Navigating the journey to 5G Standalone

Service assurance is essential at every phase
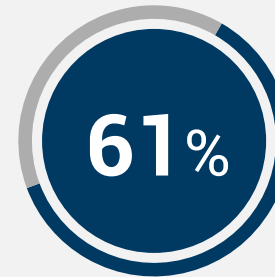
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Navigating the journey to 5G standalone

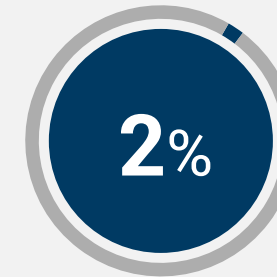# 5G standalone drives new opportunity

Service assurance is vital

89% of 5G revenue will require performance guarantees [1]

61% of new service revenue depends on real-time assurance [2]

2% of operators say their service assurance is 5G ready [3]

Service assurance underpins orchestration and lifecycle management. It must:

- Be flexible, cross-domain and end-to-end.

- Span multiple layers and technologies (infrastructure, network functions, services, slices).

- Correlate data and provide root cause analysis.

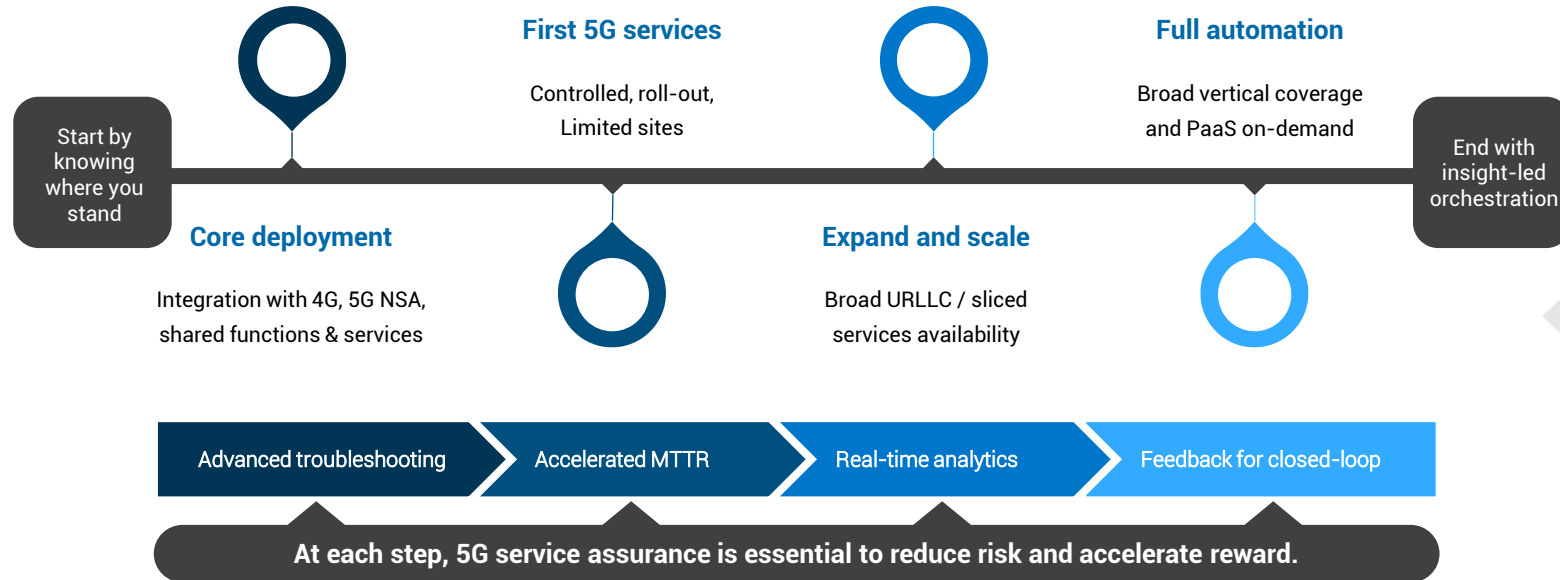- Apply end-to-end to automate and orchestrate assurance for SLAs and on-demand services.

▲**70**%

Of mobile network operators (MNOs) plan to deploy a 5G standalone network in the next two years (by 2023), half of these by 2022. [4]

Enterprise and industry partners are driving the roadmap: they account for 70% of new 5G standalone revenue. [5]

MNOs' priority: get the 5G core working.

Rising complexity and integration and interoperability challenges across domains, infrastructure and vendors remain big challenges.

1, 2, 3, 4, 5. GSMA/Mobile World Live global MNO survey, 2021

Navigating the journey to 5G standalone

Moving to 5G standalone is a process
...and it will take time.

Start by knowing where you stand

Core deployment
Integration with 4G, 5G NSA, shared functions & services

First 5G services
Controlled, roll-out, Limited sites

Expand and scale
Broad URLLC / sliced services availability

Full automation
Broad vertical coverage and PaaS on-demand

End with insight-led orchestration

Advanced troubleshooting → Accelerated MTTR → Real-time analytics → Feedback for closed-loop

At each step, 5G service assurance is essential to reduce risk and accelerate reward.

Before going live with core deployments:
- Conduct field experiments with partners.
- Use pilot network to test 5G SA, from device to core network, including IT.
- Prepare new operator model for end-to-end integration and automation.

> **5G standalone is a process. Services such as network slicing will be introduced in phases while we prove out network design and end-to-end assurance.**
>
> Nabil Chakrani
> *CTO Director, Network Architecture and Automation, Orange*

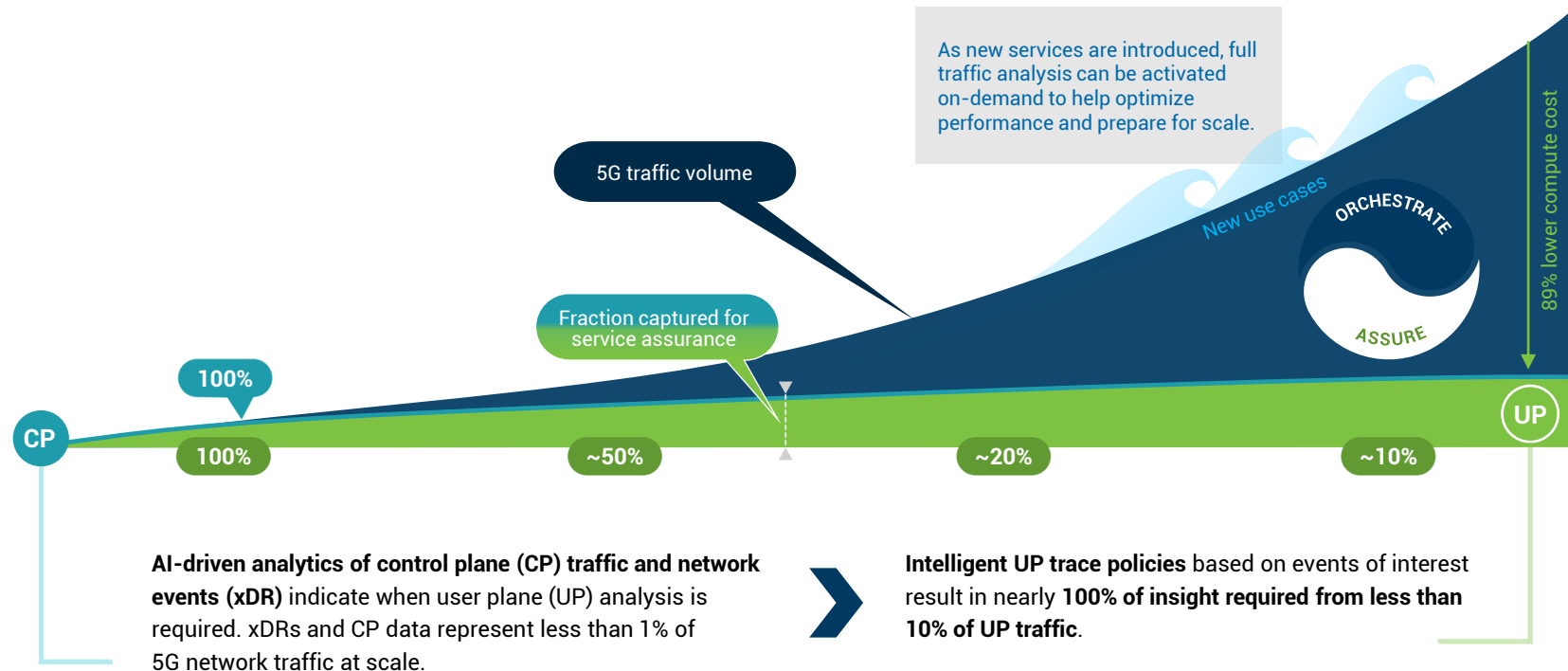1. MME, IMS, VoLTE as examples

Glossary →

Keep only essential data as 5G scales up

Each phase of 5G deployment has different service assurance needs. All data needs to be available at the onset, which is feasible while traffic volumes are small.
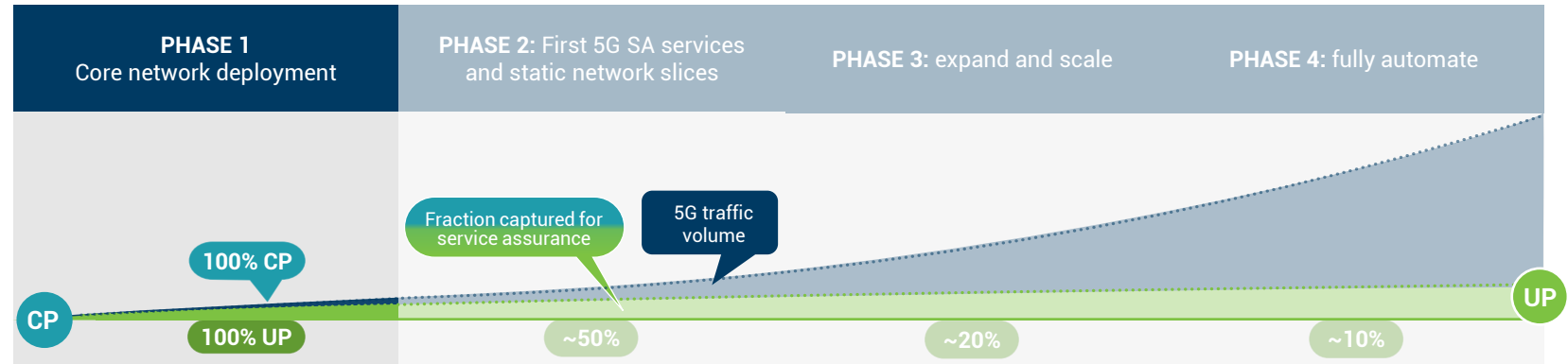
As 5G scales up, it's cost prohibitive—and practically impossible—to analyze all data when only a fraction is required to guide network operations and automation.

Adaptive service assurance reduces resources required to capture, move and analyse data by nearly 90%[1], without losing sight of customer impacting and anomalous events.

Actionable insight is retained. 'Everything is normal' data doesn't fill up data lakes and slow down critical closed loop feedback and troubleshooting.

As new services are introduced, full traffic analysis can be activated on-demand to help optimize performance and prepare for scale.

5G traffic volume

Fraction captured for service assurance

New use cases

ORCHESTRATE
ASSURE

89% lower compute cost

CP

UP

100%

100%   ~50%   ~20%   ~10%

AI-driven analytics of control plane (CP) traffic and network events (xDR) indicate when user plane (UP) analysis is required. xDRs and CP data represent less than 1% of 5G network traffic at scale.

Intelligent UP trace policies based on events of interest result in nearly **100% of insight required from less than 10% of UP traffic**.

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Glossary →

Navigating the journey to 5G standalone

PHASE 1 Core network deployment	PHASE 2: First 5G SA services and static network slices	PHASE 3: expand and scale	PHASE 4: fully automate

100% CP

100% UP

Fraction captured for service assurance

5G traffic volume

CP · ~50% · ~20% · ~10% · UP

Phase 1 goal: Getting the core 5G network operational. The new service-based core drives new service assurance and orchestration needs.

Mobile network operators (MNO)s need to get the new 5G core working with 4G and 5G non-standalone and shared network functions like IMS and SDN.
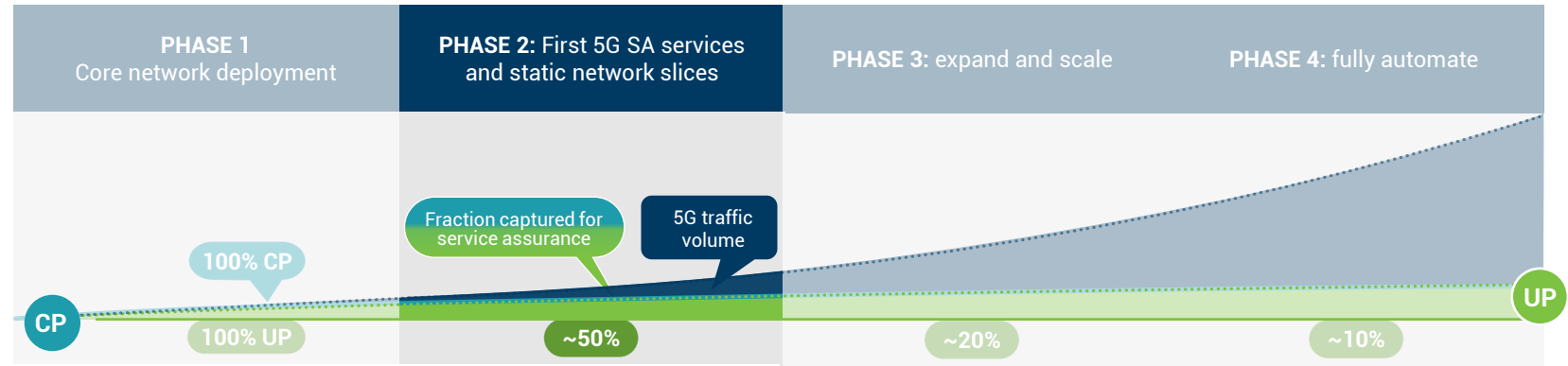
70% **of MNOs** will use a unified approach to orchestrate and assure 4G and 5G networks.[1] This requires a common service assurance foundation.

Essential service assurance during this phase:

- **Packet-level troubleshooting** to capture and analyze up to 100% of control and user plane traffic as needed. Test multi-vendor interoperability and 5G core optimization.

- **A common data framework** or messaging databus. collection of data from network functions, probes, RAN parsers, open tracing/ telemetry and observability.

- **Visibility into IMS, MME** shared services and 5G interactions.

- **Data from PCAP files** and lab and engineering tools until the network is fully monitored end-to-end.

Glossary →

Navigating the journey to 5G standalone

PHASE 1
Core network deployment

PHASE 2: First 5G SA services and static network slices

PHASE 3: expand and scale

PHASE 4: fully automate

Fraction captured for service assurance

5G traffic volume

CP

100% CP

100% UP

~50%

~20%

~10%

UP

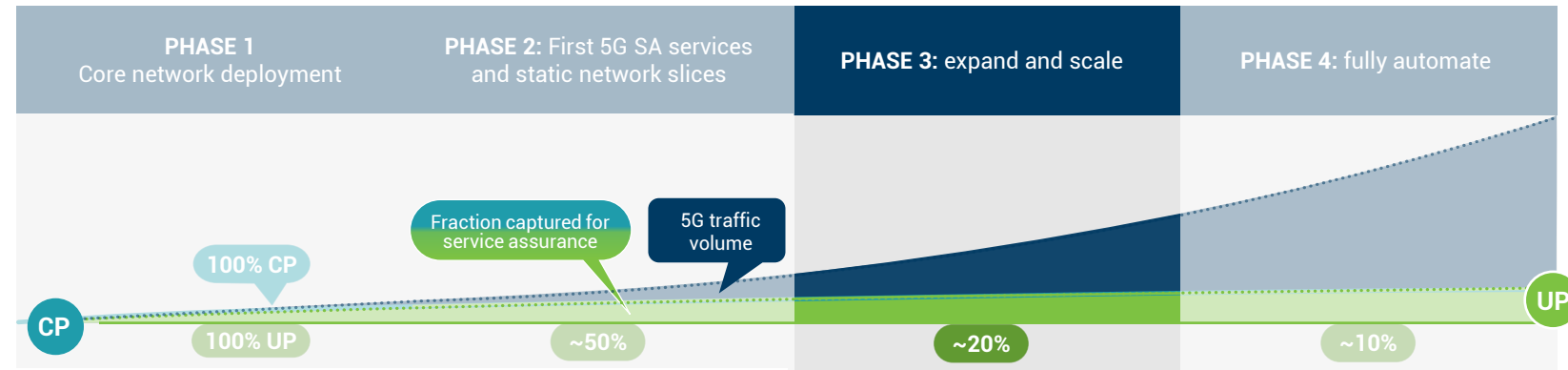**Phase 2 goal: launch, deploy and assure services at scale; build trust with industry partners and develop expertise.**

The first 5G standalone services will roll out on a controlled basis. 5G standalone cores will deploy at targeted sites served by a small number of cells.

- Assure services are performing at scale for commercially launches.
- Engage enterprise and industry partners with targeted use cases based on ROI.

Essential service assurance during this phase:

- **Assure live services** - can be internal users to start with.
- **Enterprise services** in private or campus networks.
- **Service quality and user experience**, in near real-time or live views.
- **Network and RAN QoS**
- S**ervice degradation issues,** drill down to root cause (live and historic).

- **On-demand troubleshooting** to speed up MTTR.
- **Static network slices test and monitoring** -
core slice = set of core VNFs
  - radio slice = 1 portion of spectrum
  - device: slice concept
  - OSS/BSS: slice concept

Glossary →

Navigating the journey to 5G standalone

PHASE 1 Core network deployment	PHASE 2: First 5G SA services and static network slices	PHASE 3: expand and scale	PHASE 4: fully automate

- Fraction captured for service assurance
- 5G traffic volume

CP — 100% CP — 100% UP — ~50% — ~20% — ~10% — UP

Phase 3 goal: expand and scale 5G SA and launch advanced services.

Begin to orchestrate and automate service lifecycles: instantiate, test, deploy, assure, fix.

- Broaden the availability of ultra-reliable low-latency services based on network slices.
- Introduce dynamic network slice capabilities.

Essential service assurance during this phase:

- **Real-time analytics and AI-powered anomaly detection** and root cause analysis to manage services at scale.
- **Correlate and analyze diverse data sources** to assure end-to-end service quality and user experience.
- **Assure slice performance** throughout lifecycle
- **Capture user plane traffic** on-demand for deeper troubleshooting.

- **Automate processes using AI** algorithms with human involvement.
- **Adaptive data capture and probing** to:
  - dramatically reduce data and cloud bills
  - preserve edge resources
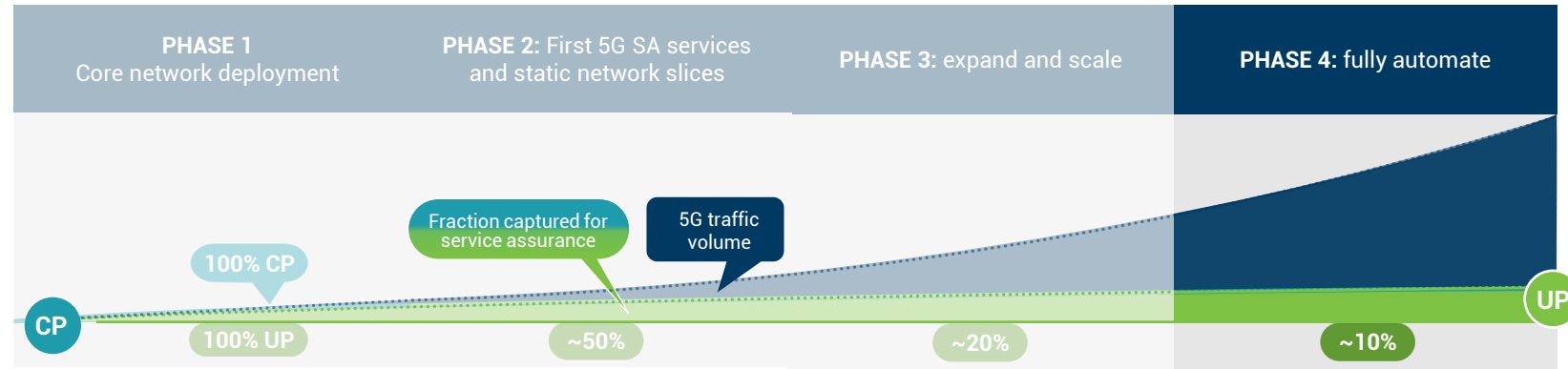 - achieve time-to-insight (e.g. 100 ms to 1 second for per user/device KPIs and KQIs).

"Service assurance is not just about better network performance – it also helps increase capital and cost efficiency and even enables new revenue streams based on network slicing.

James Crawshaw
Principal Analyst, Omdia

Glossary →

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PHASE 1
Core network deployment

PHASE 2: First 5G SA services and static network slices

PHASE 3: expand and scale

PHASE 4: fully automate

CP

100% CP

100% UP

Fraction captured for service assurance

5G traffic volume

~50%

~20%

~10%

UP

Phase 4 goal: Automate processes and orchestrate service lifecycles – instantiate, test, deploy, assure services.

Broaden the availability of ultra-reliable low-latency communications services based on network slices. Introduce dynamic network slice capabilities.

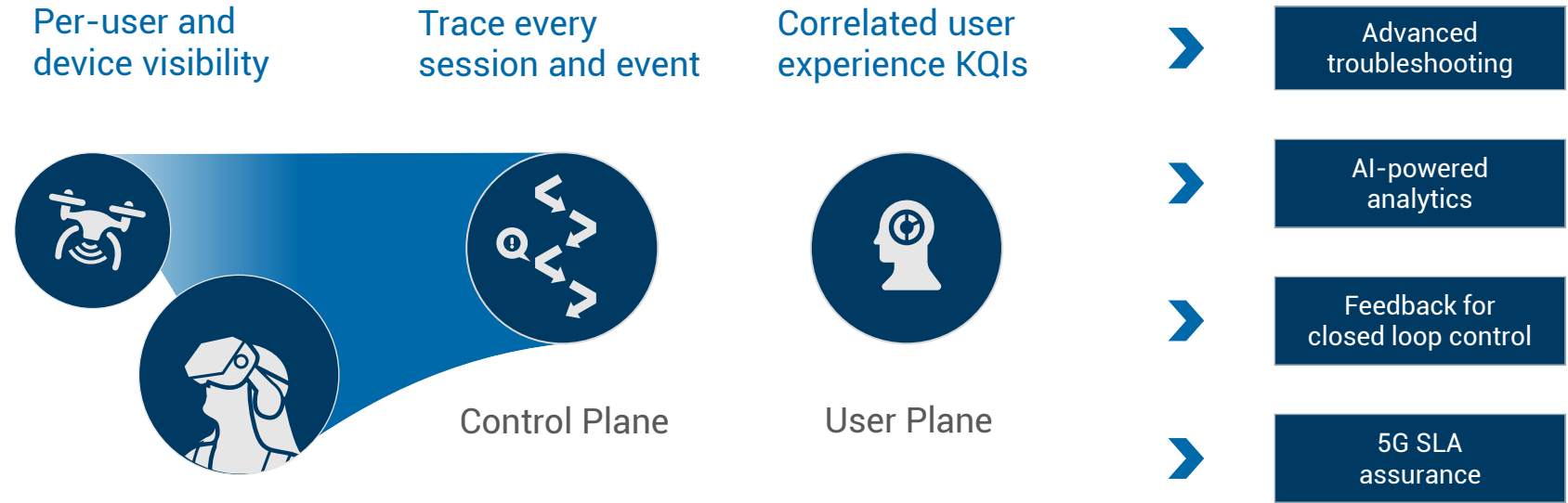## Essential service assurance during this phase:

- **Orchestrate and assure** dynamic 5G services with diverse KPIs and SLAs
- **5G PaaS on demand or NaaS** over 5G SA (fixed and mobile)
- **Zero touch network** and closed loop automation for 'non-critical services'
- **Dynamic slice orchestration and assurance** (radio slice = 1 portion of spectrum + set of radio VNF, radio/transport/core controllers) to dynamically manage slices.

- **Automated anomaly detection** and root cause analysis
- **AI with prescriptive action** (and human checks) to avoid service-impacting events.
- **Orchestrated trace policies**— probing/data collection and domain analytics for efficient resource usage.
- **Charging and assurance** to capture new revenue

Glossary →

Navigating the journey to 5G standalone

Operationalize 5G standalone in phases
Service assurance adapts to support each step

Per-user and device visibility

Trace every session and event

Correlated user experience KQIs

Control Plane

User Plane

> Advanced troubleshooting

> AI-powered analytics

> Feedback for closed loop control

> 5G SLA assurance

Incremental benefits drive business case and secure future investment for service assurance.

- Collapse analytics resources and big data overhead by 90% over traditional methods.[1]
- Gain crucial per-user and per-device monitoring necessary to monetize 5G standalone.
- Automatically measure only what's needed, when needed—in context—to deliver real-time insight and closed loop feedback for orchestrated 5G standalone networks.

5G standalone capabilities will be incrementally deployed, pilot tested, optimized and then automated. Adaptive service assurance is aligned with this approach.

1. EXFO U.S. Tier-1 operator lab trials and live 5G standalone deployments

Learn more →

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