# IBN for Whole-of-System Automation

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# Key references

IRTF:

RFC 9315  Intent-Based Networking: Concepts and Definitions
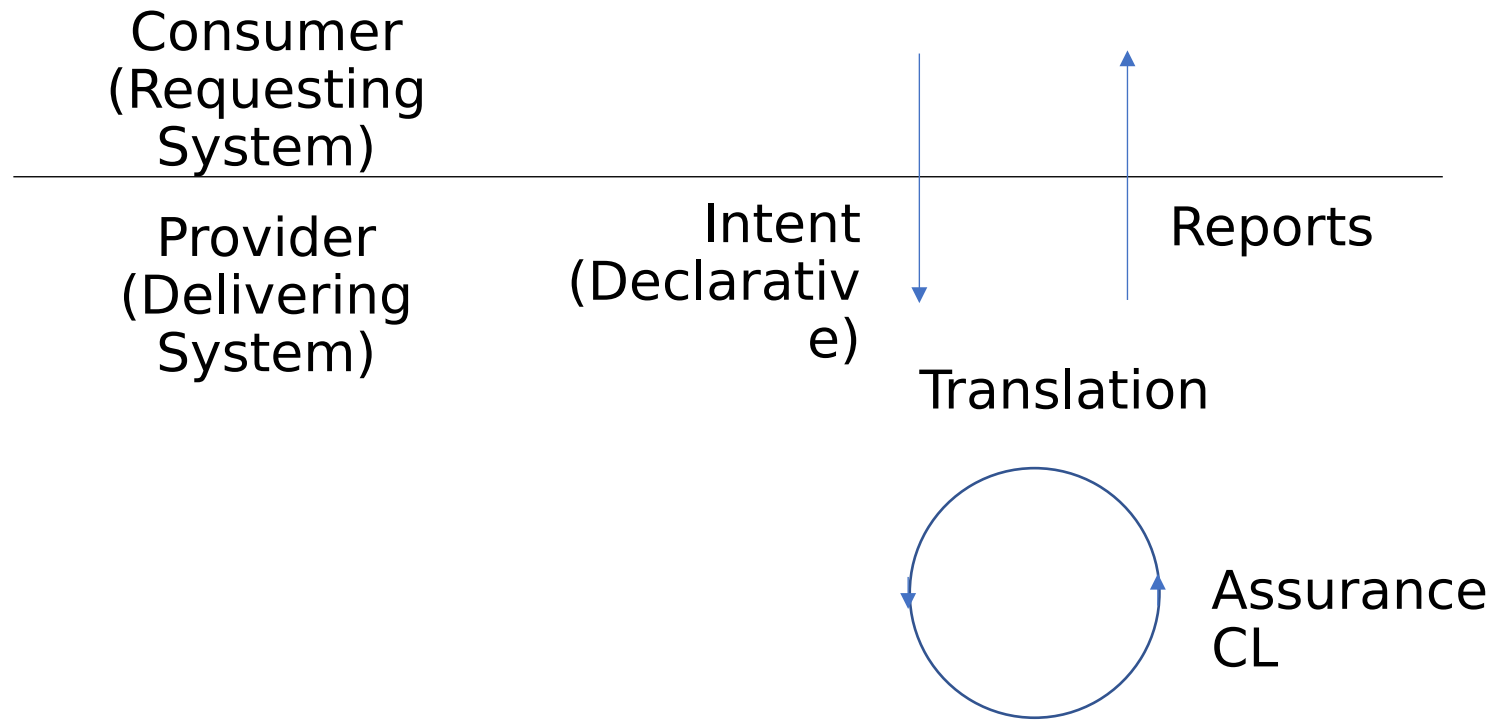
RFC 9316: Intent Classification

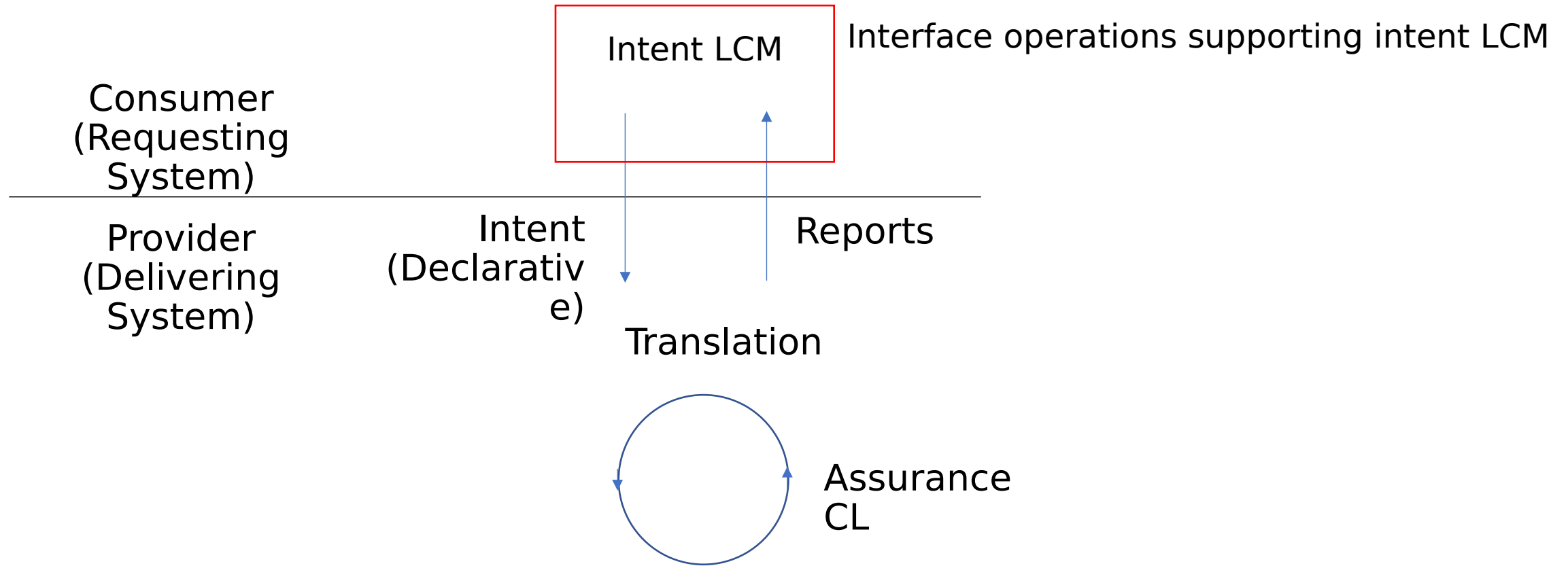Coming (draft): Use Cases and Practices for Intent-Based Networking

ETSI ZSM:

ETSI GR ZSM 011: Intent-driven autonomous networks: Generic aspects

ETSI GS ZSM 016: Intent-driven closed loops

# Key aspects in common

Consumer
(Requesting
System)

Provider
(Delivering
System)

Intent
(Declarative)

Reports

Translation

Assurance
CL

# Additional aspects from ZSM

Intent LCM

Interface operations supporting intent LCM

Consumer
(Requesting
System)

Provider
(Delivering
System)

Intent
(Declarativ
e)

Reports

Translation

Assurance
CL

# Corollaries: Whole-of-System Automation

The consumer is strictly a "demand system"
- It plays *no role* in network operations
- Intent is declarative *as a consequence*
- Receives *only reports* indicating intent compliance or lack of it
- Reaction to reports limited to *LC responses*

This creates a strict role separation between consumer and producer
- As is generally characteristic of the role separation between buyers and vendors

It also enables whole-of-system, top-to-bottom automation
- *consumer-vendor interaction may be automated* by automating intent LC decision-making
- delivery is automated by assurance closed loop

Intent is the functional target for major *system interfaces in automated systems*
- Directly between automated, intelligent network and demand generation/management syste
- Intent is a set of mechanisms working in concert, not a model
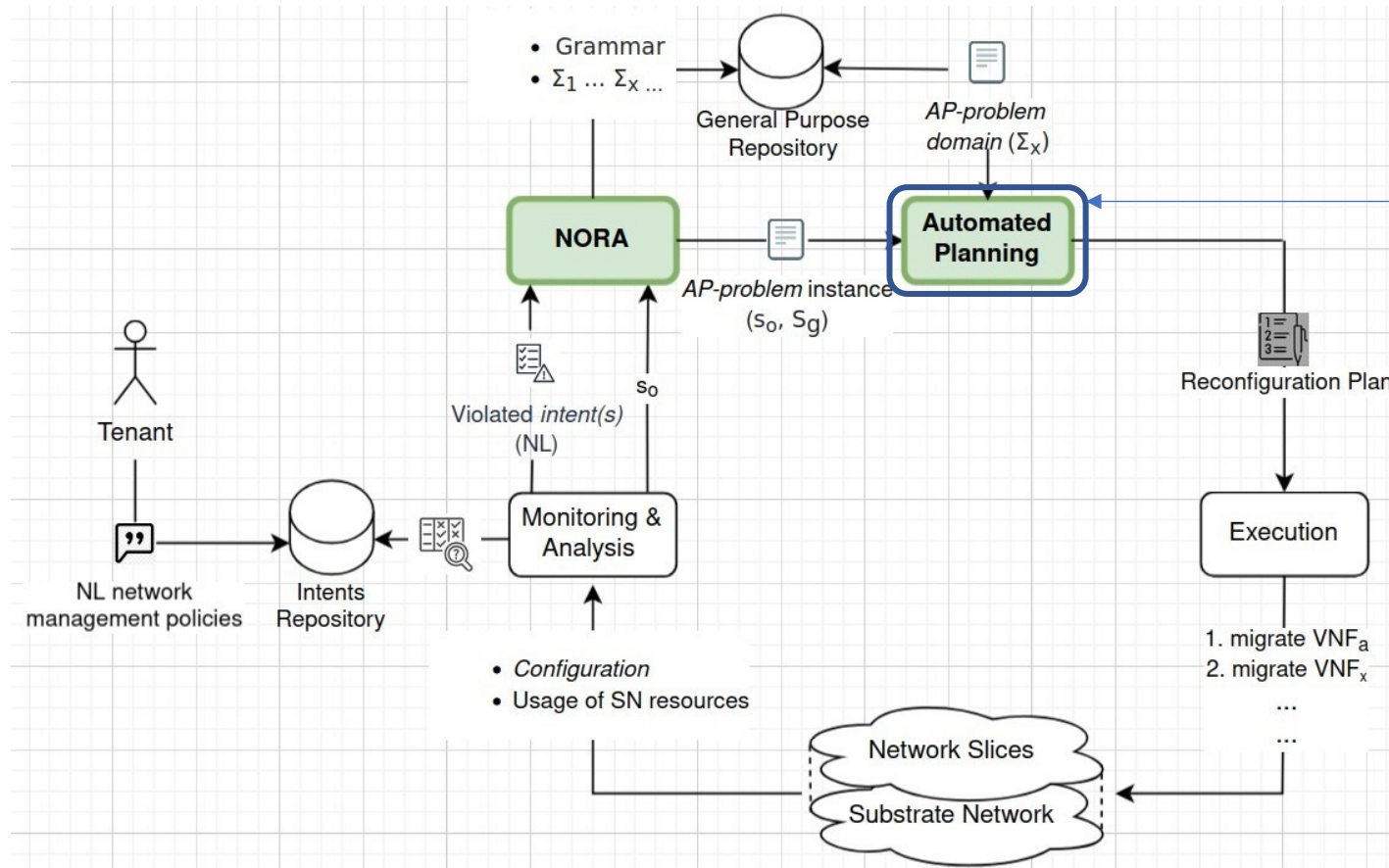  - Any appropriately abstracted model may be compatible with use in an intent-based syste

# Assurance Closed Loops in IBNs

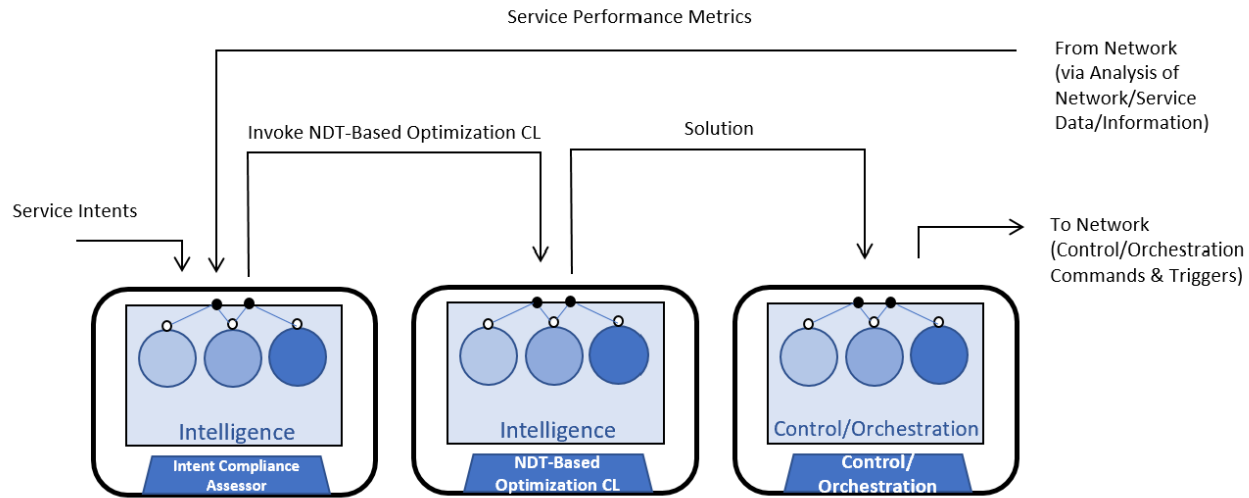E.g. from: "An Autonomic Control Loop with AI-planning and NLP for achieving self-reconfiguration in a sliced network"
(Angela Vivas et al, presented in NMRG session IETF 121)

"Outer Closed Loop"
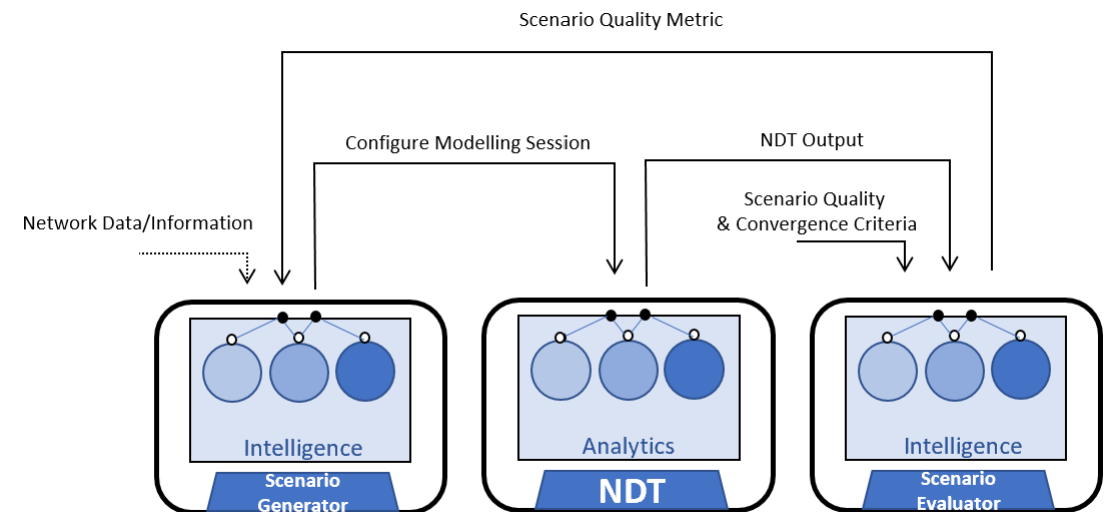


NDTs can be used here…

# From ZSM 016: NDT-Based Inner Closed Loop



"Outer Closed Loop"

"Inner Closed Loop"

(An instance of an NDT-based optimization CL)

# From NMRG C&A Draft

https://datatracker.ietf.org/doc/draft-irtf-nmrg-network-digital-twin-arch/