

Aruba Certified Design Professional

OFFICIAL CERTIFICATION STUDY GUIDE

(EXAM HPE6-A47)

First Edition

Aruba Education Development Team

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About the Authors

The material in this Study Guide was developed by Kimberly Graves and Leo Banville from the Aruba Education Development team and by Miriam Allred.

Introduction

This book is based on the Aruba Certified Design Professional (ACDP) course, which teaches networking professionals how to design best practice Aruba networking solutions, as well as how to explain the benefits of the solution to customers. The book explains how to gather information about customer requirements and how to translate those requirements into technical needs.

The guide covers best practices for security and high availability, as well as strategies for designing Quality of Service (QoS) solutions that protect voice and other time-sensitive traffic. Design topics include high density deployments for auditoriums and also solutions for telecommuters and traveling employees. Finally, the guide discusses Aruba AirWave and Central and explains when and how to add these solutions to a proposal.

As the guide progresses, readers can apply what they learn in a detailed scenario using practical skills. For example, there are activities to create VisualRF plans for AP locations and to design a logical network topology based on a set of requirements. At the end of the guide, you can put everything together, creating a complete Bill of Materials (BOM) and network solution design for a new scenario.

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Audience

This book is designed for presales solution architects involved in supporting the sale of Aruba solutions.

It is assumed that you have an understanding of basic wireless and wired technology and familiarity with the Aruba 8 architecture as well as interest in learning about design best practices to help you understand customers' business issues and to propose appropriate solutions.

Assumed Knowledge

Aruba Certified Design Professional Official Certification Study guide is a professional level book, which assumes some prior knowledge of Aruba solutions.

Minimum Qualifications

Typical candidates for this exam are networking IT professionals who have architect experience with Aruba wireless and wired switching solutions. They have relevant field experience focused on interpreting architectures and customer requirements to design Aruba subsystems or single campus network solutions.

Relevant Certifications

After you pass the exam, your achievement may be applicable toward more than one certification. To determine which certifications can be credited with this achievement, log in to The Learning Center and view the certifications listed on the exam's More Details tab. You might be on your way to achieving additional certifications.

Preparing for Exam HPE6-A47

This self-study guide does not guarantee that you will have all the knowledge you need to pass the exam. It is expected that you will also draw on real-world experience and would benefit from completing the hands-on lab activities provided in the instructor-led training. To pass the certification exam, you should be able to demonstrate that you can collect the information relevant to designing the solution, analyze this information to determine customer requirements, and create a plan to meet those requirements. The exam tests you on all components of the design from selecting the wired and wireless products; designing the physical and logical topology; creating the security, QoS, and management plans; and delivering the BOM.

Recommended HPE Training

Recommended training to prepare for each exam is accessible from the exam's page in The Learning Center. See the exam attachment, "Supporting courses," to view and register for the courses.

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1 Information Gathering

EXAM OBJECTIVES

- ✓ Given a customer's needs for a single site, determine the information required to create a solution.
 - ✓ Evaluate a customer's needs for a single-site campus, identify gaps, and recommend components.
-

Assumed knowledge

- Aruba Mobility Master and Controller architecture
- Basic knowledge of 802.11 and radio frequency (RF) concepts
- Basic knowledge of switching and routing

Introduction

In this chapter you will determine and document the existing network environment and identify key stakeholders. The scope and size of the project will be defined using the physical site information and the current network usage.

Key stakeholders

You will first consider how to identify and interview an organization's key stakeholders.

Key stakeholders of a deployment project

Information gathering for network design projects requires information from many different sources within the organization. Usually, someone at the executive level within the organization initiates a new or network upgrade project. Other C-level executives such as Chief Technology Officer (CTO), Chief Executive Officer (CEO), or Chief Financial Officer (CFO) may also need to “buy-in” and support the project, depending on the level of complexity and cost of the project. Most obviously technical employees such as network administrators or managers will need to be involved in the

technical aspects of the project. Lastly, if the project will affect end-users, then appropriate training and information will need to be provided to the ultimate end-users of the system. It is good to understand what the customer wants to do with the network in terms of the business reasoning behind it. This information will enable you to discuss the appropriate Aruba solutions.

Many large and complex network design projects will require a long sales cycle. A proof of concept (POC) and possibly a pilot of the new network systems might be required to show the value they can bring to an organization. In many cases, the scope of the project may be defined in a Request for Proposal (RFP) or Request for Quote (RFQ), and the sales process will be highly competitive more often than not. Price and benefits of the new network design as well as solving the business needs are of utmost importance when discussing deployment projects.

Interview stakeholders

Once a network design project is underway, the information gathering process starts with talking to the organization's stakeholders and clarifying their expectations. It is important to define the scope of the project by discussing the current network deployment and issues or problems with the current systems. During the interview process, the critical needs and pain points of the current network and systems should be discussed. The anticipated growth of the organization, including additional expanded locations and additional users or devices, should also be discussed.

Stakeholder interview checklist

1. What is the scope of the project?
2. What is the primary purpose of the new network deployment?
3. What business problems are you trying to solve?
4. What are your most critical needs?
5. What are your pain points or most important issues?
6. What is your anticipated growth of the environment?

Wireless RF/network questionnaire

A common way to gather information is to use a questionnaire to ask about the network environment and customer needs. Figure 1-1 outlines the topics you would cover in a typical questionnaire.

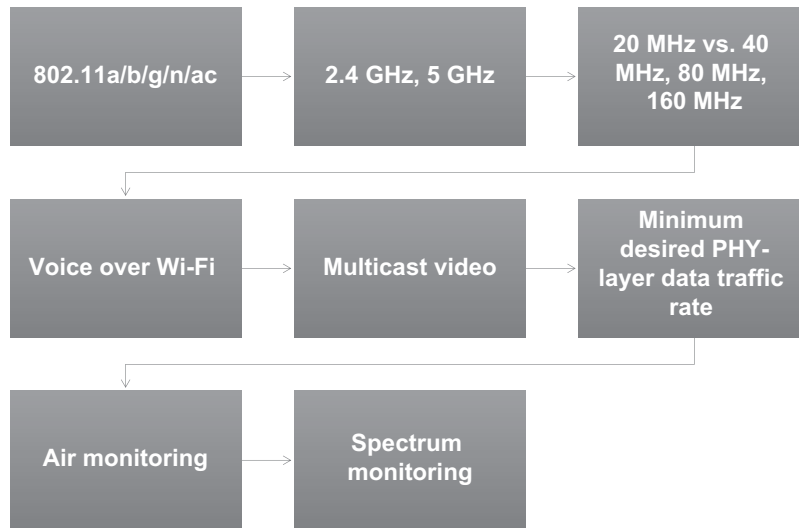


Figure 1-1 Wireless RF/network questionnaire

Prior to creating a network design, you should determine which 802.11 standards the customer devices currently support. You should also determine if client devices will be upgraded in the near future.

Almost all new enterprise deployments will be based upon 5 GHz radio frequency channels unless there is a compelling need for 2.4 GHz coverage. It may also be necessary to perform an on-premises walkthrough and spectrum analysis to determine if it is feasible to use 40 MHz or wider channels.

The primary use of the network such as voice, video, or data is critical when designing an RF network. Knowing a targeted minimum data rate is also helpful prior to starting the design process. Lastly, It is important to ask the customer if air monitoring/WIPS with containment or spectrum-monitoring services are necessary for the network.

Keep in mind that many customers might not know answers for all of these questions. Many environments feature clients introduced by the users themselves, and some customers lack insight into all the applications in use. It is generally best practice to design to support 802.11ac, as well as voice and video applications, in order to future proof.

Wireless RF/network questionnaire

1. What 802.11 PHY types are required over the course of the WLAN lifecycle (802.11a/b/g/n)?
2. Which RF bands (2.4 GHz, 5 GHz) will be used? Plan to use both bands due to increases in client density.
3. What channel width (20 MHz vs. 40 MHz) will be used in each band? Typically, 20 MHz channels are used in 2.4 GHz, and 40 MHz channels are used in the 5 GHz band.
4. Will voice over Wi-Fi be used? This answer will affect your planning for roaming and access point (AP) signal strength calculations.
5. Will multicast video over Wi-Fi be used? Use of roaming video has a similar effect as voice.
6. What is the minimum desired PHY-layer data traffic rate that must be available throughout the coverage area? Do some areas have different minimum data rate needs?
7. What are the desired air monitoring rates? Are dedicated air monitors required for security or compliance purposes?

Wired network questionnaire

You should also investigate the customers' wired network needs by asking, how many wired ports does the customer require for users and devices? What types of applications run over the network? It is also important to ask the customer about device capabilities (including Power over Ethernet [PoE]), logical topology, physical wiring closet locations, and site cabling.

Typical questions to ask the customer about the wired network include how many wired ports the customer needs to support, including ports for wired users and other devices such as printers and Internet of Things (IoT) devices. You should also ask what applications users run on the wired network. Ask whether the customer can share information about the current topology and device capabilities. You will also need to assess the physical requirements. In addition to closet locations, you need to gather information about the site's cabling. This will help you to select the correct switches and transceivers, and it might also affect whether you propose switches that support Smart Rate ports.

You should also keep in mind that information that the customer provides about the topology might not be update. If the customer is open to you passively collecting some information about the network, you could install an evaluation copy of AirWave or use a tool such as SolarWinds to map the network.

Wired network questionnaire

1. How many wired ports for users and devices?
2. What types of applications are used on the network?
3. What are the current device capabilities and topology?
4. Where are closets located?
5. How is the site cabled?

Device needs

Determining the user device needs is critical for accurately designing a wireless network. To better refine customer needs around AP model and number of APs, begin by asking, how many devices will each user have? Today, Aruba recommends you plan for at least three devices per user: a laptop, a tablet, and a smartphone.

As Figure 1-2 shows, other considerations about device capabilities such as max transmit power, number of supported spatial streams, and support for DFS channels are all important.

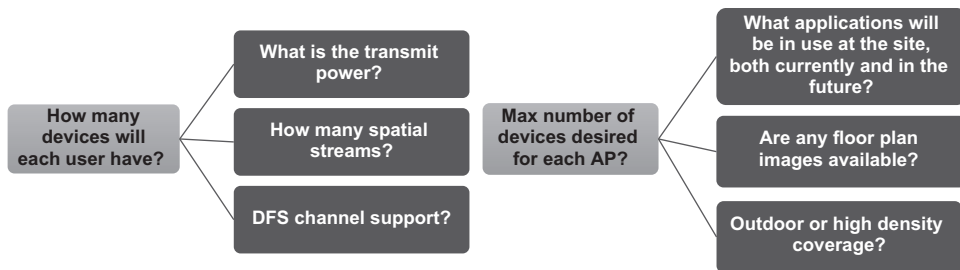


Figure 1-2 Device needs

Next, it is important to determine the maximum number of devices desired for each AP. Typically, Aruba recommends 20–30 devices per radio (40–60 per dual-radio AP). This number may be more or less, depending on traffic type (voice or data), expected load, and connection type (802.11a, b, g, or n).

Prior to starting an RF plan, you should try to gather any floorplans or image files from the customer and determine the scale of the floor plans.

You should ask the customer what their requirements are in terms of security—not only technical requirements but also regulatory. This is true for both wired and wireless. You should also gather all information they have in terms of regulatory requirements for their environment.