RFCODE

Telemetry Performance Specification

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Scope:

1. Environmental Sensor Telemetry
2. Rack Power Distribution Unit (rPDU) Telemetry
3. Fluid Detection Telemetry

Defines the minimum requirements for data center telemetry data collection from In-Rack and Aisle Environmental Sensors, Rack Power Distribution Units (PDUs), and Fluid Detection systems within the data center white space.

For Information Only

This template is provided by RF Code as a tool to help data center operators define and formalize telemetry performance standards. An editable version is coming soon.

Contact us if you need expert advice or telemetry for your data center.

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1. Environmental Sensor Telemetry

This section defines the requirements for thermal and humidity monitoring to maintain or exceed compliance with industry guidelines and ensure equipment longevity.

Requirement Area	**Metric / Requirement**	**Specification**
Data Points	Air Temperature	Measured at: [Choose Resolution Specification] High Resolution: In-Rack Front Top, Middle; Bottom, Rear: One Sensor; Every Rack Medium Resolution: In-Rack Front: One Sensor; Rear: One Sensor; Every Rack Low Resolution: In-Rack Front: One Sensor; Rear: One Sensor; Every Third Rack Cold Aisle (Inlet), Hot Aisle (Outlet)

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Requirement Area	Metric / Requirement	Specification
	Relative Humidity (RH)	Measured at: [Choose Resolution Specification] High Resolution: In-Rack Front Top, Middle; Bottom, Rear: One Sensor; Every Rack Medium Resolution: In-Rack Front: One Sensor; Rear: One Sensor; Every Rack Low Resolution: In-Rack Front: One Sensor; Rear: One Sensor; Every Third Rack Cold Aisle (Inlet)
	Dew Point Temperature	Calculated from RH and Temperature.
Accuracy	Temperature	Measurement accuracy must be ±[value]°F / ±[value]°C or better.
	Relative Humidity	Measurement accuracy must be ±[value]% RH or better.

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Requirement Area	Metric / Requirement	Specification
Sampling Rate	Temperature/RH	Must be collected and reported at a minimum rate of [value] seconds.
End-to-End Latency	Alerting	Less than [value] seconds from measurement to DCIM platform availability.
Alarms	Warning Alarm (Cold Aisle)	Temperature exceeds [value]°F / [value]°C.
	Critical Alarm (Cold Aisle)	Temperature exceeds [value]°F / [value]°C.
	Humidity Out of Range	RH falls outside the [value]% to [value]% target range.
Deployment Efficiency	Time To Install Sensor	Less than [value] minutes per sensor and must be deployable without requiring lead time for wiring or trades people.
	Infrastructure Requirements	Sensors must be deployable without requiring dedicated electrical or network cabling at each sensor point.

Requirement Area	Metric / Requirement	Specification
	Tool-Less Mounting	Mounting methods must allow for rapid placement/relocation by data center technicians without specialized trade tools.

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2. Rack Power Distribution Unit (rPDU) Telemetry

This section ensures continuous monitoring of power usage, capacity, and quality at the cabinet and outlet level.

Requirement Area	**Metric / Requirement**	**Specification**
Data Points	Active Power (kW)	Per PDU inlet and Per Phase.
	Apparent Power (kVA)	Per PDU inlet.
	Current (Amps)	Per PDU inlet, Per Phase, and Per Outlet (for switched/metered units).
	Voltage (V)	Per PDU inlet and Per Phase.
	Power Factor (PF)	Per PDU inlet.
	Energy Consumption (kWh)	Total accumulator, resettable.
Accuracy	Power/Current	Measurement accuracy must be ±[value]% of the reading, minimum.

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Requirement Area	Metric / Requirement	Specification
Sampling Rate	Power/Current/Voltage	Must be collected and time-stamped locally at a minimum rate of [value] second.
End-to-End Latency	Alarm Delivery	Less than [value] seconds from threshold breach to notification system.
Alarms	Critical Alarm	Load exceeds [value]% of PDU rated capacity (Per Inlet).
	Warning Alarm	Load exceeds [value]% of PDU rated capacity (Per Inlet).
	Outlet Overload	Immediate alert on current exceeding [value]% of outlet rating.
Security	Air Gapped System	Telemetry is performed without connecting rPDU to the network.

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Requirement Area	Metric / Requirement	Specification
Deployment Efficiency	Time To Install Sensor	Less than [value] minutes per sensor and must be deployable without requiring lead time for wiring or trades people.
	Infrastructure Requirements	Sensors must be deployable without requiring dedicated electrical or network cabling at each sensor point.
	Tool-Less Mounting	Mounting methods must allow for rapid placement/relocation by data center technicians without specialized trade tools.

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3. Fluid Detection Telemetry

This section covers the immediate, high-priority detection and reporting of any conductive or non-conductive liquid leaks.

Requirement Area	**Metric / Requirement**	**Specification**
Data Points	Leak Detected	Boolean State (True/False).
	Leak Location	Distance from sensor panel (for sensing cable systems).
	Cable Continuity	Sensor line integrity status (fault detection).
Response Time	Detection Speed	Detection and alarm initiation within [value] second of fluid contact.
Accuracy	Location Pinpointing	Leak location for cable systems must be accurate to ±[value] meter.
End-to-End Latency	Alarm Delivery	Immediate, critical alert via SNMP/API/Email within [value] seconds of detection.
Alarms	Fluid Detection (Critical)	Any confirmed liquid contact with the sensing element.
	Cable Fault/Break	Any discontinuity in the sensing cable loop (indicating potential blind spots).

Requirement Area	Metric / Requirement	Specification
Deployment Efficiency	Time To Install Sensor	Less than [value] minutes per sensor and must be deployable without requiring lead time for wiring or trades people.
	Infrastructure Requirements	Sensors must be deployable without requiring dedicated electrical or network cabling at each sensor point.
	Tool-Less Mounting	Mounting methods must allow for rapid placement/relocation by data center technicians without specialized trade tools.