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**Research topic report**

**Topic name:**

**Popular systems of blockchain**

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1. **Blockchain system divided into 3 main types**
2. **Public**
   1. **Definition**

Anyone has the right to read and write data on the Blockchain. A large number of participating nodes are needed for the Blockchain's transaction validation procedure. As a result, attacking the Blockchain system would be extremely expensive and unfeasible.

* 1. **Characteristics**
* Access: unlimited. (Everyone can access and use)
* Speed: slow.
* Security: proof of Work or Proof of State. (Consensus mechanism)
* Identify identity: anonymous.
* Initialization cost: cheap, just join and build the application.
* Transaction costs: expensive.
  1. **Advantages and Disadvantages**

1. **Advantages**

**Trustable**: The public blockchain has absolutely no third-party involvement, so it has eliminated the risks caused by intermediaries of any kind. In actuality, the participants of the transaction do not need to trust anyone, but the request is still processed and confidential.

**Secure**: There are many nodes involved in the Public Blockchain validation process, so it is completely impossible to attack this system. Bad actors cannot gather and work together to gain control of the consensus network.

**Transparency**: All features on Public Blockchain are public and extremely transparent. Transaction-related data is open to the community for verification. In addition, anyone can retrieve the data to check the validity of that transaction.

**Unregulated**: The public blockchain can resist censorship due to its large network size and multi-nationality. The government cannot control and control.

**Anonymous Nature**: It is a secure platform to make our transaction properly at the same time, we are not required to reveal our name and identity in order to participate.

1. **Disadvantages**

**Processing**: The rate of the transaction process is very slow, due to its large size. Verification of each node is a very time-consuming process.

**Energy Consumption**: Proof of work is high energy-consuming. It requires good computer hardware to participate in the network

**Acceptance**: No central authority is there so governments are facing the issue to implement the technology faster

* 1. **Platform for application to the system**

**Ethereum**

Ethereum is a marketplace for many financial services, apps, and games that can't steal your data. Besides payments, the technology also owns its cryptocurrency called Ether (ETH), which is capable of paying transaction fees and service fees.

1. **Private**
2. 1. **Definition**

Private Blockchain is a platform that only allows users to read data, not write permissions. This write permission will belong to a wholly trusted 3rd party. This third party may or may not allow the user to read the data in some cases. The third-party has full authority to decide on any changes on the Blockchain.

* 1. **Characteristics**
* Access: decentralize read/write.
* Speed: high.
* Security: pre – approved participants.
* Transaction type: all transactions.
* Initialization cost: expensive due to self-built network.
* Transaction costs: cheap.
  1. **Advantages and Disadvantages**

1. **Advantages**

**Speed**: The rate of the transaction is high, due to its small size. Verification of each node is less time-consuming.

**Scalability**: We can modify the scalability. The size of the network can be decided manually.

**Privacy**: It has increased the level of privacy for confidentiality reasons as the businesses required.

**Balanced**: It is more balanced as only some user has the access to the transaction which improves the performance of the network.

1. **Disadvantages**

**Trust**: The validity of a profile cannot be independently verified. External actors must fully trust the Private Blockchain without any form of control over the verification process.

**Low security**: The number of nodes in this type is limited so chances of manipulation are there. These blockchains are more vulnerable. Besides, since there are few nodes if nodes go offline the entire system blockchain can be endangered.

* 1. **Platform for application to the system**

**Ripple**

Ripple is a blockchain platform released in 2012, it is a popular platform used beside famous networks such as Bitcoin, and Ethereum. Currently, it is rated as one of the best-performing technology platforms. Ripple is a platform to link payment providers, banks, cryptocurrency exchanges, and transactions. It allows users to send money quickly and easily globally. Thanks to the high processing speed, the platform can perform 5 transactions / 1s.

1. **Hybrid**
2. 1. **Definition**

Hybrid Blockchain can be understood as a blockchain that uses the best of both private and public blockchain solutions. In an ideal world, a hybrid blockchain would have controlled access and freedom at the same time.

Hybrid Blockchain is not open to everyone, but still provides blockchain features such as integrity, transparency, and security.

Hybrid Blockchain is fully customizable. The members of the hybrid blockchain can decide who can participate in the blockchain or which transactions are made public. This offers the best of both worlds and ensures that a company can work with its stakeholders in the best possible way.

* 1. **Advantages and Disadvantages**

1. **Advantages**

**Ecosystem**: Most valuable thing about this blockchain is its hybrid nature. It cannot be hacked as 51% of users don’t have access to the network.

**Cost**: Transactions are cheap as only a few nodes verify the transaction. All the nodes don’t carry the verification hence less computational cost.

**Architecture**: It is highly customizable and still maintains integrity, security, and transparency.

**Operations**: It can choose the participants in the blockchain and decide which transaction can be made public.

**Security**: You can make some data public and keep others confidential in a private system.

1. **Disadvantages**

**Efficiency**: Not everyone is in the position to implement a hybrid Blockchain. The organization also faces some difficulty in terms of efficiency in maintenance.

**Transparency**: There is a possibility that someone can hide information from the user. If someone wants to get access through a hybrid blockchain it depends on the organization whether they will give or not.

**Ecosystem**: Due to its closed ecosystem this blockchain lacks the incentives for network participation.

* 1. **Platform for application to the system**

Kadena is a hybrid blockchain platform, it was born to solve the scalability problem of current blockchains. The Kadena project is set up to merge blockchains such as public blockchain and private blockchain to help increase application in the community. It helps maintain security, improves throughput, and delivers value integrity. It also shows that Kadena is a fast, secure, and good scalability blockchain.

1. **Conclusion**

The table below summarizes some of the key differences between the types of Blockchain mentioned above.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Public** | **Private** | **Hybrid** |
| **Does it need permission to modify data?** | Yes | No | No |
| **Who can read the data on the blockchain?** | Anyone | Invited users only | Depending |
| **Who can write data?** | Anyone | Participants are accepted | Participants are accepted |
| **Ownership** | No one | A single organization | Many organizations |
| **Will the participant's identity be revealed?** | No | Yes | Yes |
| **Transaction speed** | Slow | Fast | Fast |

In summary, Public, Private, and Hybrid Blockchain systems are 3 popular systems and there are many platforms built on top of these 3 systems. Depending on the fields and deployment purposes, we will choose the appropriate system. Most organizations build a foundation based on these 3 systems for data security, reliability, and high transparency.

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