SOLUTION DESCRIPTION

Document Information	
Description	SCOM Solution description for multiple use cases and operational challenges across multiple domains

Contact Information

Alok Sharma
CEO
Mobile: +91 99 5820 7966
e-mail: Alok.Sharma@nebularc.com

Prakash Paunikar
Technology Head
Mobile: +91 98 4546 6500
e-mail: Prakash.paunikar@nebularc.com

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About NebulARC

NebulARC is founded by Tech veterans, alumni of IIT Bombay, Stanford GSB and BITS Pilani with a combined experience of 60+ yrs., the team has proven business management and technology prowess with expertise across Supply Chain domain.
NebulARC is continuously demonstrating innovative solution for the shipping and port logistics using cutting edge technology like AI, IoT and cloud computing. Our vision is to enable our partners and customers achieve operational excellence in the shipping port and logistics domain.
Thus enabled to overcome the challenges of scaling up into a successful Tech startup in Supply Chain industry.

Executive Summary

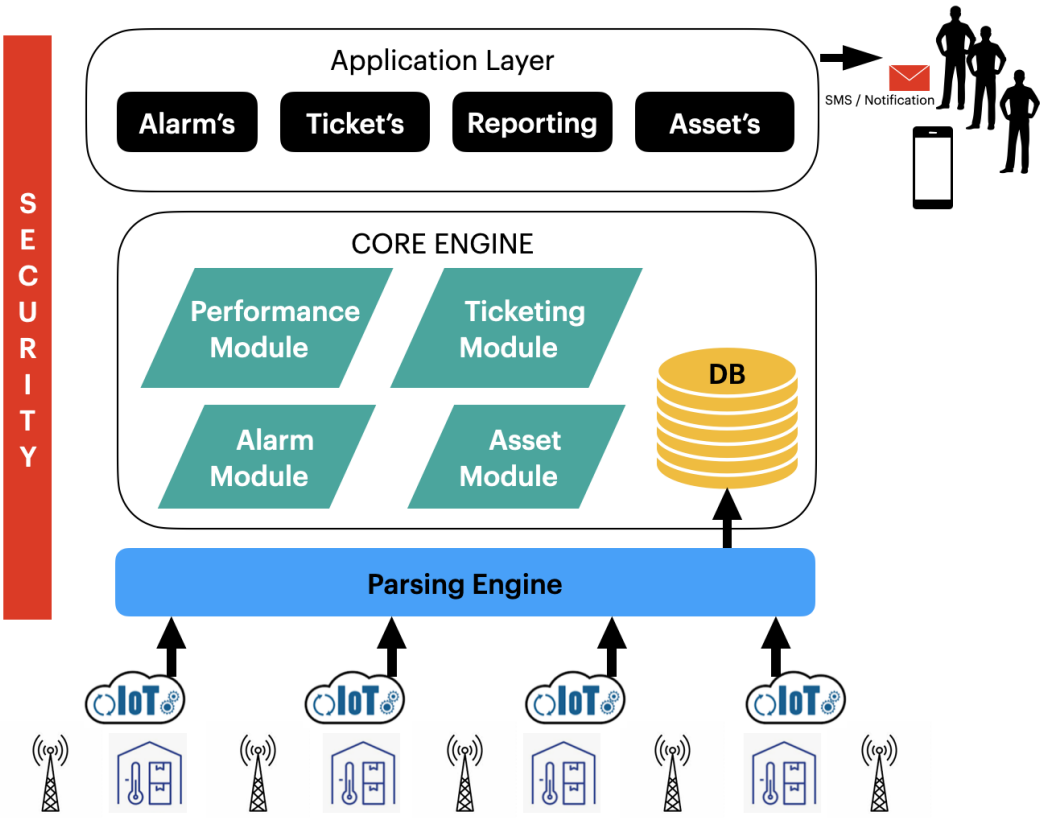
NebulARC is honoured to respond market need for a comprehensive solution for remotely monitoring the businesses of cold storages, warehouses , telecom sites and CFS warehouses. NebulARC is a producer of a small portfolio of IoT enables centralized monitoring products, known as the NeCO suite of products. NebulARC is also a well-known integrator of its own products and delivered implementation to many large-to-medium-scale enterprises in India. We are confident in our ability to convert our experience to an operational system.

Our strong mediation product enables us to connect to all the sites using multiple, concurrent communication methods. Our scalable architecture enables us to support a vast number of sites, alarms, trouble tickets and users. Our experience in building centralised operation solutions for Cold storage / Warehouse / cellular operators and our understanding of their business processes ensures that we can build a very effective system for you, and we believe that our prices will also be very competitive.

Solution Description

SCOM Solution

The following diagram depicts the proposed solution for Cold storage / Warehouse / cellular sites infrastructure monitoring. The solution is based on NebulARC's off-the-shelf modules complemented with additional customization.



Solution Architecture Diagram

Solution Benefits

Salient Features

- A wide range of measurement options
- LCD display for a variety of transmitters and sensors
- Reliable, accurate and durable hardware suitable for long-term environmental monitoring
- Long-life batteries that are user changeable
- 24/7 monitoring
- Automated alarms with various notification options
- Backup memory in transmitters and receivers
- Automated reporting
- EMS software

Accurate & reliable

- Quality assured hardware that is durable and easily maintained.

Secure

- Permission controls, data owned by customer.

Configurable to each user requirement

- Customised alarm notifications, data display, sensor & multi-site grouping.

Intuitive & audit ready

- Audit trails, scheduled reports, clear design for ease of use.

Validated software

- When required, we provide comprehensive custom protocols for the Pharmaceutical sector, Cell towers operators and Warehouse operators. Trained engineers and distributors are available for smooth validation protocol execution.

Managing environmental data has never been so easy – whatever and whenever you need it – from wherever you are.

- The highly comprehensive SCOM software takes environmental monitoring data display to another level. Full data collection with interactive graphs, tables and plan views, allows users to slice historical

environmental data in many ways for more advanced analysis. SCOM administrators can create user groups for tiered management of sensor groups, zones and/or multi-site management – making managing environmental data easier and more accessible than ever.

- SCOM smartphone app is designed for users to access sensor alarm status, active alarms, list of sites, zones and sensor groups on-the-go.

Whatever you need

- Single or multi-user access for small, medium or large sites
- Share data with users and allocate permissions to various data groups
- Collect and display more data than any other system on the market
- Display quick overview of sites and/or sensor groups
- Access interactive graphs, tables and plan views for more detailed analysis

Whenever you need it

- Access real-time data, 24/7
- Immediate email, SMS and mobile alarm notifications to user-defined personnel
- Generate automated reports or alternatively access reports immediately and easy

Wherever you are

- Access critical information on your smartphone and local PC, via the intranet, network or internet.
- Cloud based server hosting options are available
- View and interact with data and settings from anywhere in the world using your browser
- Modular approach – Basic is Parsing Engine and Alarm module. Other modules are plug and play as required.
- Cost Effective
- Real time fault alarm to the dashboard and mobile app (PWA – no need to install on mobile like play-store app)
- Integration with cost effective IoT device (NebulARC's NeCo-IIoT platform) to receive fault alarms and performance data

- Real time site health view (On Mains / Battery / Battery Voltage)
- Real time critical alert/notification generation on low battery voltage (low battery + No Mains) and auto generation of trouble ticket creation / SMS notification
- Real time tracking of work activities via trouble ticket module
- Reducing fault resolution-time by smart usage of the trouble ticketing system.
- Dashboards and Reports indicating real time site health and performance based on history
- NebulARC's SCOM solution is cloud ready therefore easy to deploy and maintain.
- NebulARC provides a turnkey solution including unique software, database licenses, and professional services related to specifications, implementation, integration, testing, training, and acceptance. NebulARC also provides technical support and maintenance.

Solution Components

Parsing Engine:

Flexible and easily adaptable to new versions and types of IoT devices. Ready with industry standards protocols and data format. The platform is built in a distributed and scalable multithreaded architecture which supports monitoring of additional cell sites and device types as network / sites grows therefore it is **5G ready**.

Protocols:

Parsing engine supports following two protocols to receive the data from any IoT devices. The protocols are

1. HTTP
2. TCP/IP

Parsing engine works in real time for processing the alarm data that means the faults will be reflected from parsing engine to alarm window as soon as the data comes to server.

The performance data (periodic) will be stored to database as soon as

received from the IoT devices.

Data Format

Parsing engine preferred data format is xml which widely accepted and in use in the industry. Parsing Engine may support other data format like CSV or Text. This may require additional fine tuning to receive data in such format.

Alarm Module:

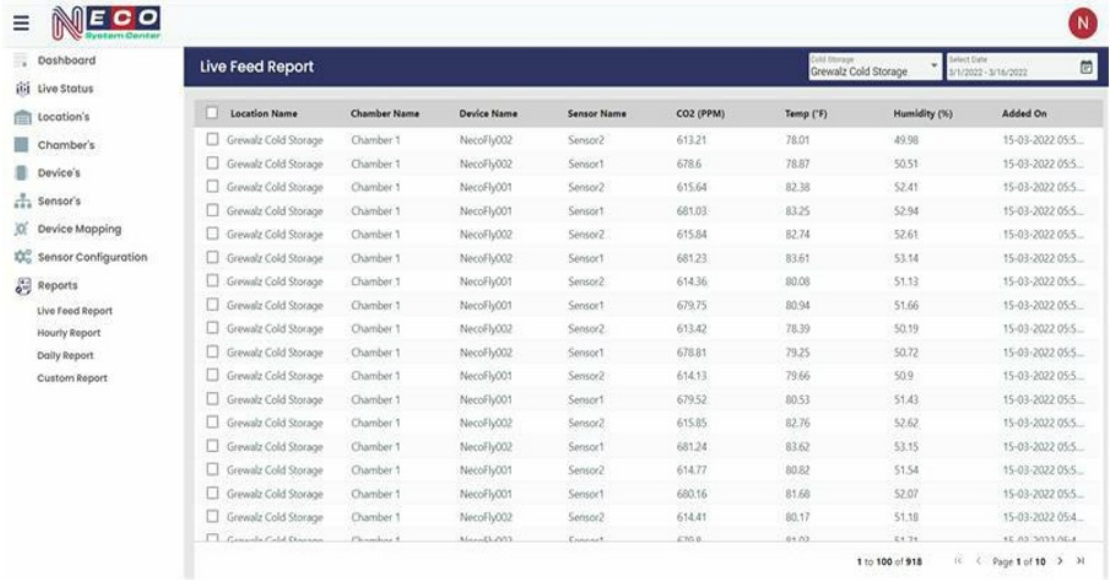
The Dashboard provides a concise high-level view of the network sites at any given moment so that managers at all levels can see at a glance how many problems there are in the network, what and where those problems are and what is being done about them. With Dashboard:

- Managers get a better and clearer picture of the site and its state, and get it in real-time. The unified console enables both operators and managers to be fully focused on a single monitor and see the "big picture" at all times.
- They also get actual control over the high-level issues by being able to directly manipulate faults they perceive as most important. This is especially significant, as with Dashboard, they have a much clearer view of the priorities at any given moment. As a direct result, managers can target points of failure, requiring their attention and can timely react and proactively respond to evolving conditions in the network.
- As a web-based application, the Dashboard can be used anywhere and anytime. For example, managers that are on the road may login remotely and continue to supervise the site from wherever they are.
- Dashboard is integrated with other modules, such as Trouble Ticketing, Performance Management, thus providing more in depth analysis of the network's behaviour and business aspects.

Alarm module supplies the essential “eyes and ears” of the service provider into its site infrastructure. Some of Alarm Module key features are described below:

Alarm presentation:

Intuitive Graphical User Interface, incorporating best practices from leading telecom operators, unified methodology across the TOC domain and integrated end-to-end display.


Dashboard
Live Status
Location's
Chamber's
Device's
Sensor's
Device Mapping
Sensor Configuration
Reports
Live Feed Report
Hourly Report
Daily Report
Custom Report
Live Feed Report
Cold Storage
Grewalz Cold Storage
Select Date
3/1/2022 - 3/16/2022
Location Name
Chamber Name
Device Name
Sensor Name
CO2 (PPM)
Temp (°F)
Humidity (%)
Added On
Grewalz Cold Storage Chamber 1 NecoFly002 Sensor2 613.21 78.01 49.98 15-03-2022 05:5...
Grewalz Cold Storage Chamber 1 NecoFly002 Sensor1 678.6 78.87 50.51 15-03-2022 05:5...
Grewalz Cold Storage Chamber 1 NecoFly001 Sensor2 615.64 82.38 52.41 15-03-2022 05:5...
Grewalz Cold Storage Chamber 1 NecoFly001 Sensor1 681.03 83.25 52.94 15-03-2022 05:5...
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Dashboard
Live Status
Location's
Chamber's
Device's
Sensor's
Device Mapping
Sensor Configuration
Reports
Live Status
Device Na...
Location Name
Chamber Name
CO2 (PPM)
Temp. (°F)
Humidity (%)
Battery (%)
Last Update On.
Sensor1 Grewalz Cold Stor... Chamber 1 0 0 0
Sensor2 Grewalz Cold Stor... Chamber 1 0 0 0
Sensor1 Grewalz Cold Stor... Chamber 1 0 0 0
Sensor2 Grewalz Cold Stor... Chamber 1 0 0 0

Alarm management:

Sorting, Filter, Dispatching and Profiling alarms to and from the main console.

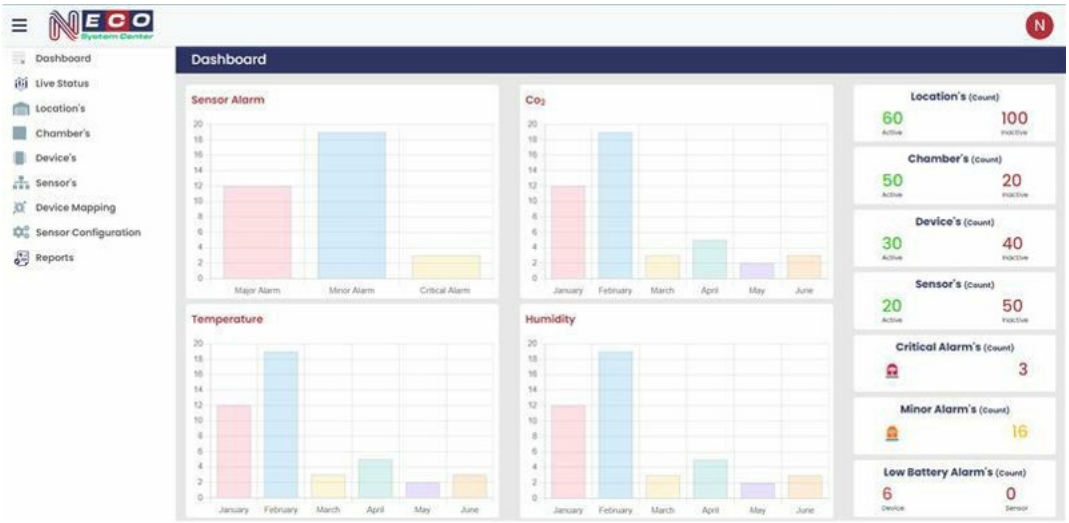
Reporting:

No system is considered complete without a reporting mechanism. Alarm Module supplies basic and advanced reporting mechanisms, as well as the ability to create and modify reports based on the new requirements.

-Note: Actual reports are not included.

Key Benefits

- Business level reports - Focuses on the impact of operations on business processes and business-level objectives.



- Analyze historical data - Enables network operators to gain
- comprehensive insights into their operations and allows them to effectively manage their operations and reduce their costs.
- Long Term Data Storage - Saves statistical data for customer-defined time periods, and allows long term network insight.
- Achieve Low TCO - Web GUI reduces the total cost of ownership by enabling users to access the system anytime and anywhere without needing additional software installation.

Security & partitioning:

Alarm Module is backed by an integrated state-of-the-art security mechanism. Each module, function and Element instance is protected individually. Administrators can set up user and group security profiles, grant and revoke permissions and implement customized security policy.

Some of the features provided in the alarm window are:

- Flexible display: Drag and move of alarm columns in the alarm window
- Once click sorting, filtering of alarms based on each column type
- One click alarm action – Acknowledge, Create TT, Details, Defer etc.
- Alarm filters: Users can apply filters based on any alarm field, or combinations of alarms fields. Filters can also be set up and saved for later use.
- Quick recognition graphics: Unacknowledged alarms appear in bold font, and escalated alarms (alarms which have not been dealt with in the appropriate time frame) are highlighted with a special icon.
- Manual alarm defer in case of maintenance period of site

Performance Module (PM):

Performance Module works on the periodic data coming from the IoT devices. The data can be

(i) Voltage

(ii) Current

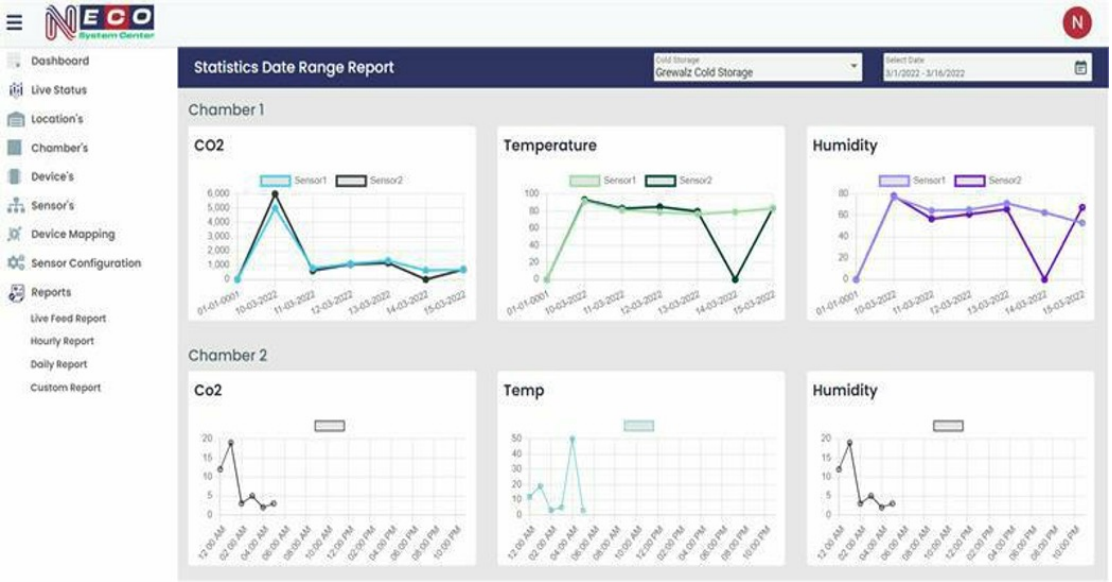
(iii) Temp

(iv) Humidity

(v) Carbon di-oxide.

(vi) etc.

The data acquisition is based on the IoT device which is installed at the site. NeCo-Flyer which can send the alarm information about Site Mains, Battery Voltage etc, this data can be used to generate the reports about site performance over the period. The performance reports can be viewed based on the time window which can vary from day, week, month, year etc.



The Performance Module provides web-based report GUI. The PM Reporter, supplies detailed tabular and graphical spreadsheets (XLS) and HTML-based reports from anywhere and at any time.

The report data can be downloaded to local machine to use in Excel application for further use.

These performance reports can be used to calculate service specific performance calculation for each site and vendors. This service KPI is vary reliable and accurate and can be used as KPI for service monitoring.

Key Features:

- Reports anytime any where using mobile
- Filter, Sort, Drag and Move Columns
- Tabular and Graphical reports
- Report Dashboard for key KPI's
- Briefly Site Performance View (Weekly, Monthly, Quarterly)
- Asset Performance View
- Exception Reports

CONTACT NEBULARC

NebulARC Technologies Pvt Ltd.
No 702, Tower-1, Vipul Greens,
Sector - 48, Sohna Road
Gurugram – 122 018

Tel: +91 99 58207 966

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