

Problems Statement and Requirements Analysis of DNS for Internet of Agents (IoA)

draft-ye-problems-and-requirements-of-dns-for-ioa-01

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Proliferation of AI Agents



Explosive Growth

- Projected to reach around 900B by the end of this decade



Role Transformation

- Become key Internet entities, deeply engaging in network interaction and resource scheduling



Complex Interactions

- Interaction entities: agent2agent, agent2tools, agent2human
- Interaction mode: task planning and decomposition, context sharing, resource Scheduling

DNS for IoA

REQ1 Global Unique Identifier

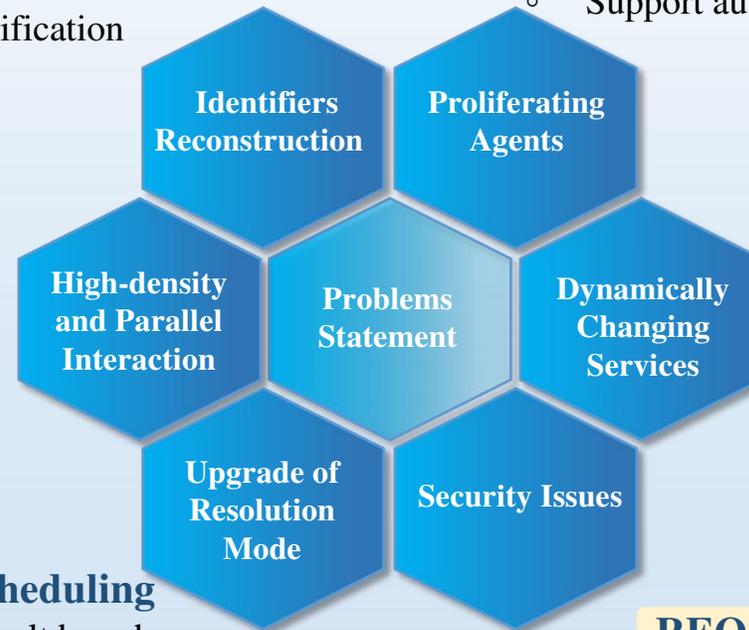
- Semantic hierarchical name
- Isolate impact caused by frequent changes of IP addresses or URLs
- Provide a foundation for agent identity verification

REQ2 Autonomous Capability Registration&Discovery

- Precise and accurate Capability & State Awareness
- Support autonomous registration and discovery of agent capabilities

REQ3 High-Performance Resolution

- Rapidly and accurately processing a large number of concurrent query requests



REQ5 Multi-Dimensional Dynamic Scheduling

- Dynamically select the optimal resolution result based on:
 - Agent information (RRs indicating capabilities, locations, loads, etc.)
 - Service requirements (EDNS/other labels in pakctes)
 - Network environments and load-balance strategies

REQ4 Information Exchange

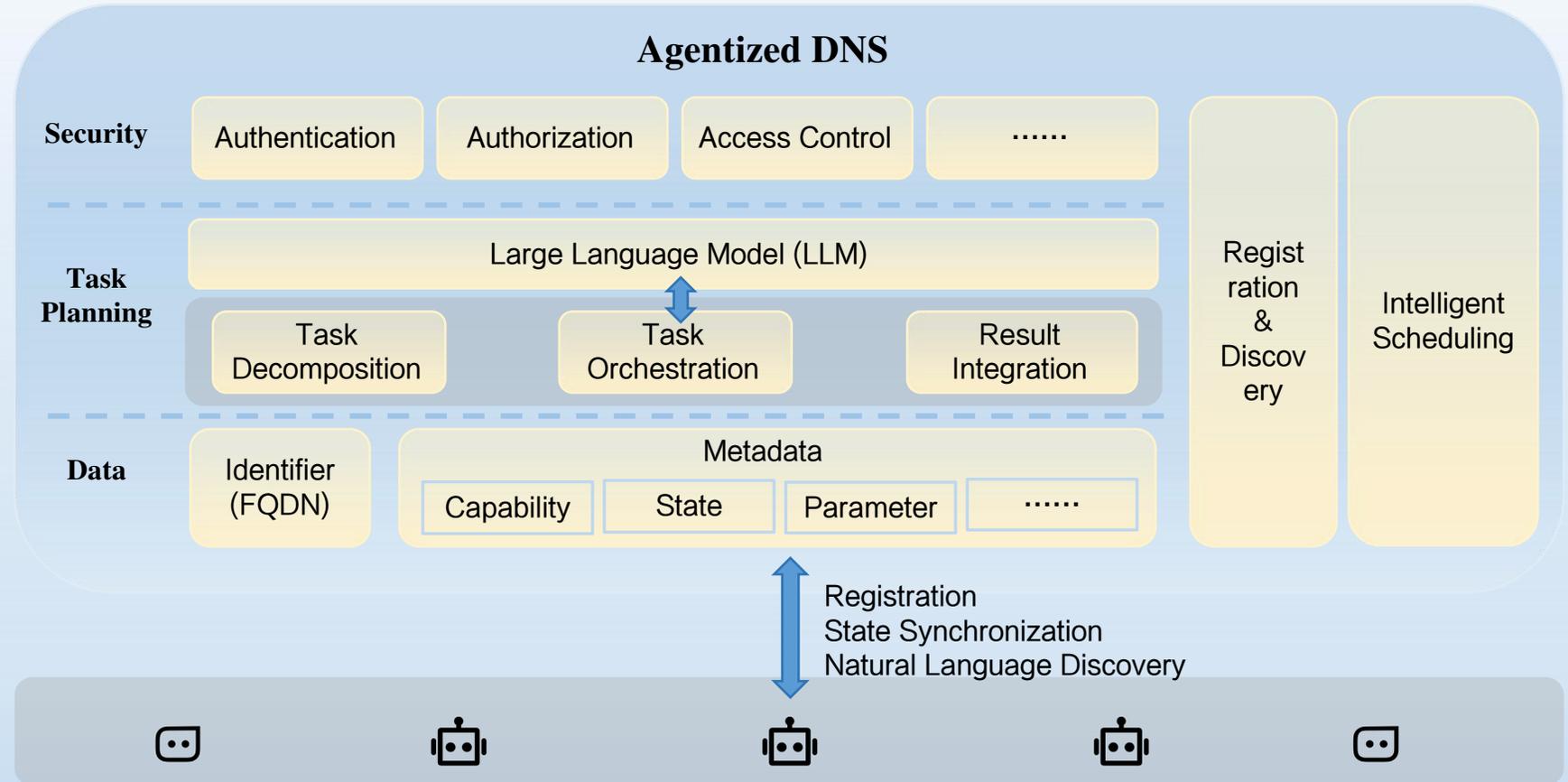
- Carry extensive metadata via rich-information RRs (e.g. SRV\TXT\SVCB) for detailed capability descriptions, configuration parameters, loads, other valuable information
- Maintain data freshness through subscription-push, regular detection and/or periodic report

REQ6 Authentication and Authorization

- Verify agent IDs and claimed capabilities (e.g. RRs)
- Verify when agents register capabilities and when service consumers receive data

Future DNS

- **FQDN-based Identity Registration**
- **Semantic Capability Registration**
- **Natural Language Agent Discovery**
- **LLM-based Task Planning**
- **Multi-Protocol Compatibility**



Thanks