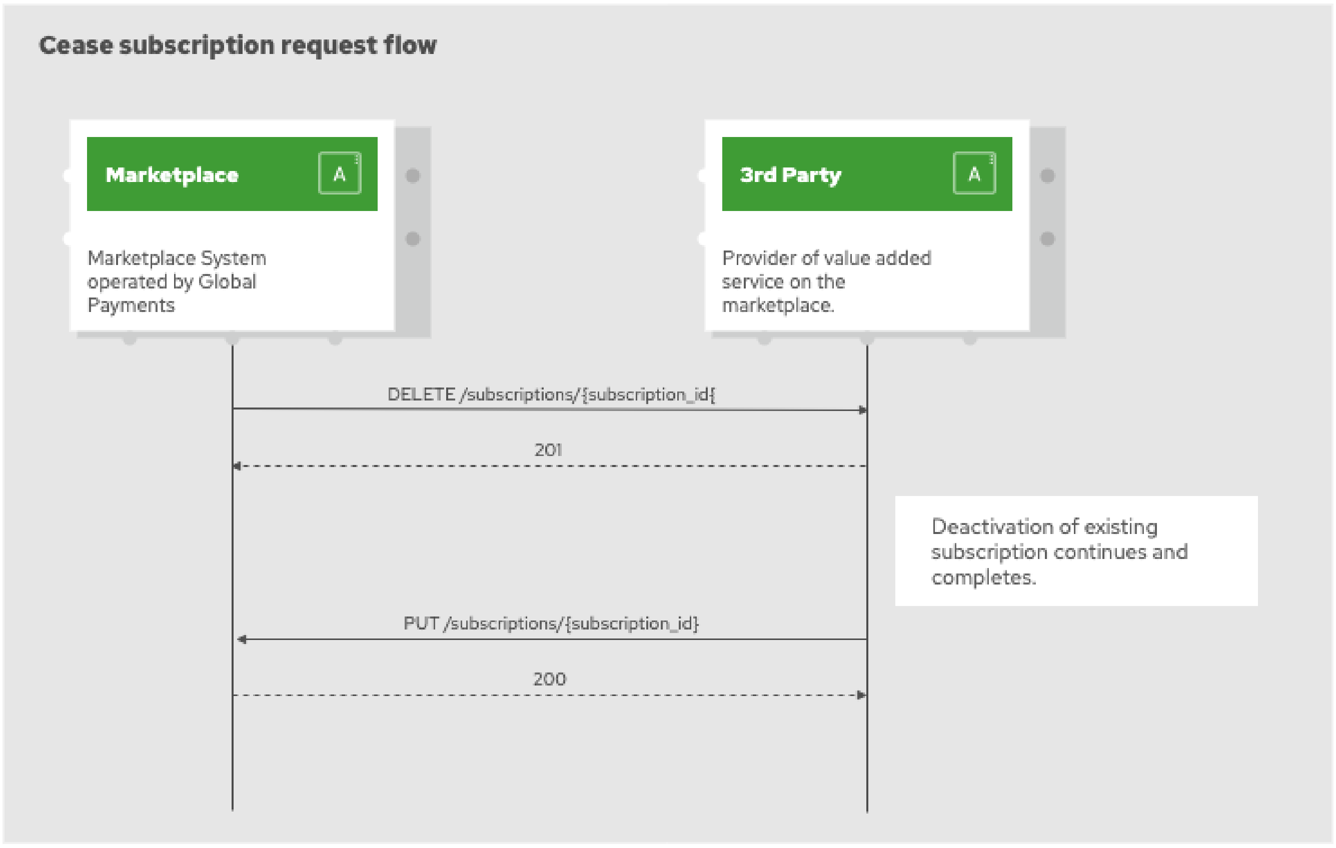
```
RequestID: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'reason': 'Short description of the reason.',
    'details': {
        '<name>': '<value>'
    }
}
```

The content of the request body passed with the update request **must** be interpreted by the server as **the declaration of desired target state** for the subscription. E.g. with the request body provided in the example the desired target state for the subscription is as follows:

- capabilities CAPID01, CAPID02 and CAPID03 are enabled/applied
- outlets MID01 and MID03 are covered by the subscription
- gateways MID11 and MID12 are covered by the subscription

Cease subscription

Request to cease a subscription is submitted as a HTTP DELETE request to the `/subscriptions/{subscription_id}` endpoint on the 3rd party system.


Cease subscription request flow
Marketplace
A
Marketplace System operated by Global Payments
3rd Party
A
Provider of value added service on the marketplace.
DELETE /subscriptions/{subscription_id{
201
Deactivation of existing subscription continues and completes.
PUT /subscriptions/{subscription_id}
200

Request example:

```
DELETE /subscriptions/{subscription_id} HTTP/1.1
Host: www.3rd-party.com
Content-Type: application/json
Content-Length: 581
Authorization: Bearer <JWT>
RequestId: 1CAC7410-744B-44F2-B02E-5C15710D3F0D
```

3rd party system is expected to reply with one of the following HTTP status codes:

- 200 - subscription was found and ceased
- 201 - request to cease the subscription was accepted and subscription is in the process of being ceased
- 400 - request did not pass validation on 3rd party system
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - target subscription record could not be located/retrieved by the 3rd party system
- 422 - request is valid but cannot be accepted due to a conflict on the 3rd party system
- 5xx - technical problem on 3rd party system

Response body structure for HTTP response codes 40x:

```
RequestID: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'reason': 'Short description of the reason.',
    'details': {
        '<name>': '<value>'
    }
}
```

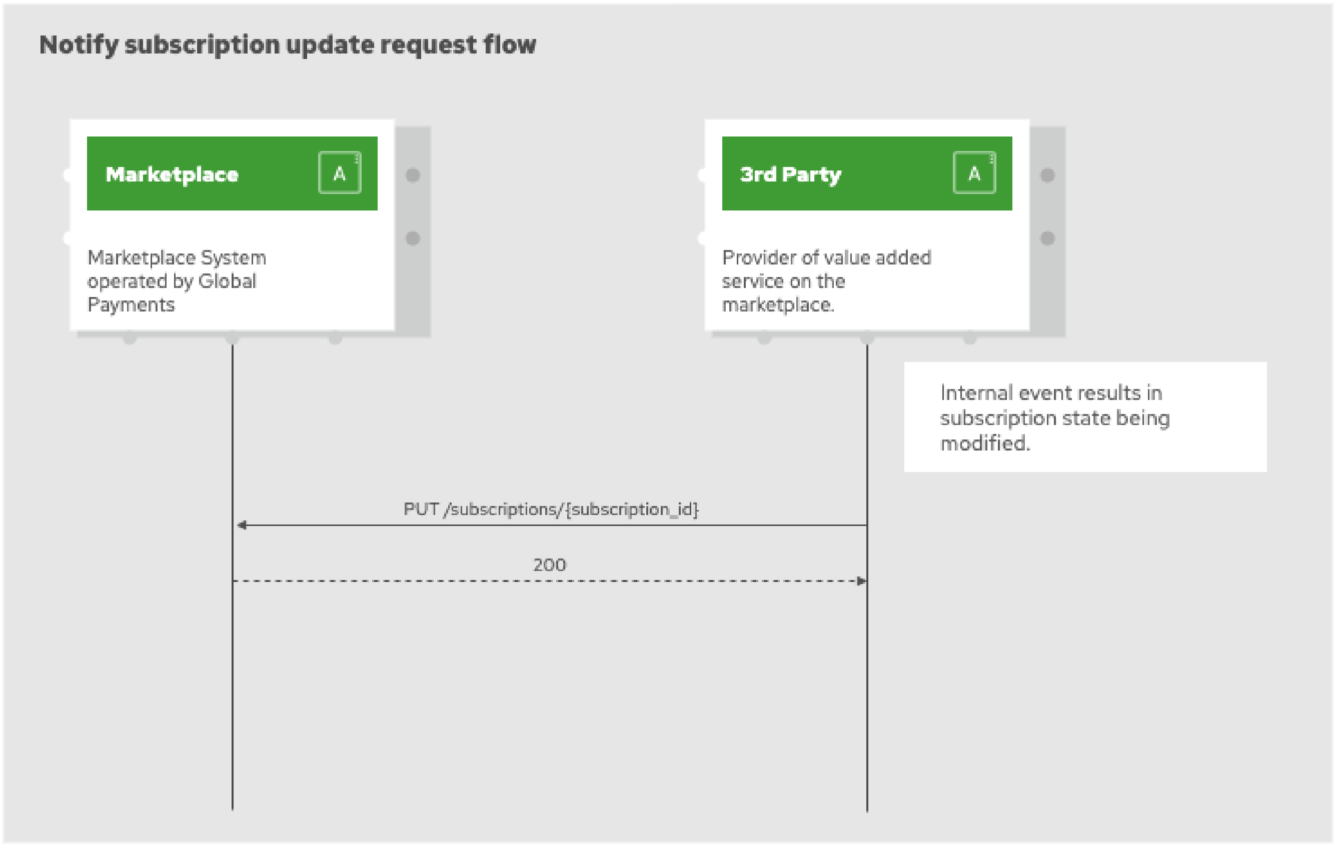
Lifecycle events originated from 3rd party

Events discussed in this section originate in the 3rd party system and are submitted to the Global Payments Marketplace the form of HTTP requests (API calls).

Subscription status update

Any changes to the subscription that originate in the 3rd party system and are significant from the customer relationship perspective must be reported to the marketplace. Such events include:

- completion of subscription activation
- completion of subscription modification
- completion of subscription deactivation (cease)



Notify subscription update request flow
Marketplace
A
Marketplace System operated by Global Payments
3rd Party
A
Provider of value added service on the marketplace.
Internal event results in subscription state being modified.
PUT /subscriptions/{subscription_id}
200

Request to provide subscription status update is submitted as a HTTP PUT request to the `/subscriptions/{subscription_id}` endpoint on the GPM system.

Request body structure example:

```
PUT /subscriptions/{subscription_id} HTTP/1.1
Host: api.mygp.global
Content-Type: application/json
Content-Length: 581
Authorization: Bearer <JWT>
RequestId: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'status': 'ACTIVE',
    'attributes': {
        '<name>': '<value>'
    }
}
```

GPM system is expected to reply with one of the following HTTP status codes:

- 200 - subscription status updated was accepted and processed
- 400 - request did not pass validation on GPM system
- 401 - authentication credentials (JWT token) were missing or could not be validated
- 403 - authentication credentials do not carry required authorisation
- 404 - target subscription record could not be located/retrieved by the GPM system
- 422 - request is valid but cannot be accepted due to a conflict on the GPM system
- 5xx - technical problem on GPM system

Response body structure for HTTP response codes 40x:

```
RequestID: 1CAC7410-744B-44F2-B02E-5C15710D3F0D

{
    'reason': 'Short description of the reason.',
    'details': {
        '<name>': '<value>'
    }
}
```

Subscription lifecycle states

Recognised states during the subscription lifecycle are:

State	Description
ACTIVATING	Subscription activation process has been started. Normally this is the initial state after the GPM submitted request to partner system, which accepted the request and replied with HTTP status code 201, indicating that subscription activation is in progress.
ACTIVE	Subscription activation on the partner system has been completed successfully. This state is achieved if partner system replied with HTTP status code 200 upon initial request - meaning that activation request was completed synchronously - or when partner system submitted subscription status update request indicating that subscription is in active state.
MODIFYING	Subscription modification process has been started. Normally this state is entered after a modification request was submitted by the GPM to the partner system, which accepted the request and replied with HTTP status code 201, indicating that subscription modification is in progress.
CEASING	Subscription de-activation process has been started. Normally this state is entered after a deactivation request was submitted by the GPM to the partner system, which accepted the request and replied with HTTP status code 201, indicating that subscription deactivation is in progress.
SUSPENDED	Subscription has been suspended. Normally this is the intermediate state and is entered when partner system submitted subscription status update request indicating that subscription is in suspended state.
CEASED	Subscription has been deactivated. Normally this is the final state after the GPM submitted deactivation request to partner system, which accepted the request and replied with HTTP status code 200- meaning that deactivation request was completed synchronously - or when partner system submitted subscription status update request indicating that subscription is in ceased state.
PAUSED	Subscription has been paused by the customer. Customer cannot use the subscription while it is in the paused state, but subscription data is retained on the provider's system and subscription can be resumed in the future. Support for this state is optional as it is not applicable for all services.

Integration testing with sandbox APIs

Developers charged with implementation of integration between a service and GPM subscription lifecycle management APIs can use sandbox APIs provided by the GPM to help with the task. The purpose of the sandbox APIs is to allow developers to create test data (customer records, user accounts, etc) and trigger actions in GPM that will result in an integration event.

Complete specification of sandbox APIs can be viewed and downloaded from the main documentation page. This section is specifically dedicated to explain how sandbox APIs can be used for integration testing of subscription lifecycle management integration.

Prerequisite steps

NOTE Examples of sandbox API usage provided in this section are using **curl** command line utility. A simplified CLI interface is being prepared and will be available in near future.

Sandbox APIs are protected with OAuth-like authentication scheme, where every API request issued by the client must be supplied with a bearer token. Following recipes demonstrate how an access token can be obtained using a combination of command line utilities. These recipes depend on following command line utilities to be available on the system:

- curl
- jq
- json_pp

Prepare command line environment (shell)

```
$ export KCCLIENT="test-client"
$ export KCSECRET="ae85****-****-****-****-******60d9"
$ export KCURL=https://uat1.mygp.cz/auth
$ export KCREALM=mygp-cz
$ export APIROOT=https://uat1-api.mygp.cz
```

Retrieve fresh access token (using one very long command line) with curl and jq

```
$ export KCTOKEN=$(curl --silent \
  --data
"grant_type=client_credentials&client_id=${KCCLIENT}&client_secret=${KCSECRET}" \
  ${KCURL}/realms/${KCREALM}/protocol/openid-connect/token \
  | jq -r .access_token)
```

Print access token into terminal window

```
$ echo $KCTOKEN
eyJhbGciOiJSUzI1NiIsInR5cCIgOiAiSldUIiwia2lkIiA6ICJ4b29DV...
```

Create new sandbox customer record

A customer record is required for most sandbox API operations and creation of new sandbox customer record is usually the first step in the flow of integration testing.

Invoke curl request to create new sandbox customer record with (random) system generated outlet and payment gateway

information

```
$ curl -s "${APIROOT}/v1/sandbox/customers" \
  -X POST -H "Authorization: Bearer $KCTOKEN" \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer record was created successfully.",
  "customer_key":"658b426f3aa480d885edfeaa9e2d39b233a068bc",
  "outlets":[
    {
      "locid":"MPLLOC000000000000047",
      "location_number":"992020062739822"
    }
  ],
  "gateways":[
    {
      "locid":"MPLLOC000000000000048",
      "location_number":"992020097484427"
    }
  ]
}
```

The **customer_key** attribute reported in the response body is important and should be copied away somewhere safe and handy for reference with future requests.

Invoke curl request to create new sandbox customer record with client supplied outlet and payment gateway IDs

```
$ curl -s "${APIROOT}/v1/sandbox/customers" \
  -X POST -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "outlets": ["TESTMID000000000000001"], "gateways": ["TESTMID000000000000002"]
}' \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer record was created successfully.",
  "customer_key":"658b426f3aa480d885edfeaa9e2d39b233a068bc",
  "outlets":[
    {
      "locid":"TESTMID000000000000001",
      "location_number":"992020062739822"
    }
  ],
  "gateways":[
    {
      "locid":"TESTMID000000000000002",
      "location_number":"992020097484427"
    }
  ]
}
```

This variant of sandbox customer record setup is useful when partner system depends on data that s related to specific well known MIDs (outlet and gateway IDs) and cannot work successfully with arbitrarily generated MIDs.

Create user account registration link for sandbox customer account

Customer records created through sandbox API are not automatically connected with a user account and require pairing. Paring is a process where customer record is linked with a new (or existing) user account. In order to start the pairing process, a (unique) account pairing invitation link must be generated through the onboarding API.

```
$ curl -s "${APIROOT}/v1/sandbox/users" \
  -X POST -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "customer_key": "0b5dea3c19127741519c85dbcc53a547800cb84e" }' \
  | json_pp
{
    "code":"200",
    "message":"SUCCESS",
    "description":"Sandbox user account invitation was created successfully. Open
invitation link in browser and complete user registration.",

"invitation_url":"https://uat1.mygp.cz/onboarding/QwZN0_clk4ItotzKS1UQCsIHsh8zugoy"
}
```

The URL link returned by the sandbox API can be used to pair new (or existing) user account with the sandbox customer record. Registration and pairing of user accounts is described in separate section of the document.

Modify outlet and gateway setup for sandbox customer record

Curl request to add additional outlets to existing sandbox customer record

```
$ curl -s
"${APIROOT}/v1/sandbox/customers/aadc655afa2f75ccc93edb88dbc923c1aeea83d5/add-outlets"
\
  -X POST \
  -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "outlets": ["TESTMID000000000000003"] }' \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer record was updated successfully with new outlets.",
  "outlets":[
    {
      "locid":"TESTMID000000000000003",
      "location_number":"992020018847857"
    }
  ]
}
```

IMPORTANT As in the previous request to create sandbox customer record the MIDs (outlet/gateway IDs) must be unique and unknown on the system.

Curl request to remove outlets on existing sandbox customer record

```
$ curl -s
"${APIROOT}/v1/sandbox/customers/aadc655afa2f75ccc93edb88dbc923c1aeea83d5/remove-
outlets" \
  -X POST \
  -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "outlets": ["TESTMID00000000000001"] }' \
  | json_pp
{
    "code":"200",
    "message":"SUCCESS",
    "description":"Sandbox customer record was updated successfully."
}
```

Curl request to add additional payment gateways to existing sandbox customer record

```
$ curl -s
"${APIROOT}/v1/sandbox/customers/aadc655afa2f75ccc93edb88dbc923c1aeea83d5/add-
gateways" \
  -X POST \
  -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "gateways": ["TESTMID000000000000004", "TESTMID000000000000005"] }' \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer record was updated successfully with new gateways.",
  "outlets":[
    {
      "locid":"TESTMID000000000000004",
      "location_number":"992020018847858"
    },
    {
      "locid":"TESTMID000000000000005",
      "location_number":"992020018847859"
    }
  ]
}
```

Curl request to remove payment gateways from existing sandbox customer record

```
$ curl -s
"${APIROOT}/v1/sandbox/customers/aadc655afa2f75ccc93edb88dbc923c1aeea83d5/remove-
gateways" \
  -X POST \
  -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "gateways": ["TESTMID000000000000002"] }' \
  | json_pp
{
    "code":"200",
    "message":"SUCCESS",
    "description":"Sandbox customer record was updated successfully."
}
```

Initiate start subscription transaction on GPM

Start subscription transaction is triggered by creating a sandbox order where:

- customer_key property of the request body JSON object is set to a value previously returned from create sandbox customer request,
- offer_id property of the request body JSON object is set to a value defined in the partner catalog,
- operation is set to ADD.

Invoke curl request create sandbox order to start subscription

```
$ curl -s "${APIROOT}/v1/sandbox/orders" \
  -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "customer_key": "aadc655afa2f75ccc93edb88dbc923c1aeea83d5", "offer_id":
"18CB9C1F-6CA8-4C67-8401-E104485FED3D", "operation": "ADD" }' \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer order was created successfully.",
  "order_id":"50736515-72e5-44b3-a252-518dbbf4d005"
}
```

When customer order was created successfully, GPM should respond within short time-frame (max 60 seconds) by invoking the registered start subscription endpoint of the partner system.

Initiate update subscription transaction on GPM

Update subscription transaction is triggered by creating a sandbox order where:

- customer_key property of the request body JSON object is set to a value previously returned from create sandbox customer request,

- offer_id property of the request body JSON object is set to a value defined in the partner catalog,
- operation is set to MODIFY,
- subscription_id property of the request body JSON object is set to a value generated for the previously created subscription by the partner system.

Invoke curl request create sandbox order to update existing subscription

```
$ curl -s \
  "${APIROOT}/v1/sandbox/orders" \
  -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "customer_key": "aadc655afa2f75ccc93edb88dbc923c1aeea83d5", "offer_id":
"18CB9C1F-6CA8-4C67-8401-E104485FED3D", "operation": "MODIFY", "subscription_id":
"6d1444f8-926b-4b72-94a6-374468370d74" }' \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer order was created successfully.",
  "order_id":"edf0ee7a-abd7-46d6-8959-9a9a8a792e6c"
}
```

When customer order was created successfully, GPM should respond within short time-frame (max 60 seconds) by invoking the registered update subscription endpoint of the partner system.

Initiate cease subscription transaction on GPM

Cease subscription transaction is triggered by creating a sandbox order where:

- customer_key property of the request body JSON object is set to a value previously returned from create sandbox customer request,
- offer_id property of the request body JSON object is set to a value defined in the partner catalog,
- operation is set to REMOVE,
- subscription_id property of the request body JSON object is set to a value generated for the previously created subscription by the partner system.

Invoke curl request to create sandbox order to cease subscription

```
$ curl -s "${APIROOT}/v1/sandbox/orders" \
  -H "Authorization: Bearer $KCTOKEN" \
  -H "Content-Type: application/json" \
  -d '{ "customer_key": "aadc655afa2f75ccc93edb88dbc923c1aeea83d5", "offer_id":
"18CB9C1F-6CA8-4C67-8401-E104485FED3D", "operation": "REMOVE", "subscription_id":
"6d1444f8-926b-4b72-94a6-374468370d74" }' \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer order was created successfully.",
  "order_id":"cdbdd558-711a-48bd-910b-4c6cde28aa70"
}
```

When customer order was created successfully, GPM should respond within short time-frame (max 60 seconds) by invoking the registered cease subscription endpoint of the partner system.

Retrieve subscription information for sandbox customer on GPM

An auxiliary HTTP GET operation is exposed in the sandbox API that can be used to retrieve information about active subscriptions for the sandbox customer record. Only subscriptions that are managed by the user account supplied with authentication credentials are returned.

Invoke curl request to retrieve active subscriptions for sandbox customer record

```
$ curl --s \

"${APIROOT}/v1/sandbox/customers/4c4c57b98ddaf30d8b5aa96c311d92a7d3098eb9/subscription
s" \
  -X GET \
  -H "Authorization: Bearer $KCTOKEN" \
  | json_pp
{
  "code":"200",
  "message":"SUCCESS",
  "description":"Sandbox customer subscriptions were retrieved successfully.",
  "count":1,
  "items":[
    {
      "subscription_id":"93518b0c-a297-4862-9b45-6e579f20f793",
      "offer_id":"6ac389b4-09e6-43c8-be74-c4fb1c23a792",
      "status":"ACTIVE",
      "origin_id":"48e87148-b3df-4f5a-ba66-8bfa0813efde",
      "created":"2020-04-27T21:33:20.566451Z",
      "modified":"2020-04-27T21:39:01.523046Z"
    }
  ]
}
```

External links and references

- Keycloak: Securing Applications and Services Guide
- OpenID Connect explained
- Access Tokens
- Refreshing Access Tokens
- Introduction to JSON Web Tokens
- JSON Web Token Libraries
- JSON Web Token Claims

Revision history

Revision	Date	Notes
8	27.4.2020	Updated sandbox API documentation with example for get sandbox customer subscriptions request.
7	15.4.2020	Updated sandbox API examples with recent extensions to response objects for some operations.

Revision	Date	Notes
6	31.3.2020	Updated sandbox API examples with added line breaks for readability. References to company_key in API docs and examples replaced with customer key where appropriate.
5	18.3.2020	Added section about using sandbox API as a test utility for integration of subscription lifecycle management.
4	20.2.2020	List of supported locale codes added to the document.
3	15.2.2020	Expended section on JWT validation. Clarified requirements for API request authentication.
2	11.2.2020	Content related to API integration (e.g. authentication) moved to its own chapter. Added description for JWT token validation. Added document preamble with introduction of markets and endpoint locations.
1	30.1.2020	Separate documents consolidated into single one.