

# Integrating for Success: Journey of Integration Modernization

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## Agenda

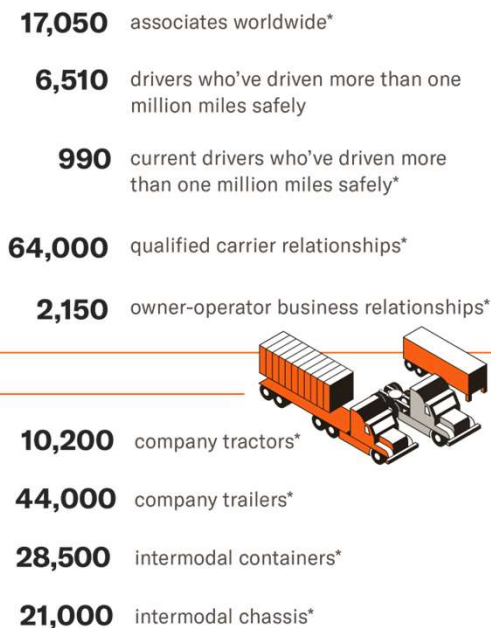
- Schneider Overview
- Case for Change
- Legacy Integration Stack
  - Point to Point
  - Hub
- Next Gen Integration Stack
  - Goals
  - Architecture Landscape
    - Streaming
    - Containers
    - Cloud Ready
    - Domains
    - Accelerators
  - Patterns
  - Benefits / Savings

## SCHNEIDER OVERVIEW | (NYSE: SNDR)

### By the numbers



This couldn't  
be done  
without



\*Number is an approximate.  
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Schneider is the leading multi modal transportation provider in North America

- Head quartered in Green Bay, WI.
- **88** years in business
- Truckload, Intermodal and Logistics services
- We have about 8300 customers across various portfolios.

As a strong **technology** driven company, we received a business intelligence group (BIG) innovation award in 2020. In the same year we were also the winner of CIO 100 Innovation award as well.

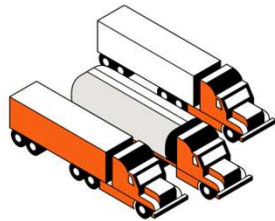
**SCHNEIDER**

## THE OPTIONS YOU NEED WITH THE TRANSPORTATION AND LOGISTICS EXPERTISE TO PERFORM AS PROMISED



### Intermodal

Bulk  
Express Services  
North America Cross-Border  
Regional  
Transcontinental  
Rail Dray



### Truckload

Bulk  
Dedicated  
Long-Haul  
North America Cross-Border  
Regional  
Expedited  
Power Only



### Logistics

Cross-Dock Logistics  
Port Dray  
Supply Chain Management  
Transloading and Distribution  
Brokerage  
Warehousing

Approximately  
**10,200**  
company  
tractors

Approximately  
**72,500**  
company trailers  
and containers

Approximately  
**2,150**  
owner-operator  
business relationships

Over  
**64,000**  
qualified carrier  
relationships

Approximately  
**17,000**  
associates  
worldwide

  
**1935**  
operations in  
United States

  
**1992**  
operations  
in Mexico

### DEI:

Schneider named a Best Employer for Diversity by Forbes

### Community Involvement:

In 2021, our Schneider Foundation donated more than \$2.25 million in grants to support and provide relief for local communities – that's the Schneider way.

### Truck Driving is for Veterans:

Schneider is one of the nation's largest and most decorated employers of current and former military personnel. We're proud to offer great truck driving jobs for military veterans that recognize their service.

**SCHNEIDER**



# Schneider Intermodal just got greener:

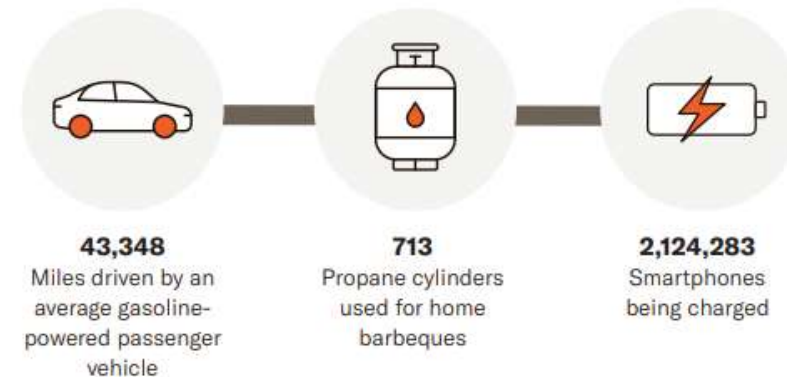
One of the largest battery-electric  
truck fleets in North America

At Schneider, we're committed to reducing our carbon footprint and creating a more sustainable future for the transportation industry. We're adding 92 Freightliner eCascadias to our Southern California intermodal operations. The new eCascadias have the potential to avoid over 81,000 pounds of carbon dioxide emissions per day which over the course of a year is equivalent to removing 2,400 gas-powered cars from the road.

## CO<sub>2</sub> Real Life Example:

- 100 orders per week in SoCal 120 mile dray (60 miles each way)
- $100 \times 120 = 12,000$  miles / 7 MPG =  
**1,714 gallons of diesel per week**
- $1,714 \times 22.46$  pounds of CO<sub>2</sub>  
**per gallon = 38,496 pounds of CO<sub>2</sub>**
- $38,496$  pounds of CO<sub>2</sub> / 2,000 =  
**19.25 tons of CO<sub>2</sub> savings per week**

## This savings equates to:



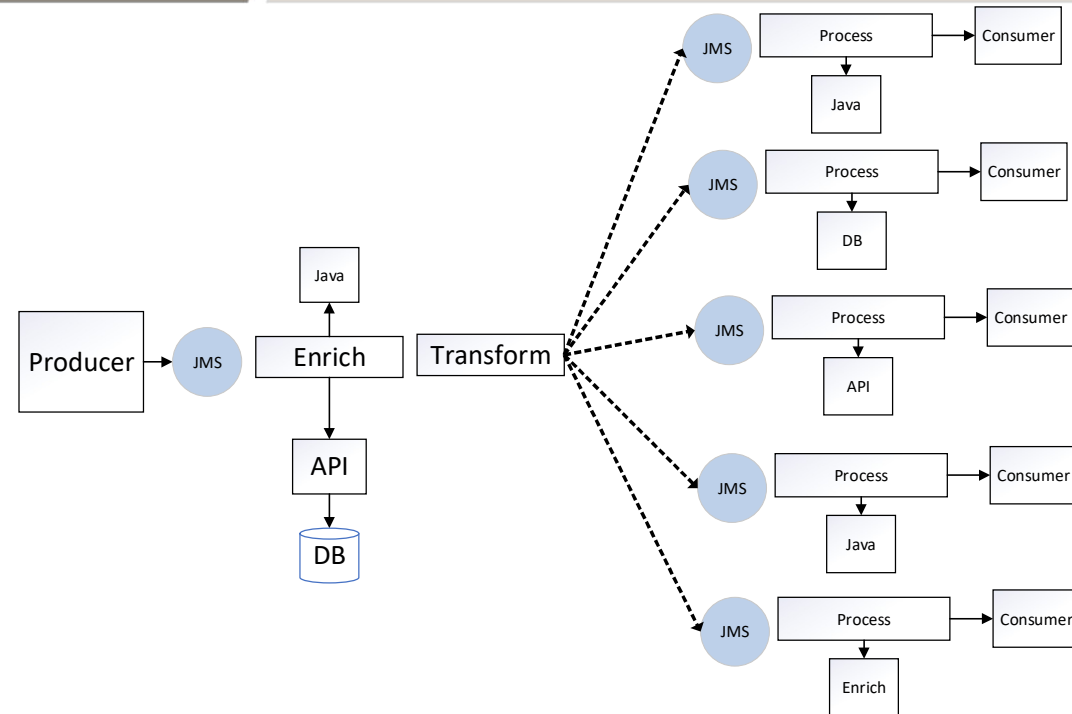
## LEGACY INTEGRATION | CASE FOR CHANGE

- High Complexity - TCO
  - Integrations for both Custom Build and Purchased products
  - No Registry or Dependency lineage
  - On-prem – Brittle, a service failure resulted in high backlogs
  - Not extensible for our Cloud strategy
  - Upgrades – Maintenance costs too high - Testing each leg for end-to-end impact - very time consuming
  - Developer skills
- Micro Services Architecture Direction
  - Monolith applications to Services based architecture
  - Desire for smaller, loosely coupled services that operate together
- Simplification Strategy
  - Processes, technology and reduce overlapping tools and technologies
  - Create business services that can be Assembled – Reused for purpose

## LEGACY INTEGRATION | PATTERNS



- **Point to Point** Messaging Pattern
- JMS provides Guaranteed Message Delivery
- Multiple P2P flows to create business process
- Integration Platform used to create Services for enrichment, business logic and transformations



- **Hub and Spoke** Messaging Pattern
- Many consumers dependent
- Issues cause challenges in Many business systems
- Very difficult to catch up from message backlogs

## LEGACY INTEGRATION | LANDSCAPE

- SOA Suite and JMS
  - Built Services for business **logic** and Messaging into same tool suite
    - 1000 Composites, 350 JMS Queues
    - Need for Unit of Order (sequencing) complicated the solution
  - BPEL language
  - **Monolithic**, Long time to load
  - Problem with one integration; bounce entire server brings down the all the composite
  - Domain recycle takes about 30 minutes
  - Vertical scaling only.
  - Hub and Spoke message **duplication** based on the number of consumers
  - Message **deleted** after consumption
  - Impact Analysis done **manually**
  - High Costs
    - Testing end to end for even smaller changes
    - No platform based built in Health monitoring
    - Very expensive to upgrade



## NEXT GEN INTEGRATION | GOALS

- **Vendor Neutral**

- Managed and Composable - Standardized Open-Source ex: *Kubernetes (OCP)* , *Kafka (Confluent)*
- Improve Flexibility for Hybrid Cloud – Need multiple deployment options, languages, Operating Systems
- Not tied to a specific technology - trading Vendor Y with Vendor X that locks us into a tool/platform

- **TCO Reduction**

- Container based architecture

- **Reduced Complexity (Simplification)**

- Same Dev tools, type of Server Resources and People resources required
- Increased Performance - Scalability – Stability (*Ex: POD self-healing, auto scaling*)
- Consistency in Integration Design Patterns

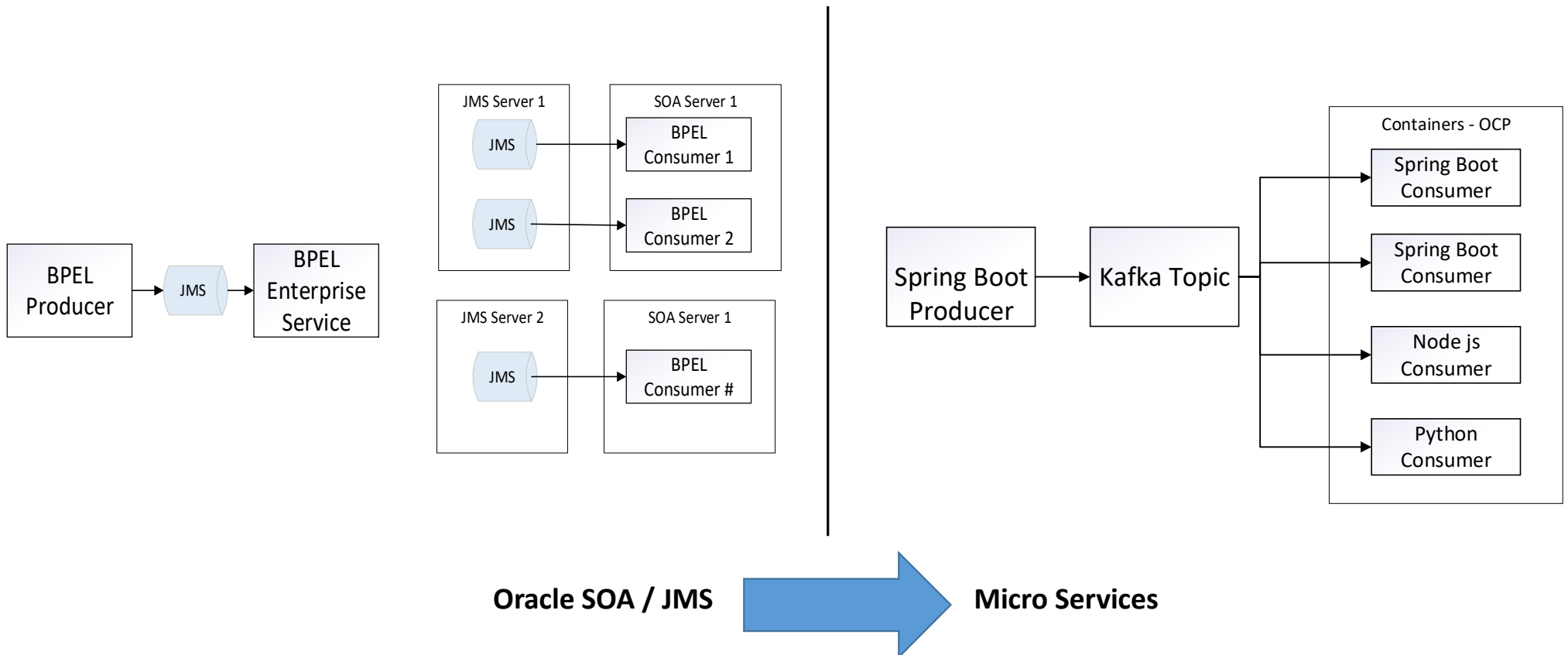
- **Reduced Time to Deliver**

- Need to have Accelerators - Governance through Automation

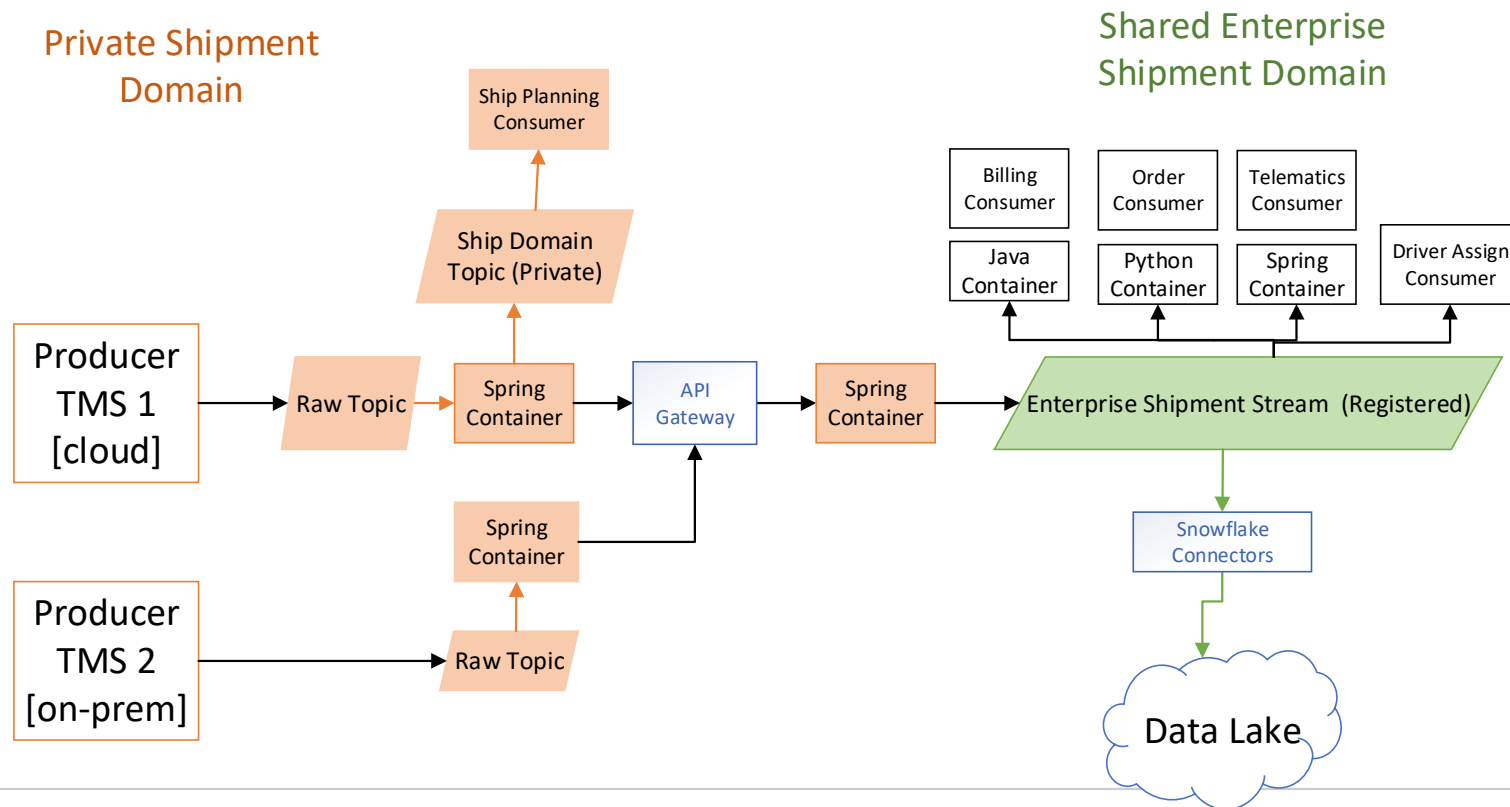
## NEXT GEN INTEGRATION | ARCHITECTURE LANDSCAPE

- Using same tooling for both app dev and integration
- Hybrid Cloud - **On-Prem** Cloud Ready and Cloud Native
  - Redhat OpenShift for on-prem
  - Azure AKS for Cloud
  - Kafka Cloud First
  - Paves way for Serverless
- Service Mesh for blue-green/canary testing
  - Istio (bundled with Redhat OpenShift)
- **Domain** Based Standards – For both APIs and Topics
  - Demarcate Shared (aka Enterprise) vs Private Service (used within a Domain)
- API Manager
  - Azure API Manager (cloud)/Hosted Azure API Manager (on-prem)
  - Expose Shared Domain APIs

## NEXT GEN INTEGRATION | NEW HUB PATTERN



## NEXT GEN INTEGRATION | ENTERPRISE HUB



## NEXT GEN INTEGRATION | ARCHITECTURE LANDSCAPE

- Accelerators – Backstage – Developer Portal
  - Golden Path Templates
    - Code standardization and generation
    - Easier on-boarding of resources
    - Reduce cognitive overload
  - Catalog of Services
    - Service Health
    - Resource Utilization
  - Mass Updates/Deployments
- Accelerators – Comparator Service
- CI/CD pipelines follow the same path as Application Development
  - Code quality, Security Scanning
  - Automated testing



## NEXT GEN INTEGRATION | KEY BENEFITS - RECOMMENDATION

- **Unified Runtime Platform, Tools, Skillset**
  - Simplified project execution – how you run the project and build software - Flexibility in staffing
  - Full stack developers / teams - Reduce handoffs – number of teams required to execute the project
- Seek professional input - need thinking partner to influence design
- **Auto-scaled runtime** - Simplified event Hubs
- Kafka - Stream **Play Back** Capability
- Canary testing & A / B validations in parallel with live version
- Improved **security** access to services
- **Stay current** through simple means and individually
- Preserving backwards compatibility for existing consumers (Schema Registry)
- Time to Market for new integration reduced by 25%
- Cost avoidance of \$1m yearly in maintenance budget by not doing large upgrades

Our Journey is not complete!

[illegible]