Preface

This document provides design guidance, configuration examples, and Cisco recommended best practices for interconnecting geographically dispersed data centers and implementing Layer 2 connectivity across Layer 3 network infrastructure using VPLS. The specific solution presented in this paper is named “MC-LAG to VPLS” and leverages the VPLS and MC-LAG functions available on Cisco ASR 9000 platforms. MC-LAG allows interconnecting two physically independent ASR 9000 PE devices to a single (physical or logical) device with a port-channel connection. The paper highlights the design considerations when ASR 9000 PE devices are connected to pair of Nexus 7000 using the virtual Port-Channels (vPC) technology. This solution is specifically targeted to high scale DCI deployments, usually found in large enterprise or Service Provider market segments. Two different deployment scenarios are the focus of this paper; the first one aiming to provide LAN extension services between data center sites for 500 VLANs. The second increasing this figure to 1200 VLANs. Also, despite the fact that the main focus of the paper is on the integration of ASR 9000 and Nexus 7000 platforms, interoperability with other Cisco platforms (as 7600 routers and Catalyst 6500 in VSS mode) was also considered during the validation effort.

Audience

This document is intended for customers and system engineers who are designing solutions or looking for design guidance with interconnecting data centers ensuring high availability Layer 2 connectivity and STP isolation. In addition, the solution presented in this paper applies to large-scale Layer 2 extension.

Organization

This document is organized as follows:

- MC-LAG to VPLS Introduction, page 1-1 Provides an overview of design considerations and the Cisco Validated Design (CVD) program
- Data Center Interconnect Solution Overview, page 2-1 Provides an overview of Cisco Data Center Interconnect solutions, highlighting their main functional components and functional requirements, specifically focusing on the LAN Extension aspects of such solutions.

- MC-LAG to VPLS Technology and Solution Overview, page 3-1 Provides an overview of the technologies required to deploy the MC-LAG to VPLS solution, including MC-LAG, vPC and VPLS. An high level architecture overview is also provided in this chapter, highlighting alternative solution deployment models.
- Data Center Multitier Model and Testbed Topology, page 4-1 Describes the Cisco-recommended data center multitier model and the testbed that was used to validate the specific MC-LAG to VPLS solution
- Deploying MC-LAG to VPLS Solution, page 5-1 Discusses in detail the deployment of this specific LAN Extension solution, presenting also specific results achieved under various failure scenarios.

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