# AAVE V2 TVL 计算

### 简介

我们之前已经分析了如何获取代币价格(Uniswap Router)、如何解析 aToken 的精度、如何获取当 前以太的价格(相对于 U)。那么掌握了上述基础构建块,我们就可以计算代币的 TVL(Total Value Lock) 。



🤗 对于 TVL 的理解可以结合 compound 的 cToken,用户往 compound protocol 中存入基础 资产,获得相应数量的 cToken 作为兑换凭证。我们将池中的所有 cToken 数量(供应量)兑 换成基础资产数量,然后再乘以基础资产的价格,就可以得到总的锁仓量。

## 我们先分析下目前可以获取到的数据

- 1. 可以通过 uniswap Router 获取到以太的价格(U)
- 2. 可以通过借贷池合约获取到 AAVE V2 所有支持的代币列表 (allTokens)
- 3. 可以通过借贷池合约获取到 aToken 地址和精度信息(aTokenAdress & decimal)
- 4. 可以通过 ERC20 合约获取到 aToken 的 name、symbol 以及总供应量(symbol、totalSupply)
- 5. 可以通过 Aave Price Oracle V2 获取到代币相对于以太的价格(单个 token 的价格,比如 WBTC = 14.72 ETH)

## 完整代码

```
1 const Web3 = require('web3');
2 const uniswapABI = require('.../../json/uniswap.json');
3 const priceOracleAbi = require('../../json/priceOracle.json');
4 const erc20ABI = require('.../../json/erc20.json');
5 const lendingAbi = require('../../json/lending_pool.json');
7 const web3 = new Web3('http://cloudflare-eth.com/');
8 const uniswapRouter = new web3.eth.Contract(uniswapABI ,'0x7a250d5630B4cF539739d
9
10 // aave lending pool v2 contract instance
11 // aave v2 借贷池合约实例
12 const lendingContractInstance = new web3.eth.Contract(lendingAbi, '0x7d2768dE32b
13
14 // price Oracle contract instance
15 // aave v2 价格预言机合约实例
```

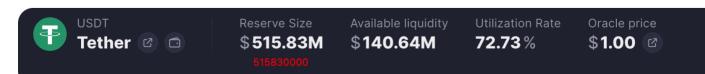
```
16 var priceInstance = new web3.eth.Contract(priceOracleAbi, '0xA50ba011c48153De246
17
18 // 打印所有 AAVE V2 支持代币列表的 TVL 信息
19 const main = async function () {
      // 调用 getReservesList API 获取 AAVE V2 支持的代币列表(地址形式显示)
20
      let allTokens = await lendingContractInstance.methods.getReservesList().call
21
      console.log(allTokens);
22
23
24
      // 获取以太坊相对于 U 的价格
25
      let pricesPair = await uniswapRouter.methods.getAmountsOut('10000000000000000
      console.log('pricesPair:',pricesPair);
26
      let oneEth = pricesPair[1] / 10 ** 6;
27
      console.log("1ETH exchange ", oneEth, "USDT");
28
29
      // 求出单个以太价格后,我们需要求当前 token 可以兑换多少个 ETH,一旦得出这个值,再乘1
30
31
      for (let i = 0; i < allTokens.length; i++) {</pre>
          // 解析 ctoken 对应的精度
32
33
          let tuple = await lendingContractInstance.methods.getReserveData(allToke
          let data = tuple.configuration.data;
34
          let dataHex = web3.utils.padLeft(web3.utils.numberToHex(data), 64);
35
36
          let bytes = web3.utils.hexToBytes(dataHex);
          let decimal = bytes[25];
37
38
          // 类似于 cToken 的一种代币,比如 USDT 对应的 aToken 为 aUSDT
39
          let aTokenAddress = tuple.aTokenAddress;
40
          const erc20Instance = new web3.eth.Contract(erc20ABI, aTokenAddress);
41
          let symbol = await erc20Instance.methods.symbol().call();
42
          // 获取 aToken 的总供应量
43
          let totalSupply = await erc20Instance.methods.totalSupply().call();
44
45
          // 获取当前处理代币的价格(单位 wei,即相对于以太的价格)
46
          let oraclePrice = await priceInstance.methods.getAssetPrice(allTokens[i]
47
48
          // 获取当前处理代币的价格(相对于 USDT 的价格)
49
          // token = 1234 wei = 1234 / 1e18 eth = 1234 / 1e18 * oneEth USDT
50
51
          // 推导出下面公式 : token price = 1234 * oneEth / 1e18
          // oraclePirce 是该代币相对于以太的价格(wei) 所以需要 / 1e18 转换为 Ether,系
52
          oraclePrice = oraclePrice / 1e18 * oneEth;
53
54
          // tvl = 总的锁仓量价值(求 aToken 的总价值)
55
          // 我们已经知道单个 token 的价格(U),只需要乘以它的供应量就可以得出它的锁仓量
56
          let tvl = totalSupply * oraclePrice / Math.pow(10, decimal);
57
          console.log('symbol:',symbol,'totalSupply:', totalSupply, 'tvl:', tvl);
58
59
      }
60 }
61
62 main();
```

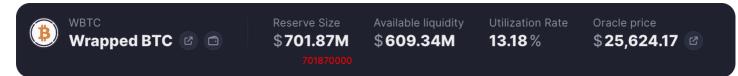
#### • 运行结果

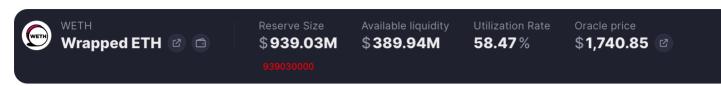
```
pricesPair: [ '100000000000000000', '1733547529' ]
1ETH exchange 1733.547529 USDT
symbol: aUSDT totalSupply: 515852928214248 tvl: 513656316.2620846
symbol: aWBTC totalSupply: 2739106769066 tvl: 698929246.9853772
symbol: aWETH totalSupply: 539598610044563141858467 tvl: 935419837.094587
symbol: aYFI totalSupply: 429324454294489934603 tvl: 2219374.0486450405
symbol: aZRX totalSupply: 48337364769445578131131352 tvl: 7993137.374290926
symbol: aUNI totalSupply: 2247112492118059157681916 tvl: 8716475.23159154
symbol: aAAVE totalSupply: 1214570414025894799302302 tvl: 62745950.82647077
symbol: aBAT totalSupply: 2152654814183473175988124 tvl: 349142.51697898225
symbol: aBUSD totalSupply: 1969543497619104570035733 tvl: 1959964.2289194805
symbol: aDAI totalSupply: 150388123597600043095837305 tvl: 150003061.08473197
symbol: aENJ totalSupply: 5490350969842216023693579 tvl: 1330442.5486839435
symbol: aKNC totalSupply: 101023862733900227686177 tvl: 46235.983546346535
symbol: aLINK totalSupply: 12696618611298992076278250 tvl: 64703580.995974086
symbol: aMANA totalSupply: 2977879721153328123378263 tyl: 990388.5070854085
symbol: aMKR totalSupply: 18696905967998147000618 tvl: 10874542.399909774
symbol: aREN totalSupply: 4067623138839591289895447 tvl: 231198.91340265452
symbol: aSNX totalSupply: 4208549781641757357229420 tvl: 7354634.054998839
symbol: aSUSD totalSupply: 2746537740835339882482565 tvl: 2757318.747509522
symbol: aTUSD totalSupply: 22559484553988819791494166 tvl: 22413827.231767897
symbol: aUSDC totalSupply: 587131538479157 tvl: 584947068.252343
symbol: aCRV totalSupply: 308610907461398162404347656 tvl: 196006844.94402105
symbol: aGUSD totalSupply: 135310782 tvl: 1347431.8395218288
symbol: aBAL totalSupply: 170404617249794616944097 tvl: 760098.931884777
symbol: aXSUSHI totalSupply: 2513630278639982907454677 tvl: 1957988.2173632733
symbol: aRENFIL totalSupply: 6358771807629559867136 tvl: 21524.78956481729
symbol: aRAI totalSupply: 99361362509882048178756 tvl: 271200.70179764763
symbol: aAMPL totalSupply: 181641648917675 tvl: 182245.01778219748
symbol: aUSDP totalSupply: 1180603034292411733593194 tvl: 1178827.038328568
symbol: aDPI totalSupply: 5357419091419456853058 tvl: 291345.85723305616
symbol: aFRAX totalSupply: 2713710014393252182338668 tvl: 2714647.8730243123
symbol: aFEI totalSupply: 15230499483795613721706 tvl: 14558.894888415534
symbol: aSTETH totalSupply: 927645737576551793894781 tvl: 1606644171.4849346
symbol: aENS totalSupply: 1110719733574721861027723 tvl: 8024598.99576109
symbol: aUST totalSupply: 7245377804024 tvl: 74590.62569866193
```

#### · 验证前三个代币的 TVL

symbol: aUSDT totalSupply: 515852928214248 **tvl: 513656316.2620846** symbol: aWBTC totalSupply: 2739106769066 **tvl: 698929246.9853772** symbol: aWETH totalSupply: 539598610044563141858467 **tvl: 935419837.094587** 







误差率

aUSDT: 4.21%

wBTC: 4.18%

wETH: 3.84%