

A large, abstract graphic element consisting of a white, wave-like shape at the top, a dark blue background with horizontal, multi-colored lines (blue, purple, green) in the middle, and a white area at the bottom. A thick blue line separates the middle section from the bottom section.

# Intent-based Networking

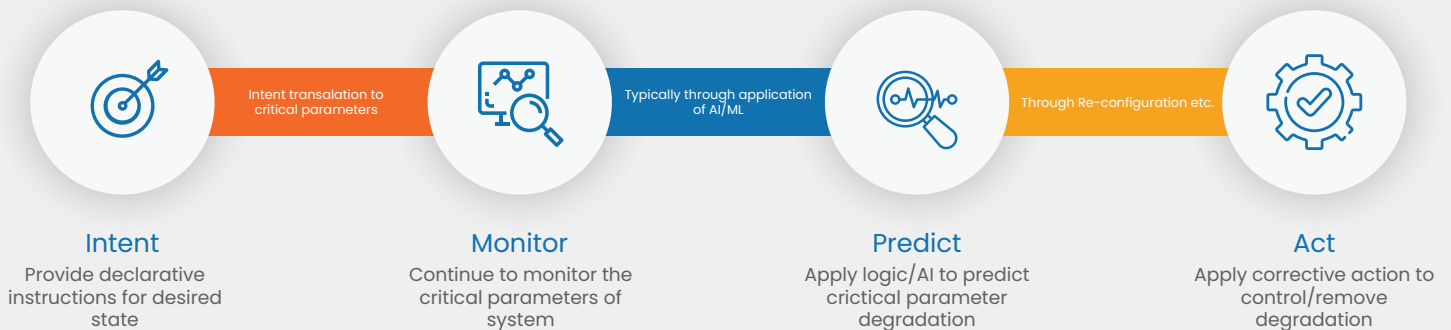
Bridging the Gap Between Business  
Intent and Network Operations

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# Unlocking the Power of Intent-based Networking

Intent-based networking, often known as IBN, is an emerging technology that uses artificial intelligence (AI) and machine learning (ML) algorithms to manage and optimize computer networks. The primary concept of IBN is intent, which refers to the desired outcome or goal a user wants to achieve through the network. IBN aims to make network management easier and more intuitive by focusing on business objectives rather than technical configurations. Traditionally, network administrators had to configure networks by specifying individual settings for each component and relying heavily on a command-line interface (CLI). This process is time-consuming and error-prone and does not consider the organization's overall business objectives. With IBN, administrators can define high-level intents that align with their business objectives, and the network will automatically configure itself to meet those intents. The IBN system also predicts potential deviations from the business intent and prescribes the necessary action to adhere to it by providing real-time visibility into a network's activity. The technology relies on a feedback loop to ensure the network is always aligned with the anticipated results. To keep the network aligned with the desired outcome, data is continuously collected and analyzed to assess network performance, and adjustments are made as needed.



## Key Components

The Intent engine, Radio Intelligent Controller (RIC) from the RAN, and Network Data Analytics Function (NWDAF) from the 5G core network are the three elementary modular components that make intent-based networking feasible. Together, they provide a seamless tapestry of network optimization and performance enhancement. So, let's explore how these components harmoniously function within the IBN system, unlocking unprecedented network performance and excellence levels.

### Intent Engine

In the context of Intent-Based Networking (IBN), an Intent Engine refers to the central component, or more precisely, the brain, that drives the entire IBN system. It acts as the bridge between human intentions or requirements and the underlying network infrastructure. The intent engine takes input in the form of natural language, statements, or declarative policies from network administrators or users. It then analyzes and processes this input to extract the desired outcomes or goals.

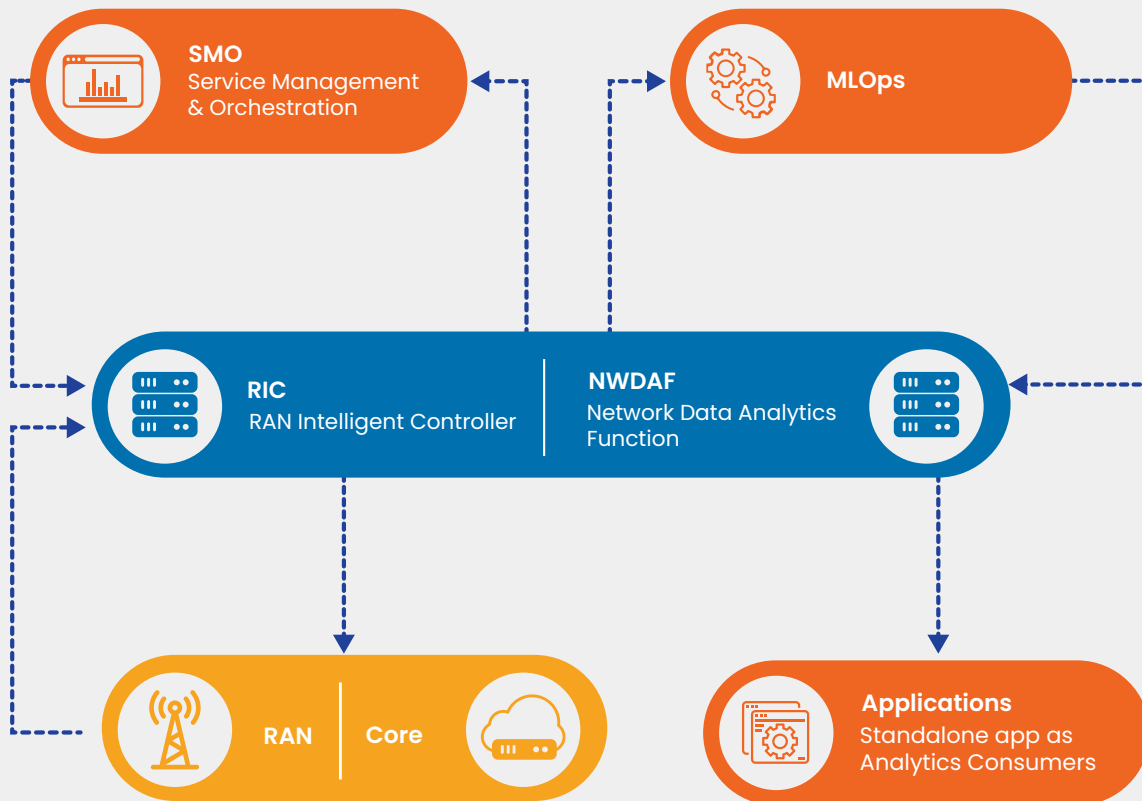
### Radio Intelligent Controller (RIC)

At the forefront of the 5G network stands the Radio Intelligent Controller (RIC) framework, which enables the deployment of network applications and services at the edge. This ingenious framework facilitates the interaction between software applications and the network, opening a wide range of opportunities such as network slicing, traffic optimization, and many more transformative use cases. RIC enables a decoupled and modular architecture, which allows for deploying new services without affecting the underlying network infrastructure.

## Network Data Analytics Function (NWDAF)

NWDAF provides analytics and insights into network traffic and user behavior. It collects data from different network nodes and processes it to provide real-time insights into the network's performance and user experience. This information is then used to optimize the network and improve the overall user experience.

By combining the outputs of the Intent Engine, RIC, and NWDAF, the network can be automatically configured and optimized to align with the defined business policies and intents. For instance, if a network administrator sets an intent to prioritize video traffic, the automation process will adjust the network's configurations to ensure that video traffic receives the highest priority. This automation eliminates manual intervention, as the network infrastructure autonomously adapts to meet the specified goals.



## Intent-based Networking: Benefits and some key challenges

Benefits	Description
Automation and Efficiency	Streamlines network management tasks through automation, reducing manual configuration efforts and minimizing human errors. This leads to increased operational efficiency and faster network deployments and updates.
Intent Alignment	Translates high-level business policies and intents into actionable network configurations, simplifying network management and ensuring alignment with business objectives.
Real-time Adaptability	Dynamically adjusts network resources, traffic prioritization, and performance optimization in real-time based on changing demands and defined intents. This leads to improved user experience and network reliability.

Benefits	Description
Simplified Network Management	IBN abstracts complex network configurations into higher-level policies and intents. This simplifies network management, reduces the need for deep technical expertise, and enables network administrators to focus on strategic tasks rather than manual configurations.
Enhanced Security and Compliance	Enables centralized control and policy enforcement, enhancing network security and compliance with regulatory requirements. Intent-based networking offers a framework for consistent and automated security measures across the network.
Cost Reduction	By automating and optimizing network operations, IBN can lead to cost reductions. It minimizes operational expenses, reduces network downtime, optimizes resource utilization, and enables better capacity planning.

While Intent-Based Networking (IBN) offers numerous benefits, as an emerging technology, it also presents several challenges that must be addressed to unlock its potential fully.

One challenge is ensuring that the Intent engine accurately interprets high-level business policies and intents. This requires a deep understanding of the network's business objectives and technical capabilities.

Another challenge is ensuring the analytics engine collects and analyzes data from all network parts. This requires a robust data collection and analysis infrastructure and the ability to detect and respond to anomalies in real time.

A third challenge is ensuring that the controller can effectively communicate with all devices and components in the network. This requires standardized communication protocols and interfaces that are widely adopted throughout the industry.

To conquer these hurdles and unleash the boundless potential of Intent-Based Networking (IBN), Amantya has ingeniously crafted an end-to-end solution to revolutionize the landscape of network management. Say farewell to the limitations of traditional network management and embrace a future where networks effortlessly adapt to your grandest ambitions. With our cutting-edge technology, organizations can soar to new heights of efficiency, agility, and alignment with their business objectives.



## From Concept to Implementation

From modest enterprises to well-known networking providers, intent-based networking companies provide a few distinct options. But implementing IBN requires a sophisticated network orchestration system that can make complex decisions. This is where Amantya emerges as a game-changer. The company offers intent-based networking and analytics as a cohesive solution that streamlines data center, network design, build, deployment, and operation.

Amantya's RIC and NWDAF serve crucial roles in IBN, gathering network data, processing it, and supporting intelligent decision-making to align network behavior with the desired business goals. It enhances IBN's automation, optimization, and closed-loop control aspects in a 5G network environment. From initial design and construction to ongoing operations, Amantya empowers organizations to thrive in a fast-paced digital landscape by seamlessly aligning network operations with the ever-evolving business requirements.



## Conclusion

Intent-based networking offers significant advantages to businesses and service providers, making it a valuable deployment. This approach automates network configuration and optimization, facilitating the swift implementation of new services. Additionally, it enhances network efficiency and scalability, ensuring businesses remain competitive and deliver an exceptional user experience. It transcends traditional boundaries, where the lines between intent, intelligence, and action become indistinct, marking the dawn of a new era in network management excellence.

## Contact Us

 [www.amantiatech.com](http://www.amantiatech.com)

 [connect@amantiatech.com](mailto:connect@amantiatech.com)

 +1 (781) 408 7457 | +91 798 257 3857

 USA: 122 South Michigan Avenue, Suite 1390-E37, Chicago, IL 60603

Canada: 567 Roehampton Ave, Unit #63, Toronto, ON M4P 1S5

India:

Gurugram: 12<sup>th</sup> Floor, Tower B, Unitech Cyber Park, Sector 39, Gurugram - 122003