Amazon Web Services

ITS Carolinas Conference

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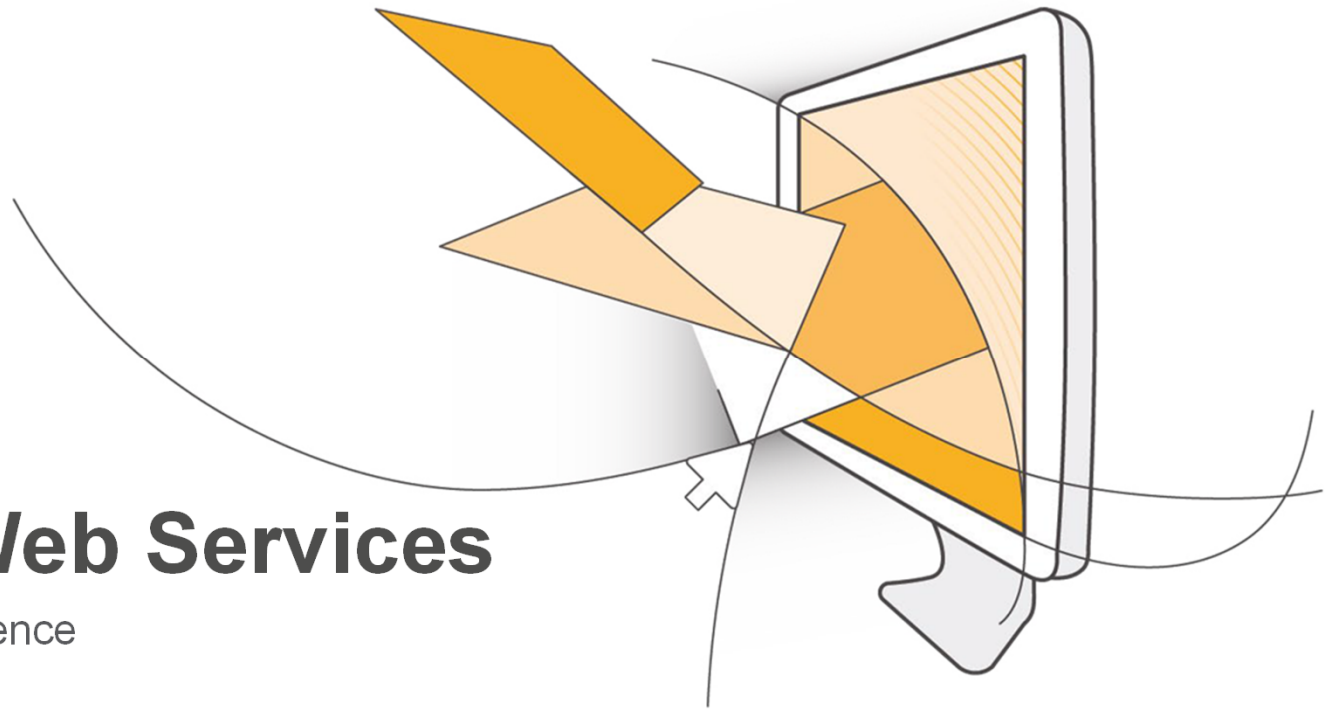
What Is (True) Cloud Computing?

The on-demand delivery of IT resources that provide hyper-scalability, geo-scale redundancy and reliability, high security, with zero up-front costs, no long-term contracts, and pay-as-you-go pricing

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Why Are Customers Adopting Cloud Computing?

Seven main benefits experienced by customers in virtually every industry

1. It drives down IT costs, both up-front and ongoing
2. It offers premium security capabilities at non-premium prices
3. It replaces up-front capital expense with low variable cost
4. It offers lower total costs than companies can achieve themselves
5. It provides pricing-model choice to support variable and stable workloads
6. It supports highly available workloads (as well as DR/COOP) for a fraction of the cost
7. Agility and speed of innovation: *programmable infrastructure revolutionizes IT*

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AWS Global Infrastructure

18 Regions – **52** Availability Zones – **102** Edge Locations
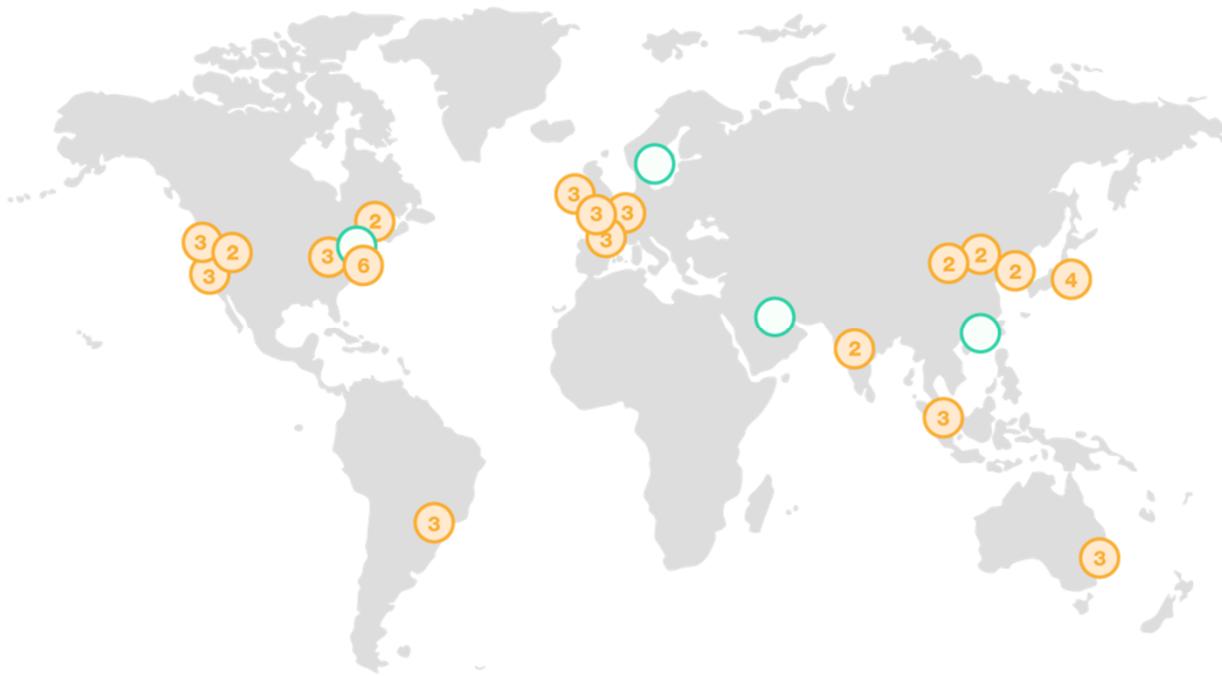
Region & Number of Availability Zones

US East
N. Virginia (6), Ohio (3)

US West
N. California (3), Oregon (3)

AWS GovCloud (US-West) (2)

Asia Pacific
Mumbai (2), Seoul (2), Singapore (3), Sydney (3), Tokyo (4)

Canada
Central (2)

China
Beijing (2), Ningxia (2)

Europe
Frankfurt (3), Ireland (3), London (3), Paris (3)

South America
São Paulo (3)

Announced Regions

Bahrain. Hong Kong SAR, China, Sweden, AWS GovCloud (US-East)

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AWS Security and Compliance

Physical Security

Amazon has many years of experience in designing, constructing, and operating large-scale data centers. The AWS data centers are secured with a variety of physical controls to prevent unauthorized access.

Secure Services

Each of the services within the AWS cloud is architected to be secure and contains a number of capabilities that restrict unauthorized access or usage without sacrificing the flexibility that customers demand.

Data Privacy

AWS enables customers to encrypt their data within the AWS cloud and publishes backup and redundancy procedures for services so that customers can gain greater understanding of how their data flows throughout AWS.

Certifications

AWS Security Center

http://aws.amazon.com/security

AWS Compliance Center

http://aws.amazon.com/compliance

ITS Priorities and Initiatives

ITS Priorities:

Safer Vehicles and Roadways

Enhance Mobility

Limit Environmental Impact

Support Transportation System
Sharing

ITS Initiatives:

Connected Vehicles

Automation

Emerging Capabilities (Innovation)

Enterprise Data (Data collection,
management, sharing)

Interoperability

Accelerated Deployment

(source: US DOT ITS Strategic Plan, 2015-2019)

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Technical Challenges Reaching ITS Goals

Broad communications	Sensors everywhere	HUGE DATA	Valuable data consumption
Hyper-scalability and elasticity	Mission-critical Reliability	Proven security	Agility and flexibility

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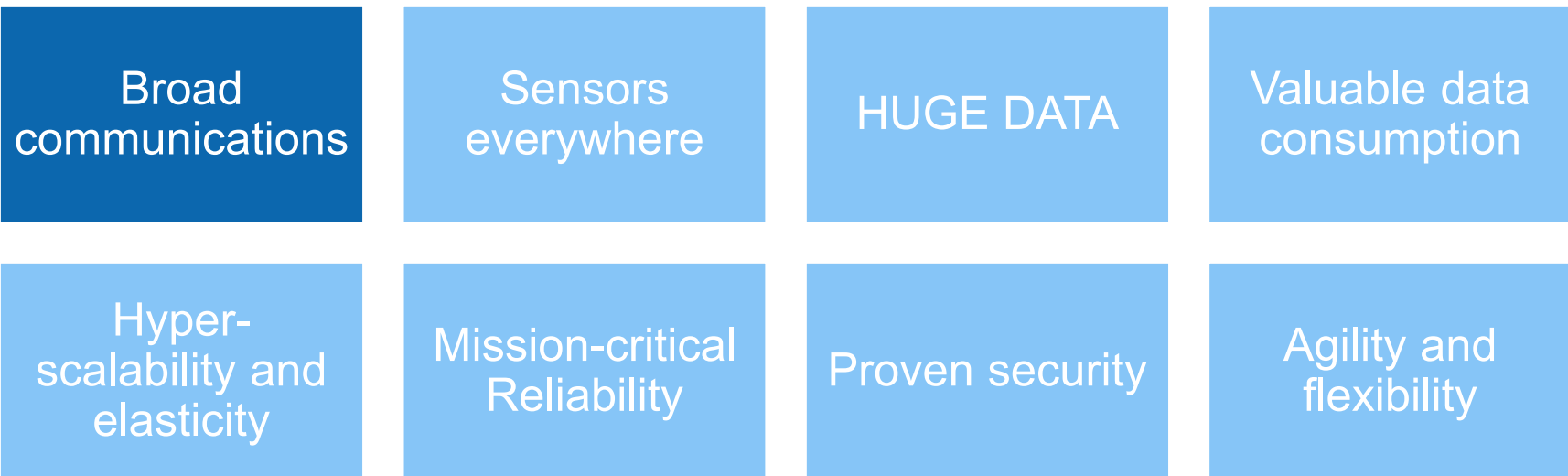
Technical Challenges Reaching ITS Goals

Broad communications

Cloud capabilities

- Global networking infrastructure

- High speed internal communications

- Local points of presence

- Private connections

- Built-in services and APIs to support communication solutions (such as IoT)

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Technical Challenges Reaching ITS Goals

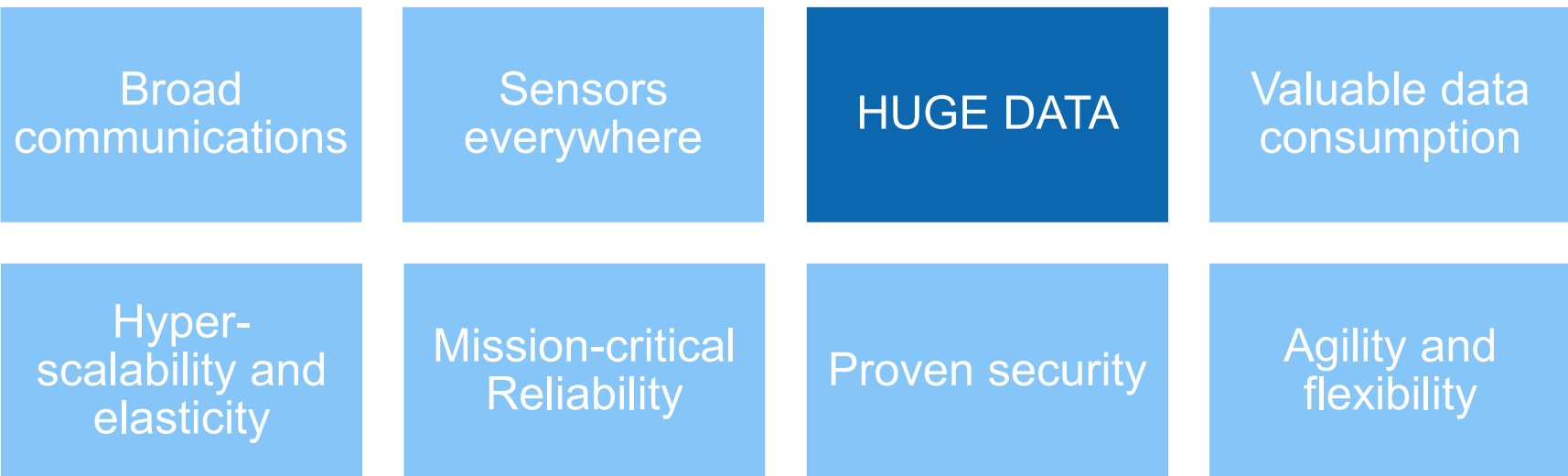|			
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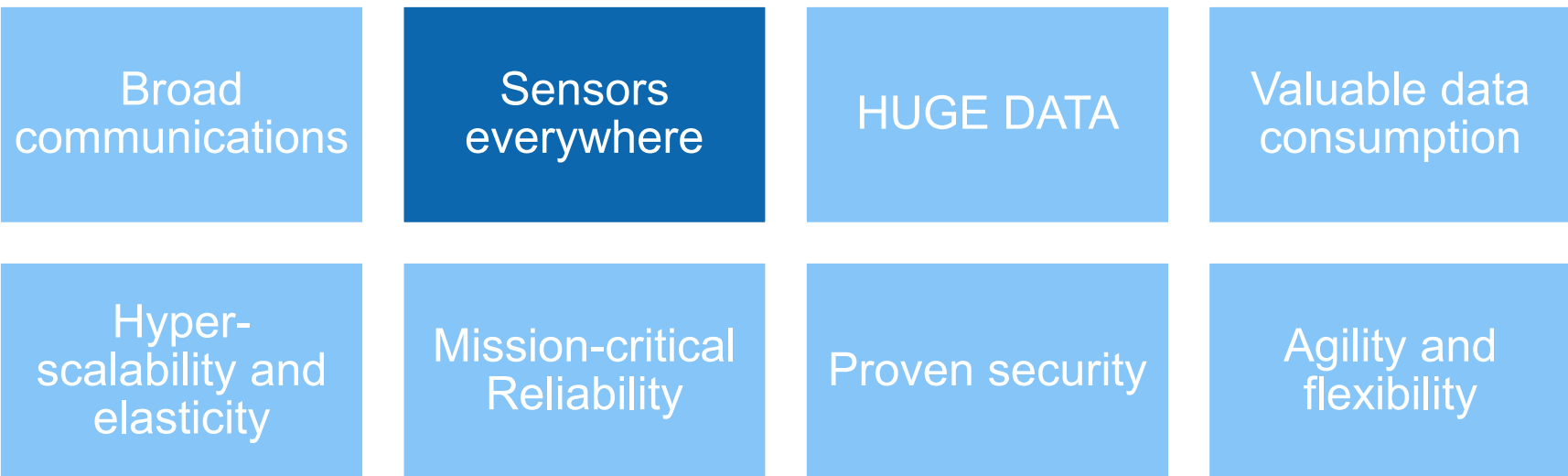
Technical Challenges Reaching ITS Goals

Sensors everywhere

Cloud capabilities:

- Built-in services and APIs to support device/sensor solutions (such as IoT)

- Established standards to simplify and ensure device compatibility

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Technical Challenges Reaching ITS Goals

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Technical Challenges Reaching ITS Goals
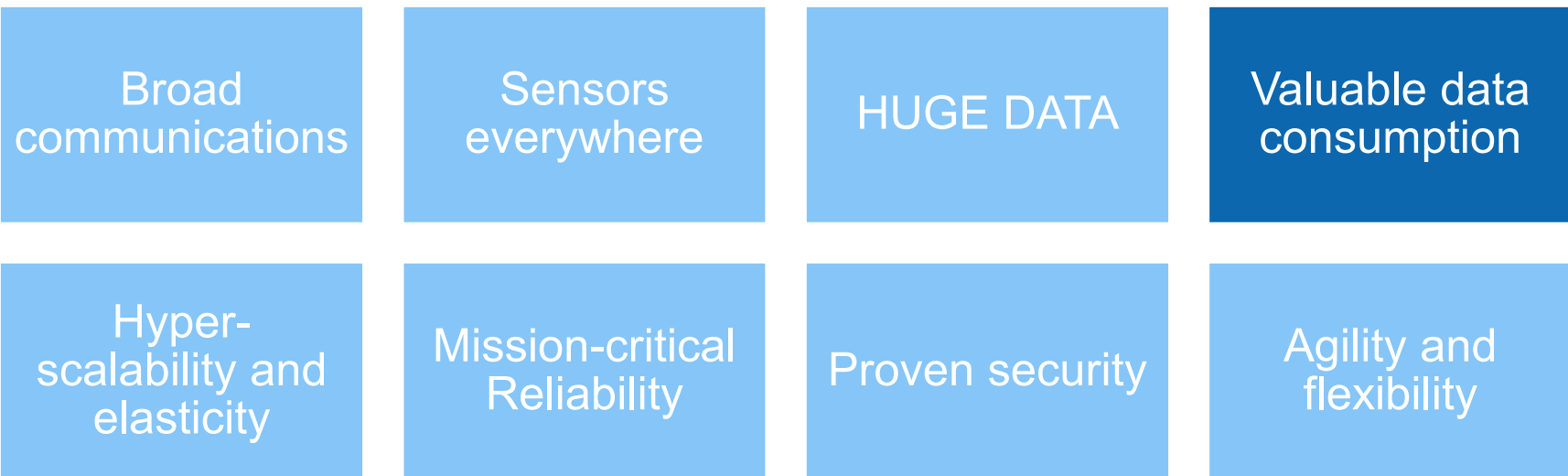
Cloud capabilities:

- Massively scalable storage resources

- Highly resilient, replicated data

- Multiple options for storage architecture – object, block, relational, etc.

- Cost-efficient options for archive and long-term storage

HUGE DATA

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Technical Challenges Reaching ITS Goals

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Technical Challenges Reaching ITS Goals

Cloud capabilities:

Native data warehouse and large-scale data capabilities

Real-time data processing and pipeline

Built-in analytics services

Built-in machine learning services

High-level artificial intelligence services – such as image recognition and voice interaction

Valuable data consumption

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Technical Challenges Reaching ITS Goals

Broad communications	Sensors everywhere	HUGE DATA	Valuable data consumption
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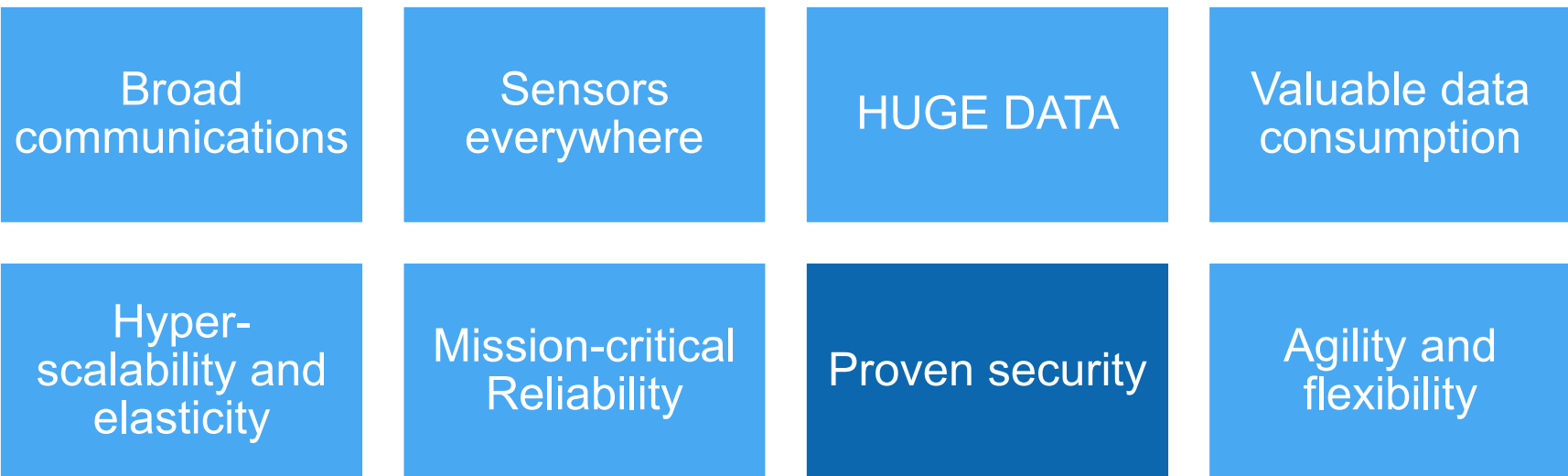# Technical Challenges Reaching ITS Goals

Cloud capabilities:

- Global infrastructure

- Geographically distributed regions and points of presence

| Hyper-scalability and elasticity | Mission-critical Reliability |

- Highly redundant physical infrastructure – power, utilities, networking

- Many options for sizing – from micro-instances to very large compute and memory instances

- Utility-based pricing (pay only for what you use)

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Technical Challenges Reaching ITS Goals

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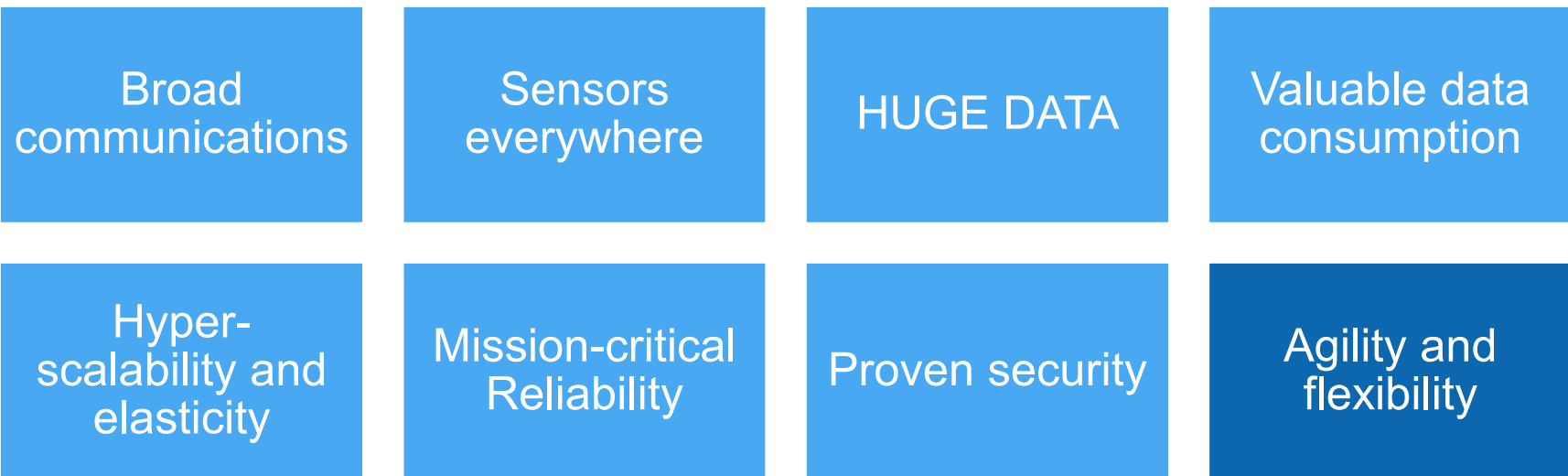# Technical Challenges Reaching ITS Goals

Cloud capabilities:

- Scalable identity and access management

- Multiple data encryption options

- Software-defined infrastructure enables logging and auditing for deep visibility, management, and security analytics

- Shared security model

- Government/industry compliance

Proven security

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Technical Challenges Reaching ITS Goals

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# Technical Challenges Reaching ITS Goals

Cloud capabilities:

- Automated tools for deployment and management

- Rapid deployment instantiation – minutes instead of months

- Large 3rd-party ecosystem of management and monitoring tools

- Rapidly evolving services

Agility and flexibility

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AWS Connected Vehicle Solution

Connect to AWS Services, secure data and interactions, process and act upon connected vehicle data
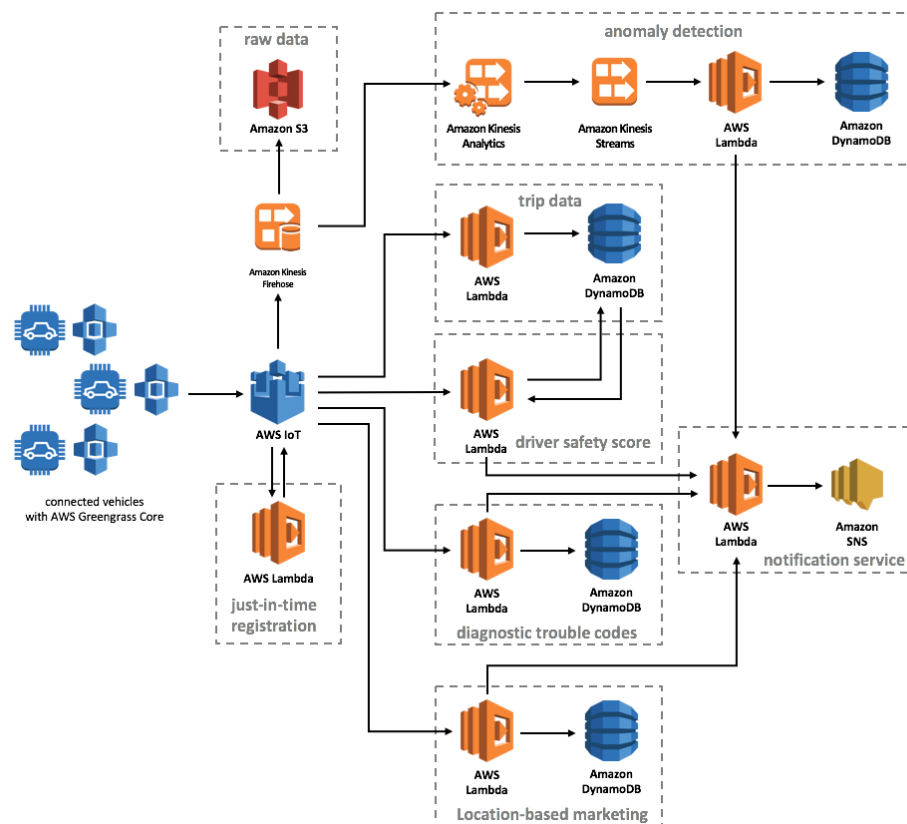
Easily connect vehicles to the AWS cloud
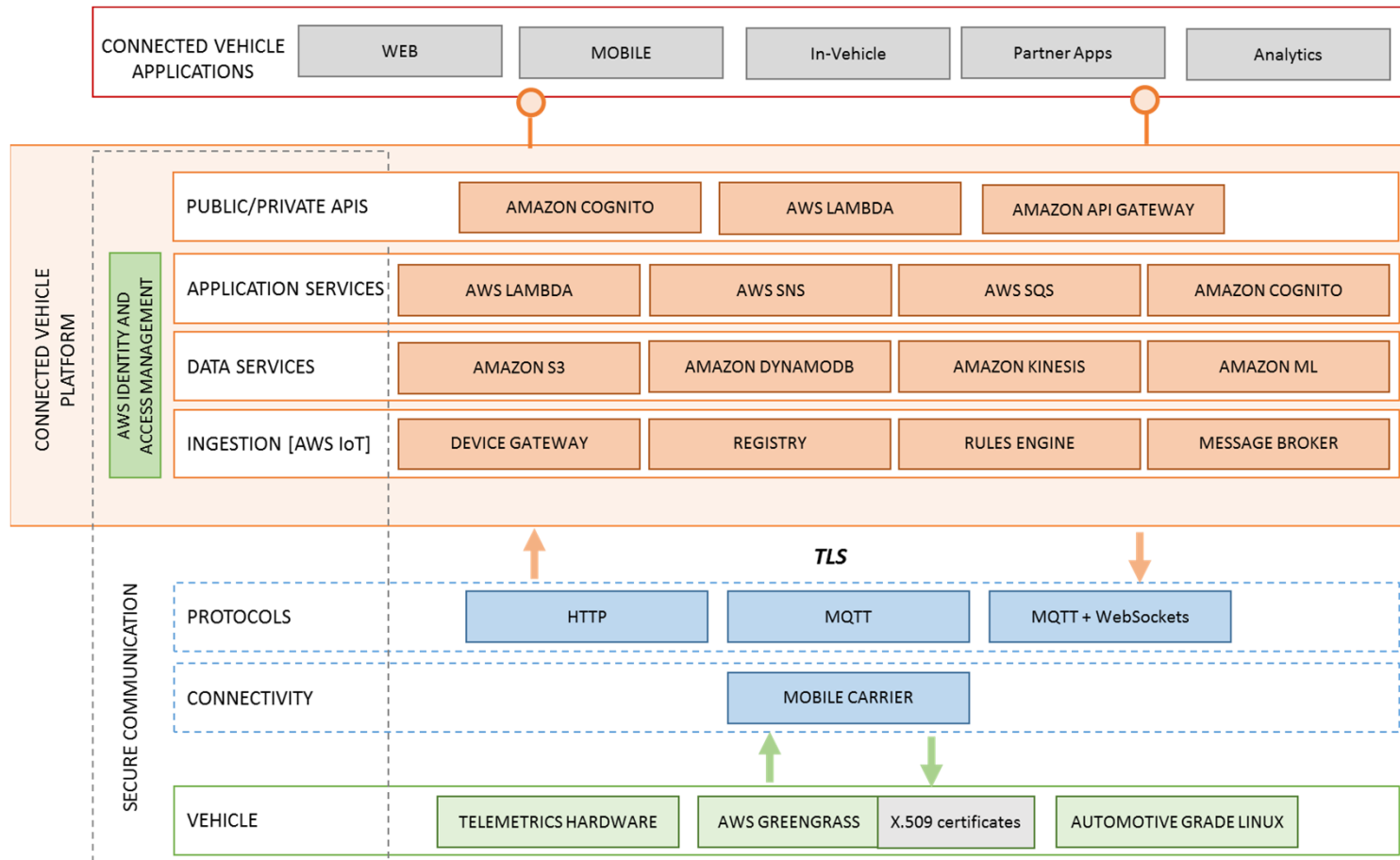
Secure vehicle connections and data

Process and act upon telemetry with easy rule engine

Tracks vehicle metadata such as attributes and capabilities

SDK to easily and quickly connect vehicles

AWS Connected Vehicle Platform Technology Stack

Summary

- Government agencies are seeing real value from cloud
- ITS priorities and initiatives have demands on infrastructure that require revolutionary thinking
- Cloud can provide the scale, security, and reliability needed to support ITS
- AWS services and frameworks, such as IoT, Machine Learning, AI services, and Connected Vehicle Solution can greatly accelerate development and implementation

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Resources

AWS Information - https://aws.amazon.com

AWS Security and Compliance - https://aws.amazon.com/compliance/

AWS SmartCity Solutions - https://aws.amazon.com/smart-cities/

AWS SmartCities Marketplace - https://aws.amazon.com/mp/gctc/

AWS Public Sector Blog - https://aws.amazon.com/blogs/publicsector/

AWS IoT - https://aws.amazon.com/iot/

AWS Connected Vehicle Solution - https://aws.amazon.com/about-aws/whats-new/2017/11/introducing-the-aws-connected-vehicle-solution/

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