Gateway Bulletin GB-2014-02 Action Recommended
New Feature: Balance Freeze
August 1, 2014

Overview

Similar to Bitcoin, Ripple implements virtual, physical-like currencies. As with physical coins or paper bills, once a Ripple balance is issued, the issuing party relinquishes control of the asset. The users trusting the issuer can pass around the balance person-to-person as they would any other physical coin or note.

This stands in sharp contrast to the "electronic money" managed by traditional financial institutions. In those systems, the institution maintains complete control of all transaction processing. This enables financial institutions the flexibility to stop transaction processing if systems become compromised, or to "freeze" individual account issuances if called upon to do so by authorities.

Ripple Labs is extending the Ripple protocol to enable support for both physical-like and electronic-like currencies. This will allow gateways additional feature flexibility and in some cases enable compliance with local laws.

Intended Use of The Freeze Feature

The freeze protocol extension gives gateways the ability to 1) globally freeze all their issued funds, or 2) freeze funds issued to a particular user. Frozen funds may only be sent back to the gateway who issued them.

The global freeze feature allows a gateway to freeze all balances issued by it. The gateway may still issue payments. Accounts holding frozen balances may return the funds to the gateway. This feature is useful for migrating users from one account to another and to safeguard users in the event of a compromise of the gateway account.

The individual freeze is intended primarily for complying with regulatory requirements which may vary from one jurisdiction to another. It also allows gateways to freeze individual accounts issuances in order to investigate suspicious activity. These features allow gateways to better operate in compliance of laws and regulations.

Opting Out of Individual Account Freeze

Some gateways may want to continue operating under the existing physical-like money system. In these cases, the gateway can permanently disable their own ability to freeze their issued assets individually. By opting out a gateway and its users will continue operating according to the same physical money rules to which they have become accustomed. This prevents gateways from freezing individual account issuances (of the gateway only) in the event that an account is compromised or is engaged in suspicious activity.

Deciding on a Metaphor

Since the freeze feature represents a significant shift in metaphor, Ripple Labs is encouraging each gateway to decide if they wish to employ or opt-out of these new features. In addition, Ripple encourages each gateway to notify their current users of their decision in advance of the freeze feature taking effect. That will allow users to opt-out and move to an alternate, physical-like money gateway.

Timeline

The Freeze feature will be implemented in two phases. On or before August 15th (rippled version 0.26.0 or later), gateways will have to ability to set their address' "NoFreeze" flag. Setting this flag permanently opts the gateway out of both the abilities to 1) individually freeze issuances and 2) unfreeze issuances globally.

The ability to actually freeze accounts will be enabled on September 15th. This interim month is intended to give users time to move their funds should they choose to do so.

- New flags available on or before (rippled version 0.26.0 or later): August 15, 2014
- RippleTrade client to identify frozen trust lines: August 15, 2014
- Freeze flags enforced: September 15, 2014

Actions Recommended

1. Gateways planning to disclaim freezing should:
   a. Set the NoFreeze flag on their Ripple address before September 15.

Note: If the freezing ability is required in the future, the gateway must migrate to a new issuing address.

2. Gateways planning on having freezing enabled for their issuances should:
   a. Revise their terms of use.
   b. Inform users of the revision.
   c. Follow their terms of use once freezing is enabled.

Additional Resources

- [Freeze feature in the Ripple Wiki](#)
- [User FAQ and explanations](#)
- [Freeze feature rollout: Option B](#)

Where to Go For Assistance

Ripple Labs is here to help. Please write integration@ripple.com with questions.

Technical Implementation: Use Cases

Global Freeze

<u>Use cases</u>
- One or more gateway wallets have been compromised.
- Need to migrate customers from an expired issuing account to affect an escheat policy.
- Need to migrate customers from an issuing account due to some change in terms.

<u>Action</u>
- Gateway freezes all outstanding issuances.
    - All trading activity of these issuances is ceased.
    - Direct currency issuance and redemption is allowed.

<u>Conclusion</u>
- If wallets are *not* compromised:
    - Global freeze is reversed.
        - Only possible if no_freeze was never set (see below).
    - Gateway communicates situation to users.
    - Normal activity is resumed.
- If wallets are compromised:
    - Gateway creates a new issuing wallet.
    - Gateway communicates situation with users.
    - Users migrate trust lines and balances are restored.

Individual Account Freeze

<u>Use cases</u>
- Suspicious or unusual activity is noticed on an individual account.
- A gateway's terms of use are violated by an individual account.
- Funds are held during a dispute resolution.

<u>Action</u>
1. Gateway freezes user's issuances in the suspicious or disputed account.
    a. Only possible if no_freeze was never set (see below).
2. Gateway conducts extended due diligence.
    a. Gateway contacts user if information is available.

<u>Conclusion</u>
- Gateway releases account freeze if activity determined legitimate.
- Gateway assists user in migration if their account has been compromised.

Technical Implementation: New Flags and Fields

Ledger entry changes

New account_root ledger entry flags
- *lsfNoFreeze 0x00200000*
  - If set, account may not freeze individual trust lines.
- *lsfGlobalFreeze 0x00400000*
  - If set, account is globally frozen.

New ripple_state ledger entry flags
- *lsfLowFreeze 0x00400000*
  - Low account has frozen the trust line.
- *lsfHighFreeze 0x00800000*
  - High account has frozen the trust line.

Transaction changes

New AccountSet transaction options
- *asfNoFreeze 6*
  - Set the no freeze flag.
- *asfGlobalFreeze 7*
  - Set the global freeze flag.

New TrustSet transaction flags
- *tfSetFreeze 0x00100000*
  - Freeze the trust line.
- *tfClearFreeze 0x00200000*
  - Unfreeze the trust line.

Json changes

New RPC account_lines JSON field
- "freeze" = true
  - If you have frozen the trust line.
- "freeze_peer" = true
 - If the peer has frozen your trust line.

Technical Implementation: Semantics

New AccountSet Semantics
- An account that has not set the no freeze flag may clear the global freeze flag.
- Once set, the no freeze flag can never be cleared.
- Global freeze cannot be cleared if no freeze is set.

New TrustSet Semantics
- Each party can freeze or unfreeze their own issuances.
- An account that has set the NoFreeze flag may not freeze a trustline.
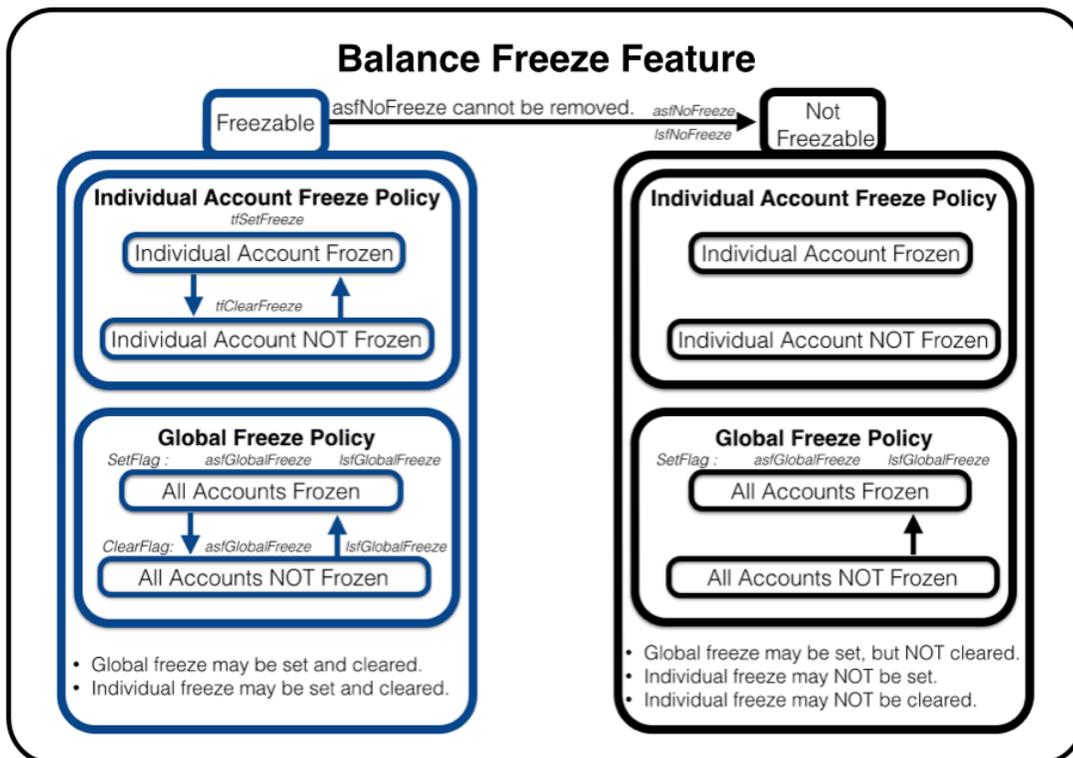
Additional Notes
- Offers may not be placed to sell a frozen asset.
- Offers placed to sell an asset whose issuer has frozen the owner's line to them are considered unfunded during payment processing.
- Outstanding offers that are frozen are considered unfunded.
- If an account is globally frozen, its order books are treated as if they were empty.
- Existing offers are not automatically removed as unfunded but may be cancelled by those who placed them.
- During payment processing and pathfinding, a path that redeems frozen funds is treated the same as if the line wasn't frozen.
  - A frozen trust line has no effect on acquiring more of the asset.

Disclaimer:
- While Ripple Labs has tried to ensure the accuracy of this document, it may contain errors.