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CONNECTING
THE WORLD



USING NIAGARA TO ADVANCE YOUR BUILDING'S AI JOURNEY

NIAGARA FORUM
CONNECTING
THE WORLD



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Chief Technology Officer

TRIDIUM

NF
25



Using niagara for Your Buildings' AI Journey

AGENDA

01

AI BUZZ
VERSUS REALITY
FOR BUILDING
INDUSTRY

02

TODAY - NIAGARA
FEATURES FOR AI

03

FUTURE - AI ASSIST
FOR SI'S,
OPERATOR AND
DEVELOPERS

A REALITY CHECK ABOUT AI...

- AI Buzz is at a Frenzy
- Potential for AI-enabled solutions for the Built Environment is Real & Significant
- Large, global customer base helps to see through the Hype and focus efforts on what is **REAL**.

Top stories

 Fortune

Why did MIT find 95% of AI projects fail? Hint: it wasn't about the tech itself

1 day ago



 The Economic Times

\$30 billion down the drain? MIT says 95% of companies see no returns from...

1 day ago



 Forbes

[MIT Says 95% Of Enterprise AI Fails-Here's What The 5% Are Doing Right](#)

1 day ago



 Axios

95% of organizations got zero return on AI investment in MIT study

2 days ago



THE MANY HURDLES TO THE ADOPTION & SCALING OF BAS TECHNOLOGY

(...and success at BAS is prerequisite to leveraging AI)



Your Building Automation Platform is the Foundation to Your AI Strategy.

NIAGARA JOURNEY ...

niagara4
niagara
cloud SUITE

VENDOR
LOCK-IN

CYBER-
SECURITY

COST OF
REMOTE
ACCESS

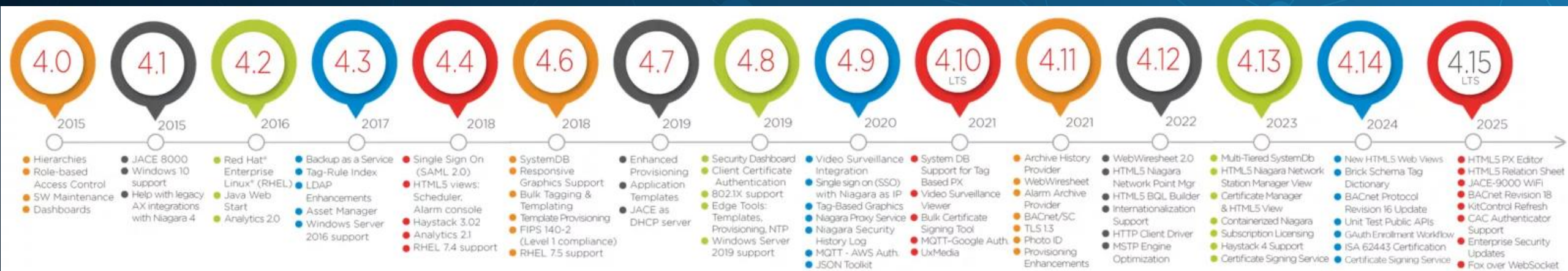
PROPRIETARY
TOOLS

KEEPING UP-
TO-DATE WITH
STANDARDS

<continue>

HIGH UPGRADE
COST

SKILLED LABOR
SHORTAGE



“Tridium Niagara’s Core Vision is to Overcome These Challenges”

WHAT IS AI?

Simulation of human intelligence process by computer systems. This includes learning, problem-solving, and decision making.

Machine Learning

A subset of AI that uses algorithms to learn from data and make predictions.

- Mainly used for Analytics
- Used for tasks like Predictive Analytics, Recommendation Systems & Diagnostic Tools

Generative AI (Gen AI)

Application of machine learning that uses machine learning techniques to create new content that mimic human creations.

- Content Creation & Interpretation
- Used for Creative Domains, Advanced Simulations, etc.

Agentic AI

AI Systems that can **autonomously** achieve pre-defined goals, going beyond simple rule-based automation & requiring less direct human oversight.

- Optimizing energy consumption
- Smart Security
- Resource optimization

AI technology continues to evolve and it's just a start !!!

AI BUZZ ➡ APPLICATIONS...

**OPERATIONAL
EFFICIENCY**

**SKILLED LABOR
SHORTAGE**

REPORTING

**CONTROL &
OPTIMIZATION**

ALARM FATIGUE

**PREDICTIVE
MAINTENANCE**

FAULT DETECTION

COMMISSIONING EFFORT

**ENERGY
MANAGEMENT**

“AI Buzz, Demystified : What they really mean for our industry”

AI – BUILDING MANAGEMENT SYSTEMS

HAVE YOU FIGURED OUT HOW
TO RUN OUR BUILDINGS ON AI?



WORKING
ON IT.

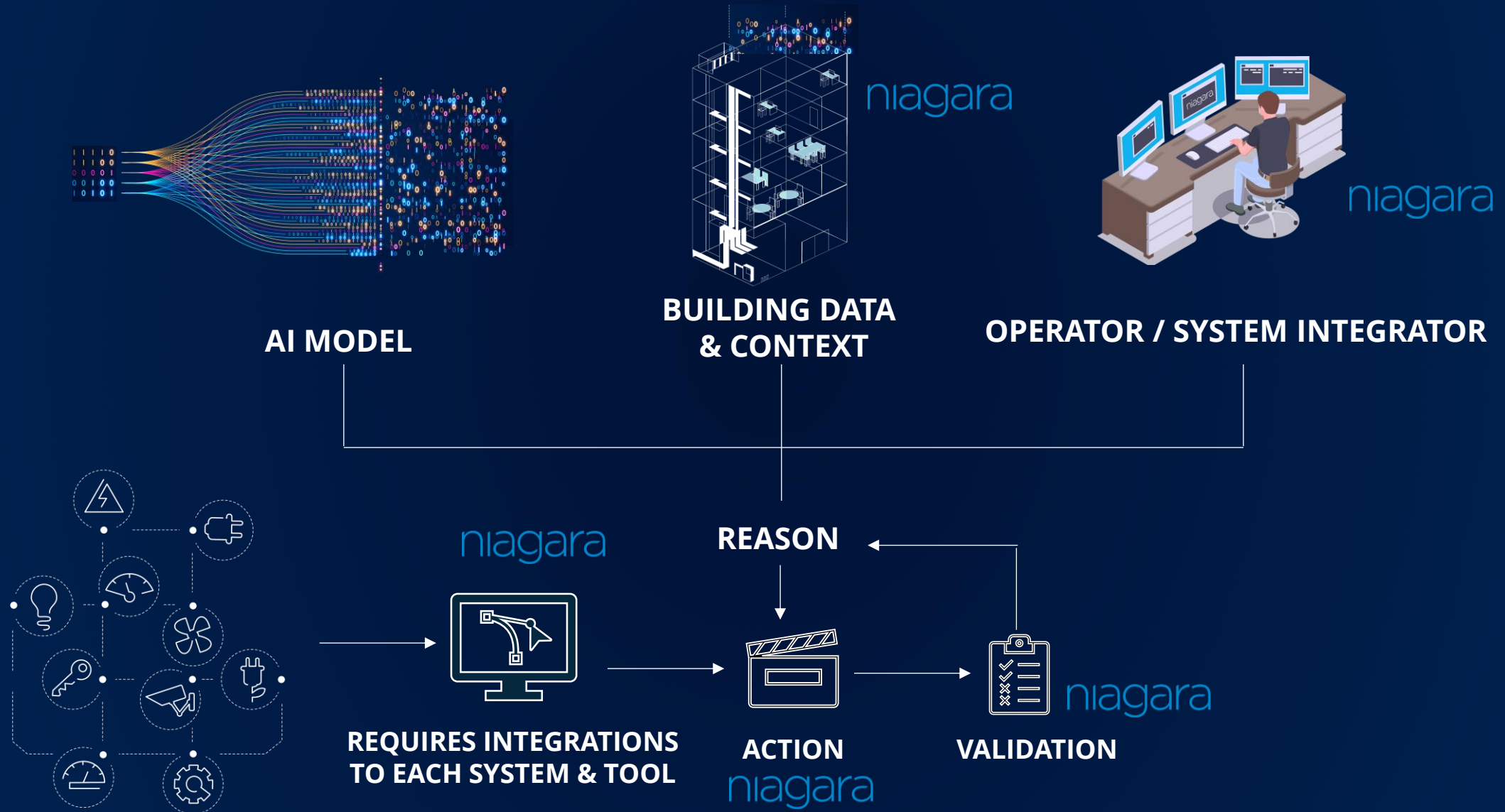


Make my building autonomously minimize energy consumption, comfortable for occupants, healthy to be in, and easy to use.



I'm sorry, but as an AI language model, I'm not able to make up for decades of neglecting your device, network, and data layers.

AGENTIC AI FOR BUILDINGS



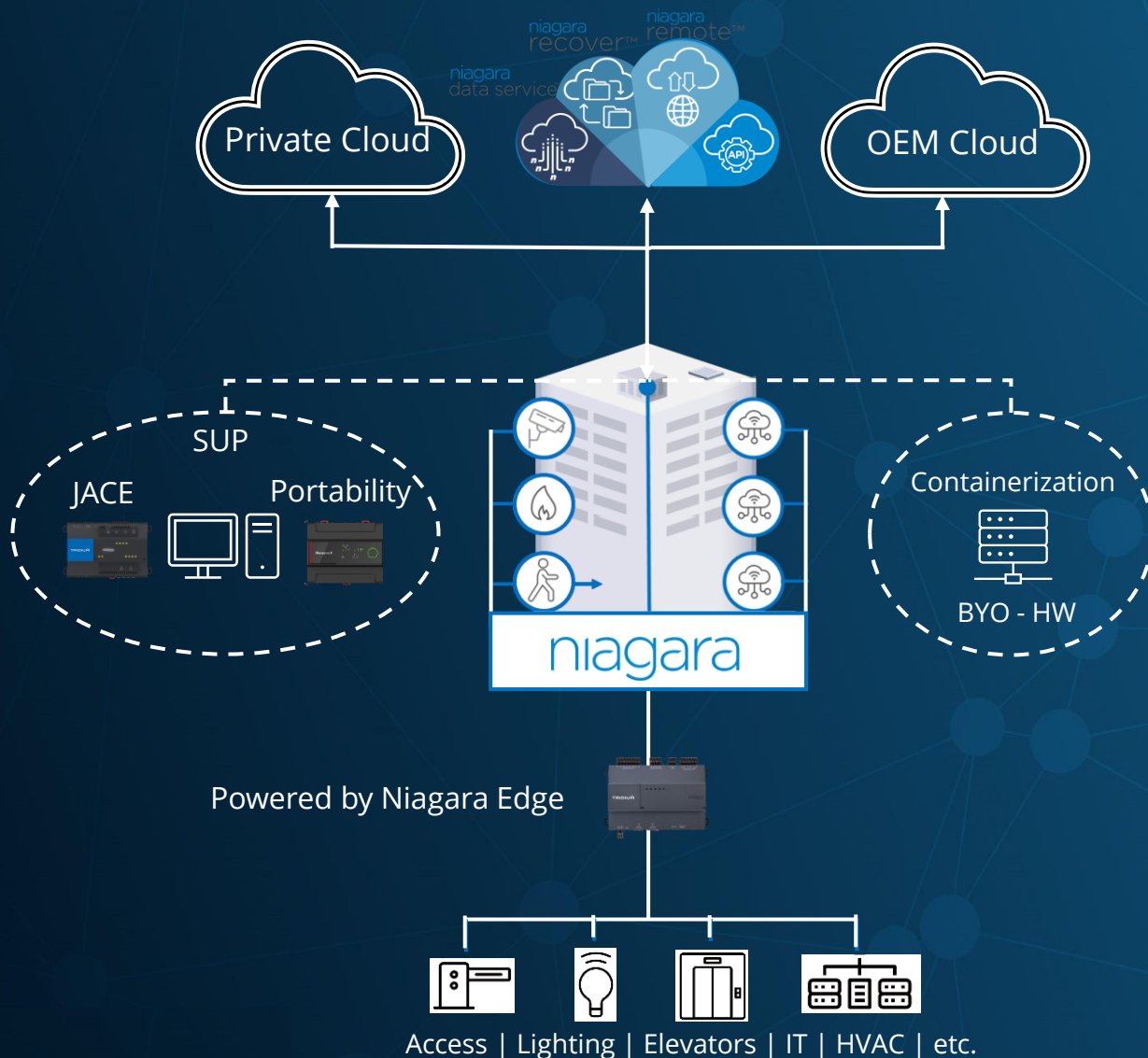
AI MODEL – KEY PLAYERS

- **Microsoft : Phi – 2**
- **OpenAI : GPT-4, GPT-5**
- **Anthropic : Claude 3.5**
- **Google : Gemini**
- **Meta : LLaMA**
- **Mistral AI : Mistral**
- **xAI: Grok**

* Tridium team does not recommend any specific model.
Choice is up to the customer.



BUILDING DATA & CONTEXT – NIAGARA FEATURES



Connectivity (Edge to Cloud)

- **Connectivity with field devices, cloud & enterprise apps** – 40+ from Tridium & 100+ drivers from community (MQTT, AMQP, JSON Toolkit, HTTP Client Driver, along with DIY)



Data Context & Storage

- Niagara 4 Tag Dictionary & Tag Rules
- Archive History & Alarm Provider
- Support for Industry Standard Tag Libraries



Deployment

- NCS Cloud-to-Clouds for Cloud-to-Cloud Data access
- Niagara Containers
- Supervisors

BUILDING DATA & CONTEXT – NIAGARA FOR DATA ANALYSIS



Niagara Analytics

- Algorithm library, Energy Charts & Reports, Alerts,
- Missing data strategy, Dashboard widgets, Public API's



niagara
data service™



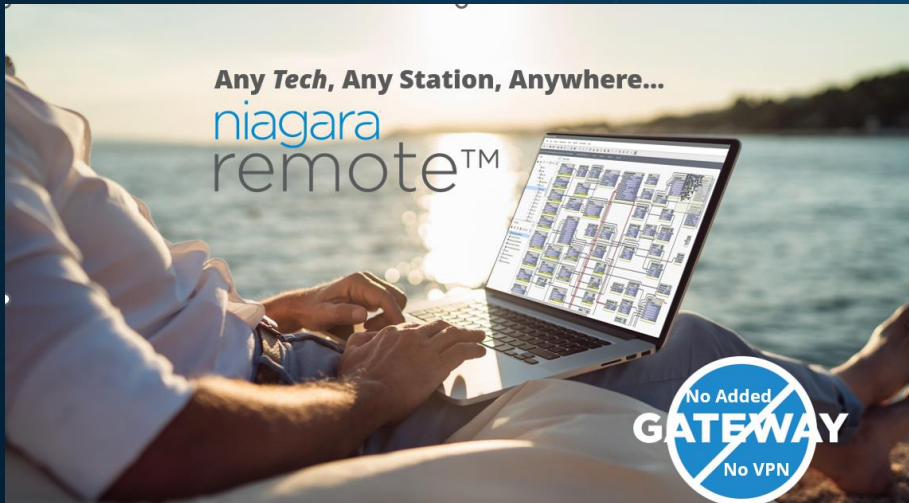
API Architecture: Enables easy connection to 3rd-party applications



Contextualized Data for Trend Analysis — Supports Data Interoperability

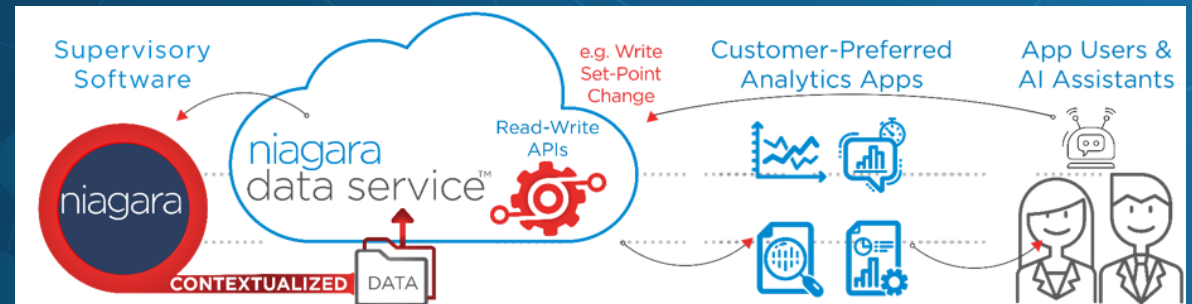
ACTION & VALIDATION – NIAGARA FEATURES

For Manual Actions



niagara
data service™

Live Read & Write of Data via API



Connectivity

- Connectivity with field devices, cloud & enterprise apps for live read and writes on-prem

Instant Data Access via Read-Write API:

- Retrieve live data on-demand

Dynamic updates:

- Push changes directly to your Niagara system, eliminating delays and manual updates.

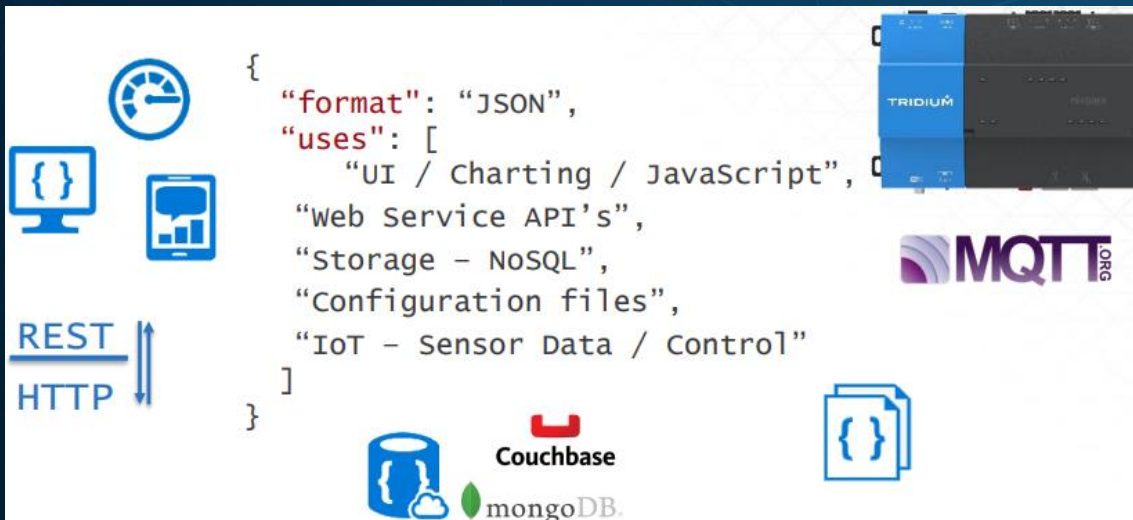
INTEGRATION TO EACH SYSTEM & DIVERSE TOOLS

JSON Toolkit

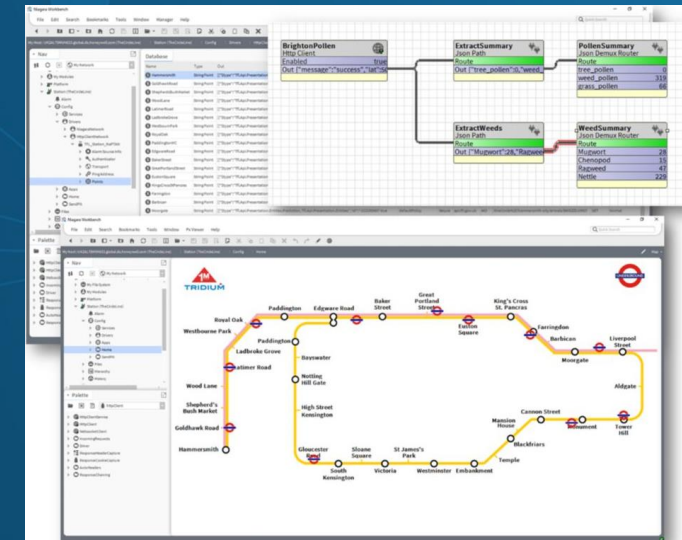
- **“JSON is the de-facto data encoding standard for the IOT”** – A JSON schema is a component within the JSON toolkit which allows you to build bespoke JSON strings.

HTTP Client Driver

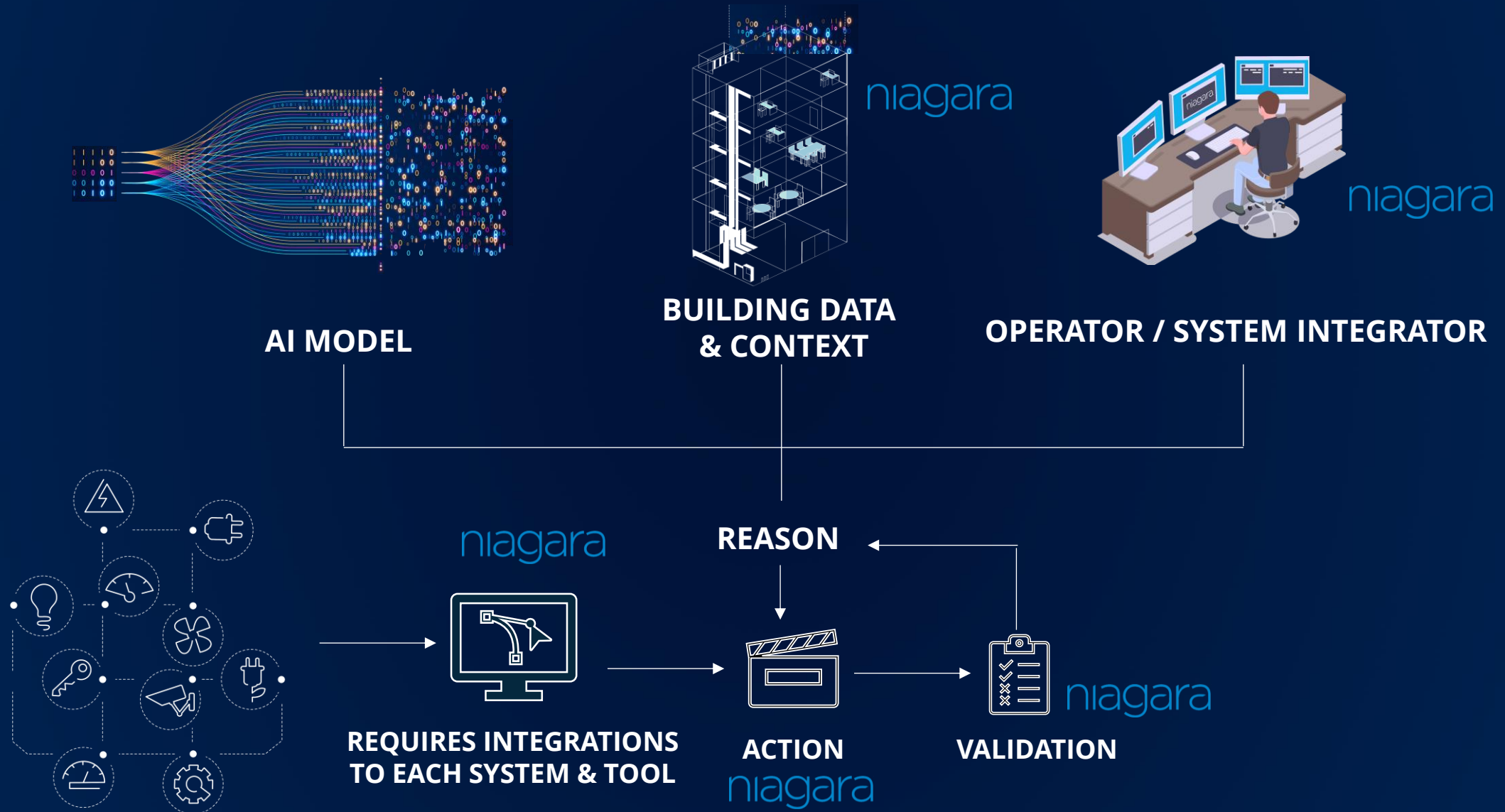
- Easily interact with HTTP web services & APIs to that data can be exchanged both in & out of the Niagara Framework.



```
{  
  "format": "JSON",  
  "uses": [  
    "UI / Charting / JavaScript",  
    "Web Service API's",  
    "Storage - NoSQL",  
    "Configuration files",  
    "IoT - Sensor Data / Control"  
  ]  
}
```



AGENTIC AI FOR BUILDINGS



niagara5

SEAMLESS CONNECTIVITY.

POWERFUL INTELLIGENCE.

niagara⁵

TRIDIUM
niagara

**STAYING UP-TO-DATE
WITH STANDARDS**

UPGRADE COST

SKILLS SHORTAGE

**COMMISSIONING
ALARM FATIGUE**

Tridium is working now to address the next set of hurdles

CODE CREATOR

AI-Assistant to support Program object / Wire sheet development

▼ Fan Coil Unit - Basic Cooling Control

System Description

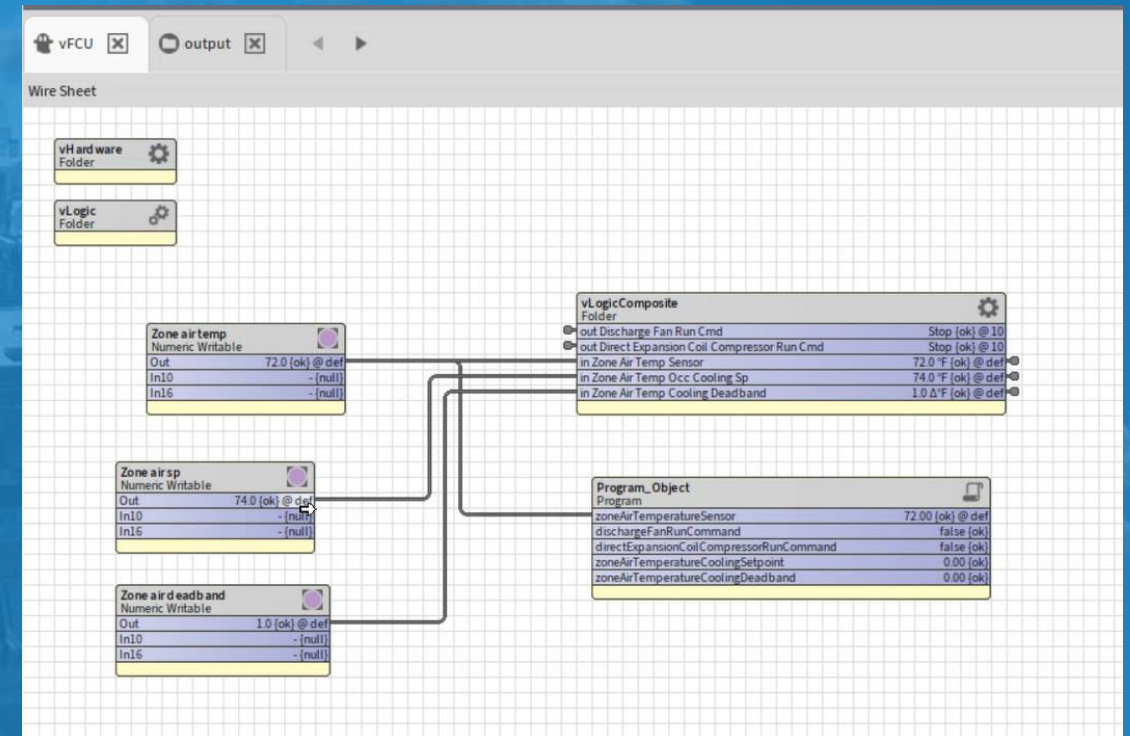
The fan coil unit shall have the following hardware inputs: • Zone Air Temperature Sensor

The fan coil unit shall have the following hardware outputs: • Discharge Fan Run Command (binary) • Direct Expansion Coil Compressor Run Command (binary)

The fan coil unit shall have the following software points: • Zone Air Temperature Cooling Setpoint (74° Fahrenheit initially, adjustable) • Zone Air Temperature Cooling Deadband (1 Δ° Fahrenheit initially, adjustable)

Sequence:

- Upon the Zone Air Temperature becoming greater than or equal to the Zone Air Temperature Cooling Setpoint the Discharge Fan shall be commanded to run.
- Upon the Discharge Fan having been commanded to run the Direct Expansion Coil Compressor shall be commanded to run.
- Upon the Zone Air Temperature becoming less than or equal to the Zone Air Temperature Cooling Setpoint minus the Zone Air Temperature Cooling Deadband the Direct Expansion Coil Compressor shall be commanded to stop.
- Upon the Direct Expansion Coil Compressor having been commanded to stop the Discharge Fan shall be commanded to stop.



ALARM SERVICE PROOF OF CONCEPT

AI-Driven Alarm Diagnostics in Action.

Alarm Analysis



Root Cause

The ZoneAirTempSensor is reporting values consistently above the high limit due to ineffective cooling.

Detailed Explanation

The ZoneAirTempSensor has been reporting values above the high limit of 76.0°F, with a present value of 76.6°F. Telemetry data shows a consistent upward trend in temperature, peaking at 82.834°F before starting to decrease. The cooling setpoints (ZoneAirTempOccCoolingSp and ZoneAirTempEffectiveCoolingSp) are fixed at 74.0°F, indicating that the cooling system is not effectively reducing the zone temperature to the desired levels. The compressor run command is active, suggesting the cooling system is operational but not achieving the required cooling effect. This could be due to issues such as insufficient refrigerant, blocked airflow, or a malfunctioning compressor.

Early Indicators

The temperature trend showed a consistent increase over time, peaking significantly above the setpoint.

Recommended Action

Inspect the cooling system for potential issues such as refrigerant levels, airflow obstructions, or compressor functionality.

Confidence

High

OK

THANK YOU

