Preface

Converged Plantwide Ethernet (CPwE) is a collection of architected, tested, and validated designs. The testing and validation follow the Cisco® Validated Design (CVD) and Cisco Reference Design (CRD) methodologies. The content of CPwE, which is relevant to both operational technology (OT) and informational technology (IT) disciplines, consists of documented architectures, best practices, guidance, and configuration settings to help industrial operations and OEMs achieve the design and deployment of a scalable, reliable, secure, and future-ready plant-wide or site-wide industrial network infrastructure. CPwE can also help industrial operations and OEMs achieve cost reduction benefits using proven designs that can facilitate quicker deployment while helping to minimize risk in deploying new technology. CPwE is brought to market through an ecosystem consisting of Cisco, Panduit, and Rockwell Automation emergent from the strategic alliance between Cisco Systems® and Rockwell Automation.

Deploying Parallel Redundancy Protocol within a Converged Plantwide Ethernet Architecture (CPwE PRP), which is documented in this Design and Implementation Guide (DIG), outlines several use cases for designing and deploying PRP throughout a plant-wide or site-wide Industrial Automation and Control System (IACS) network infrastructure. CPwE PRP highlights the key IACS application requirements, technology, and supporting design considerations to help with the successful design and deployment of these specific use cases within the CPwE framework. Rockwell Automation architected, tested, and validated CPwE PRP with assistance by Cisco Systems and Panduit.

Release Notes

This is the summary of the additions or changes in the August 2022 release:

- New IACS and network hardware with PRP support
  - ControlLogix® 5580 Redundancy PAC
  - ControlLogix Ethernet module 1756-EN4TR
  - Stratix® 5800 managed switch
- New or updated LAN topologies and use cases
- Updated Precision Time Protocol (PTP) architecture with multi-VLAN support and boundary clocks (BC) in PRP-independent LAN topologies
- Validated PTP performance and updated recommendations
- Recommendations for HMI, computers, and thin clients in a PRP network

Document Organization

This document is composed of the following chapters and appendices.

Chapter/Appendix	Description
CPwE Parallel Redundancy Protocol Overview	Overview of CPwE Parallel Redundancy Protocol.
CPwE Parallel Redundancy Protocol Design Considerations	Describes primary design considerations when choosing how to implement CPwE Parallel Redundancy Protocol in an IACS architecture.
CPwE Parallel Redundancy Protocol Configuration	Describes how to configure CPwE Parallel Redundancy Protocol within the CPwE architecture based on the design considerations and recommendations of the previous chapter.
CPwE Parallel Redundancy Protocol Monitoring and Troubleshooting	Information on monitoring and troubleshooting CPwE Parallel Redundancy Protocol.
References	Links to documents and websites that are relevant to Deploying Parallel Redundancy Protocol within a Converged Plantwide Ethernet Architecture Design and Implementation Guide.
Test Hardware and Software	Lists the Cisco and Rockwell Automation hardware and software used in testing the CPwE Parallel Redundancy Protocol solution.
Acronyms	List of all acronyms and initialisms used in this document.
About the Cisco Validated Design (CVD) Program	Describes the Cisco Validated Design (CVD) process and the distinction between CVDs and Cisco Reference Designs (CRDs).

For More Information

More information on CPwE Design and Implementation Guides can be found at the following URLs:

- Rockwell Automation site:
  - https://www.rockwellautomation.com/en-us/capabilities/industrial-networks/design-guides.html
- Cisco site:
  - https://www.cisco.com/c/en/us/solutions/design-zone/industries/manufacturing/cpwe.html

Note

This release of the CPwE architecture focuses on EtherNet/IP™, which uses the ODVA, Inc. Common Industrial Protocol (CIP™), and is ready for the Industrial Internet of Things (IIoT). For more information on EtherNet/IP and CIP Sync™, see odva.org at the following URL:

- http://www.odva.org/Technology-Standards/EtherNet-IP/Overview

Inclusive Terminology

Rockwell Automation, Cisco and Panduit recognize that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology.

We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.