



# DeFi Talents

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## Assignment 2

November 18, 2024



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# Assignment for next session

*Practical: Participate in a Twitter Space and tell us about it.*

## 1. L1s/L2s DeFi comparison

- Which metrics/aspects do you think are important for DeFi activities?
- What L1s/L2s have the most DeFi activity?
- What are the top 3 DeFi Categories in terms of TVL? What projects dominate each one of them?

Hint: [DeFiLlama](#)

## 2. Compare 3 lending platforms of your choice

- Tip: compare attributes e.g. "decentralized/centralized", "undercollateralized/overcollateralized"
- How are lending and borrowing interest rates determined?
- Do you think one specific platform is better than the others? Why?
- What are the risks associated with decentralized lending/borrowing?

## 3. What are flash loans and how are they executed? Check out <https://rekt.news/>

- Create 1 process chart of how a flash loan creates a profit for a flash loan user.
- Are flash loans overall good or bad? Do you consider the user an "attacker/hacker" or a legitimate use?
- How could protocols protect themselves from flash loan attacks?

**DYOR!**

# L1s/L2s DeFi comparison

**L1 solutions** are more secure, well-established, and have larger ecosystems but face issues related to scalability, cost, and speed.

**L2 solutions** address scalability, speed, and cost challenges by building on top of L1s, but they are newer and sometimes face challenges with security and interoperability.

Aspect	Layer 1 (L1)	Layer 2 (L2)
Scalability	Limited, often congested with low TPS	High scalability, thousands of TPS
Cost	High, especially in peak periods (e.g., Ethereum)	Low, optimized for cheaper transactions
Speed	Slow (minutes) due to congestion and block time	Fast (seconds), due to off-chain or batch processing
Security	High, well-tested over time	Inherits L1 security, but with added complexities
Ecosystem	Large, well-established DeFi ecosystem	Growing, but smaller and newer ecosystems
Interoperability	Generally strong within L1 network	Can be complex between different L2s but improving

# Which metrics/aspects do you think are important for DeFi activities?

## Important Metrics for DeFi Activities:

1. **Total Value Locked (TVL):** Represents the total assets deposited in DeFi protocols on a blockchain, indicating the platform's liquidity and user trust.  
[DeFi Pulse Docs](#)
2. **Transaction Volume:** Measures the total value of transactions over a period, reflecting the level of economic activity and user engagement.
3. **Number of Active Users:** Counts unique users interacting with DeFi protocols, providing insight into the user base and adoption rate.
4. **Transaction Fees:** Evaluates the cost of executing transactions, affecting user experience and protocol efficiency.
5. **Network Security:** Assesses the robustness of the blockchain against attacks, crucial for safeguarding user assets.

## What L1s/L2s have the most DeFi activity?

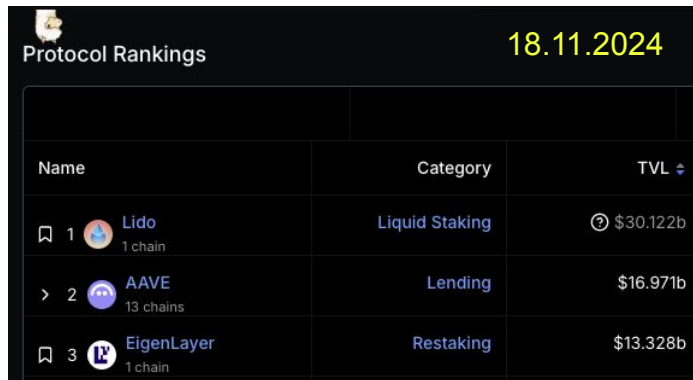
As of November 2024, the following blockchains exhibit significant DeFi activity:




- **Ethereum (L1):** Continues to lead in DeFi activity, hosting numerous protocols and maintaining a substantial TVL.
- **Binance Smart Chain (L1):** Offers lower transaction fees and has attracted a variety of DeFi projects.
- **Polygon (L2):** Provides scalability solutions for Ethereum, facilitating faster and cheaper transactions, thereby supporting a growing DeFi ecosystem.
- **Arbitrum (L2):** An Ethereum Layer 2 solution that enhances transaction throughput and reduces costs, gaining traction among DeFi users.

# What are the top 3 DeFi Categories in terms of TVL? What projects dominate each one of them? Hint: DeFiLlama

According to DeFiLlama, the leading DeFi categories by Total Value Locked are:

- Liquid Staking:**
  - Dominant Project: Lido, Liquid staking for Ethereum and Polygon. Daily staking rewards, no lock ups.
- Lending Protocols:**
  - Dominant Project: Aave, a protocol enabling users to lend and borrow a variety of cryptocurrencies.*
- Restaking:**
  - Dominant Project: EigenLayer, EigenLayer is a protocol built on Ethereum that introduces restaking, a new primitive in cryptoeconomic security. This primitive enables the reuse of ETH on the consensus layer*



Name	Category	TVL ↕
1  Lido 1 chain	Liquid Staking	🕒 \$30.122b
> 2  AAVE 13 chains	Lending	\$16.971b
3  EigenLayer 1 chain	Restaking	\$13.328b

## Compare 3 lending platforms of your choice

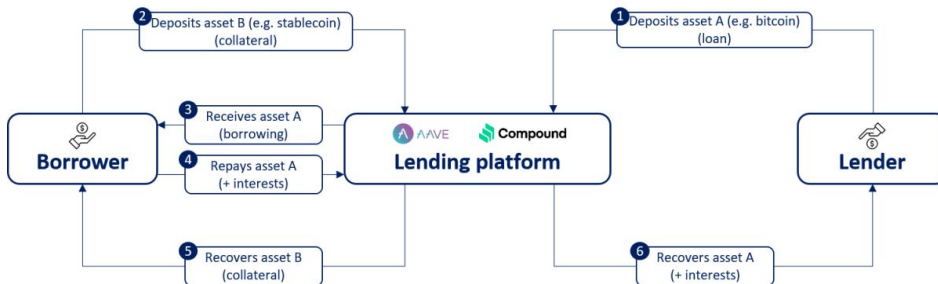
Tip: compare attributes e.g. "decentralized/centralized", "undercollateralized/overcollateralized"

Attribute	Aave	Compound	Nexo
Type	Decentralized	Decentralized	Centralized
Collateralization	Overcollateralized	Overcollateralized	Overcollateralized
Description	Non-custodial liquidity protocol; supports features like flash loans and rate switching.	Algorithmic protocol; dynamic interest rates based on supply and demand.	User-friendly crypto-backed loan platform with insurance and credit card options.
Governance	Token-based governance via AAVE token.	Token-based governance via COMP token.	Centralized decision-making by Nexo team.
Supported Assets	Wide range of cryptocurrencies, including niche tokens.	Major cryptocurrencies and stablecoins.	Major cryptocurrencies and fiat options.
Unique Features	Flash loans, rate switching, and high flexibility for developers.	Transparent smart contracts, automated interest rates.	Daily interest payouts, insurance for custodial assets, crypto credit cards.
Risk	Dependent on smart contract security.	Dependent on smart contract security.	Risk of centralization and custodial control.
Interest Payouts	Dynamic rates, often paid in deposited assets.	Dynamic rates, often paid in deposited assets.	Daily payouts in crypto or fiat.

# How are lending and borrowing interest rates determined?

In decentralized finance (DeFi), lending and borrowing interest rates are primarily determined by

- Market dynamics, specifically the supply and demand for assets within a given protocol.
- The demand for borrowing a particular asset increases, the interest rates for borrowing that asset tend to rise, incentivizing more lenders to supply liquidity.
- If there is an abundance of supply and lower borrowing demand, interest rates decrease to encourage borrowing.



This mechanism ensures that interest rates are dynamically adjusted to maintain a balance between lenders and borrowers, promoting efficient utilization of assets within the DeFi ecosystem.



## Do you think one specific platform is better than the others? Why?

No, I don't. I think it depends on my needs, risk tolerance, and specific use case.

For example:

1. **Aave** : Ideal for Advanced DeFi users, developers, and those needing unique features like flash loans.
2. **Compound**: Ideal for Users seeking simplicity, security, and exposure to core crypto assets.
3. **Nexo**: Ideal for Beginners and users seeking simplicity, traditional finance integrations, or custodial security.

# What are the risks associated with decentralized lending/borrowing?

**1. Smart Contract Vulnerabilities:** DeFi platforms operate on smart contracts, which, if not thoroughly audited, can contain bugs or vulnerabilities. Exploiting these flaws can lead to significant financial losses.

**2. Collateral Volatility:** Assets used as collateral in DeFi are often cryptocurrencies, known for their price volatility. A sudden drop in collateral value can trigger liquidations, resulting in losses for borrowers.

**3. Liquidity Risks:** High demand for withdrawals or loans can strain a platform's liquidity. Insufficient liquidity may prevent users from accessing their funds promptly.

**4. Governance Risks:** Many DeFi platforms are governed by token holders. Concentrated token ownership can lead to decisions that may not align with the broader community's interests.

**5. Regulatory Uncertainty:** The evolving regulatory landscape for DeFi can introduce compliance challenges and potential legal risks for users and developers.

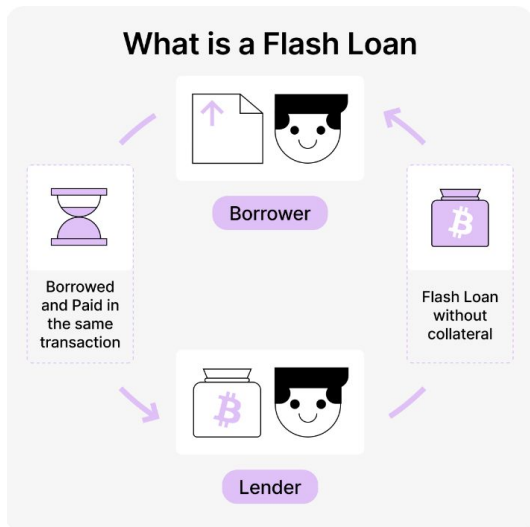
**6. Oracle Manipulation:** DeFi platforms often rely on oracles to fetch external data, like asset prices. If an oracle is compromised, it can lead to incorrect data inputs, affecting lending and borrowing terms.

**7. Platform-Specific Risks:** Each DeFi platform has unique protocols and mechanisms. Users should understand the specific risks associated with the platform they choose to use.

# What are flash loans and how are they executed? Check out <https://rekt.news/>

## DEFINITION

A flash loan is a type of loan where a user borrows assets with no upfront collateral and returns the borrowed assets within the same blockchain transaction. [\[ref\]](#)



<https://www.croptio.io/loan/flash-loans-crypto>

## How Flash Loans Work: 7 Steps

1. The borrower selects a DeFi platform with flash loan support.
2. The borrower creates a smart contract for borrowing and repayment in a single transaction.
3. The borrower links the wallet to the DeFi platform and executes the contract.
4. The DeFi lender sends requested assets to the borrower.
5. The borrower uses borrowed assets for predefined contract actions.
6. Smart contract refunds funds to the lender.
7. The lender checks the balance; if the repayment is insufficient, the transaction is reversed. If successful, assets return to the lending pool/protocol.

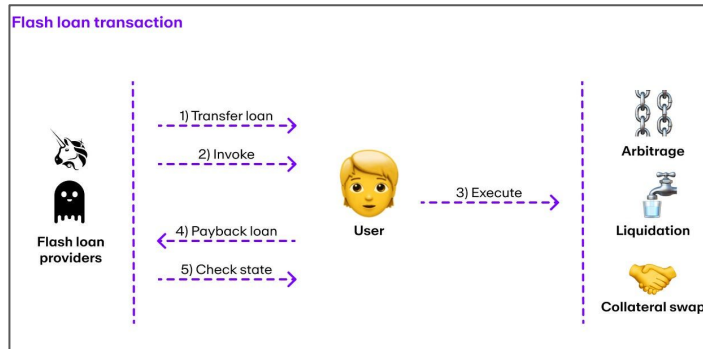
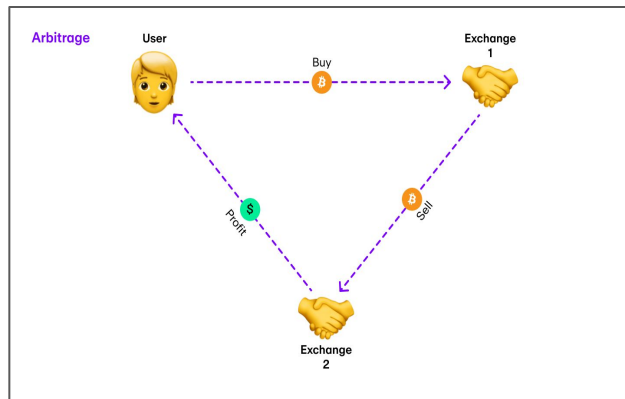
Techopedia

[\[ref\]](#)

# Create 1 process chart of how a flash loan creates a profit for a flash loan user.

**Arbitrage** is the strategy of leveraging price differences for the same asset in different exchanges to make a profit.

One way some seek to generate a profit with flash loans is by becoming a **liquidator**. When a debt becomes undercollateralized, a class of users called liquidators will trigger a liquidation event to buy undercollateralized assets at discounted prices.



<https://www.moonpay.com/learn/defi/defi-flash-loans>

## Example to create a profit:

- **Flash Loan Amount:** 5,000 ETH
- **Price on Exchange 1 (buy price):** \$200 per ETH
- **Price on Exchange 2 (sell price):** \$220 per ETH
- **Profit per ETH:**  $\$220 - \$200 = \$20$
- **Total Profit Before Fees:**  $5,000 \text{ ETH} * \$20 = \$100,000$
- **Flash Loan Fee (0.09%):**  $5,000 \text{ ETH} * \$200 * 0.09\% = \$9,000$  (for example)
- **Final Profit:**  $\$100,000 - \$9,000$  (flash loan fee) = \$91,000

In this process, the flash loan allows the user to leverage a significant amount of capital quickly, without needing initial collateral, and profit from small price differences across markets.

# Are flash loans overall good or bad? Do you consider the user an "attacker/hacker" or a legitimate use?

Flash loans can be seen from multiple perspectives, and whether they are "good" or "bad" largely depends on how they are used and the broader context of the DeFi ecosystem.

## Pros of Flash Loans:

- Legitimate Arbitrage Opportunities
- Innovative Financial Use Cases
- Access to Large Capital

## Cons of Flash Loans:

- Potential for Exploitation (Attacks)
- Market Distortion
- Security Concerns

## Legitimate Use (Non-Malicious):

**Arbitrage Trading:** When a flash loan is used purely for arbitrage (e.g., exploiting price differences between two exchanges), the user is typically seen as a legitimate participant in the market.

**Financial Optimizations:** Users who leverage flash loans to swap collateral or restructure debt without needing to sell assets are often considered engaging in legitimate financial practices.

## Potentially Malicious Use (Attacker/Hacker):

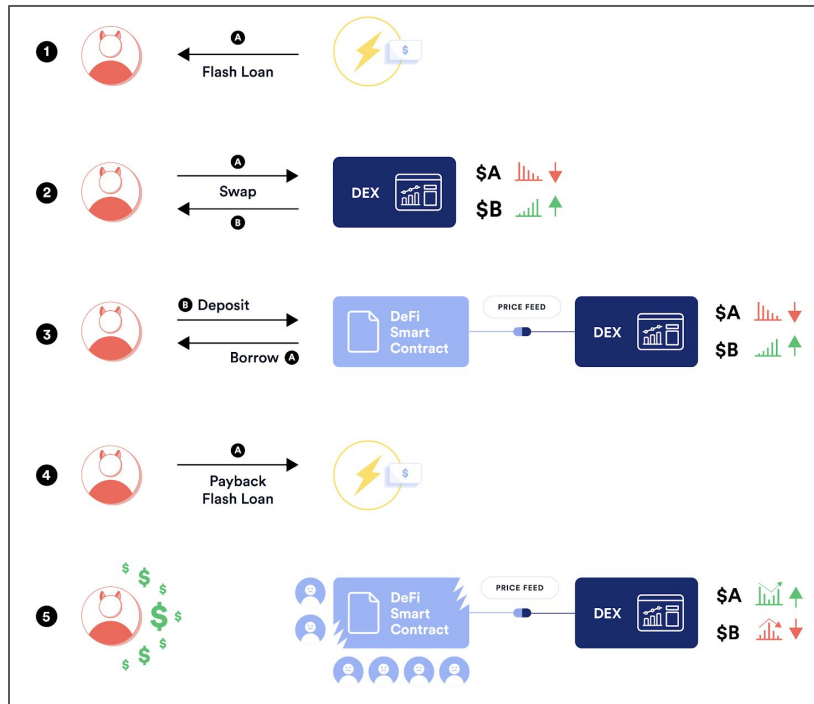
**Exploiting Vulnerabilities:** If a flash loan is used to exploit flaws in a smart contract, manipulate price oracles, or execute "**pump and dump**" schemes, the user would be considered an attacker or hacker.

## Regulatory and Ethical Concerns

# How could protocols protect themselves from flash loan attacks?

Here are the top 5 most important points for protecting DeFi protocols from flash loan attacks:

1. **Improved Oracle Security:** Use decentralized oracles and Time-Weighted Average Prices (TWAP) to prevent price manipulation.
2. **Transaction Limits:** Set size limits on loans, trades, or withdrawals to reduce the impact of large-scale flash loan attacks.
3. **Anti-Manipulation Mechanisms:** Implement slippage limits, reentrancy guards, and circuit breakers to prevent malicious transactions.
4. **Monitoring and Alerts:** Implement real-time monitoring and anomaly detection to spot suspicious activity quickly.
5. **Collateralized Flash Loans:** Require collateral for flash loans to reduce the risk of large uncollateralized borrowings being used for malicious purposes.



Steps taken by a malicious actor during a flash loan price oracle attack [Ref]