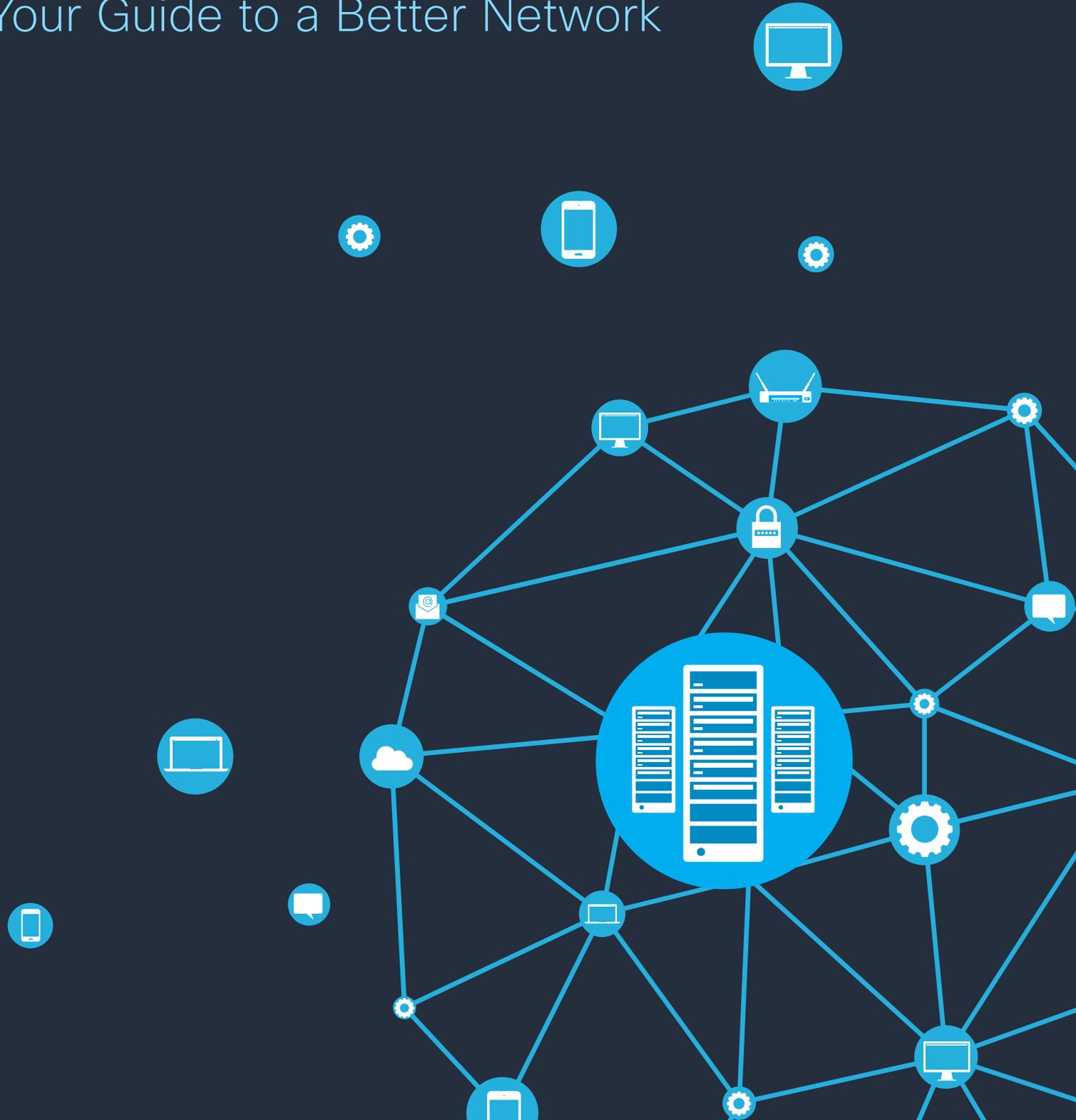


# Network Optimization Handbook

## Your Guide to a Better Network



# Who is this book for?

This e-book is for IT leaders who are ready to adopt a proactive approach to optimizing their networks and who want insights into the foundations necessary to prepare their networks for tomorrow.

With a Proactive Approach You Can...



Gain Greater Network Control



Manage Change with Confidence



Reduce Downtime and Improve Reliability



Plan for the Future



Address Security Before It's an Issue



Resolve Issues and Make Better Decisions Faster

# Table of Contents

## Section 01

Is Your Network Ready or This?.....Page 4

## Section 02

Architecture Strategy and Planning ..... Page 17

## Section 03

Compliance and Change Management ..... Page 23

## Section 04

Operations Support & Lifecycle Management ..... Page 29

## Section 05

Analytics and Modeling .....Page 33

## Section 06

Security and Risk .....Page 37

## Section 07

Operations Efficiency & Automation ..... Page 40

## Section 08

Put It Into Practice ..... Page 45

SECTION  
01

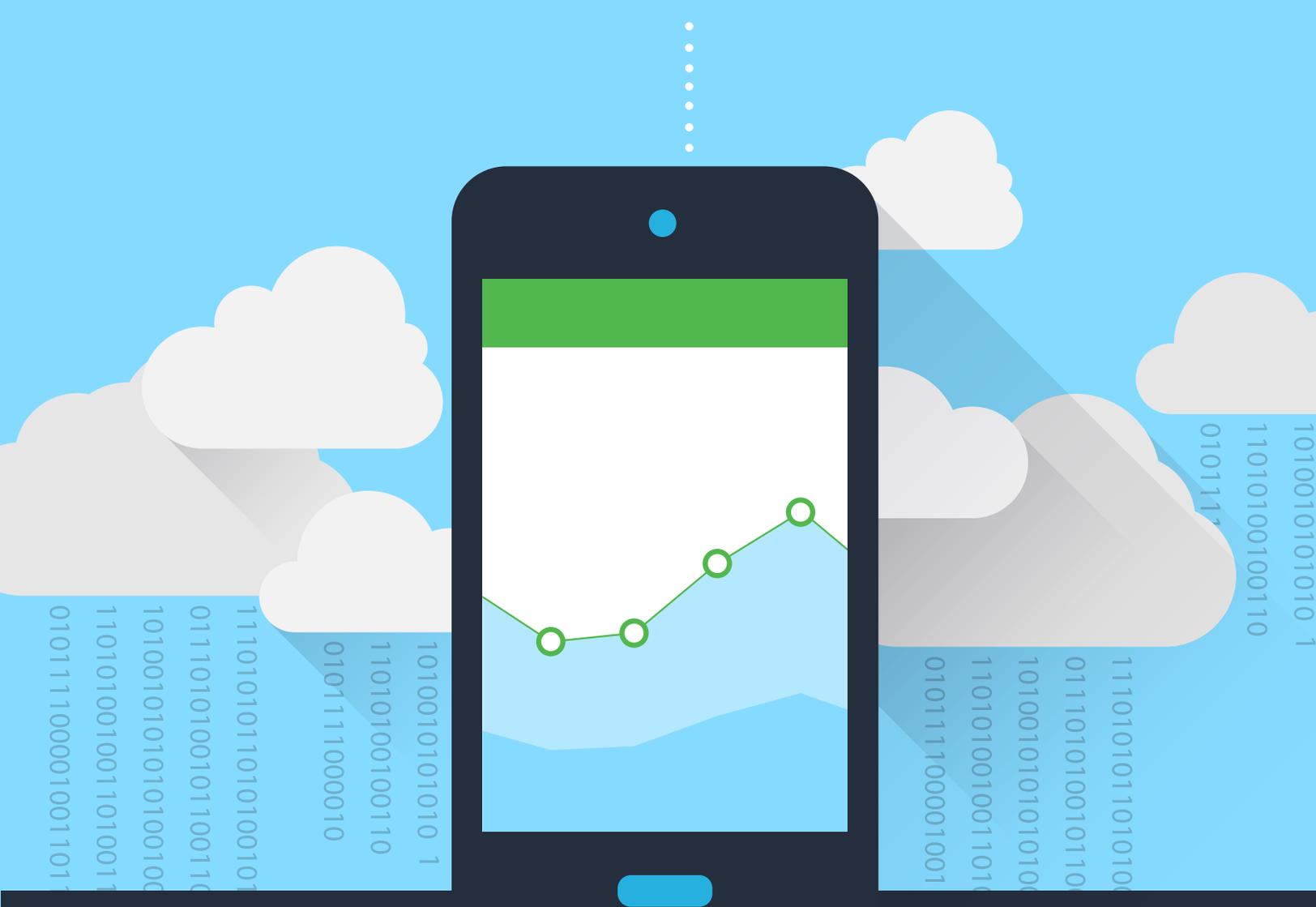
Is your network ready for this? .....



Don't you wish you were asked that question before a decision was made to deploy, support, and maintain that new technology on your network? .....



Connected, real-time business  
is here and demand on the  
network will continue to grow.<sup>1</sup>



Technologies such as cloud, mobile, big data, and collaboration are putting more stress on the network—and on those who manage and operate it.

What new technologies have you been asked to support?

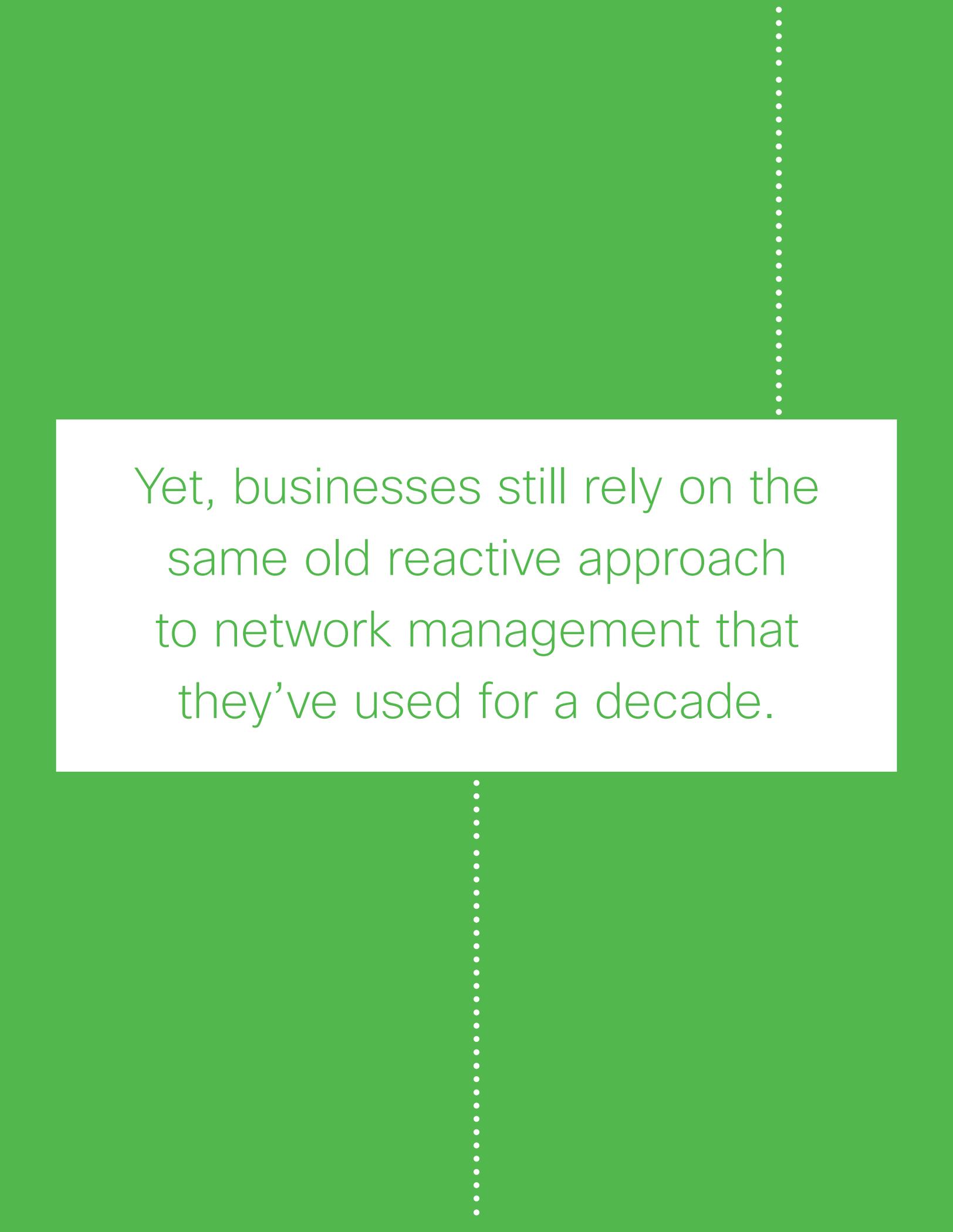


Business leaders often assume the network will always be reliable and many decisions are made without IT's input.

When businesses decide to launch a new technology such as big data or private clouds, they spend a lot of time considering the software and hardware, but they rarely consider the impact on network reliability and performance.

As a result, network managers are left to figure out ways to ensure network availability despite the growing demands.



The background is a solid green color. There are two vertical white dotted lines: one on the right side and one on the left side, both extending from the top to the bottom of the page. A white rectangular box is positioned in the center, containing the text.

Yet, businesses still rely on the same old reactive approach to network management that they've used for a decade.

A typical response has been to throw resources at the problem, with more...



But as networks grow, this quickly becomes an expensive, reactive, brute force solution to the problem.

# What if there was a better way?



The following chapters outline best practices to achieve your desired business outcomes.

# What are your desired business outcomes?



Cutting costs and improving your profitability?



Creating a more engaged and productive workforce?



Creating personalized customer experiences?



Making better decisions faster?



Protect against modern threats created by increased connections?



Reducing risk associated with change?

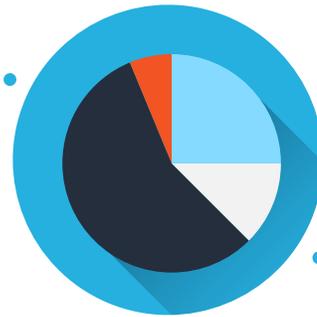


Have you thought about  
what capabilities you need  
to deliver these outcomes?

# An optimized network is the foundation for business innovation and outcomes



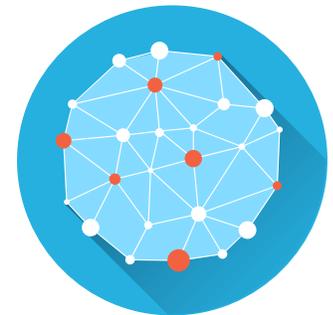
Security and risk



Analytics and modeling



Operations efficiency and automation



Compliance and change management



Architecture strategy and planning



Operations support and lifecycle management

To prepare your network, here are **six areas** you need to address:

Let's take a look at how an organization might address each of these areas. Meet Carroll's First Bank, a fictional financial institution that's experiencing rapid growth and evolving business needs.



The bank's IT team has new network services it is planning to roll out to help it achieve its desired business outcomes:

- Providing a better customer service experience
- Creating a more engaged and productive workforce
- Protecting sensitive data
- Reducing downtime
- Validating network changes prior to implementation
- Making better decisions faster



Currently the bank is able to manage its entire IT infrastructure from its headquarters. However, with plans to acquire a local credit union, Carroll's First Bank needs to decide how and if that network will be integrated and managed.



To prepare for these changes, the bank's IT team will need to review the six fundamental areas. The following chapters take you through the team's journey of these six areas.

SECTION

# 02



## Architecture Strategy and Planning

**Goal:** To identify what can be optimized to enhance your network's stability and performance.

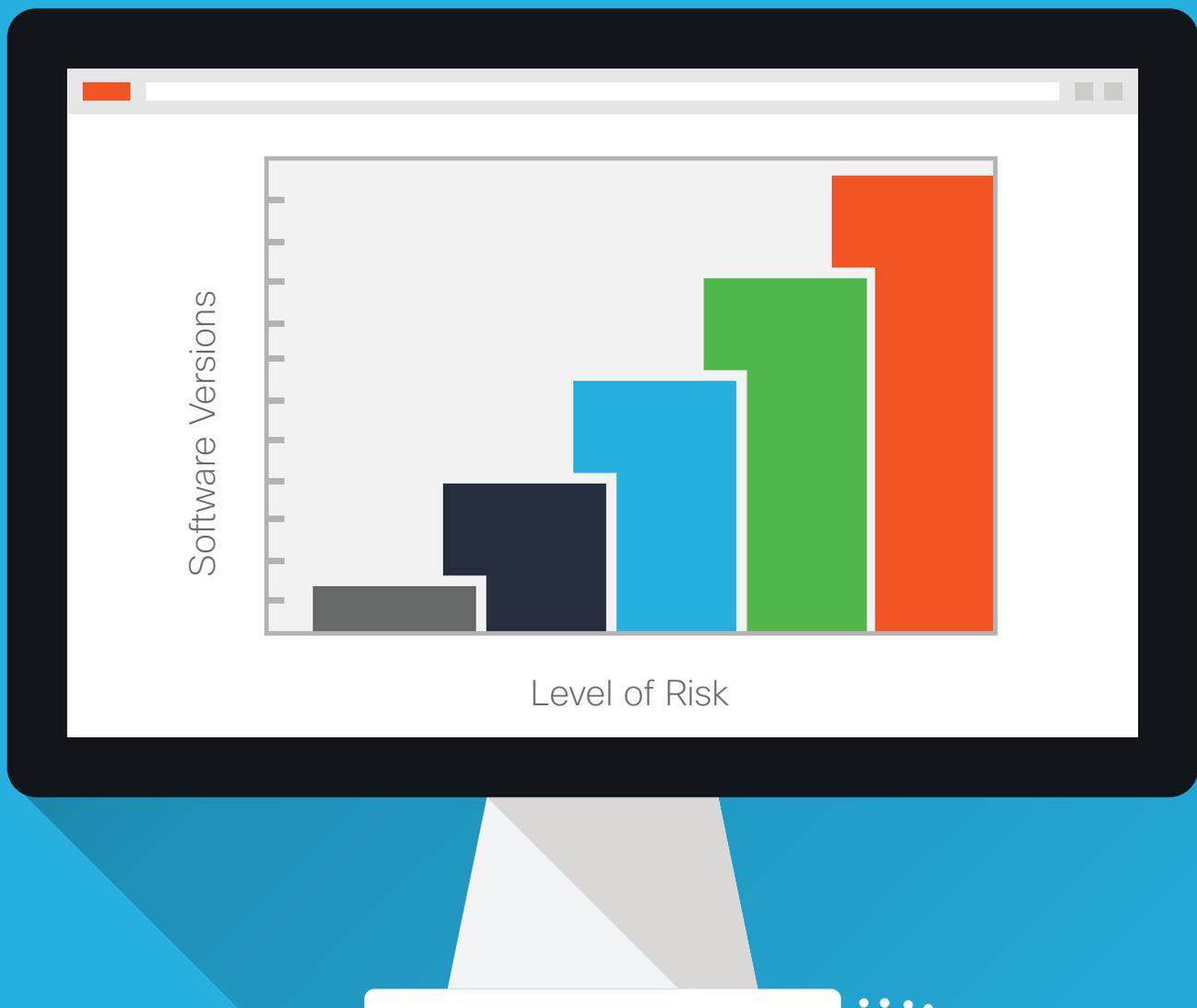
Why is architecture strategy and planning so important?

Let's start by taking a look one of the leading causes for network instability: *variability*.

## ... Assessing variability: ...

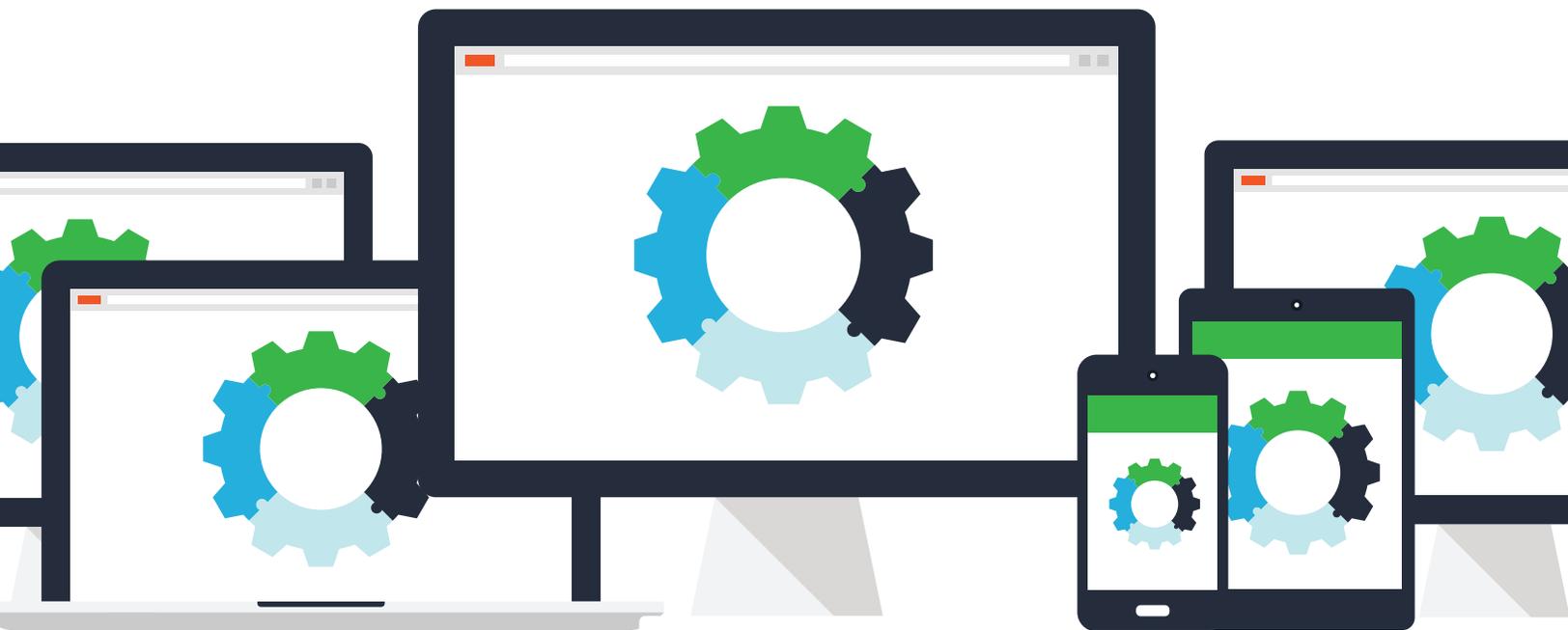
- How many types of hardware are you managing?
- How many software versions are you running?
- How many configurations are you managing?

The higher the number, the greater the variability in your network.





Your objective: Combat variability by standardizing hardware, software, and configurations.

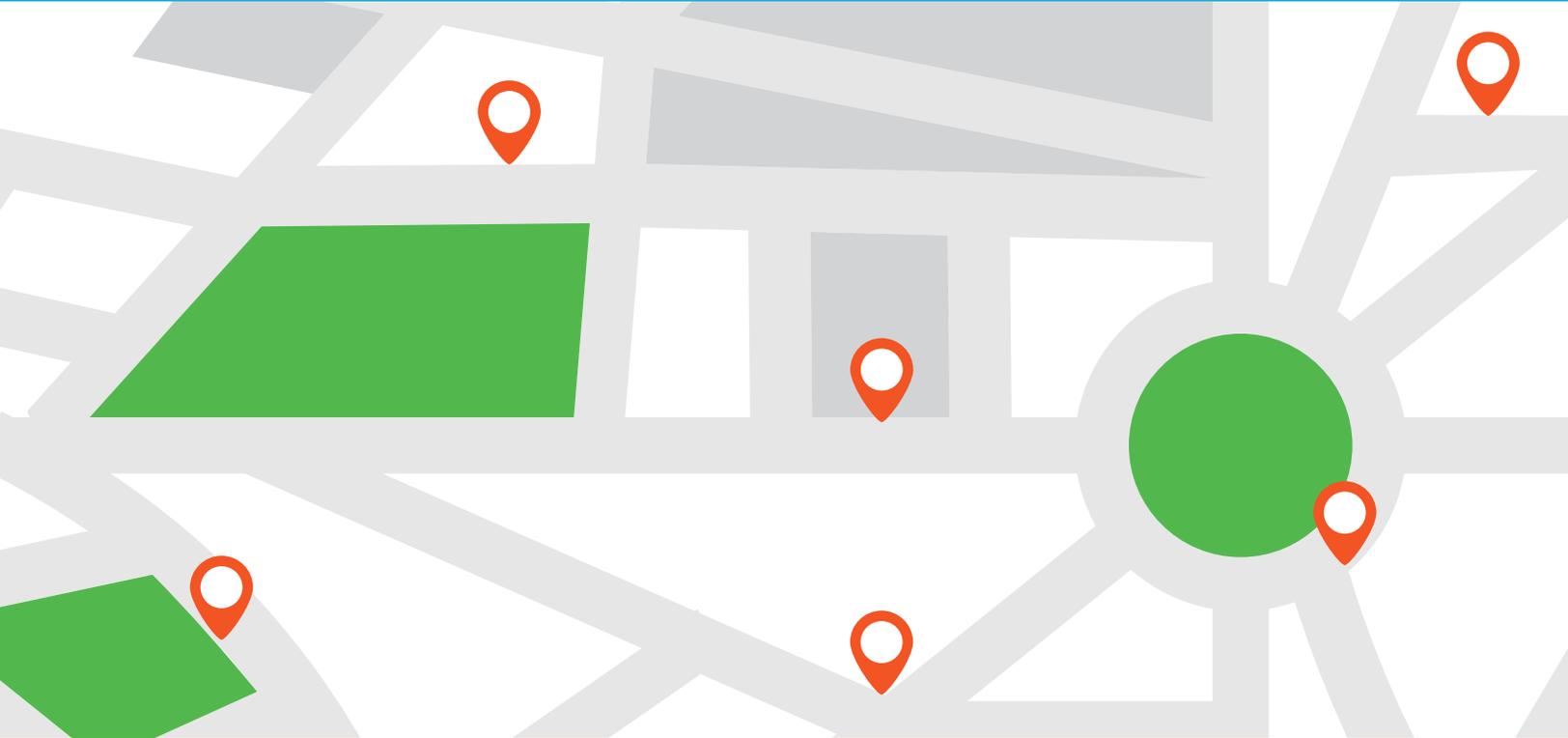


With proper architecture strategy and planning, you can achieve standardization and establish a baseline of what's acceptable in your network. So, you'll know the answers to questions, such as:

- Is this line card compatible?
- Has this software been validated for use in our network?
- Do I have the proper configuration?



# A Strong Framework



Carroll's First Bank is expanding rapidly due to organic growth, as well as some recent mergers and acquisitions.

With plans to continue its expansion over the next 5 years, they need to design a network that will support this expansion, integration of acquired networks, and addition of new services.

To accomplish this, the bank's IT team has to look at its:

- Capability
- Capacity
- Scalability
- Stability .....

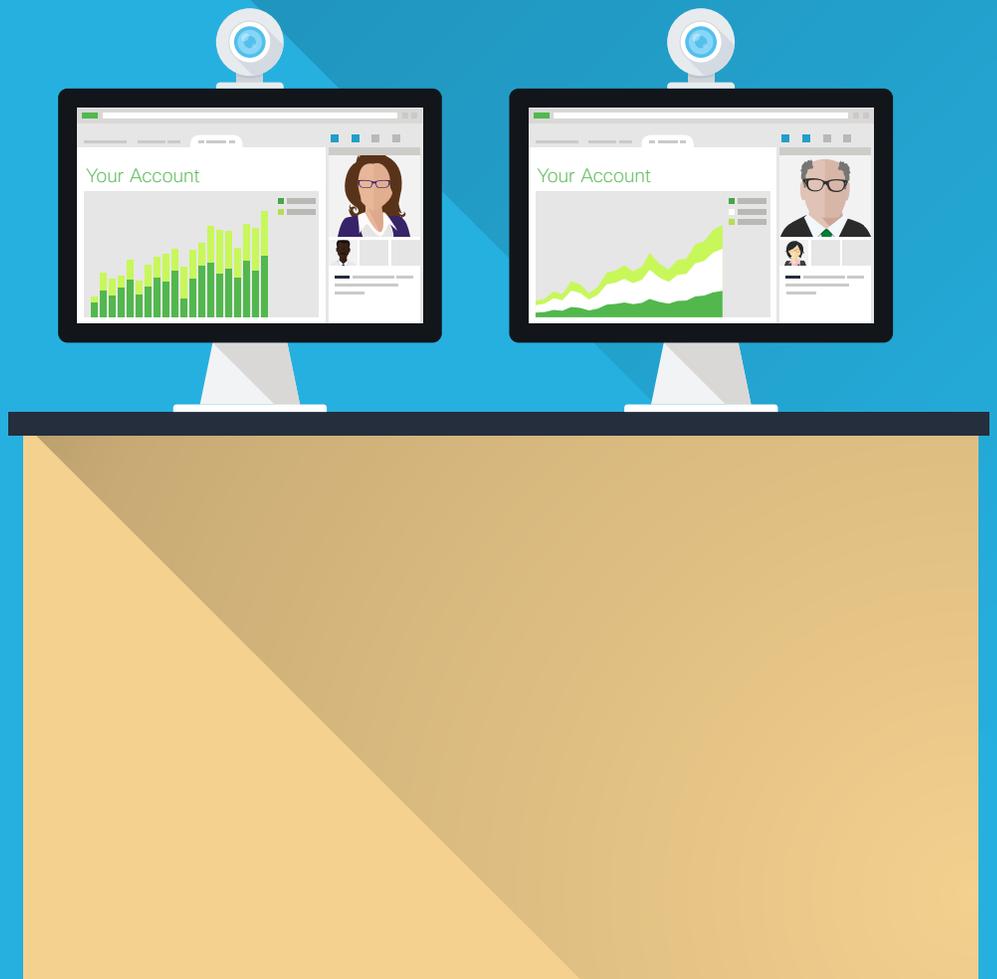
One of its first projects is to introduce a virtual bank teller. This customer service initiative requires the delivery of high-quality video from a central location to each of its branches.



To deliver this experience, the bank must optimize its edge network for media delivery, which involves ensuring adequate bandwidth and that the proper video codecs are in place.

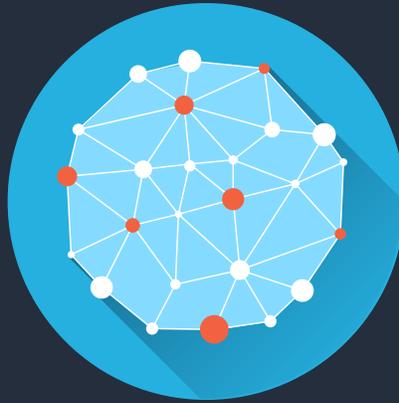
Because the bank's network architecture is already aligned to its business goals, the bank knows which devices and configurations are acceptable based on its established architecture and configuration policies. So, its IT team is able to add this new service without worry.

Your architecture strategy and plan helps you establish what's acceptable in your network and what's not.



SECTION

# 03



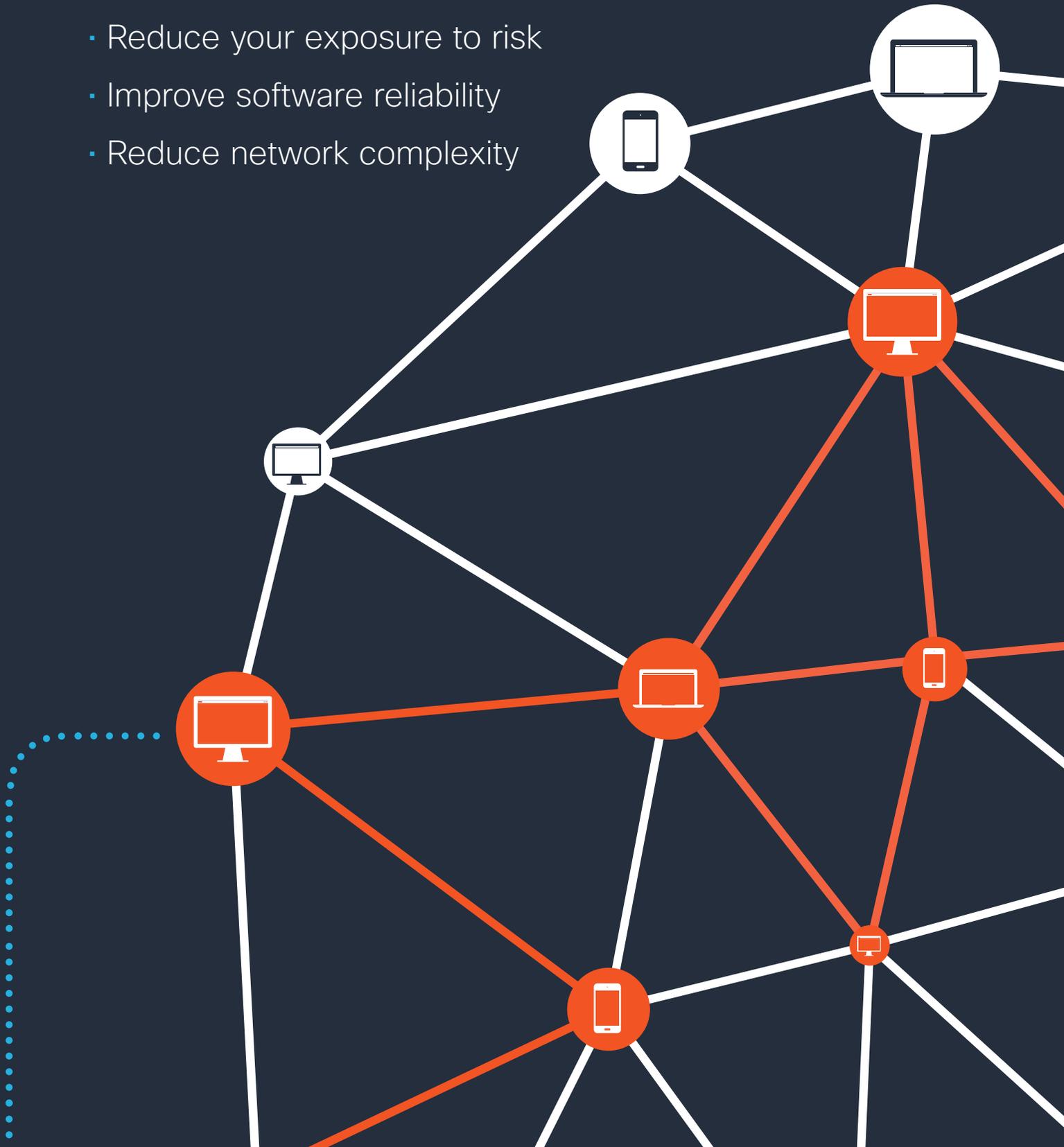
## Compliance and Change Management

**Goal:** To prepare your network and team to support new solutions and applications in a controlled, consistent, and efficient manner.

## Why is change management important?

All changes have a potential of being disruptive to the business. Establishing processes to select, validate, and maintain Cisco IOS® versions in your network will help to:

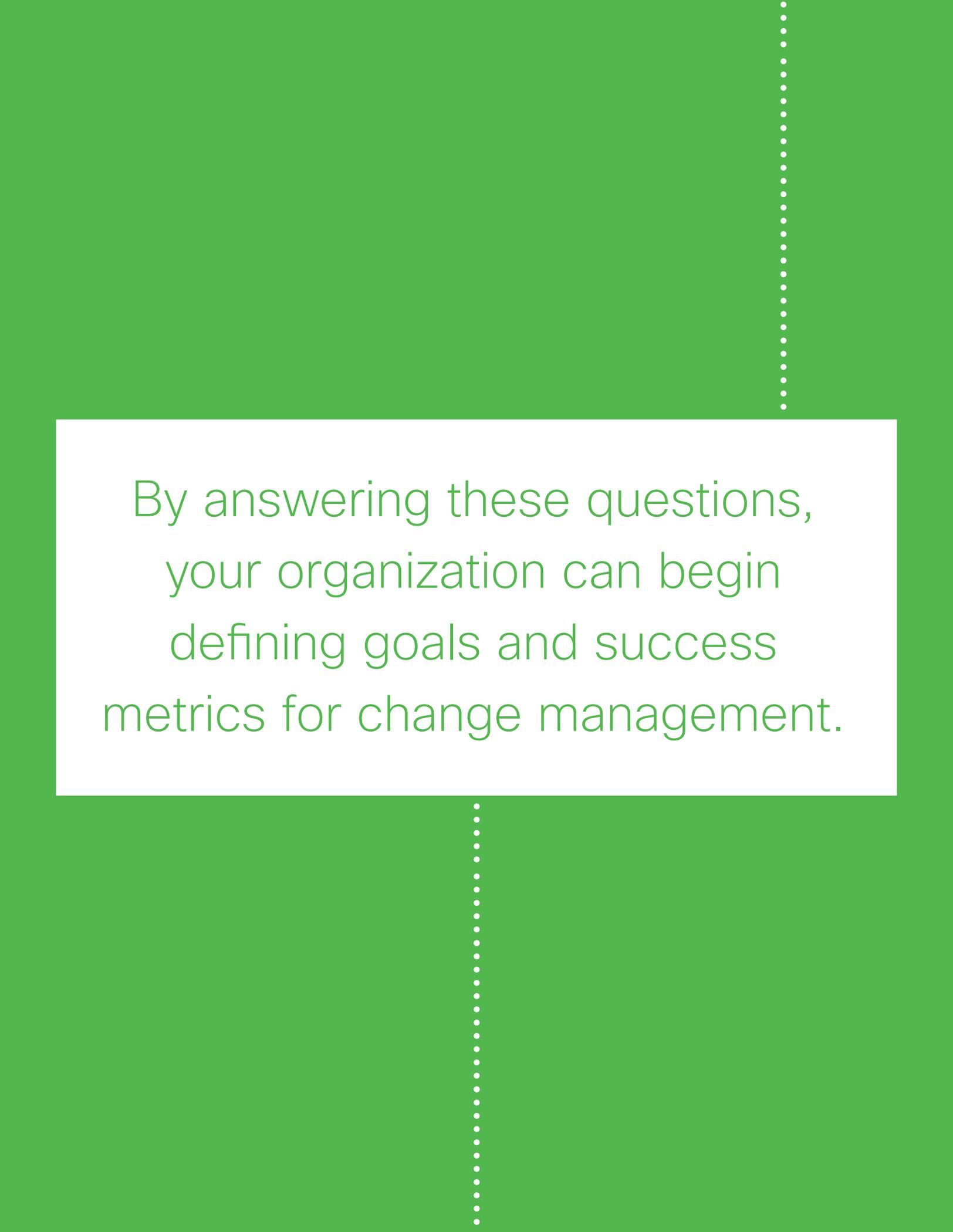
- Reduce your exposure to risk
- Improve software reliability
- Reduce network complexity



When you are planning to introduce new technologies and applications into your network, start with an honest assessment of your current change management practices.

- Do you know when to upgrade software?
- Do you have a process to test and validate software?
- Do you have a limit to the amount of IOS versions actively running?
- Do you have difficulty deploying new IOS software?
- How often do you experience downtime due to IOS stability issues?
- How are you measuring the success of your changes?

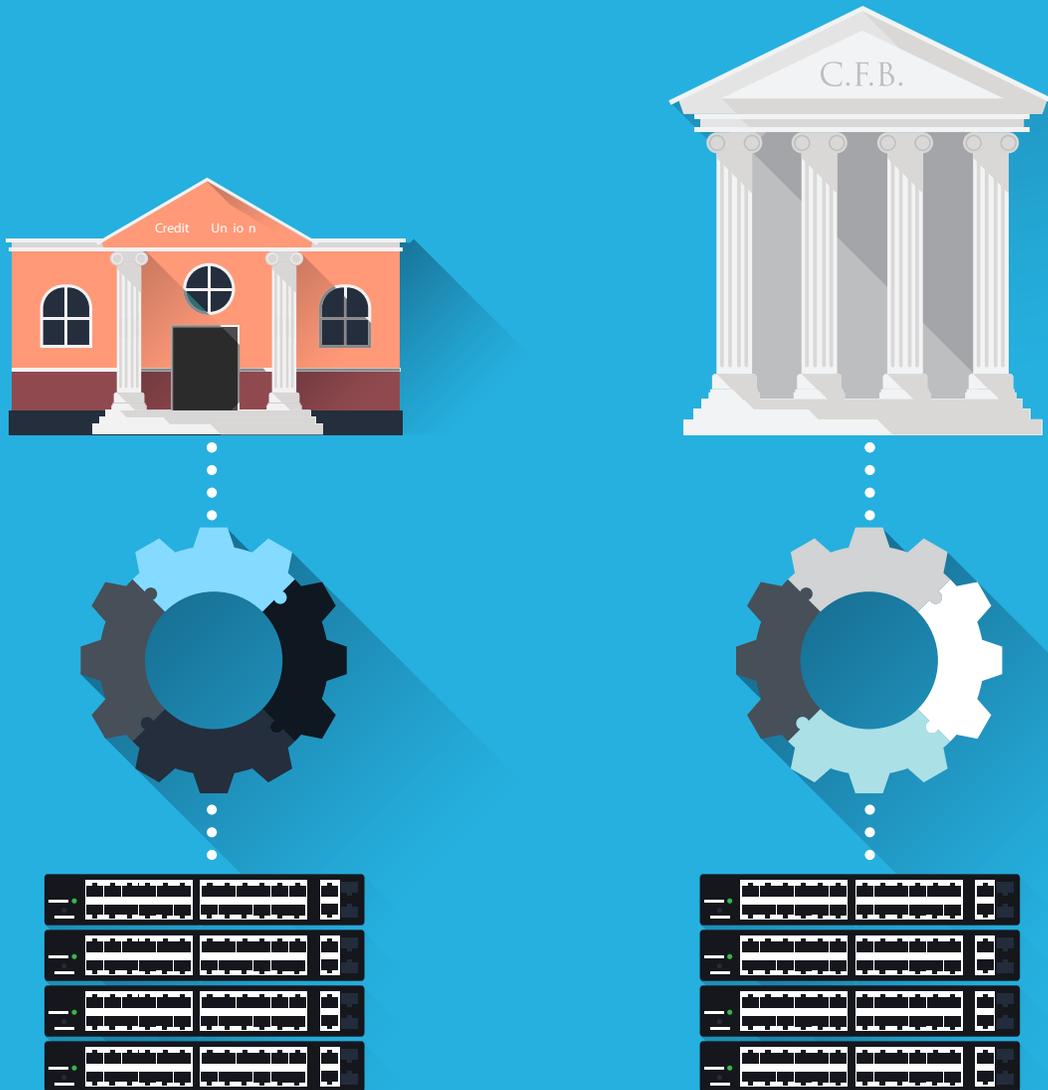


The background is a solid green color. There are two vertical white dotted lines: one on the right side and one on the left side, both extending from the top to the bottom of the page. A white rectangular box is positioned in the center, containing the text.

By answering these questions,  
your organization can begin  
defining goals and success  
metrics for change management.

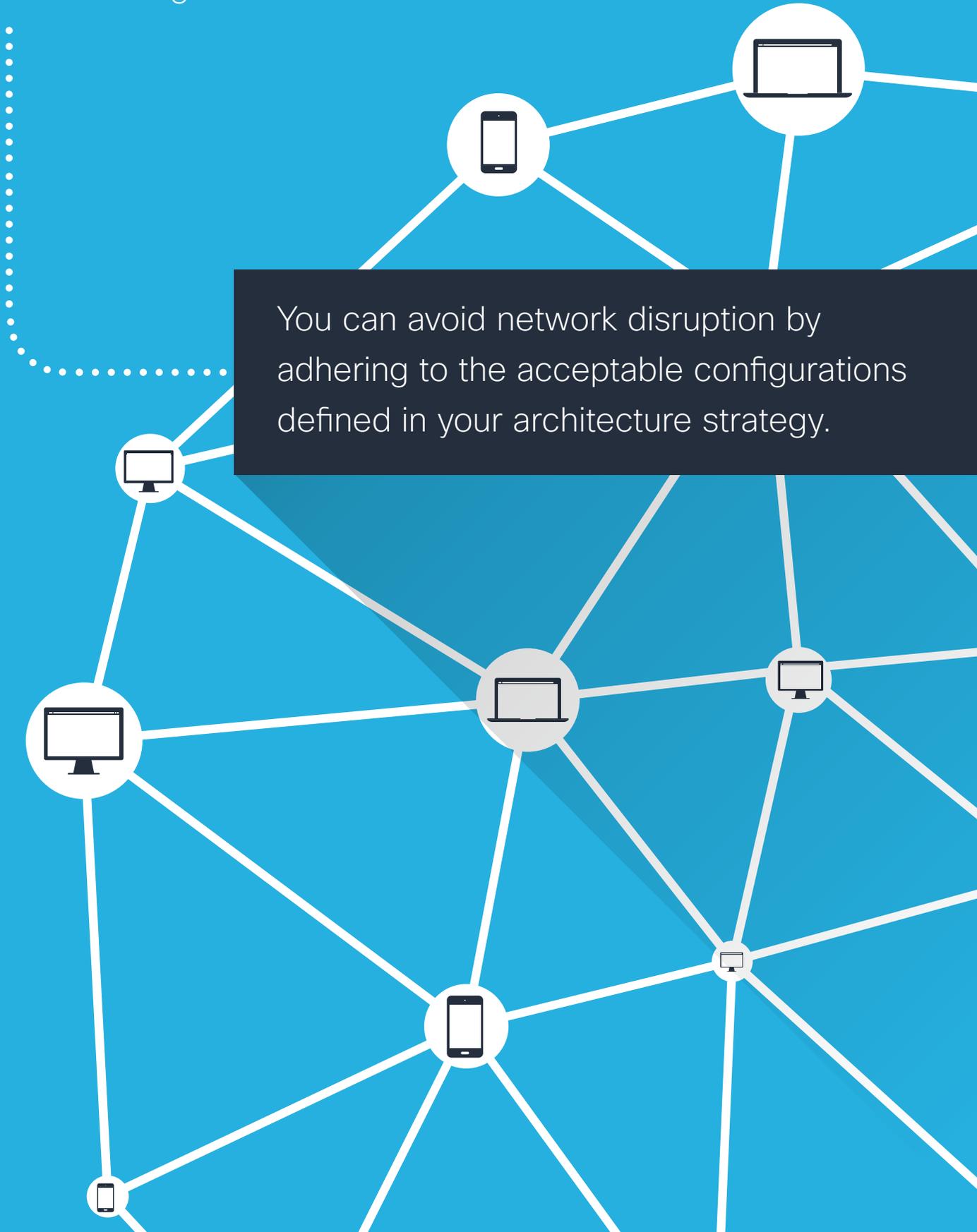
# Prepared for Change

To optimize its expansion efforts, the bank set a standard configuration for each of its branch types.



These standardized configurations were applied to each branch rollout according to the bank's architecture plan. So if issues come up, teams at each branch know how to react to those issues in a consistent way.

This helps each team avoid any disruption because each team has a consistent configuration that needs to be complied with and a change management process based on the bank's standard architectural configurations.



You can avoid network disruption by adhering to the acceptable configurations defined in your architecture strategy.

SECTION

# 04



## Operations Support & Lifecycle Management

**Goal:** To maximize network uptime by proactively managing device and software lifecycles.

Why is operations support and lifecycle management important?

Defining upgrade cycles allows organizations to improve network availability by lowering the probability of software defects or related change or upgrade failures.



*It also provides the opportunity to properly test and validate new devices and software before deployment.*

# Planning Ahead

Carroll's First Bank's IT team is introducing a new network capability, which may not be supported by the current software release in some of the bank's branch routers.

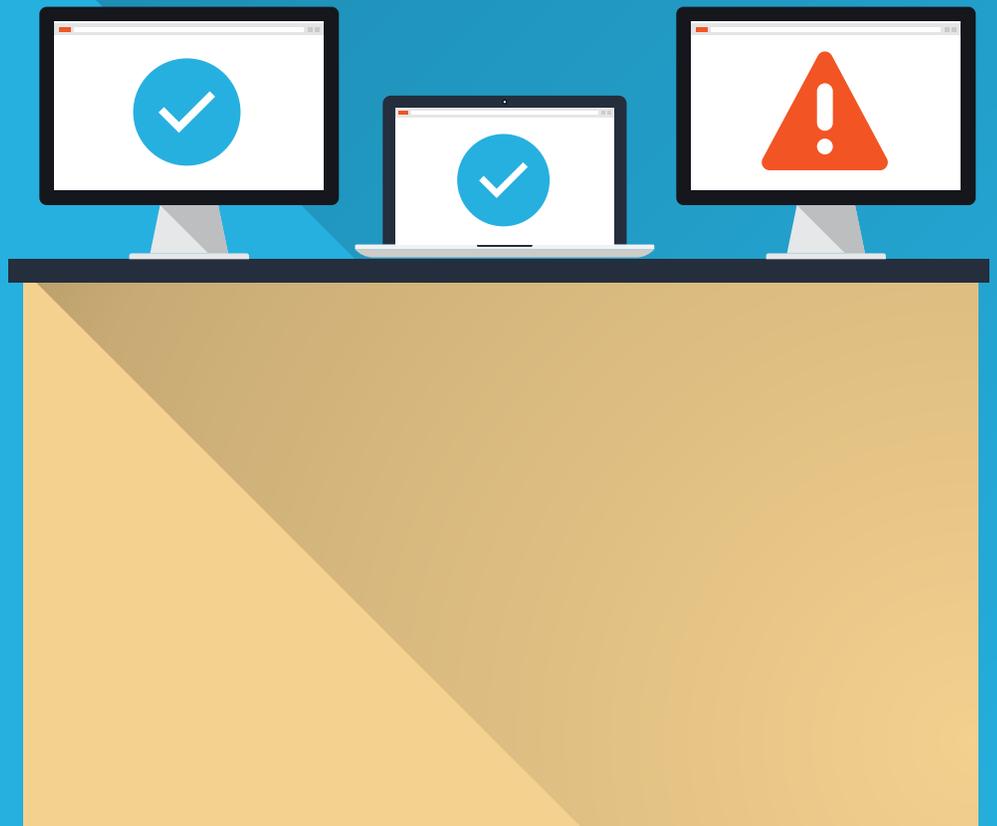


Because of the standardized architecture and configuration, the network manager is able to proactively identify where software upgrades are needed and what process will be used to test and validate the changes.

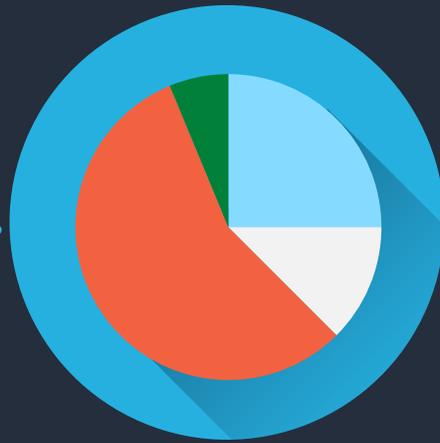
Furthermore, because of its lifecycle management approach, the IT team is able to anticipate which devices are going to reach an end-of-life or end-of-support status.

This proactive behavior helps the team effectively budget and plan for upgrades and replacements, which are part of the architecture plan, and follow the bank's change management plan in a predictable and manageable way.

With operations support and lifecycle management, you can budget more effectively and plan for upgrades and network changes.



SECTION  
05



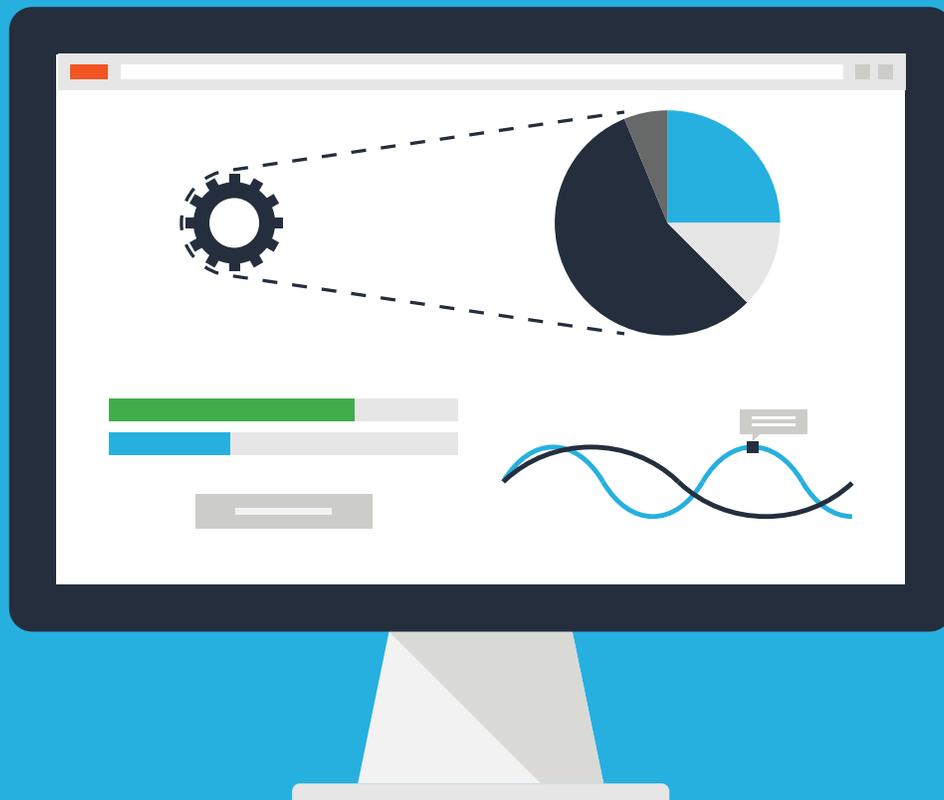
## Analytics and Modeling

Goal: To validate network changes before implementation.

## Why is analytics and modeling important?

Because they can help your team:

- Quickly determine if your network can support new services and what the impact would be
- Model a network prior to investing new physical equipment
- Determine if your network has the ability to scale rapidly for new demands
- Test your continuity strategy



# Implementing Predictability

As part of their expansion plan, Carroll's First Bank acquired a local credit union.

Before a decision was made on how to handle the network integration, the IT team modeled how the networks will operate if they are flattened into one network.



By modeling its integration design, the bank was able to identify and make necessary changes before the two networks were merged.



Using analytics and modeling, you can predict what impacts a change will have on your network before implementing it.

With this information, you can quickly make fact-based decisions about your network.



## Security and Risk

**Goal:** To minimize vulnerabilities to protect sensitive data from infiltration and attack.

Why is security and risk important?

Any change to the network has a potential of being disruptive to your business. Vulnerability can occur by having just one configuration error.

# Reducing Risk

Carroll's First Bank wants to add a new payment-processing service between branch locations and headquarters.



Because the bank has an established configuration and change management process, it knows which configurations meet its security policy and protocols.

These standardized configurations and established processes help ensure that when changes are made to the network, they comply with policies and protocols, mitigating the risk of security breach.



Minimize the risk of human error by establishing standardized configurations and policies for change management.

SECTION

# 07



## Operations Efficiency & Automation

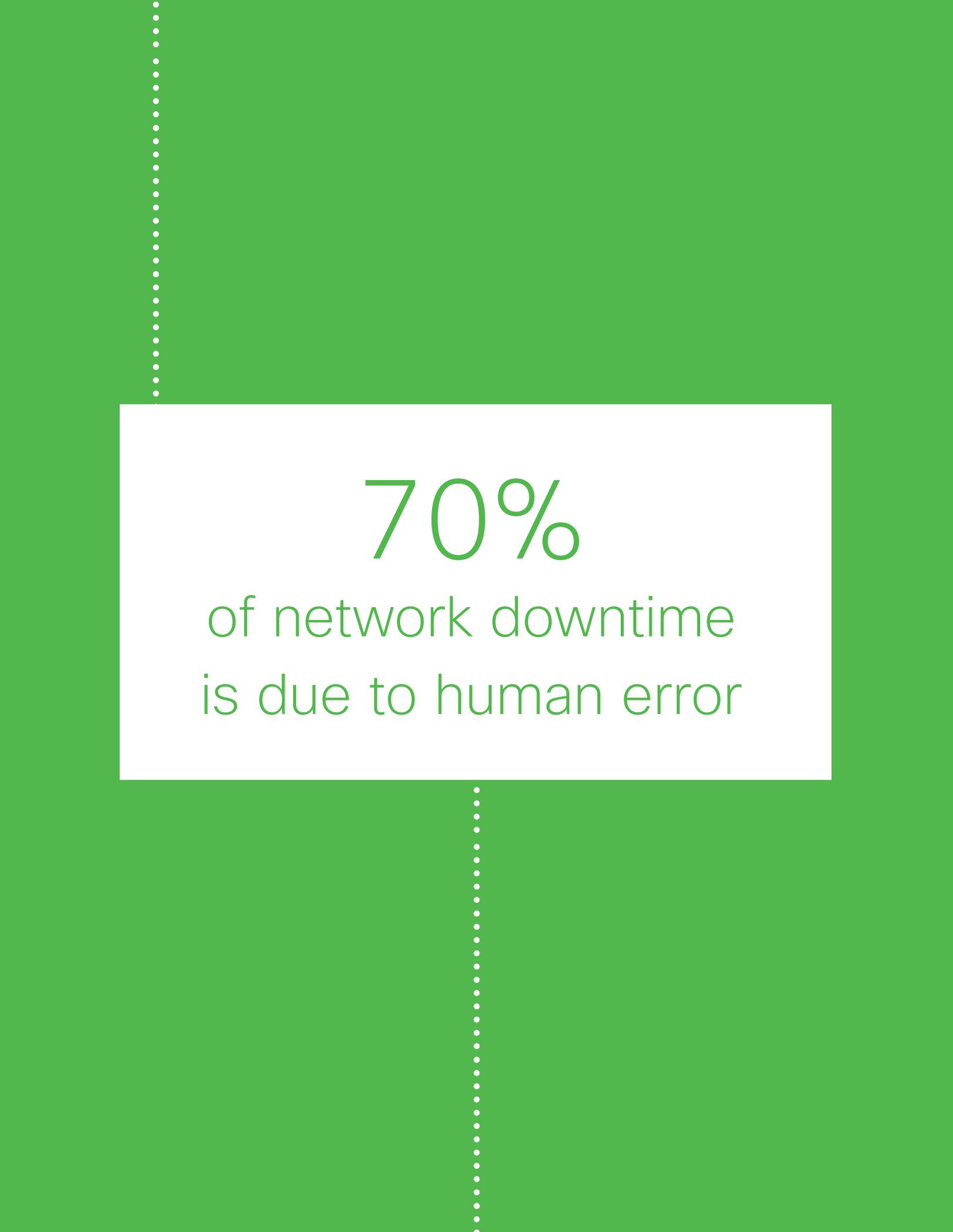
Goal: To spend more time innovating and less time troubleshooting.

Why is operations efficiency and automation important?

In many companies many network operations tasks, such as device inventory, alerts management, and fundamental support processes, are still manually coordinated, resulting in configuration errors that can cause critical issues.

But the tools are out there. So why leave room for error and spend valuable resources on tasks that can be automated?





70%

of network downtime  
is due to human error

# Enhancing Efficiencies

Because the bank has established an architecture, a configuration management strategy, and a change management strategy, when there is a reason for change, such as a Cisco IOS upgrade, Carroll's First Bank can automate that upgrade process.



This ability helps the bank to eliminate the opportunity for human error and allows its IT team to focus on more strategic activities rather than manually implementing Cisco IOS upgrades across the network.



Use automation tools as much as possible, even if it's not the most complicated process, because it ensures that any issues with your methodology are resolved before critical processes need to be automated.

SECTION  
08

## Put It into Practice



Prepare your network for the future of your business. Take time to assess your company goals and to address each of the six focus areas.

*When you're ready to take the next step, Cisco can help.*

Explore the [Cisco Network Optimization Service](#) to learn how you can gain expert insight and receive the tools that can help you develop a framework and defined methodology for ensuring that your network is optimized, so you can meet the demands of your business.

## How to buy

To view buying options and speak with a Cisco sales representative, visit [www.cisco.com/c/en/us/buy](http://www.cisco.com/c/en/us/buy).

