IETF Hackathon
Agent Communication System for Network AIOps

IETF 125
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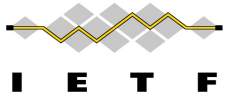
Shenzhen, China



Hackathon Plan

- Problem solving: multi-agent communication and collaboration framework that facilitates the coordination of heterogeneous multi-agents and supports intelligent automatic network operations and maintenance
- Draft: Agent Communication Framework for Network AIOps https://datatracker.ietf.org/doc/draft-fu-nmop-agent-communication-framework/
- Agent Discovery + Agent Communication

AgentDNS： Agent Metadata Management and Identity Authentication

New ideas

- **Agent Metadata Management** — management of the key elements of an agent, including job responsibilities, codes of conduct, working environment, tools and skills, and professional knowledge.

- **Identity Authentication** — Relying on the trust root of the operator network, unified identity authentication for agents is achieved through SIM cards or hardware trusted modules, establishing a unique and trusted digital identity for digital employees.

AgentDNS：DAG-guided Orchestration

New ideas

- **Unified Agent Gateway** — one entry layer for agent discovery, intelligent addressing, and coordination.
- **Dual-mode Resolution** — supports both explicit-name lookup and natural-language intent resolution.
- **Capability-driven Matching** — selects agents by registered capabilities instead of fixed endpoints.
- **DAG-guided Collaboration** — decomposes complex tasks into structured multi-agent workflows.

New design / architecture

- **Core Capabilities** — A unified, AgentDNS-powered gateway integrating end-to-end resolution with DAG-guided orchestration across three functional layers: Resolution, Matching, and Orchestration.
- **Name-to-Name Resolution** — resolves a target Agent by name for scenarios where the caller already knows which Agent to invoke.
- **Semantic Resolution** — maps natural-language requests to the most suitable Agent based on semantic understanding and registered capabilities.
- **DAG-guided Orchestration** — decomposes complex tasks, matches subtasks to agents, and returns a dependency-aware DAG execution recommendation under caller-controlled execution.
- **Key Feature** — decoupled invocation and registry-based onboarding enable scalable agent integration without changing caller logic.

AgentGateway：pub-sub mode

New ideas

- **Dual-Layer Communication Framework** — combines the Agent Gateway and the L3.5 communication overlay for scalable agent communication.
- **Cross-Layer Mediation** — bridges application-layer agent interaction with network-layer delivery through protocol adaptation and service mediation.
- **Network-Native Communication Optimization** — introduces pub/sub, message aggregation, and communication-aware control into the overlay layer.
- **Policy-Aware Traffic Steering** — enables differentiated forwarding through intent-based labeling and SRv6 steering.

New design / architecture

- **Dual-Layer Architecture** — a two-layer design composed of the Agent Gateway and the L3.5 Agent Communication Overlay, bridging upper-layer agent services with network-side communication optimization.
- **Unified Agent Gateway** — serves as the common entry point for AI agents, tools, and requests such as MCP and A2A, enabling seamless access to the lower communication plane.
- **Gateway-Native Small-Packet Aggregation** — reduces forwarding overhead through ingress-side message batching.
- **L3.5 Asynchronous Pub/Sub** — improves traffic convergence by replacing repeated unicast delivery with subscription-based dissemination.
- **Intent-Aware Dynamic QoS** — enables policy-driven differentiated forwarding through label marking and SRv6 steering.

Wrap Up

Team members:

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Welcome to our side meeting:
Jiangsu Room, Monday, 10:45-12:15
More details and presentation,
Interconnection and Discovery of AI Agents on the Internet