Avanseus
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CONFIDENTIAL

Cognitive Assistant For Networks Release 5.0
Major Features

Artificial Intelligence
for Telecom, Enterprise & IoT Applications

Cool Vendor in Communications Service Provider Business Operations

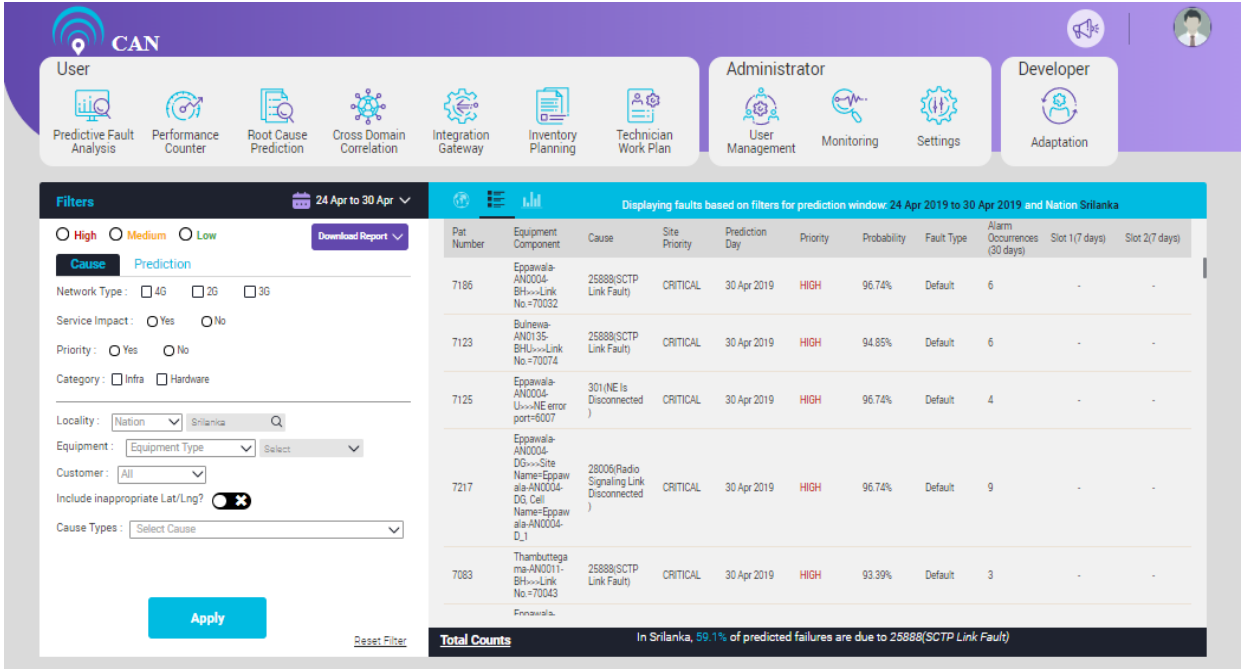
The Gartner, "Cool Vendors in Communications Service Provider Business Operations", was written by analysts Norbert Scholz | Sylvain Fabre | Jouni Forsman | Ian Keene | Martina Kurth | Wm. L. Hahn | Peter Liu | Ramesh Marimuthu | Amresh Nandan | Michael Porowski | Kosei Takiishi and published on 24 September 2018. The Gartner Cool Vendor Logo is a trademark and service mark of Gartner, Inc., and/or its affiliates, and is used herein with permission. All rights reserved. Gartner does not endorse any vendor, product or service depicted in our research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner's research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

CAN 5.0 Features

1. Improvised User Interface for Simple and Optimized operations
2. Integrated Development Environment to reduce integration efforts
3. PM Counter integration and Health Monitoring
4. Voice Based Interface for ease of access
5. Enhanced KPI reporting for more transparency
6. Integration with BMC Remedy
7. Integration with Splunk
8. Weather Integration for relevant insights and work plan setting
9. Identification of domains in Cross Domain Correlation to reduce decision making time for customers
10. Containerisation for ease of implementation and scalability
11. Security by design features
12. Knowledge repository maintenance

1. New Generation User Interface

- **Optimized User Interface** that is more captivating and engaging
- **Simpler** and **Easy** to use interface
- Redistribution of menu **linking the like and related** functionalities
- **Advanced filters** for enhanced insight options
- **Enhanced** map view
- **Easy navigation** across different tabs
- **Enhanced** download option
- **More semantics** per screen
- **Advanced integration gateway** for dynamic third-party integrations

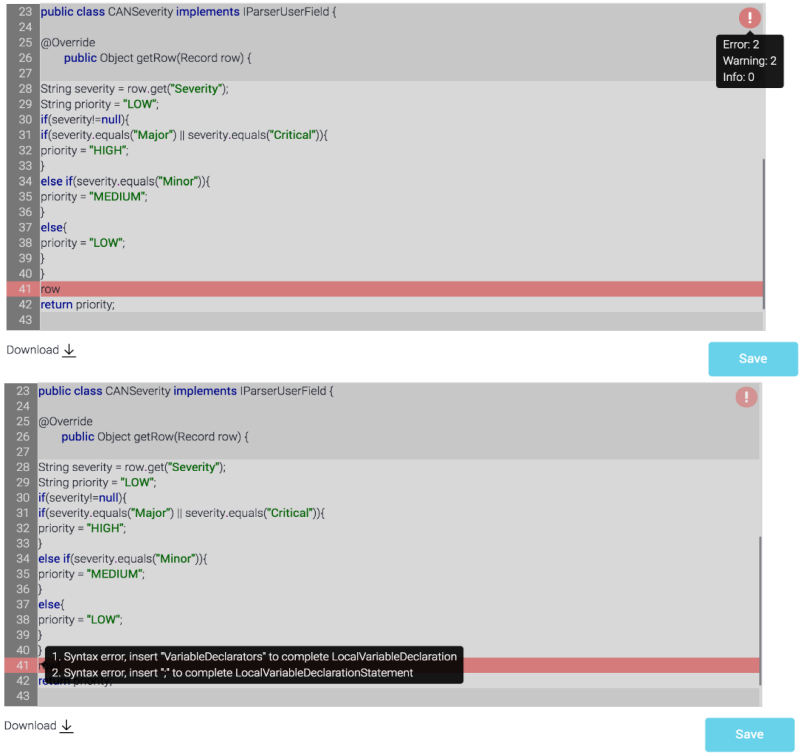


New Generation User Interface - Salient Features

- **Improved clarity** through clear language, redesigned flow, hierarchy and visual elements
- **Concise** representation to avoid cluttering of information
- **Improved relevance** by making it identifiable with the telecom NOC environment specifically keeping NOC engineers and telecom professionals in mind
- **Non-sluggish** and **highly responsive** interface that provides quick outputs and keeps the user engaged
- **Consistent** user interface that retains the same pattern across modules to ensure the ease of use
- **Advanced ergonomics** where the semantics are appropriately placed and provides a nicer user experience when browsing through CAN 5.0 features
- **High efficiency** by appropriate placing of features and short cuts making the UI **more productive**

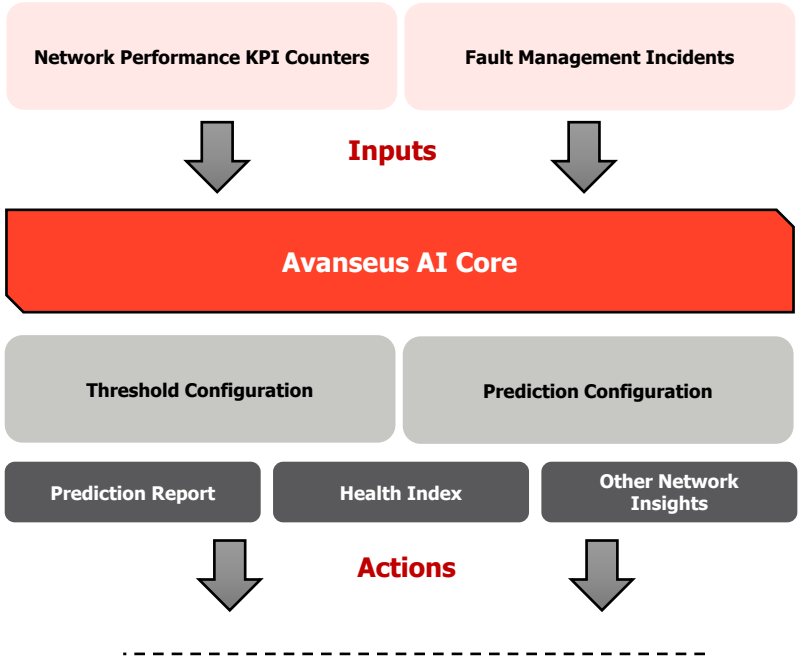
2. Integrated Development Environment

- **Integrated Coding Environment** for additional customization of reports, training of AI Core and ease of use
- Mainly used to **ultra customize** certain input or output scenarios temporarily or permanently as per user requirements
- CAN 5.0 provides a **smart editor** for code input that can compile the code as it is entered
- The Compilation results are shown in real time for appropriate actions with **different colour codes** for easy identification along with suggested changes
- **Autofill option** for the input codes available to make the editor more user friendly
- The entered code snippets can be **downloaded** as a Java file for reference and used later if any modification is needed.

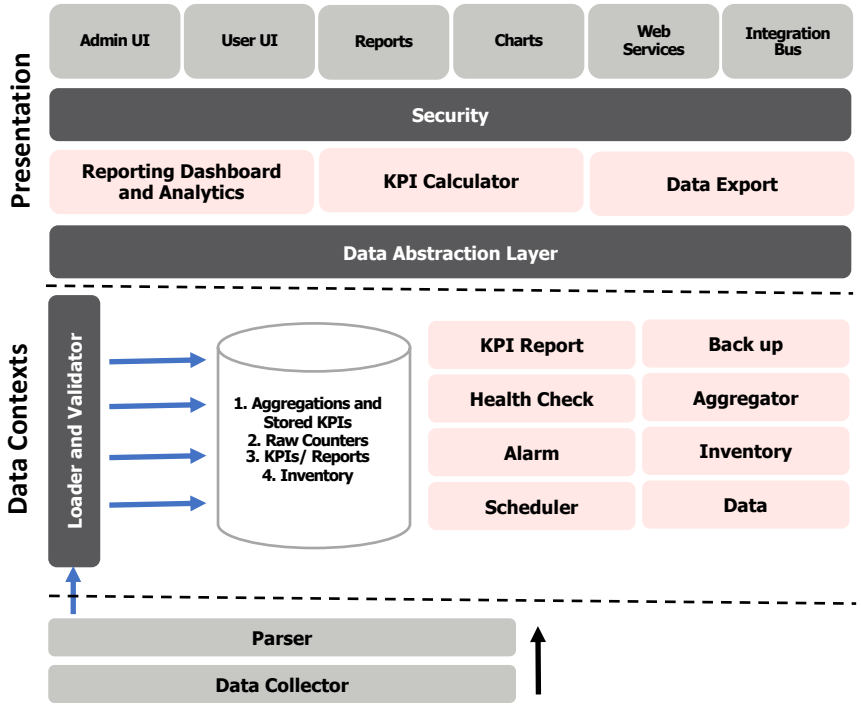


3. Performance Counter Prediction and Health Management

- **Network Performance Counters** will be monitored by CAN 5.0 for insight generation
- **Comprehensive Predictive Insights** on Network Performance Counters
- Enables **real time as well as forecast tracking** of all network performance KPIs in all kinds of network
- Comprehensive **Health Index** of equipment components that shows the current and historical health status
- Option to **set thresholds** to trigger alerts and actions
- **Improves network performance** by ensuring the Network KPI values and system health index thresholds
- **Correlation** of performance counter values to the fault alarms for Performance Degrade predictions



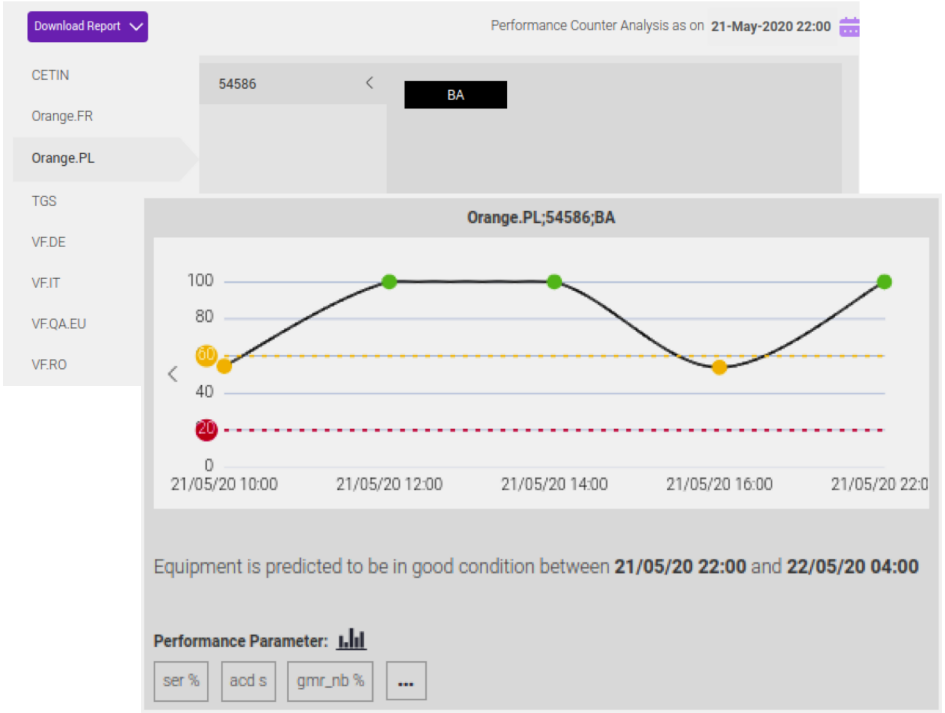
Performance Counter Brief Architecture & Features



- **Health Index** predictions for continuous monitoring
- Integrated and Highly Efficient **Incident predictions** considering health index, network KPI values, historical incidents
- **Configurable dashboard** to highlight high priority equipment components and equipment with high risk factor
- **Automated actions** configuration for pre-set thresholds
- **Downloadable** Reports, **matching report**s are summarized with confusion matrix for better under understanding
- **Integration** with inventory management, ticketing tools
- **Independent operations** as well as **integration** with incident management software

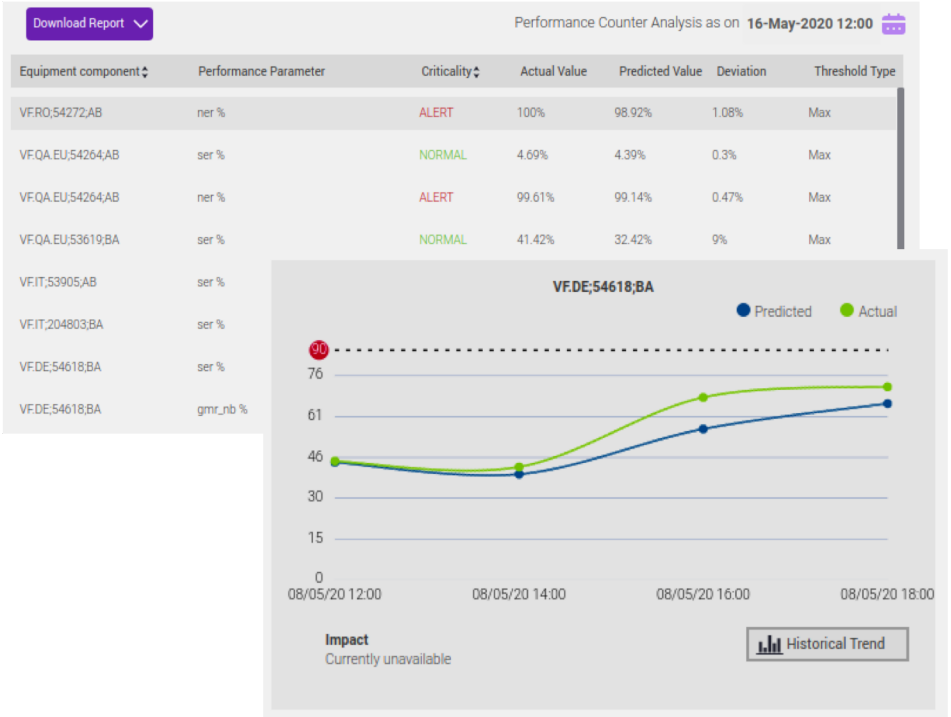
Performance Counter Health Index - User Interface

- Health status shown **graphically**
- Shows the **healthy period** of equipment concisely
- Tabular view shows **the hierarchy** of equipment
- **Easy** to understand and interpret
- Provides adequate insight on **upcoming failure** in a given prediction window
- Option to view **historical variations** of equipment health



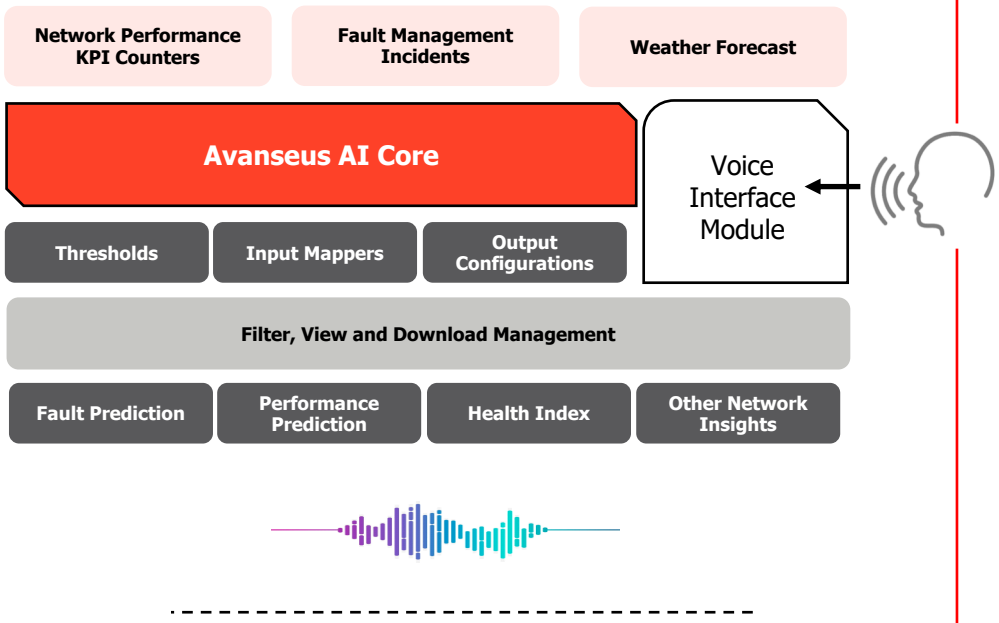
Performance Counter Health Index - User Interface

- Option to define **threshold** values for the network performance KPIs
- List view of defined KPIs with Actual Vs Predicted values mapped to the **criticality** of equipment
- Critical equipment/Threshold **breach** highlighted for easy notability
- Performance KPI values shown **graphically** for better interpretability
- The breach impact and history of such breaches made available at **one point** for easy decision making



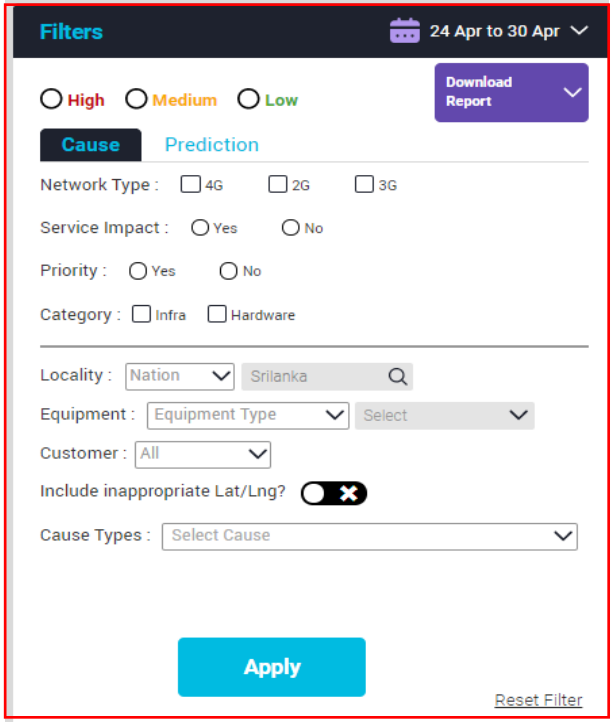
4. Voice Based Interfacing

- **Natural Language Processing(NLP)** enabled and connected to CAN AI engine
- The AI engine takes **voice commands** and generate results
- Increased **Ease of accessibility** and **time saving**
- **Reduced browsing time** for applying complex filters
- **Voice assist functionality** by providing nearest match in case of ambiguous command
- **Comprehensive command list** dealing with network health status, major faults, priority customer management
- Option to **download** the output reports
- **Interactive interfacing** as the output highlights are spoken out by CAN 5.0
- Enable easy access to **differently abled and new users of CAN 5.0**



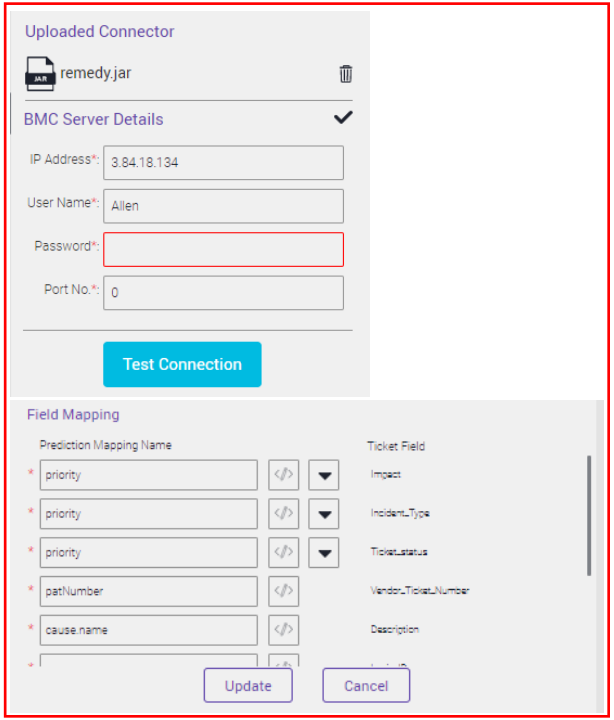
5. Enhanced KPI reporting

- **Enhanced KPI reporting** based on wider requirement criteria of users
- Enable customers to understand the **performance** of particular network segment or for finer attributes sensitive to their business
- Some of such criteria includes **Location, Cause Type, Site Profile, Service Affecting/Non Service Affecting** etc.
- Enables user to **bring down the focus area** of customer to specific KPIs that need attention enabling network improvement
- **Reduces much of the manual processing** that would have been involved in otherwise filtering the reports
- **Enhanced filtering mechanism** makes multiple combination of KPI parameters for overall realistic network performance view

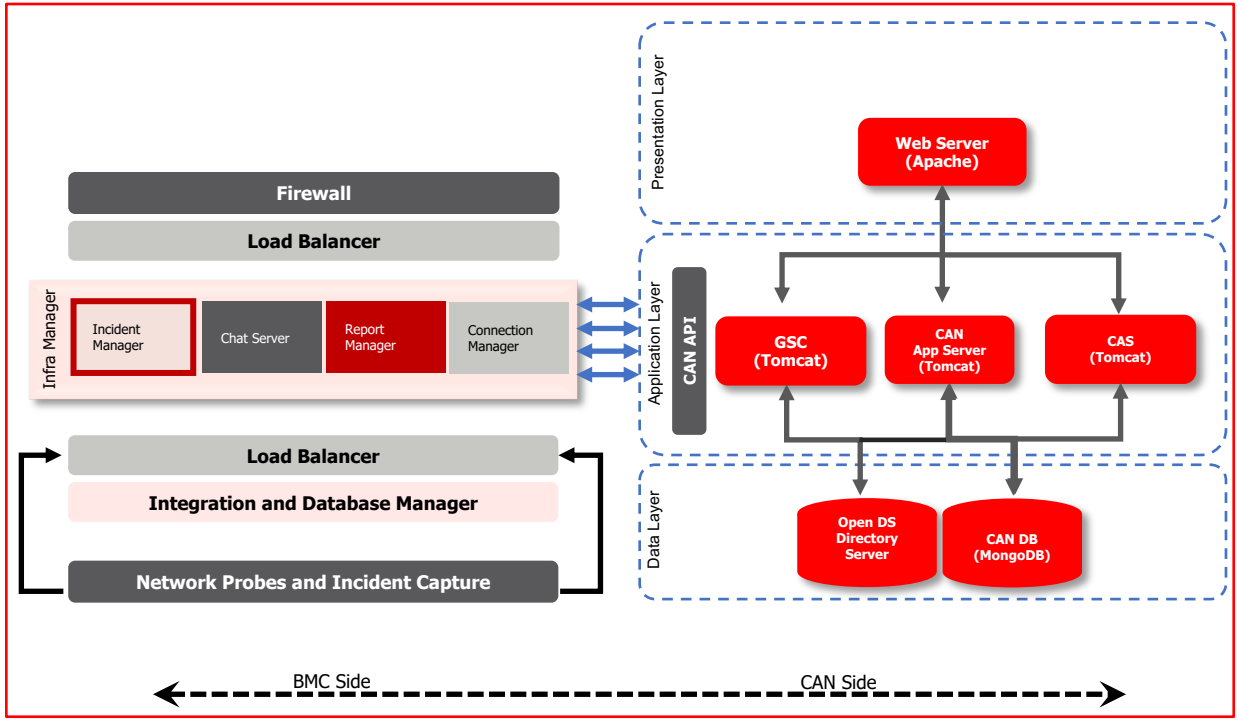


6. Integration Gateway- BMC Remedy

- Integration Gateway enables **Third Party Software integration** to provide seamlessness in the interconnectivity and enables automation
- BMC Remedy is a **ticketing/incident management software** for booking trouble tickets and managing them
- Provides **list view and graphical view** of pending prediction tickets
- Enable **new prediction ticket booking** and **assignment**
- Enable **update** of existing prediction tickets
- **Real-time updates** from CAN 5.0 to BMC Remedy and vice versa
- **Maps all essential field** automatically with an option to customize extra fields depending on user requirement
- Seamless interconnection using the **connector application**



CAN 5.0 – BMC Remedy Integration Architecture

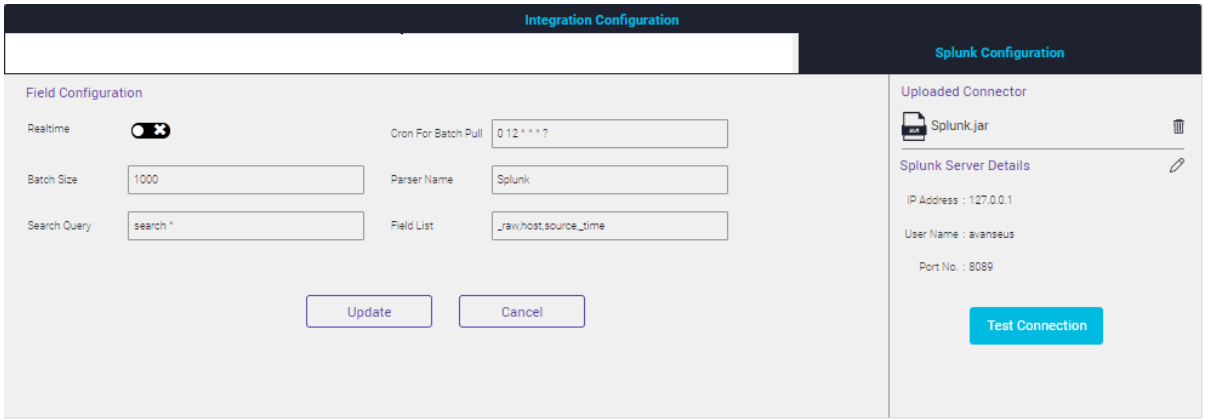


Salient Features :

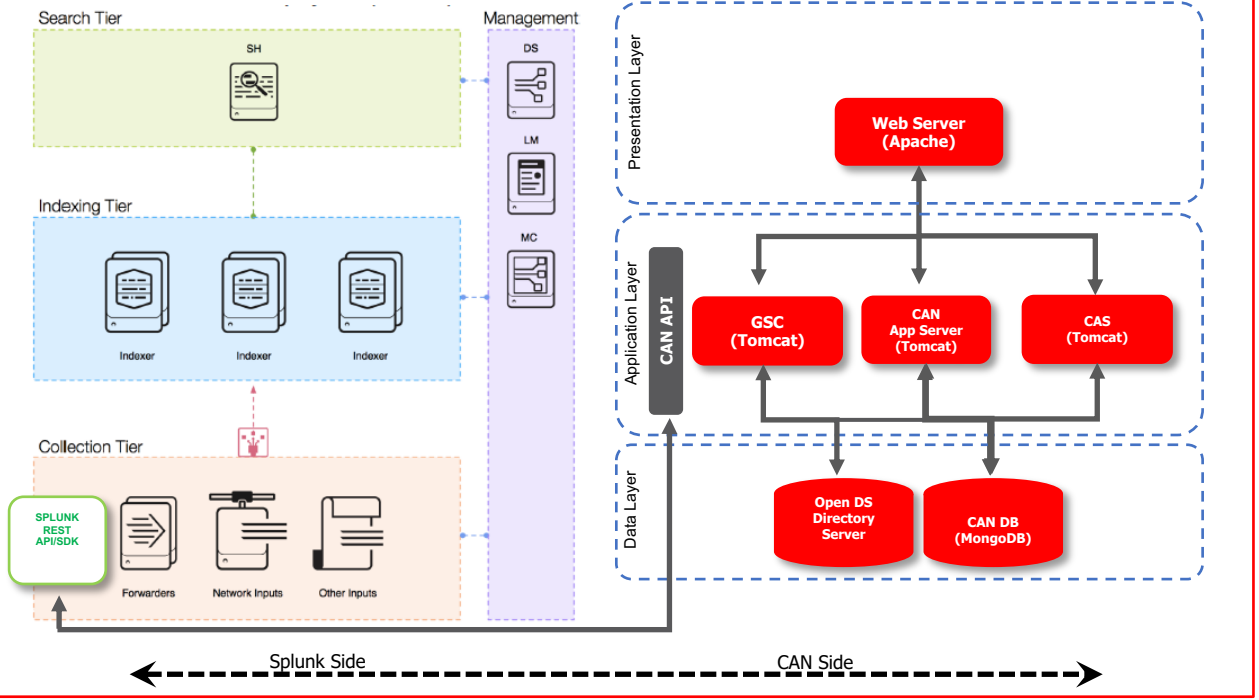
- **Seamless** transition from prediction to BMC tickets
- Ticket generation can be **automated** on threshold configuration
- **Direct ticket booking** from Prediction list
- **Ticket edit** option from CAN
- **Ticket search** option from CAN
- All changes on open tickets will be visible in CAN **real time**
- Ticket report **download** option
- **Ticket closure** and **Engineer assignment** to happen from BMC
- Option to use customer fields in BMC or CAN

7. Integration Gateway- Splunk

- Integration Gateway enables **Third Party Software integration** to provide seamlessness in the interconnectivity and enable automation
- Splunk is an application used to search, monitor and analyse machine generated big data/logs
- Tight integration over Splunk SDKs extracting log data from Splunk indexing tier
- Flexible and automated extraction of data
- Option to search and download domain specific or equipment specific data for light weight implementation
- Seamless interconnection using the **connector application**



CAN 5.0- Splunk Integration Architecture



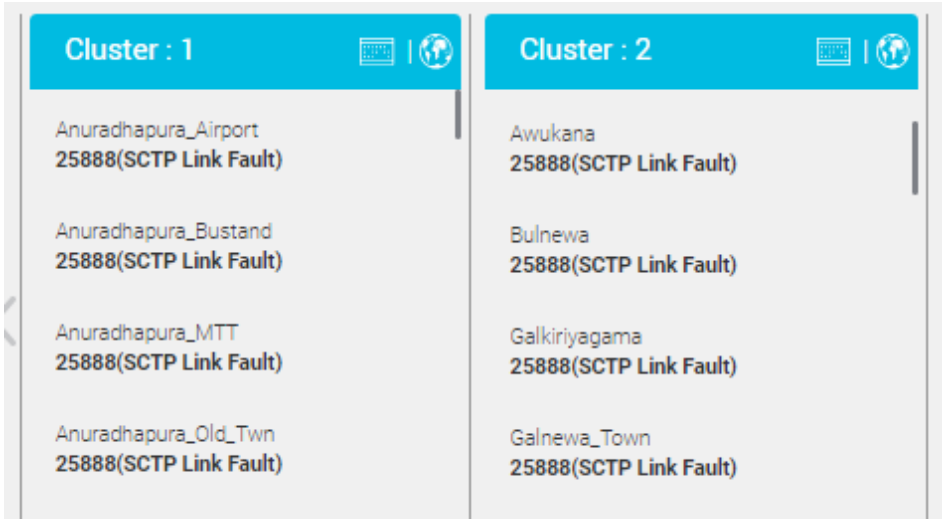
- Integrated over **Splunk REST APIs**
- **Data** searched and retrieved automatically or as per requirement from Splunk
- Option to **schedule the data download** at specific time
- Option to **search specific data** from the indexing tier
- Indexed data is r**eceived and processed** by CAN for generating prediction output

8. Integration Gateway : Weather Integration

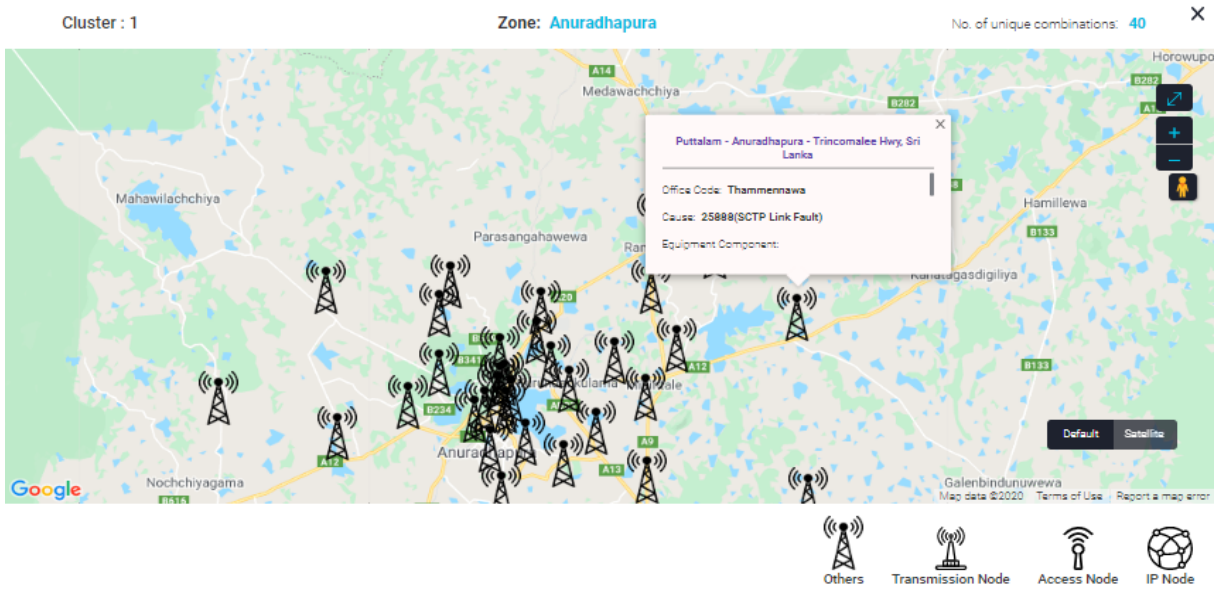
- **Enable** CAN 5.0 to use the weather information for appropriate decision making
- **Zone based comprehensive forecast** of weather up to 5 days with an interval of 3 Hours
- Option to **schedule field visits** of pending predictive tickets based on the weather forecast
- Enable **users to brace** themselves for any radical weather phenomenon
- **Multiple input option** where customer can provide the weather inputs namely
  - Direct input through options such as file upload
  - Feeder input through public domain where CAN could extract the weather information from **www.openweathermap.com**
- Makes CAN insights more relevant especially during the times of weather emergencies
- Seamless interconnection using the connector application

9. Enhanced Cross Domain Correlation

- **Enhanced discovery** of topology across multiple domains
- **Crispier representation** over map view and cluster view
- **Detailed representation** of faults on cluster nodes
- **Correlates** the equipment from different network segments that are interconnected
- This correlation helps in identifying the **root cause points** of alarms and will provide more relevant insights as the CAN being able to understand the network topology
- Existing version of CAN identify the domains, but they are presented as a list view along with cluster ID
- This new feature will add the **domain details** along with the list of equipment in the cluster along with their alarms



Cross Domain Correlation-Enhanced Map View

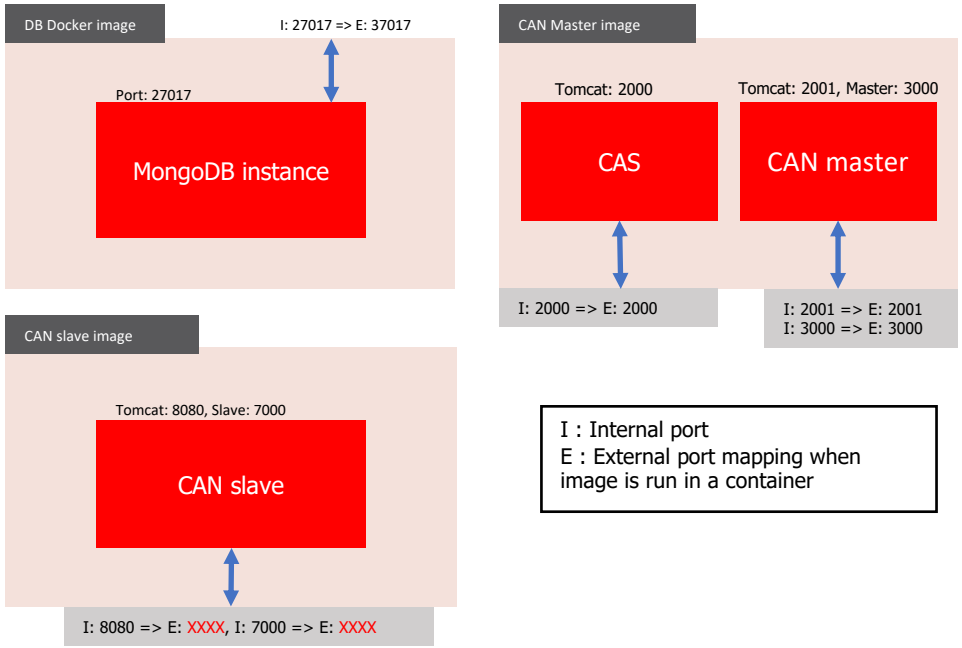


- **Enhanced Map View** with domains specifications
- **Interconnected domain/Multiple domains** shown graphically
- Details of predicted faults shown on hovering over the mapped cluster node.

10. Containerization for dynamic and scalable implementation

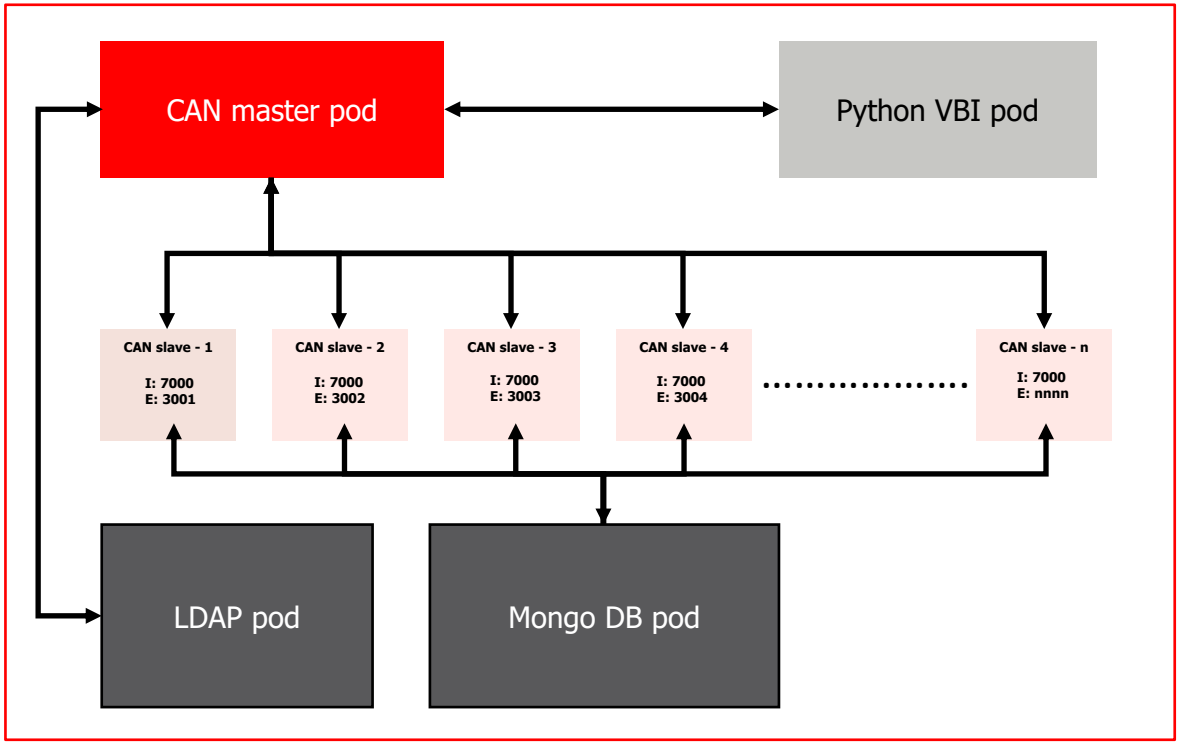
- To enable CAN compatible to **Cloud Native Environments**
- CAN 5.0 is **compatible** to Docker or other similar container tools to enable automation of deployment, scaling and management through various orchestration applications like **Kubernetes**
- Docker containerization is used to run the modules separately as a **Virtual machine**
- Containerization makes sure that CAN 5.0 installation process is **simple, dynamic and easily scalable**
- Containerization allows **distribution** of a Docker image into multiple similar containers
- Creating copies of same image allows **easy way of installation** software for distributed processing
- CAN 5.0 has **distributed prediction** processing using a master and slave concept where each slave CAN instance will process prediction separately and inform results to the master CAN instance after completion

CAN 5.0 container architecture



- Kubernetes container cluster consists of **one master** and **multiple worker or slave nodes**
- **Kubernetes Orchestration** program manages the master-node coordination
- CAN master decides what run on other nodes like **workload schedules, scaling and upgrades**
- Nodes/Slaves are managed by master and runs **agents that will coordinate** with master for its smooth functioning

CAN 5.0 Container Implementation Architecture



- Highly Optimized **Enterprise Ready** Google Kubernetes Engine Architecture
- **Quick and easy** image deployment on Kubernetes Pods
- **Auto scalability** based on usage requirement
- **Distributed** node pool for enhanced processing and load distribution
- **Auto repair** if any node health deteriorates.

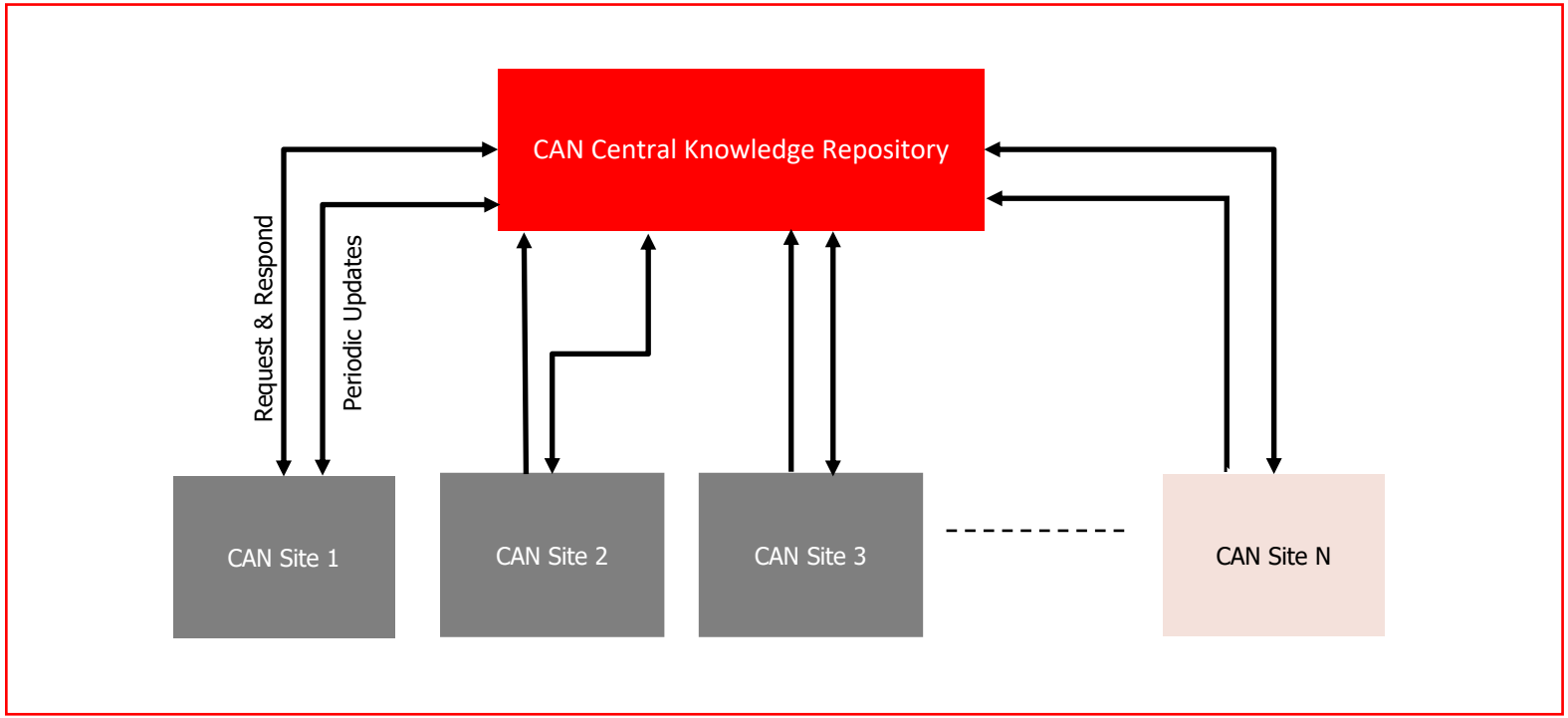
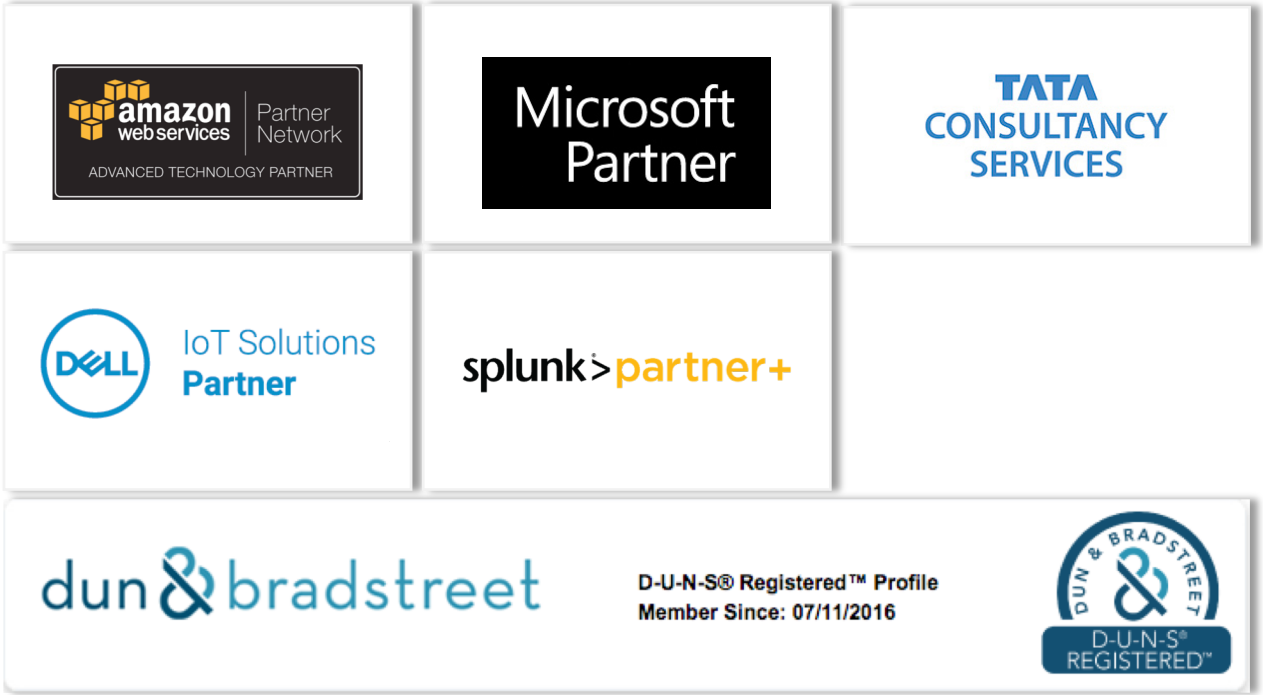
11. CAN 5.0 Security By Design for any ecosystem

- Compliance to **OWASP** (Open Web Application Security Project) duly audited by third party
- Reduced **risk** and security **threats** to application environment
- Compliance towards **prevention of injection** attacks and other vulnerabilities
- Compliance of **authentication management** to prevent unwarranted users
- Protection of **sensitive** data and **prevention** of information leakage
- Processing of **external** XML entities
- Enhanced of **Access Control** measures based on roles
- Security **misconfiguration issues and error** handling
- **Mitigation** of cross site scripting related vulnerabilities
- **Prevent** insecure deserialization
- **Compliance** while using components with known vulnerabilities
- Compliance in cases of **insufficient logging** and **monitoring**

12. Knowledge Repository

- Common **knowledge repository** for CAN applications
- To be used for basic training of the AI core while **green field and grey field** implementations
- Knowledge repository is used to share the knowledge across CAN applications. This knowledge will be used for **fine tuning** of predictions, creating synthetic history etc.
- All CAN applications makes a connection to knowledge repository through **HTTP** to update and retrieve the knowledge information
- Periodically CAN applications will share their knowledge information to **centralized knowledge repository**, later this combined knowledge information will be used by individual CAN application as per requirement
- Increases the **reliability** on CAN 5.0 predictions there by achieving benchmark prediction KPIS

Knowledge Repository Implementation Architecture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