



# Convergence P2P cloud computing

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Computing services are changing from traditional Internet services to peer-to-peer (P2P) cloud networking. Currently, resources with scalability are being served to many users through P2P cloud networking. P2P-based cloud systems can be classified based on their purpose and the method of providing the service using cloud technology. Convergence P2P cloud services consist of management by the various providers, depending on the purpose of the service. This issue involves some of the hottest topics in convergence P2P cloud computing, including P2P cloud networking, security in P2P computing, P2P overlay networks, hybrid P2P networking systems, mobile communications, P2P mobile networks, delay-tolerant P2P networking, P2P sensor networks, P2P-based systems, and P2P network services.

The first paper by Begam et al. [1] proposes an optimized P2P quantitative structure property relationship (QSPR) for prediction of enthalpy in a formation using outlier detection and subset selection. This study focuses on an optimized QSPR model to understand biological activity and the physicochemical property by identifying that relationship with the P2P network. This deals with benchmarking models based on polynomial regression, principal component regression, and partial least square regression in a P2P network. The paper

by Shin et al. [2] suggests writer identification using inter-stroke and intra-stroke information for security enhancements in a P2P-based system. This study focuses on handwriting identification that uses a hybrid of hidden features and a block-type model to improve accurate and efficient P2P security enhancements. In addition, a user can register and be identified using an authentication feature. This feature extracts major components of characters and boundary points of blocks in P2P-based systems. The paper by Kim et al. [3] introduces a data transmitting method for delay-tolerant P2P networking for Internet of Things (IoT) services. This study deals with an efficient delay-tolerant network (DTN) that exploits the connection status between sensor nodes, mobile sink nodes, and gateway nodes in P2P networking. The proposed method predicts an opportunistic network status using a naïve Bayes classifier to improve efficient decision-making under wireless conditions.

The paper by Jeong et al. [4] suggests a fast Fourier transform (FFT)-based efficient data processing technique for big-data processing-speed enhancement in a P2P computing environment. The proposed method focuses on keywords for searching big data as coefficients of polynomial expressions. In addition, this method transforms vectors using the coefficients of polynomial expressions to minimize service delay times. The paper by Lee et al. [5] develops a radio frequency identification (RFID)-based sensing system for context information management using a P2P network architecture. This study focuses on a sensor network for ubiquitous computing capable of recognizing users entering and exiting the area around the network. The proposed method develops an RFID-based sensing system that receives context information about users in a P2P network. The system processes data efficiently, and each sensor node can operate under P2P networking. The paper by Yoon et al. [6] describes evaluation of cloud computing and P2P as a platform for comprehensive and thorough key search of block ciphers. This study deals with the performance of a dedicated hardware and machines using exhaustive key search of a Data Encryption Standard (DES) algorithm and a knowledge requirement mechanism in P2P networking. Cloud computing

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has the scalability, efficiency, and flexibility of resources in P2P networking.

The paper by Jang et al. [7] develops application of an IoT educational tool in a P2P networking. This study focuses on development of the tools used by non-professionals and teachers engaged in IoT education based on a P2P network. This method designs the size, the modular sensors, and a minimized functionality, considering usability and scalability when reducing the complexity of a P2P networking environment. The paper by Chae et al. [8] presents an intensified secure device authentication method in a P2P-based smart farm system. This study focuses on an evaluation of P2P-based smart Palm devices using a secret key in the registration response brought from a P2P networking. This deals with a secure device authentication algorithm to reduce registration time, encryption time, and decryption time under low-power computing. The paper by Kim et al. [9] proposes a local-area alert system against ultraviolet rays and particulate matter in an open IoT platform with P2P communications. This study deals with an open IoT platform, a device platform, and a server platform that collectively manage IoT devices when providing a data-based service to control things under P2P while handling communications, data transmissions, protocol conversions, data storage, and processing in P2P environmental communications.

The paper by Kim et al. [10] develops a creative children's English education system of an augmented reality (AR) type using the P2P network service model. This focuses on collaboration and feedback between learners and instructors for creative English education under P2P networking. The proposed method consists of three-dimensional (3D) content generation, character recognition, speech extraction, word meanings, 3D stereoscopic rendering, and P2P-based wireless communications. It uses increased AR scientific creativity by presenting various types of stereoscopic data. The paper by Kim et al. [11] develops a P2P sensor network-based disaster prevention solution for dangerous industrial environments. This study deals with disaster prevention to ensure safety in industrial fields. Status is monitored by a field manager, a general management center, and workers in real-time. The integrated management solution analyzes disasters and accidents in real time through P2P sensor networks. The paper by Kim et al. [12] proposes mining of health-risk factors using personal health record (PHR) similarity in a hybrid P2P network. This study predicts personalized health status, pain, mental health, and fatigue via a similarity-based mining algorithm. It deals with PHR-based similarities over a hybrid P2P network that is composed of a peer, a P2P gateway, and a P2P server. PHR data are clustered based on similarity using examinations, diagnoses, and health status, depending on the risk factors, through hybrid P2P networking.

The paper by Yoo et al. [13] develops an information retrieval (IR) system from captured video frames under convergence

P2P networking. The proposed IR system uses an experience model and minimized interruptions to generate P2P information and multiple search options. This extracts the region of interest from streaming data, and the region features of edge projection values, to construct an optimal database. This IR system obtains information matching the screenshots using IoT devices over P2P networking. The paper by Lee et al. [14] proposes an intelligent closed-circuit television (CCTV)-based de-identification mechanism of smart grid metering data for security in P2P cloud computing. This study is focused on a de-identified data mechanism using smart grid metering data on time and numerical information for availability and statistical processing in P2P cloud computing. The last paper by Yoo et al. [15] proposes mining-based life-care recommendations using adaptive decision feedback and a P2P dataset. The proposed method analyzes biometric big data, and includes a personal health device and context awareness in real time using P2P-based life-care technology. The method provides evolutionary decision feedback to improve psychological and physical health in response to potential risk situations over P2P networking.

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