Vertiv™ Environet™ Alert
GUIDE SPECIFICATIONS
Data Center and Facilities Infrastructure Monitoring System
1.0   GENERAL

1.1   Summary

This document contains the specifications for a data center monitoring software solution. The software shall provide real-time (gather data within seconds) monitoring for critical infrastructure at the data center rack, row and room levels – including, but not limited to, rack power distribution units (rPDU), uninterruptible power supplies (UPS), environmental monitoring and other critical equipment capable of communicating as specified.

1.2   System Requirements

- All material and equipment used shall be standard components, regularly manufactured and available and shall not be custom-designed especially for this project. All systems and components, except site-specific software, shall have been thoroughly tested and proven in actual use prior to installation of this project.

- The manufacturer will furnish or supply a site-specific software solution system based on customer requirements.

- The system architecture shall be fully modular, permitting expansion of application software, peripherals and field hardware.

- The solution shall have the option to implement a failover server solution so that functionality is not fully dependent on a single server.

- The solution shall be based on open protocols and integrate with Vertiv software suites.

- Open protocols supported direct to the server (without protocol conversion) shall include, but not be limited to, SNMP v1, 2, 3 and Modbus TCP

- An employee of the manufacturer shall initialize, commission and warrant the solution.

- The solution shall have the capability of being remotely monitored and managed 24 hours a day, 7 days a week.

- The solution shall have the ability to be deployed with support for monitoring multiple locations via a single server.

- The solution shall operate as a true Web-based system; the Web interface shall support browsers listed in Section 1.4.1, Step 4 and shall support HTML5.

- The solution shall operate on a server provided by the customer, matching the system requirements from the manufacturer; the solution shall support virtual server environments by default.

1.3   Approved Products

The monitoring system shall be Vertiv™ Environet™ Alert as manufactured and commissioned by Vertiv. No substitutions shall be accepted.

1.4   Scope Of Work

1.4.1   Owner-Supplied Items

The owner shall furnish the following system components:

1. Network (LAN) hardware and software required to provide an Ethernet backbone to be used for transport of IP data packets from critical infrastructure equipment. These components may include hubs, routers, cabling, network operating systems, firewalls, IP addresses, Virtual Private Networks (VPN) and other components as required. The owner will supply network drops for the server and gateway hardware (if applicable).

2. Dedicated server (virtual or stand-alone) meeting the following requirements:

Requirement	Minimum	Recommended
Operating System	• Windows 10 (64bit) • Windows Server 2016 • Windows Server 2019	Windows Server 2019
CPU	(Intel or AMD) 2 CPU, 2.0 GHz or Higher	(Intel or AMD) ≥4 CPU, ≥2.2 GHz or Higher
RAM	8 GB	≥16 GB
Disk Space	100 GB	≥300 GB
Disk I/O	15 MBps Read/Write Speed	≥200 MBps Read/Write Speed
Network	10/100 MBps	≥1 GBps

3. Server may be virtual-environment compatible.

4. Client access PCs meeting the following minimum requirements:

One or more of the following Web browsers:

• Microsoft Edge

• Mozilla Firefox

• Google Chrome

5. The owner shall supply the following information to facilitate system implementation:

- The customer is responsible for physical installation of all equipment and cabling. The customer is responsible for providing suitable power supplies where required. The customer is responsible for installation of suitable protective earth connection to any item as required by local, state or federal laws.

- Ensure that the server and all other IP devices are in the same network subnet. If they are not in the same network subnet, ensure that requests can be routed between the server and networked devices.

- Provide remote access for programming and administrative rights to install the software.

- Drawings and schematics, as needed, to create graphic pages and configuration.

- Provide a person as the nominated system owner for administrator purposes.

- Assistance in defining point descriptions, alarm messages and content for customized graphic pages and configuration.

1.4.2 Vendor Responsibilities

In the overall scope of the project, the manufacturer shall provide one or more of the following components:

1. Software

- Server software and license

- Graphic and software configuration

2. Provide hardware and software as listed

- Create site-specific software configuration and graphic screens based on information provided by the owner or customer.

- Provide system startup, commissioning and operator orientation by a factory-employed system specialist.

- Provide 8x5 system application and service support through a toll-free number.

- Provide warranty (parts and labor) per the manufacturer's warranty statement.

- The vendor shall be ISO 9001 listed for design and manufacture of environmental control systems for Critical Monitoring and Control applications.

1.5 Submittals, Documentation and Acceptance

1.5.1 Submittals

Equipment List: Shall be submitted prior to purchase order and shall consist of a complete list of equipment to be monitored, including manufacturer, model and any technical literature needed for device communication.

1.5.2 Owner's Instructions

The vendor shall provide full instructions to designated personnel in the operation, maintenance and programming of the system. The training shall be specifically oriented to the system and interfacing equipment installed.

1.6   General Conditions

1.6.1 Warranty

Vertiv shall warrant that all systems, subsystems, component parts and software are fully free from defective design, materials and workmanship for a period of one (1) year from the date of commissioning.

2.0   EQUIPMENT

2.1   System Overview

The vendor shall provide system software based on Web-based architecture, designed around the open standards of Web technology. The server shall be accessed using a Web browser over the owner's intranet.

At a minimum the software solution shall provide:

- Unlimited simultaneous users

- Historical database

- Built-in alarming, trending and analytics/reporting capabilities

- Support for third-party device integration

- Open Restful and OBIX API

2.2   Web Architecture

The intent of the Web architecture is to provide the operator(s) complete access to the system via a Web browser. The graphical user interface (GUI) shall support Microsoft Edge, Google Chrome and Mozilla Firefox.

2.3   Operating System Support

The server software must support Microsoft Windows operating environment.

2.4   Graphical User Interface and Functionality

1. The client Web browser GUI shall provide a comprehensive user interface. It shall be constructed to function as an application and provide a complete and intuitive mouse- or menu-driven interface. It shall be possible to navigate through the system using a Web browser. The Web browser GUI shall (as a minimum) provide a navigation menu for navigation, and a pane for display of graphics, alarms/events, active graphic setpoint controls, configuration menus for operator access, analytics and reporting actions for events. All system graphics are to be HTML 5 compatible.

2. Supported Browsers: The GUI shall support the following browsers:

   - Microsoft Edge

   - Google Chrome

   - Mozilla Firefox

3. Color Graphics: The Web browser GUI shall make extensive use of color in the user interface to communicate status information about the equipment being monitored. Both light and dark user interfaces will be supported and able to be toggled within seconds.

4. Display Size: The GUI workstation software shall graphically display in 1920 x 1080 pixels and 32-bit true color.

5. General Graphics: General area maps shall show the locations of controlled buildings in relation to local landmarks, if desired.

6. Integrated Devices: system graphics shall show the system components via a graphical representation (points, status color(s), labels, and trends). Points being controlled or monitored for each piece of equipment shall be displayed with the appropriate engineering units. SNMP and Modbus TCP devices can be integrated via the Web UI by the end user.

- The equipment view shall show the status of equipment such as rack rPDU, UPS and so on.

- The view must allow users to drill down into equipment pages to view alarms and equipment information in full detail, including individual status of all associated device points.

7. Minimum System Color Graphics: Color graphics (32 bit) shall be selected and displayed via a Web browser.

8. Intuitive Interface: Visualizations of boards/sites are to be customized by the user. The main view will comprise the side navigation menu, including boards, analytics, equipment and system admin. The main view can be used for navigation and to drill down into all boards, sites, devices and other features within the system.

9. System Navigation

- At a minimum, the user must be able to navigate the system through a side navigation menu.

- The system must provide the capability of using links to navigate through the user interface.

- Floorplan views must provide geographical navigation and are flexible to show global, regional, local and data center specific views of site/location hierarchy. Components of the floorplan view must include:

- Ability to import image to match level of hierarchy being viewed (map, data center, etc.)

- Add groups, devices, racks, points, labels, or IP cameras to the floorplan view

- Ability to add a heatmap view, capable of showing hot spots and cold spots for environmental or power data

- Visualization of alarms

- When racks are added, a dropdown view selector will allow for: alarm status, free front/rear rack U space, max contiguous front/rear rack U space, max rack temp, max rack kW load percent, total rack kW, heatmap view

- The user must be able to create, edit and add boards, dashboards and floorplan views

10. Graphics shall show each piece of equipment monitored or controlled for:

- Each building

- Each floor

- Each room

- Each rack

- Each device

11. Events and Alarms: Events and alarms associated with a specific system, area or equipment shall be displayed on the main site view and/or within an embedded alarm console. The solution must have native capability to alarm on all connected devices. The alarm system shall have multiple alarm types depending on the severity level. Users must be able to drill down through views to locate alarm sources. The alarm should be accessible from the device level. Events, alarms and reporting actions shall have the following capabilities:

- Alarm Console: Capable of displaying the following information for each alarm that has occurred in the system: Alarm State (with associated status color), Site, Device, Circuit, Tenant, Point, Point Type, Point Unit, Source, Last Alarm, Acknowledge Requested, Acknowledge State, Last Acknowledgment, Last Acknowledged By, Last Return to Normal, Last Update, Alarm Class, Warning Class, Message and Notes. The Alarm Console must also provide a link to the Site, Device and Point.

- User Definitions: Users must be able to choose the thresholds (high and low) for when an alarm and/or warning will activate, along with the points for the severity level. Users must be able to acknowledge and filter alarms. Alarms should have a way to prioritize more important alarms. The solution shall include an alarm history page where all system alarms are stored. Users should be able to search for previous alarms by site, device, or point.

- Nuisance Alarms: Alarm settings should also contain time delay and deadband settings to help reduce the number of nuisance alarms that occur within the data center.

12. Alarm / Event Notification: The solution must be able to notify different users based on the type of alarm. Users should be able to acknowledge alarms remotely. The alarm system should be able to notify users until a person acknowledges the alarm via escalating alarm levels. The alarm system should be able to alert users via email. The solution must allow users to customize alarm messages by escalation level. Unique alarm instructions must be available within the system. Users must be able to edit messaging for alarms and return-to-normal status. The user shall be able to:

- View events throughout the system.

- Dependent on access level, manage the event through acknowledgements, deletions, sorting rules and viewing alarm notes.

- Configure Alarm / Event notifications:

  - Alarm console and alarm pop up window

  - E-mail

13. Configuration of operators

- User names and passwords:

  Permissions: The Permissions field allows administrators to set access level for different users. Permissions include the following options:

  a. Read/Write: Full read access and full write access to the entire system.

  b. Read Only: Full read access but no writes or changes may be done.

  c. Read/Acknowledge: Full read but no write or changes may be done, except to alarm database for acknowledging alarms. System owner shall have the ability to assign combinations of roles and privileges to users that define access levels.

14. Audit History: A log shall record operator activities and some system activities, such as opening and closing the database or automatic deletions.

15. Histories/Trending: Histories shall be user-configurable and displayed via the GUI. Trends shall comprise native points, along with calculated points (collections of point data). A trend log's properties shall be editable within the GUI.

- Viewing Trends: The operator shall have the ability to view trends with a time series line chart by using the history database or by selecting a specific point within the GUI. The line chart must be exportable within the pop-up window to Microsoft Excel and able to be saved as a visualization to be used within the Analytics tool.

- Historical Data Records: Trend data shall be collected locally and retained within the local hard drive.

- History Intervals: Historical records shall be saved to match the user-defined polling interval. Each trended point shall have the ability to be trended at a unique interval as specified by the user.

- Tolerance: The user shall be able to enter a value for tolerance (change of value) – if point data changes by the specified amount in between historical reading, a separate record will be created.

- Numeric Value Display: It shall be possible to mouse over any value on a history chart and have the numerical value and time of data capture displayed.

- Systemwide Trends: Any trend point in the system can be evaluated alongside any other trend point in the system. Unit or location shall not define trends.

- Graph Appearance: Trend values can be presented in line chart graphical format.

16. Global Parameter Change: The system shall have the ability to execute a global parameter change (for example, bulk config of all points or a filtered subset of points for historical trending and/or alarm setpoints).

17. Analytics and Reports: The software solution shall allow users to view previously created reports as well as to create new, user-defined reports using drag-and-drop functionality.

- Reports shall contain visualizations utilizing the following graphic types:

  - Bar Chart

  - Gauge

  - Pie Chart

  - Scatter Plot

  - Simple Value

  - Table

  - Time Series

  - User Image

  - User Text

- User-defined reports shall include but not be limited to:

  - Alarms

  - Historical device data

  - Trend data based on user-defined timeframe

- Each report can be run *ad-hoc* within the Analytics feature.

- Each report shall have the ability to be saved electronically. Standard and user-defined reports can be saved in the following file formats:

  - XLS

  - PDF

- Each report shall have the ability to be delivered via email or saved to a specified file path, using a daily/weekly/monthly schedule.

18. IT Racks: The solution provides IT rack management tools and contain the following capabilities:

    - IT rack view where the user can search IT racks by name, make, model, serial number, asset tag and so on.

    - The user should be able to associate power and environmental data to each rack.

    - Other important rack information such as rack location, RU used and RU free (front and rear), contact details, etcetera – along with the ability to select/deselect columns from the view.

    - The user must also be able to create custom columns for inputting custom data.

    - Allow users to add new racks to the system and export/import rack data using spreadsheet format, to include install IT assets within the rack.

    - The user must be able to link to the individual rack view from the main rack database.

19. IT Assets: The solution includes an asset database. IT Assets are representations of a physical rack assets that will be associated to IT Racks within the software. These assets are created within a dedicated assets feature. The assets feature contains a detailed list view of assets. The asset feature shall provide the following capabilities:

20. Asset database which is sortable, filterable and searchable by key asset data

21. Add assets – manually or via CSV import

22. Edit assets individually or by group

23. Support of assets within assets (blade server enclosures, as an example)

24. Export of existing asset database

25. Ability to assign IT assets to IT racks

26. Asset tab within the Rack View to visually display IT assets within each IT rack

27. Control Groups: The solution shall provide the ability to control points, along with providing the ability for the user to create control groups. Control groups will consist of identical points across equipment (single or multiple) that can be sent a control command for the entire group.

28. Maintenance: The solution must provide users with a feature to manage device maintenance events. The maintenance feature will silence all alarms and trending on specific equipment or multiple pieces of equipment for the duration of the maintenance event.

    - Users must be able to place a device into maintenance mode instantly or schedule maintenance within the interface, for single or multiple grouped devices at a time.

    - Users have the option to receive email notification for the start and end of maintenance events.

    - Maintenance events must include start and end dates, devices and task descriptions.

- Users must be able to view maintenance history.

- The solution shall allow users to add, edit and delete maintenance tasks. Events that have completed cannot be deleted.

2.5   Software Integration

The software solution shall support software integration via its open API.

2.6   Security

The software solution shall also be subject to owner's policies for security without effect on the Server or Client operation.

- The system shall not deploy protocols inherently susceptible to intrusion.

- The system shall strip all unnecessary files and services from the Web service to protect the owner from intrusions.

- Must support the ability to add security certificates via the user interface.

2.7   Database Support

The software solution shall support the following databases as a minimum:

- Niagara

- MySQL

2.8   Software Components

All components of the software solution shall be installed and completed in accordance with the specification. Components shall include:

- Server software, database and Web browser Graphical User Interface

- System configuration utilities for future modifications to the system

3.0 EXECUTION

3.1 General

The vendor, unless specified in other sections of the specifications, shall install all equipment and devices furnished under this section of these specifications. The vendor shall install all other equipment, appurtenances, devices and auxiliaries thereto that are required to make the system complete and operative.

Terminate hardware module wiring required to complete the installation.