CASE STUDY

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Cisco Identity Service Engine (ISE)

Fixing What Hardware Checks Miss:

The Root Causes Behind a Year of Wireless Disruption

SNAPSHOT

A large Canadian regional hospital network had been experiencing persistent instability in its Cisco ISE deployment, including recurring SEV1 outages tied to authentication delays and 802.1X failures. A standard Cisco ISE Health Check provided baseline data, but it did not uncover the underlying issues. Cisco brought in our experts to extend the investigation beyond the initial hardware-focused review, revealing and correcting deep configuration, policy, and architectural problems that had gone unresolved for more than a year.

This healthcare provider's environment spans 17 hospitals and clinics, all funneled through two wireless LAN controllers and a single ISE deployment. When authentication latency spiked, every hospital experienced a multi-hour wireless outage — impacting clinical operations across the entire region.

Challenges: Chronic Instability Meets Clinical Operations

Loose policies, unmanaged configuration drift, and years of inconsistent maintenance were beginning to affect both security and patient care. During outages, critical medical devices — dialysis machines, glucose monitors, diagnostic imaging equipment, and mobile ultrasound units — would drop off the network for hours at a time.

Although the customer's basic Cisco ISE Health Check outputs appeared largely "green," the report did not connect warnings (such as certificate issues and high swap utilization) to real-world impact. In practice, the organization continued to experience repeated, hours-long wireless outages each quarter. A pass/fail report could not explain why 802.1X users could not reliably connect.

Service Impacting Performance Failures

- High-latency RADIUS responses causing authentication delays and outages
- Recurring SEV1 incidents tied to unpredictable performance spikes

Misconfiguration and Policy Design Issues

- High-resource operations triggered on every RADIUS request
- Poorly constructed and poorly ordered policy rules
- Deviation from Cisco best practices for NAD integration

Infrastructure and Architecture Gaps

- Improper infrastructure sizing
- Backend services consuming excessive resources
- No clear correlation between configuration issues and service impact

These were not hardware failures. They were rooted in policy logic, system design, and operational configuration — precisely the areas where our expertise goes beyond the scope of a standard Cisco health check.

Action: Root Cause Analysis at the Policy Layer

We started with our own comprehensive health check, which then evolved into a structured, multi-phase remediation program focused on stabilizing authentication services and eliminating the root causes of latency and outages. We applied a three-phase, architecture-driven methodology to correct the issues that had eluded traditional Cisco TAC/BU case-based troubleshooting.

Key Actions:

Phase 1 — Immediate Stabilization

- Reordered and optimized RADIUS policies
- Removed unnecessary, resource-intensive operations
- Tuned backend services to reduce processing overhead
- Applied Cisco best practices for NAD integration

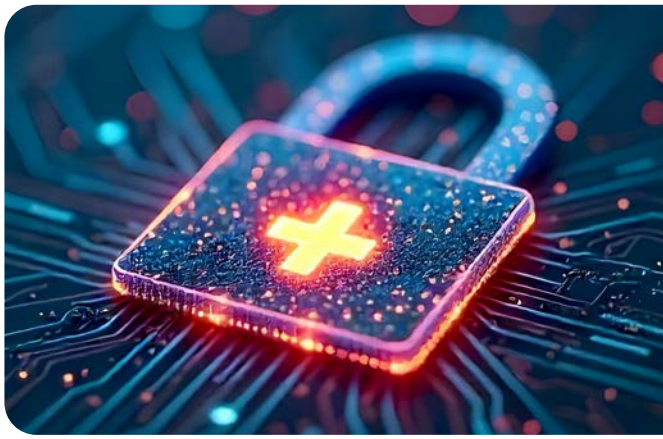
Phase 2 — Infrastructure Optimization

- Right-sized ISE personas and resources
- Redistributed load across nodes
- Improved redundancy and failover behavior

Phase 3 — Policy and Architecture Modernization (In Progress)

- Rationalized and simplified policy sets
- Strengthened governance and operational alignment
- Prepared the environment for future certificate-based authentication

Results: Stability Restored. Latency Eliminated.



Dramatic Performance Improvement Even After Phase 1

- RADIUS latency reduced by over 93% — from 840 ms to 50 ms
- Significant reduction in SEV1 outages and authentication failures

Operational Stability

- Wireless 802.1X services stabilized across the environment
- Predictable, reliable authentication performance restored

Clear Path Forward

- A structured roadmap now guides long-term architectural improvements
- Remaining phases will strengthen scalability, governance, and security posture

Looking to the Future

Our goal is to move the customer beyond basic stability and into a performance tier capable of supporting real-time mobility — such as VoIP roaming and wireless video conferencing — while maintaining strong access control through RADIUS and 802.1X, including certificate-based authentication.

Phase 1 restored stability; the remaining phases will drive latency toward the threshold required for real-time services (approximately 50 ms or below) and establish a foundation for long-term scalability.

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Key Outcomes

This engagement demonstrates that "green" infrastructure metrics do not equal operational health. By focusing on *how policies are built, ordered, and maintained,* we delivered measurable business outcomes:

1 Stability Restored, Risk Reduced
Chronic authentication outages were eliminated through architecture-led policy redesign, restoring reliable access across all hospitals.

2 Built to Scale, Ready for What's Next
Modernized infrastructure and policy foundations now support certificate-based authentication and future growth without added complexity.

3 Governance That Performs
Clear, enforceable policies improved operational consistency, accelerated troubleshooting, and strengthened confidence at both IT and executive levels.

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