

Persistent Capabilities: Autonomous Networks for Network Operators

June 2025



We are Persistent

A Trusted Digital Engineering & Enterprise Modernization Partner



We are fortifying our Digital Engineering heritage...





Persistent in Communication, Media and Technology



the World

Persistent's strengths in communications

1)

(4)

Service Orchestration

- Service Orchestration : ISVs, OEMs & CSPs
- Development, Product Engineering, Configurations of FP, Virtual Topology System & controllers like EPNM, CNC, ONC
- Help to enhance Close loop automation
- Services & Network Device provisioning with automation across network elements
- Worked with multi-vendor Orchestrator(CP4NA, CrossWorks, NSO, HCO) and ONAP based Service Orchestrator

Network Design & Planning

- Enhancing & building GIS Based Physical Inventory solution for a large CSP in APAC
- Product engineering & Quality engineering for

RF planning tools

 Adapter development for RAN 5G, 4G, 3G, 2G vendors like Ericsson, Nokia, Huawei, Altiostar etc

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5)

- Radio Frequency Planning, Predictions and Covered Buildings Analysis for Fixed Wireless
- Partnership with large ISV for Al powered
 Dynamic ML models to delivery RAN Energy Saving Solution

AlOps & Observability for Service Management

- End to End **observability** across Network, Application & Resources with AlOps for a smarter Service Management
- End-to-End **Correlation** across multi-domain heterogeneous Networks
- Telco Cloud based Service Assurance with 4G/5G & Wireline Networks
- Solution & Product Engineering partner for AIOps
- AIOPs + Instana + Turbonomics + SevOne + TNCP + Ivanti + Service Now with Watson AlOps

Autonomous Networks & Al

- Zero Touch automation leveraging LLMs
- Level-0-3 Autonomous network journey for Core / RAN / Transmission networks
- Leverage Azure GPT 40 mini capabilities with the ingested Intellectual Capital as context for **Defect** Summarization and **Defect Classification**
- Al Ops layer to gain insights, reduce noise and automate high severity use cases
- Develop robust UI to enable PS engineers to manage all steps of the Bug scrub workflow & generate report.
- Build necessary pipelines to ingest all possible Intellectual Capital and details about Defects.

Cloud Native - Telco Cloud

- Persistent's partnership with leading cloud providers
- Bring in-house tools, technologies & accelerators e.g
 GenAl & cloud accelerators & more
- Value driven approach with App+Cloud Assessment, Migration & Optimization
- Automated Assessment, Migration & Continuous monitoring, Saasification
- Tier#1 CSP- Migrated 3500+ apps with reduction in DM
- Netezza, TNCP, other products: Extended Products ALM and increased cross-selling & up-selling

5G Capabilities & Services



- NFV Management & Orchestration on Multi-cloud Orchestrators like Rancher, Tanzu, Robin
- Redhat OpenShift, VMWare and other Hyperscalars based virtualized deployments.
- Private 5G managing the IoT, telemetry data with eMBB & mMTC traffic
- Managing setup of 5G core networks & its integrations
- Network Slicing use-cases using urLLC, eMBB, mMTC for various business



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Current Telecom Industry Challenges

Multi-domain AlOps & Observability

Ensuring end-to-end visibility & control into complex network operations to enhance performance, user experience, and security

Regulatory Challenges

Compliant with complex regulatory environments remains a significant challenge

Evolving Networks

Mobile telecom operators evolved from 2G to 5G, copper to fiber & need to keep-up with the latest but managed legacy too, networks are getting complex & diversed & brings need for simplification & optimization.

5G Deployment

Challenges related to the nationwide rollout of 5G network and their services including interoperability issues and the slow materialization of promised services



Market Competition & Business Performance

Increased competition from IT, Hyperscalars & new market entrants driving cost pressures. Also maintaining profitability while investing in new technologies & infrastructure is a struggle

Complex Services & faster TTM

Services are getting complex and offered for large enterprises like 5G, Network Slices, eMBB, urLLC, mMTC, backhaul, Enterprise Services, dark fiber while a growing need for faster time to market

Technological Transformation

The telecom industry is undergoing a significant transformation driven by new technologies like 5G, cloud computing, and AI bringing challenges

Energy Efficiency

Building green networks to prevent energy consumption from increasing linearly with traffic



Autonomous Networks & use-cases

Autonomous networks plays a crucial role in accelerating digital transformation by automating network operations and enhancing their capabilities leveraging AI/ML to to create self-optimizing, self-healing systems for CSPs. It drives faster service deployment, improved performance, efficient resources utilisation, ultimately leading to new business opportunities and enhanced customer experiences

Closed-Loop Automation & Service Orchestration

Autonomous networks implement closed-loop automation, where the system continuously monitors, analyzes, and adjusts operations to maintain optimal performance.

Optimized Resource Management

Efficiently manage network resources, ensuring optimal utilization and reducing operational costs.

Enhanced Security

Autonomous networks can identify and mitigate security threats in real-time, providing robust protection against cyber-attacks.



Self-Optimizing with Zero Touch

Use-cases to automatically adjust their parameters and configurations to optimize performance without human intervention.



Self-Healing Networks

Networks can detect and resolve issues proactively, ensuring minimal downtime and maintaining high reliability.

Artificial Intelligence

Leveraging artificial intelligence and machine learning, autonomous networks can make intelligent decisions based on real-time data and predictive analytics.



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Autonomous Networks Maturity Model							
Tm Forum Autonomous Network Maturity Model	tmforum	Level 0 Manual operations & maintenance • System delivers assisted monitoring capabilities • Full manual operations and maintenance	Level 1 Assisted operations & maintenance • System executes a specific, repetitive subtask based on pre-configuration to increase efficiency • Online, assisted execution	ost Operators are Level 1 to Level 2 <u>Level 2</u> Partial autonomous network • System enables closed-loop operations and maintenance • Static rule/policy- based automation • Execution is automated • Awareness and analysis are based on human pre- defined rules/policies	Level 3 Cond. autonomous network System senses real-time changes in network and will optimize itself Dynamic rule/policy-based automation Awareness, execution and most analysis are automated AN Framework, Roadmap	Close Loop Management Level 4 Highly autonomous network Cross-domain decision-making based on predictive analysis Active closed-loop management of service-driven networks Awareness, analysis, decision, and execution are automated Most of the staff time can focus on expert experience, and unsupported scenarios	Level 5 Fully autonomous network Closed-loop automation capabilities across multiple services and domains Auto-evolution, Full autonomy, all scenarios Awareness, analysis, decision, execution and intent/experience are autonomous AI / Agentic Al enabled Zero Touch Automation
	Applicability	N/A	Select scenarios	Select scenarios	Select scenarios	Select scenarios	All scenarios
	Intent/Experience	Manual	Manual	Manual	Manual	Manual/Auto	Auto
	Decision	Manual	Manual	Manual	Manual/Auto	Auto	Auto
	Analysis	Manual	Manual	Manual	Manual/Auto	Auto	Auto
	Awareness	Manual	Manual	Manual/Auto	Auto	Auto	Auto
	Execution	Manual	Manual/Auto	Auto	Auto	Auto	Auto

- Level 0 Manual Management : the system deliver assisted monitoring capabilities, which means all dynamic tasks must be executed
- **Level 1** Assisted Management : the system executes a certain repetitive sub-task on pre-configuration to increase efficiency.
- Level 2 Partially Autonomous Networks : the system enables partial automatic O&M for certain units based on pre-defined rules or policies under certain external environments
- Level 3 Conditionally Autonomous networks : building on L2 capabilities, the system with awareness can sense real-time environmental changes, and in certain network domains, optimize and adjust the external environment
- Level 4 Highly Autonomous Networks: building on L3 capabilities, the system enables, in a more complicated cross-domain environment, analysis and decision making based on predictive or active closed-loop management of service and customer experience-driven networks
- Level 5 Fully Autonomous Networks: this level is the goal for telecom networks evolution. The system posses closed-loop automation capabilities across multiple services, multiple domains and the entire lifecycle, achieving Autonomous Networks.



High AI/ML and Automation centric

Our Building Blocks for Autonomous Networks

AN Assessment	AI / ML / Gen AI L2-L5	AlOps L1-L5		
 TMForum aligned Network Assessment to provide current maturity level Provide consulting steps to move & drive up the maturity model levels 	 Using Data Science (AI/ML/GenAI) to bring more automation & decision meaning from data and reducing human centric decisions 	 Artificial Intelligence in managing the Operations and Network issues quickly, reducing the downtime and improving overall service quality 		
Closed-Loop Automation L4-L5	Self-Healing Networks	Service Orchestration L2-L5		
 Have an issue, identify the solution, rectify and resolve the issue. Scaling up & down based on the compute demand Zero Touch Provisioning 	 Edge networks or network nodes to identify and resolve the problem at the edge systems itself to reduce any compute on the core systems & bring auto-healing of networks 	 Manage the multilevel services orchestration of services in the underlying networks functions 		
Network Planning	Predictive Maintenance	Observability L1-L5		
 Real-time tracking and navigation of the existing network layout and provide an efficient plan for improved network plan & build followed by Design & Assign 	 Using Data Science (AI/ML/GenAI) to bring more automation identify incidents before they turn out as a problem, understand the meaning from data and reducing human centric decisions 	• Deep dive in the network, services & resource monitoring and further identify and provide a comprehensive decision-making insights		

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Top 5 business problems of IT Operations in Autonomous Networks



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NetSynX: Automating Service Lifecycle Management





We are Demonstrating

- Join us for an exciting demonstration on Agentic AI driven Automation
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Solution Architecture using IBM Concert



Solution Architecture using IBM Concert

Router vendors **Operators &** - New & OEMs vendors This solution is considering **IBM Concert** for Agentic AI Product roubleshooting SRE workflows, IBM SevOne for Network Monitoring, IBM Ticket Watson managing the LLMs & recommendations Perform CURD Above solution is agnostic & can fit with any other **Operations on JIRA** applications · Implemented a Hub and Spoke architecture. IBM Concert • The infrastructure (router) is hosted on cloud for the Knowledge purpose of demo **JIRA** Base Agent The Agents will integrate with IBM watsonx.ai for the LLMs & decision Looking for solution in process Knowledge Base Policy for Infra Layer Implementing Creating and Updating will be triggered 6 J 6 J Cloud Proposed Solution ticket on Jira ÷ Infrastru **IBM Concert** cture Planner Agent **Orchestration Agent** Ticketing 485 hatton portages IAAS Checking for Recent Metrs Agent Agents. IXC POP Open-Source Tools. CENTER BASE Data used for creating CENTRAL OFFICE **UIFor Prometheus** knowledge base. MOBILE HLR SWITCH 41 Monitoring Alerts Grafana Dashboard **Prometheus** Monitoring Agent **Re(Al)magining**[®] the World

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Persistent's play in Autonomous Networks

A transformative approach towards network management, leveraging Network Automation and AI & ML with minimal human intervention **Insights**

Our Leadership in Full Stack Observability, Assurance (Network, Resource Observability & Optimization), Application Observability

Decision

Intelligent decision making via Rules based, Traditional AI/ML models, GenAI (Agentic AI)





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