

Industry	Government Corporation
Use Case Title	Managed Cloud Services for Seda Smart City Complaint Management Platform
About the Customer	<p>The Seda Smart City Complaint Management Platform is an AI-Based solution designed to handle the Solid Waste Complaints by the Citizens. The platform is owned by Municipal Corporation in the Netherlands. It includes a user-friendly mobile application with comprehensive waste disposal information, an interactive map for locating collection stations, real-time updates and notifications, and an interactive waste sorting guide. The platform aims to optimize waste management processes, enhance accessibility to information, and promote responsible waste disposal practices among residents.</p>
Technical Requirements/problem	<p>1.Efficient Deployment and Configuration Management: Implement streamlined deployment and configuration management processes to ensure efficient system setup and maintenance.</p> <p>2.Scalability and Availability: Ensure the system can handle varying workloads and maintain uninterrupted service by implementing scalable architecture and measures for high availability.</p> <p>3.Monitoring and Alerting: Implement robust monitoring and alerting capabilities to proactively identify and address system issues, ensuring optimal performance and security.</p> <p>4.Accessibility and Secure Communication: Enable seamless accessibility for authorized users while ensuring secure communication channels to protect sensitive data.</p>
Solution	<p>1.Deployment and Configuration Management: Adopted Kubernetes for container orchestration, enabling efficient deployment, scaling, and management of waste management systems. Implemented version control for infrastructure code to track changes and ensure consistency across environments.</p> <p>2.Scalability and Availability: Leveraged Kubernetes' horizontal pod autoscaling (HPA) feature to dynamically adjust the number of running instances based on demand, ensuring optimal performance and scalability. Utilized Kubernetes' cluster autoscaling to automatically add or remove worker nodes based on resource utilization, improving availability and accommodating traffic spikes.</p>

	<p>Implemented load balancing using Kubernetes' built-in load balancer and integrated external solutions like NGINX for distributing traffic and improving system availability.</p> <p>3. Monitoring and Alerting: Utilized Sysdig monitoring solutions to collect and analyze system metrics, container performance, and resource utilization. Configured custom monitoring dashboards and alerts to proactively identify issues, security threats in the waste management system. Integrated logging and monitoring with centralized tools like ELK stack (Elasticsearch, Kibana) for real-time visibility.</p> <p>4. Networking and Security:</p> <p>Routing and TLS Encryption: We have set up routing protocols and implemented TLS encryption to ensure the secure transmission of data between the different components. This helps protect sensitive information and prevents unauthorized access.</p> <p>NGINX as Reverse Proxy and Web Server: NGINX is utilized as a reverse proxy and web server to enhance security. We have implemented access control lists (ACLs) and whitelisted specific IP addresses, allowing access only to authorized users. This helps in preventing unauthorized access and safeguarding the application.</p> <p>Web Application Security: To protect against common cyber-attacks such as cross-site scripting (XSS), distributed denial of service (DDoS), and SQL injection, we have implemented robust web application security measures. These include configuring security features and implementing best practices to mitigate potential vulnerabilities.</p> <p>Source Code Analysis: To ensure that the source code of the application is up-to-date and free from vulnerabilities, we have implemented source code analysis. This involves using tools and techniques to scan and analyze the code, identifying potential security flaws or weaknesses. By addressing these issues, we ensure that the application is secure and resilient against potential threats.</p>
<p>Outcome</p>	<p>Efficient Deployment and Configuration Management: Streamlined deployment processes and ensured consistency across environments.</p> <p>Enhanced Scalability and Availability: The system achieves 99.99% availability through the use of Kubernetes replicas and robust scaling mechanisms.</p> <p>Effective Monitoring and Alerting: Real-time downtime alerts and easy log access ensure quick recovery and minimize system downtime.</p>

	<p>Strengthened Networking and Security: Secured communication, restricted access to authorized users, and implemented measures to protect against cyber-attacks.</p>
<p>Value Adds</p>	<p>Developed and Implemented a Central Log System (CLS) to effectively capture and monitor application logs in real-time. This enhances system visibility, enabling proactive troubleshooting and optimizing overall performance.</p> <p>Enhanced traceability of requests and responses between municipality departments for streamlined collaboration and improved efficiency.</p>