



BPO Service Design and Development

BPO212ILT, Version 1.0

Blue Planet Orchestrate

Challenge Lab

LEGAL NOTICES

THIS DOCUMENT CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION OF CIENA CORPORATION AND ITS RECEIPT OR POSSESSION DOES NOT CONVEY ANY RIGHTS TO REPRODUCE OR DISCLOSE ITS CONTENTS, OR TO MANUFACTURE, USE, OR SELL ANYTHING THAT IT MAY DESCRIBE. REPRODUCTION, DISCLOSURE, OR USE IN WHOLE OR IN PART WITHOUT THE SPECIFIC WRITTEN AUTHORIZATION OF CIENA CORPORATION IS STRICTLY FORBIDDEN.

EVERY EFFORT HAS BEEN MADE TO ENSURE THAT THE INFORMATION IN THIS DOCUMENT IS COMPLETE AND ACCURATE AT THE TIME OF PUBLISHING; HOWEVER, THE INFORMATION CONTAINED IN THIS DOCUMENT IS SUBJECT TO CHANGE.

While the information in this document is believed to be accurate and reliable, except as otherwise expressly agreed to in writing CIENA PROVIDES THIS DOCUMENT "AS IS" WITHOUT WARRANTY OR CONDITION OF ANY KIND, EITHER EXPRESS OR IMPLIED. The information and/or products described in this document are subject to change without notice. For the most up-to-date technical publications, visit www.ciena.com.

Copyright© 2024 Ciena® Corporation – All Rights Reserved

The material contained in this document is also protected by copyright laws of the United States of America and other countries. It may not be reproduced or distributed in any form by any means, altered in any fashion, or stored in a database or retrieval system, without the express written permission of Ciena Corporation.

Security

Ciena cannot be responsible for unauthorized use of equipment and will not make allowance or credit for unauthorized use or access.

Contacting Ciena

Corporate headquarters	410-694-5700 or 800-921-1144	www.ciena.com
Customer technical support/warranty		
In North America	1-800-CIENA24 (243-6224) 410-865-4961	Email: CIENA24@ciena.com
In Europe, Middle East, and Africa	800-CIENA-24-7 (800-2436-2247) +44-207-012-5508	Email: CIENA24@ciena.com
In Asia-Pacific	800-CIENA-24-7 (800-2436-2247) +81-3-6367-3989 +91-124-4340-600	Email: CIENA24@ciena.com
In Caribbean and Latin America	800-CIENA-24-7 (800-2436-2247) 410-865-4944 (USA)	Email: CIENA24@ciena.com
Sales and General Information	410-694-5700	E-mail: sales@ciena.com
In North America	410-694-5700 or 800-207-3714	E-mail: sales@ciena.com
In Europe	+44-207-012-5500 (UK)	E-mail: sales@ciena.com
In Asia	+81-3-3248-4680 (Japan)	E-mail: sales@ciena.com
In India	+91-124-434-0500	E-mail: sales@ciena.com
In Latin America	011-5255-1719-0220 (Mexico City)	E-mail: sales@ciena.com
Training		E-mail: learning@ciena.com

For additional office locations and phone numbers, please visit the Ciena website at www.ciena.com

Change History

Blue Planet Release	Revision	Publication Date	Reason for Change
23.12	1.0	February 2024	Initial release.

Contents

Challenge Lab: Add Multi-Site Support for L2VPN Service 5

Challenge Lab: Add Multi-Site Support for L2VPN Service

Introduction

This document describes the concepts of the Challenge Labs for the Blue Planet Orchestrator Academy and contains the Challenge Lab tasks for the Service Design and Development section of the Academy.

After the ILT training is completed, you are provided with an additional day of access to the remote lab environment, where you should independently perform the Challenge Lab exercises. This will give you an opportunity for additional self-study and assessment of the knowledge gained during the training.

The Challenge Lab document and the exercises are similar to the Lab Guide, but only the final goal/outcome is presented to you, without step-by-step instructions.

For any questions or assistance, the instructor is available in the training chatroom for the duration of the Challenge Lab. You will be assisted as needed with troubleshooting issues that may arise during the Challenge Lab.

After the Challenge Lab is completed, a 1-hour review workshop will be delivered to the student group.

Documentation

PlanSDK documentation - <https://developer.blueplanet.com/docs/plansdk/index.html>

BPO Developer guide - <https://developer.blueplanet.com/docs/bpocore-docs/title.html>

Task 1: Implement Multi-Site Support for L2VPN Service

In this task, you modify your L2VPN service template and its imperative plans to support adding multiple sites to each L2VPN instance. You are given the following example of the devsim device configuration that you must apply to each device and port attached to your L2VPN instance.

```
dev-sim:interface {  
  GigabitEthernet 0/0/0.300 {  
    switchport {  
      mode trunk;  
      trunk {  
        allowed {  
          vlan {  
            vlans 300;  
          }  
        }  
      }  
    }  
  }  
}  
  
Vlan 300 {
```

```
    service-policy {
        input 10M;
    }
    xconnect {
        vfi 300;
    }
}
dev-sim:l2 {
    vfi 300 {
        mode manual;
        neighbor 2.2.2.2 {
            encapsulation mpls;
        }
        neighbor 3.3.3.3 {
            encapsulation mpls;
        }
        vpn {
            id 300;
        }
    }
}
dev-sim:policy {
    policy-map PE-1.TestService.PolicyMap {
        class TestService-policy-class {
        }
        police {
            cir 10000000;
            bc 160000;
            pir 80000;
            be 16000;
        }
    }
}
dev-sim:vlan {
```

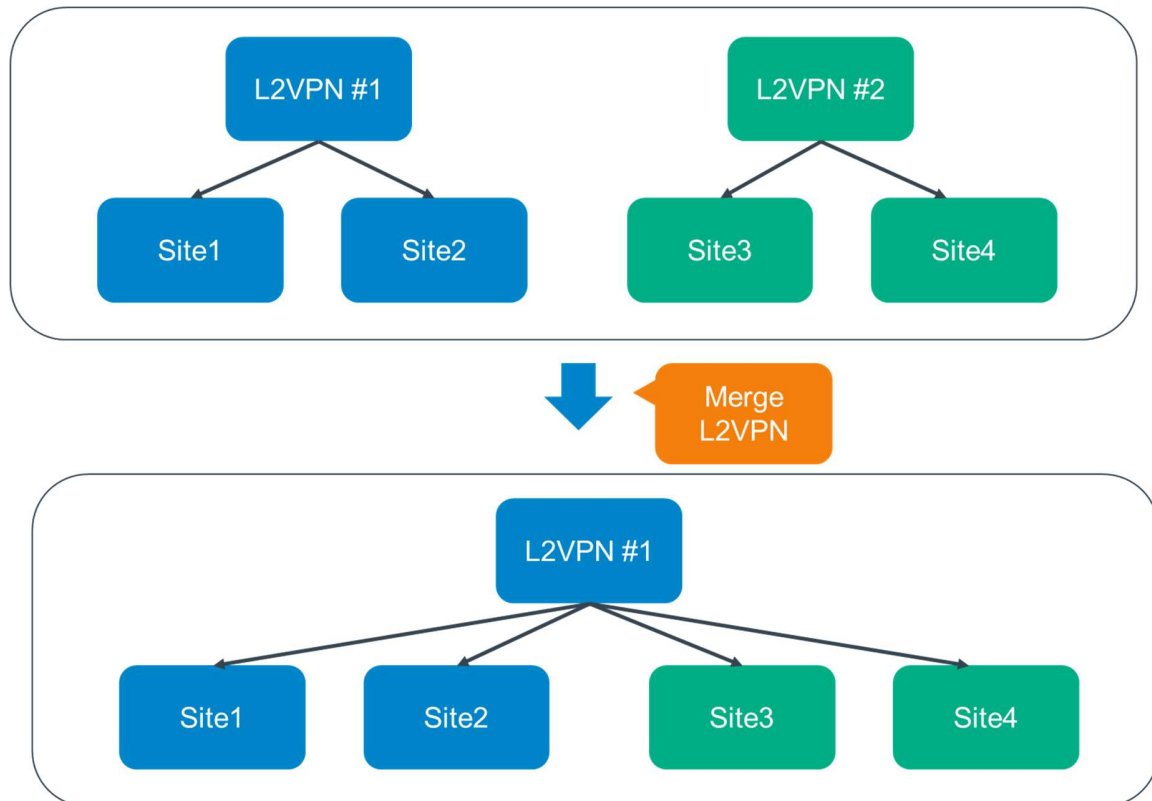
```
vlan-list 300 {  
    name PE-1.TestService.VLAN;  
}  
}
```

Objectives

- Study the example configuration and identify the differences between this multi-site configuration and the current p2p configuration.
- Modify the I2vpn Resource Type to support 2+ sites.
- Modify the logical interface creation code:
 - Remove the encapsulation, xconnect, and service-policy segments.
 - Add a switchport segment.
- Create a VLAN port on each device.
 - Apply the service-policy.
 - Add an xconnect segment.
- Create an I2 VFI instance on each device:
 - Add a VPN segment with an ID parameter.
 - Set the mode to manual.
 - Add device neighbors – this configuration will differ on each device since you need to add neighbors as IP addresses of neighboring devices. As in previous labs, the IP address on the Loopback110 interface should be used as a neighbor device address.
- Modify the code in the Terminate class so that it supports multiple sites:
 - Make sure that the logical port and VLAN ports are deleted.
 - Make sure that the L2 VFI instance is deleted.
 - Make sure that the policy map and VLAN are deleted.
- Modify the code in the Update class so that it supports multiple sites:
 - Make sure that configuration on all site devices is properly updated when a VLAN is changed for the L2VPN resource.
- Modify the code in the ChangePort class so that it supports multiple sites:
 - Make sure that the configuration for the old port is removed and the configuration on the new port is properly applied when a port on a site is changed.

Task 2: Implement a Merge L2VPN Custom Operation

In this task, you improve your L2VPN service by implementing a Merge L2VPN Custom operation. This operation simulates the merging of two customer networks by migrating the sites and their attached ports from one L2VPN instance to another and reconfiguring all migrated managed resources to use the service configuration from their new L2VPN resource.



Objectives

- Modify the l2vpn service and add a new mergeL2vpn plan.
- Modify the l2vpn resource type and add a new mergeL2vpn interface – this interface should have an input that represents the label of the L2VPN resource you want to merge to an existing one.
- Create a new class to implement this custom operation in the imperative plan.
- Modify and add code to existing methods to support this migration as needed.