Reimagine the Network

What is Reimagine the Network?

An intelligent autonomous network using AI

... that dynamically adjusts to customer needs (human-centered network)

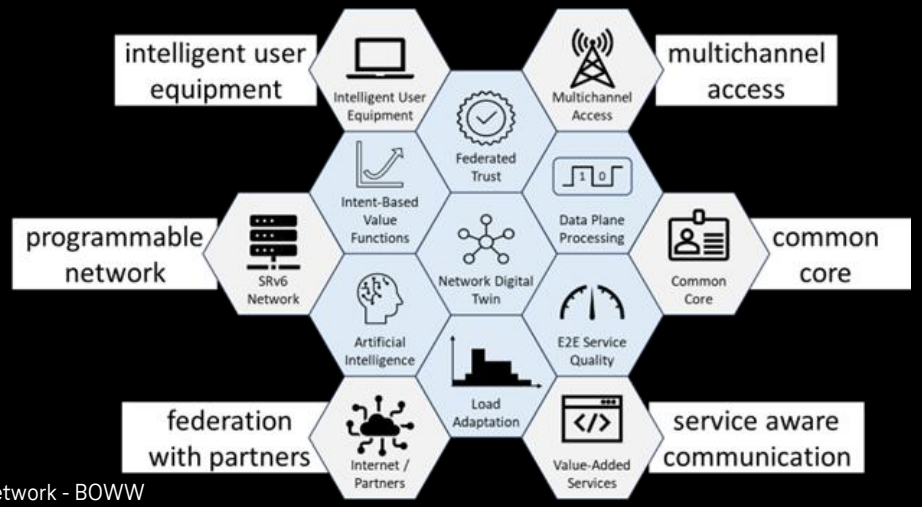
... based on **radical simplification**.

Objectives

- double the performance
- halve the cost
- scale resource consumption with usage

&

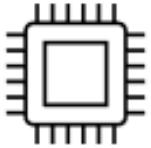
- open up new business opportunities



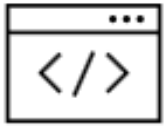
Solution Elements

Reimagine the Network

Architecture Principles



hardware for performance



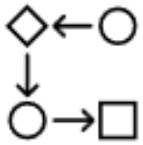
software for flexibility

AI drives design & optimization

share & reuse resources

interconnect partners via IP

optimize resource utilization via LCM



make networks programmable

enable service awareness

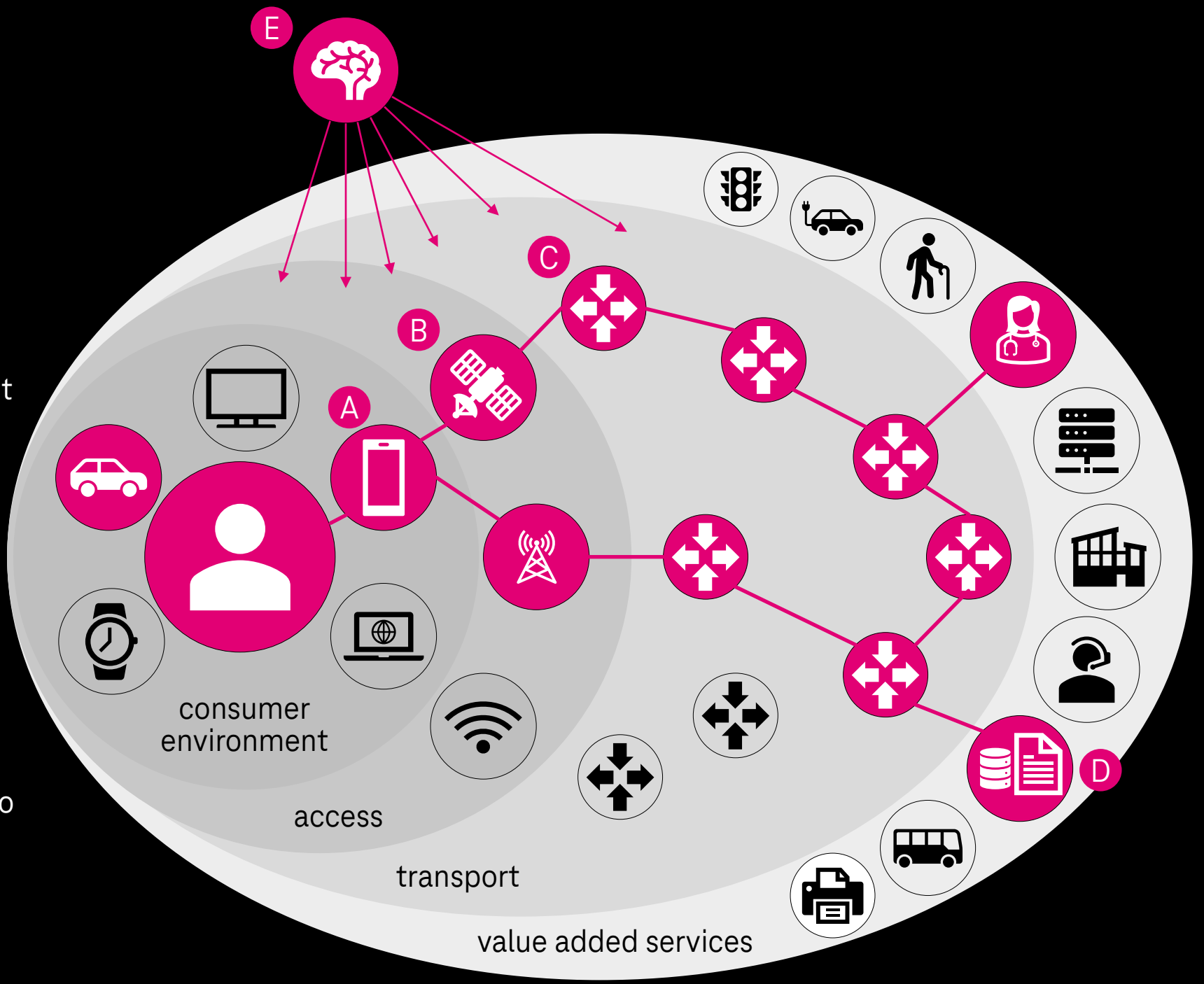
zero-touch automation

keep it super simple

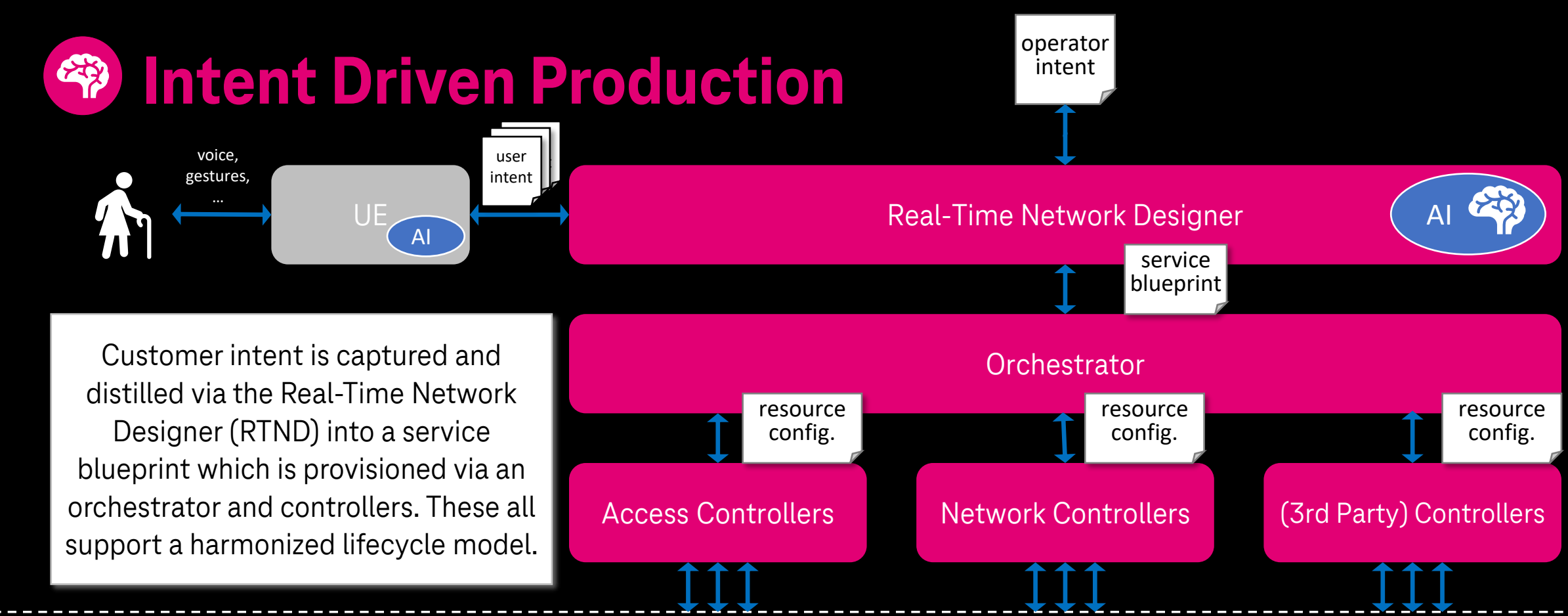
Key Concepts

Center of Focus: Human Intent

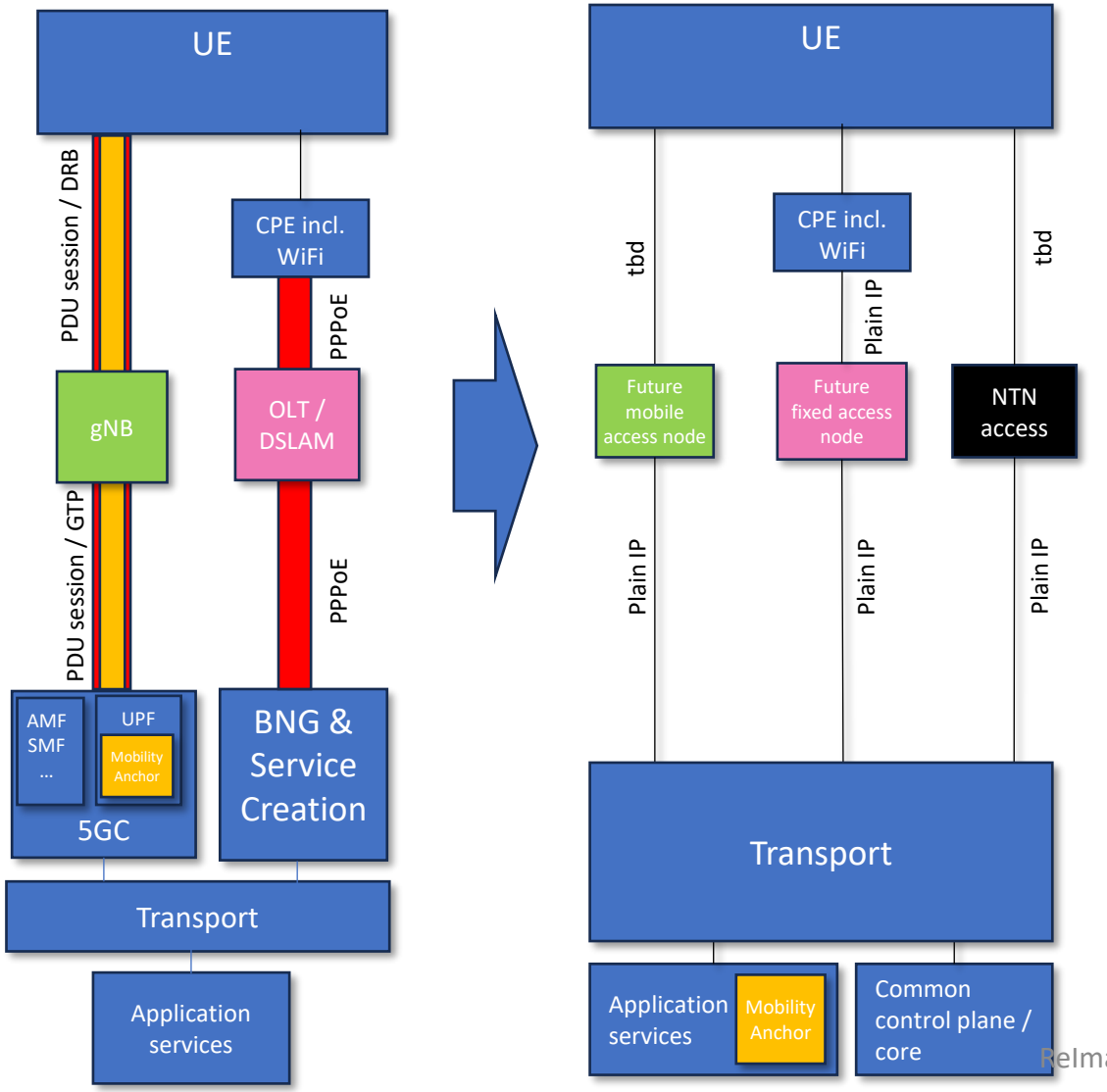
- A **Intelligent UE** captures context and human intent
- B Simplified integration of different access technologies via **Plain IP**
- C **Programable Network** for dynamically creating a suitable communication environment
- D Dynamic provisioning and **Integration of 3rd party value added services** based on simplified lifecycle model
- E One autonomous control plane to coordinate the **Intent Driven Production**



Intent Driven Production



Plain IP access



Features & Benefits

Principle: Review the way we produce services & functionalities provided.
Is it still needed? Can we simplify it?

Observation: Extensive use of tunneling in telco networks

- Generates overhead
- Couples access and core
- Creates telco specifics → less vendors, higher price

Reimagined approach:

- Access Nodes terminate plain IP, without tunneling or encapsulation
- Access node can be of any kind of layer 1 or layer 2 technology
- UEs connect to access nodes & communicates via plain IP
- Common, unified control plane is established via IP between UE & core (e.g. for authentication)

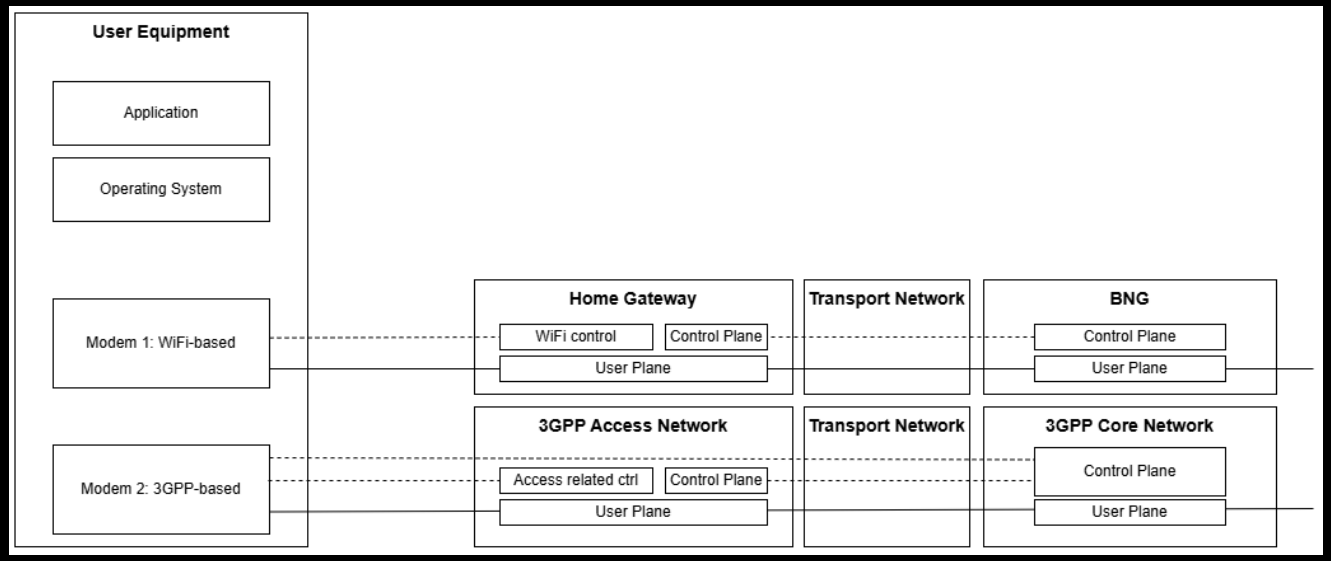
Affected functionality:

- Persistent IP address during mobility
  - Not needed for many use cases (static, nomadic) and many applications
  - Mobility anchor (in case needed) will be left to the application
- Charging, legal intercept, policy enforcement, … are for further study

Benefits:

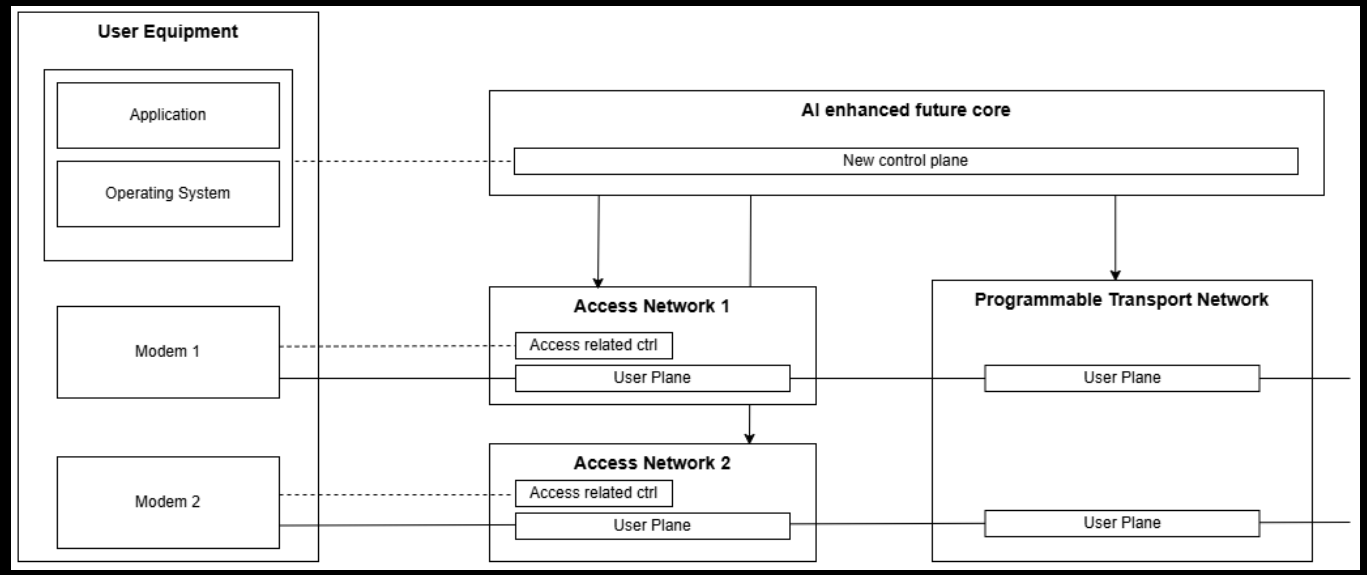
- Significant complexity reduction
- Allows for easy integration of new access technologies and standards

Plain IP control and user plane



Objectives:

- Harmonization / Simplification
- New ecosystem based on Internet principles
- Use all available resources

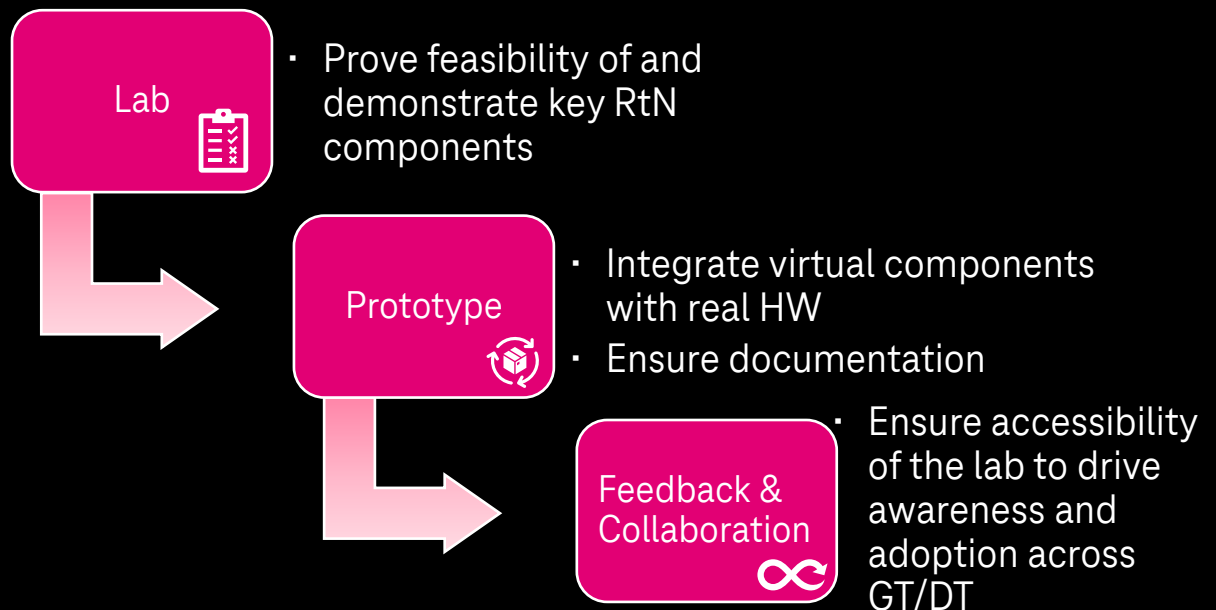


The Lab – A sandbox for the networks of tomorrow

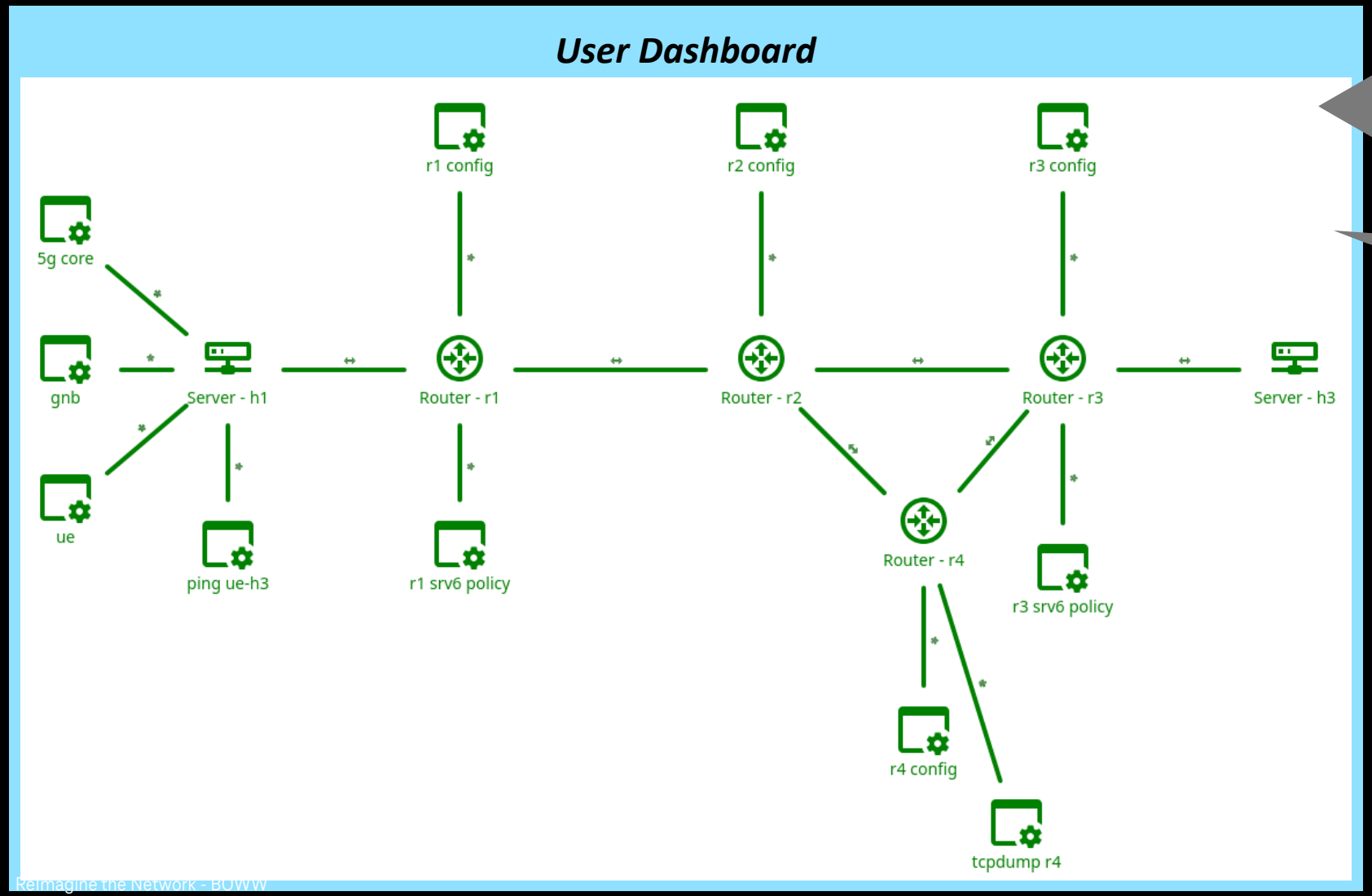
Objective: The Re-Imagine Lab is our innovation sandbox—built to prototype, test, and validate ideas around, programmable, intelligent, and scalable networks.

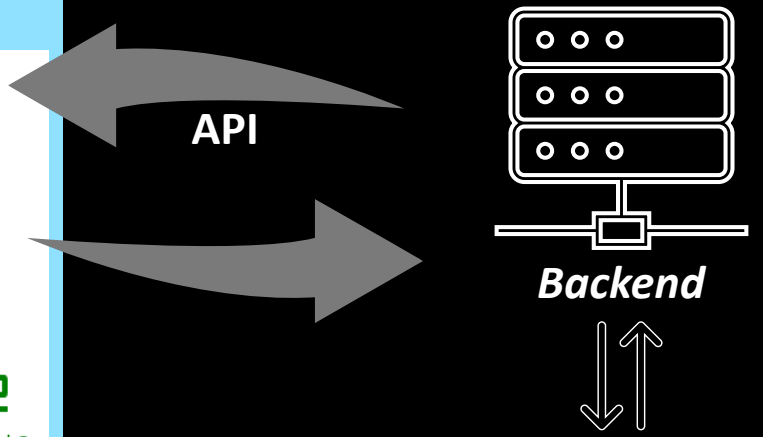
Strategic Aims:

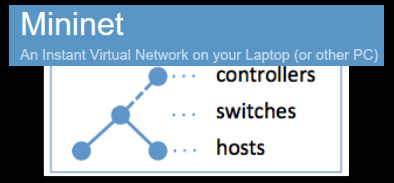
- Accelerate innovation cycles by enabling rapid and collaborative prototyping.
- Provide a vendor-agnostic, neutral, environment for testing.
- Open feedback loop within DT units and externals.
- Integrate new hardware and technologies to overcome existing *"tech gaps"*.



Simulation Environment Architecture







Other linux apps

Where we stand vs. What‘s next

Focus Areas

i. SRv6 integration with 5G User Plane

ii. SRv6 packet processing network logic

iii. Plain IP (without GTP tunneling) transport analysis

Next Steps

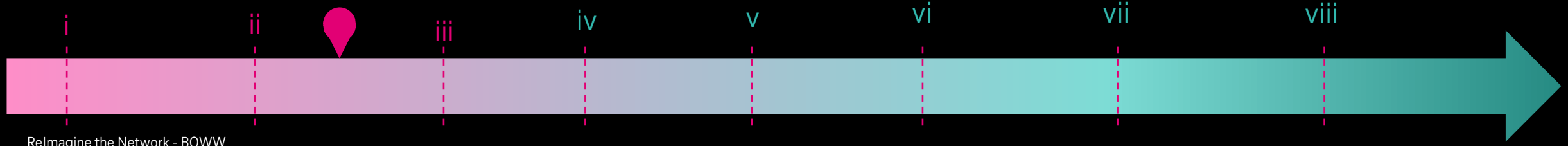
iv. Add Mobility and handover scenarios

v. Integration with real Hardware

vi. Further collaboration with vendors

vii. Integration of the E2E LCM

viii. Implementation of the Intelligent Scheduler



THANK YOU

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Back-up

Abbreviations

3GPP	Standardization Body
AI	Artificial Intelligence
BSS	Business Support Systems
E2E	End-to-End
GTP	GPRS (General Packet Radio Service) Tunnelling Protocol used in mobile networks
HDA	Horizontal Digital Architecture
LCM	Lifecycle Management, i.e. the creation, configuration, activation, ... of a production element
NDT	Network Digital Twin
NTN	Non-Terrestrial Networks
OSS	Operations Support Systems
RtN	Reimagine the Network
RTND	Realtime Network Designer
SRv6	Segment Routing IP Version 6
TPM	Telekom Production Model
UE	User Equipment, e.g. a mobile device
HTWK	HTWK Leipzig – Hochschule für Technik, Wirtschaft und Kultur