

Taler Systems S.A.

Taxable Anonymous Libre Electronic Reserves

Christian Grothoff & Leon Schumacher

Independent One-Click Payments

March 7, 2017

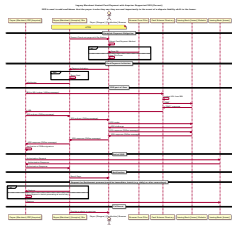
"I think one of the big things that we need to do, is we need to get a way from true-name payments on the Internet. The credit card payment system is one of the worst things that happened for the user, in terms of being able to divorce their access from their identity."

—Edward Snowden, IETF 93 (2015)

Agenda

1. What is Taler?
2. The Market
3. About Us
4. The Plan
5. Supplemental Materials
6. Financials

1. The Problem



3D Secure

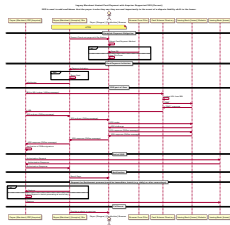


Using 3D secure (verified by visa) is a nightmare for customers. The process is complicated, takes a long time to complete and can refuse valid payment requests with obscure errors.

As a result, cryptographers write short papers with titles like: “Verified by Visa and MasterCard SecureCode: Or, How Not to Design Authentication”.

Today's online credit card payments will be replaced, but with what?

1. The Problem



3D Secure



AML, KYC

2017-03-07

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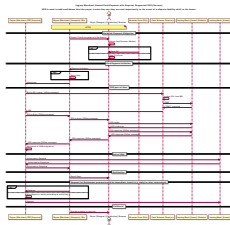
└─What is Taler?

└─1. The Problem

1. The Problem

Any technology deployed by European banks also needs to be compliant with applicable regulation, such as anti-money laundering and know-your-customer rules.

1. The Problem



3D Secure

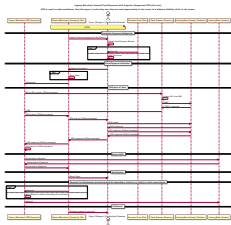


AML, KYC

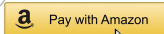
Foreign technological providers will use their established brands and platforms to both ignore regulations (see “safe harbor”) and to enthrall customers with payment solutions that exploit the “trusted” platform. Amazon can offer one-click payments today, but smaller business cannot. Eventually, these providers will obtain banking licenses.

The day Google attaches a bank account to every Gmail account offering one-click payments via all Android devices and free personal banking will be the beginning of the end of European banking (and economic/political independence).

1. The Problem



3D Secure



AML, KYC



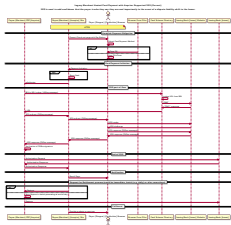
The Future of Payments

European competitors fail to be global, and are technologically and economically disadvantaged compared to the global brands. They also are decades behind the technical state of the art. Cryptographers (or CCC hackers) will write more papers.

Some banks will continue to follow the blockchain meme, ignoring performance, scalability, compliance or usability concerns.

(Blockchains are P2P protocols implementing Byzantine consensus using computationally expensive puzzles for leader election. Our research team has worked on secure P2P protocols for over 15 years and published papers on Byzantine consensus in 2016. While we are thus subject-experts, Taler does aggregation at the payment provider, thus rarely needs multi-party consensus and simply relies on traditional wire transfers (including possibly Bitcoin) to settle in aggregate.)

1. The Problem



3D Secure

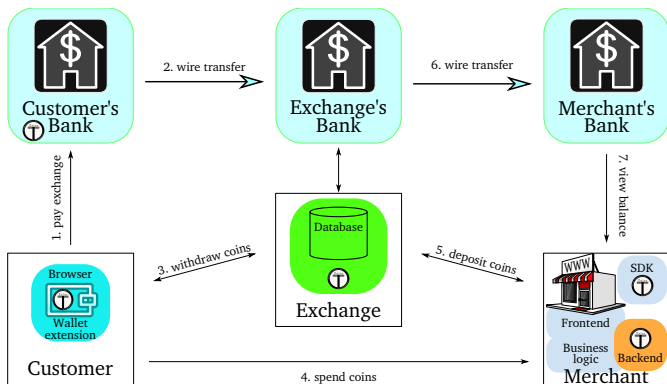


AML, KYC, **GDPR**

Once the EU's general data protection regulation mandating privacy-by-design and data minimization is enforced, all of these providers will be out of compliance, as none implement strict data minimization or privacy-by-default.

Non-EU providers will continue their quest for dominance and operate extra-legally, extra-territorially if necessary, ready to take over the market once regulation allows it.

2. What is Taler?



⇒ Convenient, taxable, privacy-enhancing, & resource friendly!

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└ What is Taler?

└ 2. What is Taler?

2. What is Taler?



⇒ Convenient, taxable, privacy-enhancing, & resource friendly!

Taler is a modern payment system based on cryptography, providing an open standard with a free software reference implementation. Taler avoids authentication during payments, enabling convenient and fast one-click payments in compliance with applicable regulation (AML, KYC and GDPR).

We have a public demonstrator running at <https://demo.taler.net/>.

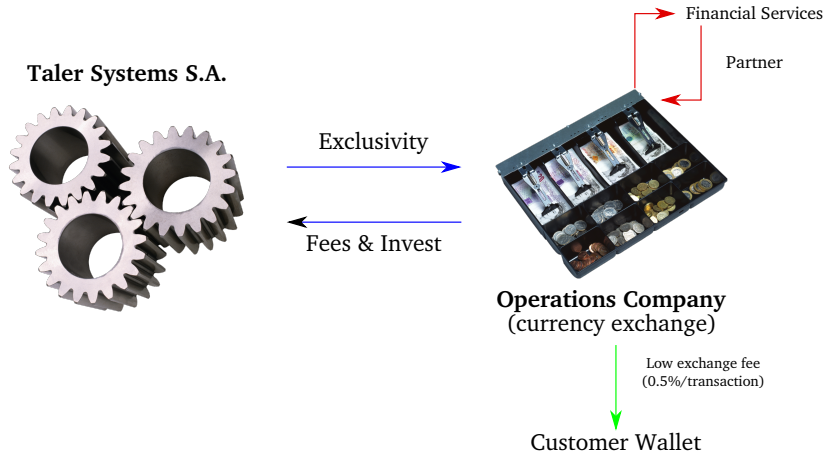
Advantages of Taler

- All operations provide cryptographically secured, mathematical proofs for courts & auditors
- Customer can remain anonymous
 - retain civil liberties in increasingly cash-less world
 - eliminates costly customer authentication
 - no credit card number theft possible
 - merchants do not need to operate certified equipment (PCI DSS, etc.)
 - unlike Chaum, Taler can give change and refunds, even to anonymous customers
- Merchants are identifiable
 - bad for illegal business
 - no tax evasion

Advantages of Taler

- Payments in existing currencies, does not introduce any new currency
 - financial stability, no risks from currency fluctuation
 - payment system, not speculative investment
- Scalable, fast protocol implementation
 - low transaction costs (at least in terms of computation at high volume)
- Open standard protocol without patents with free reference implementations
 - low barrier to entry for new merchants
 - governments may adopt as part of digital sovereignty agenda

3. Operating Model



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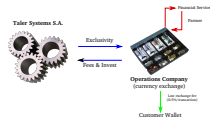
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└ What is Taler?

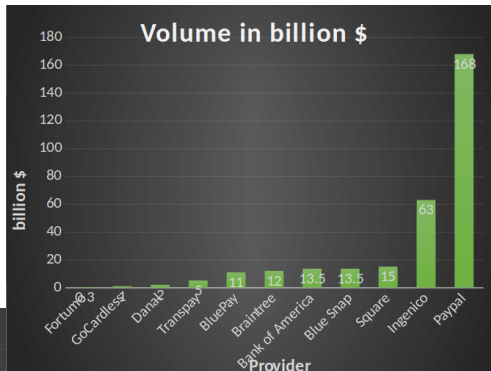
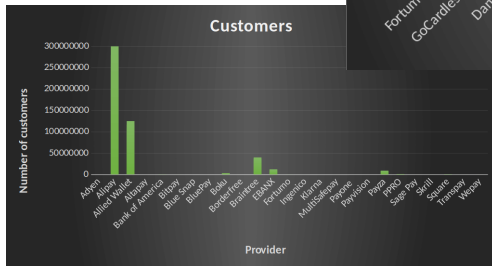
└ 3. Operating Model

3. Operating Model



Operator charges transaction fees. Taler Systems develops core technology and provides exclusive support to payment service provider. In return, payment service provider contributes financially to Taler Systems S.A.

4. The Market



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Electronic **R**eserves

└─ The Market

└─ 4. The Market

4. The Market

The market is big.

5. Competitor comparison

	Cash	Bitcoin	Zerocoin	Creditcard	GNU Taler
Online	---	++	++	+	+++
Offline	+++	--	--	+	--
Trans. cost	+	---	---	-	++
Speed	+	---	---	o	++
Taxation	-	--	---	+++	+++
Payer-anon	++	o	++	---	+++
Payee-anon	++	o	++	---	---
Security	-	o	o	--	++
Conversion	+++	---	---	+++	+++
Libre	-	+++	+++	---	+++

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└ The Market

└ 5. Competitor comparison

5. Competitor comparison

	Cash	Bitcoin	Zerocoin	Creditcard	GNU Taler
Online	---	++	++	o	+++
Offline	+++	---	---	o	---
Trans. cost	+	---	---	---	++
Speed	+	---	---	o	++
Privacy	---	---	---	+++	+++
Payee-anon	++	o	++	---	+++
Payee-anon	++	o	++	---	---
Security	---	o	o	---	++
Conversion	+++	---	---	+++	+++
Libre	---	+++	+++	---	+++

Not having payee-anonymity is a good thing as otherwise money laundering becomes a real problem.

6. Payment solutions - Pricing

Provider	Pricing
Alipay	2,0% - 3,0%
Allied Wallet	1,95% + \$ 0,20
Amazon Payments	2,9% + \$ 0,30
Avangate	4,9% + \$ 2,50
Billpro	2,1% + 3,5% fee
BitGold Inc.	1% fee on every purchase
Bitpay (Bitcoin)	0%
Checkout.com	2,95% - 3,95% + £0,15
Coinify (Bitcoin)	0%
eComCharge	3,5% + 0,35€
GoCardless	1% up to a maximum of £2
Western Union	Variable — From 5% up

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Electronic Reserves

└ The Market

└ 6. Payment solutions - Pricing

6. Payment solutions - Pricing

Provider	Pricing
Alipay	2.0% - 3.0%
Allied Wallet	1.95% + \$ 0.20
Amazon Payments	2.9% + \$ 0.30
Avangate	4.9% + \$ 2.50
Billgro	2.1% + 3.5% fee
BitGold Inc.	1% fee on every purchase
Bitpay (Bitcoin)	0%
Checkout.com	2.95% + 3.95% + 10.15
Coinify (Bitcoin)	0%
eComCharge	3.5% + 0.35€
GoCardless	1% up to a maximum of 1.2
Western Union	Variable — From 5% up

Transaction cost in Taler is $\approx 0.0001 \text{€}$ (plus salaries and profits).

7. Why now and why us?

Why now?

- Chaum's original patents¹ from 1996-1999 have expired
- Increased awareness of issue of privacy in payment systems
 - Contemporary payment systems fail on privacy
 - Cash is disappearing
 - Alternatives urgently needed
- Cryptocurrencies threaten control over money supply and tax base of governments

Why us?

- solved (technical) problem of unlinkability
- designed a modern, open standards based version
- We have (most) of the technical expertise to really build it:
 - 15 years of research in network security and privacy
 - Founder of GNUnet and related projects
- good contacts: free software movement, press, academics

¹USPTO 5878140, 5781631, 5712913

8. Team

&

Advisory Board

Leon Schumacher

CEO, co-founder

Dr. Christian Grothoff

CTO, co-founder

Dr. Jeff Burdges

PostDoc

Dr. Christina Onete

PostDoc

Dr. Richard Stallman

Founder of the
Free Software movement

Prof. Mikhail Atallah

Cryptographer, co-founder
Arxan Technologies Inc.

Prof. Roberto Di Cosmo

Director IRILL



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└ About Us

└ 8. Team

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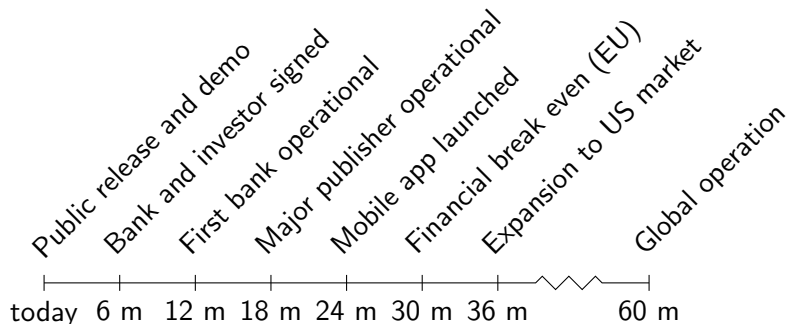
Prof. Mikhail Atallah
Cryptographer, co-founder
Arxan Technologies Inc.

Prof. Roberto Di Cosmo
Director IRILL



Advisory board still under construction.

9. Status quo and plan



500 k Bank operational (integration, documentation, auditing)

500 k Publisher operational (training, integration, marketing)

500 k Mobile app for major platforms (incl. NFC protocol)

500 k Operational overheads until break even

	Year 1	Year 2	Year 3	Year 4	Year 5	Invest
EBIT	-208	-2.666	-2.902	1.689	9.542	5 M

10. Contact details

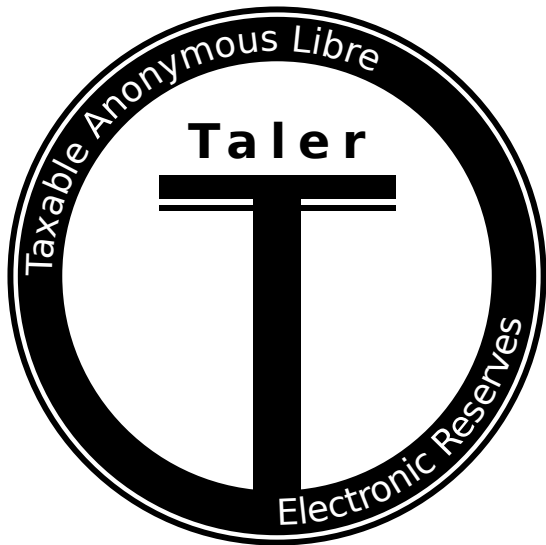
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CTO

Dr. Christian Grothoff
cto@taler.net
+33-2-99-84-71-45

<https://www.taler.net/>



Partners

Research and development:



Banks (in discussion):



Business development:



Merchants:



Strategic partners:



Recent Press

09-2015

- <https://bitcoinmagazine.com/21901/bitcoin-governments-without-privacy-taxes/>
- <http://www.heise.de/tp/artikel/46/46089/1.html>

06-2016

- http://www.theregister.co.uk/2016/06/06/gnu_cryptocurrency_aims_at_the_mainstream_economy_not_the_black_market/
- <http://www.golem.de/news/halbanonymes-bezahlssystem-gnu-taler-soll-kryptowaehrungen-gerechter-machen-1606-121323.html>
- <http://www.heise.de/newsticker/meldung/GNU-Taler-Open-Source-Protokoll-fuer-Zahlungen-in-Version-0-0-0-erschiene-3228525.html>

08-2016

- <https://www.theguardian.com/technology/2016/sep/01/online-publishers-readers-ad-block-surveillance-donate-anonymously>

02-2017

- <http://hackerpublicradio.org/eps.php?id=2222>

Business risks and measures

Risk	Impact	Countermeasure
Usability too low	few users, insufficient income	usability testing
Exchange data loss	financial damage	backups
Exchange compromise	financial damage	limit loss by key rotation
Exchange offline	reputation loss	redundant operation
Compliance issues	illegal to operate	work with regulators
No bank license	illegal to operate	work with banks

License model

Component	License	Why?
Exchange	Affero GPL	competitors must share extensions
Wallets	GPLv3+	enable community development
Merchant	Lesser GPL	maximize market adoption

Balance Sheet: Year 1, 2, 3 (kEUR)

	Year 1	Year 2	Year 3		Year 1	Year 2	Year 3
Fixed assets				Equity			
Incorporation costs	5	4	3	Share capital	45	45	45
Intangible assets	16	63	40	Share premium	5'350	10'350	10'350
Tangible assets	20	44	68	Reserves			
Financial assets	0	0	0	Retained earnings	0	-1'477	-4'987
Current assets				Profit/loss for the year	-1'477	-3'510	-1'500
Inventory				Provisions	0	23	168
Accounts receivable (clients)		30	200	Long-term debts > 1 year			
Accounts receivable (affiliated)				Bank loans	0	0	0
Other current assets				Accounts payable (affiliated)	0	0	0
Cash in bank	3'898	5'364	3'840	Short-term debts < 1 year			
				Bank loans	0	0	0
				Accounts payable (suppliers)	0	0	0
				Fiscal and social debt	21	74	75
				Accounts payable (affiliated)	0	0	0
				Other liabilities	0	0	0
TOTAL ASSETS	3'939	5'505	4'151	TOTAL EQUITY + LIABILITIES	3'939	5'505	4'151

Projections for years 4–6 available upon request.

Income Statement: Year 1, 2, 3 (kEUR)

Profit or loss	Year 1	Year 2	Year 3
Turnover	0	129	2'520
Other operating income	0	0	0
Cost of goods sold	0	0	0
Personnel costs	-1'066	-2'804	-3'085
Value adjustments	0	0	0
Other operating charges	-412	-835	-935
Operating result	-1'477	-3'510	-1'500
Interest & similar income	0	0	0
Interest & similar charges	0	0	0
Financial result	0	0	0
Result from ord. act. before taxation	-1'477	-3'510	-1'500
Extraordinary income	0	0	0
Extraordinary expenses	0	0	0
Extraordinary result	0	0	0
Taxes	0	0	0
Profit or loss fiscal year	-1'477	-3'510	-1'500

Cashflow Statement: Quarter 1 to 12 (kEUR)

Cash flow (Q1-Q12)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Beginning Cash Balance (A)	0	298	5'065	4'561	3'898	3'084	2'214	1'263	5'364	4'633	4'107	3'794
Cash Inflows												
Turnover (inc VAT)	0	0	0	0	0	2	7	120	300	480	690	1'050
R&D subsidy	0	0	0	0	0	0	0	0	0	0	0	0
Initial capital	45	0	0	0	0	0	0	0	0	0	0	0
Capital contribution/Loans	350	5'000	0	0	0	0	0	5'000	0	0	0	0
Other income	0	0	0	0	0	0	0	0	0	0	0	0
Total Cash Inflows (B)	395	5'000	0	0	0	2	7	5'120	300	480	690	1'050
Cash Outflows												
Personnel costs	47	128	373	518	644	685	712	763	776	770	770	770
External costs	20	49	37	64	69	72	72	76	75	57	57	57
Investments	2	6	6	6	6	6	6	6	6	6	6	6
Other expenses	28	88	88	76	95	109	168	174	174	173	171	171
Total Cash Outflows (C)	97	503	503	664	814	872	958	1'019	1'031	1'006	1'004	1'004
Ending Cash Balance (A + B - C)	298	4'561	4'561	3'898	3'084	2'214	1'263	5'364	4'633	4'107	3'794	3'840

