



# Getting Started-IoT Solution for Security and Surveillance

## Contents

1.0	Introduction.....	3
1.1	The Internet of Things (IoT).....	3
1.2	Security and Surveillance an overview .....	3
1.3	The security surveillance-core components.....	3
1.5	The Workflow .....	4
2.0	Core Structure.....	5
2.1	Core Architecture components: .....	6
2.2	Solution Architecture .....	7
2.3	Basic Architecture .....	7
2.4.0	Standard Architecture .....	8
2.4.1	Primary Architecture .....	10
3.0	IoT Hub.....	11
3.1	Event Hub .....	12
3.2	Web Application .....	12
3.4	Cosmos DB.....	13
3.5	OMS Log analytics.....	13
3.6	Application Insights.....	14
3.7	Power BI .....	14

CONFIDENTIAL

## 1.0 Introduction

The concept of security and surveillance has much evolved in the current context as the surveillance industry has undergone a sea change and has literally transitioned itself from being a basic alarm monitoring to video surveillance which accommodates remote security features with it. These features have immensely helped to increase visibility for organizations which intends to safeguard their staff, assets and buildings in particular.

## 1.1 The Internet of Things (IoT)

The Internet of Things (IoT) has created a buzz in the marketplace in the recent years. The IOT brings with it a concept of connecting any device to the internet and other connected devices to the network. **Security and surveillance is the major concern for the companies today and safeguarding them becomes an utmost necessary.**

IOT becomes a pivotal component which helps to have safer cities, homes and businesses; IOT enables both the private and public organizations to monitor facilities on a real-time basis. The IoT brings with it the secure connections of devices such as cameras, IP cameras, sensors to the smartphones to mention a few here. The combination of the connected devices would enable IoT solutions to “gather data, analyse the data and create an action” which enables to perform a particular task in near real time.

## 1.2 Security and Surveillance an overview

Security and Surveillance (SNS) is a comprehensive terminology which deals with detection, tracking and recognition of humans and various objects. The detection and tracking happens through a live streaming or a recorded version of the captured video streams that facilitates the task of security and surveillance.

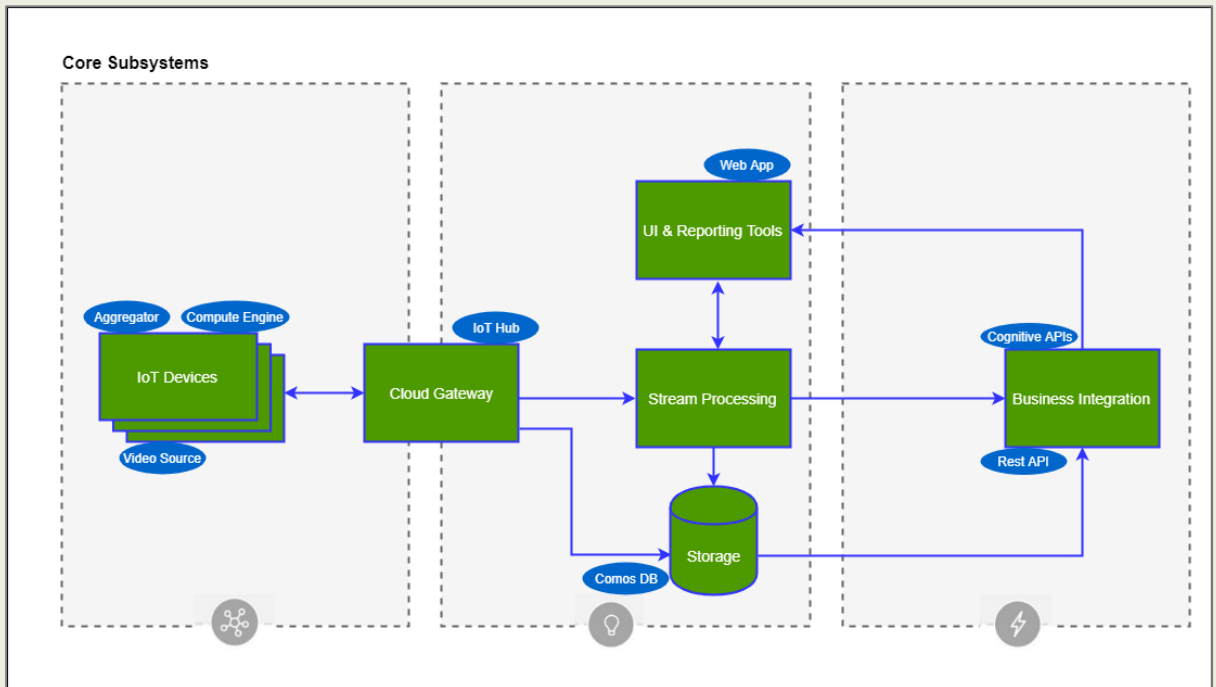
**SNS solution is a modular framework which works independently with the connected devices and becomes a yardstick concerned with multiple verticals such as retail, security, etc.** SNS solution can be seamlessly integrated with existing security devices in the on-premises. SNS can easily access and in turn connect to the IP cameras which help to detect and capture stream from the connected cameras.

## 1.3 The security surveillance-core components

Security and surveillance solution is based on three core components.

- **Aggregator** – Connects with existing infrastructure. Fetches Camera streams and integrates them in system. A solution can consist of one or more aggregators.
- **Compute Engine** – Core module responsible for detection and tracking. A solution can consist of one or more compute-engines.

- **Backend Server** – REST API server which acts as a coordinator and gatekeeper for overall solution



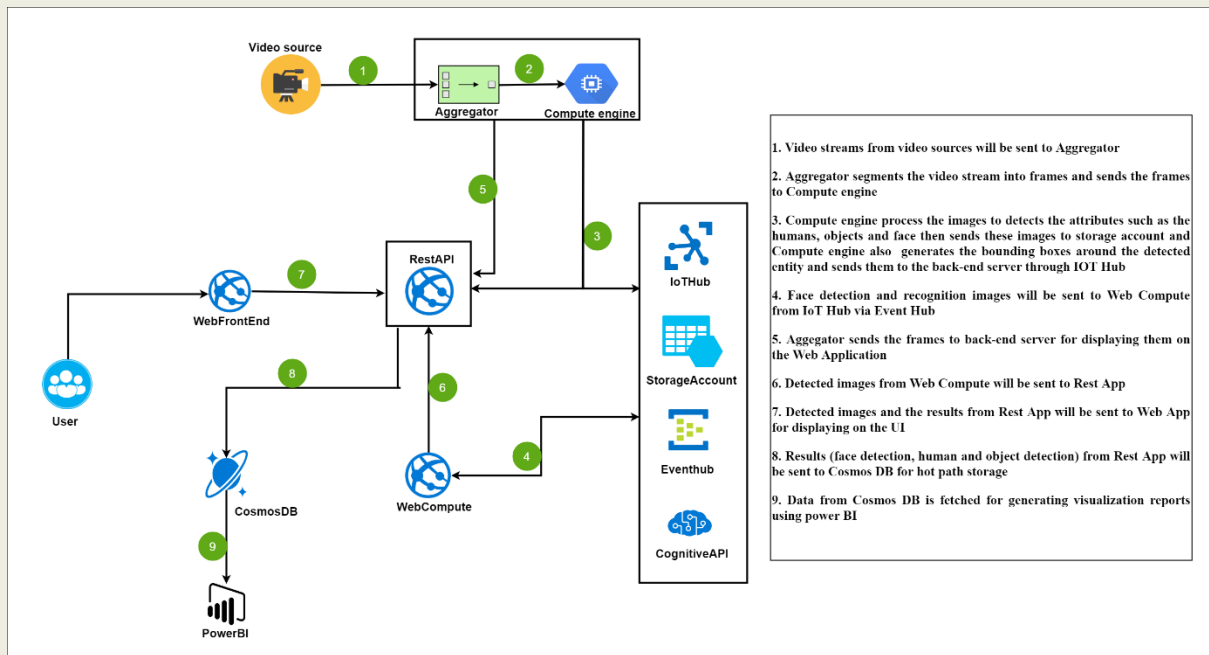
#### 1.4 Security and Surveillance an overview

Security and Surveillance (SNS) is a comprehensive terminology which deals with detection, tracking and recognition of humans and various objects. The detection and tracking happens through a live streaming or a recorded version of the captured video streams that facilitates the task of security and surveillance.

**SNS solution is a modular framework which works independently with the connected devices and becomes a yardstick concerned with multiple verticals such as retail, security, etc.** SNS solution can be seamlessly integrated with existing security devices in the on-premises. SNS can easily access and in turn connect to the IP cameras which help to detect and capture stream from the connected cameras.

#### 1.5 The Workflow

The video stream from the CCTV Cameras or IP cameras are being sent to the electronic devices such as Digital Video Recorder (DVR), which in turn converts the video streams to digital format.



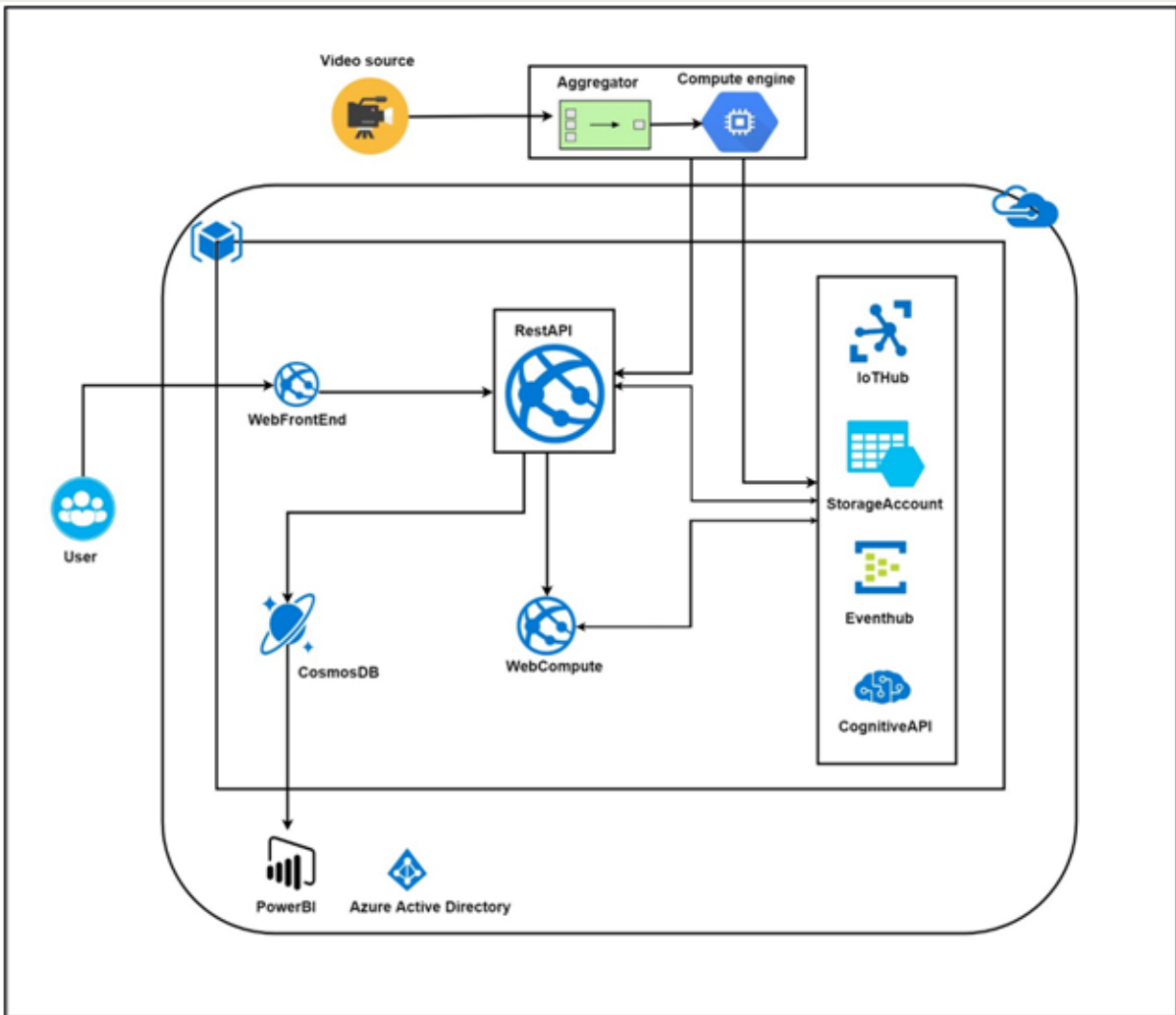
1. Video streams from video sources will be sent to Aggregator
2. Aggregator segments the video stream into frames and sends the frames to Compute engine
3. Compute engine process the images to detects the attributes such as the humans, objects and face then sends these images to storage account and Compute engine also generates the bounding boxes around the detected entity and sends them to the back-end server through IOT Hub
4. Face detection and recognition images will be sent to Web Compute from IoT Hub via Event Hub
5. Aggregator sends the frames to back-end server for displaying them on the Web Application
6. Detected images from Web Compute will be sent to Rest App
7. Detected images and the results from Rest App will be sent to Web App for displaying on the UI
8. Results (face detection, human and object detection) from Rest App will be sent to Cosmos DB for hot path storage
9. Data from Cosmos DB is fetched for generating visualization reports using power BI

**The above diagram explains about the data flow between different components within the solution.**

The digitally formatted video stream is sent to the aggregator which segments videos into frames. The aggregator sends the frames to the compute engine which detects certain attributes such as humans, objects and face recognition. Further, the compute engine generates the bounding boxes around the detected entity and sends them to the back-end server.

The backend server implements the micro-services which is used for detection, recognition and tracking. All the required parameters such as on-boarding/off boarding of devices/components which connects to the wide range of video streams are controlled through web application, as the web application brings with it a feature to select video source, area of interest for detection.

## 2.0 Core Structure



## 21. Core Architecture components:

- IoT Hub
- Event Hub
- Storage Account
- Cognitive API
- Web Compute
- Rest API
- Web Frontend
- Cosmos DB
- Azure Active Directory
- Power BI

**Note:** Please refer to section 3.0 for more details about the above components

## 2.2 Solution Architecture

The core solution provided by the System Integration (SI) Partner is hardened with **Security, High-Availability (HA) & Disaster Recovery (DR)** and **monitoring** using the cross-cutting application needs, which are based on the key IoT Architecture Blueprint.

The core solution is automated for single-click deployment using Azure Resource Manager (ARM) template to reduce the time of deployment from weeks-to-days.

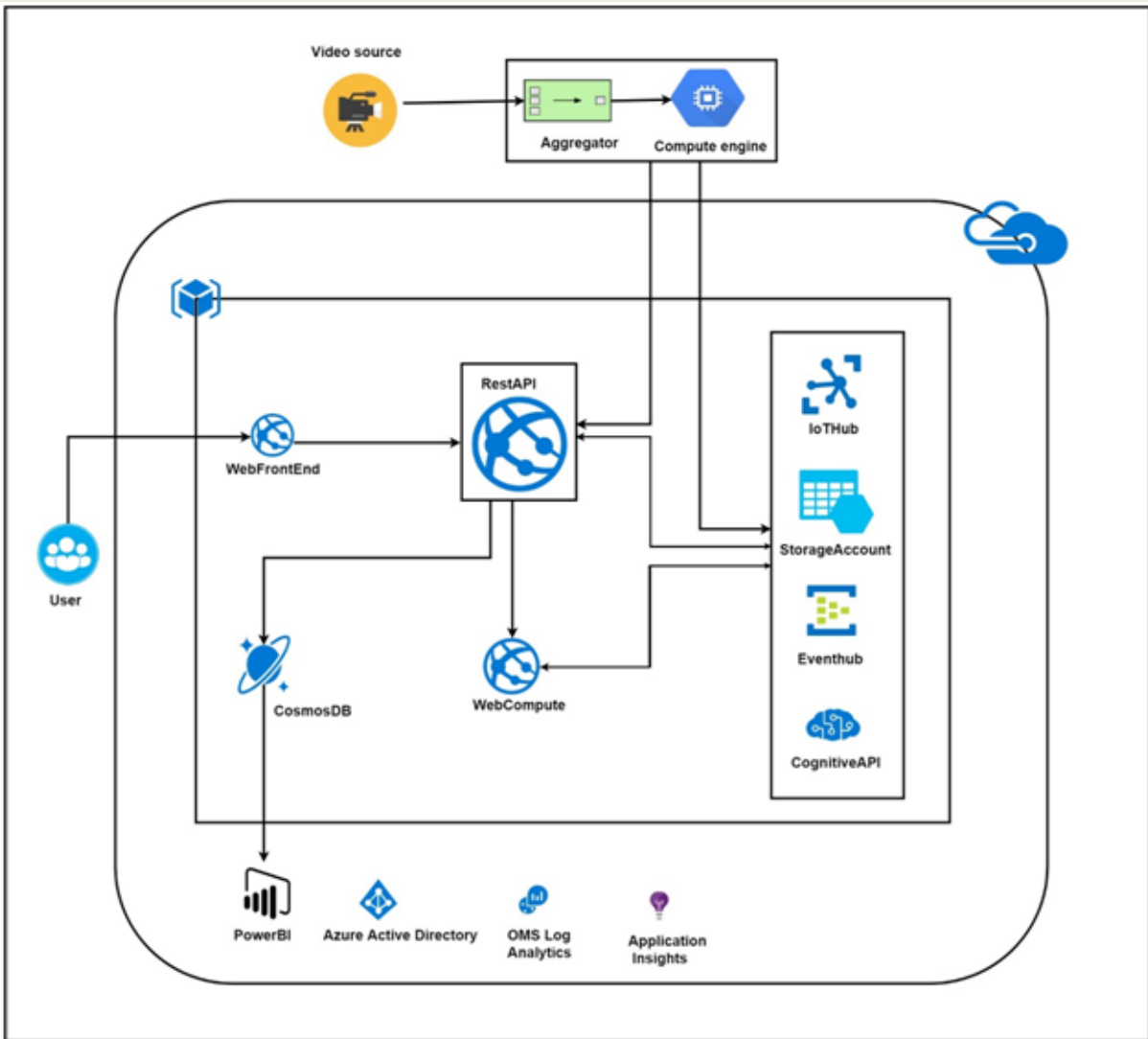
### The IoT Solution hardening focuses on the following five IoT Architecture Pillars (AAP)

- **Security:** Security is critical to the success of the entire lifecycle of an application from design to deployment
- **High Availability and Disaster Recovery (HA/DR):** Availability is usually measured as a percentage of uptime and focuses on ensuring an IoT system is always available, including from failures resulting from disasters. The technology used in IoT subsystems has different failover and cross-region support characteristics. For IoT applications this can result in requiring hosting of duplicate services and duplicating application data across regions depending on acceptable failover downtime and data loss.
- **Resiliency:** The ability of the system to withstand failures and continue to function.
- **Scalability:** The flexibility of a system to grow with increased workload
- **Management:** Covers the operational and deployment processes that keeps an application running in production. Logging and monitoring for IoT application is critical determining system uptime and troubleshooting. The solution uses Azure Operations Management Suite (OMS) and App Insights for operations monitoring, logging, and troubleshooting.

## 2.3 Basic Architecture

Basic solution will have core components, in addition this solution also consists monitoring components like Application Insights and OMS Log Analytics.

- Application Insights provide monitoring for Web API.
- OMS Log Analytics provide monitoring for IoT Hub, Event Hub, Cosmos DB, Cognitive API, Rest API, Web Computer, Web Front End and Application Insight.



- 3-Web Apps
- 1-IoT Hub
- 1-Event Hub
- 4-Cognitive API
- 1-Storage
- 1-Cosmos DB
- 1-Log Analytics
- 1-Application Insight
- 1-Azure Active Directory

## 2.4.0 Standard Architecture

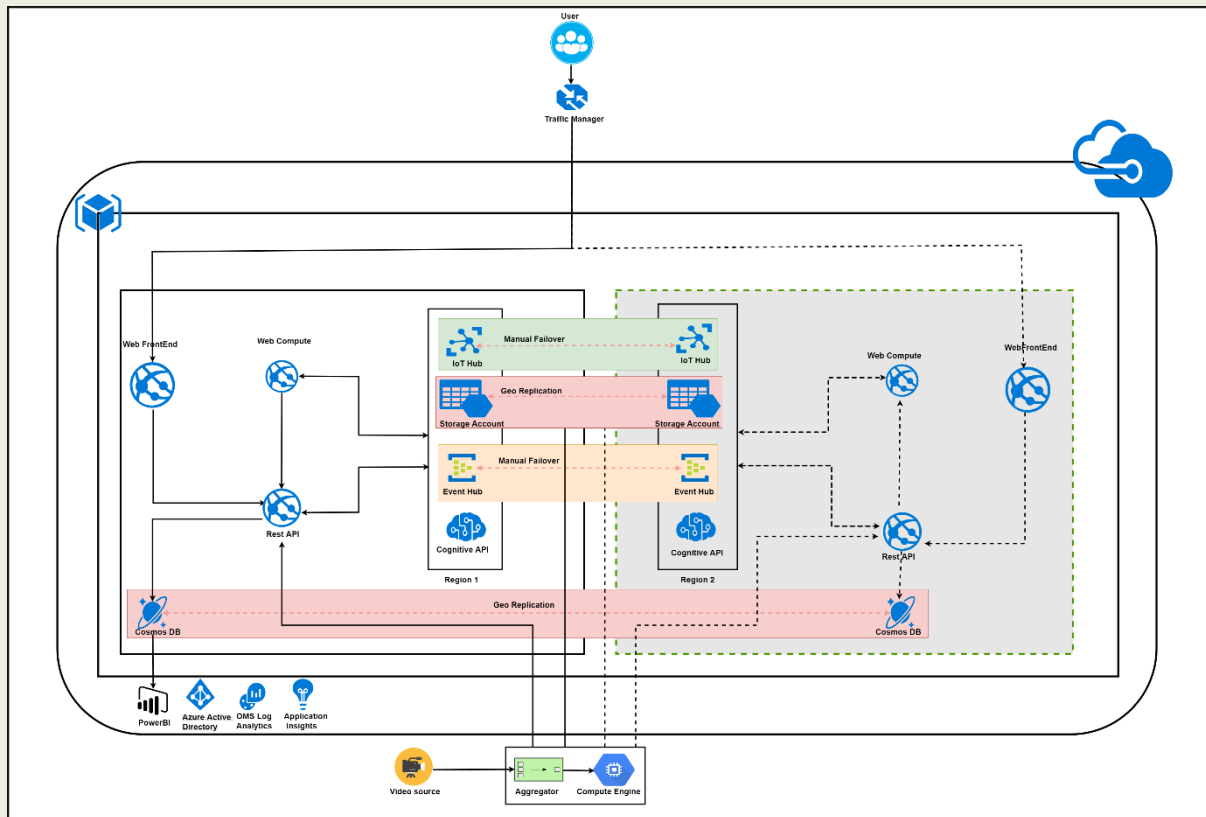
The standard solution is implemented by adding the High Availability and Disaster Recovery (HA & DR) features along with monitoring components like Application Insights and OMS Log Analytics to the Core solution.

Standard Architecture diagram contains two regions

- Primary Region (Deployment)
- Secondary Region (Redeployment)



The below diagram depicts the data flow between Azure Components in standard solution.



Standard Architecture comprises of following components:

- 6-Web Apps
- 1-IoT Hub
- 1-Event Hub
- 8-Cognitive API
- 1-Storage
- 1-Cosmos DB
- 1-Traffic Manager
- 1-Log Analytics
- 1-Application Insight
- 1-Azure Active Directory

**Note: Please refer to section 3.0 for more details about the above components**

The Azure components highlighted with a grey background are provisioned using ARM template, whenever there is disaster at the *primary region*, that deploys the ARM template on a designated *secondary region* (Excluding Cosmos DB, Event Hub, IoT Hub, Storage Account)

Cosmos DB is running on both Primary & Secondary (with Geo Replication enabled). Event Hub is running on both Primary & Secondary (with Geo Replication enabled with manual fail-over). All the three web app are enabled with Auto scale feature. The Front-end Web App is added under Traffic to provided High availability and Custom SSL certificate is offloaded on the traffic manager.

The main use of this solution is whenever disaster occurs the re-deployment components will deploy in another region which reduces the down time of the solution.

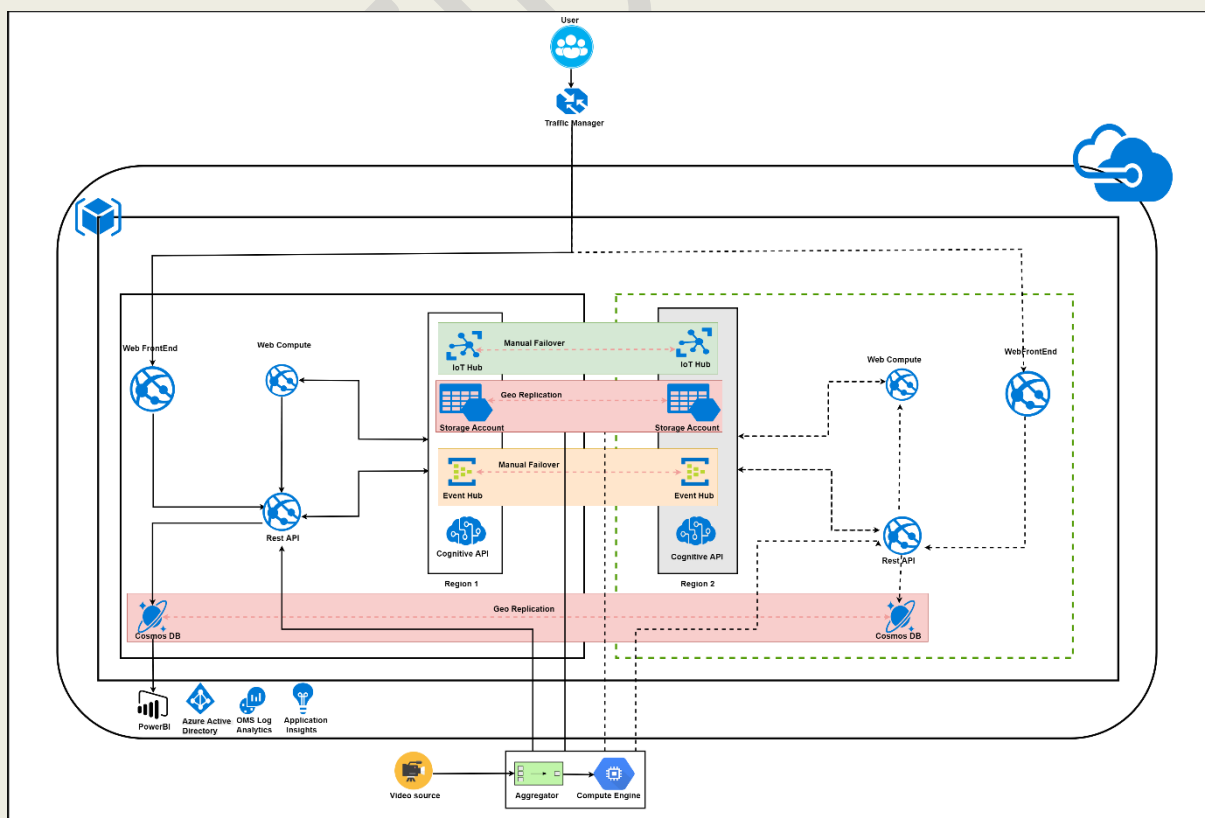
### 2.4.1 Premium Architecture

The premium solution is implemented like Standard solution by adding the High Availability and Disaster Recovery (HA & DR) along with monitoring components like Application Insights and OMS Log Analytics to the Core solution. But the only difference between Standard and Premium is all the components get deployed at once including the re-deployment components.

Premium Architecture comprises of two regions

- Primary Region
- Secondary Region

All the components get deployed at once in the premium architecture. The diagram below depicts the data flow between the Azure components in premium solution



### **Premium Architecture comprises of following components:**

- 6-Web Apps
- 1-IoT Hub
- 1-Cosmos DB
- 1-Event Hub
- 1-Storage
- 8-Cognitive API
- 1-Log Analytics
- 1-Application Insight
- 1-Traffic Manager
- 1-Azure Active Directory

**Note: Please refer to section 3.0 for more details about the above components**

In this type of solution all resources including re-deployment components will be deployed. This type of solution reduces downtime of solution when region is down. In this solution there is redeployment approach which reduces downtime of the solution.

### **3.0 IoT Hub**

Azure IoT Hub is a fully managed service which enables millions of IoT devices and solutions so that the entire system can have a bidirectional communication among each other. This communication between the devices are highly scalable and reliable and more importantly secured.

The IoT Hub allows for multi device-to-cloud and cloud-to-device hyper scale messaging, which absorbs data from millions of devices to make the seamless business communications happen.

Before you can communicate with IoT Hub from a gateway you must create an IoT Hub instance in your Azure subscription and then provision your device in your IoT Hub. Some samples in this repository require that you have a usable IoT Hub instance.

The Azure IoT Hub offers several services for connecting IoT devices with Azure services, processing incoming messages or sending messages to the devices. From a device perspective, the functionalities of the Azure IoT Hub enable simple and safe connection of IoT devices with Azure services by facilitating bidirectional communication between the devices and the Azure IoT Hub.

### **Implementation**

IoT Hub is the core component of any IoT solution. Let us try to understand how the IoT Hub is used in the solution.

Aggregator device generates data and sends to IoT Hub, from IoT Hub the data will be sent to the backend server. The face recognition of the identified images are sent to the event hub from the IoT Hub and then to the backend server. For this in IoT Hub a route is configured with the query type ="cloudcomputellimages"

### 3.1 Event Hub

Azure Event Hubs is a highly scalable data streaming platform and event ingestion service which is capable to receive and processing millions of events per second. Event Hubs can process and store events, data or telemetry produced by distributed software and devices. Data sent to an event hub can be transformed and stored using any real-time analytics provider or batching/storage adapters.

#### Implementation

Event Hub is used to communicate with the web compute engine. All the message marked as "cloudcomputerimages" are sent to event hub from IoT Hub then these images will be sent to backend server for further processing.

### 3.2 Web Application

#### Introduction

**A web application (Web App) is an application program that is stored on a remote server and delivered over the internet through a browser interface.**

Azure Web Apps enables you to build and host web applications in the programming language of your choice without managing infrastructure. It offers auto-scaling and high availability, supports both Windows and Linux OS, enables automated deployments from GitHub, Visual Studio Team Services or any Git repo.

Web Apps not only adds the power of Microsoft Azure to your application, such as security, load balancing, auto scaling, and automated management. You can also take advantage of its DevOps capabilities, such as continuous deployment from VSTS, GitHub, Docker Hub, and other sources, package management, staging environments, custom domain, and SSL certificates.

#### Implementation

This solution contains three web apps one is a frontend web app which is used for all the admin operations, second one is for the web compute engine which is used for text, face recognition and the third one is backend web app which interacts with all other components of the solution like aggregator, compute engine and docdb etc.

### **3.3 Azure Active Directory**

#### **Introduction**

Microsoft Azure Active Directory (Azure AD) is a cloud service that provides administrators with the ability to manage end user identities and access privileges. The service gives administrators the freedom to choose which information will stay in the cloud, who can manage or use the information, what services or applications can access the information and which end users can have access.

#### **Implementation**

Azure Active directory is used to authenticate users to login to Web Application. Azure active Directory enables secure authentications to web application

### **3.4 Cosmos DB**

#### **Introduction**

Azure Cosmos DB is a Microsoft cloud database that supports multiple ways of storing and processing data. As such, it is classified as a multi-model database. In multi-model databases, various database engines are natively supported and accessible via common APIs.

#### **Implementation**

In this Solution, Cosmos DB have Templates, Messages and Groups Collections. The Messages collections will get updated with the telemetry data of the Device.

### **3.5 OMS Log analytics**

#### **Introduction**

The Microsoft Operations Management Suite (OMS), previously known as Azure Operational Insights, is software as a service platform that allows an administrator to manage on-premises and cloud IT assets from one console.

Microsoft OMS handles log analytics, IT automation, backup and recovery, and security and compliance tasks. Log analytics will collect and store your data from various log sources and allow you to query over them using a custom query language.

#### **Implementation**

In this solution OMS is used for getting logs for each component like web app, cosmosDB, event hub and cognitive services etc.

### 3.6 Application Insights

Application Insights is an extensible Application Performance Management (APM) service for web developers on multiple platforms. Use it to monitor live web application. It will automatically detect performance anomalies. It includes powerful analytics tools to help diagnose issues and to understand what users do with web application.

Application Insights monitor below:

- Request rates, response times, and failure rates
- Dependency rates, response times, and failure rates
- Exceptions
- Page views and load performance
- AJAX calls
- User and session counts
- Performance counters
- Host diagnostics from Docker or Azure
- Diagnostic trace logs
- Custom events and metrics

#### Implementation

Application Insights to provide monitoring for Web Application. Application Insights store the logs of the Web API which will be helpful to trace the web API working.

### 3.7 Power BI

#### Introduction

Power BI is a suite of business analytics tools that deliver insights throughout your organization. Connect to hundreds of data sources, simplify data prep, and drive ad hoc analysis. Produce beautiful reports, then publish them for your organization to consume on the web and across mobile devices. Everyone can create personalized dashboards with a unique, 360-degree view of their business. And scale across the enterprise, with governance and security built-in.

#### Implementation

Power BI desktop is used to visualize the output of the solution. Power BI gathers data from Cosmos DB and presents in pictorial representation like bar charts or graphs. In this solution Power BI templates are used to generate the custom reports.

### 3.8 Cognitive Services

#### Introduction

Microsoft Cognitive Services are a set of APIs, SDKs and services available to developers to make their applications more intelligent, engaging and discoverable. Microsoft Cognitive Services expands on Microsoft's evolving portfolio of machine learning APIs and enables developers to easily add intelligent features – such as emotion and video detection; facial, speech and vision recognition; and speech and language understanding – into their applications. Our vision is for more personal computing experiences and enhanced productivity aided by systems that increasingly can see, hear, speak, understand and even begin to reason.

## **Implementation**

In this solution Face API and Compute Vision are used for face detection and face recognition.

## **4.0 Solution Types & Cost Mechanism**

Tiers help the customer to choose to deploy Azure resources with minimal cost for regular use or maximum cost for production/enterprise use. The Security and Surveillance automated solution have 3 pricing tiers named Basic, Standard and Premium based on type of resources used in the deployment. Generally, for testing or POCs the customer can choose Basic pricing tier and for production/ enterprise grade solutions he can choose Standard/Premium tier.

### **4.1 Solutions and Associated Costs**

The solutions are created considering users requirements & have cost effective measures. Users have control on what type of Azure resources can be deployed with respect to Stock Keeping Unit (SKU) or pricing tiers.

These options would enable the users to choose, which Azure resources to be deployed with minimal SKU and production SKU.

The cost models per solutions are explained in further sections:

### **4. 2 Basic**

The Basic solution requires minimum Azure components with minimal available SKU's. This Solution provides (Core + Security + Monitoring) features such as security, application Insights & OMS Log Analytics.

The estimated Monthly Azure cost is: **\$142.76**

**Note:** Refer below table for the optional component list & Features

**Pricing Model for Basic Solution:**

Prices are calculated by Considering Location as West US and Pricing Model as "PAYG".

Basic Solution Costing Details			
Source Name	Size	Resource costing model	Azure Cost/month
Application Insights	Basic, 1GB * \$2.30 First 5GB free per month	PAYG	\$2.30
App Service	Basic Tier; 1 B1 (1 Core(s), 1.75 GB RAM, 10 GB Storage) x 730 Hours; Windows OS	PAYG	\$54.75
IoT Hub	Standard Tier, S1: Unlimited devices, 4,00,000 msgs/day, \$25.00/mo, 1 Units	PAYG	\$25.00
Event Hubs	Standard tier: Maximum throughput units: 20. Up to 1 MB per second of ingress events. Up to 2 MB per second of egress events. 1 million ingress events and 1 throughput unit per month	PAYG	\$21.93



Storage	Block Blob Storage, Blob Storage, LRS Redundancy, Hot Access Tier, 100 GB Capacity, 100,000 Write operations, 100,000 List and Create Container Operations, 100,000 Read operations, 1 Other operations. 1,000 GB Data Retrieval, 1,000 GB Data Write	PAYG	\$3.12
Azure Cosmos DB	0 GB storage, 4 x100 RUs	PAYG	\$25.86
Azure Active Directory B2C	50,000 user(s), 50,000 authentication(s), 0 authentication(s)	PAYG	\$0
Log Analytics	First 5GB of data storage is free. Per GB(Standalone). After finishing 5GB, \$2.30 per GB	PAYG	\$2.30
Cognitive Services	* Face: Standard tier, 1,000 transactions (Up to 10 transactions per second) with 1,000 faces stored per month with \$1.25 of each.	PAYG	\$2.50
Cognitive Services	2 * computer vision: S1, Up to 10 transactions per second.1,000 transactions per one unit with \$2.50 of each	PAYG	\$5.00
Total Cost/Month			\$142.76

### 4.3 Standard

The standard solution provides (Core + Security + Monitoring + Hardening) features such as security, application Insights, OMS Log Analytics, High Availability & Disaster recovery. The details on components used in this section is listed in the table given below

Prices are calculated by Location as **West US** and Pricing Model as **"PAYG"**.



The Estimated Monthly Azure cost is: **\$266.13**

*Note: Refer below table for the optional component list & Features*

**Pricing Model for Standard Solution:**Prices are calculated by Location as **West US** and Pricing Model as **"PAYG"**.

Standard Solution Costing Details			
Resource Name	Size	Resource costing model	Azure Cost/month
App Service	2*Standard tier S1 (1 Core(s), 1.75 GB RAM, 50 GB Storage) x 730 Hours; Windows OS(\$73.00 per App service)	PAYG	\$146.00
Traffic Manager	0 million DNS queries/mo, 2 Azure endpoint(s), 0 Fast Azure endpoint(s), 0 External endpoint(s), 0 Fast External endpoint(s), 0 million(s) of user measurements, 0 million(s) of data points processed.	PAYG	\$0.72
IoT Hub	Standard Tier, S1: Unlimited devices, 400,000 msgs/day, \$25.00/mo, 1 Units	PAYG	\$25.00
Event Hubs	Standard tier: Maximum throughput units: 20. Up to 1 MB per second of ingress events. Up to 2 MB per second of egress events.1 million ingress events and 1 throughput unit per month	PAYG	\$21.93
Storage	Block Blob Storage, General Purpose V2, GRS Redundancy, Hot Access Tier, 100 GB Capacity, 1,00,000 Write operations, 1,00,000 List and Create Container Operations, 1,00,000 Read operations, 1 Other operations. 100 GB Data Retrieval, 100 GB Data Write, 100 GB Geo-replication data transfer	PAYG	\$8.62

<b>Cognitive Services</b>	4 * Face: Standard tier, 1,000 transactions (Up to 10 transactions per second) with 1,000 faces stored per month with \$1.25 of each.	PAYG	\$5.00
<b>Cognitive Services</b>	4* computer vision: S1, Up to 10 transactions per second.1,000 transactions per one unit with \$2.50 of each	PAYG	\$10.00
<b>Azure Active Directory B2C</b>	50,000 user(s), 50,000 authentication(s), 0 multi- factor authentication(s)	PAYG	0
<b>Log Analytics</b>	First 5GB of data storage is free. Per GB(Standalone). After finishing 5GB, \$2.30 per GB.here we are taking 10 gb storage	PAYG	\$11.50
<b>Application Insights</b>	Basic, 1GB * \$2.30 First 5GB free per month.Here we are taking 10 GB storage	PAYG	\$11.50
<b>Total Cost/Month</b>			<b>\$266.13</b>

#### 4.4 Premium

This solution also provides (Core + Monitoring +Hardening), the difference between Standard & Premium solution is under Premium - Both the regions can be deployed at same time, and however this is not possible under standard solution. The details on components used in this solution are listed in Section:

The Estimated Monthly Azure cost is: **\$266.13**

#### Pricing Model for Premium Solution:

Prices are calculated by Considering Location as **West US** and Pricing Model as **"PAYG"**.

## Premium Solution Costing Details

Resource Name	Size	Resource costing model	Azure Cost/month
<b>App Service</b>	2*Standard tier S1 (1 Core(s), 1.75 GB RAM, 50 GB Storage) x 730 Hours; Windows OS(\$73.00 per App service)	PAYG	\$146.00
<b>Traffic Manager</b>	0 million DNS queries/mo, 2 Azure endpoint(s), 0 Fast Azure endpoint(s), 0 External endpoint(s), 0 Fast External endpoint(s), 0 million(s) of user measurements, 0 million(s) of data points processed.	PAYG	\$0.72
<b>IoT Hub</b>	Standard Tier, S1: Unlimited devices, 400,000 msgs/day, \$25.00/mo, 1 Units	PAYG	\$25.00
<b>Event Hubs</b>	Standard tier: Maximum throughput units: 20. Up to 1 MB per second of ingress events. Up to 2 MB per second of egress events.1 million ingress events and 1 throughput unit per month	PAYG	\$21.93
<b>Storage</b>	2* Block Blob Storage, General Purpose V2, GRS Redundancy, Hot Access Tier, 100 GB Capacity, 1,00,000 Write operations, 1,00,000 List and Create Container Operations, 1,00,000 Read operations, 1 Other operations. 100 GB Data Retrieval, 100 GB Data Write, 100 GB Geo-replication data transfer	PAYG	\$17.24

<b>Cognitive Services</b>	4 * Face: Standard tier, 1,000 transactions (Up to 10 transactions per second) with 1,000 faces stored per month with \$1.25 of each.	PAYG	\$5.00
<b>Cognitive Services</b>	4 * computer vision: S1, Up to 10 transactions per second.1,000 transactions per one unit with \$2.50 of each	PAYG	\$10.00
<b>Azure Active Directory B2C</b>	50,000 user(s), 50,000 authentication(s), 0 multi-factor authentication(s)	PAYG	0
<b>Log Analytics</b>	First 5GB of data storage is free. Per GB(Standalone). After finishing 5GB, \$2.30 per GB.here we are taking 10 gb storage	PAYG	\$11.50
<b>Application Insights</b>	Basic, 1GB * \$2.30 First 5GB free per month.Here we are taking 10 GB storage	PAYG	\$11.50
<b>Total Cost/Month</b>			<b>\$266.13</b>

#### 4.5 Core Comparison

In this section we will be comparing the cost for all the solution provided in terms of Features & dollar \$ Impact:

#### 4.6 In terms of features:

The below table explain the distinctive features available across solution types.

2 Dollar Impact:

The below Table explains the \$ impact for the solutions by resources.

Resource Name	Parameter	Basic	Standard	Premium
App Service Plan	SKU	B1	S1	S1
	Cores	1 core	1 core	1 core
	RAM	1.75 GB	1.75 GB	1.75 GB
	Storage	10 GB	50 GB	50 GB
	OS	Windows OS	Windows OS	Windows OS

Traffic Manager	DNS Queries		0 million/month	0 million/month
	Azure Endpoints		2 Endpoints	2 Endpoints
	Fast Interval Health Checks Add-on (Azure)		0 Endpoints	0 Endpoints
	External Endpoints		0 Endpoints	0 Endpoints
	Fast Interval Health Checks Add-on (External)		0 Endpoints	0 Endpoints
	Real User Measurements		0 million measurements	0 million measurements
	Traffic View		0 million data points processed	0 million data points processed
IoT Hub	SKU	S1	S1	S1
	Devices	Unlimited Devices	Unlimited Devices	Unlimited Devices
	Messages	4,00,000 msgs/day	4,00,000 msgs/day	4,00,000 msgs/day
Event Hubs	SKU	Standard	Standard	Standard
	Ingress	1 million events	1 million events	1 million events
	Throughput	1 throughputs	1 throughputs	1 throughputs
Storage	Type	Block Blob Storage	Block Blob Storage	Block Blob Storage
	REDUNDANCY	LRS	GRS	GRS
	Capacity	100 GB	100 GB	100 GB
	Write Operations	100000 Operations	100000 Operations	100000 Operations
	List and Create Container Operations	100000 Operations	100000 Operations	100000 Operations
	Read operations	100000 Operations	100000 Operations	100000 Operations
	All other operations	1 Operations	1 Operations	1 Operations
	Data retrieval	1000 GB	100 GB	100 GB
	Data write	1000 GB	100 GB	100 GB
Cognitive Services (Face)	SKU	Standard	Standard	Standard
	API	Face, 1,000 faces stored per month.	Face, 1,000 faces stored per month	Face, 1,000 faces stored per month
Cognitive Services (Computer Vision)	SKU	S1	S1	S1
	API	computer vision, Up to 10 transactions per second.1,000 transactions per one unit	computer vision, Up to 10 transactions per second.1,000 transactions per one unit	computer vision, Up to 10 transactions per second.1,000 transactions per one unit
Azure Cosmos DB	SKU	Standard		
	Storage	0 Storage		
	Purchase model	4 * 100 RU/sec		
Azure Active Directory B2C	Stored users	50000 users	50000 users	50000 users
	Authentications	50000 Authentications	50000 Authentications	50000 Authentications
	Multi-Factor Authentications	0 Authentications	0 Authentications	0 Authentications
Log Analytics	Data Retention	6 GB, 5 GB of data is included for free.	6 GB, 5 GB of data is included for free.	6 GB, 5 GB of data is included for free.
Application Insights	Logs collected	6 GB, 5 GB of data is included for free.	6 GB, 5 GB of data is included for free.	6 GB, 5 GB of data is included for free.

## 4.7 Dollar Impact

The below Table explains the \$ impact for the solutions by resources.

Resource Name	Basic	Standard	Premium
App Service	\$54.75	\$146.00	\$146.00
IoT-Hub	\$25.00	\$25.00	\$25.00
Event hub	\$21.93	\$21.93	\$21.93
Cognitive Service(Face)	\$2.50	\$5.00	\$5.00
Cognitive Service(Computer vision)	\$5.00	\$10.00	\$10.00
Cosmos DB	\$25.86	\$25.86	\$25.86
Storage Account	\$3.12	\$8.62	\$17.24
Azure Active Directory B2C	\$0.00	\$0.00	\$0.00
Application Insights	\$2.30	\$11.50	\$11.50
Log Analytics	\$2.30	\$11.50	\$11.50
Traffic Manager	\$0.00	\$0.72	\$0.72

## 4.3. Estimated Monthly Cost for each Solution:

Resource Name	Basic	Standard	Premium
Estimated monthly cost	<b>\$142.76</b>	<b>\$240.27</b>	<b>\$248.89</b>

## 4. Further References

### 4.1. Deployment Guide

To Deploy the Security Surveillance solution please refers Deployment Guide.

### 4.2. Admin Guide

To Deploy the Security Surveillance solution please refers Admin Guide.

### 4.3. User Guide

To find how to use Security Surveillance solution once deployed successfully in Azure portal refer User Guide