

# Applicability of A2A to the Network Management

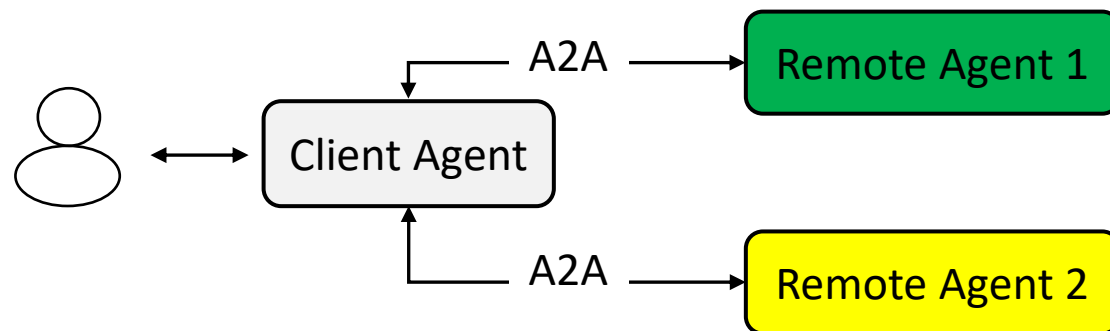
draft-yang-nmrg-a2a-nm-02

**NMRG**

On behalf of Authors and Contributors (Diego Lopez, Nathalie Romo Moreno, Lionel Tailhardat, Qiufang Ma, Qin Wu, Yuanyuan YANG, **Shailesh Prabhu**, Houda Chihi)

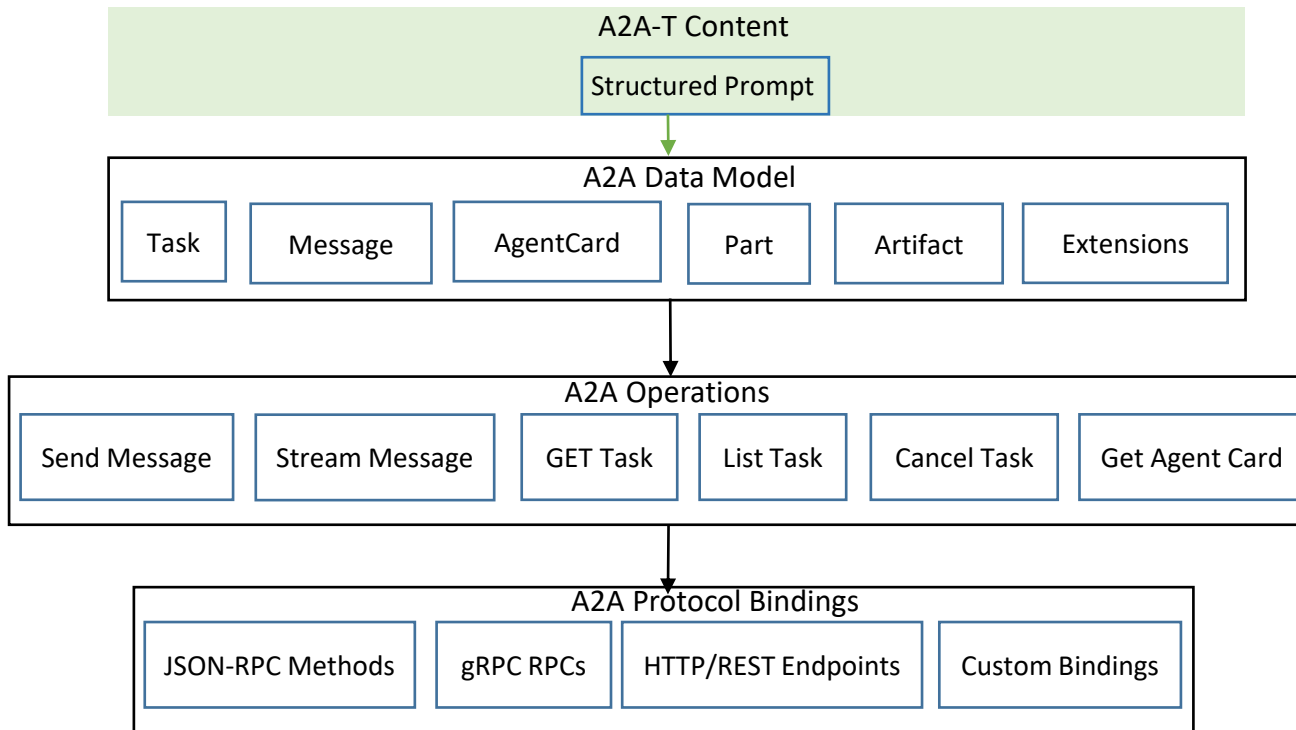
# A2A Protocol & Core Concepts

- **What is A2A?:** An open protocol for communication and collaboration between AI Agents across different platforms.
- **Core Concepts**
  - **Message:** An A2A message represents a single turn of communication between a client and a server Agent. A message contains one or more Part objects.
  - **Part:** A granular container for the actual content, which can hold different types of content including text, binary data, URLs, and structured JSON data.



# TMF A2A-T: Agent to Agent Protocol for Telecoms

- A2A defines how Agents communicate with each other, but does not define how Agents understand and negotiate semantics.
- A2A-T (Agent-to-Agent for Telecom, IG1453) is an enhancement and improvement of A2A at the semantic level based on structure prompts.
  - But it still lacks standardized semantics that supports quick parse and validation.



```
## Task Type
Fault diagnosis task
## Task Description
Please analyze the root cause of the fault based on <Target Object>, <Environment Information>, and <Constraints>, and provide repair recommendations. Return the task response result according to the structure defined in <Expected Output>.
## Target Object
{{Fault ID}} (Mandatory)
Requirement: The fault ID must include the fault ticket number.
{{Affected Object}}
Requirement: The network element object must include the EMS resource object on the network side that is affected by the fault.
{{Associated Information}}
Requirement: The associated information must include the list of associated Incidents and the list of associated alarms.
## Environment Information
{{Fault Occurrence Time}} (Mandatory)
{{Fault Context Object}} (Mandatory)
Requirement: The fault context object may include information about fault preprocessing on the OSS side and original alarm messages on the EMS side.
{{Extended Attributes}}
## Constraints
{{Task Priority}}
{{Task Time Requirement}}
## Expected Output
The fault diagnosis result should include the following information:
1. Diagnosis status, either success or failure
2. Fault diagnosis analysis results
3. Repair recommendations
4. List of root causes
5. Domain-specific information
```

# YANG-based Structured Data for Agent Communication

- **The proposal:** Integrate IETF YANG-modeled data within the parts of an A2A message.
- **Core Value:**
  - Unambiguous and machine-parsable definitions for network operations.
  - Seamless integration with existing IETF NETCONF/YANG ecosystem.
  - Human-Machine Synergy to combine plain text with YANG structured instance data

# An A2A-T Message Example with both text and YANG-data parts

```
POST /agents/network-ai-agent HTTP/1.1
Host: example.com
Content-Type: application/json
{
  "jsonrpc": "2.0",
  "method": "message/send",
  "params": {
    "message": {
      "message_id": "123e4567-e89b-12d3-a456-426614174000",
      "context_id": "conversation-12345",
      "role": "ROLE_USER",
      "parts": [
        {
          "text": "Please diagnose the service degeneration incident for 'optical-svc-A' in 'FAN' domain...Provide root cause, severity level, and resolution recommendations.",
          "media_type": "text/plain"
        },
        {
          "data": {
            "incident": {
              "name": "Service Degradation",
              "type": "network_problem",
              "incident_id": "56433218",
              "service_instances": ["optical-svc-A"],
              "domain": "FAN",
              "priority": "critical",
              "status": "raised",
              "occurrence_time": "2026-02-10T04:01:12Z",
              "last_updated": "2026-02-10T04:01:12Z",
              "probable_events": [{"...}],
              "media_type": "application/json",
              "metadata": {
                "yang_module": "ietf-incident",
                "revision": "2025-09-16"
              }
            }
          }
        }
      ]
    },
    "configuration": {
      "accepted_output_modes": ["application/json"],
      "blocking": false,
      "history_length": 3
    },
    "metadata": {
      "request_type": "incident_diagnosis",
      "priority": "critical",
      "response_deadline": "2026-02-10T06:00:00Z"
    }
  }
}
```

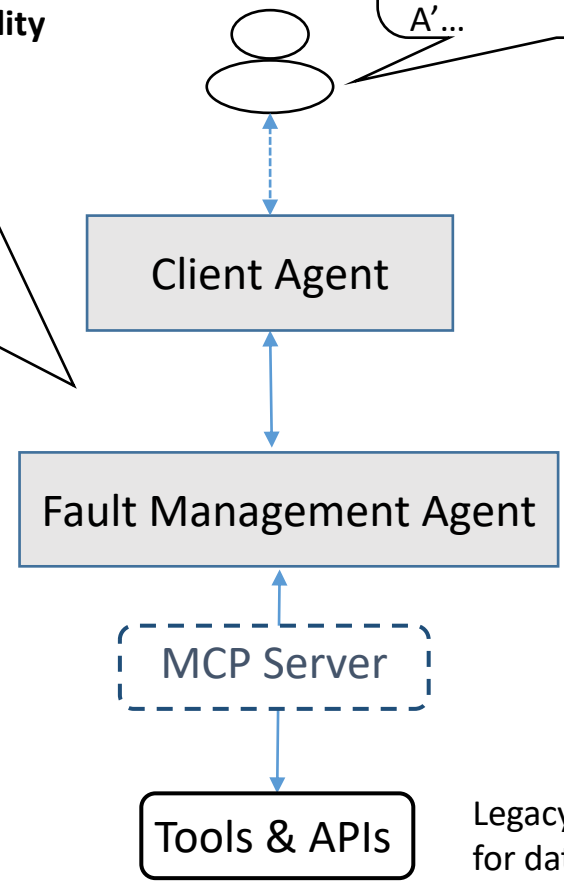
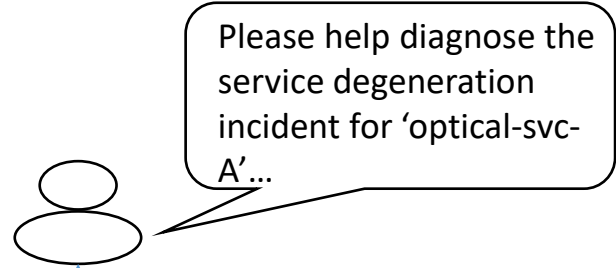
Natural language for human readability

“text”: “Please diagnose the service degeneration incident for ‘optical-svc-A’ in ‘FAN’ domain...Provide root cause, severity level, and resolution recommendations.”,  
“media\_type”: “text/plain”

YANG-based structured data for quick parse, validation, and process

“incident”: {  
“name”: “Service Degradation”,  
“type”: “network\_problem”,  
“incident\_id”: “56433218”,  
“service\_instances”: [“optical-svc-A”],  
“domain”: “FAN”,  
“priority”: “critical”,  
“status”: “raised”,  
“occurrence\_time”: “2026-02-10T04:01:12Z”,  
“last\_updated”: “2026-02-10T04:01:12Z”,  
“probable\_events”: [{...}],  
“media\_type”: “application/json”,  
“metadata”: {  
“yang\_module”: “ietf-incident”,  
“revision”: “2025-09-16”  
}  
}

Defined in I-D.ietf-nmop-network-incident-yang



Legacy tools that requires rigorous clarity for data semantics and formats.