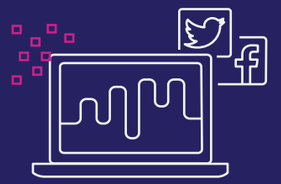
IoT Core & KVS

Jong Hyuok Kim
MFG Solutions Architect

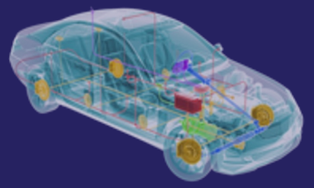
Data sources Trend

Mobile apps



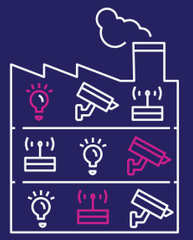
Web clickstream / social

Application logs



IoT sensors

Connected products



Smart buildings

aws

Data Ingestion?

폭발적인 데이터 증가

완전 관리형

저장, 분석, 시각화...

또다른 활용(IoT, AI/ML)

aws

Amazon Kinesis

COLLECT, PROCESS, AND ANALYZE VIDEO AND DATA STREAMS IN REAL TIME

Kinesis Data Streams

Kinesis Data Analytics

Kinesis Video Streams

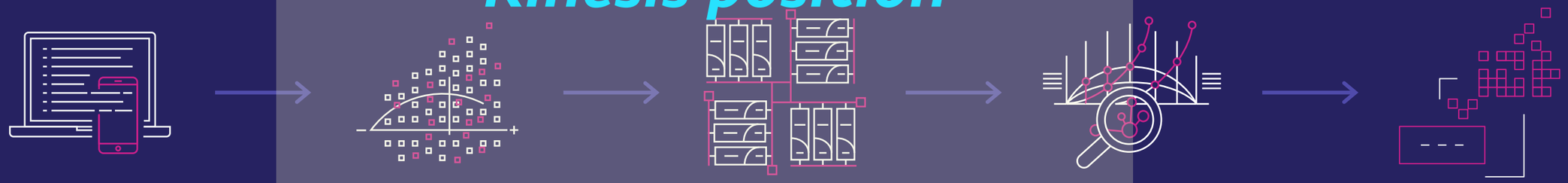
Kinesis Data Firehose

aws

Real-time analytics

Ingest, process, and analyze high volumes of high-velocity data from a variety of sources in real time

Kinesis position



Source

Devices and/or applications that produce real-time data at high velocity

Stream ingestion

Data from tens of thousands of data sources can be collected and ingested in real time

Stream storage

Data is stored in the order it was received for a set duration of time, and can be replayed indefinitely during that time

Stream processing

Records are read in the order they're produced, allowing for real-time analytics or streaming ETL

Destination

Data lake

Data warehouse (most common)

Database (least common)

aws

Amazon Kinesis

Easily collect, process, and analyze data streams in real time

Amazon Kinesis Data Streams

Collect and store data streams for analytics

Amazon Kinesis Data Firehose

Load data streams onto AWS data stores

Amazon Kinesis Data Analytics

Analyze data streams with Amazon Kinesis Data Analytics Studio or Apache Flink

Amazon Kinesis Video Streams

Collect and store video streams for analytics

aws

Amazon Kinesis Video Streams

Amazon Kinesis Video Streams

Amazon Kinesis Video Streams with WebRTC

aws

AWS IoT Core – 수집된 데이터를 특정 서비스로 라우팅

디바이스와 AWS간 안전한 상호작용

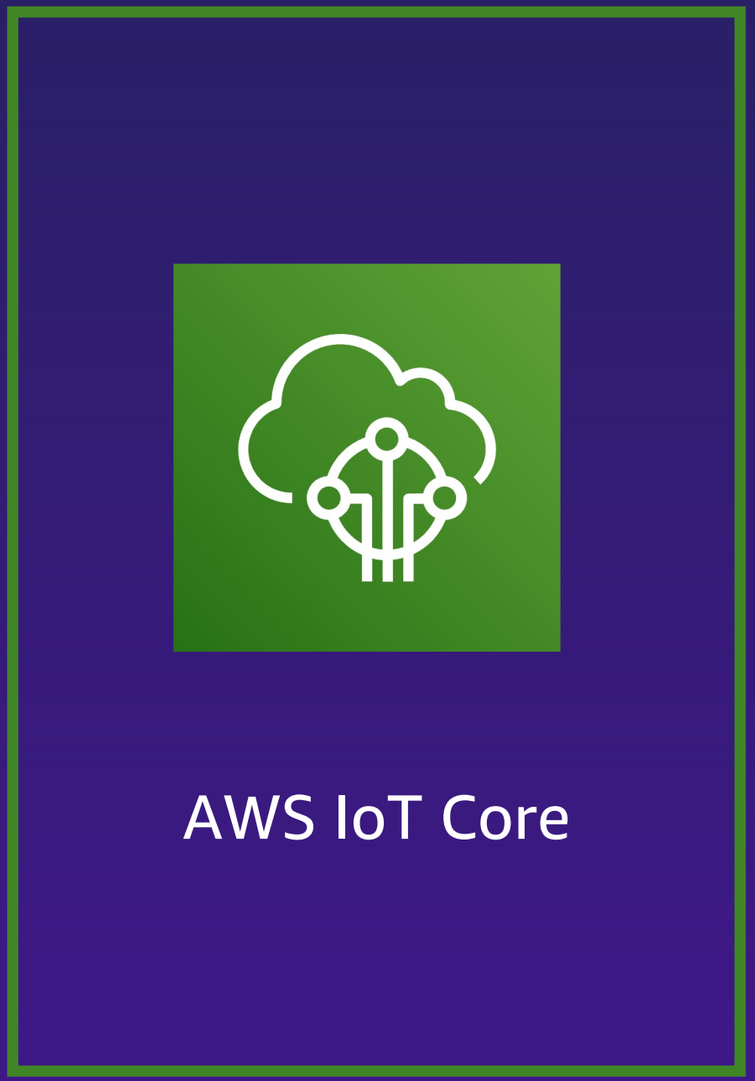
- 사용자 지정 규칙에 따라 디바이스 데이터를 필터링, 변환하고 AWS IoT와 연결하는 서비스

수집 대상 디바이스의 Topic 구독

- 디바이스와 MQTT Protocol을 통해 연결하고 수집되는 데이터를 구독

IoT Rule로 IoT Sitewise와의 연계

- Edge에서 생성된 데이터를 AWS IoT Sitewise로 Routing 처리



Overview

Background

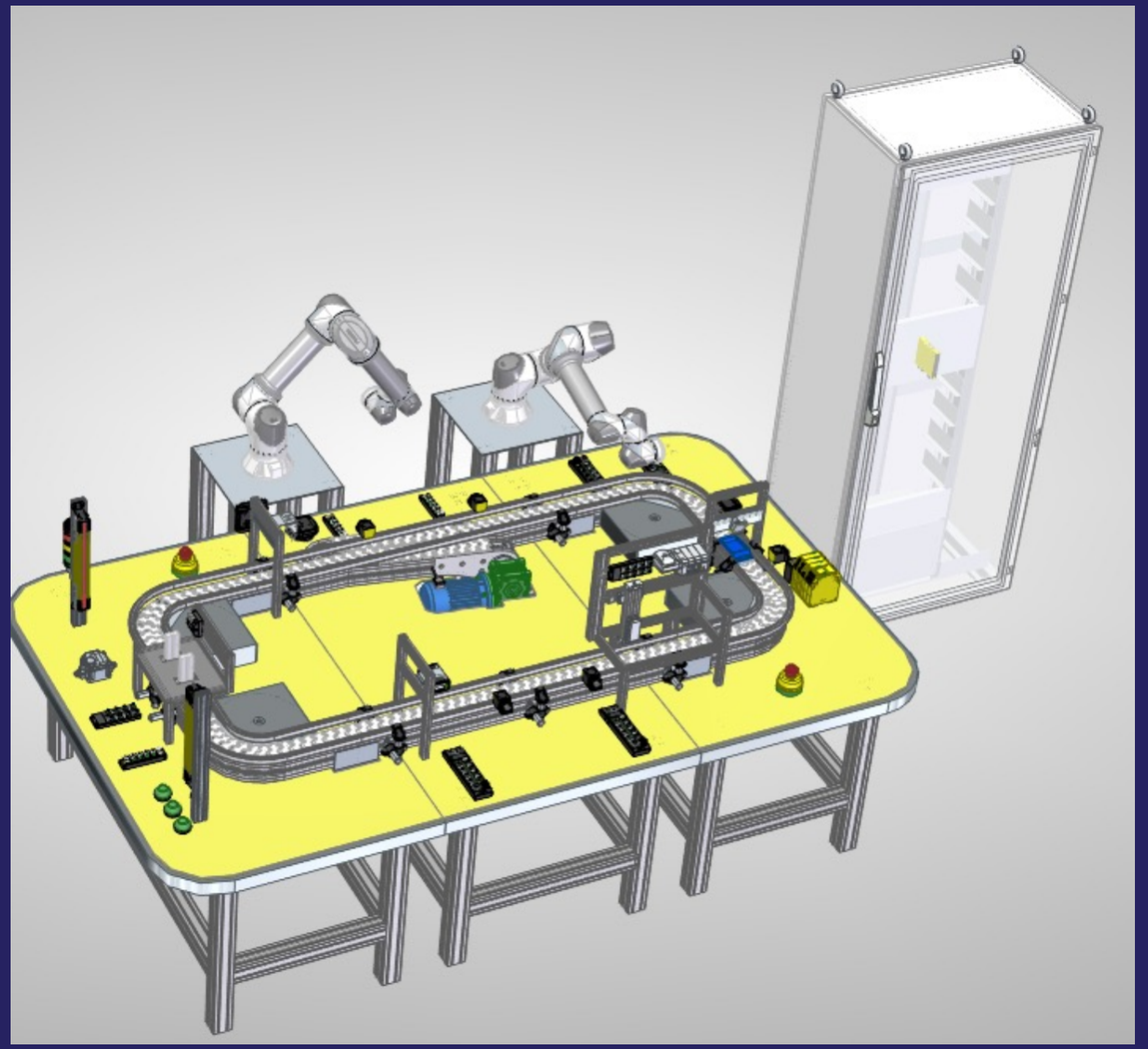
- BIOPLUS-INTERPHEX KOREA (August 3-5, 2022) is the biggest bio-pharmaceutical exhibition that encompasses biopharmaceutical Value Chain and proposes ways to expand overseas by building global business networks.
  https://www.bioplusinterphex.co.kr/

Scenario

- Korea's IoT specialists SA and Account SA work with Turck Korea Team to build digital twin demonstrations to manufacture medical equipment.
  For this demonstration, AWS IoT Twin Maker, IoT Sitewise and Kinesis Video Streams are used, and eventually Turck Korea's mini conveyor is implemented as a digital twin.

Goal

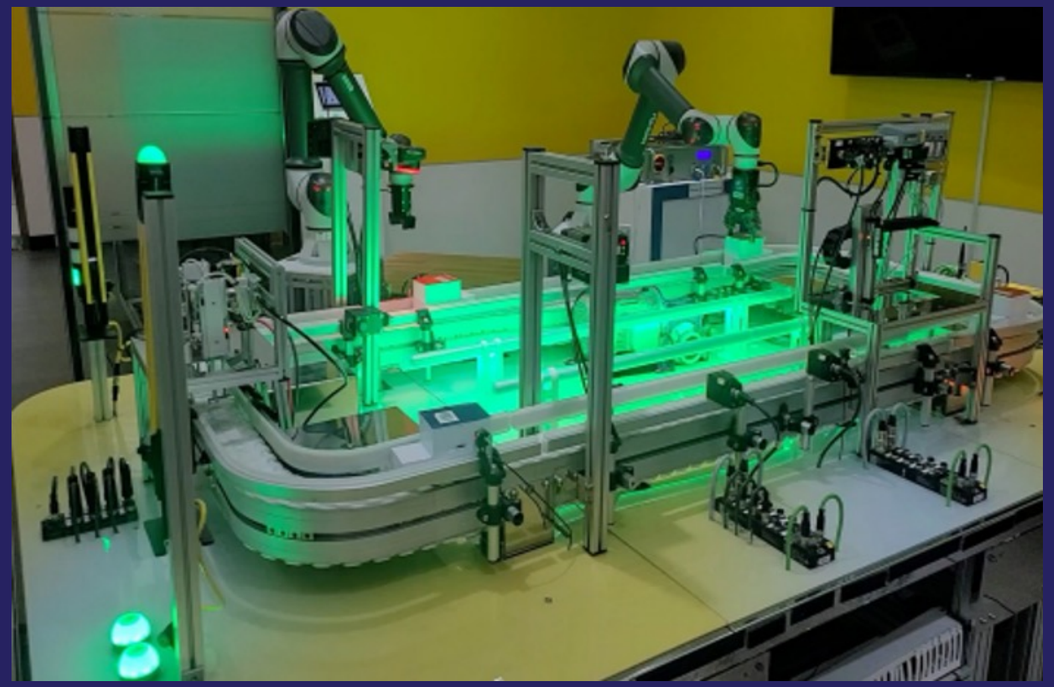
- Data from the conveyor can be collected from AWS Greengrass in an Edge environment to AWS Cloud and monitored in real time through AWS twin makers and Grafana dashboards.
  The data collected from this demonstration is as follows:
  (conveyor, Robot, Sensor, Vision, Telemetry and more)



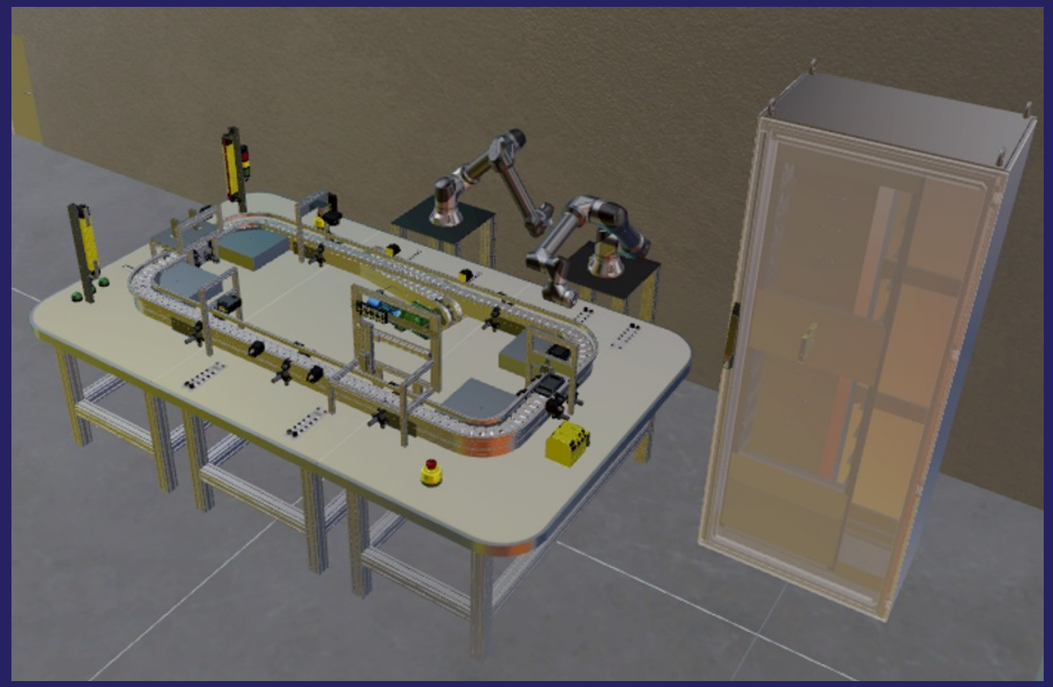
aws

활용 CASE

Actual Equipment(Turck Korea)



Digital Twin(Amazon Twin Maker)



Process of the Digital Twin

- Turck Korea의 산업용 장비(Conveyor, Cabinet, Robot 등) 으로 부터 데이터를 Edge(MiniPC) 영역에 수집
- AWS IoT Core>AWS IoT Sitewise를 통해 수집된 데이터를 모델/자산화
- 3D로 모델링된 오브젝트를 lib화 하여 AWS에 저장소에 적재
- 데이터 모델과 3D 오브젝트의 값을 Mapping
- AWS Twinmaker를 데이터소스로 하는 대시보드에서 **이미지/비디오/시계열** 데이터 로딩

Ingested Data : Type

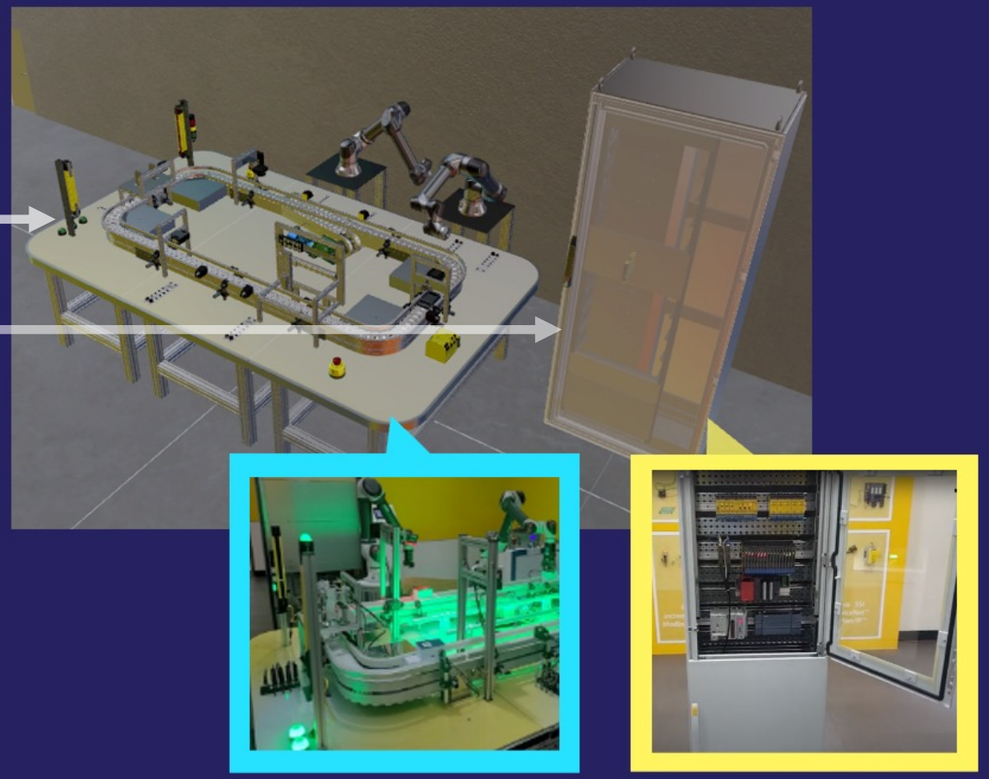
Conveyor(TCG20) Data	
status : *unit*	temperature : *float*
color : *unit*	z-velocity : *float*
barcode : *unit*	x-velocity : *float*
robot1 : *unit*	z-accelation : *float*
robot2 : *unit*	x-accelation : *float*

Cabinet(CCM50,51) Data	
temperature : *float*	humidity : *float*
sn : *double*	value :

CCTV/CAM Data	
Video Stream	

Conveyor Data

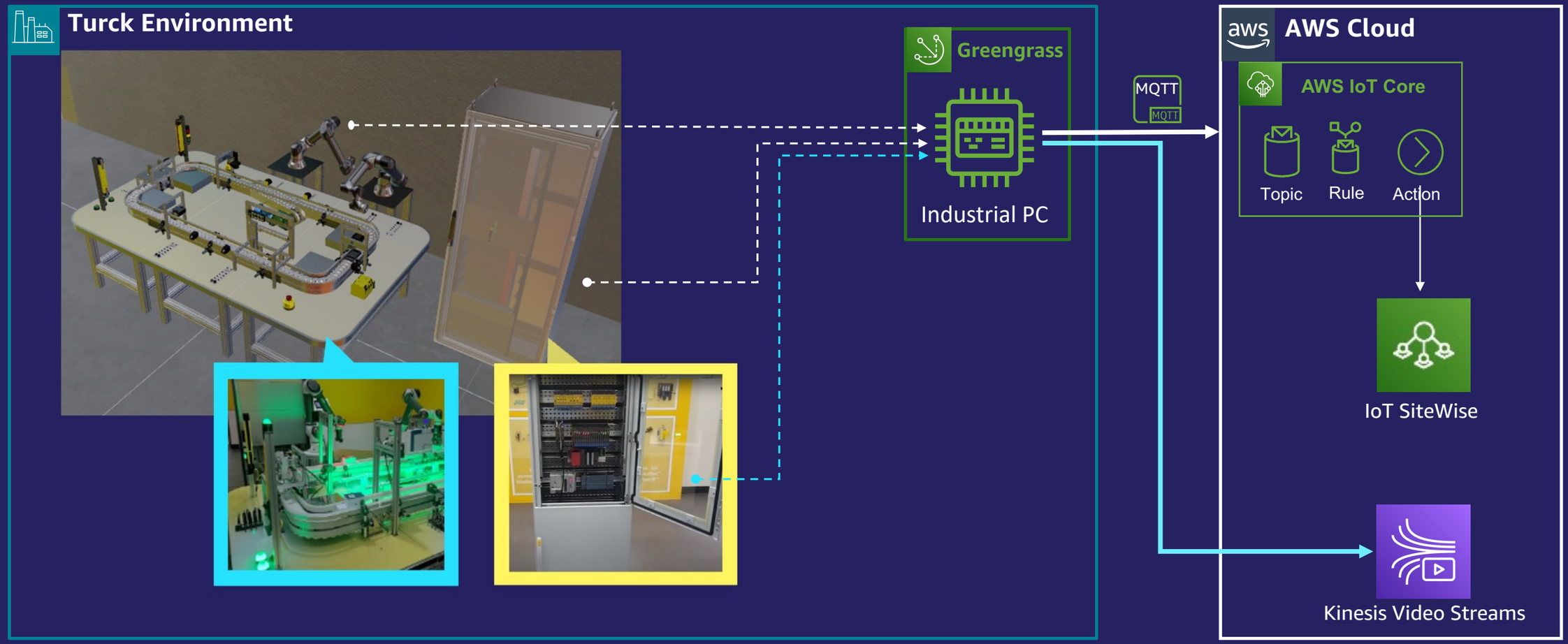
Cabinet Data



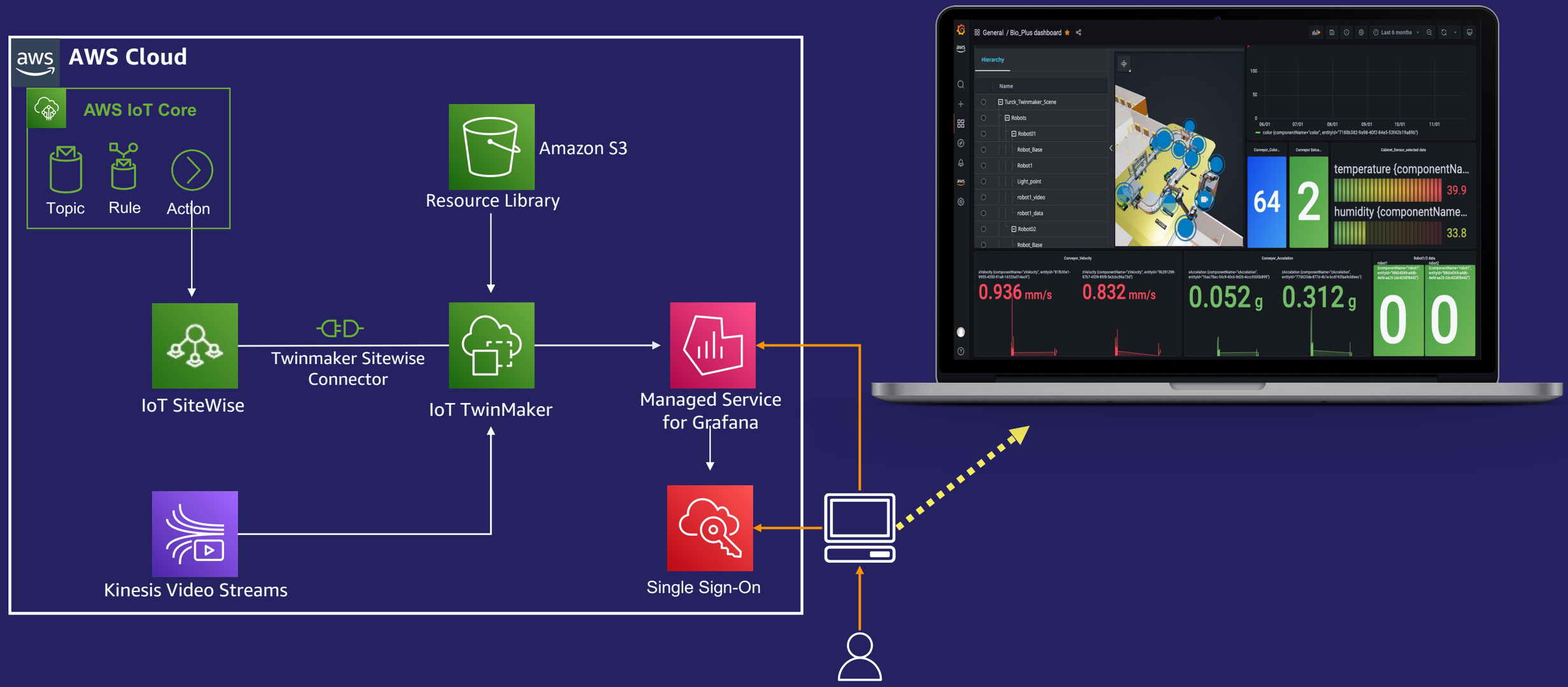
Video Stream Data

aws

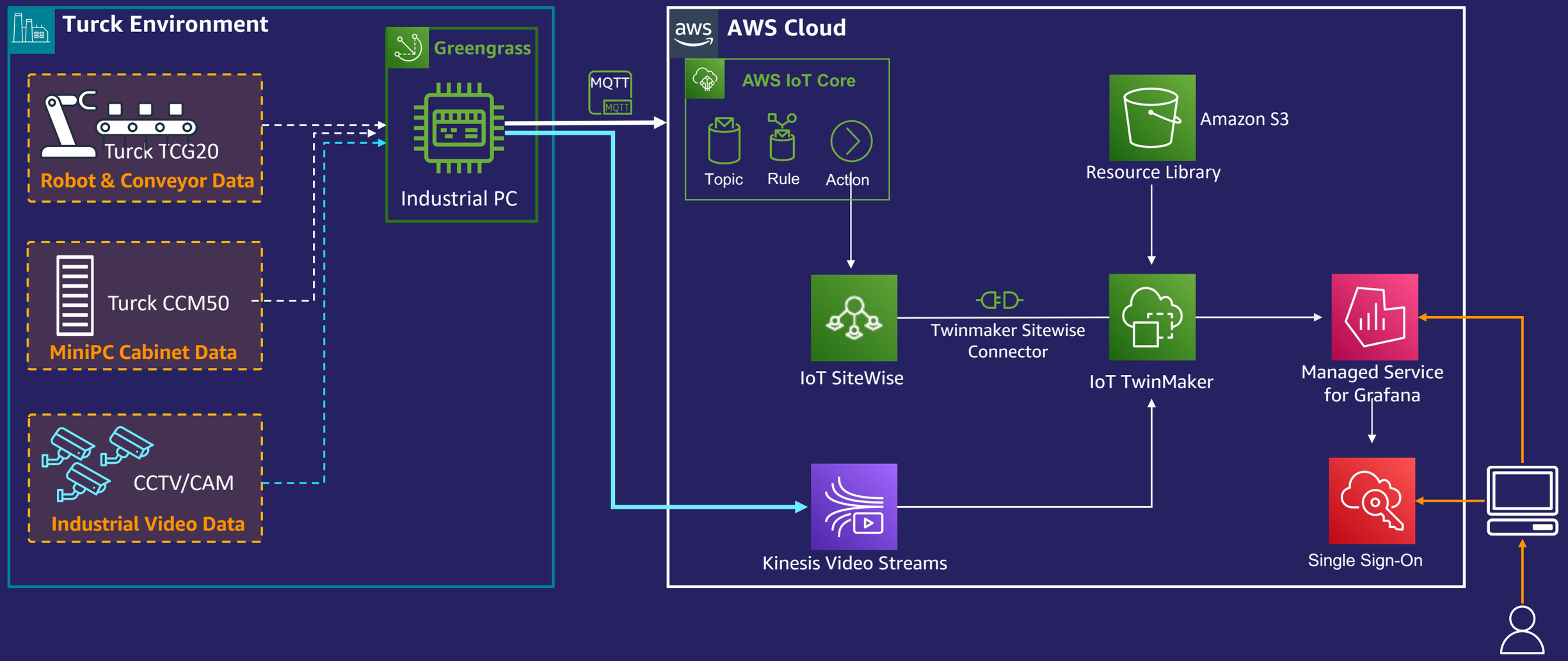
Ingested Data : AWS Services



Viewer : Building & Monitoring



Architecture



Amazon Managed Grafana - Monitoring



현장 운영자를 위한 대시보드 생성

- 디지털 트윈을 3D지원 애플리케이션에 통합

다양한 형태의 데이터를 표현

- Sitewise 의 시계열, Twinmaker의 3D Scene, KVS의 비디오 데이터 등

AWS IoT Twinmaker와 연계

- SSO를 통해 로그인 하고, Twinmaker의 Component들을 대시보드에 표현

Thank you!