Status update
draft-clemm-nmrg-dist-intent-03
“Intent-Based Networking – Concepts and Overview”

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Status update

• Draft updated from rev -02 to rev -03

• Updates:
  • Filled in gaps with regards to Intent Lifecycle discussion
  • Described lifecycle in greater detail, including intent fulfillment and intent assurance functions and their interactions
  • Removed research challenges
Intent lifecycle

**User Space**
- recognize/articulate intent

**IBS Space**
- translation & refinement
- Learn
- Plan
- Render

**Network Operations Space**
- config/provision/orchestrate

**Fulfill**
- report & oversee
- abstract
- analyze & aggregate
- validate

**Assure**
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. Items for Discussion

9. IANA Considerations

10. Security Considerations

11. References
Open Items – next steps

• Consolidation of intent lifecycle (currently two diagrams)
• Section 7 Edits – Intent-Based Networking Functionality
  • Editorial alignment needed with section 6 (lifecycle)
  • Probably move section 6 material into 7
• Distinction between Intent Categories and Intent Granularity
  • Add here or leave for Intent Classification document?
  • Operational intent (general operational goals)
  • Rule intent
    • excluded now - this is related to ECA and policies
    • As “intent washing” of concepts occurs, may be good to include for completeness reasons
  • Service intent (intent for services and service instances – compare RFC 8309)
  • Flow intent (intents for individual flows)
• Add brief discussion of security implications and challenges
  (Security Considerations)
Positioning within IBN workplan in NMRG charter

• Document the problem statement, design goals and challenges
Goal: describe the problem and solution spaces; identify the limits of current technologies and methods and derive the associated research challenges.

• Document fundamental concepts, background, and terminology
Goal: provide clarity and achieve a common understanding of the various concepts, definitions and terms of what constitutes an IBN system.

• Develop a taxonomy and document suitable means to express intents
Goal: categorize the different forms of intents and define what constitutes a “well-formed” intent; describe how an intent can be expressed and what can be expressed using an intent with means such as information models, grammars, and languages.

• Design and specify a common architectural framework comprising requirements, functions and techniques to realize an archetypal IBN system; describe the lifecycle and theory of operations.
Goal: determine the elementary functional blocks of an IBN system, their interactions, inputs and outputs; propose different techniques applicable for the different functions.
Next steps

• Editorial updates (-04):
  • Section 7 edits (functionality), security considerations
  • We do not expect major additions and believe we are ready for decision on adoption decision

• Request adoption as NMRG work item
Thank you!
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)