Turning business ideas into reality at the edge

Wipro's edge solutions, powered by Intel® technologies, accelerates the adoption of edge computing with innovative services and accelerators.

Executive Summary

We are in an era where information takes center stage, characterized by robust connectivity and increased digitalization. Amid the rising demand for automation and intelligence across sectors, organizations are seeking the next wave of digital transformation, and edge computing is an integral part of this. IDC predicts the edge computing market will reach $250 billion in 2024.

We believe that, as demand for real-time AI solutions and decentralized data processing continues to grow, implementing AI at the edge is becoming critical. An edge computing strategy should also target specific business objectives related to cost, growth, quality, and experience.

The way forward is to allow splintered workloads to run in the places best suited for them. This could be at the edge, core, hosted cloud or public clouds, thus making the landscape of enterprises boundaryless. Around 10% of enterprise-generated data is created and processed outside a traditional centralized data center or cloud. By 2025, Gartner predicts this figure will reach 75%.

This white paper outlines how businesses can strategically utilize Intel's infrastructure innovation in conjunction with Wipro solutions to effectively deploy and manage edge computing. The document also provides access to comprehensive Gartner research on developing an edge computing strategy and a detailed framework for implementing a next-generation operating model for distributed IT.

Accelerating Edge Deployment with Intel

AI and edge computing are elevating the Internet of Things (IoT) to new heights, transforming industries, and reshaping the future of IoT. Intel recognizes the need to bring distributed compute power from the cloud to the edge as a part of the broader computing continuum, while emphasizing seamless integration of resources to enable near-real-time decision making.

Intel further believes in the urgent need to accelerate edge computing for optimal business outcomes. Businesses must adopt edge AI to keep up pace with change and realize the benefits of emerging technologies like 5G and AI. Edge AI presents an effective approach for achieving connected intelligence, delivering high-quality AI services with low latency at the edge.

To meet the increasing demands of new and evolving use cases—from camera streams to industrial robots to smart kiosks—organizations should continually adapt and innovate their strategies, technologies, and processes. The ideal solutions will align with workload performance, size and power constraints, and budgetary considerations.

Intel provides an robust portfolio of edge-ready technologies and tools to enable a more resilient, intelligent edge from end to end, including Intel® Xeon® Scalable processors, IoT and embedded processors, Intel® Ethernet products, Intel® FPGA products, and Intel's GPUs.
The low-power Intel® processor offers affordable entry-level performance needed for IoT edge deployments. Intel® Core™ Ultra processors are ideal for demanding workloads at the edge, with multiple compute engines in a power-efficient BGA package to enable more flexibility for innovative designs.

With advanced capabilities for AI including Intel® Deep Learning Boost (Intel® DL Boost), storage, virtualization and networking, Intel® Xeon® processors are ideal for demanding applications. They offer performance for multi-threaded applications with large memory space and I/O capacity, IT/OT convergence, and edge workload consolidation systems.
The hardware acceleration is driven by Intel® Xeon® Scalable processors while the software acceleration is enabled by Intel's portfolio of optimized AI software tools, frameworks, and libraries.

Intel provides a complete suite of open standards-based software for building, deploying, managing, and securing edge infrastructures and applications. Intel® distribution of the OpenVINO™ toolkit enables seamless experiences with AI across any model, any hardware, from edge to cloud, without rewriting the application. Using the OpenVINO™ toolkit's optimization techniques such as model quantization, layer fusion, and hardware-level optimizations, organizations can significantly enhance the efficiency of neural network inference. When deployed on Intel's discrete GPUs, these optimized models can leverage the parallel processing capabilities of the GPU, resulting in faster inference speeds.

Generative AI at the Edge

The rise of Generative AI has led to an increase in lightweight large language models (LLMs) being deployed at the edge, opening avenues for advanced applications and improved performance. Intel offers an end-to-end software portfolio to support use cases across Generative AI applications. This allows organizations to deploy high-performance capabilities wherever they are most needed—from the edge to the cloud—to change operations and experiences.

Edge Adoption: Wipro's Complete Edge Lifecycle Management Powered by Intel

Wipro BoundaryLess Universal Edge (BLUE) is Wipro's holistic framework designed to address the different aspects of delivering robust, production-grade edge services. Wipro BLUE employs a wide range of accelerators, including a ready-to-adopt, end-to-end cloud-based solution; reference architecture; reusable components; and shared services that are tuned to address the complete lifecycle.

Wipro also connects clients with a vast ecosystem of technology vendors to address edge elements like IoT platform, data analytics, latency-intensive and regulated apps, and autonomous operations, which businesses can access as a service.

Hyperscale Edge Computing (HEC) is a cloud-out-to-edge solution that brings the cloud experience to the edge with comparable hyperscale. It thereby provides a footprint to run a variety of applications, including those developed by its open API architecture that independent software vendors (ISVs) can take advantage of, such as content distribution and high-performance computing.

It is important to note that cloud-out and edge-in architectures are complementary and not mutually exclusive. Edge-in to cloud architecture offers value when edges are tethered to a single hyperscale provider.

There is growing adoption of edge-in to cloud— in the zero- to one-year range— an edge-first architecture, compared to cloud-out to edge (profiled in this Impact Radar as hyperscale edge computing) in the three- to six-year range.

The Wipro BLUE framework combines Wipro's experience, digital capabilities and partner network. Five key elements to an edge strategy are:

1. Establishing a vision
2. Building use cases
3. Identifying and addressing challenges
4. Establishing edge computing standards
5. Executing and managing services operations

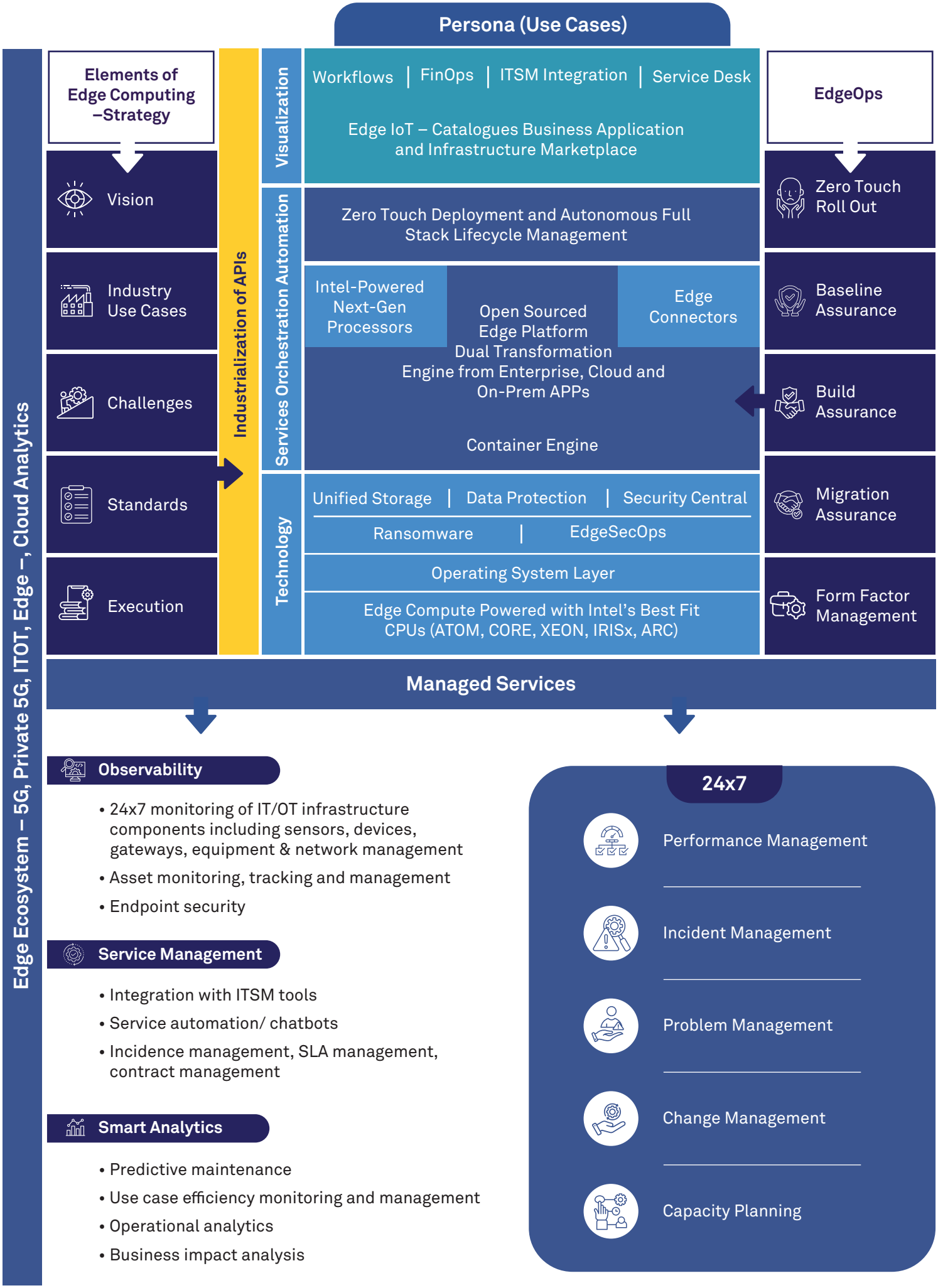
Industry-specific use cases play a key role in designing edge roll-out. Wipro works with clients to clarify their vision for edge and edge AI, and define use cases based on that vision and the specific needs of the business.

Common challenges to an edge rollout include scalability, cost, security and data management. Companies need to have an understanding of the velocity, variety, and volume demands of an edge program—how much data is likely to pass through it, the different types and at what rate. Businesses must be prepared to meet those needs and adapt to fluctuations.

Wipro BLUE addresses these challenges by standardizing infrastructure, assets and processes through a combination of as-a-service models, shared services, minimum skills requirements for operations management, and other approaches. Businesses use Wipro BLUE to modernize assets in accordance with industry standards and implement security standards.

The architectural framework, below shows the three-layered approach Wipro BLUE uses to industrialize APIs, focusing on the Technology, Orchestration, and Visualization layers to drive edge adoption in alignment with the organization's vision and ideal use cases.

At the technology layer, Wipro leverages its partner ecosystem to connect clients with the capabilities and tools they need to address their edge AI needs, such as modernizing legacy data center infrastructure and standardizing assets. The Services Orchestration Automation layer employs Wipro accelerators through the Wipro ServiceTheater to automate and standardize services, thereby optimizing performance. The Visualization layer focuses on workflows and reporting such as cost management, integration with IT service management (ITSM) like ServiceNow. Additional functions of the Visualization layer include dashboards, FinOps, and consumption-based models.


Persona (Use Cases)
Edge Ecosystem – 5G, Private 5G, ITOT, Edge –, Cloud Analytics
Elements of Edge Computing –Strategy
Vision
Industry Use Cases
Challenges
Standards
Execution
Industrialization of APIs
Visualization
Workflows | FinOps | ITSM Integration | Service Desk
Edge IoT – Catalogues Business Application and Infrastructure Marketplace
Services Orchestration Automation
Zero Touch Deployment and Autonomous Full Stack Lifecycle Management
Intel-Powered Next-Gen Processors
Open Sourced Edge Platform Dual Transformation Engine from Enterprise, Cloud and On-Prem APPs
Edge Connectors
Container Engine
Technology
Unified Storage | Data Protection | Security Central
Ransomware | EdgeSecOps
Operating System Layer
Edge Compute Powered with Intel's Best Fit CPUs (ATOM, CORE, XEON, IRISx, ARC)
EdgeOps
Zero Touch Roll Out
Baseline Assurance
Build Assurance
Migration Assurance
Form Factor Management
Managed Services
Observability
• 24x7 monitoring of IT/OT infrastructure components including sensors, devices, gateways, equipment & network management
• Asset monitoring, tracking and management
• Endpoint security
Service Management
• Integration with ITSM tools
• Service automation/ chatbots
• Incidence management, SLA management, contract management
Smart Analytics
• Predictive maintenance
• Use case efficiency monitoring and management
• Operational analytics
• Business impact analysis
24x7
Performance Management
Incident Management
Problem Management
Change Management
Capacity Planning
OEM Technology
Open Source
GSI – Service Provider

Automation and Generative AI with Wipro Accelerators

Wipro ServiceTheater accelerators work on the Services Orchestration Automation layer to accelerate services rollout in an agile way during various phases of the IT lifecycle such as building, operating, and modernizing. These accelerators can be accessed through a consumption-based model using either an existing digital platform or self-service portal, enabling the client to easily scale services as needed and maximize business value:

- Significant improvement in IT operations and managed services
- Transformation of IT services delivery by equipping providers with platform-augmented services model
- Consistent services standards and maturity across hybrid/multicloud
- Provision of a single-pane-of-glass services delivery for hybrid cloud environments
- Centralization of automation and leveraging of modular approach to create new automation utilities from existing ones.

The various accelerators under Wipro Service Theater use automation and Generative AI to enhance capabilities and support clients in pursuing critical use cases:

- **Edge Rollout:** Zero-touch edge rollout with baseline assurance
- **Marketplace:** Global edge marketplace for full-stack provisioning of edge applications
- **Catalogue:** Ready-to-provision edge catalogues based on edge business case
- **Edge-to-Cloud on Demand:** Encryption at the source to secure business-critical edge apps
- **Autonomous Lifecycle Management:** Autonomous full-stack edge lifecycle management for resilient ops
- **Open API Consumerization:** Developer-friendly environment and a cloud-like edge experience
- **Managed Services:** Continuous improvement, availability, and efficiency of the edge infrastructure

The Freedom of Choice

Although clients are free to choose the product and services as per their requirement; Wipro has pre-packaged the following solutions based on the most common challenges and demands enterprises face today:

- nBLUE - Wipro BLUE, powered by Nutanix
- Azure Stack HCI, powered by Dell
- Edge powered by Intel® Edge AI Designs
- Red Hat OpenShift

This solution stack depicts a simple approach to deploying and managing edge compute and enterprise workloads at scale. Wipro's expertise in complete edge lifecycle management, in collaboration with partners like Intel, make it easier to align to business objectives, execute global rollouts and accelerate edge adoption.

Conclusion: Edge Is Here to Stay and Evolve

The future of edge AI is poised for significant advancements, including increased processing power at the edge, faster response times, reduced latency, and robust security. Organizations will continue to adapt to hybrid cloud, bringing edge wherever possible, and anticipate edge playing a crucial role in next-generation AI-enabled services. Edge computing is about to enter a new era as ubiquitous compute, connectivity, infrastructure and sensing come together with AI. Access the Gartner report below for detailed guidance on how to build a comprehensive edge computing strategy.

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1Source: Worldwide Edge Spending Guide: IDC - https://www.idc.com/getdoc.jsp?containerId=IDC_P39947

2Source: What Edge Computing Means for Infrastructure and Operations Leaders: Gartner - https://www.gartner.com/smarterwithgartner/what-edge-computing-means-for-infrastructure-and-operations-leaders Performance varies by use, configuration and other factors. Learn more at https://intel.com/benchmarks

3Source: Gartner, Emerging Tech Impact Radar: Edge Artificial Intelligence, Danielle Casey and 15 others, 18 January 2024

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Your costs and results may vary.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy. Intel technologies may require enabled hardware, software or service activation.

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