Will Cloud architecture conquer the heart of industrial manufacturing – using TOSCA?
What is Orchestration? - a (very) short definition

- Automation
- Coordination
- Lifecycle Management
(Very) Short History of Orchestration?
What is TOSCA?

- Standard developed by OASIS
- Used manage Applications in Cloud (and multi-Cloud) and Telecom network management
- Structured language that describes:
  - Cloud applications
  - The infrastructure the application needs in order to operate
  - Any dependencies the application requires in order to operate
Who is CPLANE.ai

- Silicon Valley Software Company
- Orchestrator of orchestrators platform
- Roots in Telecom & Cloud
- Products include:
  - SDN for IaaS
  - WAN orchestration
  - Distributed cloud orchestration (orchestrator of orchestrators)
  - Edge systems orchestration (orchestrator of orchestrators)
What is an Industrial Control System?

Distributed Control System

Advanced Control

Control Apps

Sensors Actuators
Huge Shift from Proprietary to OPEN Systems

Distributed Control System

- Advanced Control
- Control Apps
- Sensors Actuators

Open-Architecture Control System

- Advanced Control
- Control Apps
- Sensors Actuators

CPLANE.ai
General Requirements

- Show **Startup Phase** of an Open Industrial Control System
- Use orchestration to show open, multi-vendor OT environment
- Automate a system-wide (IT/OT) deployment **without** IT expertise
- Prove that **TOSCA** can encompass vendor-specific details to install OT application correctly
Information Exchange for System Orchestration

- **Digital System Lifecycle Requirements**
  - Applications
  - Plant Assets
  - Plant Zones
  - Security Zones
  - Policies
  - etc.

- **System Or orchestrator**
  - 1499 / 1131 Design Tool
    - FB Configuration
    - Logical Asset Descriptions

- **Physical System Descriptions**
  - Device Capacity
  - Connected I/O
  - Network zones
  - Telemetry data
  - etc.

- **Digital Lifecycle Management**

**Industrial Digital Infrastructure**
Model Driven Orchestration
Intelligently Manages System Lifecycle with State Awareness

Physical System Attributes
- Device Capacity
- Connected I/O
- Network zones
- Telemetry data

Digital System Life Cycle
- Application Requirements
- Plant Assets and Zones
- Security Zones
- Policies

Application Configurations
- FB Configuration
- Logical Asset Descriptions

Digital Infrastructure Events
- Failures / Errors / Warnings

CPLANE Orchestrator

Digital Twin Model
- State Analyzer
- Policy Engine
- Workflow Engine
- Event Manager

Supervisory Applications
- Process Control Layer
- Compute Layer
  (OS, VMs, Containers)
- Network Security
- Network