



# CHAPTER 1

## MC-LAG to VPLS Introduction

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Various data center requirements have resulted in an expansion of Layer 2 domains, thus increasing the extension of Spanning Tree domain at the network level. Considering the fact that the Spanning Tree Protocol was developed to handle a small network diameter, the enterprise/SP network needs to meet the required Layer 2 connectivity challenges to ensure high availability between geographically dispersed data centers.

Exponential growth in data center resources and security requirements are driving the need to connect multiple data centers over larger distances. As a result, customers are facing additional challenges such as maintaining the high availability of applications and dealing with complex multi-sites interconnections.

This document covers one specific VPLS-based solution (referred to as “MC-LAG to VPLS”) that provides a high-scale, low-latency network and Spanning Tree Protocol isolation between data centers. This document encompasses issues related with large Layer 2 bridging domains and provides guidance for extending VLANs over Layer 3 network using VPLS technology.

Extensive manual testing was conducted in a large-scale customer representative network. The MC-LAG to VPLS solution was validated with a wide range of system test types, including system integration, fault and error handling, and redundancy to ensure a successful customer deployment. An important part of the testing was end-to-end verification of unicast and multicast traffic.

## Cisco Validated Design Program

The Cisco Validated Design (CVD) Program consists of systems and solutions that are designed, tested, and documented to facilitate faster, more reliable and more predictable customer deployments. These designs incorporate a wide range of technologies and products into a broad portfolio of solutions that meet the needs of our customers. There are two levels of designs in the program: Cisco Validated Design and CVD System Assurance.

## Cisco Validated Design

Cisco Validated Designs are systems or solutions that have been validated through architectural review and proof-of concept testing in a Cisco lab. Cisco Validated Design provides guidance for deploying new technologies or in applying enhancements to existing infrastructure.

## CVD System Assurance

Cisco Validated Design System Assurance is a program that identifies systems that have undergone architectural and customer relevant testing. Designs at this level have met the requirements of a CVD design as well as being certified to a baseline level of quality that is maintained through ongoing testing and automated regression for a common design and configuration.

Certified designs are architectural best practices that have been reviewed and updated with appropriate customer feedback and can be used in pre and post-sales opportunities. Certified designs are supported with forward looking CVD roadmaps and system test programs that provide a mechanism to promote new technology and design adoption. CVD Certified Designs advance Cisco System's competitive edge and maximize our customers' return on investment while ensuring operational impact is minimized.

A CVD certified design is a highly validated and customized solution that meets the following criteria:

- Reviewed and updated for general deployment
- Achieves the highest levels of consistency and coverage within the Cisco Validated Design program
- Solution requirements successfully tested and documented with evidence to function as detailed within a specific design in a scaled, customer representative environment
- Zero observable operation impacting defects within the given test parameters, that is, no defects that have not been resolved either outright or through software change, redesign, or workaround (refer to test plan for specific details)
- A detailed record of the testing conducted is generally available to customers and field teams, which provides:
  - Design baseline that provides a foundational list of test coverage to accelerate a customer deployment
  - Software baseline recommendations that are supported by successful testing completion and product roadmap alignment
  - Detailed record of the associated test activity that includes configurations, traffic profiles, and expected results as compared to actual testing results

For more information about the Cisco CVD program, refer to:

[http://cisco.com/en/US/netsol/ns741/networking\\_solutions\\_program\\_home.html](http://cisco.com/en/US/netsol/ns741/networking_solutions_program_home.html)