AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

GPS316

Accelerate your smart building strategy with AWS Quick Starts

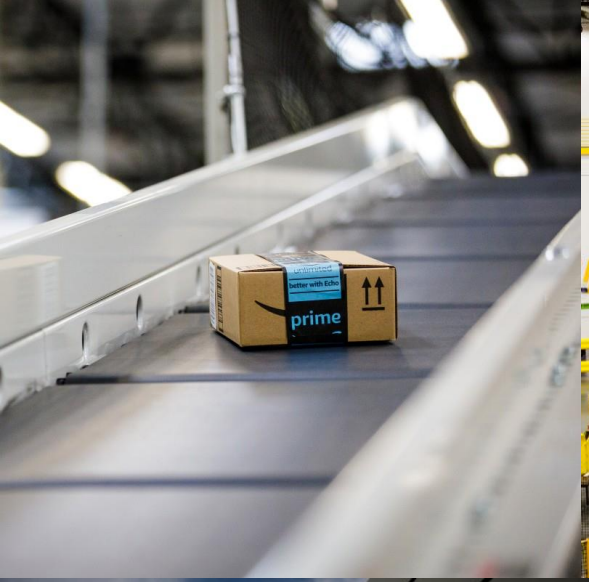
Ivan Panushev
Principal Partner Solutions Architect
Engineering, Construction & Real Estate
AWS

Vinod Shukla
Sr. Partner Solutions Architect
AWS Integration & Automation
AWS

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Why smart buildings?

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.































aws internet of things

IoT is breathing life into buildings today

1 million live data points

40 disparate systems

250 daily users

1 user interface

Monitor
Measure
Manage

Systems


Security and access control


CCTV


Digital signage


Fire services


Hydraulics


Lighting control


Mechanical and climate controls


Metering


Vertical transportation


Waste and recycling

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What is driving transformation in the built environment?

Sustainability
Reducing carbon footprint and achieving net-zero for buildings

Health and safety
Post-pandemic safety and health measures to ensure an agile workspace for collaboration

Customer experience
Workplace as a place to innovate, collaborate, and drive engagement for employees



Data is a key enabler

Digital twins
Ability to model future behavior and anticipate how a building will react to changes

Smart buildings
Natural and intuitive interfaces for building access, security, and operations

Virtual buying
Buying and selling is becoming 100% virtual, powered by VR and online transactions

aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What are the business requirements?

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.



74% of commercial real estate leaders report that a smart building strategy produces a competitive advantage

Reduce energy consumption and CO_2 emissions by up to **30%**

Reduce maintenance cost by up to **40%**

Improve cognitive function by as much as **60%**

Transparency on building performance **100%**

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What are our customers telling us?

1

"I want to own and access my smart building data."

2

"I can't be locked in to a single software or hardware vendor."

3

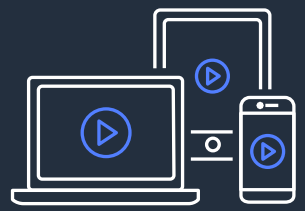
"I need solutions that deliver on my business outcomes."

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Smart buildings deliver on business outcomes



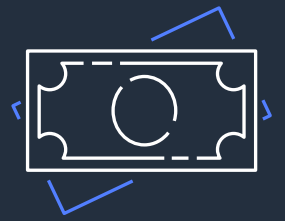
Create new revenue sources



Optimize operations & predict failures



Forecast demand, occupancy & expenses



Reduce energy usage and costs



Improve customer experience & loyalty



Meet or exceed sustainability goals



Enhance safety and security



Liberate data and reveal insights

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Who is the customer?

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What are the key use cases for a smart building?

Building management

- BIM and intelligent integration
- Data combination (weather/utility pricing/HVAC)
- All machinery granular, historical

Meeting management

- Social distancing
- Room reservations
- Occupancy detection & indicators
- Floor navigation kiosks
- People counting/code compliance

Workspace management

- Luminaires with motion
- THO sensors
- Cafeteria/food experience management
- Remote ordering

Parking management

- Real-time parking availability
- Parking reservations
- Smart phone parking app
- Access, validation, and payment
- Electric vehicle charging

Service management

- Smart key for business
- Smart lockers
- Real-time condition survey
- Parcel delivery lockers

Data integration & analytics

- Dashboards and control surfaces
- Data ingest, cleaning, and reporting
- IoT orchestration/management
- Cloud connectivity
- Usage-based predictive analytics

Health & wellness

- WELL building monitoring
- Thermal check and social distancing
- Area hygiene
- Filter/air quality monitoring
- Emergency response

Security & surveillance

- Biometric readers
- Zone management
- Ingress/egress management
- Building surveillance
- Intrusion detection and alerting

Space management

- Sensor-based space management
- Track meeting room utilization
- Building usage analytics

Energy management

- Customer-controlled lighting & HVAC
- Smart windows – auto tinting
- Smart lighting
- Real-time data – electric, water, gas
- Battery walls, inverters

Equipment management

- Equipment measurement & metering
- Predictive maintenance
- Energy consumption against baselines
- Digital twin operations

Customer experience

- Mobile application for tenants
- Geofencing/location awareness
- Digital kiosks and virtual assistants
- Digital room signage
- Service requests

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

How do we see buildings evolving?

Level 1

Connected building



- Automated rules
- BMS/PMS-enabled
- Standardized processes
- Scheduled maintenance

Many of our customers are here

Level 2

Intelligent building



- IoT sensors (connected)
- Cloud connectivity
- Remote monitoring
- Building mgmt. system
- Control dashboards
- Prescriptive maintenance

Level 3

Smart building



- Machine learning abilities
- Digital twin modeling
- Energy management
- Human-centric (WELL)
- Hygiene-aware (air, water)
- Open architecture, protocols
- Predictive analytics
- Responsive security

Level 4

Cognitive building



- Automated maintenance
- Machine-to-machine comms
- Energy-neutral
- Carbon-neutral
- Threat-aware
- Robotics-enabled
- Computer vision
- AR/VR-based systems
- Self-learning
- Self-diagnosing
- Self-healing

aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

A few existing deployments



We have joined with members of the real estate industry to bring the Alexa Smart Properties experiences to our shared customers. Our first collaborations were launched in the United States, but demand has rapidly grown to cover all of our geographies, which include the **UK, Germany, France, Spain, Italy, Japan, India, Australia, New Zealand, Canada, and Mexico,** with more countries being added all the time.

Currently, there are hundreds of thousands of multi-tenant properties enjoying the results of these collaborations. Some prominent examples **in the United States include**

AUTODESK

Carrier

Wattics

Cognizant

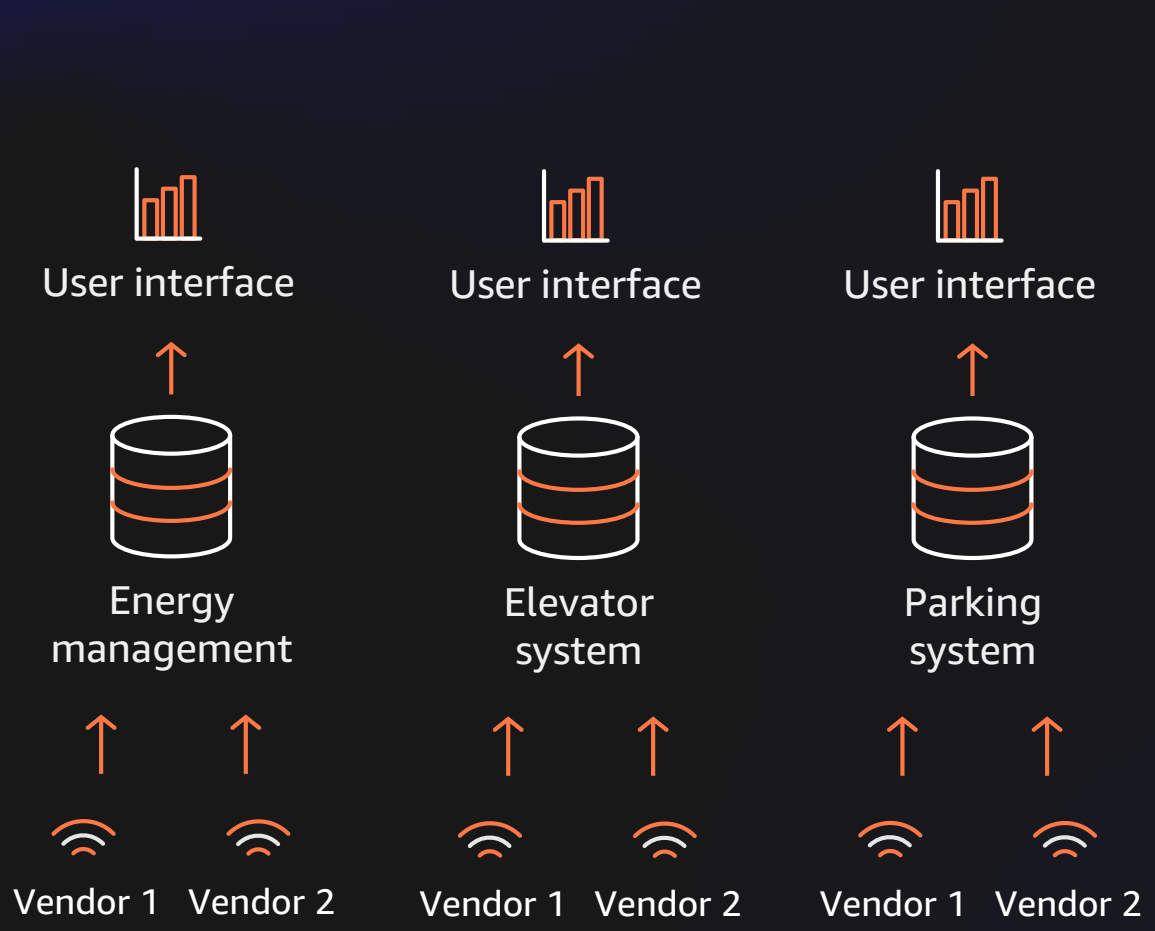
BOSCH

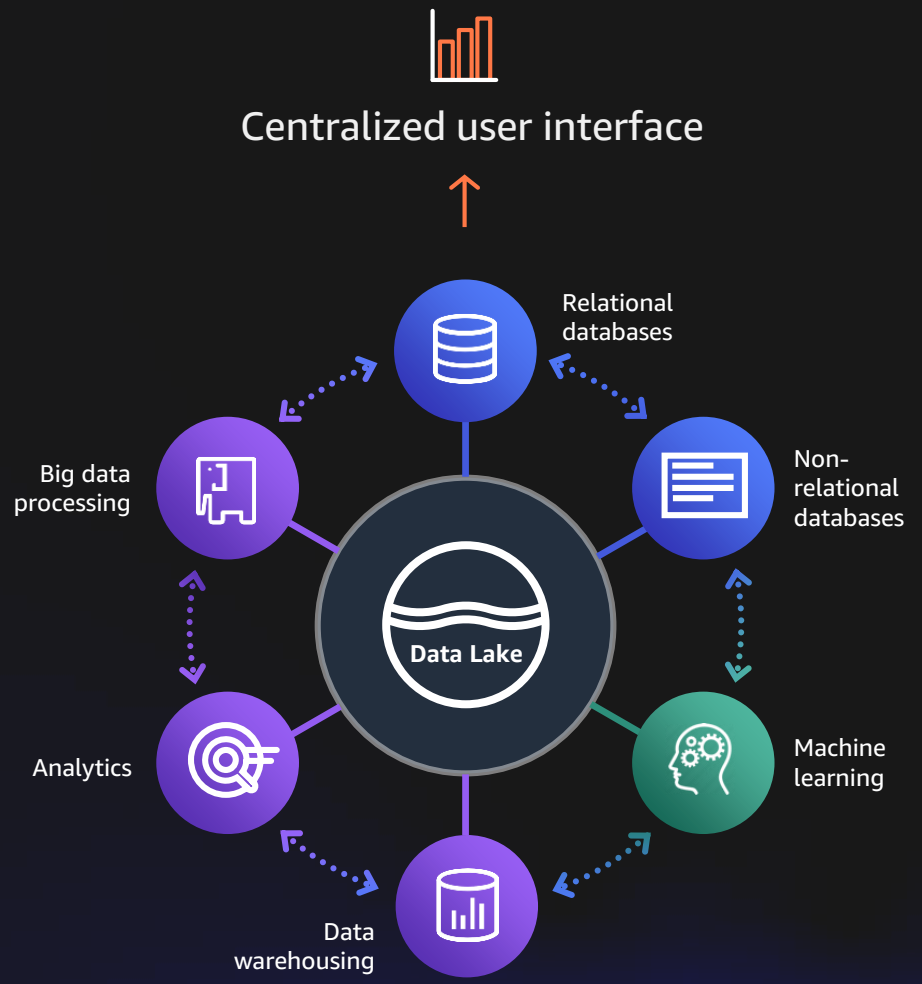
TensorIoT

aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

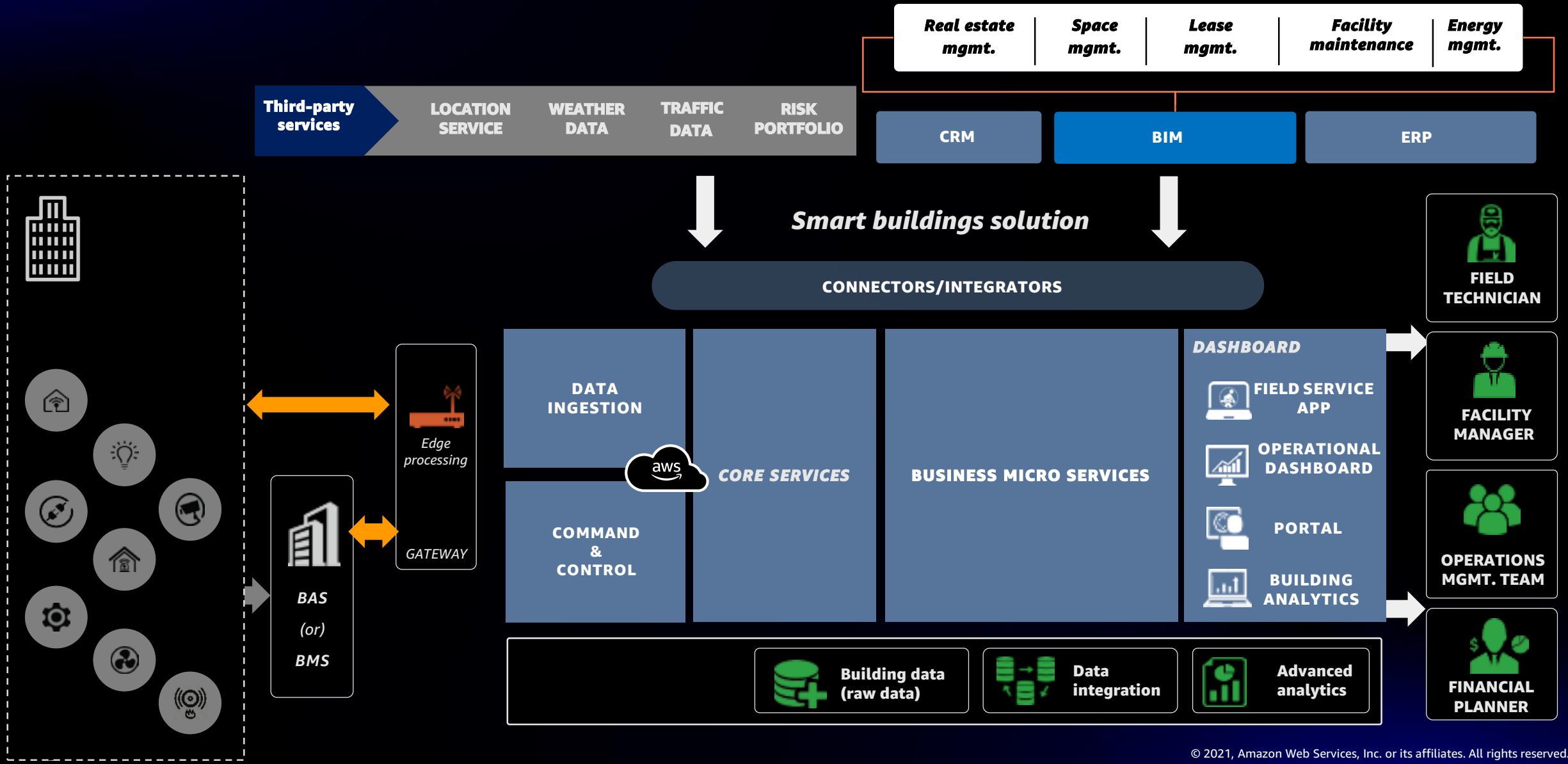
Unlock data across multiple building systems





© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Smart buildings reference architecture: Example



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.



FORGE

HTML CSS JavaScript

A set of web service APIs



node.js

RESTful API

GET PUT POST DELETE

React

Microsoft .NET



aws

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

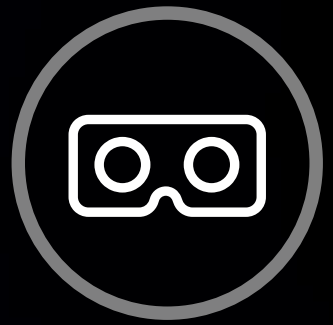
What customers and partners build with Forge



Data visualization & analysis



Digital twin



Augmented & virtual reality



SaaS integration



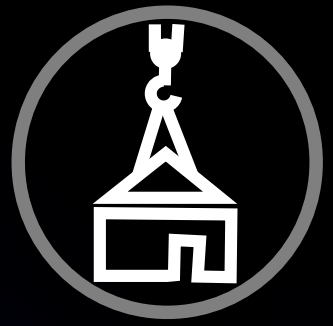
Catalogs



Configurators



Design automation



Prefabrication

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Air quality analysis



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Real-time monitoring



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

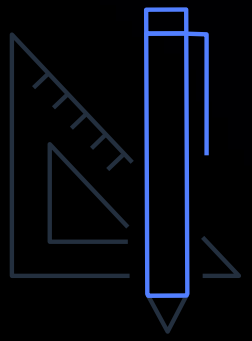
How to Quick Start with Autodesk Forge

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

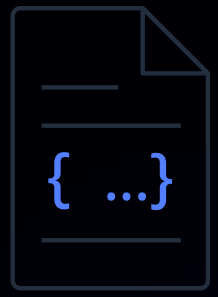
What are AWS Quick Starts?

AWS Quick Starts are ready-to-use accelerators that fast-track deployments of key cloud workloads for customers; these accelerators reduce hundreds of manual procedures into automated, workflow-based reference deployments for partner technologies

AWS Quick Starts are made up of



Reference architecture with AWS best practices built in



Scripted ”push-button” deployments using AWS CloudFormation

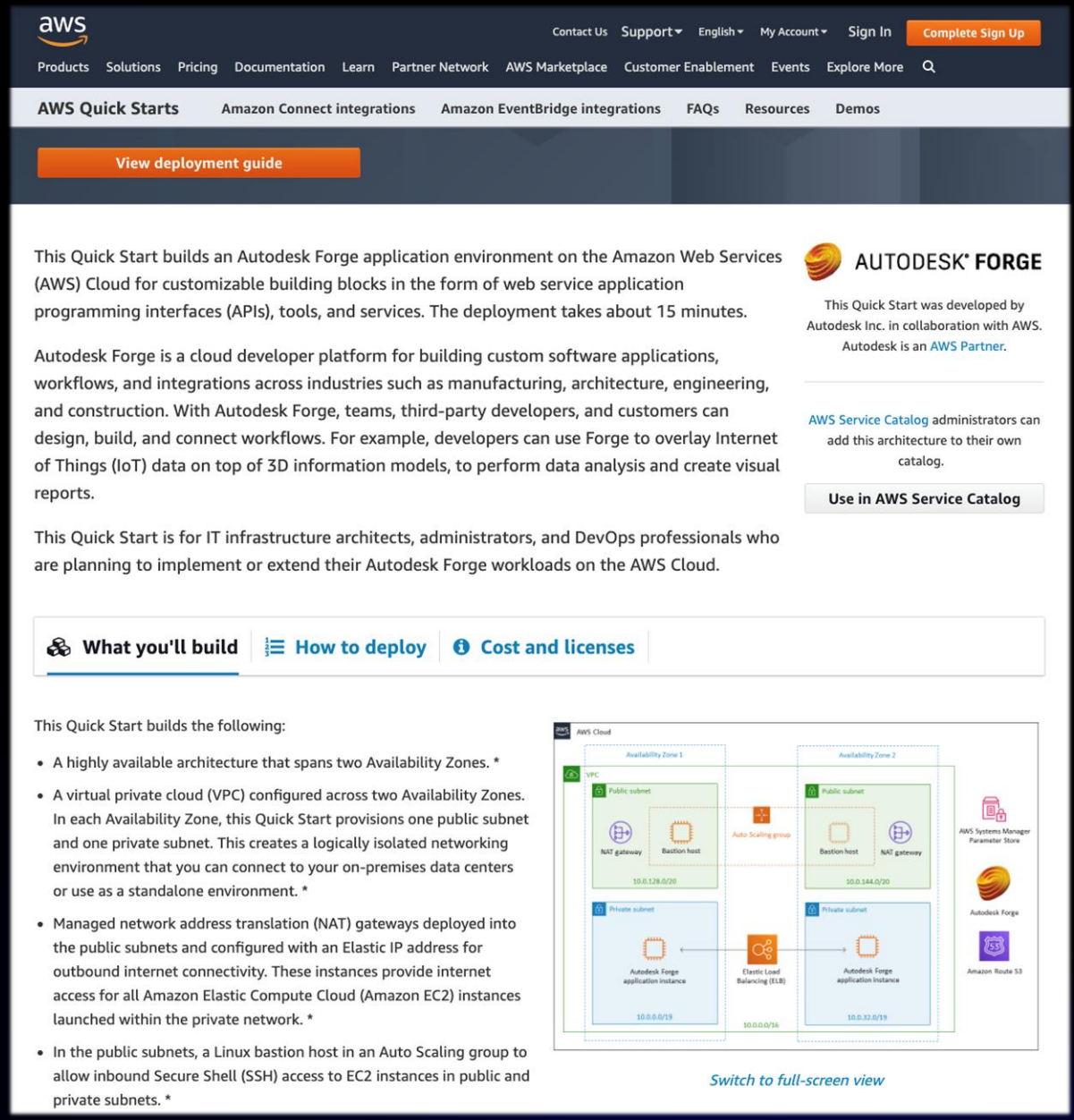


Detailed, step-by-step architecture and deployment guides

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS Quick Starts are made up of

- A reference architecture with AWS best practices built in
- A “push-button” way to deploy that best-practice architecture using AWS CloudFormation
- A deployment guide that describes the architecture in depth

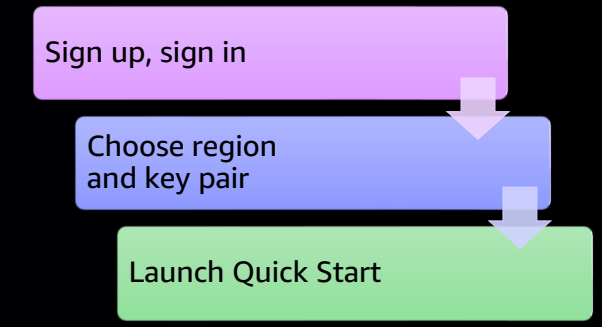


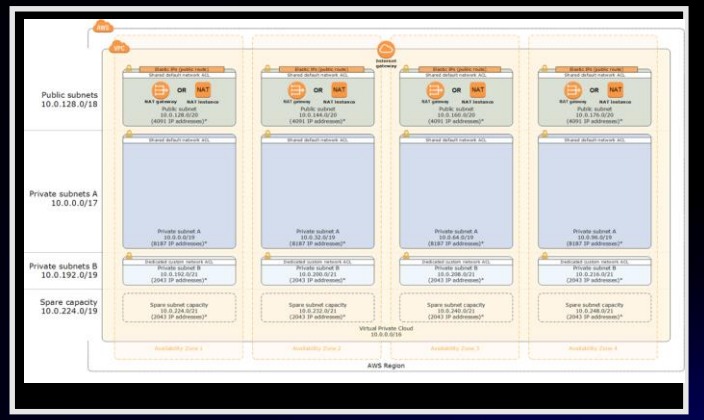
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Why Quick Starts?

Manual Deployment

Sign up, sign in	• 1 step
Choose region and key pair	• 2 steps
Create VPC	• 4 steps
Create internet gateway	• 4 steps
Create 12 subnets	• 24 steps
Create 4 NACLs	• 24 steps
Create 4 NAT gateways	• 16 steps
Create 9 route tables	• 27 steps
Create routes	• 2 steps
Add more stacks	• Many more steps





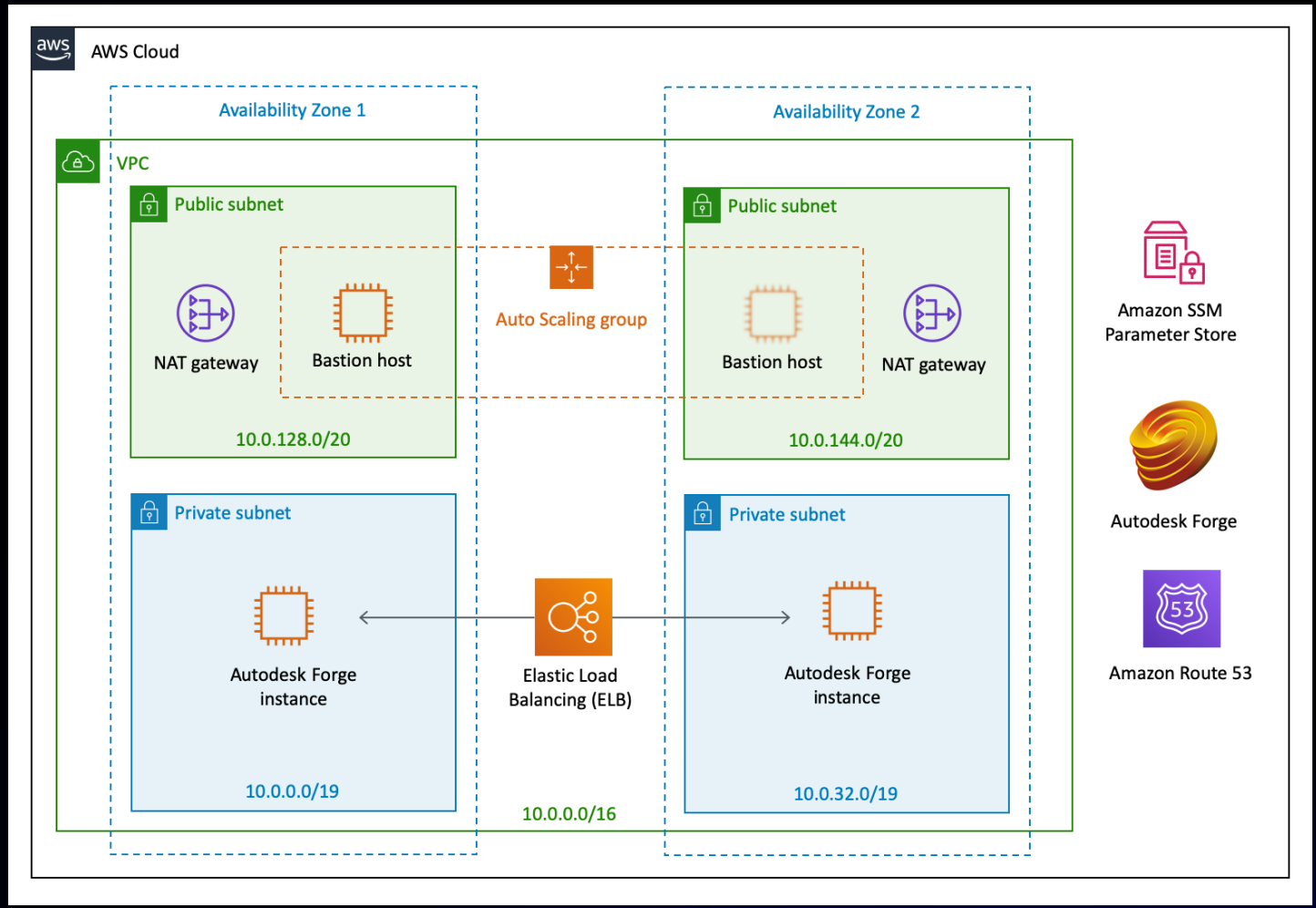
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Autodesk Forge Quick Start deployment

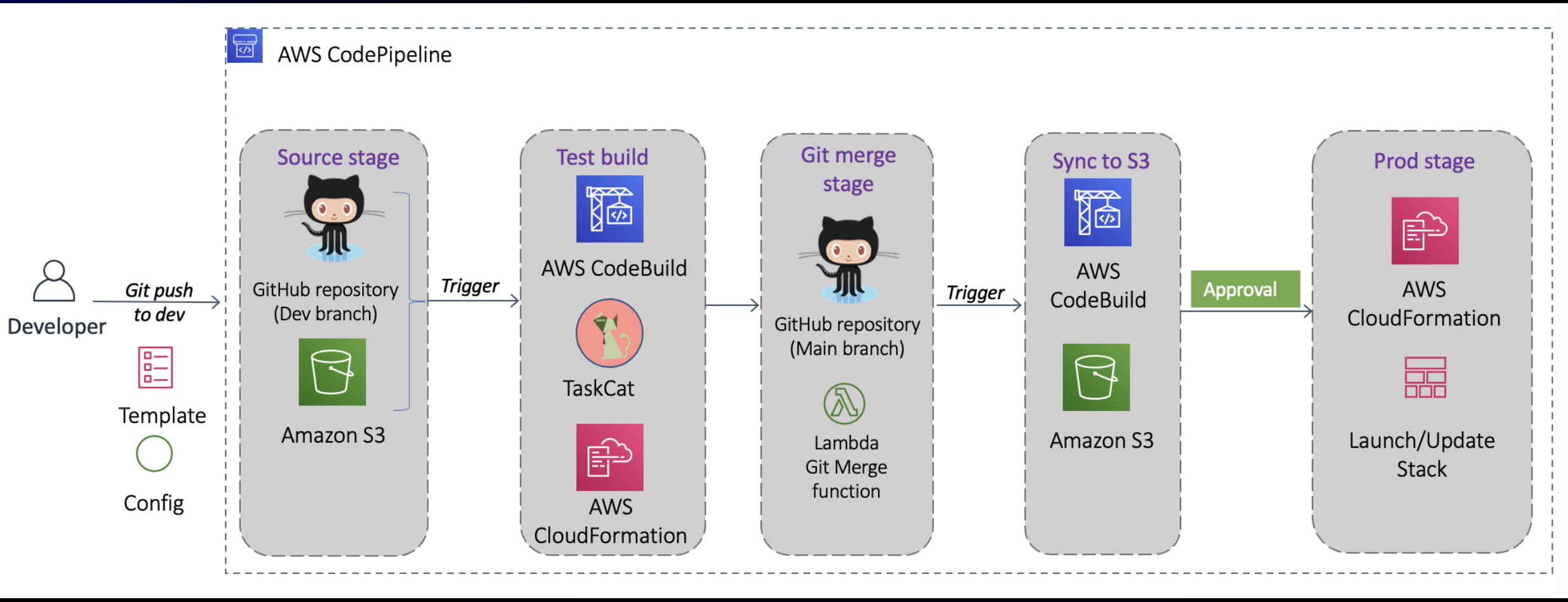
AWS CloudFormation template automates setup/deployment on new or existing AWS infrastructure

Single-button deployment launches stack in minutes

Deployment guide explains architecture, implementation, best practices, customization



© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.



Code pipeline for CI/CD automation

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

IDC names AWS a leader in worldwide applications platforms for smart cities

> "Given the breadth of solutions and products offered and the interoperability with third-party developers and apps, AWS is a powerful platform for cities capable of handling this rapid pace of innovation and needed custom development work, and AWS offers relative ease for communities to scale for additional functionalities after initial deployment."

IDC MarketScape: Worldwide IoT Applications Platforms for Smart Cities 2019–2020



aws

https://bit.ly/reinventforge

Hands-on workshop

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Thank you!

Ivan Panushev
ivapanu@amazon.com

Vinod Shukla
shukvino@amazon.com

© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.