Note: This section should be integrated into your study of Chapter 1, "The Planning Tasks of the CCNP Exams." It should replace the content starting on page 13 in the book, "How to Prepare for the Planning Topics on the CCNP Exams."

How to Prepare for the Planning Topics on the Exam

Can you create a networking implementation plan for each technology area on a CCNP exam? Can you create a verification plan for those same technologies? According to the CCNP exam blueprint, these skills are now tested on the CCNP exams. These tasks normally involve large amounts of time devoted to project planning and documentation—things that are not practical during a timed Cisco exam.

Even though the exam might not ask you to literally create a plan, you do need the skills to perform those same tasks. The new CCNP SWITCH course doesn't have much content directly related to planning, other than some common-sense advice. In the past, the CCNP exams were limited to the scope of the corresponding course. With the new exams, such as 642-813, this isn't necessarily the case.

To come up with an implementation plan, you must begin with some goals or objectives. These are generally based on the following things:

- **Business requirements**—What does the business need out of the network? What policies must be met?

- **Business constraints**—How much will the planned solution (hardware and labor) cost?

- **Technical requirements**—Which switch features should be leveraged? How should the switch configurations be carried out? What limitations are there?

As network professionals, we might or might not have a role in identifying these requirements, but we do have a role in carrying out the work. Usually, our work follows this sequence:

Step 1.   **Plan** the network architecture and every switch feature that will be used. This can be done as a detailed project plan or as something sketched on a napkin over lunch. The idea is to know what needs to be done beforehand.

Step 2.   **Implement** the plan with switches, cables, protocols, and features. The CCNP exams have traditionally focused on implementing things.

Step 3.   **Verify** that the implementation works and meets the objectives of the plan.

Now hold that up against the new 642-813 exam blueprint. There are several broad categories where you can find the words "implement" and "verify"—always with the words "create...a plan," as in the following examples:

Create a VLAN-based implementation plan
Create a VLAN-based verification plan

Create an implementation plan for the Security solution
Create a verification plan for the Security solution

Create an implementation plan for the Switch-based Layer 3 solution
Create a verification plan for the Switch-based Layer 3 solution

Create a High Availability implementation plan
Create a High Availability verification plan

So how would you "create a plan" on a Cisco exam? You might get multiple-choice questions that ask for a best approach to a problem. More likely, you might get one of those complex scenario questions. You know—the ones where you have to read a lengthy explanation in one window, squint at the network diagram in another window, and interact with some switches in some other windows, all on one small screen.

The key here is with the scenario description. It's nothing more than a huge word problem that lays out things like business requirements, business constraints, and a list of goals to reach. Even the network diagram becomes a part of the project definition. As you read through the scenario and look over the diagram, you have to **create an implementation plan** in your mind.

The scenarios don't give you a sequence of things to do; instead, they present a bunch of things to accomplish. You must figure out what specific features you'll need, what steps you'll need to configure for each feature, which switch you'll have to visit to type in configuration commands, and so on.

Even as you work through a scenario on the exam, you should spend time **creating a verification plan** so you can test and make sure each feature you have configured actually works as it should. Otherwise, whatever you typed into the switch emulators might not be correct and might not earn you valuable points.

Why did Cisco move toward such broad strokes on the exam blueprint? One possibility is to test your knowledge of the many Cisco IOS features and which ones can be used to accomplish something. For example, the exam blueprint covers the following types of plans:

■   VLAN-based plans
■   Security plans
■   Switch-based Layer 3 plans
■   High Availability plans

Those don't say much about specific switch features, commands, or protocols. Instead, you should think of each one as a big toolbox; you need to know which tools are in each toolbox so you can formulate a plan of attack on any given situation. As the old saying goes, not every problem needs a hammer.

Here is a sample scenario that should help you get a feel for this process. Suppose an exam question has a scenario text as follows, and a network diagram as shown in Figure 1-2:

> A company has a network as shown in the network diagram. Switches A and B form the core, while C and D act as distribution switches. Switches A through D are already configured with working links and routing protocols.
>
> Switch E is added into the access layer. It is connected to switches C and D by two uplinks each. Each pair of uplinks should be joined together as a single logical link using a standards-based approach.
>
> Switch E needs to support two distinct groups of users in the Accounting and Engineering departments, to be placed on VLAN 10 and 20, respectively. Each VLAN needs to have a highly available gateway address in the distribution layer, using the .1 address in the appropriate subnet. The network should be configured such that the Accounting users normally pass over the link between switches C and E, while Engineering users pass over the link between D and E.

Do not change the routing configuration on switches A, B, C, or D, other than to advertise the new Accounting and Engineering subnets. Make sure that all uplinks are functioning and that users in the Accounting and Engineering subnets can ping the 192.168.199.10 server located in the data center.
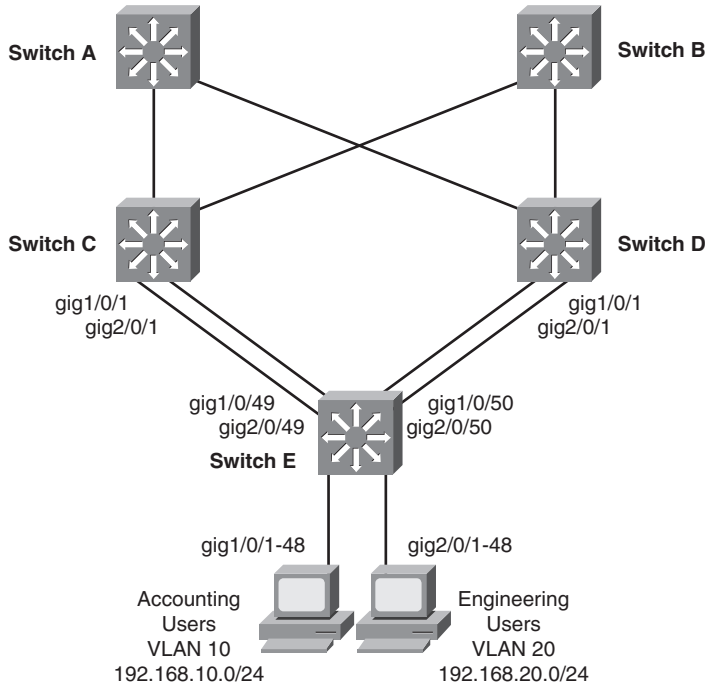
Figure 1-2   *Sample Exam Scenario Network Diagram*

Whew! That scenario covers plenty of ground, and it's really just one question on the exam! Notice that the scenario didn't really specify any switch features or protocols to be used. Instead, you have to put on your thinking cap and develop an implementation plan—fast! Remember that the exam clock is ticking. Your plan should include the following things:

- **Create VLANs**—VLAN 10 for Accounting and VLAN 20 for Engineering

- **VLAN extent**—The VLANs should exist on Switch E, where the users live, and also on C and D, where the gateways and routing protocols live.

- **EtherChannels**—Bundle one pair of uplinks between C and E and another pair between D and E. For a standards-based EtherChannel, use LACP.

- **Trunks**—VLANs 10 and 20 will need to be carried between Switches C and E and between D and E.

- **Layer 3 interfaces**—You'll need an interface vlan10 and an interface vlan20 to provide Layer 3 connectivity for the user subnets. Those will be configured on Switches C and D.

- **HSRP**—To get highly available gateways on both VLANs 10 and 20, you'll need to configure two different HSRP groups.

- **HSRP load balancing**—The two user groups need to normally pass over different uplinks. You'll need to tune the HSRP priorities so that the gateways are split across the two distribution switches.

- **Routing**—You will need to add the new subnets into the **network** commands for the preconfigured routing protocols on switches C and D.

The scenario also mentions some things to test and verify. Your mental verification plan can include things like the following:

Function to Verify	Example Commands	Verify on Switch
VLAN creation	**show vlan**	C, D, E
Working Ether-Channels toward Switches C and D	**show etherchannel summary**	C, D, E
VLAN trunking	**show interfaces** *type*/*num* **trunk**	C, D, E
Layer 3 interfaces	**show interfaces vlan10** **show interfaces vlan20** -OR- **show ip interface brief**	C, D
HSRP configuration and load balancing	**show standby brief**	C, D
Routing	**show ip route**	C, D
List	**ping 192.168.199.10 source vlan10** **ping 192.168.199.10 source vlan20**	C or D

To test whether the server is reachable from each user subnet, a regular, simple ping won't do. Instead, it's better to use extended pings so that the source address can be set to the Layer 3 interface that sits on each user subnet.

This book contains several tools to help you prepare for the planning topics and exam scenarios. At the end of each chapter, an "Exam Preparation Tasks" section presents a reminder of key topics covered in the chapter. The key topics can help you locate major features and functions that can be used to plan a switch configuration project.

After you have read through a chapter, you can continue to gain benefit from it by skimming for the Key Topic icons. Each chapter also presents the commands needed to configure a switch feature in the order in which they should be entered. Knowing this sequence of operation should help you understand the sequence of the implementation planning tasks.

Finally, each chapter ends with a command reference section in which configuration and verification commands are summarized in a table format. The left side of the table lists the task to be performed, while the right side shows the command syntax. Don't worry about memorizing the exact or complete command syntax, though. Instead, concentrate on the task and the basic command keywords.