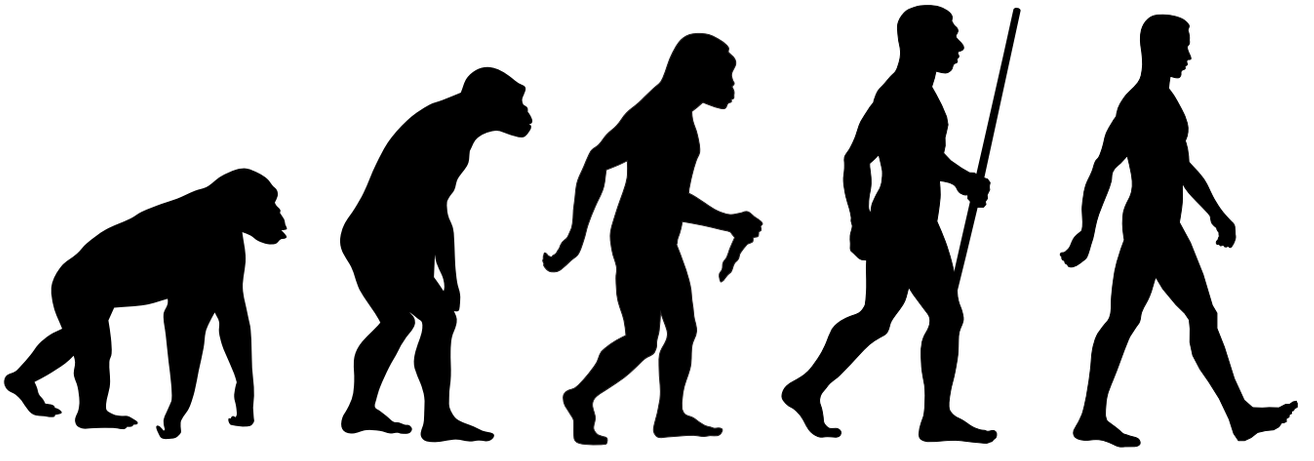
EVOLUTION OF MINING

ERA BiXBiT

MORE THAN JUST
MINING EQUIPMENT.



CPU GPU FPGA ASIC BIXBIT

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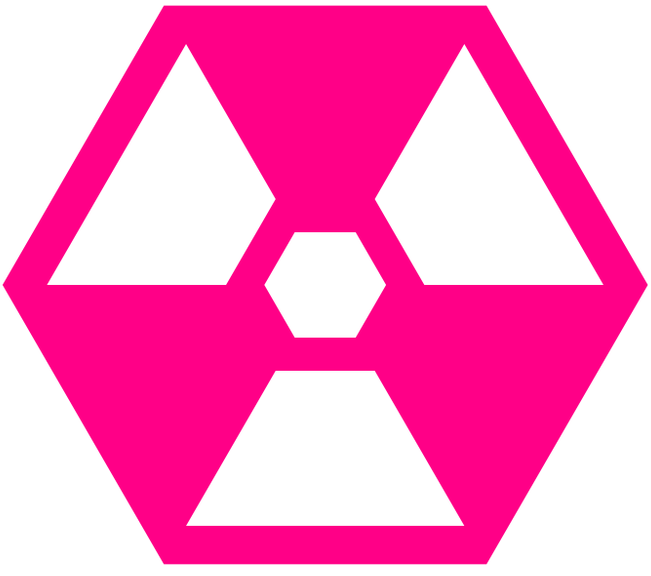


BiXBiT

COMPANY

BiXBiT COMPANY is a provider of complex solutions for improving the effectiveness of mining and knowledge computing. The company deals with development and production of mobile modular miners, which are aimed to solve key issues of industrial mining and reduce entry barriers for new players.

BiXBiT Company has developed the universal module infrastructure and provides the solution for construction of data centers and mining farms of any scale with the innovative immersion cooling system.

THE MAIN FEATURES OF THIS SOLUTION ARE:

- High density of layout
- Unification of all hardware components
- Hash rate increase
- Useful utilization of the heat
- Reduction of operational costs
- Diskless boot

The solutions proposed in the first generation of devices are aimed at extra profit from mining to three times.

MOBILE MODULAR MINER
BIXBIT

mMm is a mobile modular miner with innovative immersion cooling, life support and remote administration systems.

Modules, containers and uprights

The equipment is placed into a standard container with a capacity of 10, 20 or 40 feet. The module layout system is used. 6 ASIC devices with power units or 27 video cards can be placed into the one standard module. Modules are put one above the other in the racks. Each rack contains 4 modules. 10-foot container contains 8 racks.

THEREFORE, THE CAPACITY OF CONTAINERS IS:

10 feet (~3.05 m) – 8 uprights = 32 modules = 192 ASIC or 864 video cards;
20 feet (~6.10 m) – 16 uprights = 64 modules = 384 ASIC or 1728 video cards;
40 feet (~12.19 m) – 32 uprights = 128 modules = 768 ASIC or 3456 video cards.

Immersion cooling system

Using of immersion cooling system in 10-foot container allowed increasing density deployment of equipment from 96 to 192 ASIC devices in comparison to air cooling system.

How does it work?

THE EQUIPMENT INSIDE THE MODULE IS FULLY IMMERSED INTO THE COOLANT, WHOSE HEAT CONDUCTIVITY 25 TIMES HIGHER THAN THE AIR.

Due to immersion cooling system the operating temperature of equipment is maintained in the range 65-75°C for video cards and 85°C for ASIC. The temperature range is optimally chosen for stable operation of equipment and the most efficient heat utilization. At the customer's request the system allows the thermostating at any temperature range.
Due to full immersion the heat is equally transferred from all components, not only from the “hottest”.

THE EQUIPMENT IS PREPARED BEFORE IMMERSION:
A FAN IS DISMANTLED, DUST IS CLEANED UP.

The construction of module provides natural convection of coolant, which takes heat from equipment and then is cooled by brazed plate heat exchanger. The coolant is constantly supplied to the heat exchanger. This coolant circulates using a pump between the plates of heat exchanger, which are inside the modules, and cooling tower, in which the solution is cooled by inlet by fans air.

COOLING TOWERS ARE INSTALLED ON THE TOP OF CONTAINER – ONE COOLING TOWER PER ONE RACK.

Immersion cooling system BiXBiT allows using the heat effectively. In that case, a heat exchanger is installed instead of cooling towers. The coolant gives heat to building’s heating system by heating running through the heat exchanger water. Heated water can be used in technological processes for woodworking, textile and agriculture industries.

Power supply system

Mobile modular miner BiXBiT is completed by all necessary electrotechnical infrastructure for power supply of equipment.

Telecommunications infrastructure

Mobile modular miner BiXBiT is completed by cable system and active network equipment for Internet access and remote management of all equipment. Active network equipment 2+ level allows logical segmentation of local network. Reserving of communication channels is possible.

Management & monitoring system

The complete set of mobile modular miner BiXBiT includes servers (main and backup) for software launch for mining and management of miner’s life support system.

Access (including remote access) to all functions is implemented through a web portal.

Mobile modular miner BiXBiT is completed by sensors and microcontrollers, which allow monitoring and management of many parameters: power consumption, temperatures, liquid levels, operating mode of pumps etc.

Diskless launch system

Diskless launch system is intended for management of operation systems and rig software by mining with the use of video cards.

Diskless launch system represents configured images, which are arranged in data storage system (which needs only one hard disk drive). Each of images can be booted at any time to an unlimited number of machines, which will start or continue working with new settings a minute later.

Diskless launch system is implemented as a remote booting on computers. Once installed and fully configured operating system with all needed drivers, mining applications and connected user wallets is integrated into image that is stored in the data storage system (DSS). This OS may be Windows, Linux or any its derivatives (e.g. ethos, Hive and others). Diskless launch system installs OS from DSS item, not from computer HDD (hard disk drive).

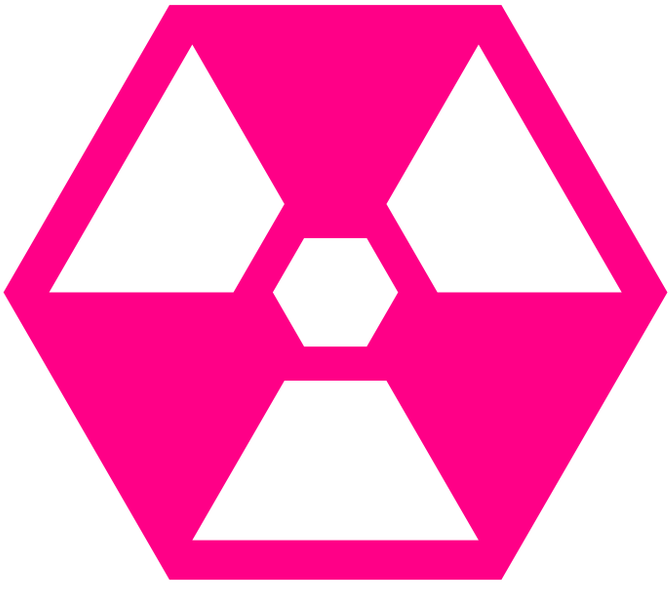
BiXBiT solution allows fast blockchain network connection as well as following task switching.

Access control & CCTV system

Mobile module miner BiXBiT is equipped with biometric electronic passcodes, surveillance cameras (two cameras are inside the container, one 360° camera is outside), door and hatch opening sensors.

Fire extinguishing system

All mobile modular miners BiXBiT are equipped with gas fire extinguishing system. Smoke sensors and infrared cameras are used for fire detection. At the customer's request, module miner can be completed by innovative hybrid fire extinguishing system.



UNIQUE FEATURES

mMm

ECONOMIC BENEFITS

Increased productivity of equipment

Immersion cooling allows increasing the productivity of mining equipment by 20-40% due to increase of working frequencies while maintaining of thermostability.

Profit: higher hashrates increase the profitability of each piece of equipment.

Efficient utilization of the heat

Produced from computers heat can be transferred to heating system practically without loss (the heat can be used on an industrial scale: in woodworking, agriculture industry, and manufacturing).

Profit: extra income from thermal energy implementation up to 600.000$ during 3 years

Electricity consumption reduction of equipment

By immersion cooling devices don’t need own fans, as a result, energy consumption of each device is being reduced. Energy saving on 864 video cards with power of 10W is over 6000 kW/h a month. For 192 ASIC devices with power of 70W energy saving is about 10.000 kW/h a month.

Profit: reduction of electricity consumption increases the profitability of mining equipment.

Saving for the purchase of equipment

Due to BiXBiT partnerships with major mining equipment manufacturers, it is possible to provide the equipment without fans. Therefore, it will reduce its cost by 2-5%.

Profit: : lower costs of equipment speeds up its payback and reduces investment risks.

DESIGN BENEFITS

High density deployment

Immersion cooling system and features of BiXBiT racks allows to cool the equipment effectively by layout of 192 ASIC devices or 864 video cards inside a standard shipping 10-foot container. For comparison, by air cooling system no more than 96 ASIC devices or 144 video cards can be placed into 10-foot container.

Profit: : more compact construction requires lower costs of transportation and layout. In addition, it isn't required to pay for extra containers and electrotechnical staffing with the same number of devices.

Easy scalability

Mobile modular miner is a standard shipping container, where the equipment is placed into typed racks and modules. Rack construction spares from having to design a room thoroughly, because "hot spots" aren't formed as in the case of air cooling. It allows a customer to start a business with the required number of equipment and then to scale fast buying the necessary number of racks and containers.

Profit: lower costs of search and purchase of equipment by expanding production.number of devices.

Mobility

Mobile modules BiXBiT can be replaced another location if necessary, for example, to cheaper electricity source. By transportation all external elements of module (cooling towers, panel board) are easily dismantled and placed inside container in fixed position. The coolant is drained in barrels and also transported inside.
The construction of a standard shipping container allows transporting modular miner using road, rail and marine transport. In the supply modular miner is completed by all necessary for transportation and deployment tools, tanks and anchorages.

Profit: reducing the costs of transportation and relocation.

Easy technical support

Modular construction, unification and typing of components, a lack of consumables, computerized life support system with remote management, existence of full documentation on all regulatory operations lower the requirements for staff and work input for the maintenance of efficiency of module BiXBiT. One operator in mode 8/5 + emergency calls can service 2-4 modules. Besides, operators aren't subjected to noise nuisance as in the case with air cooling.

Profit: reducing the costs of support staff.

Environmental friendliness

Mobility of modules allows their layout in the areas with available resumed electricity. Due to utilization the heat isn’t produced to the environment. Immersion cooling doesn’t make noise pollution and used liquid isn’t toxic.

Profit: lower ecological costs, fewer restrictions by searching for a place for module’s layout.

IMMERSION COOLING BENEFITS

Extending the service life of equipment

The coolant, in which the equipment is immersed, has 25 times higher thermal capacity than the air. Full immersion provides effective heat rejection from all elements. Therefore, the main reasons of electricity failure go away: temperature range because of uneven warmed and cooled air intake, vibration, overheating.

Profit: longer service life of equipment leads to cost reduction on its upgrading.

Protection of equipment from dust and rubbish

The layout of equipment in hermetic tanks with immersion into liquid excludes dust, insects, rubbish, which are the reasons of overheating with consequent failure of equipment.

Profit: lower costs of repair and replacement of equipment; the equipment doesn’t idle because of cleaning up the dust; the equipment doesn’t lose its presentation.

Low noise pollution

The cooling system, which generates most of noise, is removed from equipment before immersion. For example, one Nvidia GTX 1070 video card makes 39 dBa noise and one ASIC Bitmain AntMiner L3+ generates 75 dBa.

Profit: Fewer restrictions by layout of mobile miner; it isn't required to pay operators extra money for harmful work conditions.

Lack of consumables

Immersion cooling system doesn't require replacement of consumables and all components (including coolant) are aimed at exploitation for at least 3 years. Besides, the delivery of container BiXBiT includes a set of spare parts. For comparison, air cooling system requires a regular replacement of filters and fans of mining equipment.

Profit: no costs of consumables.