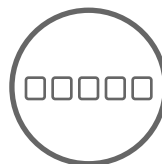# ripple

Ripple Gateways

Consumers
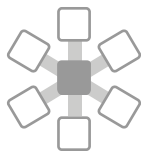
Market Makers

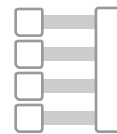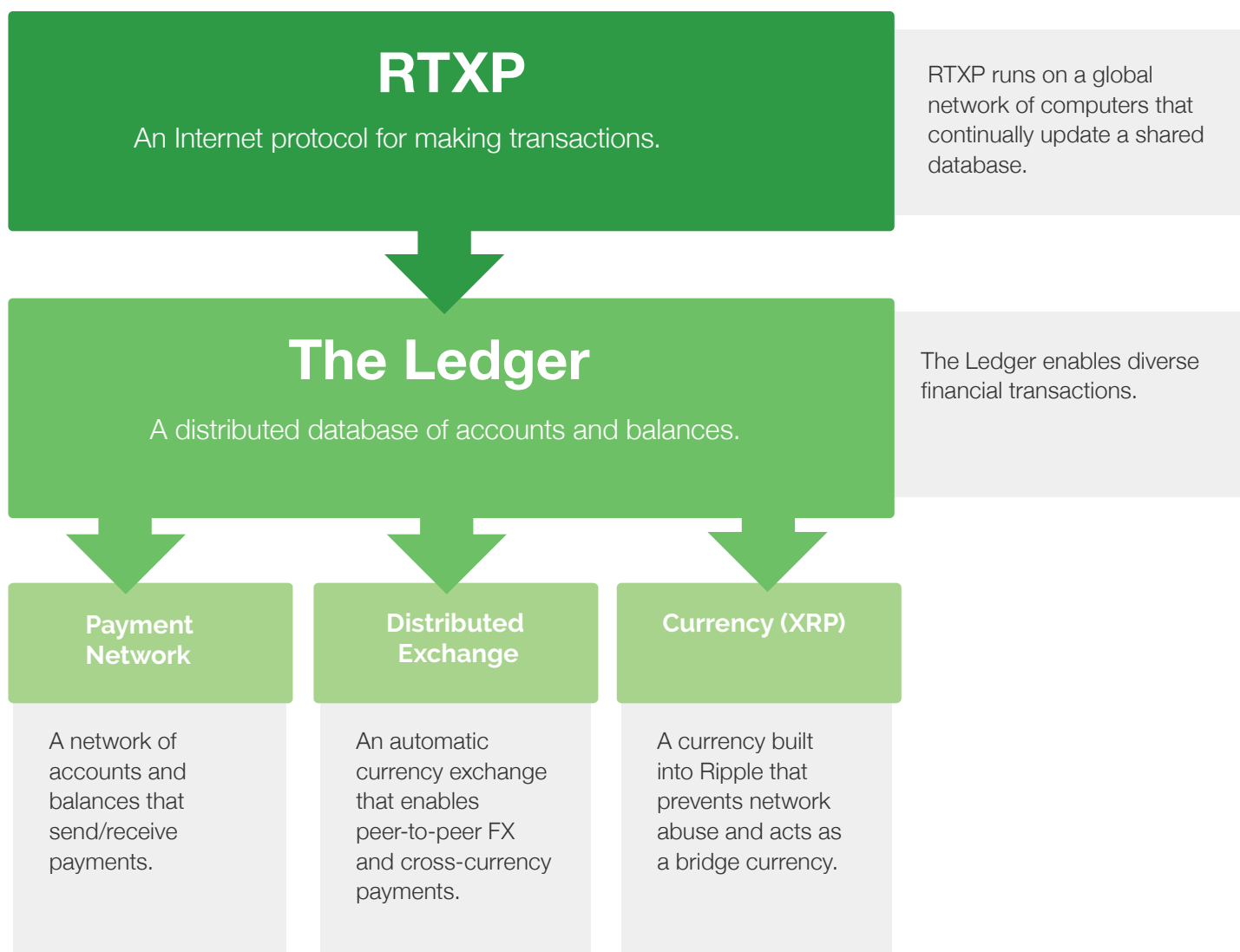**Gateways**

Merchants

Overview

A Ripple gateway is a business that provides onboard and offboard ramps to the Ripple network. Ripple is free open source software and no agreement with Ripple Labs is necessary. However, Ripple Labs would like to be of assistance in integration planning and implementation. This is a primer on considerations related to integration of the gateway service.

The Ripple System

Ripple is a universal protocol for money that allows independent payment systems to communicate as easily as email systems do. Just as SMTP created a shared standard for email, Ripple creates a shared standard for payments. As with email, no one owns Ripple, and there is no central operator. Ripple is open source software that allows servers all over the world to communicate peer-to-peer financial transactions to one another.

If the Ripple protocol becomes the standard protocol for money, payments will become as fast, cheap, and easy as email. There are no network fees, and payments are instant.

RTXP

An Internet protocol for making transactions.

RTXP runs on a global network of computers that continually update a shared database.

The Ledger

A distributed database of accounts and balances.

The Ledger enables diverse financial transactions.

Payment Network

A network of accounts and balances that send/receive payments.

Distributed Exchange

An automatic currency exchange that enables peer-to-peer FX and cross-currency payments.

Currency (XRP)

A currency built into Ripple that prevents network abuse and acts as a bridge currency.

Business Cases

Ripple offers unique value propositions to diverse financial services business models.

Remittance

- Expand geographic footprint at no cost
- Offer new currencies without capital requirements
- Pay wholesale forex spreads
- Earn 100% margin on transaction fees

Banks

- Charge fees for faster clearing
- Free, automated clearing house for money movement
- Create a new revenue channel from balance transfers within Ripple
- Expand geographic footprint without regional/country risk
- Facilitate B2B cross-border transactions without currency risk

Currency Exchanges

- Free, global clearing house and prime broker for market makers
- Create a new revenue channel from balance transfers within Ripple
- Earn 100% margin on spreads and service fees
- Expand currency coverage without new capital requirements
- Expand portfolio of brokered assets

Prepaid

- Expand participating merchant base
- Acquire a turnkey digital prepaid wallet
- Enable peer-to-peer payments
- Allow cross-border payments
- Create a new revenue channel from balance transfers within Ripple

Merchants & Marketplaces

- Own and operate a branded payment rail
- Acquire a turnkey digital wallet
- Eliminate interchange fees and fraud
- Accept international payments without currency risk
- Settle funds instantly

Merchant Acquirers

- Free payment rail
- Earn 100% margin on all processing fees
- Create a new revenue channel from balance transfers across Ripple
- Process cross-border payments at no cost
- Eliminate buyer fraud from chargebacks
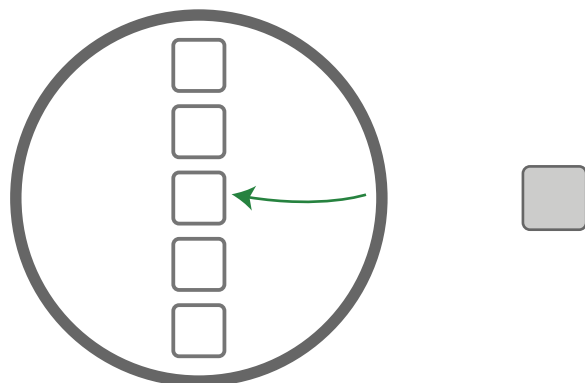- Seamless integration with existing settlement platforms

The Gateway Service

A Ripple gateway is any business that provides access to the Ripple network via the following services:
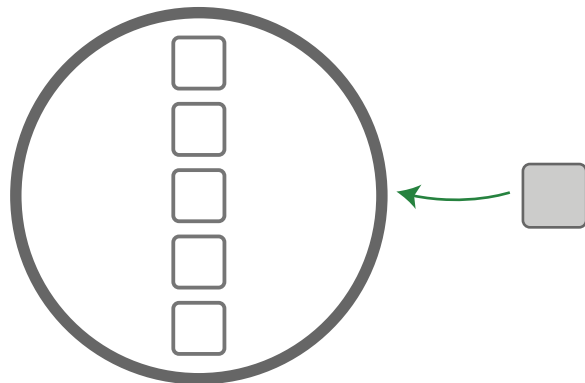
1. Accepts Cash Deposits

Alice deposits $100 paper cash at ABC Bank for safe keeping. ABC Bank stores the cash in their vault.

2. Issues Balances into User Accounts

ABC Bank credits the account with a $100 electronic balance. ABC Bank now owes Alice $100 cash on demand.
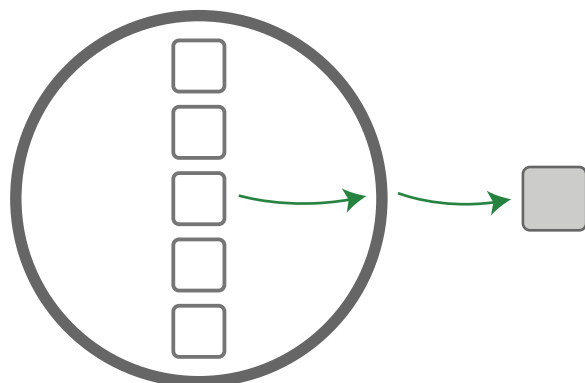
3. Withdrawal Cash on Demand

Alice needs cash. Alice goes to ABC Bank and requests redemption of her $100 balance. ABC Bank withdrawals $100 paper cash from its vault and hands over the paper cash to Alice.

○ **Gateway**   ☐ **Hosted Account**   ◻ **Non-Ripple Account**   ✓ **Value Transfer**

Types of Accounts

New Ripple gateways can choose to have their customers' accounts be independent or hosted. Independent accounts will have a un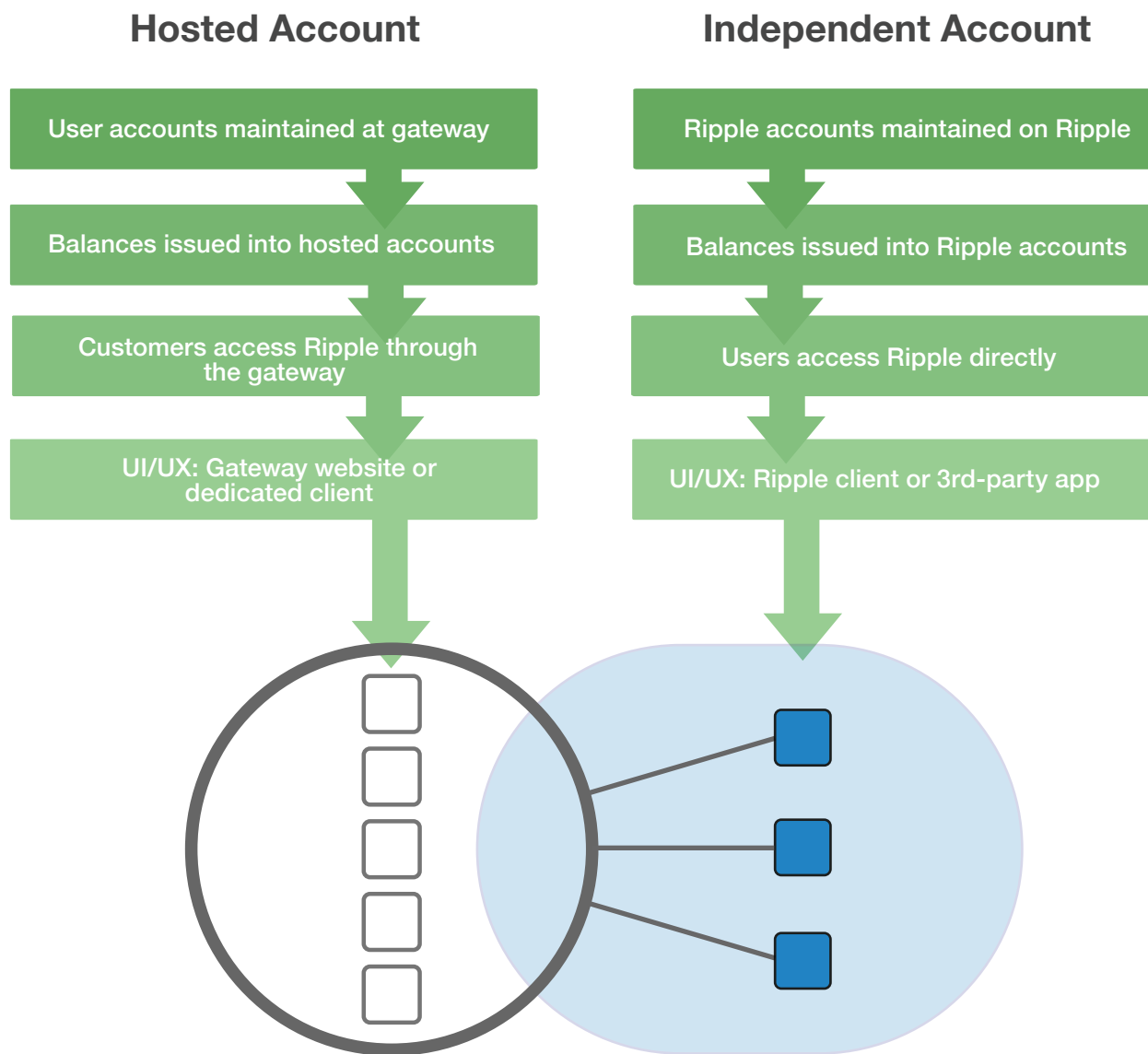ique address on the Ripple network connected to the gateway. Hosted accounts have indirect access to the Ripple network through their gateway's Ripple account. Typically, a pre-existing business with its own consumer relationship will elect to integrate as a hosted gateway.

Hosted Account	**Independent Account**
User accounts maintained at gateway	Ripple accounts maintained on Ripple
Balances issued into hosted accounts	Balances issued into Ripple accounts
Customers access Ripple through the gateway	Users access Ripple directly
UI/UX: Gateway website or dedicated client	UI/UX: Ripple client or 3rd-party app

○ Gateway   ▢ Hosted Account   ⬭ Ripple Network   ◼ Independent Account

Account Balances

Balances in accounts are demand liabilities for the gateway that issued the balance. Balances move from account to account as payments. The balance must always be withdrawn via the original issuing gateway.

The "life cycle" of a Ripple balance:
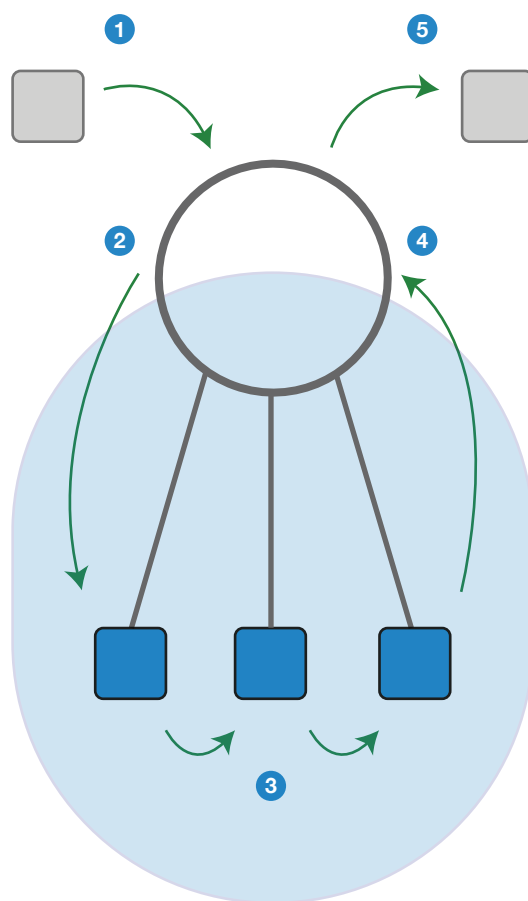
❶ Deposit / ❷ Issuance

A gateway recieves a deposit and issues a balance into an account.

Alice deposits $100 at ABC Bank by handing over cash or electronically with an ACH or wire transfer.

❸ Circulation

Balances are transferred between accounts as payments.

Sally and Bob both bank at ABC Bank. Sally owes Bob $100. Alice transfers her balance to Bob, and now ABC Bank owes $0 to Sally and $100 to Bob. The cash never left ABC Bank's vault, but Sally has paid Bob.

❹ Redemption / ❺ Withdrawal

Balances are withdrawn from the original issuing gateway.**

After receiving payment from Alice, Bob presents the balance to ABC Bank for immediate redemption and withdraws the cash from their vault.

*Gateways can limit circulation to pre-authorised accounts.

**Gateways institute prerequisites (KYC, AML) for withdrawal.

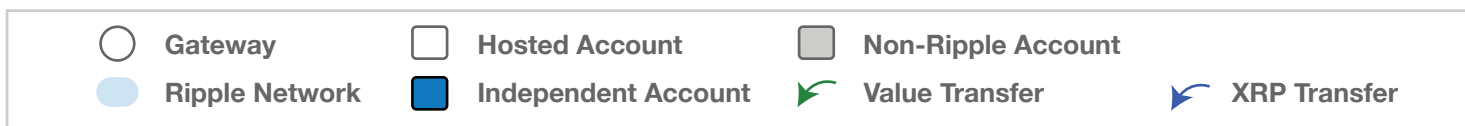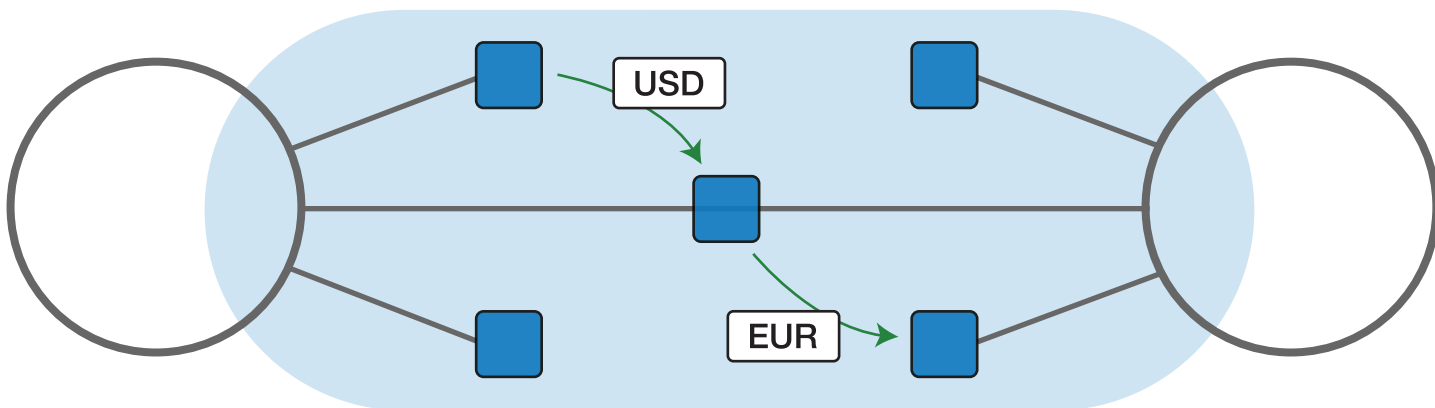| ▢ Non-Ripple Account | ◯ Gateway | ↗ Value Transfer | ⬤ Ripple Network | ▣ Independent Account |

Connecting Gateways

Ripple is designed to wire together financial institutions. Ripple wires together, or 'federates', gateways in 3 ways:

Direct Market Makers

Payments move from one gateway to another gateway through market makers holding accounts at both institutions.

- Alice holds a balance for $100 dollars in her account at ABC Bank.

- Alice needs to pay Dave, who holds an account at XYZ Bank. XYZ Bank does not accept ABC Bank balances, so neither does Dave.

- Sally has an account at both gateways and has created an offer to buy ABC Bank balances with XYZ Bank balances.

- Ripple routes Alice's payment to Dave through Sally's offer.

- When Sally's offer is fulfilled, Ripple credits her account the +$100 balance from ABC Bank which she received from Alice; and simultaneously debits her account the -$100 balance from XYZ Bank which she sends to Dave.

- Sally creates offers because she can earn a profit on spreads

◯ Gateway	☐ Hosted Account	☐ Non-Ripple Account	
Ripple Network	◼ Independent Account	↙ Value Transfer	↙ XRP Transfer

XRP as a Vehicle Currency

XRP in Ripple is like gold in your hand. It is an asset without counterparty and plays the role of a bridge currency between exotic gateways. This is similar to the role of USD in exotic forex markets.
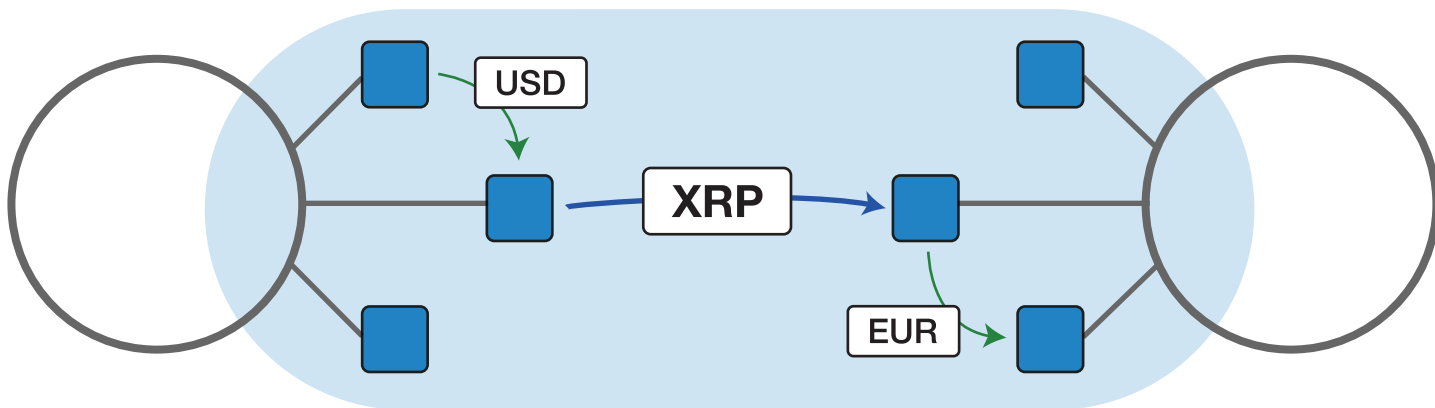
Mutual Trust

If two gateways trust each other on ripple, their balances become interchangeable. Alice can present ABC Bank balances to XYZ Bank, and Dave can present XYZ Bank balances to ABC Bank.

◯ Gateway	▢ Hosted Account	▢ Non-Ripple Account
Ripple Network	▮ Independent Account	↙ Value Transfer ↙ XRP Transfer
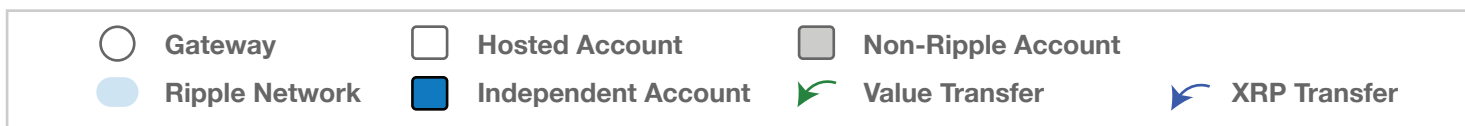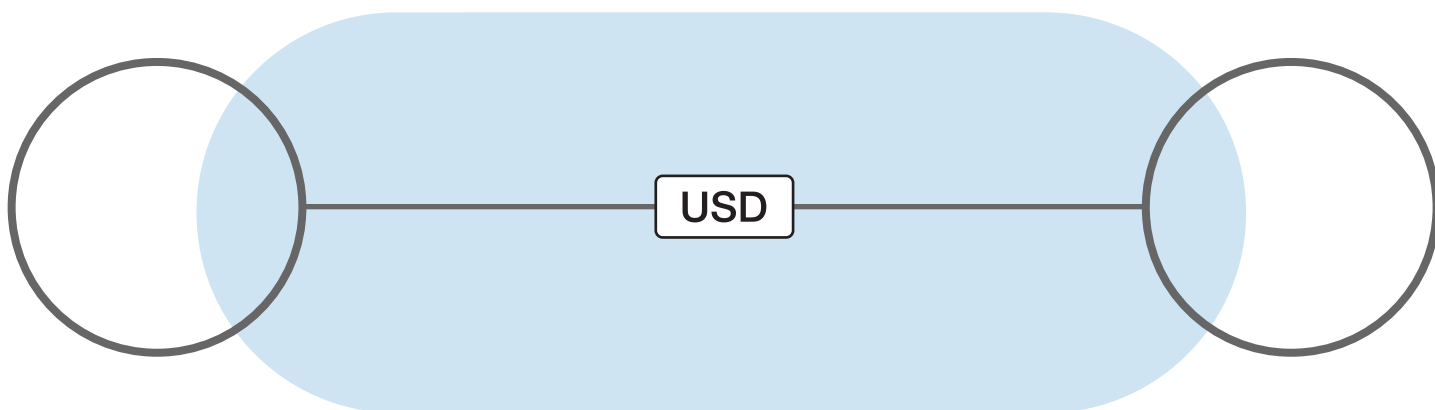
Revenue Models

Ripple allows variable fee structures and revenue models.

Traditional Revenues for Financial Institutions:

Deposit / Issuance
Fees for processing deposits into Ripple accounts.
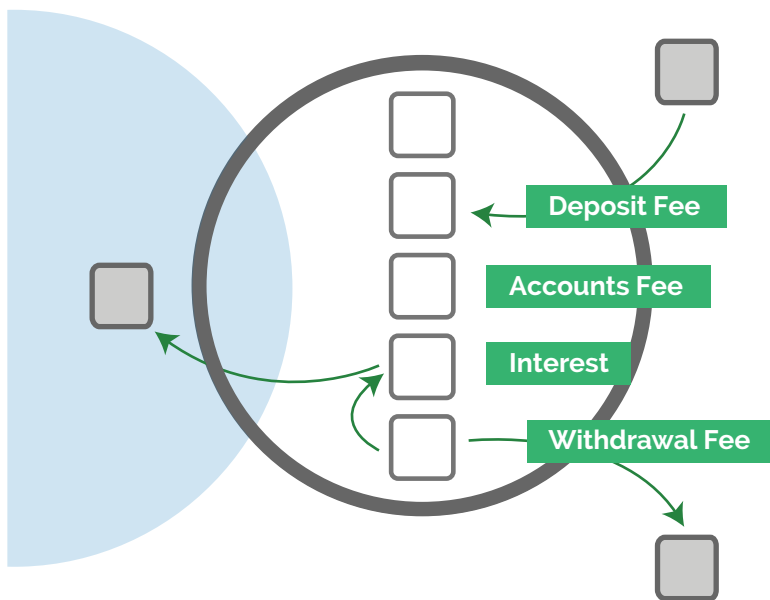
Accounts
Fees for the creation and maintenance of accounts.

Interest
Interest on deposited funds.
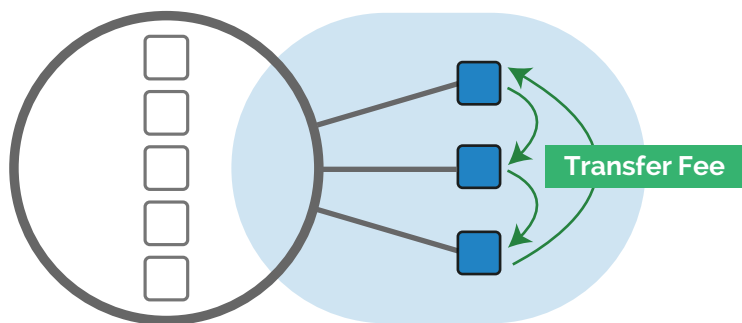
Withdrawal
Fees for withdrawals from the gateway.

Ripple Unique Revenue:

Circulation
Fees collected for the transfer of a gateways balance.

Advanced
Participate in the decentralized market and earn fees on forex spreads.

○ Gateway	☐ Hosted Account	☐ Non-Ripple Account
Ripple Network	☐ Independent Account	Value Transfer · XRP Transfer

Integration Process

Integrating Ripple into your business processes can be done in stages.

Stage 1: Mock Manual Gateway

Setting up a mock gateway can be done in minutes. Doing so provides an excellent way to gain a conceptual understanding of operating a gateway. Instructions are provided on the wiki.

Stage 2: Manual Gateway

A gateway can be professionally operated using only the Ripple client. Customers are given instructions for making deposits and withdrawals on the gateway's web site. As deposits are received, the gateway operation manually sends funds to the user's account. Upon receiving a withdrawal transaction the operator manually disburses the funds.

Stage 3: Automated Gateway

Withdrawals and deposits can be automated by interfacing the gateway's business/web server to a locally deployed Ripple server. Hosting a local Ripple server provides robustness, security, and simplifies implementation. For banks and payment processors with pre-existing funding systems, Ripple integration becomes trivial. Only two Ripple operations need to be implemented: Sending a Ripple balance upon deposit, and monitoring for Ripple withdrawals.

Stage 4: Business Integration

All gateways must implement deposits to and withdrawals from user managed Ripple wallets. These independent accounts are necessary for market makers to providing liquidity to other Ripple gateways. However, this role need not be the primary focus of the business.

Banks, card issuers, payment processors and remittance services may use Ripple's infrastructure behind the scenes without exposing Ripple to their customers. Integrated businesses enable all of their customers to transaparently send or receive payments through Ripple by acting as their proxy to the network. All that is necessary is to add a "Send Ripple Payment" option to the user's existing transaction flow. In addition businesses can provide an easy to remember email style Ripple address allowing their users to receive payments.

Stage 5: External Payment Bridges

Beyond their key business, gateways can increase their utility by providing a "Ripple Bridge" to other payment system to which they interact. Ripple's Bitcoin bridge is one example, but bridges to other popular payment systems like Alipay in China or M-Pesa in Kenya are also possible.

Gateways interact with three external parties: their banking system, the Ripple network, and their users for sending payments. This table shows the implementation effort required at each stage.

Summary of Integration Requirements

Less than one week for automated gateway integration.

	Deposit Withdrawal	Sending Transactions	Integration Effort	Time (days)
Manual Deposit and Withdrawal	Mock	Web Client	Web Client	< 1/2
Automated Deposit and Withdrawal	Bank Website	Web Client	Web Client	1
Stand-alone Gateway	Business Server to Bank	Business Server to Local Rippled	Web Client	5
Hosted Users	Completed	Implement Source and Destination Tags	Extend Business Site	5
Extended Features	Re-use Bank Interface	Extend Business Server	Web Client	5

- Custom development involved.
- Pre-existing component. No additional work required.

Legal Compliance

Gateways are responsible for complying with local regulations and reporting to the appropriate agencies. Reporting requirements vary depending on country and state, but may include:

Know Your Customer (KYC)

Know Your Customer (KYC) refers to due diligence activities by financial institutions to determine whether customers may be at risk of using the institution's to conduct criminal activity. Criminal activity in financial terms may include money laundering, terrorist financing, financial fraud, etc. Customers may be individuals, intermediaries, or businesses.

KYC requirements generally address the customer's identity, affiliations, and transaction behavior.

KYC is critical for financial institutions. Having an inadequate or nonexistent KYC program may result in criminal penalties for the gateway or individual employees.

Example: The USA Patriot Act requires strict KYC programs of all financial institutions to avoid terrorist financing. Several of the following topics refer to specific components of KYC due diligence practices.

Anti-Money Laundering (AML)

Money laundering is the process making income generated by illegal activity appear to be from a legitimate source. Anti Money Laundering (AML) refers to the laws and procedures designed to stop money laundering from occurring.

Example: The US Bank Secrecy Act requires financial institutions to comply with a minimum set of due diligence requirements outlined here: http://www.fdic.gov/regulations/examinations/bsa/bsa_13.html.

For more information on AML, visit http://www.finra.org/Industry/Issues/AML/.

Source of Funds

To support AML, financial institutions must be able to determine within reason whether the source of a customer's deposits are linked to criminal activity.

Determining the exact source of funds may not be administratively feasible for every customer. As a result, some regulatory authorities may not provide specific regulation or guidance for all accounts. In specific cases, however, authorities may require financial institutions to identify and report the source of funds.

Example: The US Bank Secrecy Act requires financial institutions to identify and report the source and expected use of funds totalling more than $1,000,000 USD in private bank accounts belonging to non-U.S. persons (deposited either directly, or indirectly via a liason).

Suspicious Activity Reporting

If a financial institution suspects that funds may be related to criminal activity, the institution must file a report (Suspicious Activity Report (SAR) / Currency Transaction Report (CTR)) with the appropriate regulatory authority. Failure to report

suspicious activity may result in in penalties for the institution.

Financial institutions may automatically generate and submit an electronic report

Example: The US Bank Secrecy Act requires any cash transactions over $10,000 USD to be reported to the government identifying the individual and the source of the cash. An example of the form required by the US Internal Revenue Service: http://www.irs.gov/pub/irs-pdf/f8300.pdf.

Travel Rule

The Travel Rule is enforced by the US Financial Crimes Enforcement Network (FinCEN; an agency of the US Department of Treasury) refers to the requirement for financial institutions sending a large amount (as of writing, value equalling or exceeding $3,000 USD) to provide the receiving institution with identifiable information about both the sender and receiver of the transfer. FinCEN may require each institution to provide this information about transactions when asked.

FinCEN outlines the required information: http://www.fincen.gov/news_room/rp/advisory/html/advissu7.html.

Workers Remittance

Workers Remittance refers to the act of workers in a foreign country sending money to their home country. Transfers are generally in cash, relatively low value (e.g. $500 USD), and channeled through remittance service providers (e.g. Western Union).

Since the systems are informal, originate in cash form, and represent significant aggregate volume ($500B USD/year) local regulatory authorities are concerned about the risk for money laundering and terrorist financing.

Office of Foreign Assets Control (OFAC)

The Office of Foreign Assets Control (OFAC; an agency of the US Department of Treasury) that administers and enforces economic and trade sanctions based on U.S. foreign policy and national security goals. OFAC helps financial institutions avoid directly or indirectly supporting activity by or with foreign states, organizations, and individuals.

Example: OFAC provides a list of specific individuals and companies that financial institutions are not allowed to support: http://www.treasury.gov/resource-center/sanctions/SDN-List/Pages/default.aspx.

A list of OFAC resources: http://www.treasury.gov/resource-center/sanctions/Pages/default.aspx.

Threshold

Any other reporting as required by law or internal policies in the country where the gateway operates.

Best Practices

Gateways should be transparent about their terms of use. A suggested end user level agreement may include consideration for:

Fees

Territory Coverage

Payment options

Deposit protection

Protection against unauthorized transaction

Regulation

Customer service

Top payment use cases

Deposit time

Chargeback Policy

Escheat

Escheat is the process of turning over unclaimed or abandoned property to the appropriate local authority. This is relevant to financial institutions whose customers may create an account, deposit funds to create a balance, but never redeem the balance. Escheat laws apply to issuers of balances and how those balances are administered after a certain time period.

Demmurage

Demurrage is the cost associated with owning or holding a currency over a given period of time. The costs can result directly from from maintaining an inventory of a physical currency (e.g. warehouse to store gold), or indirectly from currency inflation (e.g. central bank issues more currency).

Resources

International Ripple Business Association - The International Ripple Business Association (IRBA) provides unified procedures to establish trustworthy and secure services for Ripple customers. (http://www.xrpga.org/)

FFIEC Customer Identification Program - (http://www.ffiec.gov/bsa_aml_infobase/pages_manual/OLM_011.htm)

To learn more about Ripple, visit Ripple.com or the Ripple Wiki.

Contact Information

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