

SONiC Deployment for National-Scale Digital Payments Modernization

Client Overview

A leading FinTech and UPI payments operator in India runs hundreds of millions of daily transactions across multiple high-availability data centers.

Reliability, security, and observability are mission-critical – especially during peak events like festivals or nationwide settlement cycles.

The customer’s legacy, OEM-based network infrastructure created operational bottlenecks and high costs. Their goal was to transition to a SONiC-based open networking model that delivers:

- Vendor independence
- Cloud-scale agility
- Enhanced observability and automation
- Reduced total cost of ownership (TCO)

PalC Networks acted as a strategic SONiC deployment partner to modernize and operationalize a disaggregated data center fabric across its national footprint.

Business Challenges

Before the SONiC transition, the BFSI-grade network infrastructure faced:

Vendor Lock-In

Restricted scalability and expensive proprietary upgrades.

Operational Complexity

Manual provisioning, inconsistent firmware lifecycles, and high risk of misconfiguration.

Limited Observability

Siloed tools and non-standard telemetry made troubleshooting reactive.

No Unified Automation

Lack of ZTP (Zero-Touch Provisioning) and CI/CD pipelines delayed change management.

Compliance Strain

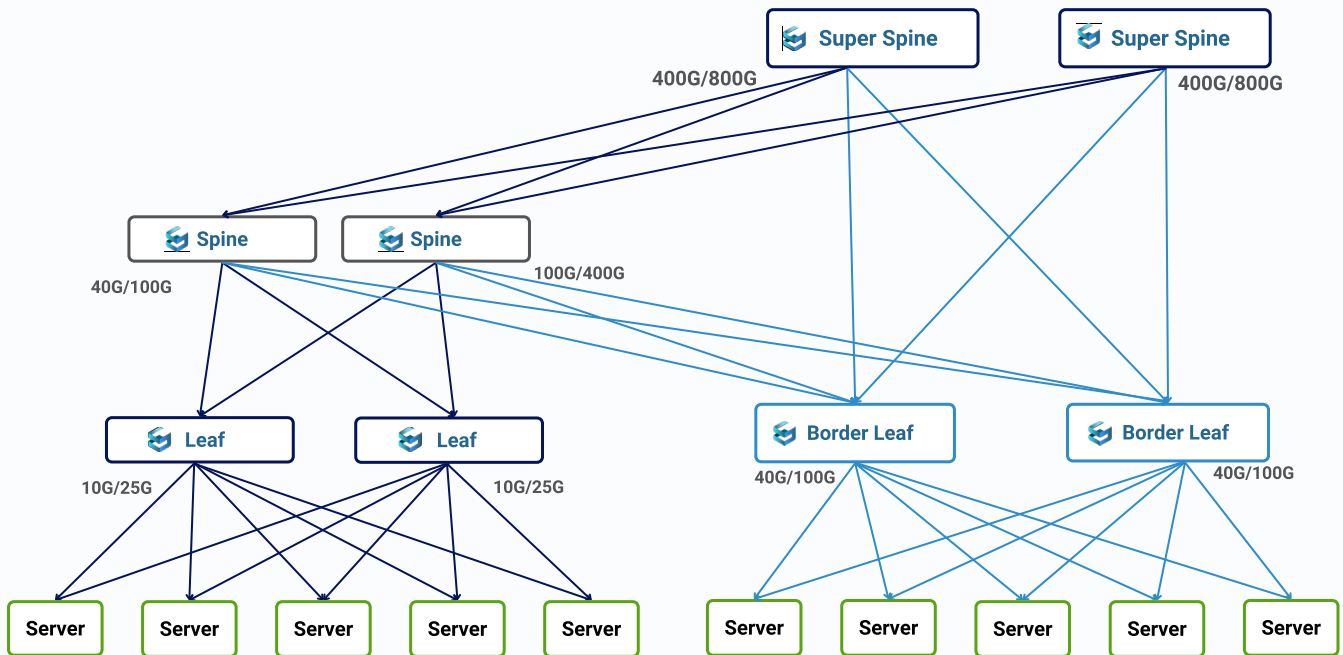
Disconnected systems limited real-time audit and fault correlation.

These limitations demanded a SONiC Deployment strategy that could support high performance, strong compliance, and continuous scalability.

PalC's SONiC Solution Approach

PalC Networks executed a three-phase SONiC Deployment model in Design, Deploy, and Sustain Phases by leveraging the SONiC NetPro Suite and open observability frameworks.

The core objective was to architect a **disaggregated, vendor-neutral, SONiC-powered network**, enabling unparalleled agility, enhanced control, and robust security through deeply integrated predictive and automated operations.



1. Design Phase: SONiC-Based Fabric Architecture

Key Highlights

- Designed a SONiC-routed underlay aligned to dual-stack IPv4 and IPv6 addressing schemes.
- Architected a three-tier Clos topology (Leaf–Spine–Superspine) supporting 100G, 400G, and 800G connectivity.
- Implemented EVPN-VXLAN overlay networks integrated with container orchestration, load balancers, and firewalls.
- Built a CI/CD-ready SONiC configuration framework with version-controlled templates.
- Created reference topologies, validation frameworks, and failover simulation plans to ensure predictable, testable SONiC operations.

Outcome

Vendor-Neutral Design

Achieved a vendor-neutral, repeatable SONiC design model for future rollouts.

TCO Reduction

Reduced TCO by 30–40% with white-box switching and open-source SONiC Network Operating System.

Enhanced Compliance

Strengthened network compliance and traceability through standardized, version-controlled designs.

2. Deploy Phase: SONiC Automation and CI/CD Integration

Core Components



Zero-Touch Provisioning (ZTP)

Automated SONiC switch onboarding and configuration without manual CLI.



SONiC + OpenStack Integration

PalC's automation plugin enabled L2/L3 fabric provisioning directly from OpenStack APIs when new workloads were onboarded.



Policy-Driven SONiC Configuration

CI/CD pipelines pushed version-controlled templates across the SONiC fabric.



Observability Stack Integration

Implemented gNMI → Prometheus → Grafana telemetry with OpenSearch for logs and compliance analytics.



Multi-Vendor SONiC Orchestration

Seamlessly managed SONiC and Arrcus NOS under a single automation pipeline.

Outcome

60% Faster

Reduced deployment time by 60%.

Consistent Deployment

Delivered consistent SONiC configuration deployment across 3 high-availability data centers.

Zero Errors

Eliminated manual errors, ensuring predictable and compliant SONiC fabric operations.

3. Sustain Phase: SONiC Observability and Lifecycle Management

Sustain Features via NetPro Suite

Full-stack SONiC Telemetry

gNMI-based telemetry for port health, link diagnostics, and interface analytics.

Centralized SONiC Observability Dashboards

Real-time visibility via Grafana and OpenSearch integration.

Automated RCA Workflows

Guided tools for L1/L2 engineers to manage incidents without senior intervention.

Lifecycle Automation

Software image management, rollback testing, and performance baseline tracking.

24/7 SONiC TAC Support

Dedicated technical assistance center (L1/L2/L3) for proactive monitoring and issue resolution.

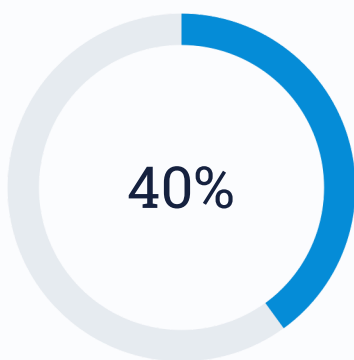
Outcome

- Reduced Mean Time to Detect (MTTD) and Mean Time to Recover (MTTR) by over 50%.
- Enabled data-driven, proactive SONiC operations.
- Improved compliance posture through audit-ready observability pipelines.

SONiC Network Architecture Summary

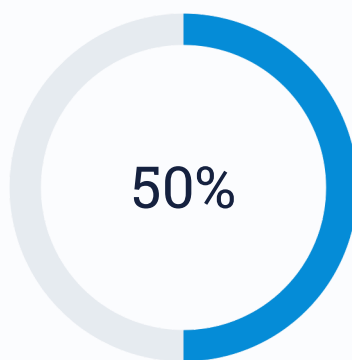
Layer	Functionality	PalC Implementation
Underlay	IPv4/IPv6 routed fabric	SONiC-based Clos design with ECMP
Overlay	EVPN-VXLAN tenant segmentation	Seamless integration with containerized workloads
Automation	ZTP + CI/CD + Policy Templates	Zero-touch SONiC provisioning
Observability	Telemetry + RCA Tools	gNMI, Prometheus, Grafana, OpenSearch
Lifecycle Mgmt.	Versioning, rollback, firmware sync	PalC NetPro Sustain Suite
Security	RBAC, audit, firewall integration	SONiC + PalC Guardian

Results & Business Impact



TCO Reduction

through open hardware and SONiC NOS adoption



Faster Recovery

via proactive observability and automation



Vendor Independence

with disaggregated, open infrastructure

- **Future-Ready IPv6 SONiC Fabric prepared for AI/ML and financial-grade workloads**
- **Unified Network Intelligence: Full visibility from device to application layer**

About PalC Networks

PalC Networks is a global leader in SONiC-based data center modernization and open networking integration.

As a Linux Foundation member and SONiC ecosystem partner, PalC enables enterprises and BFSI leaders to deploy disaggregated, cloud-native infrastructures with unmatched agility, visibility, and cost efficiency.

Core Offerings

SONiC Deployment, Validation & Support

NetPro Suite: Design, Deploy, Sustain Modules

Open Networking Automation & Observability

Data Center Lifecycle Management & Compliance

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Conclusion & Next Steps

This comprehensive document has outlined PalC Networks' successful three-phase SONiC deployment model, demonstrating a transformative approach to modern data center architecture. Our integrated Design, Deploy, and Sustain phases, powered by the SONiC NetPro Suite, have enabled enterprises to achieve unprecedented agility, control, and security in their network infrastructure.

Key Achievements & Business Impact

<p>40% TCO Reduction Achieved through open hardware and SONiC Network Operating System adoption, significantly cutting operational expenditures.</p>	<p>50% Faster Recovery Via proactive observability and automation, leading to reduced Mean Time to Detect (MTTD) and Mean Time to Recover (MTTR).</p>	<p>100% Vendor Independence With disaggregated, open infrastructure, ensuring flexibility and avoiding vendor lock-in.</p>
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Future Roadmap & Recommendations

<p> AI/ML Ready Fabric Leverage the future-ready IPv6 SONiC Fabric to support demanding AI/ML and financial-grade workloads.</p>	<p> Unified Network Intelligence Continue to enhance full visibility from the device to the application layer for optimized performance and troubleshooting.</p>	<p> Scalability & Evolution Continuously scale and evolve the SONiC infrastructure to meet growing business demands and emerging technologies.</p>
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