

Data Center Controls Engineering Demonstration

A concise technical report covering the current Ignition Perspective prototype, live multi-site KPI visualization, subsystem health rollups, and Gateway-based simulation verification.

VISIBLE PUE

1.17 - 1.19

Target shown: <= 1.40

FACILITY LOAD

48.2 - 51.3 MW

Visible multi-site snapshot

IT LOAD

40.4 - 43.7 MW

Approximately 84-85% of facility

ACTIVE ALARMS

0

No critical alarms in captured view

PERSPECTIVE - MULTI-SITE SUPERVISORY OVERVIEW

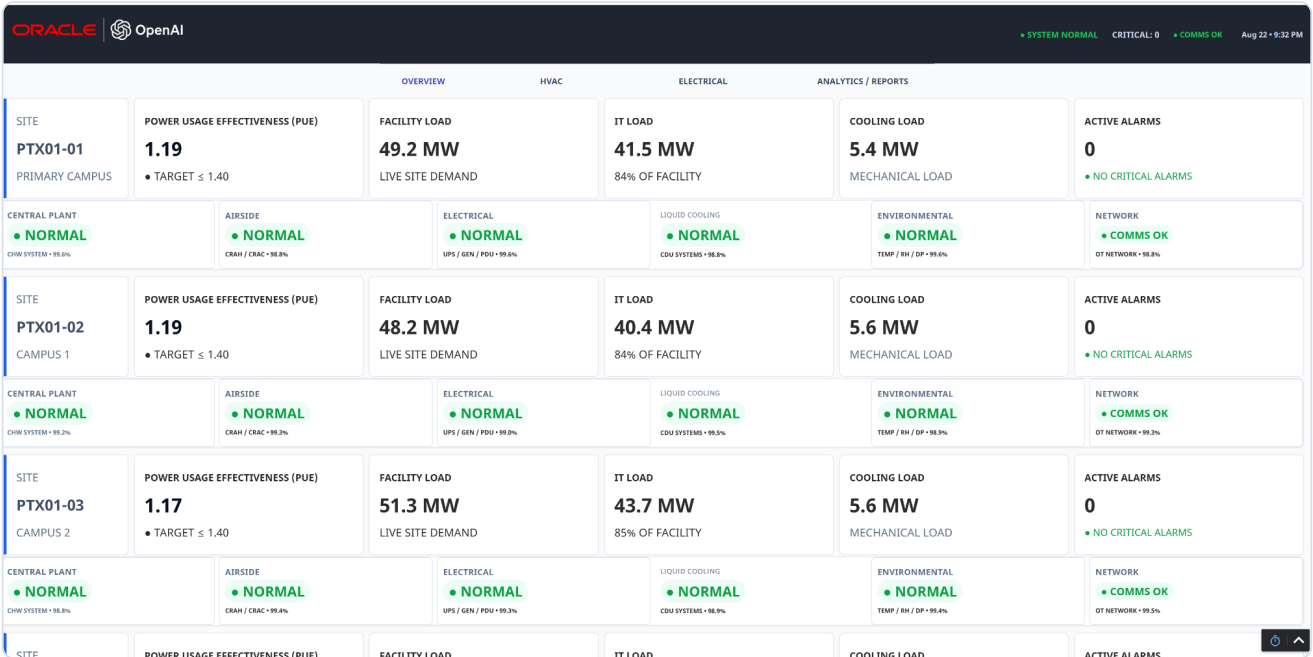


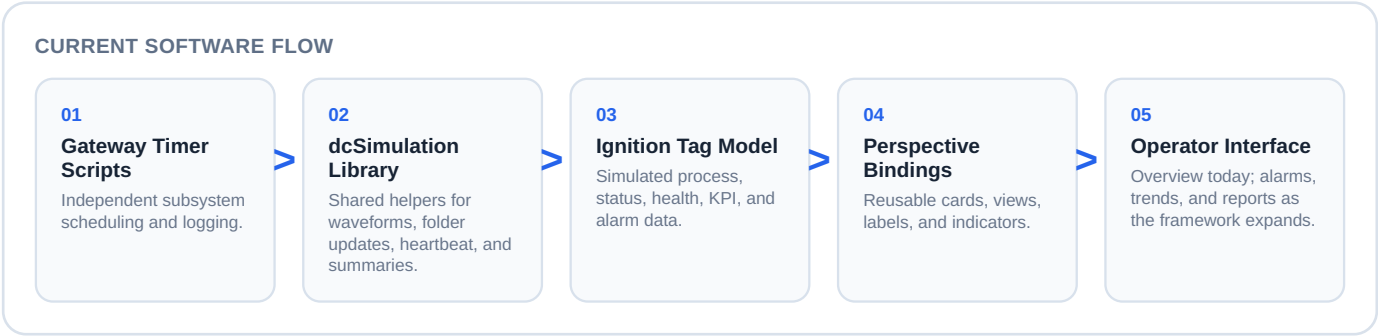
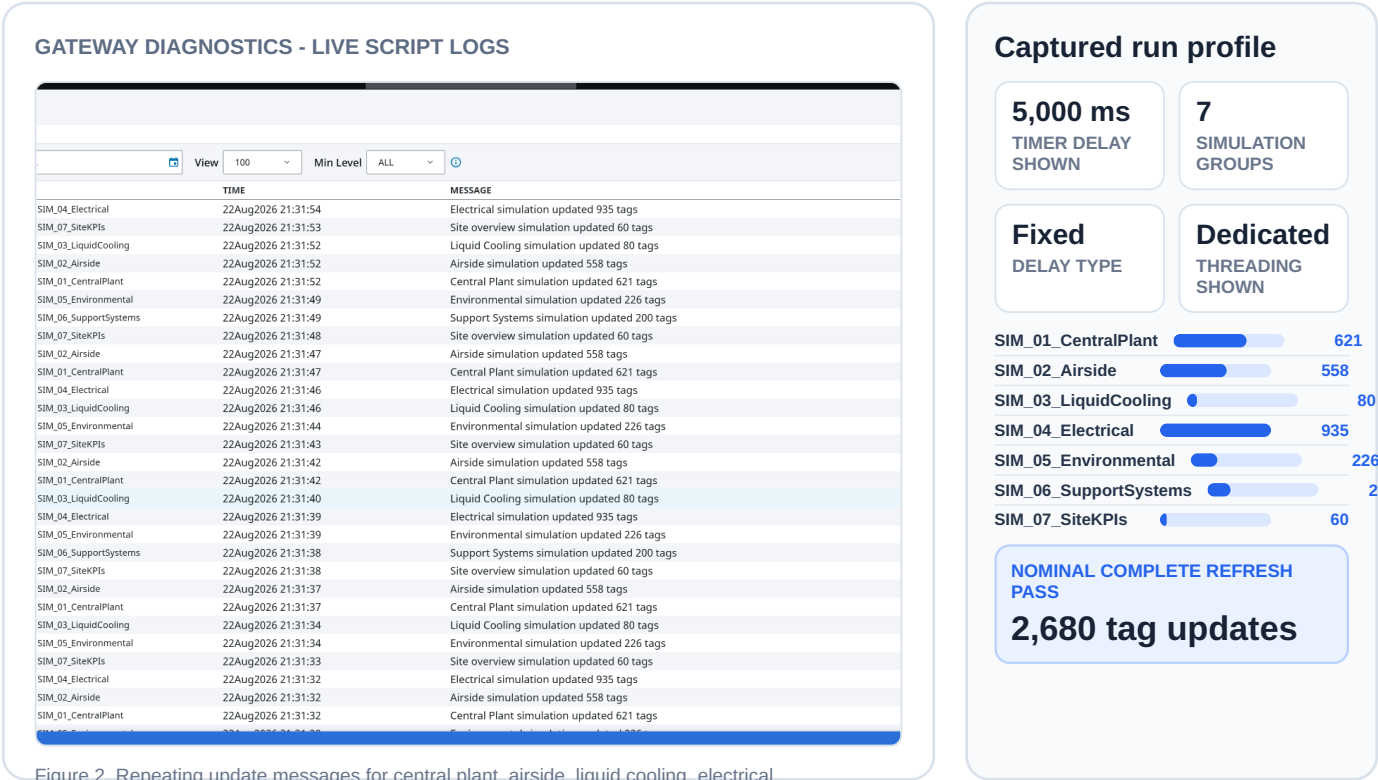
Figure 1. Operator-facing overview showing site KPIs, cooling load, active alarms, and subsystem status for central plant, airside, electrical, liquid cooling, environmental, and network systems.

- **Multi-site KPI hierarchy**
PUE, facility load, IT load, cooling load, and alarm counts are presented in a consistent, rapidly scannable format.
- **Subsystem health rollups**
Normal, communications, and alarm conditions are summarized by major mechanical, electrical, environmental, and network domains.
- **Reusable operator pattern**
Common card structure and navigation support expansion to additional sites, equipment views, trends, alarms, and reports.

GATEWAY EXECUTION

Modular Simulation with Logged, Repeatable Results

The prototype separates subsystem simulation into seven named Gateway Timer groups. Captured diagnostics show repeated information-level update messages across the full set of groups, with no visible error entries in the displayed log window.



Independent orchestration

Seven named timer groups make subsystem execution visible and individually diagnosable.

Reusable project library

Common helper functions centralize folder updates, heartbeat logic, clamping, site summaries, and tag counting.

Batched tag writes

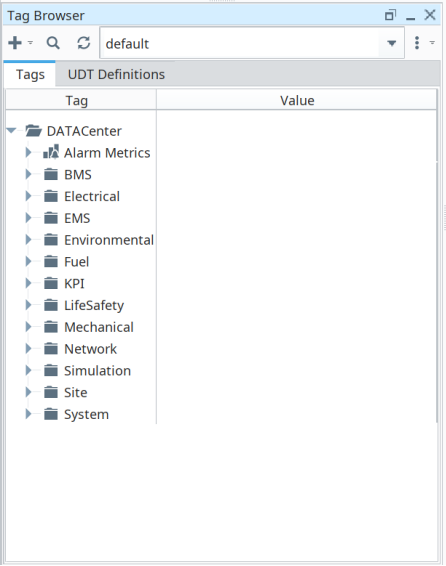
The shared library accumulates write paths and values before a blocking write, reducing repetitive write calls.

ENGINEERING ASSESSMENT

Scalable View Structure and a Clear Commissioning Path

The current build organizes the tag model, Perspective views, summary cards, and repeated equipment instances so the prototype can scale without rebuilding every display from the beginning.

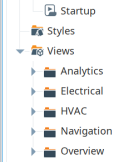
STRUCTURED DATA CENTER TAG HIERARCHY



Top-level domains include alarm metrics, BMS, EMS, electrical, environmental, fuel, KPI, life safety, mechanical, network, simulation, site, and system.

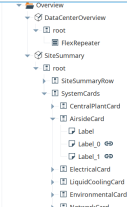
Organized Perspective views

Views are grouped by Analytics, Electrical, HVAC, Navigation, and Overview.



Reusable site summary cards

The SiteSummary view contains dedicated cards for each major subsystem.



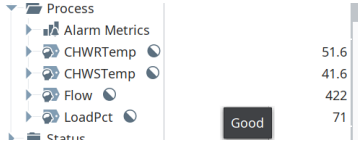
Repeated equipment instances

Chiller instances are organized under a common equipment folder for consistent point structure.



Example live process values

Captured simulated points are populated and display good quality.



CHWS 41.6 | CHWR 51.6 | Flow 422 | Load 71%

UI / OPERATIONS

ESTABLISHED

KPI hierarchy, subsystem health, navigation, and rapid status recognition.

SIMULATION

ESTABLISHED

Seven logged Gateway groups, structured tags, and populated Perspective values.

PRODUCTION I/O

NEXT PHASE

Connect approved BACnet/IP, OPC UA, PLC, meter, or sensor data sources as project requirements allow.

VERIFICATION IN CURRENT SNAPSHOT

Gateway scripts executing	PASS
Subsystem update groups logging	PASS
Perspective KPI values populated	PASS
Subsystem status indicators visible	PASS
Critical alarms shown	0 ACTIVE

RECOMMENDED PRODUCTIONIZATION SEQUENCE

- Finalize tag and UDT standards**
Naming, parameters, engineering units, quality, metadata, and reusable templates.
- Add the alarm lifecycle**
Priorities, deadbands, delays, shelving, acknowledgement, notification, and routing.
- Historize critical points**
PUE, loads, temperatures, flow, power, equipment states, and alarm events.
- Integrate approved field data**
Validate source quality, communications loss behavior, scaling, and failover.
- Harden the deployment**
Roles, permissions, backups, redundancy, audit logging, and controlled change management.

Production boundary: simulation logic should remain isolated from live control paths. Write-capable commands, alarm behavior, network interfaces, and fail-safe states must be validated against the approved sequence of operations and commissioning plan.

CURRENT RESULT

Demo-ready Ignition data-center supervisory prototype with verified live simulation, reusable views, and a defined path toward controlled field integration.

Generic prototype / simulated data - technical demonstration only

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