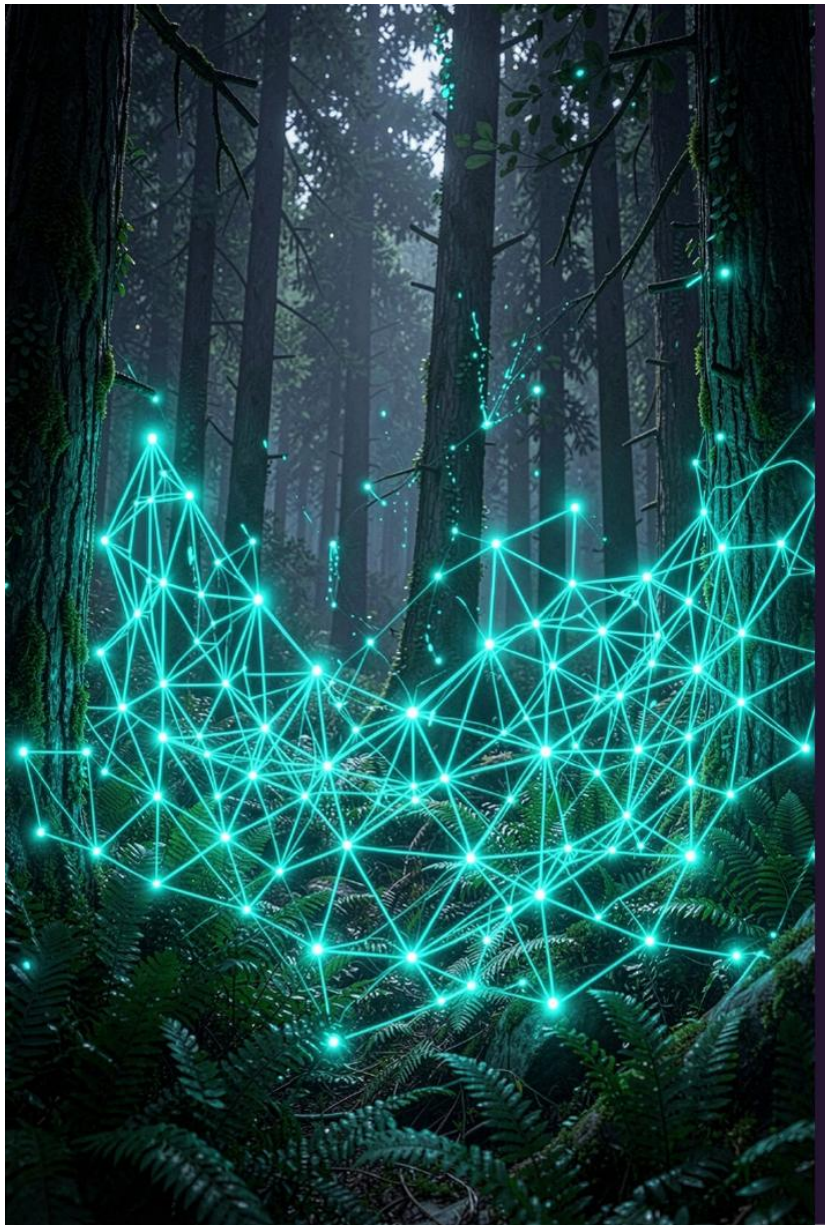

July 2026

PSHMP Core

Intelligent platform for enhancing network resilience.

Proactive Self-Healing Mesh Protocol

Next-generation overlay platform for building resilient distributed networks

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What is PSHMP Core?

Next-generation intelligent software platform

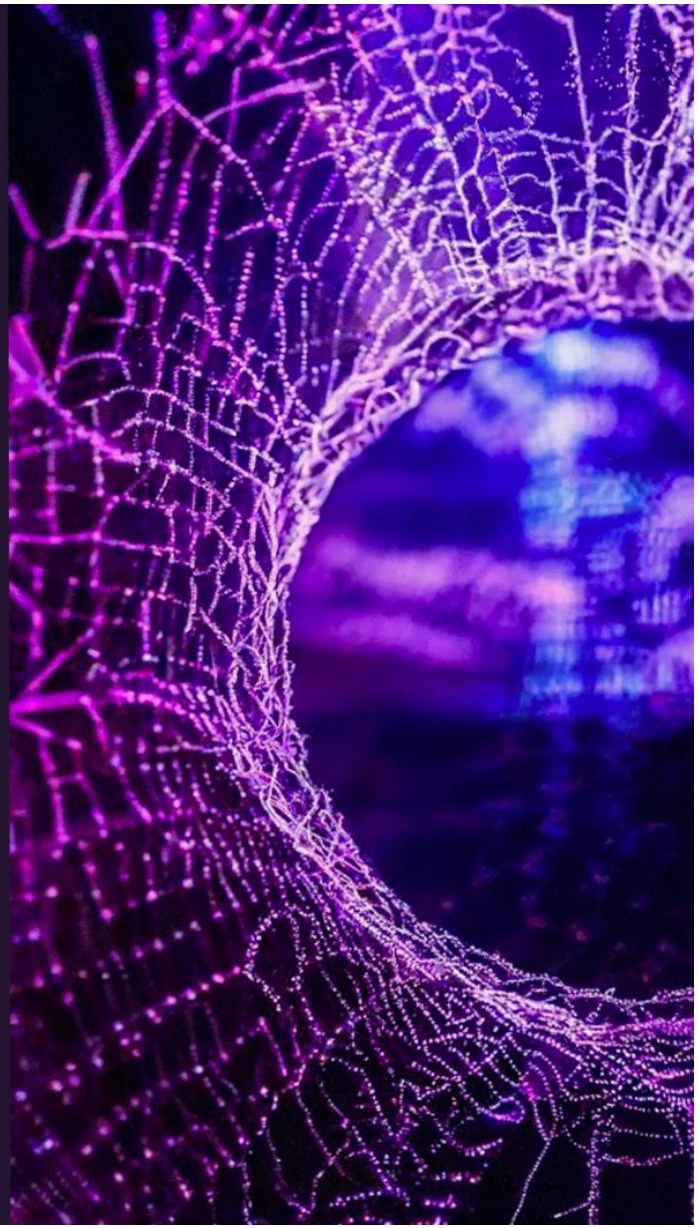
PSHMP Core is a software platform that operates over existing IP infrastructure (Overlay Network).

It continuously analyzes network status, assesses connection stability, predicts channel degradation, and automatically reroutes data traffic without administrator intervention.

The platform integrates into the existing infrastructure and does not require replacing network equipment or altering the network architecture.

Main idea.

**Not to replace the existing network,
but to make it significantly more resilient, efficient, and scalable.**

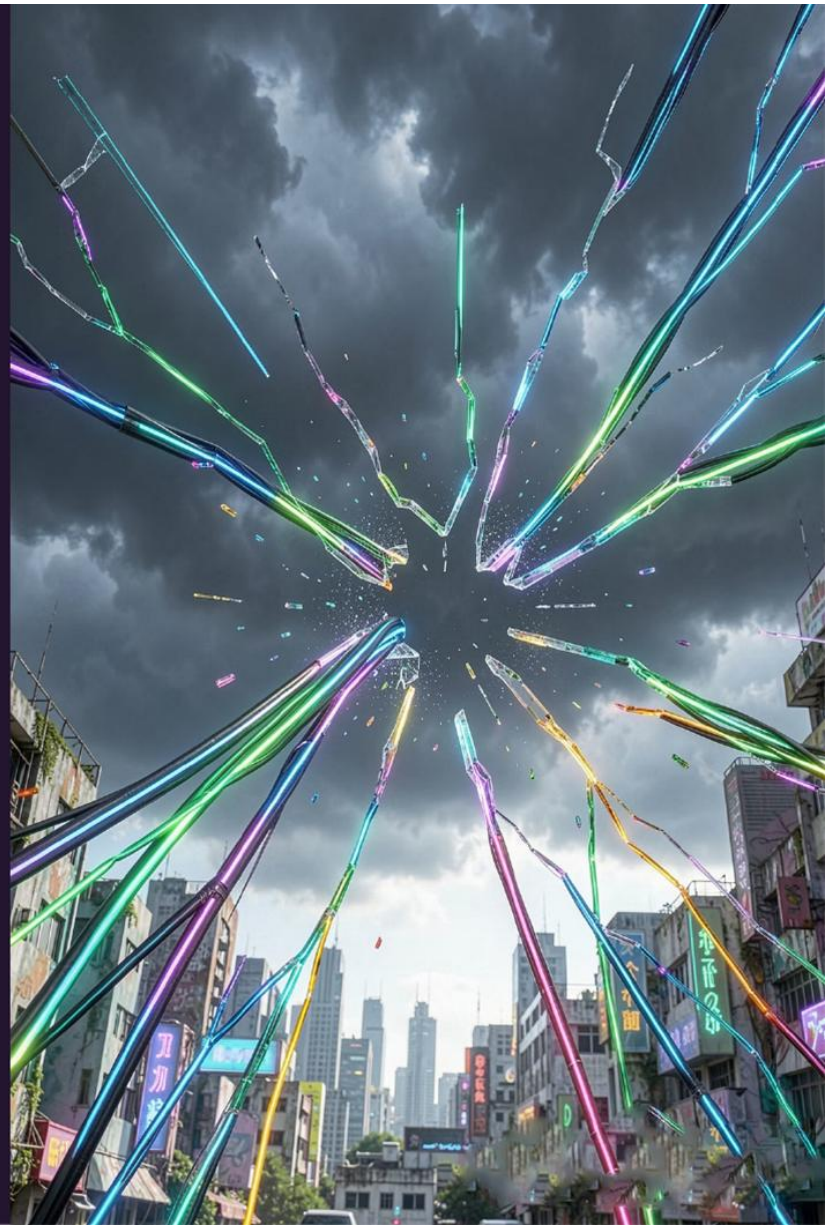


What tasks does the platform address?

Modern distributed networks place increasingly high demands on service availability, data transmission reliability, and the efficient use of communication channels.

PSHMP Core helps:

- automatically restore data transmission routes;
- maintain high service availability;
- reduce the volume of overhead traffic;
- mitigate the impact of packet loss and unstable links;
- scale distributed infrastructure;
- reduce the number of manual operations in network maintenance.



How PSHMP Core Works

1. Network status analysis

The platform continuously collects telemetry from nodes:
packet loss, latency, jitter, availability, and other parameters.

2. Assessment of compound stability

The K-Factor algorithm calculates the probability of degradation
for each connection before a failure occurs.

3. Forecasting problems

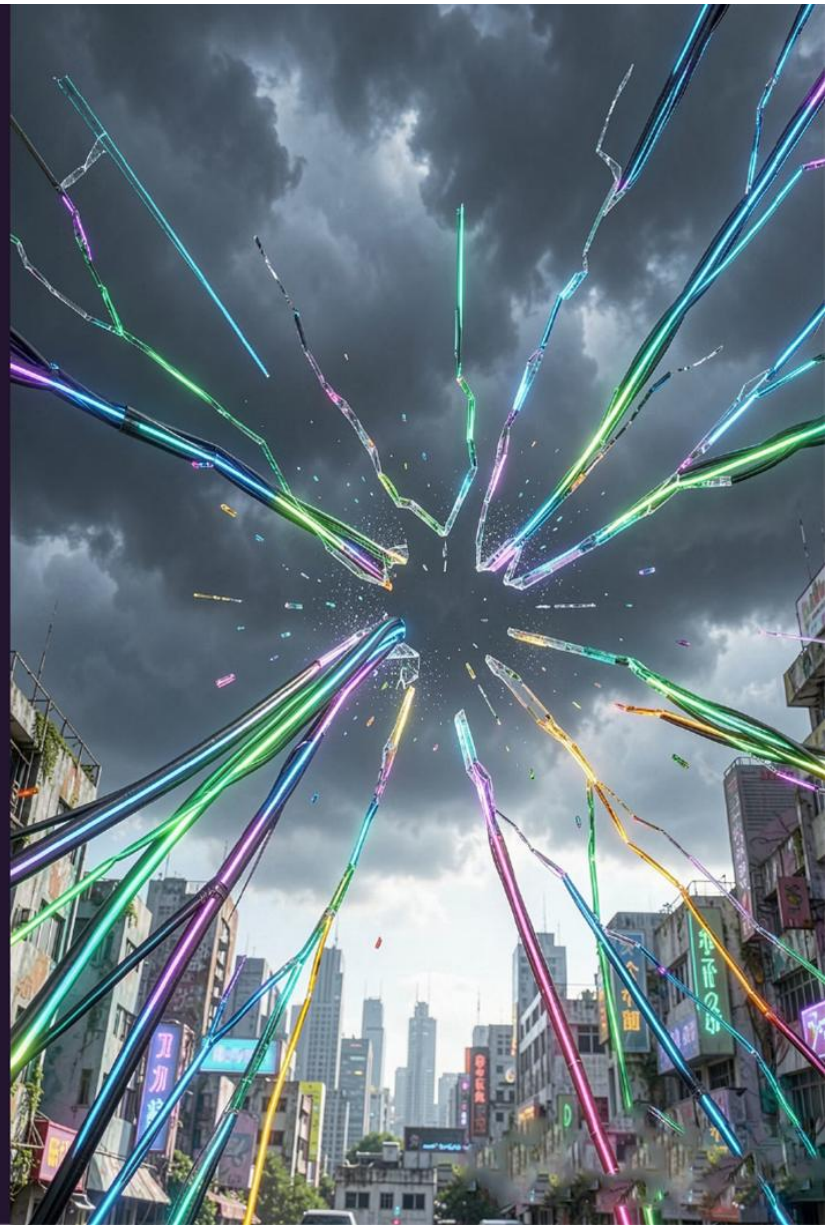
Upon detecting a degradation in quality, the system prepares alternative
data transmission routes in advance.

4. Automatic recovery

The Self-Healing Engine rebuilds the transmission chain without
administrator intervention and without interrupting application operations.

5. Continuation of network operations

Data transmission continues with minimal impact on users
and business processes.



Business impact

Using PSHMP Core enables:

- reduce operating costs;
- reduce the number of incidents;
- increase service availability;
- make more efficient use of existing infrastructure;
- defer costly equipment upgrades;
- scale the network without a major architectural overhaul;
- minimize the impact of the human factor.

Confirmed platform capabilities

Testing of the software core confirmed:
- up to 5,000 simultaneously emulated nodes;
- tests confirmed stable core operation using a model of 5,000 simultaneously active nodes.

Automatic route recovery: approximately 380 ms on average.

Stability K-factor up to 0.999

100% data delivery with simulated packet loss of up to 25%

Up to 75% reduction in control traffic via Batch ACK and Gap List

Testing Conditions
Tests were conducted on a software-based network model using the proprietary PSHMP Core emulator. The platform architecture imposes no rigid constraints and allows for future horizontal scaling through coordinator clustering and sharding.

Where it is used

CDN and Edge
Distributed Computing

5G and next-generation
mobile networks

Smart City
and Critical Infrastructure

Highly resilient
environments

Hybrid satellite
and terrestrial networks

Industrial IoT in
Distributed Infrastructure

PSHMP Core Platform Architecture

PSHMP Core is built on a modular architecture, with each component responsible for a specific function related to ensuring network fault tolerance, performance, and security.

Coordinator
Network management, node coordination, route formation, and distribution of service information.

Node
The execution component that handles data exchange, telemetry, and the execution of coordinator commands.

Self-Healing Engine
Automatically detects connection degradation and reroutes data traffic without administrator intervention.

K-Factor Engine
It analyzes communication channel quality and calculates the stability coefficient of each node to predict potential issues.

Chain Relay
It establishes optimal data relay chains, ensuring reliable message delivery.

Batch ACK + Gap List
Minimizes the volume of overhead traffic through packet delivery acknowledgment and the retransmission of only the missing packets.

Gossip Protocol
It disseminates information about the network state among nodes without placing a centralized load on the coordinator.

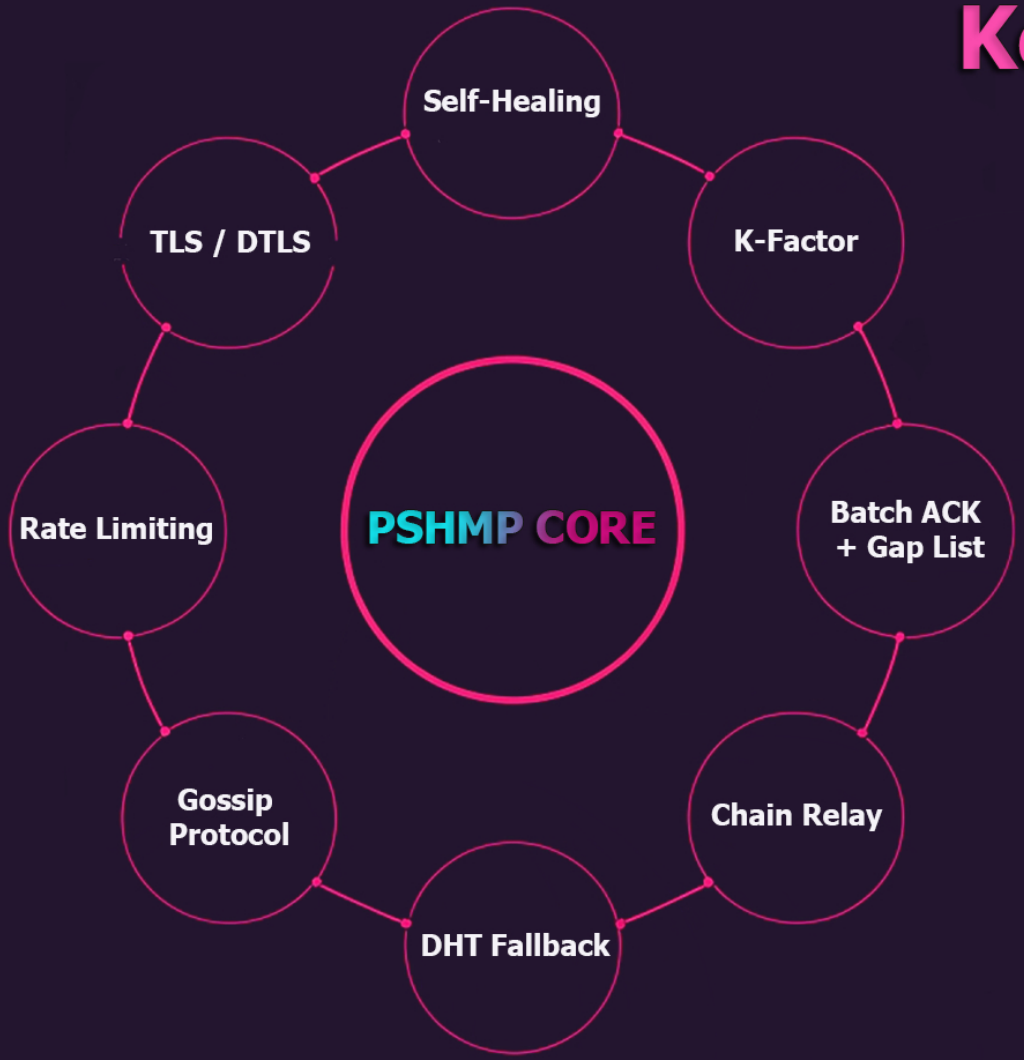
DHT Fallback
Allows the network to continue operating even when the coordinator is temporarily unavailable, using a distributed node table.

Rate Limiting & Security
Limits anomalous activity, reduces the risk of DDoS attacks, and protects the platform's service mechanisms.

Transport Layer
Unified transport layer with UDP support and extensibility to DTLS/TLS and other protocols.

Licensing
License monitoring a nd management of platform usage modes.

API
Interface for integration with enterprise systems, external services, and monitoring tools.



Key Technologies

TECHNICAL ARCHITECTURE

PSHMP Core

Self-Healing Automatic route recovery

K-Factor Network stability assessment

Batch ACK + Gap List Overhead reduction

Chain Relay Relay chain formation

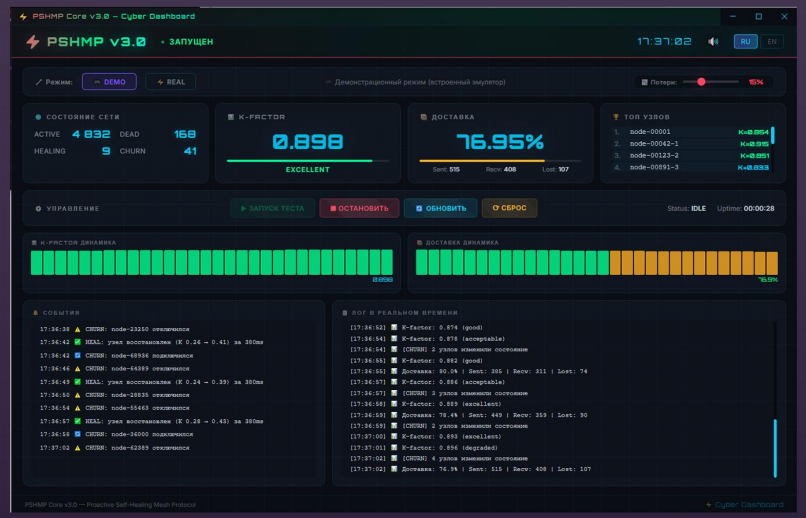
DHT Fallback Operation when the coordinator is unavailable

Gossip Protocol Node state exchange

Rate Limiting Overload protection

TLS / DTLS Secure data transmission

PSHMP Core Demonstration Stand (Cyber Dashboard)



Cyber Dashboard is a demonstration platform designed for presentations and testing.

For industrial monitoring, the platform integrates with existing systems (Prometheus, Grafana, Zabbix) via a built-in API.

The Cyber Dashboard is designed for:
- **demonstrating the platform's capabilities;**
- **visualizing algorithm operations;**
- **conducting trials;**
- **analyzing network behavior;**
- **testing various scenarios.**

The panel displays:
- **network status;**
- **stability coefficient (K-Factor);**
- **self-healing processes;**
- **data delivery;**
- **churn events;**
- **system operation log;**
- **built-in emulator controls.**

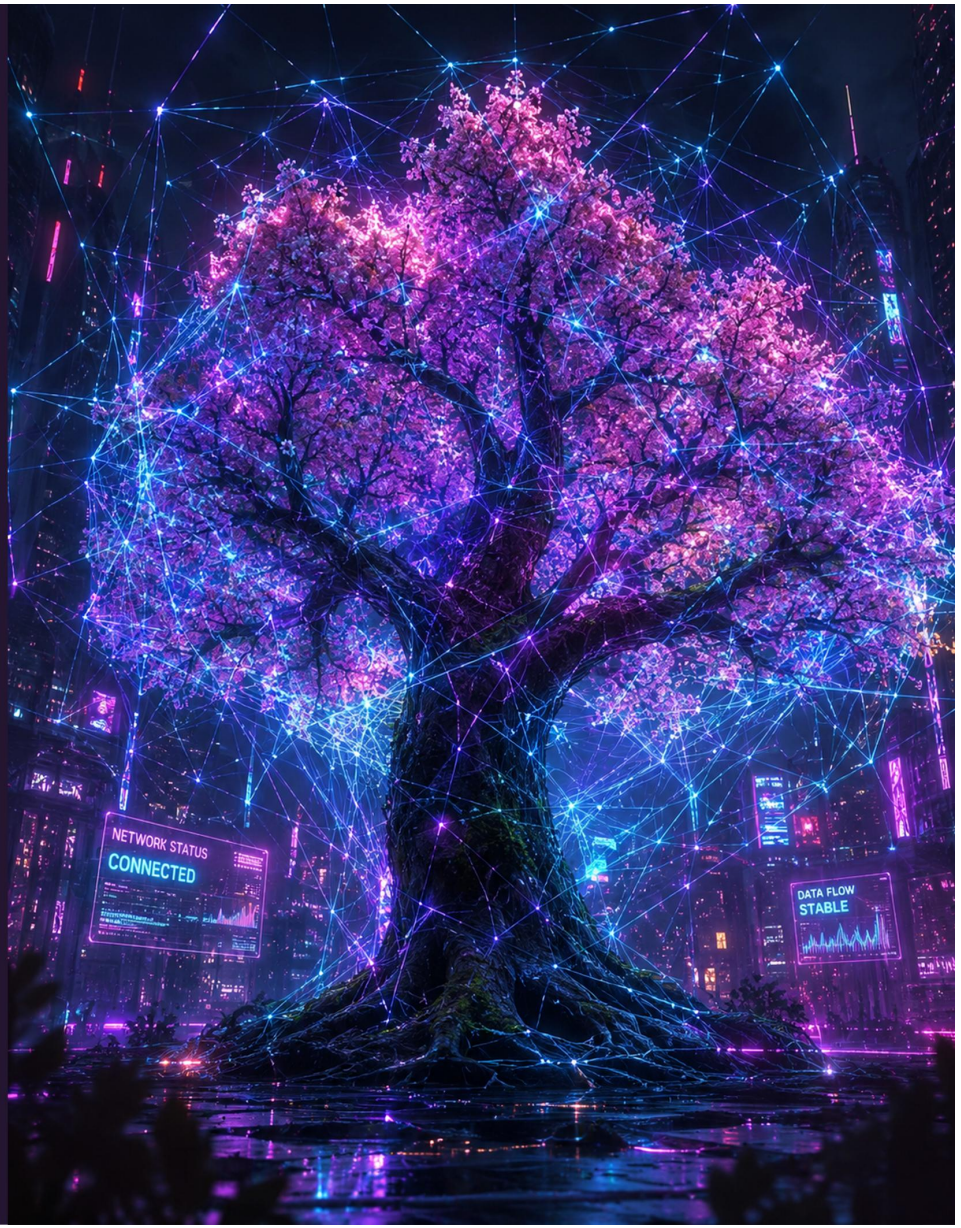
Current project stage

The PSHMP Core is at the MVP/pilot stage.

Implemented:
- functional PSHMP Core network kernel;
- 13 key platform modules;
(Self-Healing, K-Factor, Chain Relay, Gossip, DHT Fallback, Batch ACK, Security, etc.);
- Cyber Dashboard demonstration setup;
- network emulator for simulating platform operation based on the actual kernel;
- licensing system and security mechanisms;
- horizontal scaling architecture (coordinator clustering, sharding);
- over 100 technical documents covering architecture, algorithms, and platform development;
- prepared patent materials.

What does this mean?

PSHMP Core is an implemented software technology featuring a functional core, documentation, and a demonstration infrastructure.
The platform is ready for technical evaluation, capability demonstrations, customization to meet client requirements, and further development within an existing infrastructure.



PSHMP Core platform components

Software platform

The platform incorporates the functional PSHMP Core network engine, which implements key mechanisms for enhancing network fault tolerance, route self-healing, predicting connection degradation, and intelligently managing data transmission.

The platform is ready for further integration, adaptation, and development to meet customer requirements.

Engineering documentation

The set includes over 100 technical documents reflecting the platform's evolution from the initial architectural decisions to the current version:

- the documentation includes;
- platform architecture;
- algorithm descriptions;
- research and testing results;
- implementation options for specific mechanisms;
- scaling materials;
- technical specifications;
- design decisions and architectural evolution.

This body of material enables not only the use of the technologybut also an understanding of the principles behind its construction,which significantly simplifies future development and maintenance.

Demonstration infrastructure

The platform includes tools that enable the study and testing of the technology:

- Cyber Dashboard;
- network software emulator;
- simulation scenarios;
- demonstration configurations;
- use cases.

Результаты исследований, являющиеся основой патентной защиты

Materials accompanying the technology development are being transferred:

- patent materials regarding key mechanisms;
- descriptions of proprietary algorithms;
- a set of technical documentation;
- usage rights or the option for the full transfer of exclusive rights—subject to the terms of the transaction.

PSHMP Core is delivered not merely as a standalone software product, but as a comprehensive technology platform comprising the software kernel, engineering documentation, demonstration tools, and materials required for further development, integration, and commercial use.

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PSHMP Core — an intelligent platform for enhancing network infrastructure resilience.

Thank you for your attention.