ENHANCING NETWORK RELIABILITY FOR REMOTE MEDICAL SYSTEMS WITH CIRRIES DART AI

A Healthcare Use Case for Private 5G and Cloud-Based Clinical Applications

INTRODUCTION

When Network Performance Becomes Patient Safety

In modern healthcare environments, network performance is no longer just an IT concern—it is directly tied to patient outcomes.

This use case highlights how a leading medical device and services company transformed its network operations using Cirries DART AI™, enabling deterministic performance across a private 5G and cloud-connected environment that supports remotely controlled robotic surgical systems.

In this setting, latency is not a metric—it is a matter of precision. Packet loss is not an inconvenience—it is a risk. Every millisecond matters.

THE ENVIRONMENT

Precision Medicine Powered by Real-Time Connectivity

The organization operates advanced robotic systems within operating theaters, allowing surgeons to perform procedures supported by real-time control and telemetry applications hosted in the cloud.

These systems depend on a highly specialized infrastructure:

A private 5G network connects surgical environments to edge gateways and cloud platforms, enabling continuous communication between human input and machine execution. This communication must occur with ultra-low latency, minimal jitter, and near-zero packet loss to ensure accuracy and responsiveness during procedures.

In such an environment, the network effectively becomes an extension of the surgical system itself. Any degradation — no matter how small — can impact performance, confidence, and ultimately patient safety.

THE CHALLENGE

Intermittent Instability in a Mission-Critical System

Despite a well-architected private 5G deployment, the organization began experiencing intermittent jitter and packet loss across its network.

These disruptions were not constant, but when they occurred, they directly affected:

The responsiveness of robotic control systems
The integrity of telemetry and monitoring data
The confidence of surgical teams relying on consistent system behavior

Traditional monitoring tools provided partial insight. Metrics showed that performance had degraded, but they did not explain why. Logs captured events, but only after the fact. Troubleshooting required correlating data across radio, transport, and cloud domains—often manually and under time pressure.

The result was a reactive operational model, where issues were addressed only after they impacted clinical workflows. In a healthcare environment, this was not acceptable.

THE SOLUTION

To resolve these challenges, the company deployed Cirries DART AI™, bringing a new level of visibility and intelligence into its network operations.

DART AI operates by observing real network traffic across the entire service path—from operating theaters through private 5G infrastructure, across edge environments, and into cloud-hosted applications. Rather than relying solely on inferred metrics, it analyzes the actual behavior of traffic in real time.

DARTAI

This approach introduces what can best be described as network truth — a precise understanding of how the system is performing at the level that matters most.

FROM VISIBILITY TO UNDERSTANDING

AI-Driven Insight

Visibility alone is not enough in a complex, distributed environment. The real value comes from understanding.

DART AI transforms packet-derived intelligence into actionable insight using AI-driven analysis. It continuously learns normal traffic patterns associated with surgical operations and identifies deviations the moment they occur.

When anomalies are detected, the platform does not simply raise an alert. It correlates conditions across the network—radio performance, transport behavior, congestion points, and cloud application dynamics—to determine the root cause.

What previously required hours of investigation can now be understood in minutes.

This shift—from detection to explanation—fundamentally changes how network operations support clinical systems.

OPERATIONAL TRANSFORMATION

From Reactive Response to Continuous Assurance

With DART AI in place, the organization moved from reactive troubleshooting to proactive assurance.

Instead of waiting for issues to impact surgical procedures, the system continuously validates performance against expected baselines. Subtle degradations are identified early, allowing IT teams to intervene before they escalate.

The platform also provides clear, actionable remediation guidance. Network teams no longer need to interpret fragmented data or coordinate across multiple systems to identify next steps. Instead, they are equipped with precise insights that accelerate resolution and reduce operational complexity.

DEPLOYMENT

Fast, Non-Disruptive, and Clinically Safe

Given the sensitivity of the environment, deployment needed to be seamless and risk-free.

DART AI sensors were introduced across the private 5G, edge, and cloud infrastructure without requiring changes to clinical systems or operating room configurations. The deployment was passive and non-intrusive, ensuring zero impact on ongoing procedures.

Within days, the platform began delivering actionable insights. Integration with existing systems was straightforward, and the organization quickly incorporated DART AI into its operational workflows.

RESULTS

Measurable Improvements in Performance and Confidence

The impact of DART AI was both immediate and significant.

Network performance improved measurably, with reductions in jitter and packet loss that directly enhanced the responsiveness and reliability of robotic systems. Troubleshooting time decreased dramatically, allowing issues to be resolved faster and with greater precision.

Beyond the technical metrics, the broader impact was equally important.

Surgical teams gained increased confidence in the reliability of remote systems. Clinical outcomes benefited from more consistent performance. Operational risk was reduced, and SLA adherence improved across the network.

In an environment where precision and reliability are critical, these improvements represent a meaningful advancement in both technology and patient care.

WHY THIS MATTERS FOR AWS CUSTOMERS

As healthcare continues to adopt private 5G, edge computing, and cloud-based applications, the demands on network performance will only increase.

Traditional observability approaches—focused on metrics and logs—are not sufficient for these environments. What is required is a deeper level of insight, one that reflects actual system behavior and enables rapid, intelligent response.

DART AI delivers this capability by combining packet-level intelligence with AI-driven analysis, enabling healthcare organizations to operate with confidence in even the most demanding scenarios.

CONCLUSION

This use case demonstrates how advanced observability can move beyond monitoring to become a core enabler of clinical innovation.

With Cirries DART AI, the organization established a foundation of continuous assurance, ensuring that its network infrastructure can support the next generation of medical technologies without compromise.

In environments where performance directly impacts lives, there is no room for uncertainty.

Only clarity. Only precision. Only truth.