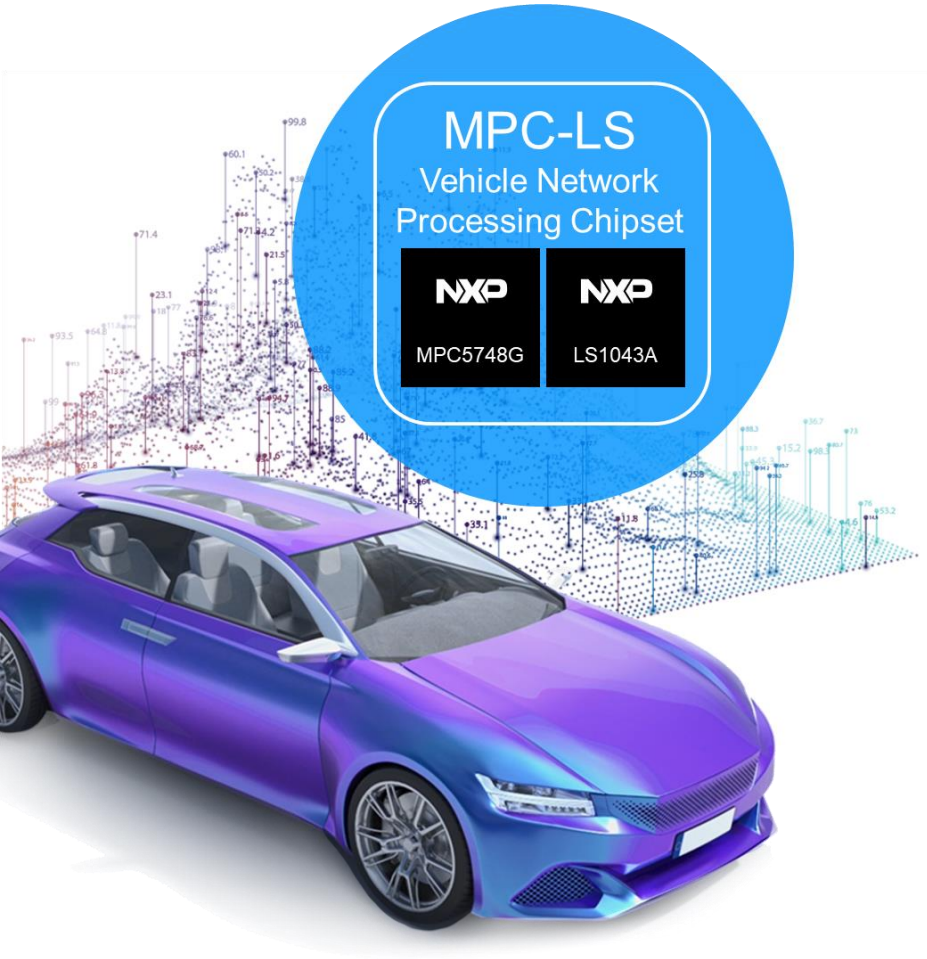
NXP Revolutionizes Gateways to Unlock Value of Connected Vehicle Data

SECURE CONNECTIONS FOR A SMARTER WORLD

PUBLIC

Announcement February 26, 2019:

NXP Enables Service-Oriented Gateways for Automakers to Unlock Value of Connected Vehicle Data



- MPC-LS chipset combines proven NXP automotive microcontroller with enterprise networking communications processor
- Provides high level of performance and networking required for new Service-oriented Gateways
- Supported by evaluation board, enablement software and growing ecosystem to accelerate product development
- Catalyst to unlock connected vehicle data for new opportunities that will transform the automotive industry

VEHICLE BIG DATA

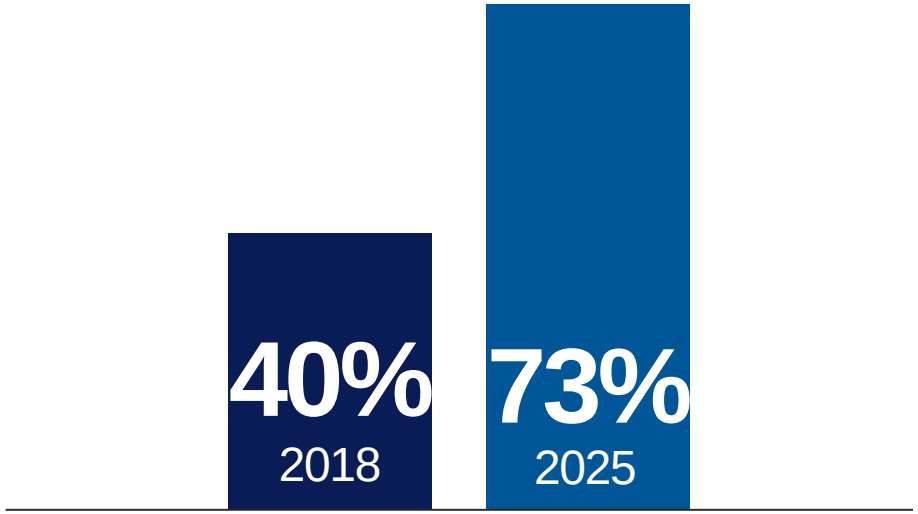
opportunities

CONNECTED VEHICLES

38

MILLION

Shipped in 2018*



Connected vehicle penetration*

VEHICLE DATA

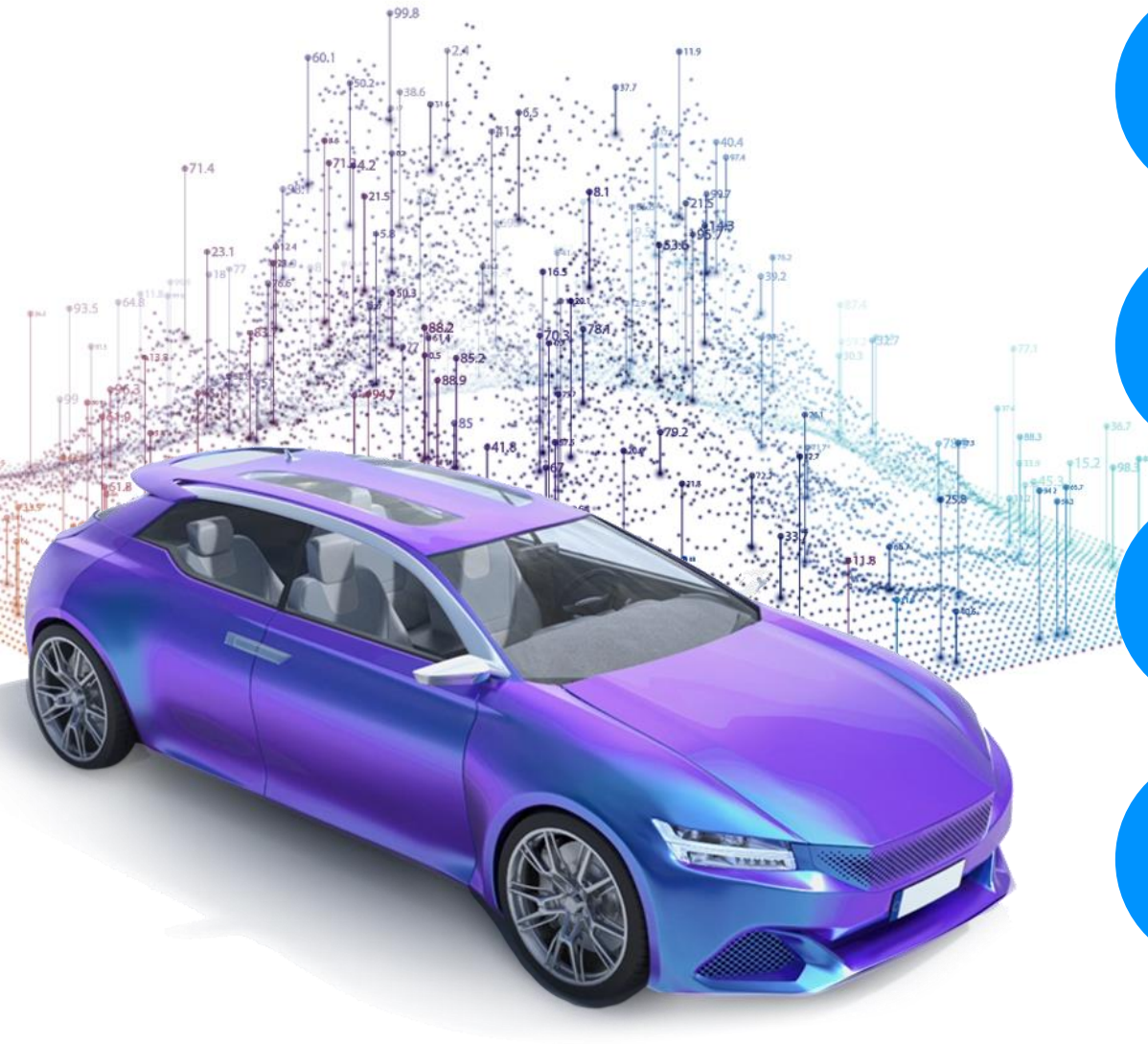
4+

TERABYTES

Vehicle data generated per hour**

Represents global data
Sources: *Strategy Analytics, 2019; **ABI Research, 2018

Vehicle Data Opportunities Will Transform the Automotive Industry



New Revenue Streams

Up to $750B* for data-driven services by 2030
77.4% millennials** willing to pay for updates

Enhanced Safety and Security

Fault detection & notification
Intrusion detection and prevention
Crash detection / emergency response

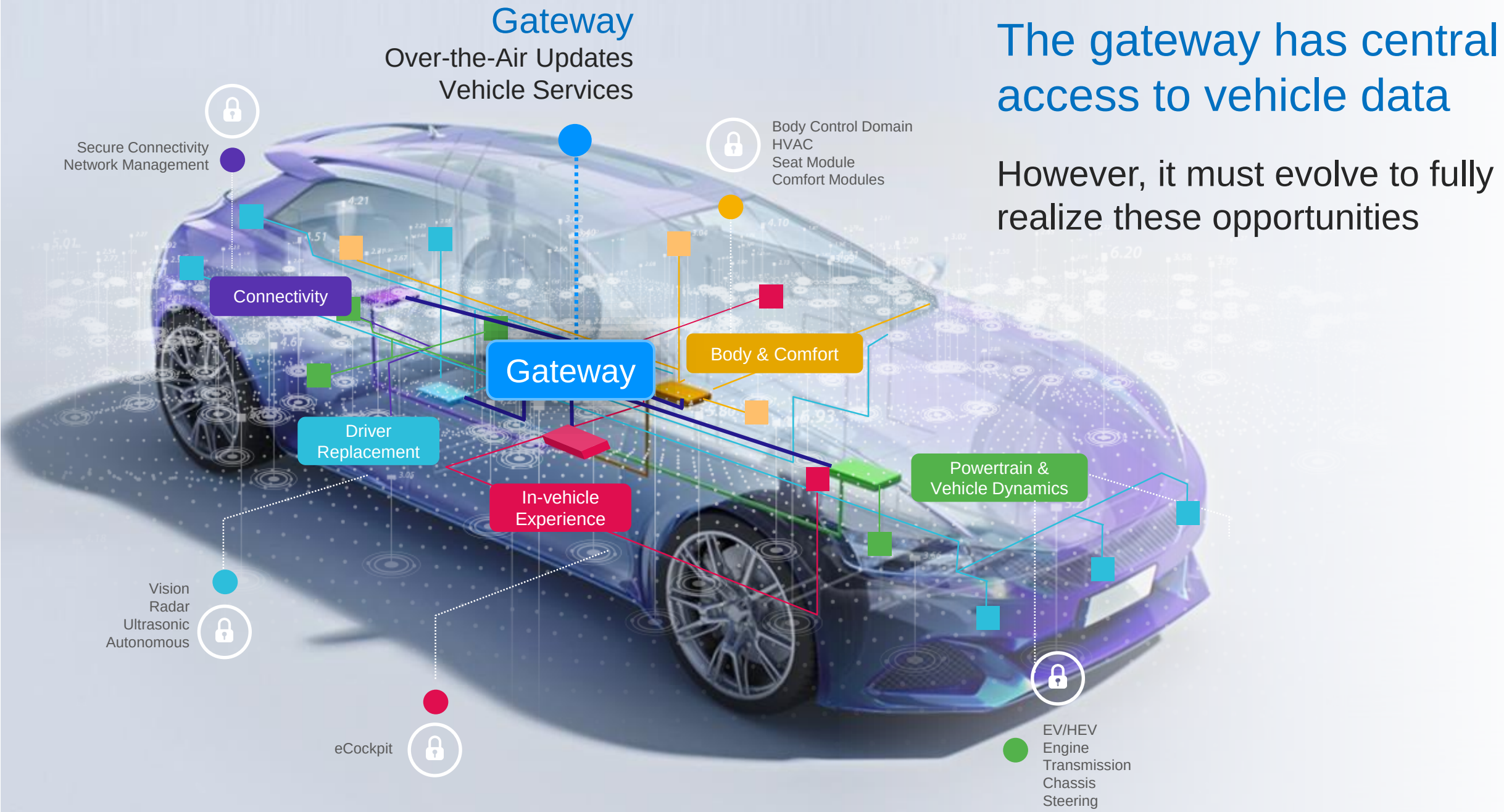
Improved User Experiences

Personalization, comfort and convenience
Post-sale feature upgrades
Location-based services

Reduced Costs

Predictive maintenance
Reduced warranty / recall exposure
Fleet management

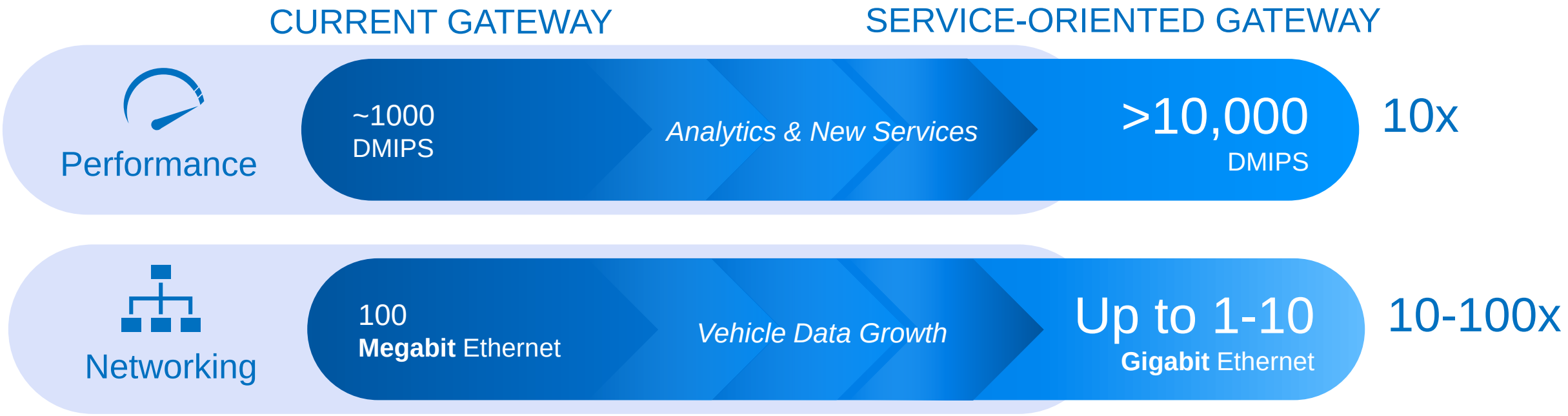
Sources: McKinsey & Company, Monetizing Car Data, 2016; IHS Markit forecast, 2018



The gateway has central access to vehicle data

However, it must evolve to fully realize these opportunities

Gateway to Service-oriented Gateway Evolution



Service-oriented gateways require ~10x performance and networking

Service-oriented Gateway Services

Vehicle-wide Over-the-Air (OTA) Updates	Deployment of remote apps, machine learning models, security and safety patches…
Edge-to-Cloud Data Analytics	Edge processing of vehicle data, pre-processing for cloud analysis and machine-learning models
Virtual ECUs	Consolidation of vehicle ECUs to reduce system cost, weight, cable harness complexity
Intrusion Detection and Prevention	Real-time vehicle network security monitoring and updates for protection against new cyber threats
Data Logging and Forensics	Centralized “black box” capability for analysis, including filtering and pre-processing of vehicle data
Centralized Vehicle Security	Remote key provisioning, secure key management, cryptographic functions and secure OTA and services
Many more services to come…	Provides platform for services innovation and supports new initiatives like Mobility-as-a-Service (MaaS)

Learning from Mobile Market Product Evolution

Cellphone

Communications → Applications & Services
kbps → Gbps Data Rates
Massive Increase in Processor Performance
Over-the-Air Updates
Enhanced Security

Smartphone

Evolution of Products

Gateway

Higher-speed Connectivity +
Applications/Services + OTA Updates
=
Growth and New Opportunities

Service-oriented Gateway

The Catalyst to Unlock Connected Vehicle Data

MPC-LS Vehicle Network Processing Chipset for Service-oriented Gateways

Heterogenous multi-core processing

Real-time + high-performance applications

Automotive meets enterprise networking

CAN FD, LIN, FlexRay™ interfaces
Up to 10 Gigabit Ethernet with packet acceleration

End-to-end security from vehicle to cloud

Embedded hardware security module for cryptography and secure key management

Big Data, **Big** Opportunities Today

- ✓ Evaluation Board (EVB)
- ✓ Reference Development Board (RDB)
- ✓ Software Enablement
- ✓ Demonstrations

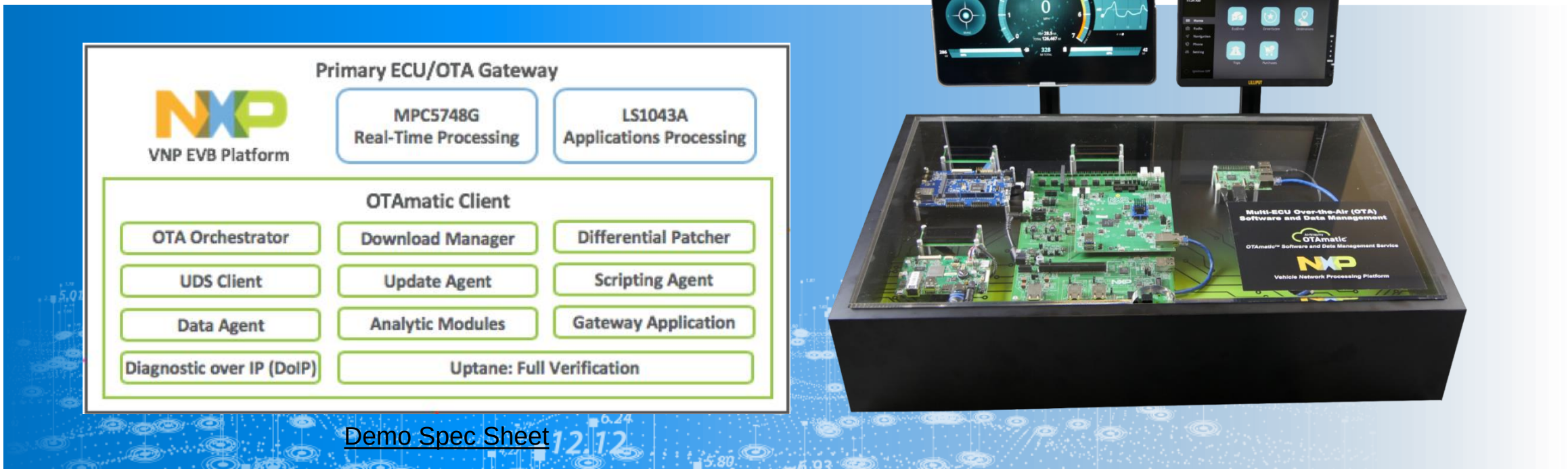
Carmakers	Application Developers	Cloud & Service Providers
Proof of concept	Innovation platform	Symbiotic compute
Benchmarking	Software development	Over-the-Air (OTA) updates
Vehicle data insights	Test and validation	Machine learning deployment
New services deployment	Demo showcase	Edge service deployment

Accelerating Transformation Across the Automotive Ecosystem

MPC-LS Vehicle Network Processing Ecosystem

Airbiquity & NXP Vehicle OTA & Data Management Service

Airbiquity®

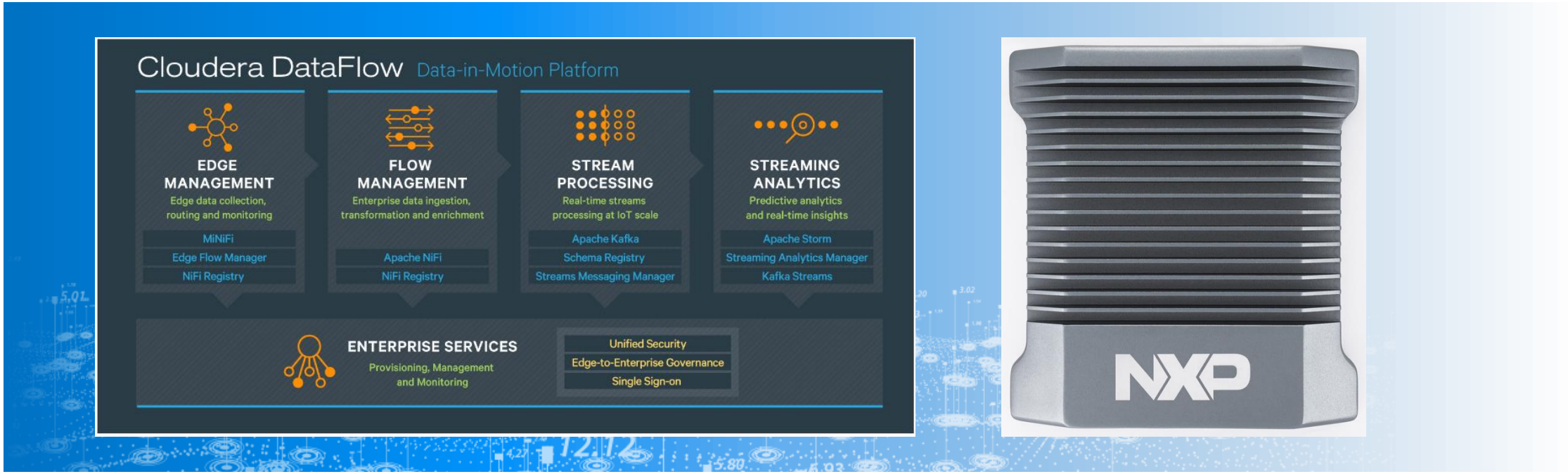


Demo Spec Sheet

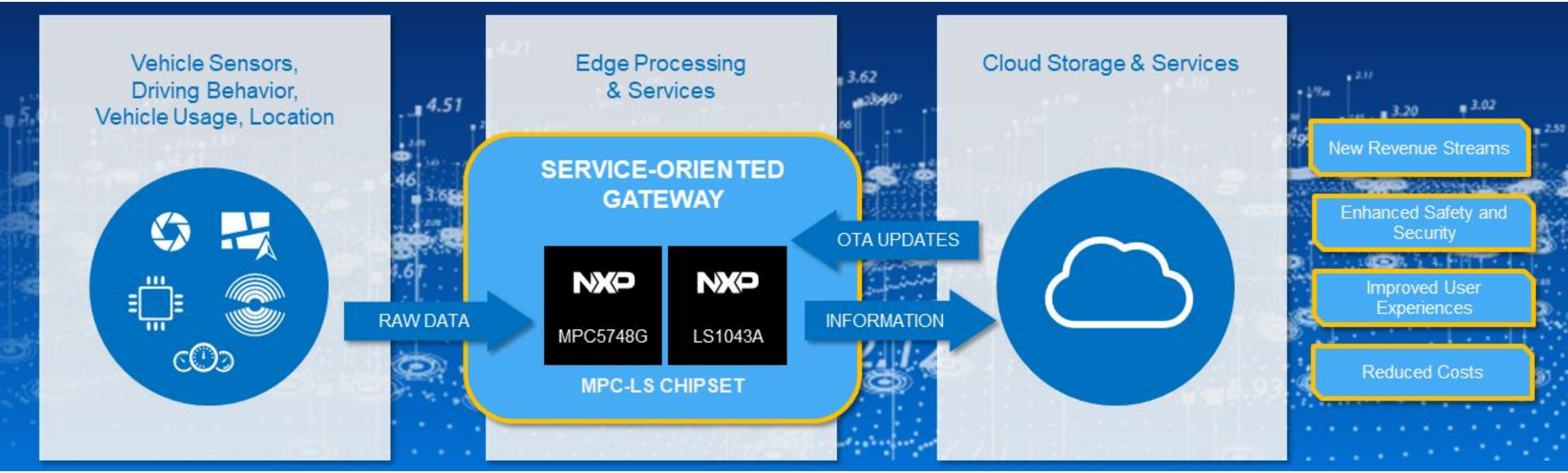
MPC-LS Vehicle Network Processing Ecosystem

Cloudera & NXP Edge-to-Cloud Streaming Data Analytics

CLOUDERA



Vehicle Service-oriented Gateway Enables Opportunities



The NXP MPC-LC Chipset Uniquely Enables Service-oriented Gateways

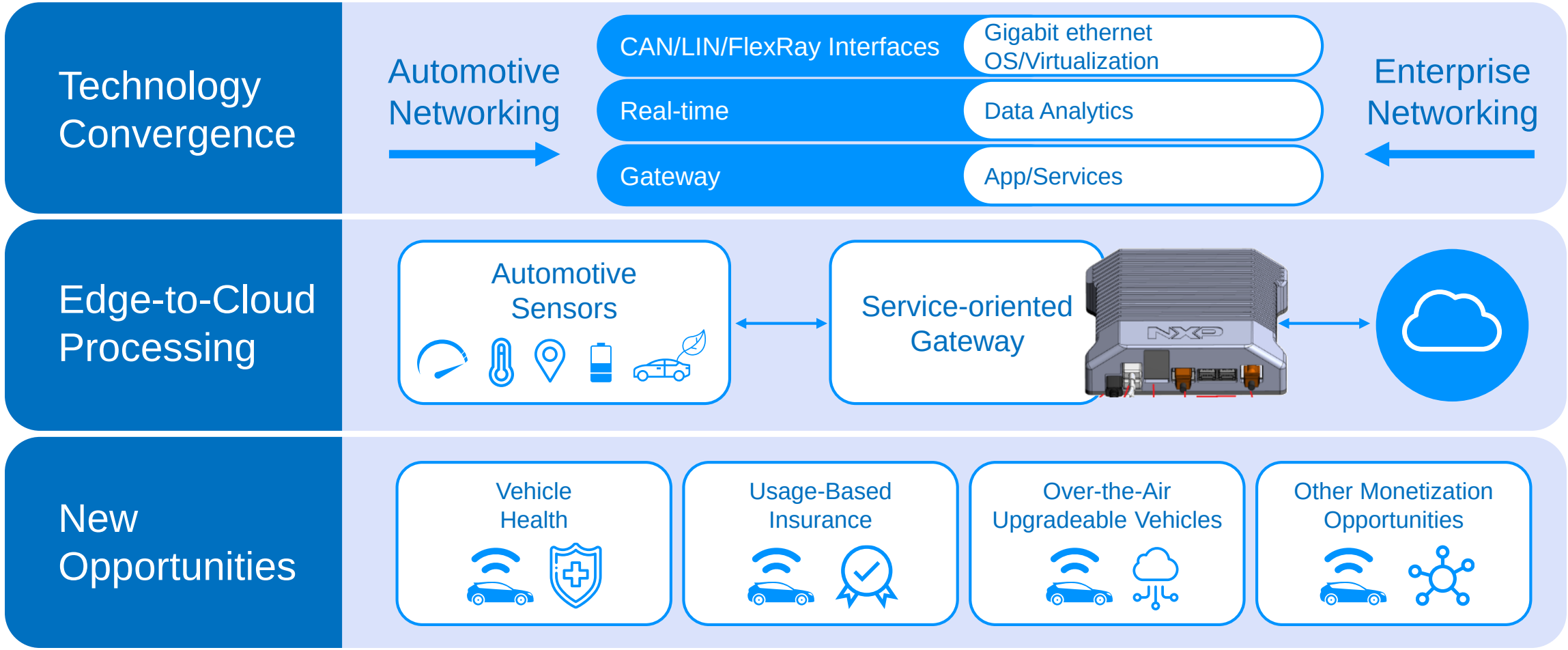
Design with the MPC-LS Chipset Today to Unlock Disruptive Vehicle Data Opportunities

- Auto-qualified chipset scheduled to be deployed in volume vehicle production starting in 2020
- Provides high level of performance and networking required for new Service-oriented Gateways
- Supported by evaluation board, enablement software and growing ecosystem to accelerate product development
- Catalyst to unlock connected vehicle data for new opportunities that will transform the automotive industry

MPC-LS VEHICLE NETWORK PROCESSING CHIPSET

NXP

Bringing Together Automotive and Enterprise Networking to Enable Disruptive Opportunities

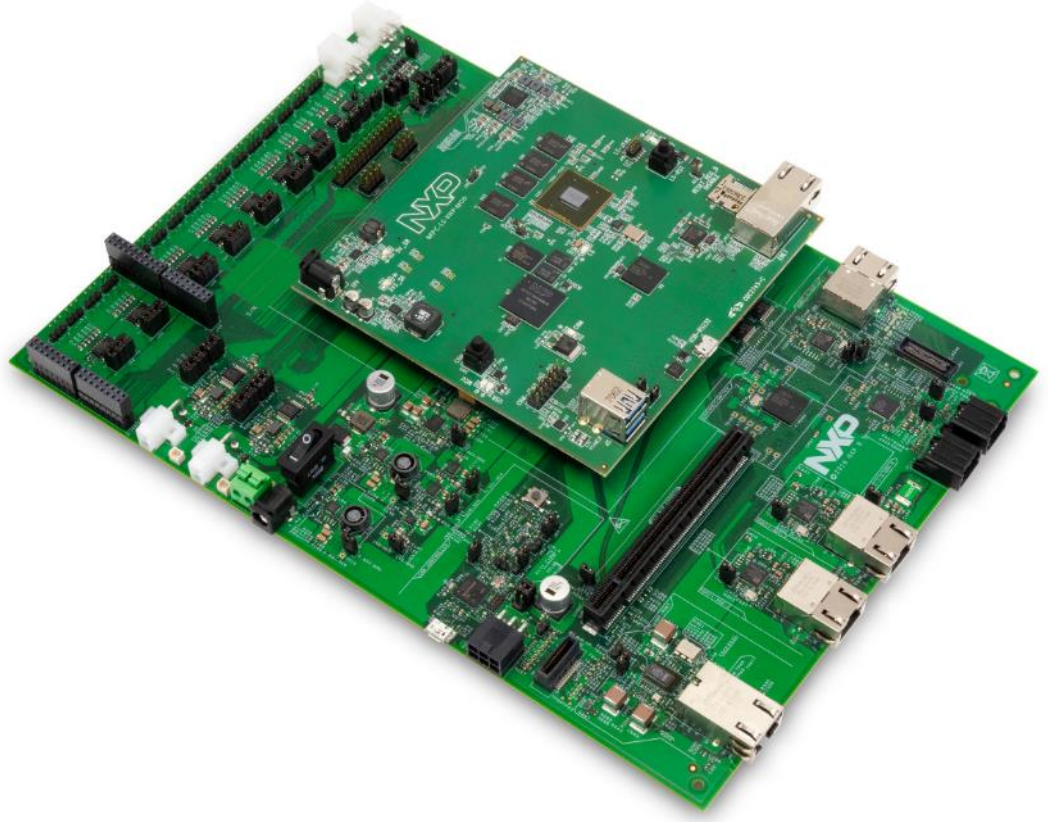


MPC-LS Vehicle Network Processing (VNP) Enablement

- MPC5748G Automotive Controller
- LS1043A Auto-Qualified Communications Processor
- NXP CAN/CAN FD/LIN/FlexRay® Transceivers
- NXP SJA1105 Ethernet Switches and PF8200 PMIC

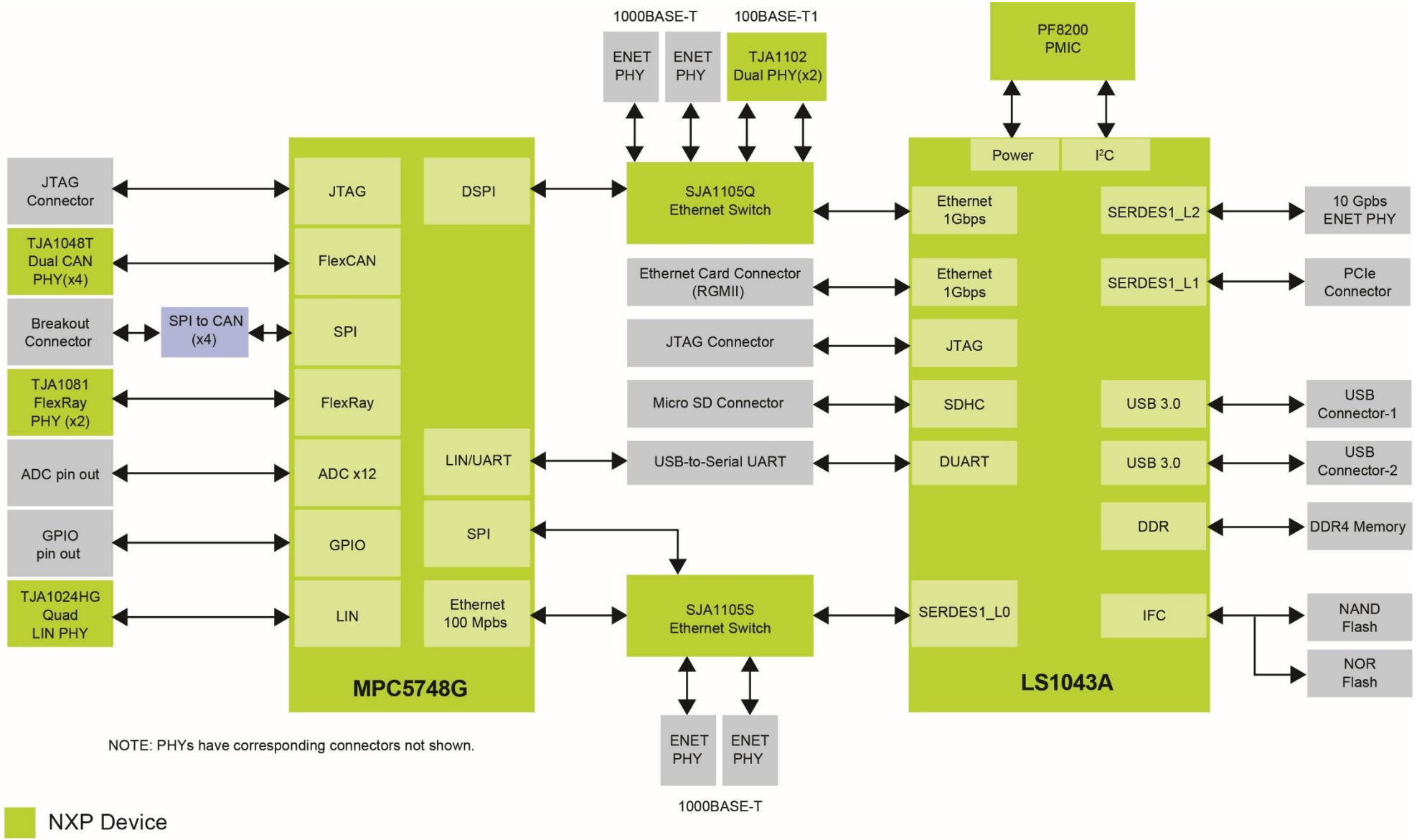
- Real-time Gateway Processing
- Applications and Network Processing
- Gigabit Ethernet Acceleration
- Embedded Hardware Security

Includes SW enablement (AUTOSAR, Bare metal, Linux) and demonstrations



ORDERING INFORMATION: **MPC-LS-VNP-EVB**

MPC-LS Vehicle Network Processing Evaluation Board



MPC-LS Vehicle Network Processing (VNP)

Reference Design Board (RDB)

- Real-time Gateway Processing
- Applications Processing
- Gigabit Ethernet Acceleration
- Embedded Security

Part Number: MPC-LS-VNP-RDB

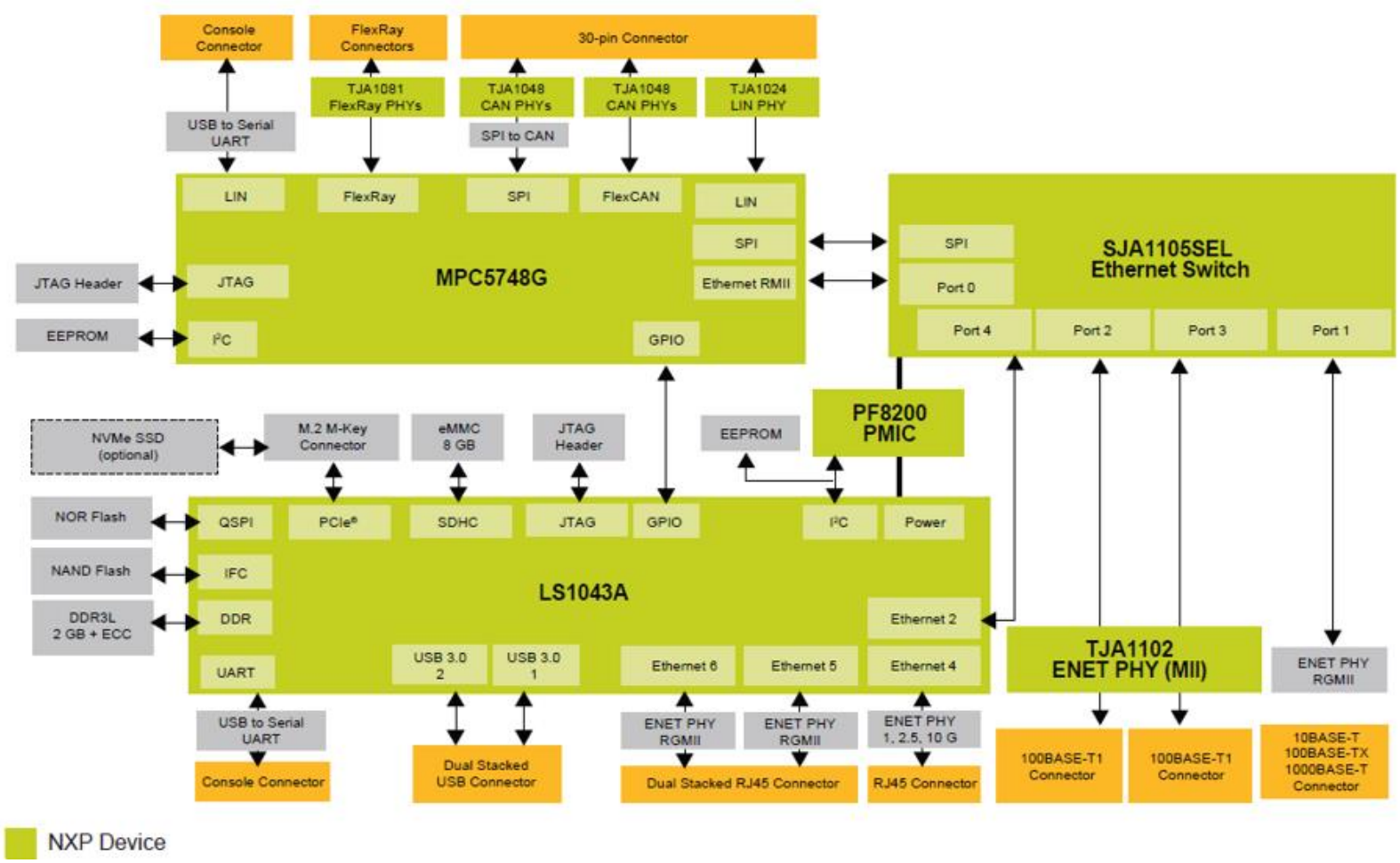
- Price: $995
- Reference Design: 90% of BOM is Automotive Grade
- Includes SW enablement and demonstrations

NXP Components:

- MPC5748G (MCU), LS1043A (Comms Processor), SJA1105SEL (5-port Ethernet switch), PF8200 (Power Management IC)
- TJA1081TS (FlexRay), TJA1024HG (Quad LIN), TJ1102HN (Dual Ethernet PHY), TJA1048T (Dual CAN Transceiver)
- NTS0102 (Dual Supply Transceiver), NX5P3090UK (USB Power Switch)

www.nxp.com/MPC-LS-VNP-RDB

MPC-LS-VNP-RDB Block Diagram



- Processors
  - MPC5748G Automotive Microcontroller
  - LS1043A Communications Processor
- Memory
  - 2 GB DDR3L @ up to 1.6 GT/s
  - 1 GB NAND flash
  - 64 MB Serial NOR flash
  - 8 GB eMMC
- Storage
  - M.2 M-Slot for optional PCIe SSD
- NXP Support Devices
  - PF8200 Power Management IC
  - SJA1105SEL Ethernet Switch
  - TJA1024 LIN PHY
  - TJA1048 CAN PHY
  - TJA1081 FlexRay PHY
  - TJA1102 100 Mbps Ethernet PHY
- PCB
  - Single 6-layer board ~ 6.1 x 6.4 inches
  - 90% of BOM Automotive Grade

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FOR A SMARTER WORLD