The GNU Taler tutorial for Python Web shops

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This tutorial is about implementing a merchant frontend to run against a GNU Taler merchant backend (version 0.4.0, 15 October November 2017),

Short Contents

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1 Introduction

1.1 About GNU Taler

GNU Taler is an open protocol for an electronic payment system with a free software reference implementation. GNU Taler offers secure, fast and easy payment processing using well understood cryptographic techniques. GNU Taler allows customers to remain anonymous, while ensuring that merchants can be held accountable by governments. Hence, GNU Taler is compatible with anti-money-laundering (AML) and know-your-customer (KYC) regulation, as well as data protection regulation (such as GDPR).

1.2 About this tutorial

This tutorial is for Python Web developers and addresses how to integrate GNU Taler with Web shops. It describes how to create a Web shop that processes payments with the help of a GNU Taler merchant *backend*. In the second chapter, you will learn how to trigger the payment process from the Web site, how to communicate with the backend, how to generate a order and process the payment. The third chapter covers the integration of a back office with the backend, which includes tracking payments for orders, matching payments to orders, and persisting and retrieving contracts.

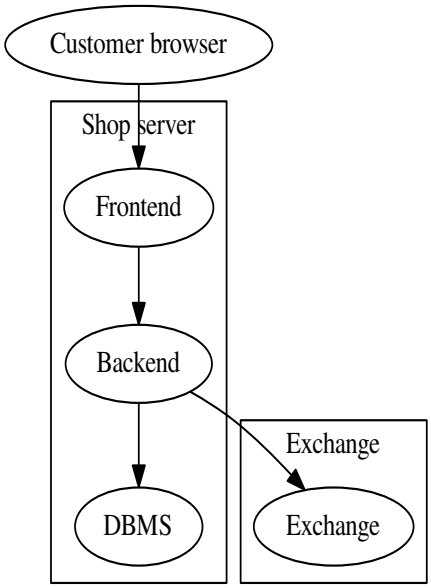
You can download all of the code examples given in this tutorial from `https://git.taler.net/merchant-frontend-examples.git/tree/python/example/`.

1.3 Architecture overview

The Taler software stack for a merchant consists of the following main components:

- A frontend which interacts with the customer's browser. The frontend enables the customer to build a shopping cart and place an order. Upon payment, it triggers the respective business logic to satisfy the order. This component is not included with Taler, but rather assumed to exist at the merchant. This tutorial describes how to develop a Taler frontend.
- A back office application that enables the shop operators to view customer orders, match them to financial transfers, and possibly approve refunds if an order cannot be satisfied. This component is again not included with Taler, but rather assumed to exist at the merchant. This tutorial will describe how to integrate such a component to handle payments managed by Taler. Such integration is shown by adding the back office functionality to the frontend implemented in the second part of this tutorial.
- A Taler-specific payment backend which makes it easy for the frontend to process financial transactions with Taler. For this tutorial, you will use a public backend, but for a production deployment a merchant-specific backend will need to be setup by a system administrator.

The following image illustrates the various interactions of these key components:



The backend provides the cryptographic protocol support, stores Taler-specific financial information and communicates with the GNU Taler exchange over the Internet. The frontend accesses the backend via a RESTful API. As a result, the frontend never has to directly communicate with the exchange, and also does not deal with sensitive data. In particular, the merchant's signing keys and bank account information are encapsulated within the Taler backend.

2 Setting up a simple donation page

This section describes how to setup a simple shop, which exposes a button to get donations via Taler. The expected behaviour is that once the "donate" button is clicked, the customer will receive a proposal to make a fixed donation, for example to donate 1.0 KUDOS to the charity operating the shop.

All the code samples shown below in the tutorial can be found at `https://git.taler.net/merchant-frontend-examples.git/tree/python/example/`. Each sample is part of a functional frontend. The language is Python, and the Web is served by Flask[1].

An error message will be shown to the user if no Taler wallet is installed in the browser.

2.1 Specifying the backend

For many critical operations, the frontend needs to communicate with a Taler backend. Assuming that you do not yet have a backend configured[2], you can use the public backend provided by the Taler project for testing. This public backend has been set-up at `http://backend.test.taler.net/` specifically for testing frontends. It uses the currency "TESTKUDOS" and all payments will go into the "Tutorial" account at the Taler "bank" running at `https://bank.test.taler.net/public-accounts`.

In our example, backend and currency are specified by setting two global variables, as shown below from `python/example/example.py`:

```
..
CURRENCY = "TESTKUDOS"
BACKEND_URL = "http://backend.test.taler.net/"
..
```

2.2 Talking to the backend

The frontend needs to issue HTTP POST requests to the backend; this can be done using the *requests*[3] library:

```
import flask
import requests
from urllib.parse import urljoin
..

# In this example we use the /proposal API offered by the
# backend, which is in charge of signing orders.
r = requests.post(urljoin(BACKEND_URL, 'proposal'), json=dict(order=order))

if r.status_code != 200:
    logger.error("failed to POST to '%s'", url)
    return r.text, r.status_code
```

[1] http://flask.pocoo.org/

[2] https://docs.taler.net/current/merchant-backend/manual.html

[3] https://docs.taler.net/current/merchant-backend/manual.html

2.3 Prompting for payment

Our goal is to trigger a Taler payment once the customer has clicked on a donation button. We will use a button that issues an HTTP GET to the frontend `/donate` URL. For this, the HTML would be as follows:

```
<!-- ../example/templates/index.html -->
<!DOCTYPE html>
<html lang="en">
  <!-- This file is in the public domain -->
  <head>
    <title>A donation button</title>
  </head>
  <body>
    <form action='/donate' method='GET'>
      <input type='submit' value='Donate!'></input>
    </form>
  </body>
</html>
```

When the server-side handler for `/donate` receives the form submission, it will return a HTML page and HTTP header that will take care of:

- showing a error message if no wallet is installed
- instruct the wallet to download the proposal related to this donation

The `/donate` endpoint looks like this:

```
@app.route("/donate")
def donate():
   response = flask.Response("No wallet installed!", status=402)
   response.headers["X-Taler-Contract-Url"] = "/generate-proposal"
   return response
```

The wallet detects the 402 status and reacts by downloading the proposal from `/generate-proposal`. The proposal is then presented to the user.

If the wallet is not present, the error message "No wallet installed!" will be shown and the Taler "X-Taler-Contract-Url" header and the 402 status code ought to be ignored by the browser.

2.4 A helper function to generate the order

We make distinction between *three* different stages of what it informally called "contract".

In a very first stage, we call it the *order*: that occurs when the frontend generates the first JSON that misses some information that the backend is supposed to add. When the backend completes the order and signs it, we have a *proposal*. The proposal is what the user is prompted with, and allows them to confirm the purchase. Once the user confirms the purchase, the wallet makes a signature over the proposal, turning it into a *contract*.

The next step is to generate a proposal whenever the wallet makes a GET `/generate-proposal` request. In our example, this logic is implemented by the function `generate_proposal()`:

```
..
from pytaler import amount
..
@app.route("/generate-proposal")
def generate_proposal():
```

```
DONATION = amounts.string_to_amount("0.1:%s" % CURRENCY)
MAX_FEE = amounts.string_to_amount("0.05:%s" % CURRENCY)
ORDER_ID = "tutorial-%X-%s" % (randint(0, 0xFFFFFFFF), datetime.today().strftime("%H_%M_%S"))
order = dict(
    nonce=flask.request.args.get("nonce"),
    order_id=ORDER_ID,
    amount=DONATION,
    max_fee=MAX_FEE,
    products=[
        dict(
            description="Donation",
            quantity=1,
            product_id=0,
            price=DONATION,
        ),
    ],
    fulfillment_url=make_url("/fulfillment", ("order_id", ORDER_ID)),
    pay_url=make_url("/pay"),
    merchant=dict(
        address="nowhere",
        name="Donation tutorial",
        jurisdiction="Ursa Minor",
    ),
)

url = urljoin(BACKEND_URL, "proposal")

r = requests.post(url, json=dict(order=order))
if r.status_code != 200:
    logger.error("failed to POST to '%s'", url)
    return r.text, r.status_code
proposal_resp = r.json()
return flask.jsonify(**proposal_resp)
```

The function `amounts.string_to_amount()` is defined by the *pytaler* library, and it is used to convert amounts given as strings (in the form `"1.2:EUR"`) to amount as 'dict' (in the form `{value:1, fraction:20000000, currency:"EUR"}`). One important thing that `generate_proposal()` needs to do is to POST the "order" to the backend. This is needed because the backend has to fill some missing fields and sign the whole order; once the backend has done that, it returns the completed data and its signature to the frontend that can eventually relay it to the wallet.

The `make_url` function is used to "attach" paths to the shop's base URL. For example, if the shop is run at `https://shop.com`, then `make_url("/path", ("a", 5))` would result in `https://shop.com/path?a=5`.

2.5 Initiating the payment process

After the wallet has fetched the proposal, the user will be given the opportunity to affirm the payment. Assuming the user affirms, the browser will navigate to the "fulfillment_url" that was specified in the offer.

The fulfillment page can be called by users that have already paid for the item, as well as by users that have not yet paid at all. The fulfillment page must thus use the HTTP session state to detect if the payment has been performed already, and if not request payment from the wallet.

The fulfillment handler at `/fulfillment` must thus first figure out if the user has already paid, and if so merely confirm the donation. If the user has not yet paid, it must instead return another "402 Payment Required" header, requesting the wallet to pay:

```
@app.route("/fulfillment")
def fulfillment():
    # Ask the state whether the user has paid or not
    paid = flask.session.get("paid", False)
    if paid:
        # Please note that flask.session["order_id"] takes its value
        # from the response the _backend_ gave for /pay. This way, the fulfillment
        # page only shows what the wallet paid for.
        return "Thank you! Your order id is: <b>%s</b>." % flask.session["order_id"]"

    # At this point, the user did not pay yet, so we set some
    # appropriate HTTP headers that will instruct the wallet to
    # make the payment, assuming the user already accepted the
    # proposal.
    response = flask.Response(status=402)

    # At this URL, the wallet may request a regeneration of the proposal.
    response.headers["X-Taler-Contract-Url"] = make_url("/generate-proposal")
    # This URL will be visited in case the user has opened
    # on someone else's fulfillment URL.  As a result, the
    # user will be offered a fresh proposal.
    response.headers["X-Taler-Offer-Url"] = make_url("/donate")

    return response
```

The `X-Taler-Contract-Query` header is crucial for implementing replayable payments. In fact, upon receiving such a header, the wallet will look in its internal database if a payment to the current fulfillment URL has already been sent. If that's the case, then the coins from that previous payment will be sent to the *pay_url*. That is exactly what happens when the user visits some bookmarked fulfillment page in order to see again what they already paid for. That header is scheduled to be removed in future versions of the wallet, as it only works with the value `"fulfillment_url"`.

2.6 Receiving payments via Taler

The final next step for the frontend is to receive the payment from the wallet. For this, the frontend must implement a payment handler at the URI specified in the `pay_url` field of the proposal, so `/pay` in our example.

The role of the `/pay` handler is to receive the payment from the wallet and forward it to the backend. The backend executes the payment. If it reports that the payment was successful by returning a `"200 OK"` status code, the handler needs to update the session state with the browser to remember that the user paid. If the backend reports a failure, the error response is passed on to the wallet.

In our example, that is done by the `pay` function; see below.

```
@app.route("/pay", methods=["POST"])
def pay():
    # Here we get the payment from the wallet.  The
    # "payment" is a JSON containing coins and proposal
    # signed by the wallet, plus some other metadata.
    deposit_permission = flask.request.get_json()
```

```
if deposit_permission is None:
    e = flask.jsonify(error="no json in body")
    return e, 400

# Forwarding the payment to the backend that will cryptographically
# verify it and persist the proof of payment.
r = requests.post(urljoin(BACKEND_URL, 'pay'), json=deposit_permission)

# Pass errors back to the wallet.
if 200 != r.status_code:
    return r.text, r.status_code

# The payment went through, so we can set the state as "paid".
# Note that once this page will return "200 OK", the wallet will
# automatically re-visit the fulfillment page (and get the "Thank
# you" message this time).
flask.session["paid"] = True

return flask.Response(status=200)
```

2.7 Running the Example

The example depends on the `pytaler` library. The next commands show how to install it:

```
$ cd python/lib/
$ export TALER_PREFIX=<YOUR-PREFIX>
$ make install
```

Make sure your python code will look for libraries within the `<YOUR-PREFIX>` directory.

The file `python/example/example.py` contains all the code samples seen so far, incuding the `make_url()` helper function. It is run as a typical Flask application, using the following commands:

```
$ cd python/example/
$ export FLASK_APP=example.py
$ flask run
```

At this point you should have the site running at `localhost` on port 5000.

To do a test payment, you first need to visit `https://taler.net/wallet` from where you can install the Taler wallet. Then, you need to withdraw a few coins from our demonstration bank running at `https://bank.test.taler.net/`. After that, you should be able to point your browser at `http://localhost:5000/` and make a donation.

3 Integration with the back office

Taler ships the back-office feature as a stand-alone Web application. See how to run it, on its own documentaion: `https://docs.taler.net/backoffice/html/manual.html`.

4 Advanced topics

4.1 Detecting the presence of the Taler wallet

Taler offers the way to the frontend developer to detect whether a user has the wallet installed in their browser, and take actions accordingly.

4.1.1 The no-JavaScript way

The follwing example shows all that is needed to perform the detection without using JavaScript:

```
<!DOCTYPE html>
<html lang="en" data-taler-nojs="true">
  <head>
    <title>Tutorial</title>
    <link rel="stylesheet"
          type="text/css"
          href="/web-common/taler-fallback.css"
          id="taler-presence-stylesheet" />
  </head>
  <body>
    <p class="taler-installed-hide">
      No wallet found.
    </p>
    <p class="taler-installed-show">
      Wallet found!
    </p>
  </body>
</html>
```

The `taler-fallback.css` is part of the Taler's *web-common* repository, available at `https://git.taler.net/web-common.git`. Please adjust the `href` attribute in order to make it work with your Web site.

The detection works by `taler-fallback.css` hiding any tag from the `taler-installed-show` class, in case no wallet is installed. If otherwise the wallet is installed, the wallet takes action by hiding any tag from the `taler-installed-hide` class and overriding `taler-fallback.css` logic by showing any tag from the `taler-installed-show` class.

4.1.2 The JavaScript way

`taler-wallet-lib.js` helps the frontend, by providing the way to register two callbacks: one to be executed if a wallet is present, the other if it is not. See the example below:

```
// js-wallet.html
<html lang="en">
  <head>
    <script src="/web-common/taler-wallet-lib.js" type="application/javascript">
    </script>
  </head>
  <body>
    <div id="content">
    </div>
    <script type="application/javascript">
```

```
        content = document.getElementById("content");
        p = document.createElement("p");

        function walletInstalled(){
          p.textContent = "Wallet installed!";
          content.appendChild(p);
        }
        function walletNotInstalled(){
          p.textContent = "Wallet not found.";
          content.appendChild(p);
        }
        taler.onPresent(wallerInstalled);
        taler.onAbsent(wallerNotInstalled);
      </script>
    </body>
  </html>
```

`taler-wallet-lib.js` exports the `taler` object that exposes the `onPresent` and the `onAbsent` functions needed to register the frontend's callbacks. Thus the function `walletInstalled` will be executed whenever a wallet is installed, and `walletNotInstalled` if not. Note that since now we can use JavaScript we can register callbacks that do more than just showing and hiding elements.

4.2 The Taler proposal format

A Taler proposal can specify many details about the transaction. This section describes each of the fields in depth.

amount Specifies the total amount to be paid to the merchant by the customer. The amount is broken up into a *value*, a *fraction* (100.000.000 *fraction* units correspond to one *value*) and the *currency*. For example, `EUR 1.50` would be represented as the tuple `value = 1, fraction = 50000000, currency = "EUR"`.

max_fee This is the maximum total amount of deposit fees that the merchant is willing to pay. If the deposit fees for the coins exceed this amount, the customer has to include it in the payment total. The fee is specified using the same triplet used for *amount*.

max_wire_fee
Maximum wire fee accepted by the merchant (customer share to be divided by the 'wire_fee_amortization' factor, and further reduced if deposit fees are below 'max_fee'). Default if missing is zero.

wire_fee_amortization
Over how many customer transactions does the merchant expect to amortize wire fees on average? If the exchange's wire fee is above 'max_wire_fee', the difference is divided by this number to compute the expected customer's contribution to the wire fee. The customer's contribution may further be reduced by the difference between the 'max_fee' and the sum of the actual deposit fees. Optional, default value if missing is 1. 0 and negative values are invalid and also interpreted as 1.

pay_url Which URL accepts payments. This is the URL where the wallet will POST coins.

fulfillment_url
: Which URL should the wallet go to for obtaining the fulfillment, for example the HTML or PDF of an article that was bought, or an order tracking system for shipments, or a simple human-readable Web page indicating the status of the contract.

order_id
: Alphanumeric identifier, freely definable by the merchant. Used by the merchant to uniquely identify the transaction.

summary
: Short, human-readable summary of the contract. To be used when displaying the contract in just one line, for example in the transaction history of the customer.

timestamp
: Time at which the offer was generated.

pay_deadline
: Timestamp of the time by which the merchant wants the exchange to definitively wire the money due from this contract. Once this deadline expires, the exchange will aggregate all deposits where the contracts are past the *refund_deadline* and execute one large wire payment for them. Amounts will be rounded down to the wire transfer unit; if the total amount is still below the wire transfer unit, it will not be disbursed.

refund_deadline
: Timestamp until which the merchant willing (and able) to give refunds for the contract using Taler. Note that the Taler exchange will hold the payment in escrow at least until this deadline. Until this time, the merchant will be able to sign a message to trigger a refund to the customer. After this time, it will no longer be possible to refund the customer. Must be smaller than the *pay_deadline*.

products
: Array of products that are being sold to the customer. Each entry contains a tuple with the following values:

  description
  : Description of the product.

  quantity
  : Quantity of the items to be shipped. May specify a unit (`1 kg`) or just the count.

  price
  : Price for *quantity* units of this product shipped to the given *delivery_location*. Note that usually the sum of all of the prices should add up to the total amount of the contract, but it may be different due to discounts or because individual prices are unavailable.

  product_id
  : Unique ID of the product in the merchant's catalog. Can generally be chosen freely as it only has meaning for the merchant, but should be a number in the range $[0, 2^{51})$.

  taxes
  : Map of applicable taxes to be paid by the merchant. The label is the name of the tax, i.e. *VAT*, *sales tax* or *income tax*, and the

value is the applicable tax amount. Note that arbitrary labels are permitted, as long as they are used to identify the applicable tax regime. Details may be specified by the regulator. This is used to declare to the customer which taxes the merchant intends to pay, and can be used by the customer as a receipt. The information is also likely to be used by tax audits of the merchant.

delivery_date
: Time by which the product is to be delivered to the *delivery_location*.

delivery_location
: This should give a label in the *locations* map, specifying where the item is to be delivered.

Values can be omitted if they are not applicable. For example, if a purchase is about a bundle of products that have no individual prices or product IDs, the *product_id* or *price* may not be specified in the contract. Similarly, for virtual products delivered directly via the fulfillment URI, there is no delivery location.

merchant

address
: This should give a label in the *locations* map, specifying where the merchant is located.

name
: This should give a human-readable name for the merchant's business.

jurisdiction
: This should give a label in the *locations* map, specifying the jurisdiction under which this contract is to be arbitrated.

locations
: Associative map of locations used in the contract. Labels for locations in this map can be freely chosen and used whenever a location is required in other parts of the contract. This way, if the same location is required many times (such as the business address of the customer or the merchant), it only needs to be listed (and transmitted) once, and can otherwise be referred to via the label. A non-exhaustive list of location attributes is the following:

  country
  : Name of the country for delivery, as found on a postal package, i.e. "France".

  state
  : Name of the state for delivery, as found on a postal package, i.e. "NY".

  region
  : Name of the region for delivery, as found on a postal package.

  province
  : Name of the province for delivery, as found on a postal package.

  city
  : Name of the city for delivery, as found on a postal package.

  ZIP code
  : ZIP code for delivery, as found on a postal package.

  street
  : Street name for delivery, as found on a postal package.

street number
: Street number (number of the house) for delivery, as found on a postal package.

name receiver name for delivery, either business or person name.

Note that locations are not required to specify all of these fields, and it is also allowed to have additional fields. Contract renderers must render at least the fields listed above, and should render fields that they do not understand as a key-value list.

4.3 Instances

Taler's design allows a single backend to manage multiple frontends. In other words, we might have multiple shops relying on the same backend. As of terminology, we call *instance* any of the frontends accounted by the same backend.

The backend's RESTful API allows frontends to specify which instance they are. However, this specification is optional, and a "default" instance will be used whenever the frontend does not specify one.

Please note that in this stage of development, the backend's REST call `/history` returns records for *any* instance. The rationale behind is to allow grouping "public" business entities under the same backend.

This way, a single frontend can expose multiple donation buttons for multiple receivers, and still operate against one backend. So in this scenario, there is no harm if the operator of instance 'a' sees history entries related to instance 'b'.

See `https://donations.demo.taler.net/`, which uses this functionality.

4.4 The fulfillment page

This section describes some of the design considerations for the fulfillment page. They are primarily relevant for high-performance setups.

The fulfillment page mechanism is designed to provide the following two properties:

1. Taler payments *can* be implemented in DB-less frontends.
2. Taler payments are replayable, meaning that each purchase is associated with a URL (the fulfillment URL) that shows the product each time it gets visited (and of course, only the first time takes the user's money).

Both properties are gotten "for free" by the way replayable payments are implemented. Since `pay.php` simply relays payments to the backend, if the latter returns "200 OK", then the frontend delivers what is mentioned in the backend's response. Note that along with the "200 OK" response, the backend returns the whole proposal associated with the fulfillment URL that triggered the payment, so the frontend has all the information useful to pick the right product to deliver. The "payment" relayed to the backend contains the *order id*, that allows the backend to perform all the integrity checks on the payment. This way, the frontend does not need any database to replay payments.

4.5 Normalized base URLs

Exchanges and merchants have a base URL for their service. This URL **must** be in a canonical form when it is stored (e.g. in the wallet's database) or transmitted (e.g. to a bank page).

- The URL must be absolute. This implies that the URL has a schema.
- The path component of the URL must end with a slash.
- The URL must not contain a fragment or query.

When a user enters a URL that is, technically, relative (such as "alice.example.com/exchange"), wallets *may* transform it into a canonical base URL ("http://alice.example.com/exchange/"). Other components *should not* accept URLs that are not canonical.

Rationale: Joining non-canonical URLs with relative URLs (e.g. "exchange.example.com" with "reserve/status") results in different and slightly unexpected behavior in some URL handling libraries. Canonical URLs give more predictable results with standard URL joining.

5 Reference

5.1 Headers for HTTP 402

The HTTP status code `402 Payment Required` can be used by the merchant frontend to trigger operations related to payments in the user agent. There are three different types of possible interactions:

5.1.1 Payment

For payments, the user agent associates at most one proposal with every URL via the proposal's `fulfillment_url` field. The associated proposal is either missing (in case it does not exist), paid (in case the payment for it was successfully sent to the merchant) or unpaid. If the associated proposal is unpaid, `402 Payment Required` will cause the user agent to pay for the associated proposal.

The following headers for `402 Payment Required` are involved in processing payments:

`X-Taler-Contract-Url`
: If there is no associated proposal, the user agent will fetch a proposal from this URL and process it. This typically prompts the user to agree to pay.

`X-Taler-Offer-Url`
: If there is no associated proposal and `X-Taler-Contract-Url` is not specified, the browser will navigate to this URL.

5.1.2 Refund

A merchant can give a customer a refund, for example if they are unable to deliver the goods or if the goods turned out to be defective. Refunds can only be issued before the exchange has transferred the funds to the customer as per the `refund_deadline` of the contract.

The following headers for `402 Payment Required` are involved in processing refunds:

`X-Taler-Refund-Url`
: If this header present, the value of this header must be a URL that the user agent can use to request and process refunds.

5.1.3 Tipping

The following headers for `402 Payment Required` are involved in tipping clients:

`X-Taler-Tipping-Url`
: If this header present, the value of this header must be a URL that the user agent can use to obtain tips (small, non-binding financial rewards) payed from the merchant to the user's wallet. If this field is present, `X-Taler-Tipping-Exchange` and `X-Taler-Tipping-Amount` must also be present. The wallet will then generate appropriate planchets and POST the required information in JSON to this URL. The merchant should add the `tip_id` and `instance` fields and pass the POSTed `planchets` to its backend at the `/tip-pickup` URI. The wallet will expect a response in the same format as returned by the backend. Note that the tipping URL will typically need to encode the `tip_id` returned by the `/tip-authorize` function of the merchant's backend.

`X-Taler-Tipping-Exchange`
: Exchange base URL for the exchange that the merchant will allow the client to withdraw the tip from.

`X-Taler-Tipping-Amount`
: Amount of tip that the user is receiving, in the standard amount format (CURR:X.Y).

`X-Taler-Tipping-Deadline`
: Optional deadline (in the usual HTTP "Date" format) until which the tip is available. Later requests may be rejected by the merchant. Note that the absence of this field should not be understood to imply that the offer is valid indefinitely. However, if there is a deadline, the wallet may visually indicate to the user that the tip needs to be picked up in a timely fashion (assuming the wallet interactively asks for confirmation and the deadline is near).

5.2 JavaScript API

The following functions are defined in the `taler` namespace of the `taler-wallet-lib` helper library available at `https://git.taler.net/web-common.git/tree/taler-wallet-lib.js`.

`onPresent(callback: () => void)`
: Add a callback to be called when support for Taler payments is detected.

`onAbsent(callback: () => void)`
: Add a callback to be called when support for Taler payments is disabled.

`pay({contract_url: string, offer_url: string})`
: Results in the same action as a `402 Payment Required` with `contract_url` in the `X-Taler-Contract-Url` header and `offer_url` in the `X-Taler-Payment-Url` header.

`refund(refund_url: string)`
: Results in the same action as a `402 Payment Required` with `refund_url` in the `X-Taler-Refund-Url` header.

5.3 Stylesheet-based presence detection

Stylesheet-based presence detection will be applied on all pages that have the `data-taler-nojs` attribute of the `html` element set `true`. The default/fallback stylesheet, that will be taken over by the wallet once installed, must be included with the id `taler-presence-stylesheet`, like this:

The following CSS classes can be used:

`taler-installed-hide`
: A CSS rule will set the `display` property for this class to `none` once the Taler wallet is installed and enabled. If the wallet is not installed, `display` will be `inherit`.

`taler-installed-show`
: A CSS rule will set the `display` property for this class to `inherit` once the Taler wallet is installed and enabled. If the wallet is not installed, `display` will be `none`.

GNU-LGPL

Version 2.1, February 1999

[This is the first released version of the Lesser GPL. It also counts
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