



# Intent Constructs on a Distributed Infrastructure

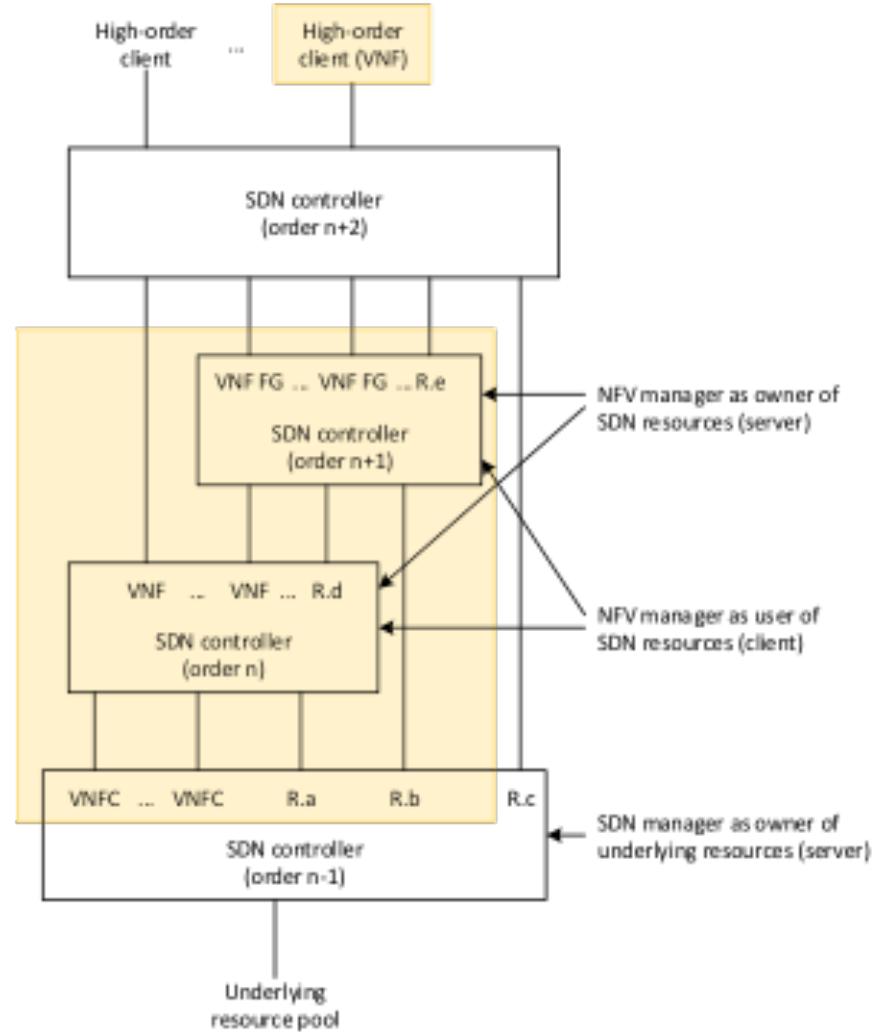
# Welcome to the Continuum

- Think software
  - Multi-language, multi-tenant, multi-thread...
  - Human in the loop
- A continuum of solutions
  - As usual in software space
- And blurred layering
  - Not the layering principles, but node layering
  - Compute vs network vs storage
  - Service vs network, in both directions
- Technology mix-and-match
  - Additional degrees of freedom for placement and forwarding
  - Mixed application/cloud/network tools and techniques
- Distribution
  - Monoculture is deleterious
  - No one-size-fits-all
  - As long as it is allowed by the laws of Physics
- Intent-based interfaces are the next line for convergence
  - Users
  - Management



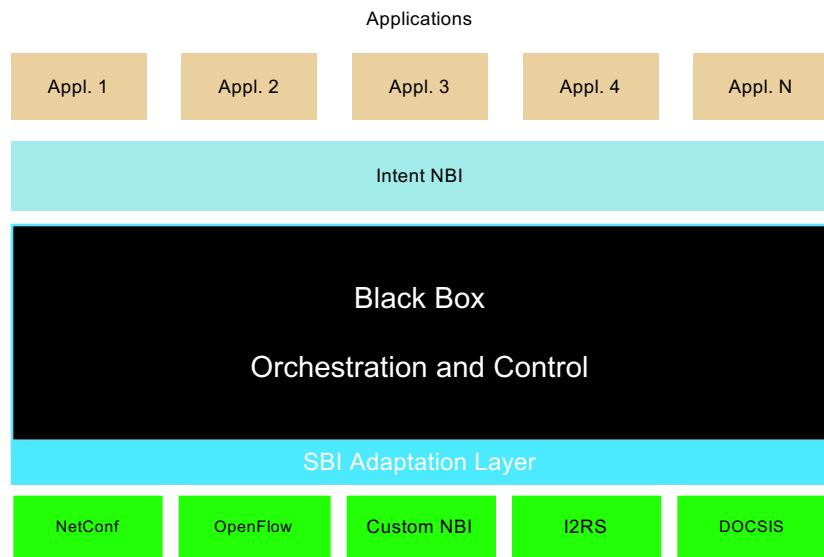
# The Recursion Issue

- Forwarding requires processing and processing requires forwarding
  - There is a deep intertwining of the two
- Forwarding can be encapsulated into a processing representation and processing into a forwarding representation
  - At any recursion level
- Neither are necessarily at the top or at the bottom of the stack and both may be intertwined at many levels of recursion
  - Stacked macro and micro views



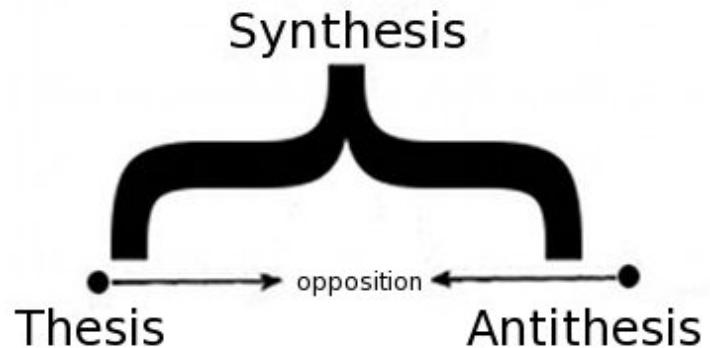
# Introducing Intent

- Describes what is required
  - Not necessarily only from the network
  - User
  - Management
- No prescriptive information
  - Nothing about how the service is to be fulfilled
- May be hierarchical
  - Services composed of other services
- Enable portability and interoperability
  - Deliver services irrespective of underlying technology



# The Dialectical Way to Support Intent

- Thesis: Translate intent into action
  - Understanding intent statements
  - Mapping onto technologies
  - Considering current state
  - A controlled but flexible language
- Antithesis: Support management constraints
  - Provided by network management
  - Evolved from general principles defined by humans
  - Equivalent but not necessarily equal language space
  - The archetypal SLA enforcement
- Synthesis: Conflict resolution
  - Among action requests
  - And with management constraints
  - Has to be initiated before translation
  - Understandable by humans for auditing purposes
- Identify application points and support composition
  - Horizontal: federation
  - Vertical: recursion



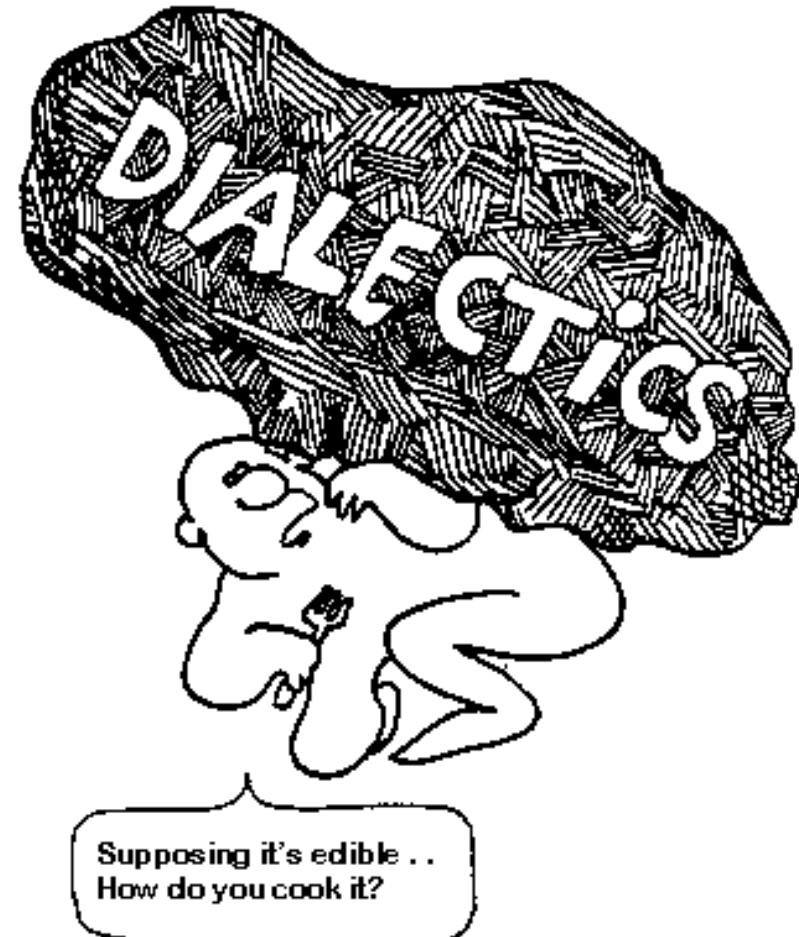
- Identity
  - Discovery
  - Provenance
  - Accountability
  - Reputation
- Computational intelligence
  - Linguistic interfaces
  - Machine learning
- Tools supporting the human(s) in the loop
  - On and beyond REST APIs

# Applying Intent Dialectics

- Personalized services
  - Composing intent expressions
  - User, service provider, slice operator, infrastructure...
  - Support for personal auditing
  - Privacy preservation according the personal requests
- The generic 5G slicing
  - Slices defined by intent expressions
  - Matched against operator infrastructure intent declaration
  - Compatible with other slice definitions
  - Supporting recursion, applying slice user intent expressions
  - Supporting federation, across network and slice providers
- Reduced service TTM
  - Applying business rules as intent
  - Domain-specific languages to capture customer requirements
  - Bridging the gap between support systems and network management
  - And the archetypal DevOps

# The Dialectical Distributed Infrastructure

- Catalogs and repositories
  - As an extension of existing ones
    - Functions
    - Services
    - Data sources
- Directories and registries
  - Suitable to become public and open by means of blockchains
    - Identity
    - Provenance
    - Accounting
- Mediation systems
  - Relaying on the above
    - Attestation
    - Orchestration
    - Monitoring



*Telefonica*

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