B
Interface specification

B.1 Syntax

```
request = '{' '"action":' action [ ',' '"data":' object ] '}'

response = '{' '"status":' status [ ',' '"message":' message ]
           [ ',' '"data":' data ] '}'

data = list | object
list = '[' [ object {',' object } ] ']'
object = fingerprint | location | map | measurement

id = ['"id":' Integer ',']

fingerprint = '{' id '"location":' location ','
      '"measurement":' measurement '}'

location = '{' id '"symbolicID":' String ',' '"map":' map ','
      '"mapXcord":' Integer ',' '"mapYcord":' Integer ','
      '"accuracy":' Integer '}'

map = '{' id '"mapName":' String ',' '"mapURL":' String '}'

measurement = '{' id ['"timestamp":' timestamp ',']
      ['"gsmReadings":' gsm ',']  ['"bluetoothReadings":' bluetooth ',']
      '"wifiReadings":' wifi '}'

wifi = '[' [ wifireading {',' wifireading } ] ']'
wifireading = '{' id '"bssid":' String ',' '"ssid":' String ','
      '"rssi":' Integer ',' '"wepEnabled":' bool ','
      '"isInfrastructure":' bool '}'

gsm = '[' [ gsmreading {',' gsmreading } ] ']'
gsmreading = '{' id '"cellId":' String ',' '"areaId":' String ','
```

```
      '"signalStrength":' String ',' '"MCC":' String ','
      '"MNC":' String ',' '"networkName":' String '}'

bluetooth = '[' [ bluetoothreading {',' bluetoothreading } ] ']'
bluetoothreading = '{' id '"friendlyName":' String, ','
      '"bluetoothAddress":' String ',' '"majorDeviceClass":' String ','
      '"minorDeviceClass":' String '}'

action = '"setFingerprint"' | '"getLocation"' | '"getMapList"'
      | '"setMap"' | '"removeMap"' | '"getLocationList"'
      | '"updateLocation"' | '"removeLocation"'

status = '"ok"' | '"failed' | '"warning"' | '"jsonError"'
bool = 'false' | 'true'
timestamp = Long (* unix time stamp *)
String = '"' { Char } '"'

(* missing token as usual *)
```

Listing B.1: Schnittstellen-Syntax in EBNF[**?**]

B.2 Semantics

B.2.1 Status

Status	*Reason*
ok	Indicates that the action handler succeeded
failed	Indicates that the action handler failed due to the reason indicated by message
warning	Indicates that the action handler succeeded with warnings indicated by message
jsonError	Indicates that the server was not able to parse the json request

B.2.2 Actions

Action	*Expected data*	*Result data*	*Description*
getMapList	-	List of Maps	Get all available maps
setMap	Map	Map	Add a new map
removeMap	Map	-	Remove a map
getLocation	Measurement	Location	Get estimated location by locator
getLocationList	-	List of Locations	Get all available locations
updateLocation	Location	-	Update a location
removeLocation	Location	-	Remove a location (including fingerprint and measurement)
setFingerprint	Fingerprint	Fingerprint	Add a new fingerprint (including new location with measurement)

B.2.3 Examples

getMapList

```
{"action":"getMapList"}
```

```
{"status":"ok","data":[
  {"id":1,"mapName":"IFW A","mapURL":"http://www.rauminfo.ethz.ch/..."},
  {"id":2,"mapName":"IFW B","mapURL":"http://www.rauminfo.ethz.ch/..."},
  {"id":3,"mapName":"IFW C","mapURL":"http://www.rauminfo.ethz.ch/..."}
  ]
}
```

setMap

```
{"action":"setMap","data":{
  "mapName":"HG B","mapURL":"http://www.rauminfo.ethz.ch/..."
  }
}
```

```
{"status":"ok","data":{
  "id":6,"mapName":"HG B","mapURL":"http://www.rauminfo.ethz.ch/..."
  }
}
```

removeMap

```
{"action":"removeMap","data":{
  "mapURL":"http://www.rauminfo.ethz.ch/...","id":5,"mapName":"IFW E"
  }
}
```

```
{"status":"ok"}
```

getLocation

```
{"action":"getLocation","data":{
  "wifiReadings":[
    {"ssid":"eth","bssid":"0:3:52:1c:32:e0","wepEnabled":false,
     "rssi":-83,"isInfrastructure":true},
    {"ssid":"public","bssid":"0:3:52:4d:bd:c1","wepEnabled":false,
     "rssi":-89,"isInfrastructure":true},
    ...
    {"ssid":"MOBILE-EAPSIM","bssid":"0:3:52:1c:13:62","wepEnabled":false,
     "rssi":-83,"isInfrastructure":true}
    ]
  }
}
```

```
{"status":"ok","data":{
  "id":1,"symbolicID":"44",
  "map":{"id":1,"mapName":"IFW A","mapURL":"http://www.rauminfo.ethz.ch/..."},
  "mapXcord":446,"mapYcord":340,"accuracy":7
  }
}
```

getLocationList

```
{"action":"getLocationList"}
```

```
{"status":"ok","data":[
  {"id":2,"symbolicID":"56",
    "map":{"id":16,"mapName":"CAB G","mapURL":"http://www.rauminfo.ethz.ch/..."},
    "mapXcord":630,"mapYcord":119,"accuracy":0},
  {"id":3,"symbolicID":"42",
    "map":{"id":4,"mapName":"IFW D","mapURL":"http://www.rauminfo.ethz.ch/..."},
    "mapXcord":568,"mapYcord":366,"accuracy":0},
  ...
  {"id":10,"symbolicID":"36",
```

```
    "map":{"id":1,"mapName":"IFW A","mapURL":"http://www.rauminfo.ethz.ch/..."},
    "mapXcord":600,"mapYcord":528,"accuracy":0}
  ]
}
```

updateLocation

```
{"action":"updateLocation","data":{
  "mapXcord":414,"symbolicID":"44","mapYcord":321,"id":1,
  "map":{"mapURL":"http://www.rauminfo.ethz.ch/...","id":1,"mapName":"IFW A"}
  }
}
```

```
{"status":"ok"}
```

removeLocation

```
{"action":"removeLocation","data":{
  "mapXcord":522,"symbolicID":"","mapYcord":166,"id":7,
  "map":{"mapURL":"http://www.rauminfo.ethz.ch/...","id":5,"mapName":"IFW E"}
  }
}
```

```
{"status":"ok"}
```

setFingerprint

```
{"action":"setFingerprint","data":{
  "location":{
    "mapXcord":414,"symbolicID":"44","mapYcord":321,
    "map":{"mapURL":"http://www.rauminfo.ethz.ch/...","id":1,"mapName":"IFW A"}
    },
  "measurement":{
    "wifiReadings":[
      {"ssid":"MOBILE-EAPSIM","bssid":"0:3:52:1c:33:2","wepEnabled":false,
        "rssi":-93,"isInfrastructure":true},
      {"ssid":"eth","bssid":"0:3:52:4d:bd:c0","wepEnabled":false,
        "rssi":-88,"isInfrastructure":true},
      ...
      {"ssid":"public","bssid":"0:3:52:1c:33:1","wepEnabled":false,
        "rssi":-94,"isInfrastructure":true}
      ]
    }
  }
}
```

```
{"status":"ok","data":{
  "id":1,"location":{
    "id":1,"symbolicID":"44",
    "map":{"id":1,"mapName":"IFW A","mapURL":"http://www.rauminfo.ethz.ch/..."},
    "mapXcord":414,"mapYcord":321,"accuracy":0},
  "measurement":{
    "id":1,"timestamp":1252941798713,"gsmReadings":[],
    "wifiReadings":[
      {"id":1,"bssid":"0:3:52:1c:33:2","ssid":"MOBILE-EAPSIM",
        "rssi":-93,"wepEnabled":false,"isInfrastructure":true},
      {"id":2,"bssid":"0:3:52:4d:bd:c0","ssid":"eth",
        "rssi":-88,"wepEnabled":false,"isInfrastructure":true},
      ...
      {"id":37,"bssid":"0:3:52:1c:33:1","ssid":"public",
        "rssi":-94,"wepEnabled":false,"isInfrastructure":true}
      ],
    "bluetoothReadings":[]
    }
  }
}
```

B.3 Image Server

The image server implements a very small subset of the HTTP Protocol [**?**], namely `GET` and `POST`. The request has to be send to the same port as the other redpin requests.

B.3.1 GET

The server accepts only `GET` request of the form `GET /imagename`. The server responds either with `HTTP/1.1 200 OK` or `HTTP/1.1 404 Not Found`.

```
GET /e039fcb597b6abcbd95af0f8b588d1e60b1f52f3
```

Listing B.2: `GET` request

```
HTTP/1.1 200 OK
Content-Type: application/octet-stream
Content-Length: 10
Connection: close

binarydata
```

Listing B.3: `GET` response

B.3.2 POST

In order to upload an image, you have to perform a multipart `POST`. The listing B.4 shows a minimalistic `POST` request to achieve an upload. Note that the `filename` has to be `redpinfile`.[1] If the request succeeded, the server returns the URL of the image. Instead of a specific host and port, the server returns the URL with placeholders {`HOST`} and {`PORT`}. Those placeholders need to be replaced on the client side in order to access the uploaded image. This makes it possible, that the server can easily change its host and port without braking old URLs, because the client replaces those placeholders every time with the current values.

```
POST /
Content-Type: multipart/form-data; boundary=AaB03x

--AaB03x
filename="redpinfile"
Content-Length: 10

binarydata
--AaB03x--
```

Listing B.4: Minimalistic `POST` request

```
HTTP/1.1 200 OK
Content-Type: text/plain
Content-Length: 61
Connection: close

http://{HOST}:{PORT}/e039fcb597b6abcbd95af0f8b588d1e60b1f52f3
```

Listing B.5: `POST` response

[1] This provides some tiny amount of security against attacker trying to misuse the server