

Status update

draft-clemm-nmrg-dist-intent-02

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Status update

- Draft update to rev -02, following NMRG interim meeting in San Jose.
- Updates:
 - Title changed to “Intent-Based Networking - Concepts and Overview”
 - Numerous edits throughout, including clearer delineation between Intent and other concepts (such as policy)
 - New section on first-order principles of Intent-Based Networking
 - New section on Intent Lifecycle
 - New section on Intent Research Challenges

Document structure

1-3. Introduction, Key Words,
Definitions and Acronyms

4. Introduction of Concepts

4.1. Intent and Intent-Based Management

4.2. Related Concepts

4.2.1. Service Models

4.2.2. Policy and Policy-Based Management

4.2.3. Distinguishing between
Intent, Policy, and Service Models

5. Principles

6. Lifecycle

7. Intent-Based Networking -
Functionality

7.1. Intent Fulfillment

7.2. Intent Assurance

8. Research Challenges

8.1. Intent Interfaces

8.2. Explanation Component

8.3. IBN Metrics to Guide Desired
Outcomes

9. Items for Discussion

10. IANA Considerations

11. Security Considerations

12. References

Intent concept clarifications

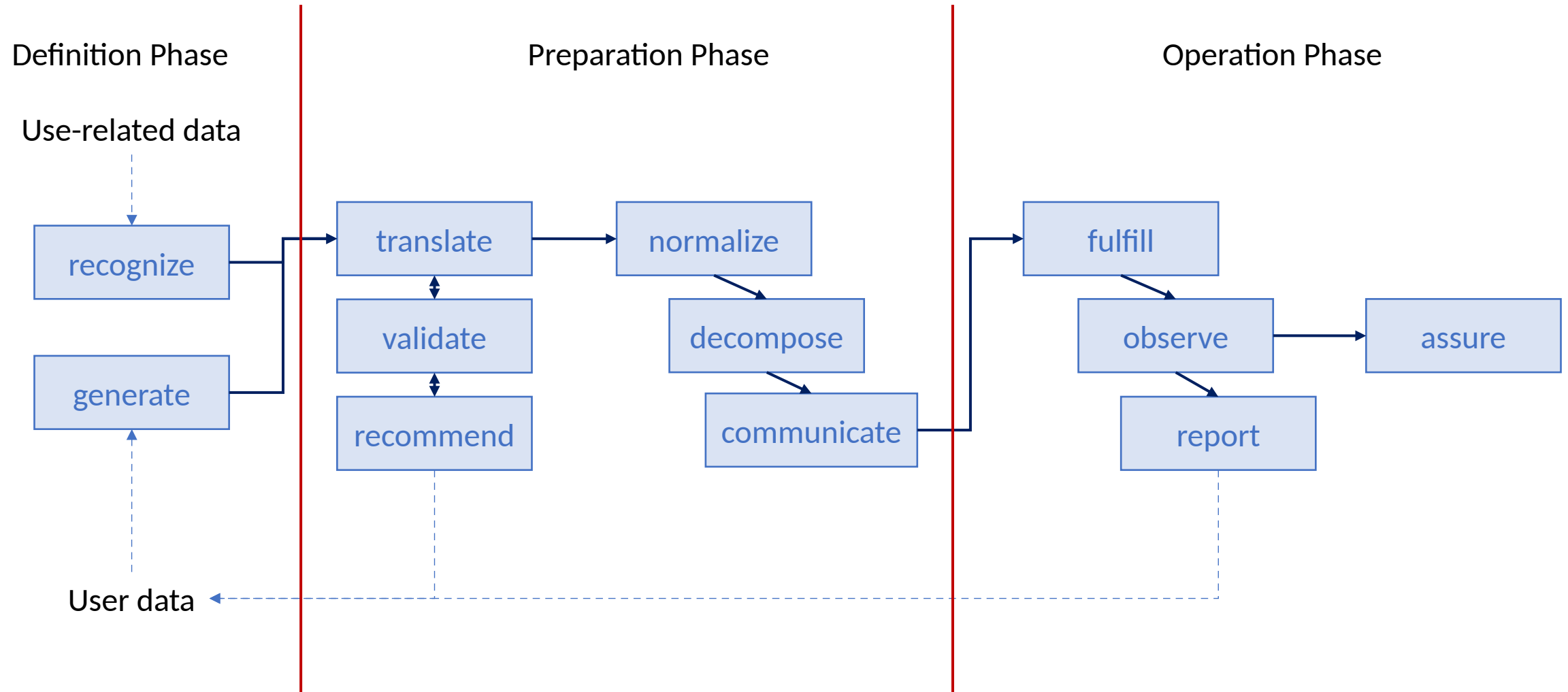
- Intent is outcome-oriented
 - “What outcomes does a network provider expect”, not “how those outcomes are achieved”
 - Intent system, not user, responsible for translating desired outcomes into courses of actions, policies, algorithms.
- On the relationship to Policy
 - “Intent-based” relates to “policy-based” like “AI and machine-learning” relate to “Expert Systems”
 - Intent defined by desired outcomes, not how to achieve them (one way of which might be means of rules)
 - Policy defined by rules (e.g. Events/Conditions/Actions) and what to do under which circumstance

Principles

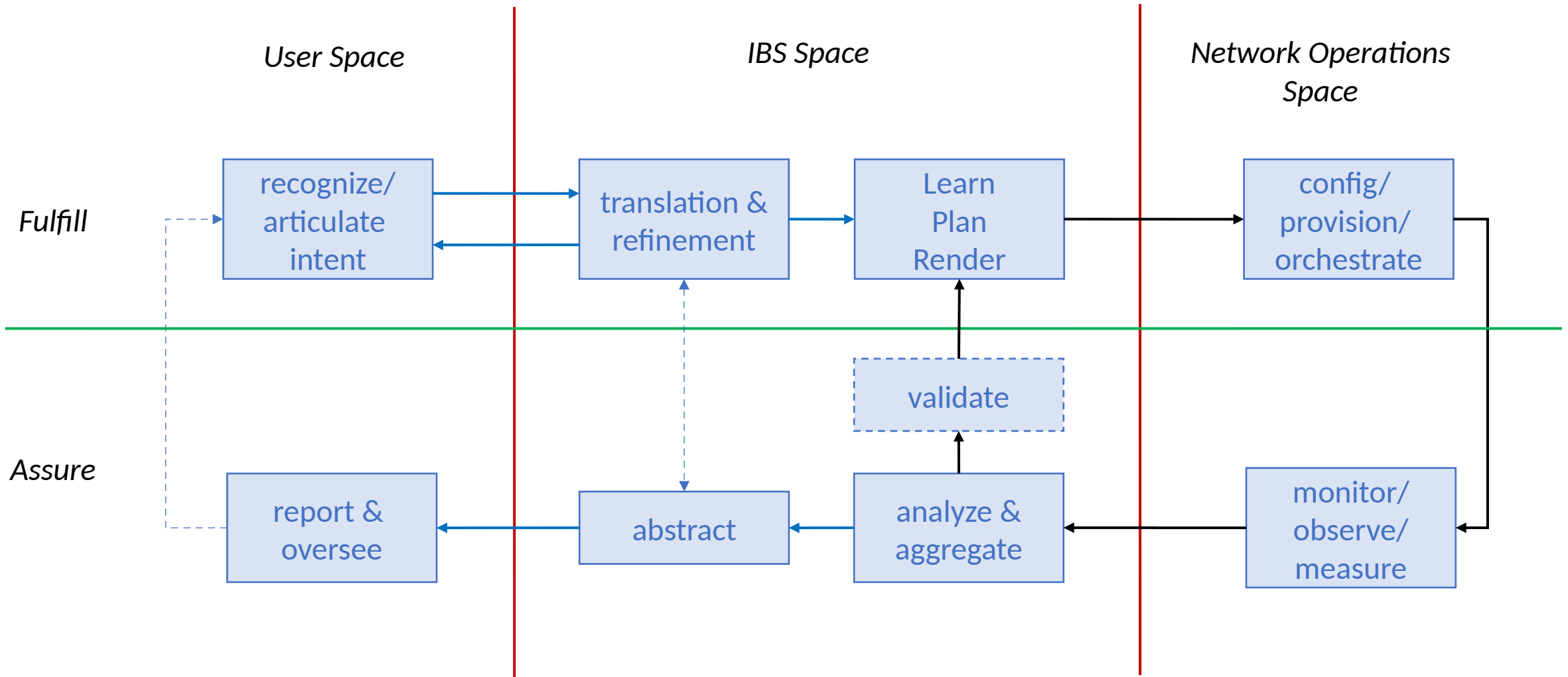
Starter set of principles defined, subject to further discussion:

- **Single source and single version of truth (SSoT/SVoT)**
(Important to capture drift, ensure system convergence)
- **One touch but not one shot**
(It may take iterations and interactions to arrive at desired intent, resolve ambiguities, avoid unintended consequences)
- **Autonomy and oversight**
(System conducts tasks on its own; users are given the necessary tools to retain an understanding of current state and what is happening)
- **Learning**
(System is able to assess effectiveness of its own actions and improve in order to optimize outcomes and adapt to dynamic conditions and changing context)
- **Explainability**
(System is able explain its actions and reason about their effectiveness)
- **Abstraction**
(Users do not need to be concerned with how intent is mapped into lower-level artefacts)

Intent lifecycle (1)



Intent lifecycle (2)



Intent Research Challenges (starter set)

- **NMRG is a research group, after all...**
- **Intent interfaces**
System is to infer the intent of the user (Intent \neq YANG, CLI, RPC, config) Human-machine interactions: facilitate interrogation/interview-style interactions, clarification, alternative selection, intent playback, iterative intent refinement
- **Explanation**
Have IBN explain actions to facilitate troubleshooting, improve confidence, retain control – compare ML
- **IBN Metrics**
Assess effectiveness of IBN outcomes, ability to learn, adapt, progress

Next steps

- Request adoption as NMRG work item

Thank you!