Framework for Normalizing Multi-Vendor Network Inputs for LLM-Assisted Network Management

draft-prabhu-nmrg-prompt-schema-llm-00

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Motivation

- Network management data originates from many heterogeneous sources:
    - CLI outputs
    - Telemetry streams
    - Alarms
    - Configuration files
    - API responses
    - Logs
- Each vendor represents the same operational state differently.
- Vendor-specific data leads to vendor-specific prompts, limiting portability and interoperability.
- A vendor-neutral representation is needed before data is consumed by an LLM.

Problem

- Same Network State, Different Representations

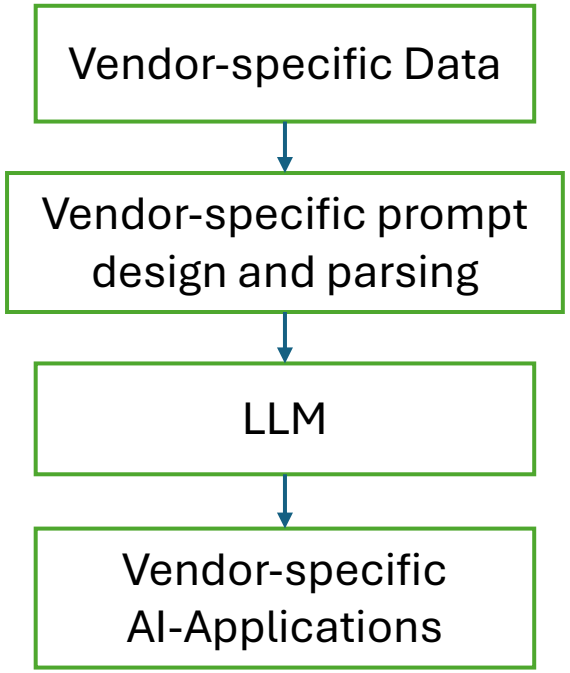
Vendor A	Vendor B	Vendor C
show interface	display interfaces	interface brief
Admin state up	enabled	state=up
rx_errors	input errors	receive_errors

- Although semantically equivalent, these representations differ in:
  - Syntax
  - Terminology
  - Field names
  - Hierarchy

- Different representations require different prompts and parsing logic.

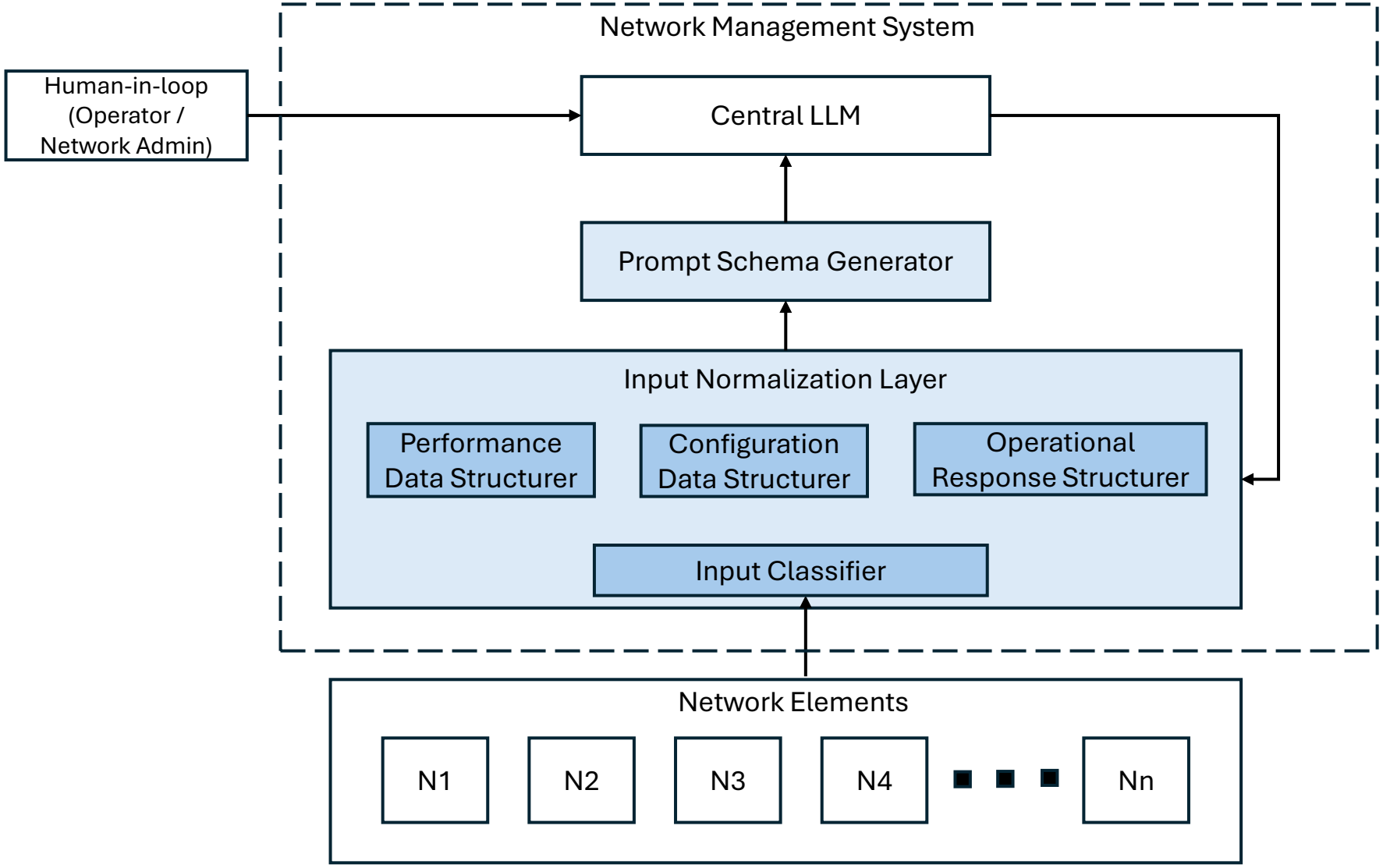
Current Approach

- Current Workflow:



- This limits:
  - Portability
  - Interoperability
  - Scalability
  - Prompt Reuse

Proposed Framework



Key Advantages

Current Approach	Proposed Framework
Vendor-specific prompts	Vendor-neutral schema
Repeated prompt engineering	Reusable schemas
Different parsers	Common abstraction
Lower interoperability	Higher interoperability
Inconsistent Inputs	Consistent LLM inputs

- Enables:
  - Vendor-independent AI applications
  - Reusable prompt schemas
  - Reduced integration effort
  - Simpler onboarding of new vendors

Discussion and Next Steps

- Feedback requested from the NMRG community on:
  - Is there interest in pursuing this problem within NMRG?
  - Is the proposed framework an appropriate starting point?
  - Are there existing efforts or standards that this work should align with?
  - What use cases or deployment scenarios should be considered?

- Looking for reviewers
  - Welcome volunteers to review this Internet-Draft, provide technical comments on the Mailing List or Github Repository: https://github.com/shaileshprabhu95/draft-nmrg-prompt-schema-llm