SONiC Deployment for National-Scale Digital Payments Modernization

Case-study

1. 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, inconsi stent firmware lifecycles, and high risk of misconfiguration.

Limited Observability
Siloedtools and non-standard telemetry made troubleshooting reactive.

No Unified Automation
Lack of ZTP (Zero-Touch Provisioning) and CI/CD pipelines delayed change management.

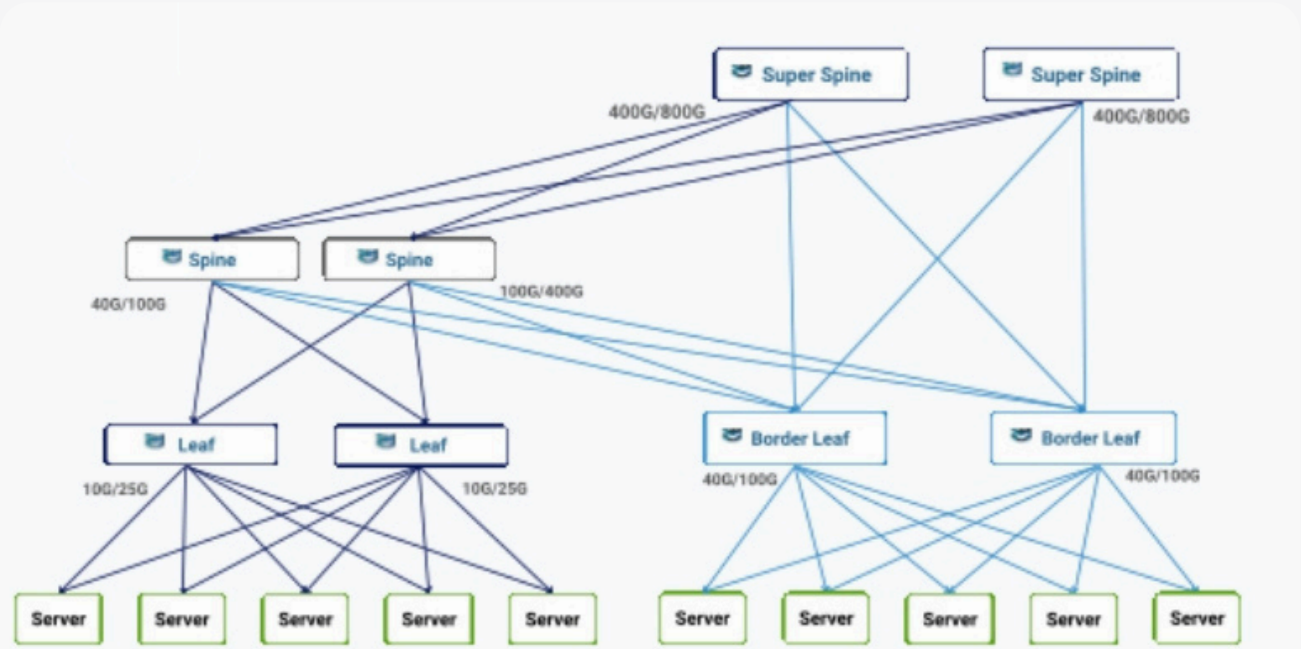
Compliance Strain
Disconnected systems limited real-time audit and fault correlation.

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 everaging 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–Super spine) 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

ReducedTCO 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 s witch 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 → Prometheus → Grafana gNMI 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 telemetryfor port health, link diagnostics, and interface analytics.

Centralized SONiC Observability Dashboards

Real-time visibility via Grafana and OpenSearch integration.

Automated RCA Workflows

Guidedtools 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.

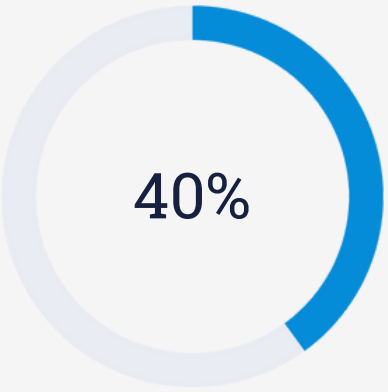
Outcome

- 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

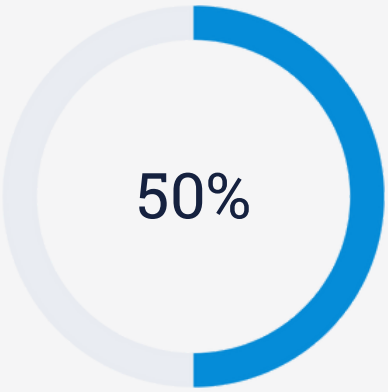
Layer	Functionality	PalC Implementation
Underlay	IPv4/IPv6 routed fabric	SONiC-based Clos design with ECMP
Overlay	EVPN-VXLAN tenant segmentation	Seamless integration with containerized workloads
Automation	ZTP + CI/CD + Policy Templates	Zero-touch SONiC
Observability	Telemetry + RCA Tools	Provisioning gNMI, Prometheus, Grafana, Open Search
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 SONiCNOS 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 workload.**
- **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 & Supp or t

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

40% TCO Reduction

Achieved through open hardware and SONiC Network Operating System adoption, significantly cutting operational expenditures.

50% Faster Recovery

Via proactive observability automation, leading to reduced Mean Time to Detect (MTTD) and Mean Time to Recover (MTTR).

100% Vendor Independence

With disaggregated, open infrastructure, ensuring flexibility and avoiding vendor lock-in.

Future Roadmap & Recommendations

AI/ML Ready Fabric

Leveragethe future-ready IPv6SONiC Fabric to supportdemanding AI/ML andfinancial-grade workloads.

Unified Network Intelligence

Continue to enhance full visibility from the device to the application layer for optimized performance and trouble shooting.

Scalability & Evolution

Continuously scaleand evolve the SONiC infrastructure to meet growing business demands and emerging technologies.