IoT Device Discovery Protocol Patent

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Assignee: Summit Digital Solutions, Inc.

Abstract

A system and method for automated discovery and authentication of Internet of Things (IoT) devices in enterprise environments, comprising a multi-layer protocol stack for secure device identification, dynamic addressing, and mesh network formation using distributed ledger verification.

Technical Field

[001] The present invention relates to the field of Internet of Things (IoT) device management, specifically concerning automated discovery protocols for enterprise-scale IoT deployments utilizing secure authentication mechanisms and distributed network topologies.

Background

[002] Traditional IoT device discovery methods rely on manual configuration or basic broadcast protocols, creating scalability challenges in enterprise environments. Existing solutions lack robust security measures and efficient means of managing large device clusters.

[003] The present invention addresses these limitations through an innovative approach to device discovery, incorporating blockchain-based authentication and adaptive mesh networking capabilities.

Detailed Description

1. System Architecture

[004] The invention comprises:

a) A primary control node implementing the Peak Performance Platform(TM) protocol stack

b) Distributed authentication nodes operating on a private blockchain network

c) Client-side discovery modules embedded in IoT endpoints

d) Secure communication channels utilizing AES-256 encryption

2. Discovery Protocol Operation

[005] The system operates through the following sequence:

1 Initial Broadcasting

- Device broadcasts presence using encrypted beacon signals
- Includes device fingerprint and capability manifest
- Temporal authentication tokens generated

2 Authentication Process

- Multi-factor device verification against blockchain registry
- Dynamic key exchange using elliptic curve cryptography
- Capability verification against authorized device profiles

3 Network Integration

- Automatic mesh network formation
- Dynamic routing table updates
- Resource allocation based on device capabilities

3. Security Mechanisms

[006] Security features include:

- Zero-trust architecture implementation
- Continuous device attestation
- Rotating encryption keys
- Anomaly detection and automatic quarantine
- Secure boot verification

4. Claims

[007] What is claimed is:

A method for automated IoT device discovery comprising:

a) Broadcasting encrypted device identifiers

b) Authenticating devices using distributed ledger verification

c) Establishing secure mesh network connections

d) Implementing continuous device attestation

The method of claim 1, wherein authentication includes:

a) Multi-factor device verification

b) Capability manifest validation

c) Dynamic key exchange protocols

A system for implementing the method of claim 1, comprising:

a) Central control nodes

b) Distributed authentication servers

c) Client discovery modules

d) Secure communication channels

5. Technical Specifications

[008] Implementation requirements:

- Processor: 64-bit architecture supporting AES-NI
- Memory: Minimum 256MB RAM per node
- Network: IPv6 compatible
- Storage: 1GB minimum for blockchain verification
- Operating System: Linux kernel 4.x or higher

Legal Notices

6. Ownership and Rights

[009] This patent and all associated intellectual property rights are owned exclusively by Summit Digital Solutions, Inc., a Delaware corporation with its principal place of business at 2500 Innovation Drive, Suite 400, Boston, MA 02110.

7. Restrictions

[010] Any unauthorized use, reproduction, or distribution of the technology described herein may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

Execution

IN WITNESS WHEREOF, the undersigned has executed this patent application as of the date first written above.

SUMMIT DIGITAL SOLUTIONS, INC.

By: /s/ Michael Chang

Name: Michael Chang

Title: Chief Technology Officer

Date: June 15, 2021

Witnessed by: /s/ Sarah Blackwell

Name: Sarah Blackwell

Title: Chief Operating Officer

Date: June 15, 2021

Patent Office Acknowledgment

[011] This patent was examined and approved by the United States Patent and Trademark Office on September 28, 2023.

Patent Examiner: /s/ David Rodriguez

Registration No.: 58,291