CCIE Service Provider v5.1 LAB

Module1-Desgin Lab1

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CCIE Design guideline:

Before starting, please read the bellow guidelines:

- In this module, you will be creating, analysing, validating and optimizing a low-level network design. All relevant resources needed to successfully complete this module are provided within this module.
- 2. The menu bar on the main screen can be used to naivete to:
 - a. Exam content.Here you will find the exam questions.This module is scenario-based and contains about 30 to 35 web-based items.No device access is provided.
 - b. Resources.Here you will find provided resources.An initial set of resources is provided at the start of the module.Additional resource is provided as you process. Resources are cumulative and remain available throughout the femainder of the module.It is recommended to read all the provided resources prior to answering a question.
 - c. Guidelines. If you want to review this guideline again during your exam, you can find them here.
 - d. Help.Here you will find more information ab6ut the exam environment and functionalities.
 - e. End Exam Section. Clocking this button willend this exam section.
- 3. Backward navigation in this module is disabled,once you proceed to the next question,you will not be able to return to the previous question.
- 4. Question point values will not be visible in this module.More complex items may have partia scoring opportunities.
- 5. Item level feedback can be provided at question level.Feedback will process,but Cisco will not reach out to you to discuss any feedback provided.Any time spent on providing feedback will not be compensated.
- Access to selected Cisco online documentation is available from your desktop. Access to select 3°party product document(such as python)is available from the resources window under the "External Documentation" category.
- 7. If you suspect an issue with your exam environment,contact the lab proctor as soon as www.passccielab.com All rights reserved Created by robbis - 2 -

possible.

8. You have 3 hours to complete this module. If you finish early, you may start with the next module by any unused will not be carried over to the next module.

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Topology

Customer Network Services:

Managed Internet

The most popular service that is sold to customers is the standard internet connectivity.

Emerald SP is a Tier-1service provider for internet and hence does not incur traffic charges for Inter Tier-1 traffic.

Layer 3 VPN

In addition to internet connectivity, Layer 3 VPNs are actively pushed by the sales organization because it delivers a much higher margin compared to basic internet services. They also provide services such as management, QoS, and automated provisioning.

Layer 2 VPN

The demand for Layer 2 VPNs has been increasing exponentially in the last 1-2 years.Some portions of the network can deliver this functionality, and this capability is being added across the Leased Lines

Documents

Executive summary

Emerald SP is a regional service provider that is based in the UK.In recent years its focus has shifted towards capturing a growing market in Europe.Emerald SP Has acquired several smaller regional providers to gain a footprint in this lucrative market.lts network architecture teams pride itself on being "cutting edge"in terms of technology and capabilities.

The main business drives are based on rapid growth expansion, highest levels of uptime. OPEX

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saving, delivering new and innovative services exceptional customer satisfaction. The company

business specifications are listed here

Internal Business Services:

Datacentres

- Two data centres are located in London and Glasgow
- Some customer services are also hosted within the data centres.

Collaboration

Emerald SP is distributed across multiple location within the UK.VolP has been implemented and reduce toll charges andis used extensively by allemployees. .pk

Customer Network Services:

Managed Internet

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OOS

Some QoS has been implemented by Emerald SPto protect important business service over internet services. The existing Qos policies were optimized around five classes with the protection of voice traffic. It is anticipated that video service with be delivered in the future, and the network must be optimized to deliver those services. The companies that have been acquired each have their own Qos implementations that do not always map directly to the existing Emerald SP model.

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Security

A security solution has been implemented at the Emerald SP Peering to inspect that comes from the internet at the erimeter. When an anomaly is detected, traffic can be dropped or inspected.Remotely triggered black-holing techniques are used to steer the traffic from the peering points to the centralized cleaning device.

Emerald SP Acquires Garnet SP

Emerald SP has acquired Garnet sP,which is a Belgium-based Tier-2 regional ISP that provides only residential broadband internet services and internet services to enterprises customers. The last mile is predominantly delivered via xDSL(residential)and metro-Ethernet

Emerald SP to scale for multiple service provider acquisitions in future. Scile

BGP

Emerald SP uses a single public AS-100 and has several router reflectors to distribute routes throughout the network. The PE router run IPv4 and VPNv4 BGP, and the core routers (also used for peering)run only IPv4 and hold the full internet routing table.

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In some countries, the leased-line infrastructure is significant, although Ethernet is becoming increasingly popular.

Network Design Information.

Emerald SP has followed a strict set of design rules when deploying new sites. However, the acquisitions introduce standardization challenges and adhering to Emerald standard architecture has been difficult.Emerald SP has 8-POPs in UK.

Physical POP Topology

A core router exists per each core POP.Each of the non-core devices is connected to two different core devices over dark fiber DWDM links.

IGP

Currently Emerald SP uses a single IS-IS domain that consists of one large Level-2 area. This area should always cover with backbone core routers and aggregation devices, which allows Emerald SP to scale for multiple service provider acquisitions in future.

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(enterprise)circuits.Garnet SP consists of two POPs in Brussels and has multiple edge routers. Business customer are connected on dedicated access routers and residential customers are connected on dedicated xDSL devices.A pair of aggregatjlm routers connects all of the different routers to the upstream transit ISPs.All of the access routers run OSPF,advertise customer routes, and receive a default route from aggregation routers.The aggregation routers hold a full view of theglobal BGP table from the two transit upstream ISPs,and they also run the iBGP between them. As a consequence of the acquisition by Emerald SP,Garnet SP must add the capability to deliver the Emerald SP service portfolio on its infrastructure(MPLS VPN).The ultimate plan is to fully intergrade Garnet SP to become a new POP in Belgium.However,in the short term,temporary solutions are needed to active some services.Emerald SP requires POP redundancy to interconnect with Garnet SP.The long-term plan is to have unified network management solution across the integrated SP.The logical topology of Emerald SP and its newly acquired Garnet SP is shown in resource topology.

Emerald SP Customer: Green Corporation

Emerald SP has multiple enterprise customers, however one of their prime customers "Green Corporation"is shown in the topology with two sales "site-11 in London"and "site-12 in "Glasgow. Both this site has redundant 1G links fromPOP-5 and POP-6.A third site,"site-13 in Brussels", is connected to the Garnet SP.GreenCofporation has MPLS service subscription from Emerald SP in the UK and Garnet SP in Belgium.

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Which long-and short-term fixes are best suggested for the IGP between Emerald and Garnet?

Drag the suggested solutions from the left to the right-hand answers

| Options | Short-term solution | Long-term solution | |
|--|---------------------|--------------------|--|
| Multi-area OSPF | | | |
| S-IS and OSPF with mutual redistribution | | | |
| Multi-level IS-IS | | | |
| Single-area OSPF | | | |
| Single-level IS-IS | | | |
| | \$0. C | | |
| Answer | . 8'0' | | |

Answer

Drag the suggested solutions from the left to the right-hand answers

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|--------------------|---|--------------------|
| Multi-area OSPF | IS-IS and OSPF with mutual redistribution | |
| | N | |
| Single-level IS-IS | | Multi-level IS-IS |
| Single-area OSPF | | |
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