



# RedStone

How to unlock DeFi potential using  
Cross-Chain Oracles

# Defi without assets pricing data



No collateral, option settlements or margin calls

# What if nodes could query external APIs directly



Issues with determinism & security

## 2-phase approach

```
function contractLogic() {  
  ...  
  requestOracleData(query);  
}
```

```
function onOracleResponse(response) {  
  price = response;  
  ...  
}
```



**Flexible**  
Can query any API



**Inconvenient**  
Breaks execution flow

# Fully persisted price feeds

```
function contractLogic() {  
  ...  
  price = priceFeed.latestData();  
  ...  
}
```



## Convenient

Latest price is available on-chain



## Expensive & non-scalable

Constant costs regardless of usage

# Redstone evm connector

```
contract YourContras is PriceAware {  
  
    function contractLogic() {  
        ...  
        price = getPriceFromMsg(query);  
        ...  
    }  
  
}
```



## Convenient

Latest price appended to transaction



## Flexible

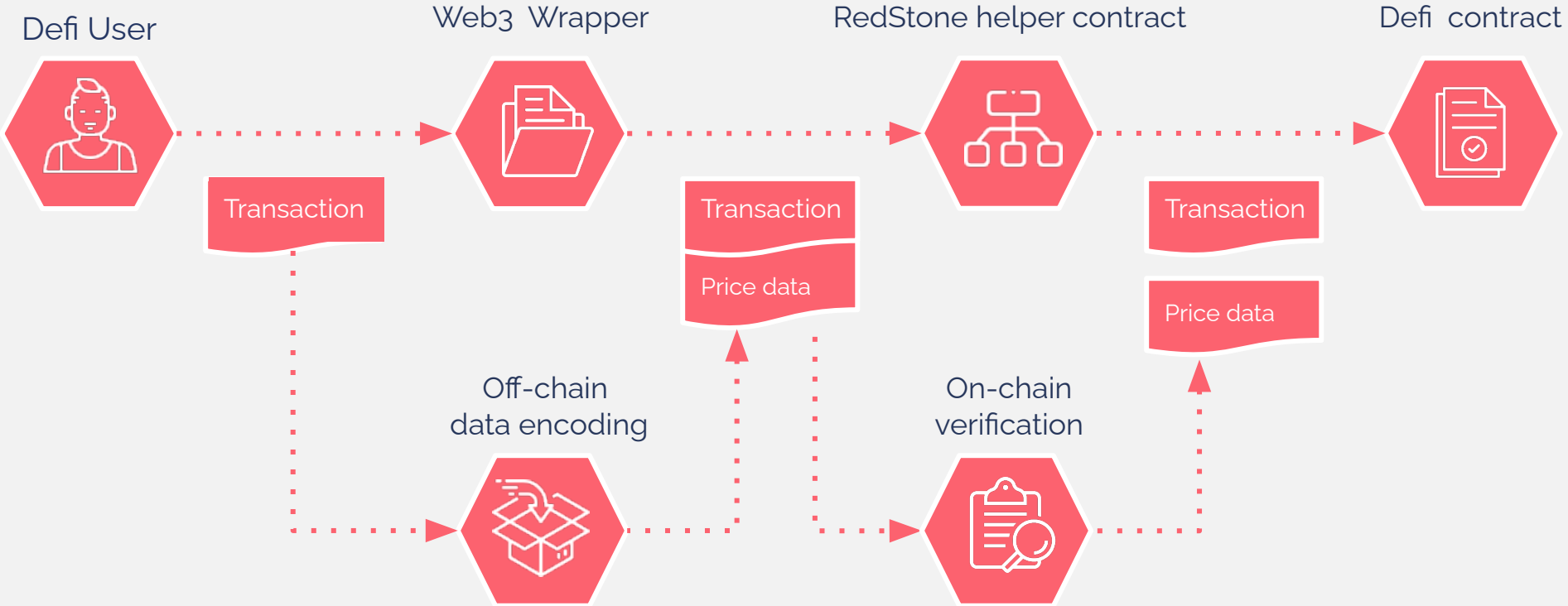
Connect to multiple APIs at low cost



## Cross-chain

Doesn't touch user storage

# How it works







# Cross-chain by design

Data providers nodes



RedStone cache layer

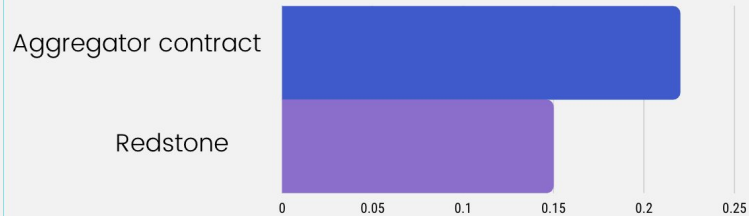


Target blockchains

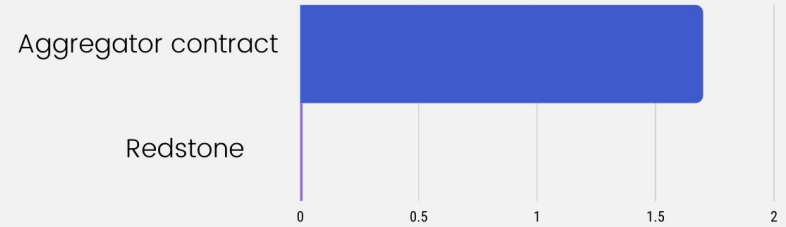


# How much does it cost

Data access costs



Data storage costs



\*) Prices in USD based on gas price 25.03.2022

## Example – stable NFT marketplace

```
// Created a new sell order
// This function requires approval for transfer on the specified NFT token
function postSellOrder(address nftContractAddress, uint256 tokenId, uint256 price) external {}

// Only order creator can call this function
function cancelOrder(uint256 orderId) external {}

// Allows to get info about all orders (including canceled, and executed ones)
function getAllOrders() public view returns (SellOrder[] memory) {}

// Returns expected price in ETH for the given order
function getPrice(uint256 orderId) public view returns (uint256) {}

// Requires sending at least the minimal amount of ETH
function buy(uint256 orderId) external payable {}
```

Simple interface for listing and buying NFTs

# Connecting Oracles

```
import "redstone-vm-connector/lib/contracts/message-based/PriceAware.sol";  
import "./Marketplace.sol";
```

```
contract StableMarketplace is Marketplace, PriceAware {  
    ...  
}
```

```
function isSignerAuthorized(address _signer) public pure override returns (bool)  
{  
    return _signer == 0x0C39486f770B26F5527BBBf942726537986Cd7eb;  
}
```

Flexible logic for data source verification

## Accessing price

```
// `_getPriceFromOrder` function uses the `getPriceFromMsg` function,  
// which fetches signed data from tx calldata and verifies its signature  
function _getPriceFromOrder(SellOrder memory order) internal view override returns (uint256)  
{  
    return (order.price / getPriceFromMsg(bytes32("ETH"))) * (10**8);  
}
```

## Updating client code

```
const wrappedMarketplaceContract = WrapperBuilder.wrapLite(marketplace)  
  .usingPriceFeed("redstone", { asset: "ETH" });
```

Extension of an ethers.js contract

# Our data

The screenshot displays the RedStone website interface. On the left is a navigation sidebar with icons for Prices, Sources, Data feeds, and Custom URLs. The main content area features a search bar and a 'Use our data' button. Below these are category filters: All (1093), Cryptos (1021), Stocks (16), Currencies (10), PST (14), Avalanche (12), Custom (13), ETF (8), and Grair. A grid of 12 cryptocurrency price cards is shown, each with a logo, symbol, name, and price. A 'Feedback' button is visible on the right side of the grid.

Symbol	Asset Name	Price
BTC	Bitcoin	\$29,257.76
ETH	Ethereum	\$1,965.74
USDT	Tether	\$1.00
BNB	Binance Coin	\$322.88
DOGE	Dogecoin	\$0.08
XRP	XRP	\$0.41
ADA	Cardano	\$0.51
DOT	Polkadot	\$9.82
XLM	Stellar	\$0.13
AR	Arweave	\$14.29
CELO	Celo	\$1.32
AVAX	Avalanche	\$28.55

60+ sources, 1,000+ assets, ~3 bln data points

# Our data

◆ Ethereum (ETH): **\$1,971.18** +\$7.89 (+0.40%)

Last hour 1 day 3 days 7 days | Min: \$1,961.62 Max: \$1,973.51 Average: \$1,967.48

Last updated 7 seconds ago



## Data sources (32)

<input type="checkbox"/>	Huobipro	\$1,971.08
<input type="checkbox"/>	Kraken	\$1,970.60
<input checked="" type="checkbox"/>	Kucoin	\$1,971.21
<input type="checkbox"/>	Lbank	\$1,971.08
<input type="checkbox"/>	Liquid	\$1,960.00
<input type="checkbox"/>	Oceanex	\$1,971.98
<input type="checkbox"/>	Okcoin	\$1,971.90
<input type="checkbox"/>	Okex5	\$1,971.42
<input type="checkbox"/>	Poloniex	\$1,971.57
<input type="checkbox"/>	Probit	\$1,971.15
<input type="checkbox"/>	Qtrade	\$2,084.31
<input type="checkbox"/>	Stex	\$1,985.60

**60+** sources, **1,000+** assets, **~3 bln** data points



# Custom data feeds

## URL

`https://api.open-meteo.com/v1/forecast?latitude=13.736717&longitude=100.523186&hourly=temperature_2m&current`

## JSON path (See how JSONPath works)

`$.current_weather.winddirection`

## Comment

Comment

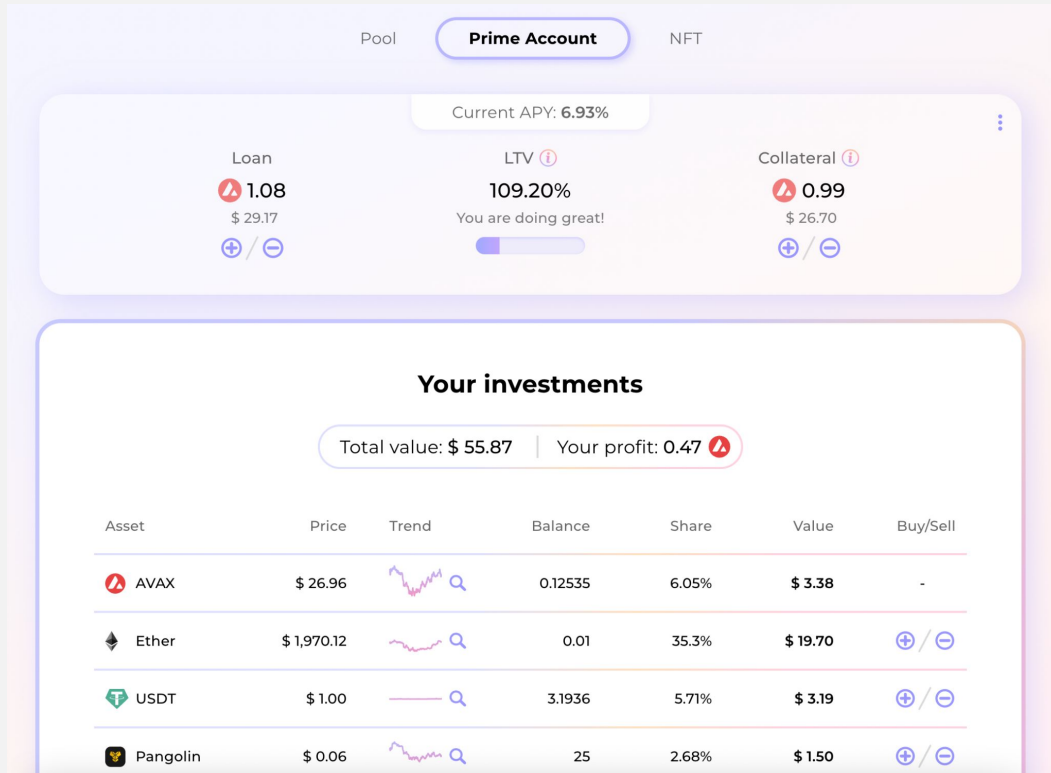
Evaluate

```
347     "hourly_units": {
348       "temperature_2m": "°C",
349       "time": "iso8601"
350     },
351     "longitude": 100.5,
352     "current_weather": {
353       "winddirection": 206,
354       "time": "2022-05-24T11:00",
355       "windspeed": 13.1,
356       "weathercode": 80,
357       "temperature": 29.9
358     },
359     "elevation": 1.9628906
360   }
```

```
1  [
2  | 206
3  ]
```

Specify your **custom data** feed with **url** and **jsonpath**

# Production use case – DeltaPrime



# User story - DeltaPrime



## User story - DeltaPrime

```
/**
 * Returns the current value of a loan in AVAX including cash and investments
 * @dev This function uses the redstone-evm-connector
 */
function getTotalValue() public view virtual returns (uint256) {
    uint256 total = address(this).balance;
    bytes32[] memory assets = getExchange().getAllAssets();
    uint256[] memory prices = getPricesFromMsg(assets);
}
```

# Node management



**Warp**  
by RedStone



## RedStone Main Demo

id: redstone-main-demo







Details

Nodes

Main RedStone Provider with all available tokens.

Nodes	Assets	Interval
2	1084	1 min

### Provided data:

Asset	Symbol	Sources
 Ethereum	ETH	
 Chainlink	LINK	
 Bitcoin	BTC	

## Contact



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