IETF Hackathon

Agent Networking Infrastructure

IETF 126

Huawei & China Telecom

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Hackathon Plan

Problem: Agent Discovery & Routing

Previous IETFs: Strong community interest in Internet of Agents

At the last meeting, many hackathon projects focused on agent-to-agent communication, which is considered as urgent standardization requirement.



Home Agent



See Link Agent (Vision Agent)



Digital Life Agent

Critical Protocol Gaps in Today's Internet

No Dynamic "Skill" Registration

Agents can't universally advertise capabilities (e.g., "Fall Detection", "Camera Control") across administrative boundaries.

Cross-Cloud Routing between Isolated Silos

Isolated enterprise clouds (e.g., Digital Health vs. Vision Security) block seamless request routing over shared broadband pipes.

"How does a Home Agent discover and invoke a See Link Agent's 'Camera' skill across different cloud domains?"

Hackathon Plan

Plan: Our IETF 126 ANI project

Turning the ANI into Running Code & Interoperability

01 Gateway Implementation

Deploying the **ANI Agent Gateway** on the vBRAS-UP, enabling Agent registration, Gateway discovery and synchronization, and cross-domain relay routing.

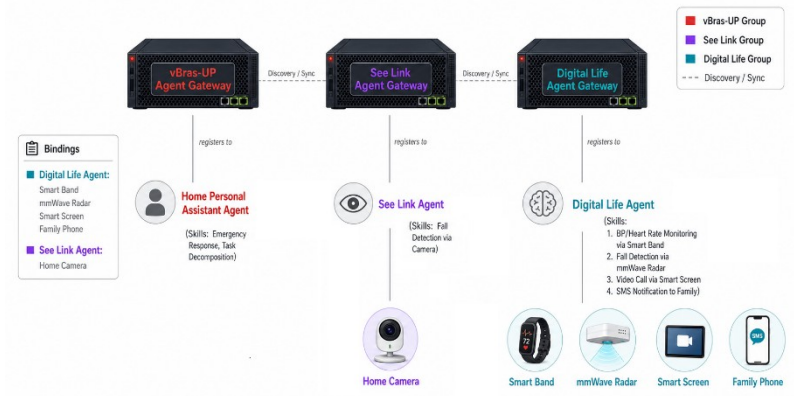
02 Scenario Validation

Verify the ANI in the scenario ——**“Elderly Fall Detection”**, integrating mmWave radar sensors with home broadband to test end-to-end protocol reliability.

Simulation Introduction

System Architecture

01 Logical Architecture View



Logical: Gateway → Agent → Device Hierarchy

Three Gateways synchronize to discover each other. Each Gateway has an Agent registered with clearly advertised skills. The radar, band, screen, and phone to Digital Life Agent; the camera to See Link Agent.

02 Physical Scenario View



Physical: Co-located devices, logically distributed

Except for the mobile phone, which is carried by one family member, all other devices are inside a room.

Simulation Introduction

Demo Call Flow — 4 Phases

01 DETECTION Trigger & Initiation	**ACTION: Motion Alert** Smart radar detects abnormal movement (fall) and sends an immediate trigger signal to Home Agent for processing.	**RELAY PATH** Radar Device → Digital Life Agent →Digital Life GW → vBras-UP Gateway → HA Core
02 VISUAL CHECK Verification Step	**ACTION: Camera Validation** HA requests real-time camera feed to confirm the fall event, ensuring accuracy and eliminating false positives.	**RELAY PATH** HA → vBras-UP GW → See Link GW → See Link Agent → Camera
03 VITALS FETCH Health Data Sync	**ACTION: Biometrics Query** System polls the wearable device to retrieve real-time vital signs (heart rate, SpO2) for emergency context.	**RELAY PATH** HA → vBras-UP GW → Digital Life GW → Digital Life Agent → Wearable Device
04 ALERT & CALL Emergency Response	**ACTION: Multichannel Notification** Auto-sends SMS alerts to emergency contacts and create a video call to the family smart screen.	**RELAY PATH** HA → vBras-UP GW → Digital Life GW → Digital Life Agent → SMS / Video Service

Key Architecture Insight: All cross-domain calls go through the Gateway — no direct Agent-to-Agent communication.

Demo & Result

Interoperability



01. Interoperability Achieved
Successful ANI message exchange validated across vBras-UP Gateway, Digital Life Gateway, and See Link Gateway, confirming full cross-domain protocol compatibility.

02. Dynamic Discovery Validated
Skill-based routing works as designed: "Camera" resolved to See Link Agent attached Gateway and "Band" to Digital Life Agent attached Gateway, ensuring accurate service discovery.

03. End-to-End Reliability
The ANI ensures that messages are delivered during the real-time data transmission.

What we learned

01 Key Observations

01. Gateway-based Routing
Confirmed to reduce cross-domain complexity by leveraging gateways over direct peer-to-peer (P2P) Agent communication, streamlining collaboration.

02. Agent Skill Registration
Lightweight, structured capability advertising simplifies cross-domain discovery and significantly lowers adaptation costs for new integrations.

03. Semantic Skill Description
Outperforms traditional API-based methods with stronger generalization, drastically cutting the adaptation period for onboarding new Agents.

02 Future Directions

Protocol Translation
Enable seamless interconnection across heterogeneous Agent platforms via unified gateway translation layers.

Efficient Synchronization
Optimize cross-gateway info sync to simplify Agent discovery in large-scale, distributed organizational networks.

Thank you :)

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