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1. Project Background

After several years of development, blockchain technology has begun to gradually show potential in several domains. However, as an emerging technology, there are still many bottlenecks to be addressed. For example, TPS (Transactions per Second) within blockchain applications are still limited. Another important factor is ease of use restricting the progress of enterprise development, which means there is still no killer block chain apps. Furthermore, there is still no block chain solution to meet highly concurrent business needs.

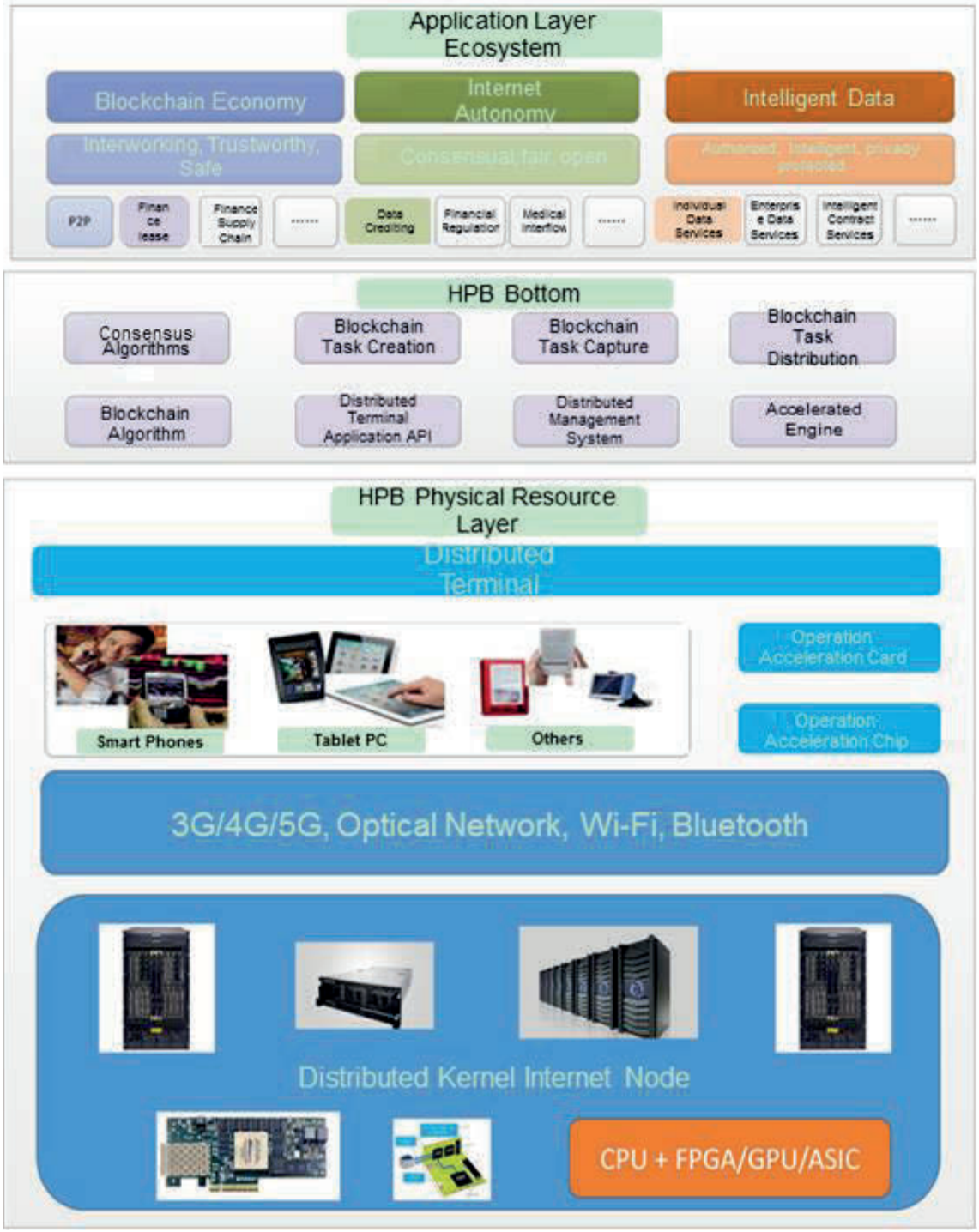
Some outstanding representatives of the community are actively promoting blockchain technology, and have made considerable progress in their respective fields. But, due to limitations in technological development, TPS is a problem faced by each platform. TPS 3000 is a common industry bottleneck, preventing blockchain from being established in high value concurrent businesses.

To sum it all up, the industry needs a platform that supports the requirements of BAT (Baidu, Alibaba, Tencent) users' massively large-scale block chain delivery needs. HPB has arisen with the aim of solving this industry bottleneck. HPB will provide intelligent access to contract services with high frequency access requirements. In addition to a centralized server user experience, it can also support a billion-node, ultra large-scale IoT scenario.

HPB hopes to eliminate the shame of having no "killer app" for blockchain, create a new blockchain ecosystem, and develop the infrastructure for a true enterprise blockchain world.

2. Design Concept

HPB is a new blockchain architecture, positioned as an easy-to-use, high-performance blockchain platform. It aims to extend the performance of distributed applications to meet real world business needs. This is achieved by creating an architecture similar to an API operating system. The software architecture provides accounts, identity and authorization management, policy management, databases, and asynchronous communication on thousands of CPUs, FPGAs or clustered program schedulers. This blockchain is a new architecture that can support millions of transactions per second and support authorizations within seconds.



As shown above, the architecture consists of two part: hardware architecture and software architecture. It is a fusion of the HPC (High Performance Computing) block chain

concept and cloud computing, hardware system with distributed core nodes, HPC supporting universal communication network, and cloud terminal HPC support platform.

In addition to network management, it supports core node blockchain standard, consensus algorithms and block chain task processing functions, hardware acceleration via core codes, and a software acceleration engine. Through TOE technology, consensus algorithm acceleration, data compression, data encryption and other technologies, it can achieve support access for millions of users. The cloud terminal under this architecture can be a traditional PC, intelligent terminal, and so on. At the same time, the terminal device gains hardware acceleration characteristics.

3. Technology Framework

3.1 Technology Features

To be successful, a high performance blockchain platform must have the following characteristics:

3.1.1 Open Source

In the history of software development, the most successful large-scale software has essentially adopted the open source model. The open source model attracts more talented developers, and promotes quicker software iteration. From the commercial perspective, users do not have to pay to use the software, and free usage can attract more attention and improve usability. For software companies, open source reduces costs and allows them to serve users with limited resources. As user scale increases, the business

can create a corresponding profit model; the subsequent success of the company can then free up more resources to improve the open source software.

3.1.2 Support Millions of Daily Users

Applications like Google, Uber, and BAT require handling of millions of active users per day through block chain technology, so a platform that can handle massive amounts of user data are critical.

3.1.3 Low Latency

Confirmation within seconds. Timely feedback is the foundation of a good user experience. If the delay is more than even a few seconds, it will greatly affect the user experience, and it may even be unable to meet business needs, thus seriously reducing the competitiveness of the application.

3.1.4 High Throughput, High Concurrency

Because applications such as exchanges can only execute operations serially as opposed to in parallel, HPB must provide powerful serial capability.

For other scenarios, we will provide powerful parallel processing capabilities, parallelization of most tasks, and a combination of hardware and software architectures that allows blockchain TPS to be raised by 2 orders of magnitude.

HPB uses TOE technology, which aims to accomplish some or all packet processing tasks through a dedicated processor on a dedicated network card. In other words, by using a specialized network card with a TEO chip, it uses four layers of TCP processing to transfer