windstream wholesale

ICON Intelligent Converged Optical Network

Windstream Wholesale leverages Ciena's 6500 Reconfigurable Line System (RLS) to continuously innovate the capabilities of our ICON network from edge to core.

Executive Summary

Windstream Wholesale's Intelligent Converged Optical Network (ICON) is engineered to support the explosive growth of AI-driven applications. By basing the photonic layer on Ciena's 6500 Reconfigurable Line System (RLS) and the Ciena Navigator controller, Windstream has created an open, vendor-agnostic foundation that can be expanded, instrumented, and automated without disrupting live traffic. This paper explains how ICON's architecture translates into tangible customer benefits—scalability, predictable performance, deep visibility, rapid service activation, and a clear path to multi-terabit capacity.

Introduction: A Platform Built for Continuous Growth

Windstream selected the Ciena 6500 RLS in 2021 as the backbone of the ICON network. The RLS's colorless, directionless, contentionless (CDC) ROADMs and open-line design allow Windstream to introduce new wavelengths, vendors, and services at will. Navigator provides model-driven, API-based control, giving operators a single pane of glass for planning, provisioning, and assurance. Together, these components allow ICON to evolve in lock-step with customer demand rather than in disruptive upgrade cycles.

Scalability and Adaptability

Traffic growth is rarely linear; it tends to arrive in surges tied to new data-center deployments, cloud on-ramps, or AI cluster expansions. ICON meets this variability by letting engineers add ROADM degrees or expand add/drop capacity with simple plug-in modules. Because the photonic layer is open, Windstream can light either native Ciena wavelengths or third-party "alien" waves at whatever band rate or modulation format best suits the application. The result is pay-as-you-grow economics that avoid forklift replacements while shortening the interval between customer order and revenue recognition.

Consistent Optical Performance

ICON's performance is stabilized from day one through Amplified Spontaneous Emission (ASE) loading. By injecting calibrated noise into every unused channel, the network behaves as though it were fully populated, maintaining optical signal-to-noise ratio (OSNR) and spectral tilt even when only a handful of wavelengths are active. This approach keeps service levels flat as additional channels, broader bandwidths, or L-band extensions are introduced—critical for latency-sensitive or high-capacity workloads.

End-to-End Visibility and Monitoring

A network is only as reliable as the operator's ability to see what is happening in real time. ICON embeds high-resolution optical channel monitors and bidirectional OTDRs at every node, streaming telemetry on power levels, OSNR, and fiber health into Navigator. Windstream's iconnect portal exposes much of this data directly to customers, enabling them to track their own services and verify SLAs without opening tickets. Predictive analytics flag fiber impairments or performance drift before traffic is affected, translating to higher availability and faster mean-time-to-repair.

Automation and Operational Efficiency

Manual turn-ups slow revenue and introduce human error. ICON addresses both issues through zero-touch provisioning. PlannerPlus software auto-generates commissioning scripts, and declarative configurations are pushed to new nodes via open APIs. Automated fiber-patch verification confirms cleanliness and polarity, reducing truck rolls. Because these workflows integrate with existing OSS/BSS stacks, Windstream can activate services in hours rather than days while holding operational costs flat even as the footprint grows.

Seamless Edge-to-Core Design

Network resources must be delivered wherever customers need them—whether at a hyperscale campus, a metro hub, or a remote edge PoP. ICON offers two hardware footprints that share a common software model: a "pizza-box" ROADM for 300 mm-depth edge sites and a high-density chassis for 600 mm metro or core facilities. Both support the same APIs, telemetry, and CDC functionality, allowing engineers to apply uniform design rules and sparing policies from edge to core.

Future-Ready Innovation

The RLS roadmap includes integrated C- and L-band ROADM cards and in-line amplifiers that collapse multiple functions into a single module, shrinking space and power while pushing per-wavelength capacity to 1.6 Tb/s today and 3.2 Tb/s tomorrow. These enhancements come via software-driven line-card swaps rather than chassis replacements, ensuring that Windstream can stay ahead of hyperscaler and cloud requirements for Wave, Optical Spectrum, Data-Center Interconnect (DCI), and Managed Optical Fiber Network (MOFN) services.

Conclusion

By integrating Ciena's 6500 RLS hardware with Navigator's software intelligence, Windstream Wholesale has built a photonic fabric that scales effortlessly, performs consistently, and operates transparently. Customers gain faster service activation, real-time visibility, multi-vendor freedom, and the assurance that the network will expand seamlessly as their bandwidth needs escalate. ICON is not just prepared for today's AI-driven data demands—it is architected for whatever comes next.

About Windstream Wholesale

Windstream Wholesale (WW) is an innovative optical technology leader that delivers fast, flexible, and customized wavelength and dark fiber solutions to carriers, content providers, and hyperscalers in the U.S. and Canada. WW is one of three brands managed by Windstream. The company's quality-first approach connects customers to new opportunities and possibilities by delivering a full suite of advanced communications services. Windstream also offers fiber-based broadband to residential and small business customers in 18 states as well as managed cloud communications and security services to mid-to-large enterprises and government entities across the U.S. Windstream is a privately held company headquartered in Little Rock, Ark. Additional information about WW is available at windstreamwholesale.com.

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