Investment fund services on Provenance
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SUMMARY OF OPPORTUNITY

The asset management industry is plagued by costly inefficiencies and intermediation. North American investment management companies spent over $300 billion in 2018 on operations, technology, custody, compliance and administration.

Provenance is a production blockchain for the financial ecosystem. Introduced in late 2018, Provenance has been used by firms such as Jefferies, Figure and Caliber Loans to reduce costs and improve execution in the loan origination, financing and securitization market. Over $1 billion of assets have been originated, financed and sold on Provenance, with industry participation and business use cases growing each month.

Our vision is to use Provenance to build an integrated ecosystem where issuers of securities, fund managers and investors all utilize a common blockchain ledger, registry and exchange to create unparalleled value. In this paper, we apply Provenance to a set of opportunities in the asset management space. Specifically, we look at investor onboarding, transfer agent and other registrar services, securities exchange and ledger/custody. We believe Provenance can generate significant cost savings in both staffing and third-party costs, improve speed and transparency and introduce new product opportunities in the asset management space.
ABOUT PROVENANCE

Provenance is a public but permissioned, distributed stakeholder blockchain for the financial ecosystem. Provenance combines the distributed, trustless and immutable characteristics of blockchain with the function of a ledger, registry and exchange.

Provenance utilizes a set of stakeholders – 12 financial firms – to validate transactions, and omnibus banks to act as a bridge between blockchain and fiat. Notably, Provenance supports immediate, riskless, bilateral trading between two parties, be it to trade a security or subscribe to a fund.

Additional information on Provenance is available in the Provenance White Paper.
APPLICATIONS FOR POOLED INVESTMENT VEHICLES

Provenance delivers services to investment managers that can improve the operating efficiency of the funds, reduce costs and improve the investor experience. Immediate benefits include:

- **Investor Passport** - Reduces cost and friction of validating investors, maintaining BSA/AML records.
- **Registrar** - Reduces or eliminates role of transfer agent in managing subscriptions, redemptions, cap table and investor communication.
- **Exchange** - Allows for up to 24x7 trading of fund subscriptions.
- **Ledger** - Reduces custody and administration costs.

With broader adoption of Provenance, additional benefits can be realized:

- **Registrar** - Reduce issuing costs using digitally native securities.
- **Exchange** - Real time settlement of native securities, reduced/eliminate counterparty exposure and name limits.

Figure and its partners have realized upwards of 133 basis points in value using Provenance for the origination, financing, trading and securitization of over $700 million in loans on Provenance. While the basis point value gain is smaller for fund custody and administration, we believe the dollar amount of benefit is at least as great.
INVESTOR PASSPORT

Figure, a leading financial platform built entirely on Provenance, is launching a verification/onboarding solution called Investor Passport with two objectives:

- Collect source of truth data about an investor and store it on Provenance
- Allow the investor to share that information with various financial institutions on Provenance

Sharing source of truth data can facilitate the opening of accounts and the purchase of products and services requiring identity, accreditation and/or qualification.

The trustless and immutable characteristics of Provenance allow for a unique solution for investor accreditation and BSA/AML compliance. Investor Passport is permission based, allowing the investor to share only the information required by the financial institution to satisfy their approval and oversight requirements. Investor Passport provides financial institutions with streamlined KYC information, reducing their cost of compliance and enhancing the customer experience.

Figure utilizes aspects of its existing loan origination application to create an Investor Passport. For illustrative purposes, we’ll use an individual investor. Investors start the process of verifying identity by uploading a government issued identification and a photo.

This visual upload is retained as part of the Investor Passport and can be provided to a requesting financial institution as part of the onboarding review process.

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Additional fields can be captured and shared including:

- Date of Birth (or age threshold, i.e. >21)
- Legal Address
- State, County, City and Country of Residence

The license expiration date creates a trigger notifying the investor of an upcoming expiration of the credential and triggers the investor to renew the source document and the Investor Passport.

**Accredited Investor**

In order to prove accredited status and buy private/exempt securities, the investor must clear income or asset thresholds. In Rule 506(c) the SEC provides a safe harbor related to the determination of accredited investor status for funds or companies that review certain documents. Investor Passport will review these safe harbor documents. For Investor Passport, proving accredited status means linking tax filings, earnings statements or bank or investment accounts. Figure has built these connections into IRS.gov and bank and brokerage accounts as part of its lending solutions, and has extended this application to Investor Passport.

**Qualified Institutional Buyer (QIB)**

Institutions designated as Qualified Institutional Buyers, pursuant to rule 144A, can have that immutable designation appended to their Investor Passport so they don’t have to provide that information each time they want to invest in a new fund. Often, background on corporate officers and documents of incorporation will accompany institutional buyer Investor Passports. While the background checks are often manual the first time through the Investor Passport, the supporting documentation remains part of the Investor Passport and can be shared easily by the QIB with the next investment manager.

**BSA/AML/OFAC Checks**

Figure runs its normal Bank Secrecy Act (BSA) Anti-Money Laundering (AML) Office of Foreign Assets Control (OFAC) and fraud checks on investors utilizing Investor Passport. The resulting information – including source material and history – is held in
the encrypted Investor Passport. Information is updated periodically, where frequency is determined by investor characteristics.

The completed Investor Passport is held on Provenance and can be shared at the investor’s discretion with any other clearing broker, custodian or fund manager who is a Provenance Member.

**Sharing an Investor Passport**

When an Investor Passport user subscribes to a new fund, the fund issuer issues the investor a public key to validate their information. The verification is specific to what is needed (e.g., this investor is accredited, this investor is a QIB, etc.) rather than providing specific information as to actual income or assets. The issuer may choose to create a copy of this validation along with the supporting methodology, though such a copy is redundant to the Investor Passport history.

Investor Passport makes it easier for the investor to share previously collected data in whole or in validated format:

- direct information (e.g. client’s actual income for each of the previous two years)
the smart contract can validate that the investor has cleared the threshold (YES, “investor has income exceeding $200K for each of the previous two years”).

Some firms may choose to take Figure’s attestation that background checks have been run and clearances provided, or they can take the original source data provided via the Investor Passport and match it to their own Bank Secrecy Act and Office of Foreign Asset Control databases and import it into their Anti-Money Laundering software for enhanced and ongoing oversight.

<table>
<thead>
<tr>
<th><strong>Investor Passport</strong></th>
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<tbody>
<tr>
<td>Provide a portable, immutable and ongoing updated record of accreditation and BSA/AML investor status.</td>
<td>● Reduce burden on investors to enter redundant information across investments.</td>
</tr>
<tr>
<td></td>
<td>● Reduce risk missing ongoing accreditation and/or BSA/AML monitoring.</td>
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<tr>
<td></td>
<td>● Minimize the sharing of Personally Identifiable Information (PII).</td>
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PROVENANCE AS REGISTRAR

Provenance as a registry provides certainty of shareholder or investor information. Investor communication and reporting can be done through Provenance, with immutable confirmation of receipt. Functions such as voting can be done electronically and held regularly or ad-hoc. Provenance can reduce costs and errors while providing new options for liquidity.

**Fund Transfer Agent**

Provenance is creating Transfer Agent Services (TAS) to record shareholder activity for funds. For the example below, we’ll assume a private, open ended fund with daily trade cutoff times as a starting point.

**Fund Subscriptions**

Investors who have opened accounts and received accreditation approval via Investor Passport can easily make new investments in a fund on Provenance as all their information is stored on Provenance.

In order to make a new investment in a fund, the investor enters an order to purchase, delivers fiat into the omnibus bank, and a settlement token is delivered on chain. The cutoff time of when that token is accepted is a function of the fund manager (and ties into the Custody discussion in this paper) and can be done through a smart contract to manage subscriptions. At the time of subscription, the token is swapped for a new fund interest registered in the investor's name on Provenance, and the fund redeems the token for fiat that is released to the fund's account.
**Fund Redemptions**

Redemptions work in a similar way. The investor notifies the fund of the redemption. The fund nets its subscriptions and redemptions, and if needed, sells securities or draws on a line to meet the redemption. The fund places the proceeds in the omnibus bank and a token is delivered to the fund on chain. That token is exchanged with the investor for their fund interest (or fraction thereof), and the investor uses the token to release the cash to their account.

**Real Time Visibility**

Using this process, all parties - including the portfolio manager, fund accounting, etc - have real time visibility to net subscriptions and redemptions. Reports can be built through smart contracts to deliver aggregated information (e.g., daily, weekly, monthly) to permissioned participants.

While the fund may only create and destroy subscription interests at specific cutoff times, it may provide the ability for two private parties to trade the fund interests bilaterally.
Reporting and Communication

TAS allows all parties to have real time visibility to net subscriptions (redemptions) and the timing therein, including the portfolio manager, fund accounting, etc. Reports can be built through smart contracts to deliver aggregated information (e.g., on demand, daily, weekly, monthly) to permissioned participants. Documents – including subscription agreements – are stored in immutable form and retrievable on demand. Information can feed third party systems as needed.

As Provenance is a registry, all investors in a given fund are known. The fund manager has the ability to build quorum, distribute information and validate receipt. Proof of the correspondence is stored in immutable form.

Registrar - Fund Transfer Agency

| Provide a solution for investor onboarding and approval, ledger for investor/shareholder accounts, delivery and tracking of documentation and investor communication. | • Reduce cost of TA  
• Provide real time visibility to investor subscriptions/redemptions  
• Reduce risk of document loss, unknown timing of document acceptance  
• Improve investor communication and voting |

Direct Issuance

Issuers of securities can leverage Investor Passport and TAS to issue directly to buyers on Provenance.

For example, assume a conduit was issuing commercial paper. The issuer creates the paper as a digital security on Provenance. Using the exchange, the issuer offers paper to buyers approved through Investor Passport. The issuer can confirm receipt and signature of offering documents on chain. Investors submit their fiat investment through an omnibus bank, the bank delivers the investor a settlement token on
chain, the token is redeemed by the issuer simultaneously with the issuance of the digital security to the investor, and the transaction is memorialized.

Over time, the issuer can use TAS for investor communication, payment of principal and interest (if applicable), and ultimately to redeem the digital security. Redemption works opposite of subscription; the issuer pushes money into the omnibus bank, collects the settlement token and swaps the token to the investor for the digital asset, memorializing in the registry.

Registrar – Direct Issuance

| Provide a solution for entities to directly issue securities to qualified investors | • Provide lower cost, disintermediated access to investors |
| • Reduce cost of cap table management and administration |
| • Reduce record keeping, payee agent and redemption expenses |
PROVENANCE AS EXCHANGE

Secondary Market for Shares of a Fund
With the approval of the fund manager, two parties could trade their interests in the fund 24x7, providing liquidity at all times.

Stable NAV Funds
Funds that trade at a stable NAV (like money market funds) could offer liquidity between authorized members who purchase at $1 NAV. From a practical standpoint, the fund is not involved in the transaction, it is merely an exchange of existing shares by approved members at the expected NAV of $1. The Total Net Assets of the fund would not change in this type of transaction which occurs outside of the fund.

Floating NAV funds
For funds that have floating NAVs that vary widely depending on the underlying assets, Provenance can offer additional liquidity options between members outside of the normal cutoff times for the fund. Much like the example of the Secondary Market Trade of a Private Security, the seller and buyer agree on a price. The fund can use Investor Passport to approve the buyer (e.g. only US investors) but does not have to make any attestation to the price of the transaction, nor does that price have to reflect the NAV of the fund, either at close or between trading sessions. The buyer then deposits fiat in an omnibus bank, they receive a settlement token on chain, the token is delivered to the seller on reassignment of ownership of interest, and the seller redeems the token for fiat. The fund has the date, time, amount, and supporting documentation of the transaction on the Provenance TAS.
Real Time – Intraday NAV

Mutual funds still price at the end of the trading day and publish an end-of-day NAV. By feeding real time pricing into a ledger, the fund can produce a real time, intraday NAV. By custodying assets on Provenance and using pricing feeds and portfolio weights, the fund manager can publish an intraday NAV and offer intraday (or after hours) liquidity with the fund if it is record kept on Provenance.

Buyers and Sellers can use the Intraday Indicative NAV to zero in on a price, but ultimately, they would be transacting between themselves, not with the fund.

During market hours, the fund managers can see demand in real time. This reduces the need for cutoff times for subscriptions or redemptions, as the fund manager knows the NAV and can automate portfolio readjustment against the investor request.

This functionality allows for intraday liquidity for mutual funds and pools that today settle at NAV at the end of the trading day, essentially, creating a tradeable share or ETF-like vehicle for a mutual fund.
These use cases can be extended to closed end funds, public funds (mutual funds) and even ETFs. For ETFs, the management of subscriptions and redemptions to fund unit creation and destruction can be done real time and simultaneously, eliminating the net asset value (NAV) and price drift.

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<th>Exchange – Secondary Market for Fund Shares</th>
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<td>Provide after hours or intra-session trading of fund shares</td>
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PROVENANCE AS LEDGER

Custody

In discussing custody on Provenance, it is important to note that the blockchain does not eliminate the regulatory need for a qualified custodian; rather, Provenance Custody Services is an alternative technology platform (similar to FIS or SEI) for such a custodian to use and acts as the administrator.

The custodial services offered on Provenance are:

- recordkeeping of assets, both digitally native assets and tokenized assets held off chain
- asset servicing
- reporting services
- transaction processing and settlement

Partner custodian banks will offer cash settlement and act as the intermediary between fiat currency and Provenance as described in many of the examples. The partner custodian will offer other services to the fund such as lines of credit, payment services, and remittances.

As with all data on Provenance, custodians can customize reporting solutions in scope, frequency and permission for internal and external consumption.
Assets Native to Provenance

Provenance provides a compelling platform for the trading of securities native to the blockchain. Native assets are those assets that were originated on Provenance (like Figure HELOCs) whose cash flows come through an omnibus bank.

When a fund buys the asset, it uses the omnibus bank and settlement token for real time, bilateral transactions. These assets might be loans or securities, with Provenance acting as registrar. Building on the use cases outlined in this document, we’ll use the issuance, trading and redemption of asset backed commercial paper (ABCP) to illustrate this value.

We have written about how warehouse originators can leverage Provenance to improve efficiency and reduce costs. Assume a warehouse provider is using ABCP to fund its lending. The provider can establish a marketplace for new issuance and subsequent trading of their ABCP. Buyers in the marketplace use Investor Passport to establish eligibility and receive notification of new issuance.
When the warehouse provider has draws, they issue ABCP through the marketplace. Buyers push fiat into an omnibus bank, receive a settlement token and exchange that token for the ABCP. The bilateral transaction settles immediately (T+0), eliminating any counterparty or settlement risk. This has the benefit of eliminating the need for approved counterparties and/or tracking counterparty settlement exposure.

Buyers have the ability to look at the underlying collateral backing the ABCP in real time. Issuers use Provenance to track buyers, issue communication and, ultimately redeem. The redemption process is the opposite of a purchase: the issuer puts fiat into an omnibus bank, settlement tokens are created for each holder, those tokens are exchanged for the ABCP and subsequently redeemed by the buyers for fiat.

In this scenario, Provenance acts as the registrar of ownership (e.g., there is no DTC or similar clearing entity). Buyers have the ability to trade their ABCP in the marketplace, or to hold to maturity. As ABCP trades, Provenance records the new buyer, ensuring the issuer (and the buyer’s custodian, as relevant) always knows who is holding the ABCP. Smart contracts drive redemption activity, including scheduling and reporting.

In addition to the immutable data provided at origination, native assets provide a custodial benefit of known cash flows and transferability. When the asset has a cash flow (on the right side in the example below, the homeowner makes a payment against the HELOC) it can be immediately distributed to its owner (a fund) and, if relevant, immediately distributed again (to the fund investor).
Traditional (Non-Native) Assets

Non-native assets work differently on Provenance, but from a fund manager’s perspective, the process is consistent with current processes.

The advantage to the portfolio manager is the real time visibility into cash flows made either via direct order entry by an investor in the fund, or via payments made from an underlying, performing asset (see previous examples).

We will use the example of a money market fund that purchases commercial paper.

When a fund manager receives information that the fund has received cash to be reinvested in the fund or an order from an investor and they wish to purchase a security, they search from dealer inventory via their normal trading platform.
Once the security is registered at DTCC in the custodian’s name, the custodian’s system will record the asset on Provenance, and the settlement process (e.g., clearing broker, registrar) performed by the custodian stays the same.

Fund managers with other funds may wish to aggregate and net trades at the complex level and will purchase securities via the normal dealer process and allocate them proportionally to the fund on Provenance as they would with any other fund.

Clearing and settlement of the security happen in the normal process with the slight nuance that the fund on blockchain might be custodied at an alternate qualified
custodian and thus different cash settlement would be set up when the fund is set up on the trading platform.

There are greater custody, trading, clearing and settlement efficiencies for native versus non-native assets, though both benefit from an immutable ledger and document repository. Further, irrespective of the composition of assets, all funds can benefit from the intersection of real time information with investor flow.
Ultimately, as multiple custodians and their clients use Provenance, real time settlement between counterparties can occur. In the same way that custodians are able to cross trade within their platform and just record the net settlement on a centralized ledger, Provenance will offer multiple custodians the ability to provide real time trading and settlement on platform.

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<tr>
<th>Ledger - Custody</th>
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<tbody>
<tr>
<td>Provide a solution for the custody, administration and reporting of data to funds and their investors</td>
<td>• Reduce custody and administration costs</td>
</tr>
<tr>
<td></td>
<td>• Support higher frequency subscription/redemptions</td>
</tr>
<tr>
<td></td>
<td>• Capture and distribute cash flows as they occur</td>
</tr>
<tr>
<td></td>
<td>• Improve timeliness of data for reporting</td>
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<tr>
<td></td>
<td>• Potential to eliminate counterparty exposure and eliminate the need for approved counterparties</td>
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**CONCLUSION**

Provenance is building an integrated and smart platform specifically designed to streamline and improve the issuance, tracking and trading of securities. More broadly, the Provenance ecosystem delivers better functionality to the professionals managing client money and to deliver better value to investors and fund shareholders.
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