
GLINENET · ENTERPRISE SOLUTIONS

Enterprise Workplace IoT Environment Management Platform

Built on the Niagara Platform · One Platform · Every System · No Silos

Unified environment, energy & asset management for
corporate office workspaces

Data Center · HVAC & IAQ · Meeting & AV · Lighting · Space · Energy · AI Analytics

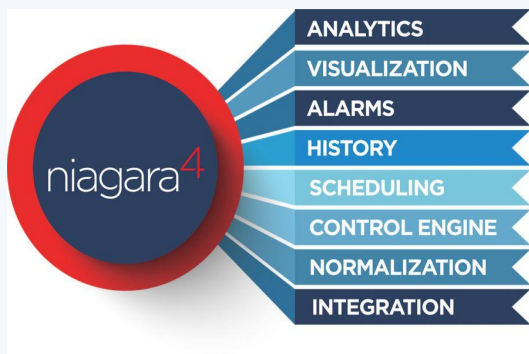
Tridium Authorized Partner · Niagara Value-Added Services — Development · Integration · 24x7 O&M

One Open Device-Management Platform for Office Spaces

IoT / environment & equipment management — for corporate office workspaces, nothing else

What the Platform Is

- ▶ **Device management** — every connected asset has identity, state, history
- ▶ **Environment management** — temperature, air quality, light, occupancy, energy
- ▶ **Unified data model** — one normalized view across all office sub-systems
- ▶ **IoT-ready** — wired and wireless sensors join the same platform



What It Is Not

- ▶ **Not a single-vendor lock** — open protocols, multi-brand
- ▶ **Not a new control system** — connects what already exists
- ▶ **Not cloud-dependent** — fully on-premise by design
- ▶ **Not limited to one room type** — DC, meeting rooms, open office

The scope is deliberately the corporate office: data center, meeting rooms, open workspace, and the systems that serve them.

What We Do as a Tridium Authorized Partner

Six service lines — from daily O&M to AI development, backed by Tridium factory engineering

Niagara O&M & Upgrades

24x7 remote monitoring & alarm handling
Patching & N4.x version upgrades
Documented change control · SLA-backed response

Compliance & Risk Management

Hardening per Niagara Hardening Guide
RBAC & audit-log reviews
IEC 62443 / NIST-aligned risk assessment

Development & Deployment

New station design, engineering & commissioning
Architecture / DR / capacity consulting
Consulting & full-cycle project delivery

Fault Diagnosis & Tridium Support

Deep fault isolation on JACE / Supervisor
Direct escalation to Tridium factory support
Firmware & licensing resolution

Third-Party Integration

BACnet · Modbus · DALI · KNX · MQTT
SNMP · LoRaWAN · cloud APIs
Legacy systems unified on one Niagara model

Niagara AI Development

On-prem AI: energy advice & alarm analytics
Predictive maintenance insights
Dashboards & automated reports on the data bus

Since 2014 — Tridium Authorized Partner · backed by Tridium factory engineering & the Niagara Community

12 Years · 200+ Projects · Serving Clients Worldwide

A Tridium Authorized Partner since 2014 — independent Niagara consulting, integration and O&M

12 Years · 200+ Projects

- ▶ 12 years deep expertise — 200+ projects delivered in China & overseas
- ▶ Fortune 500 MNC headquarters & campuses across insurance, pharma, retail, manufacturing, tech
- ▶ End-to-end delivery: design, system integration, HVAC optimization, remote O&M
- ▶ **Tridium Authorized Partner since 2014**

Niagara Preferred Consultant

Independent advisory on architecture, protocol selection and rollout strategy — unbiased, vendor-agnostic, Tridium-certified.

System Integration

Multi-brand HVAC / VRV / lighting / DC / IAQ unified on one Niagara model

HVAC Optimization

Scheduling, setpoint & demand strategies — 15–30% savings typical

Remote O&M 24×7

Remote monitoring, alarms, backups, patching & upgrades

AI & Data Analytics

On-prem AI: energy advice, alarm analytics, predictive maintenance

Enterprise IT Security — Defense in Depth

How the platform protects corporate IT: architecture, identity, encryption, audit

Design Baseline — No Public Exposure

Supervisor and JACE controllers sit entirely inside the corporate intranet: no public listening ports, no mandatory cloud account, no external data path. OT/IT network segregation is the default posture.

Identity & Access (IAM)

- ▶ **Role-based access (RBAC)** — least privilege, view/menu level
- ▶ **SAML 2.0 SSO** — single sign-on with enterprise IdP
- ▶ **LDAP / Active Directory** — enterprise directory integration
- ▶ **Two-factor (RSA SecurID)** — FIPS-grade MFA available

Encryption & Trust

- ▶ **TLS 1.3** — Fox/Web/Platform channels
- ▶ **FIPS 140-2 validated crypto** — AES-256, PBKDF2
- ▶ **PKI / X.509 certificates** — per-device identity
- ▶ **Code signing** — modules verified before load

Audit & Operations

- ▶ **Full audit log** — who, when, what, from where
- ▶ **Failure auto-alert** — audit stream to SIEM/ticketing
- ▶ **Password policy** — 10+ chars, lockout, expiry
- ▶ **Secure backup** — encrypted web backup, 3-2-1

Compliance, Sovereignty & Resilience

Why on-premise beats cloud for corporate building OT — measured across six dimensions

Dimension	Cloud / Public-Exposed Approach	Niagara 100% On-Premise
Attack surface	Public IPs / cloud APIs constantly scanned	No public endpoints — surface ≈ zero
Data sovereignty	Data passes through third-party clouds	All data remains inside the enterprise
Availability	Lost if the internet link fails	Local monitoring & control continue without internet
Vulnerability blast radius	Single flaw may expose the whole estate	Segmented zones — impact contained & auditable
Audit & e-discovery	Cloud-side logs harder to produce	Complete local logs, ready for compliance
Regulatory posture	Processor scrutiny for data handlers	Full enterprise control of OT data lifecycle

For corporate IT organizations, an on-premise OT platform integrates naturally with SOC, SIEM, IAM and DLP tooling.

Alignment: NIST framework · IEC 62443 · vendor hardening baseline · enterprise security module.

Supervisor + JACE + Open Interfaces

Enterprise supervision, edge autonomy, and every integration channel the IT teams need

ENTERPRISE LAYER

Niagara 4 Supervisor (on-premise)

Analytics · reporting · alarm consolidation · AI interface · multi-site rollup

EDGE LAYER

JACE-9000 controllers

Local schedules, control loops, alarms & trend buffering — fail-safe autonomy

FIELD LAYER

Wired & wireless sub-systems

HVAC/VRV · DALI lighting · IAQ · UPS/CRAC/PDU · AV · meters · LoRaWAN sensors

JACE runs the control logic locally — the office keeps operating even if external connectivity is lost.

Interoperability — 300+ Protocols, One Platform

BACnet · Modbus · DALI · KNX · LonWorks · MQTT · SNMP · oBIX · REST · WebSocket · Fox · LoRaWAN

WebSocket — Real-Time Data Push (Niagara 4.15+)

Full-duplex WebSocket channel (/wsbox) streams three data classes in real time: alarms, history, and live point status — server-initiated push instead of polling. Ideal for live dashboards, enterprise integrations and mobile terminals.

oBIX (XML)

- ▶ **Read / write / invoke** — mature & stable
- ▶ **Basic Auth / SCRAM** — secure handshake

REST (JSON)

- ▶ **Config / history / points** — RESTful style
- ▶ **Web-app friendly** — JSON everywhere

WebSocket (JSON)

- ▶ **Alarm stream** — real-time push
- ▶ **History updates** — incremental
- ▶ **Live point status** — subscriptions

Field Protocols

- ▶ **BACnet / Modbus** — MS/TP, IP, RTU
- ▶ **DALI (IEC 62386)** — lighting
- ▶ **MQTT** — IoT edge

Data Center Environment — Unified Monitoring

UPS · CRAC · PDU · leakage · energy meters — one alarm console

Unified Alarm Console

UPS fault/battery/bypass, CRAC high-temp/humidity, PDU overload, water leakage, power loss — consolidated on ONE alarm console with severity, acknowledgement, escalation and full audit history.

UPS

- ▶ Input/output V/Hz/A real-time
- ▶ Battery V/SOC/runtime health
- ▶ Mode & alarms
utility/battery/bypass/fault

CRAC

- ▶ Supply/return temp & RH
- ▶ Compressor/fan state
- ▶ Setpoint drift alarm
- ▶ Demand-based sequencing

PDU / Power

- ▶ Per-outlet current & power
- ▶ Phase balance & PF
- ▶ Load headroom & capacity

Leakage & Misc

- ▶ Leakage rope zones digital 0/1
- ▶ Smoke/flood inputs optional
- ▶ Door access events data center

Escalation chain: alarm → notification → ticket → maintenance-mode → root-cause analytics.

Proven Data-Center Capability (DCIM)

Rack-level visibility, power & cooling management, capacity planning

What the Platform Provides

- ▶ **Rack-level monitoring** — kW/rack, temp/rack, free RU
- ▶ **Thermographic views** — hot-spot visualization
- ▶ **Electrical one-line** — with "what-if" capacity planning
- ▶ **CRAC sequencing** — demand-based cooling, energy reduction
- ▶ **Maintenance manager** — scheduled tasks, reminders, maintenance mode

Recorded Deployments

- ▶ **900+ data-center instances** — vendor DCIM program
- ▶ **320+ customers** — across industries
- ▶ **50+ international projects** — multi-country
- ▶ **Single pane for power + cooling + space** — no DCIM island

Reference: vendor data-center presentation and 2025 data-center white paper (URLs in References).

HVAC & Multi-Brand VRF Management

Control + monitoring + fault visibility across brands and zones

Control Plane

- ▶ **Schedule engine** — workday/weekend/holiday profiles
- ▶ **Setpoint optimization** — summer 26°C / winter 20°C, $\pm 1^\circ\text{C}$ deadband
- ▶ **Occupancy-linked** — presence & booking-aware setback
- ▶ **Multi-brand** — Daikin / Mitsubishi / Hitachi via gateways
- ▶ **Write-verify loop** — readback confirmation of every command

Monitoring Plane

- ▶ **Room temperature readbacks** — per zone
- ▶ **Run status & fault codes** — real-time alarm feed
- ▶ **Runtime & energy** — usage analytics
- ▶ **Energy anomaly** — idle running, valve leaks, degradation

Automation boundary: schedule control is the recommended remote automation. All other HVAC optimization is advisory.

Fresh Air & IAQ Systems

Demand-based ventilation · continuous air-quality monitoring · purifier integration

Ventilation Strategy

CO₂/PM2.5/VOC sensors link to AHU and fresh-air dampers: ventilation is driven by measured demand instead of fixed schedules — saving fan energy while keeping indoor air within target bands.

Measured IAQ

- ▶ **CO₂** occupancy proxy
- ▶ **PM2.5/PM10** particulate load
- ▶ **VOC/HCHO** source pollution
- ▶ **Temp/RH** comfort band

Demand Ventilation

- ▶ **CO₂-based damper** fresh-air modulation
- ▶ **Pre-occupancy purge** morning flush
- ▶ **Night ventilation** free cooling

Purifier Integration

- ▶ **Purifier status** run/standby
- ▶ **Filter life** pressure-drop
- ▶ **Auto advice** not forced control

IAQ grading per zone (A/B/C) on dashboards — visible health for occupants, decision data for FM.

High-Productivity Meeting Rooms — AV & Booking

AV systems integrated with room schedules — environment ready when people arrive

Integration with the Booking System

Calendar/booking events drive a room scene: climate setpoints + DALI lighting scene + AV power + shade positions are sequenced automatically before the meeting; rooms return to standby afterwards.

AV Infrastructure

- ▶ **Projector/display** power & input
- ▶ **Audio amp/DSP** status
- ▶ **Videoconference codec** health
- ▶ **Usage analytics** per room

Booking-Driven Readiness

- ▶ **Pre-meeting prep** climate+light+AV
- ▶ **Auto-return** after meeting
- ▶ **Unused slots** energy advisory

Room Lighting Scene

- ▶ **DALI scene recall** meeting/projection/cleaning
- ▶ **Dimming & daylight** per room facade
- ▶ **Occupancy-linked** off when empty

Outcome: meetings start on time with the right environment — productivity and comfort in one scene.

DALI Digital Lighting

IEC 62386 open standard · scenes · daylight harvesting · dimming · human-centric

DALI (IEC 62386) — the open standard for intelligent networked lighting

A DALI gateway turns the lighting plant into an addressable IoT service: every driver, group and scene becomes a first-class point on the platform data model — commissioned, monitored and controlled from one system.

Digital Addressability

- ▶ **Per-driver control** individual & group
- ▶ **Scenes** meeting/projection/cleaning
- ▶ **Status & failure** lamp/driver fault detection

Daylight Harvesting

- ▶ **Photosensor closed-loop**
- ▶ **Natural-light compensation** dim to target lux
- ▶ **Window-zone tuning** per facade

Human-Centric / Circadian

- ▶ **Tunable white (CCT)**
- ▶ **Morning** cool bright
- ▶ **Evening** warm dim

Outcome: comfort scenes + energy-efficient daylight response + occupant wellbeing in one lighting service.

On-Premise AI & Data Analytics

The platform as structured data bus — AI runs inside the intranet

Private & Safe

AI models run inside the enterprise network — data never leaves the intranet. The platform acts as the structured data bus for environment, energy and equipment data.

Customized Energy Advice

- ▶ **By floor/zone/time** — targeted recommendations
- ▶ **Example:** "Meeting room 3F AC ran empty 40 min — save X kWh"
- ▶ **Quantified potential** — every advice has estimated savings

Daily Reports

- ▶ **Daily energy flash** + anomalies + yesterday
- ▶ **Pushed to employee terminals** (email / enterprise IM)
- ▶ **Manager version** with benchmarks & trends

Alarm Analytics

- ▶ **Frequency × duration × severity** — prioritization
- ▶ **Floor / zone grouping** — hotspot localization
- ▶ **Weekly/monthly summaries** — visible trends

Result: energy savings become behavior-driven, advisory and auditable — never forced automation of non-HVAC devices.

Space Occupancy Analytics

Presence · access events · booking · utilization statistics

Data Sources

- ▶ **Presence / motion sensors** — per zone (wired or wireless)
- ▶ **Access-control events** — card swipes
- ▶ **Booking systems** — calendar & room scheduler
- ▶ **Desk sensors** — hot-desking

Analytics Output

- ▶ **Occupancy / vacancy rates** — by floor × zone × time
- ▶ **Peak & idle periods** — heat-map visualization
- ▶ **Utilization %** — per room / desk / floor
- ▶ **Space-cost insights** — real-estate efficiency

Downstream: HVAC/lighting advisory, cleaning & security scheduling, evidence-based space planning.

Asset Utilization & Automated Reports

Equipment health, energy reports and preventive maintenance — automated

Asset & Trend Analytics

- ▶ **Runtime accumulation** — threshold reminders
- ▶ **Temp/current/vibration drift** — degradation early-warning
- ▶ **Filter pressure-drop** & fan efficiency decline
- ▶ **Device health history** — full digital lifecycle

Automated Reporting

- ▶ **Daily / weekly / monthly** — scheduled push
- ▶ **Sub-metered energy** — HVAC/lighting/DC/plug
- ▶ **Benchmarked** — YoY, MoM, per-area intensity
- ▶ **Multi-dimensional** — floor, zone, system, time

From "fix when broken" to "maintain before failure" — lower downtime, data-backed work orders.

Whole-Office Automation & Scheduling

One schedule engine coordinates HVAC, lighting scenes, AV readiness and reporting

Unified Scheduling Layer

Workday / weekend / holiday profiles; pre-conditioning windows; occupancy-linked setbacks — all executed by the same engine that also publishes reports and alarms.

Schedule Engine

- ▶ **HVAC schedules** — the recommended remote automation
- ▶ **Lighting scenes** — calendar-driven
- ▶ **AV readiness** — booking-linked

Cross-System Automation

- ▶ **Room readiness** — climate+light+AV+shade
- ▶ **After-hours** — setback & standby
- ▶ **Holiday mode** — full energy-preserving state

Safety Boundary

- ▶ **Only HVAC scheduling** is automated remotely
- ▶ **All other devices** — human-controlled
- ▶ **Savings advisory** — reported, not forced

Net effect: one engine runs the office rhythm — comfort when occupied, savings when not, reports every morning.

Wireless BAS — Retrofit Without Rewiring

Wireless sensors join the same platform; ideal for occupied office upgrades

The Retrofit Advantage

Wireless protocols (LoRaWAN, EnOcean, Zigbee, Wi-Fi/BLE) eliminate control-wiring cost in retrofit projects: sensors are placed exactly where they add value — occupancy, IAQ, daylight, temperature — without opening ceilings and walls.

Faster Installation

- ▶ **No new cable runs** — days, not weeks
- ▶ **Minimal disruption** — occupied office friendly
- ▶ **Add points on demand** — scalable density

Energy-Harvesting & Low-Power

- ▶ **Battery-free / long-life** — EnOcean-class & LoRaWAN
- ▶ **Near-zero maintenance** — no battery rounds
- ▶ **Sustainable** — less material & waste

Protocol Choice

- ▶ **LoRaWAN / EnOcean / Zigbee** — per-site selection
- ▶ **Gateway into the platform** — single data model
- ▶ **Wireless + wired mix** — best of both

For office buildings, wireless retrofit means: more sensor points, lower CapEx, zero operational interruption — all feeding one platform.

LoRaWAN Sensors + Platform Integration

Milesight / Elsys / Netvox IAQ & occupancy sensors — data into the same Niagara model

Integration Path (documented)

LoRaWAN gateway → network server (e.g., ChirpStack) → Niagara driver → normalized points. Milesight AM-series IAQ sensors, VS-series people-counting, Elsys CO₂/occupancy, Netvox meters — all documented integrations that land as first-class points with alarms, history and live status via oBIX/REST/WebSocket.

Milesight

- ▶ **AM102/103/307 IAQ** — CO₂/PM/TH
- ▶ **VS125/VS350 people counting** — occupancy
- ▶ **EM300/TH temp & humidity** — environment

Elsys / Netvox / Enless

- ▶ **ERS2 CO₂ & occupancy** — meeting rooms
- ▶ **EMS2 desk occupancy** — hot-desking
- ▶ **Pulse meters** — energy/water

Platform Value

- ▶ **One driver ecosystem** — vendor-neutral
- ▶ **Alarm + history + live status** — WebSocket push
- ▶ **Retrofit = instant data** — no rewiring

Sources: NAS LoRaWAN integration guides (ChirpStack→Niagara), Milesight/Elsys device docs.

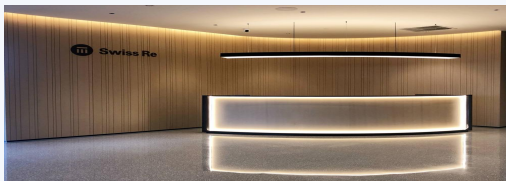
Foreign Insurers & Fortune 500 Enterprises in China

Real Glinenet deliveries — insurance, IAQ and HVAC for global MNC offices

Foreign Insurer

European leading reinsurer — Beijing digital office

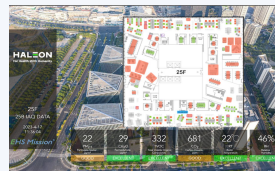
- ▶ DALI 2.0 digital lighting
- ▶ RESET-certified IAQ monitoring
- ▶ Meeting-room AV
- ▶ IT room environment & power monitoring



IAQ — Fortune 500 Offices

Pernod Ricard China · GSK China · Saint-Gobain China

- ▶ Real-time CO₂ / PM2.5 / TVOC monitoring
- ▶ Ventilation efficiency & infection-risk analysis
- ▶ Deployed at MNC HQ offices across China



HVAC & VRV — IKEA APAC HQ

IKEA Asia-Pacific HQ (Shanghai Xuhui)

- ▶ Cloud control for every VRV indoor unit
- ▶ Zone-based comfort control
- ▶ Auto-off at lunch & after hours — payback in year one



💡 The pattern: one open platform, one data model — air, energy and comfort managed from a single pane. All delivered by Glinenet (Shanghai).

BaoSteel HQ — Niagara System Integration & HVAC Optimization

Baowu Group headquarters — one open platform across the corporate estate

Niagara System Integration

Mixed legacy & new sub-systems — HVAC, VRV, lighting, metering, access — unified onto one Niagara data model; BACnet / Modbus / gateways converged into a single pane.

HVAC Optimization

Central scheduling & setpoint strategies per zone; write-verify control loops; demand-based operation cutting runtime waste while keeping comfort — measurable energy savings.

O&M & Analytics

Alarm consolidation with escalation; automated reports to facility management; trend & runtime analytics feeding preventive maintenance decisions.

 Delivered by Glinenet — enterprise-grade Niagara for a Fortune Global 500 industrial leader: one platform, every system, no silos.

Trusted by Global Enterprises — 200+ Projects

Corporate headquarters, APAC offices and retail environments on one open platform

Corporate Headquarters



GE



Walmart Logistics



Pernod Ricard



GSK



Swiss Re



Beigene HQ



Saint-Gobain



TJAD



BaoSteel HQ



IQVIA (Quintiles)



Mary Kay



Geely Group

APAC Offices



Nomura Securities



Mitsubishi Heavy

Retail & Commercial



IKEA APAC HQ



Tudor

Retail & Campus — Apple Store + Alibaba Campus

Retail stores run one way; corporate campuses run another. Both on Niagara.

Apple — Retail (Apple Store)

- ▶ Apple Store environment — Niagara Summit public case
- ▶ HVAC + lighting unified for premium retail experience
- ▶ 6 stores in China & HK built, 30+ planned (vendor case)
- ▶ Energy efficiency — store-level optimization

Alibaba — Corporate Campus

- ▶ Campus-scale environment & energy management
- ▶ Multi-building office complex — one platform
- ▶ IAQ, HVAC, lighting, occupancy across buildings
- ▶ Open API integration with enterprise systems

Glinenet Client Portfolio

- ▶ Corporate HQs: GE · Walmart Logistics · Pernod Ricard · GSK · Swiss Re
- ▶ HQs (cont.): Saint-Gobain · TJAD · BaoSteel · IQVIA (Quintiles) · Mary Kay
- ▶ APAC: Nomura Securities · Mitsubishi Heavy Industries
- ▶ Retail & Commercial: IKEA APAC HQ · Tudor · Beigene HQ · Geely Group
- ▶ **200+ buildings, one platform — retail & campus alike**

Sources: vendor-published customer list (Niagara 101 deck), Niagara Summit public case, Glinenet project records — URLs in References.
Pattern applies directly to corporate office workspaces: one platform, one data model, no silos.

The Complete Picture

One platform · every office system · no silos · 100% on-premise

One Platform

- ▶ All subsystems on one data model
- ▶ Multi-protocol multi-brand

Measurable Savings

- ▶ Scheduling + setpoints + demand 15–30% HVAC typical
- ▶ Visible waste, executable advice

On-Premise Security

- ▶ 100% intranet deployment zero public exposure
- ▶ Defense-in-depth & audit

Data Asset

- ▶ Space / energy / alarms / health fully digital
- ▶ Automated reports + preventive maintenance

On-Premise AI

- ▶ Custom energy advice & daily reports
- ▶ Data never leaves intranet privacy & compliance

Open Ecosystem

- ▶ Third-party devices easy to connect
- ▶ Wired + wireless retrofit

Sources — Vendor & Industry Publications

Accessible URLs and NAS archive paths (accessed 2026-08-25)

1. Niagara 4 brochure — open API, protocol support, 1M+ instances worldwide https://www.tridium.com/content/dam/tridium/en/documents/document-lists/niagara/2023-0016-Niagara4-Brochure.pdf
2. Data center white paper (2025) — one platform for building/IT/energy/security https://www.tridium.com/content/dam/tridium/en/documents/document-lists/whitepaper/tri-whitepaper-niagara-in-data-center-2025-0022.pdf
3. Niagara Enterprise Security v4 (NAS archive) — FIPS 140-2, PKI, TLS 1.3, SAML, RBAC, audit Niagara_Enterprise_Security_v4.pdf — archived on Glinenet NAS
4. Niagara 4 Hardening Guide 2023 (NAS archive) Niagara4-Hardening-Guide-2023.pdf — archived on Glinenet NAS
5. Niagara WebSocket vs oBIX vs REST comparison (N4.15 verified, NAS archive) — alarm/history/live status push Niagara_WebSocket_vs_oBIX_vs_REST_20260801.md — archived on Glinenet NAS
6. LoRaWAN ChirpStack → Niagara integration guide; Milesight/Elsys/Netvox wireless sensor docs (NAS archive) pages/ ... howto-install-and-integrate-lorawan-chirpstack-data-into-niagara-4.html — archived
7. Wireless BAS trend sources — Automated Logic / Johnson Controls / ABI Research / MarketsandMarkets www.automatedlogic.com · www.johnsoncontrols.com (BAS trends articles)
8. Walmart South-China logistics — DALI + Niagara case (Glinenet delivery) dalicasestudywalmartwarehouse.pdf — archived on Glinenet NAS

Note: case content summarized from public vendor/industry materials; verify details before external publication.

Thank You

A healthy, efficient, fully-managed office — one platform, zero silos, 100% yours.

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