

FHIR-Directory Search-API

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The FHIR-Directory contains entries for healthcare services provided by organizations as well as practitioner entries. This page describes how to use the FHIR-Directory /search endpoint. The specification of the FHIR-Directory ([gemSpec_VZD_FHIR_Directory_v1.1.0](https://gematik.de/fachportal-import/files/gemSpec_VZD_FHIR_Directory_V1.1.0.pdf) (https://fachportal.gematik.de/fachportal-import/files/gemSpec_VZD_FHIR_Directory_V1.1.0.pdf)) contains information about the endpoints and authentication methods.

The FHIR Profiles are defined in the [FHIR-Directory Simplifier project](https://simplifier.net/vzd-fhir-directory) (<https://simplifier.net/vzd-fhir-directory>).

In generell FHIR allows various search capabilities. The [FHIR search](https://www.hl7.org/fhir/search.html) (<https://www.hl7.org/fhir/search.html>) page describes in detail the search framework. The search always begins at a HealthcareService or a PractitionerRole ressource.

Authentication

The /search endpoint requires a valid jwt in the Authorization header. In order to get the jwt the following steps must be performed.

▼ 1. Login to the matrix homeserver

```
REQUEST
POST https://matrix.dev.service-ti.de/_matrix/client/r0/login
HEADER
{"User-Agent"=>"Faraday v2.6.0", "Content-Type"=>"application/json"}
BODY
{"type":"m.login.password","user": "@user:matrix.dev.service-ti.de","password":"password"}

RESPONSE
STATUS 200
HEADER
{"date"=>"Thu, 27 Oct 2022 09:16:30 GMT", "server"=>"Synapse/1.53.0", "content-type"=>"application/json",
"cache-control"=>"no-cache, no-store, must-revalidate", "access-control-allow-origin"=>"*", "access-control-allow-methods"=>"GET, HEAD, POST, PUT, DELETE, OPTIONS", "access-control-allow-headers"=>"X-Requested-With, Content-Type, Authorization, Date", "transfer-encoding"=>"chunked"}
BODY
{
  "user_id": "@user:matrix.dev.service-ti.de",
  "access_token": "matrix-accesstoken",
  "home_server": "matrix.dev.service-ti.de",
  "device_id": "SRCDQZFMLS"
}
```

▼ 2. Get the Matrix OpenID Token

REQUEST

POST https://matrix.dev.service-ti.de/_matrix/client/v3/user/@ettr02:matrix.dev.service-ti.de/openid/request_token?access_token=matrix-accesstoken

HEADER

{"User-Agent"=>"Faraday v2.6.0", "Content-Type"=>"application/json"}

BODY

{}

RESPONSE

STATUS 200

HEADER

{"date"=>"Thu, 27 Oct 2022 09:16:30 GMT", "server"=>"Synapse/1.53.0", "content-type"=>"application/json", "cache-control"=>"no-cache, no-store, must-revalidate", "access-control-allow-origin"=>"*", "access-control-allow-methods"=>"GET, HEAD, POST, PUT, DELETE, OPTIONS", "access-control-allow-headers"=>"X-Requested-With, Content-Type, Authorization, Date", "transfer-encoding"=>"chunked"}

BODY

```
{
  "access_token": "matrix-openid-token",
  "token_type": "Bearer",
  "matrix_server_name": "matrix.dev.service-ti.de",
  "expires_in": 3600
}
```

▼ 3. Get the jwt from the /tim-authenticate endpoint

REQUEST

GET https://fhir-directory-test.vzd.ti-dienste.de/tim-authenticate?mxId=matrix.dev.service-ti.de

HEADER

{"User-Agent"=>"Faraday v2.6.0", "Content-Type"=>"application/json", "X-Matrix-OpenID-Token"=>"matrix-openid-token", "X-Matrix-Server-Name"=>"matrix.dev.service-ti.de"}

RESPONSE

STATUS 200

HEADER

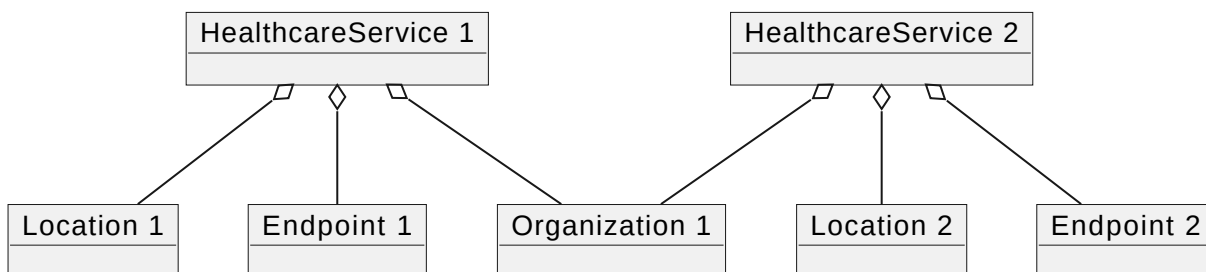
{"date"=>"Thu, 27 Oct 2022 09:22:38 GMT", "server"=>"Apache", "etag"=>"\"002d6050a8c142c91e88dc2d7ef4e3fbf\"", "content-type"=>"application/json", "content-length"=>"453"}

BODY

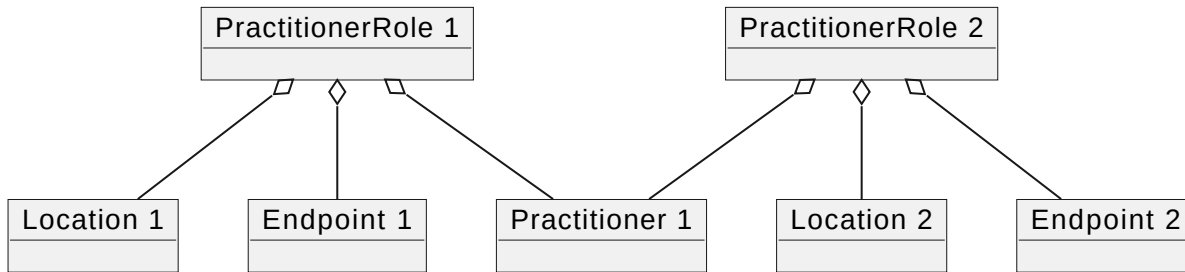
```
{
  "jwt": "tim-authenticate-token",
  "token_type": "bearer",
  "expires_in": 86400
}
```

FHIR /search Request

It is important to understand how the entries in the FHIR-Directory are structured. The FHIR-Directory has two kinds of entries. An organization entry has the following structure.



A practitioner entry has a similar structure.



Please refer to the [HL7 FHIR documentation](https://www.hl7.org/fhir/healthcareservice.html#search) (<https://www.hl7.org/fhir/healthcareservice.html#search>) to find the possible search parameters of each FHIR resource.

If the goal of the search are organization entries then the search must start with **/search/HealthcareService**. If practitioner entries are searched the search must start with **/search/PractitionerRole**. In addition the FHIR-Directory **/search** endpoint verifies that only active organization entries or active practitioner entries are requested. Therefore the search must include a **organization.active=true** or a **practitioner.active=true** filter.

The search response should include the referenced resources (search parameter **_include=***).

The matrix addresses of other users (mxid) are saved in `HealthcareService.endpoint.address`. The Endpoint resource contains the mxid of a user or of a bot. Only active endpoints should be used (search parameter **endpoint.status=active**).

The FHIR Endpoint resources are also used for other TI Applications e.g. [KIM](https://github.com/gematik/api-kim) (<https://github.com/gematik/api-kim>). For TI-Messenger Clients it is recommended to use a search parameter **endpoint.connection-type=tim**. This way only Endpoints with TI-Messenger addresses are found.

▼ FHIR /search Request

REQUEST

```
GET https://fhir-directory-test.vzd.ti-dienste.de/search/HealthcareService?
organization.active=true&endpoint.status=active&_include=*&_count=2&_pretty=true
HEADER
{"User-Agent"=>"Faraday v2.6.0", "Content-Type"=>"application/json", "Authorization"=>"Bearer tim-
authenticate-token"}
```

RESPONSE

STATUS 200

HEADER

```
{"date"=>"Thu, 27 Oct 2022 09:22:39 GMT", "server"=>"Apache", "x-powered-by"=>"HAPI FHIR 5.6.0 REST Server
(FHIR Server; FHIR 4.0.1/R4)", "x-request-id"=>"nkJjcdY5kUgp3pS", "last-modified"=>"Thu, 27 Oct 2022
09:22:39 GMT", "content-type"=>"application/fhir+json;charset=UTF-8", "transfer-encoding"=>"chunked"}
BODY
```

```
{
  "resourceType": "Bundle",
  "id": "0bd92f43-f603-4aab-b821-75043768da2c",
  "meta": {
    "lastUpdated": "2022-10-27T11:22:39.178+02:00"
  },
  "type": "searchset",
  "total": 2,
  "entry": [
    {
      "fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/HealthcareService/2667022",
      "resource": {
        "resourceType": "HealthcareService",
        "id": "2667022",
        "meta": {
          "versionId": "1",
          "lastUpdated": "2022-08-31T17:46:52.145+02:00",
          "source": "#WEHMezg1dNw2bkoR",
          "profile": [
            "https://gematik.de/fhir/directory/StructureDefinition/HealthcareServiceDirectory",
            "http://hl7.org/fhir/StructureDefinition/HealthcareService"
          ]
        },
        "text": {
          "status": "generated",
          "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-
31T17:46:52+02:00\\ndata model version:2\\nprofile version :0.8.0-beta6</div>"
        },
        "identifier": [
          {
            "system": "http://hl7.org/fhir/sid/us-npi",
            "value": "53a0664e-b434-46d7-92de-cbe7da253a50"
          }
        ],
        "providedBy": {
          "reference": "Organization/2667019"
        },
        "location": [
          {
            "reference": "Location/2667021"
          }
        ],
        "endpoint": [
          {
            "reference": "Endpoint/2667020"
          }
        ]
      },
      "search": {
        "mode": "match"
      }
    }
  ]
}
```

```

"fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/HealthcareService/2667036",
"resource": {
  "resourceType": "HealthcareService",
  "id": "2667036",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2022-08-31T17:46:52.523+02:00",
    "source": "#0yLmT2BAs1qHE5Fw",
    "profile": [
      "https://gematik.de/fhir/directory/StructureDefinition/HealthcareServiceDirectory",
      "http://hl7.org/fhir/StructureDefinition/HealthcareService"
    ]
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-31T17:46:52+02:00\\ndata model version:2\\nprofile version :0.8.0-beta6</div>"
  },
  "identifier": [
    {
      "system": "http://hl7.org/fhir/sid/us-npi",
      "value": "8f7442e3-5c66-49bd-b99d-0c27f6ce4dcb"
    }
  ],
  "providedBy": {
    "reference": "Organization/2667033"
  },
  "specialty": [
    {
      "coding": [
        {
          "system": "urn:oid:1.3.6.1.4.1.19376.3.276.1.5.5",
          "code": "ERG",
          "display": "Ergotherapie"
        }
      ]
    },
    {
      "coding": [
        {
          "system": "urn:oid:1.3.6.1.4.1.19376.3.276.1.5.5",
          "code": "FOR",
          "display": "Forschung"
        }
      ]
    }
  ],
  "location": [
    {
      "reference": "Location/2667035"
    }
  ],
  "endpoint": [
    {
      "reference": "Endpoint/2667034"
    }
  ]
},
"search": {
  "mode": "match"
}
},
{
  "fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/Organization/2667033",
  "resource": {
    "resourceType": "Organization",
    "id": "2667033",
    "meta": {

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```

    "versionId": "1",
    "lastUpdated": "2022-08-31T17:46:52.523+02:00",
    "source": "#0yLmT2BAs1qHE5Fw",
    "profile": [
      "https://gematik.de/fhir/directory/StructureDefinition/OrganizationDirectory",
      "http://hl7.org/fhir/StructureDefinition/Organization"
    ]
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-31T17:46:52+02:00\\ndata model version:2\\nprofile version    :0.8.0-beta6</div>"
  },
  "identifier": [
    {
      "system": "http://hl7.org/fhir/sid/us-npi",
      "value": "7b3e6d7b-89be-47c9-b014-f9b4f2179a8e"
    },
    {
      "type": {
        "coding": [
          {
            "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
            "code": "PRN"
          }
        ]
      },
      "system": "https://gematik.de/fhir/sid/telematik-id",
      "value": "1-2arvtst-ap000130"
    }
  ],
  "active": true,
  "type": [
    {
      "coding": [
        {
          "system": "https://gematik.de/fhir/directory/CodeSystem/OrganizationProfessionOID",
          "code": "1.2.276.0.76.4.244",
          "display": "Betriebsstätte der Kassenzahnärztlichen Bundesvereinigung"
        }
      ]
    }
  ],
  "name": "Organisation 1-2arvtst-ap000130",
  "alias": [
    "Organisation 1-2arvtst-ap000130"
  ]
},
"search": {
  "mode": "include"
}
},
{
  "fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/Endpoint/2667034",
  "resource": {
    "resourceType": "Endpoint",
    "id": "2667034",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-08-31T17:46:52.523+02:00",
      "source": "#0yLmT2BAs1qHE5Fw",
      "profile": [
        "https://gematik.de/fhir/directory/StructureDefinition/EndpointDirectory",
        "http://hl7.org/fhir/StructureDefinition/Endpoint"
      ]
    },
    "text": {
      "status": "generated",

```

```

    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-31T17:46:52+02:00\\ndata model version:2\\nprofile version    :0.8.0-beta6</div>"
  },
  "identifier": [
    {
      "system": "http://hl7.org/fhir/sid/us-npi",
      "value": "546aa01e-1e90-4f94-8940-2e8e60c799ed"
    }
  ],
  "status": "active",
  "connectionType": {
    "system": "https://gematik.de/fhir/directory/CodeSystem/EndpointDirectoryConnectionType",
    "code": "tim"
  },
  "name": "MatrixId von Organisation 1-2arvtst-ap000130 (@1-2arvtst-ap000130:tim.test.gematik.de)",
  "payloadType": [
    {
      "coding": [
        {
          "system": "https://gematik.de/fhir/directory/CodeSystem/EndpointDirectoryPayloadType",
          "code": "tim-chat",
          "display": "TI-Messenger chat"
        }
      ]
    }
  ],
  "address": "@1-2arvtst-ap000130:tim.test.gematik.de"
},
"search": {
  "mode": "include"
}
},
{
  "fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/Organization/2667019",
  "resource": {
    "resourceType": "Organization",
    "id": "2667019",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-08-31T17:46:52.145+02:00",
      "source": "#WEHMezg1dNw2bkoR",
      "profile": [
        "https://gematik.de/fhir/directory/StructureDefinition/OrganizationDirectory",
        "http://hl7.org/fhir/StructureDefinition/Organization"
      ]
    },
    "text": {
      "status": "generated",
      "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-31T17:46:51+02:00\\ndata model version:2\\nprofile version    :0.8.0-beta6</div>"
    },
    "identifier": [
      {
        "system": "http://hl7.org/fhir/sid/us-npi",
        "value": "b52f6831-0a71-41f8-8110-5dcec2a5fa2f"
      },
      {
        "type": {
          "coding": [
            {
              "system": "http://terminology.hl7.org/CodeSystem/v2-0203",
              "code": "PRN"
            }
          ]
        },
        "system": "https://gematik.de/fhir/sid/telematik-id",
        "value": "1-2arvtst-ap000129"
      }
    ]
  }
}

```

```

    ],
    "active": true,
    "type": [
      {
        "coding": [
          {
            "system": "https://gematik.de/fhir/directory/CodeSystem/OrganizationProfessionOID",
            "code": "1.2.276.0.76.4.52",
            "display": "Betriebsstätte Psychotherapeut"
          }
        ]
      }
    ],
    "name": "Organisation 1-2arvtst-ap000129",
    "alias": [
      "Organisation 1-2arvtst-ap000129"
    ]
  },
  "search": {
    "mode": "include"
  }
},
{
  "fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/Location/2667035",
  "resource": {
    "resourceType": "Location",
    "id": "2667035",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-08-31T17:46:52.523+02:00",
      "source": "#0yLmT2BAs1qHE5Fw",
      "profile": [
        "https://gematik.de/fhir/directory/StructureDefinition/LocationDirectory",
        "http://hl7.org/fhir/StructureDefinition/Location"
      ]
    },
    "text": {
      "status": "generated",
      "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-31T17:46:52+02:00\\ndata model version:2\\nprofile version :0.8.0-beta6</div>"
    },
    "identifier": [
      {
        "system": "http://hl7.org/fhir/sid/us-npi",
        "value": "583a39c5-a808-4448-a618-8a812e4037ce"
      }
    ],
    "name": "Location of Organisation 1-2arvtst-ap000130",
    "address": {
      "use": "work",
      "type": "postal",
      "text": "Peter-Hausmann-Platz 4&#13;&#10;53332&#13;&#10;Bornheim&#13;&#10;Nordrhein-Westfalen&#13;&#10;DE",
      "line": [
        "Peter-Hausmann-Platz 4"
      ],
      "city": "Bornheim",
      "state": "Nordrhein-Westfalen",
      "postalCode": "53332",
      "country": "DE"
    }
  },
  "search": {
    "mode": "include"
  }
},
{
  "fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/Endpoint/2667020",

```



```

"resource": {
  "resourceType": "Endpoint",
  "id": "2667020",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2022-08-31T17:46:52.145+02:00",
    "source": "#WEHMezg1dNw2bkoR",
    "profile": [
      "https://gematik.de/fhir/directory/StructureDefinition/EndpointDirectory",
      "http://hl7.org/fhir/StructureDefinition/Endpoint"
    ]
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-31T17:46:51+02:00\\ndata model version:2\\nprofile version :0.8.0-beta6</div>"
  },
  "identifier": [
    {
      "system": "http://hl7.org/fhir/sid/us-npi",
      "value": "5f615219-d525-424b-a80f-fff0df8865e7"
    }
  ],
  "status": "active",
  "connectionType": {
    "system": "https://gematik.de/fhir/directory/CodeSystem/EndpointDirectoryConnectionType",
    "code": "tim"
  },
  "name": "MatrixId von Organisation 1-2arvtst-ap000129 (@1-2arvtst-ap000129:tim.test.gematik.de)",
  "payloadType": [
    {
      "coding": [
        {
          "system": "https://gematik.de/fhir/directory/CodeSystem/EndpointDirectoryPayloadType",
          "code": "tim-chat",
          "display": "TI-Messenger chat"
        }
      ]
    }
  ],
  "address": "@1-2arvtst-ap000129:tim.test.gematik.de"
},
"search": {
  "mode": "include"
}
},
{
  "fullUrl": "https://fhir-directory-test.vzd.ti-dienste.de/search/Location/2667021",
  "resource": {
    "resourceType": "Location",
    "id": "2667021",
    "meta": {
      "versionId": "1",
      "lastUpdated": "2022-08-31T17:46:52.145+02:00",
      "source": "#WEHMezg1dNw2bkoR",
      "profile": [
        "https://gematik.de/fhir/directory/StructureDefinition/LocationDirectory",
        "http://hl7.org/fhir/StructureDefinition/Location"
      ]
    },
    "text": {
      "status": "generated",
      "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\">Generated by Arvato QA at 2022-08-31T17:46:52+02:00\\ndata model version:2\\nprofile version :0.8.0-beta6</div>"
    },
    "identifier": [
      {
        "system": "http://hl7.org/fhir/sid/us-npi",

```

```

      "value": "81d9f44c-20b1-4724-84e2-bd0ad704ddbc"
    }
  ],
  "name": "Location of Organisation 1-2arvtst-ap000129",
  "address": {
    "use": "work",
    "type": "postal",
    "text": "Friesstr. 5&#13;&#10;60388&#13;&#10;Frankfurt am Main&#13;&#10;Hessen&#13;&#10;DE",
    "line": [
      "Friesstr. 5"
    ],
    "city": "Frankfurt am Main",
    "state": "Hessen",
    "postalCode": "60388",
    "country": "DE"
  }
},
"search": {
  "mode": "include"
}
}
]
}

```

Display search results

The results of the search are summarized in a json FHIR Bundle structure. Each entry of the Bundle contains a FHIR ressource. The [FHIR-Directory simplifier page](https://simplifier.net/VZD-FHIR-Directory/~introduction) (https://simplifier.net/VZD-FHIR-Directory/~introduction) specifies the *must support* elements of the FHIR ressource. It is recommended to display at least those elements of the search results.

HINT: The search results can also contain FHIR data which is not marked as *must support*.

Full text search

IMPORTANT | Full text search is not yet supported by the FHIR-Directory

The search parameters, `_text` and `_content`, are used for full text search.

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