

A man in a light-colored short-sleeved shirt and dark trousers stands in a server room, working at a computer workstation. The workstation is on a stand and includes a monitor, keyboard, and mouse. The room is filled with rows of server racks. The lighting is dramatic, with strong highlights and deep shadows.

Keith Hanna  
Nathan Winters

# Mastering Microsoft Lync® Server 2013

Covers Lync 2013 Mobile Clients

 **SYBEX**  
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A grayscale photograph of a server room. A person in a light-colored short-sleeved shirt and dark trousers stands on the left, facing right, working at a computer workstation on a mobile cart. The workstation includes a monitor, keyboard, and mouse. The room is filled with rows of server racks. The floor is a perforated metal grating. The lighting is bright, creating a clean and professional atmosphere.

# Mastering Microsoft® Lync® Server 2013

**Keith Hanna**

**Nathan Winters**

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Cover Designer: Ryan Sneed  
Cover Image: Thomas Northcut/Getty Images

Copyright © 2013 by John Wiley & Sons, Inc., Indianapolis, Indiana  
Published simultaneously in Canada

ISBN: 978-1-118-52132-8  
ISBN: 978-1-118-72858-1 (ebk.)  
ISBN: 978-1-118-73245-8 (ebk.)  
ISBN: 978-1-118-72863-5 (ebk.)

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**Library of Congress Control Number: 2013933943**

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Dear Reader,

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Best regards,

A handwritten signature in black ink, appearing to read 'Neil Edde', written in a cursive style.

Neil Edde  
Vice President and Publisher  
Sybex, an Imprint of Wiley

I'd like to dedicate this book to my fantastic wife, Sharon, for allowing me the time out from "family life" to complete this second challenge—evenings are ours again—and also to Rosie and Jamie, who every day continue to amaze me with how quickly they learn and grow up.

—Keith Hanna

I would like to dedicate this book to my parents, who throughout my life have encouraged me to reach my goals and have been there for me both when I have and when I've fallen short.

—Nathan Winters

## Acknowledgments

Wow! What started as a simple chat over coffee has now developed into two books! The fact that we've gotten to our second book is as much of a surprise to us as it is to many people who know us! With the first book, *Mastering Lync Server 2010*, we established that writing a book wasn't an easy task. Knowing this, we're not quite sure why we went ahead with this follow-up. (And Nathan is even doing an Exchange book!)

Of course, we learned a lot with the 2010 book, and even more so with this 2013 version. Our approaches were very different this time: Lync 2010 had been released for around a year, and we had involvement in the Technology Adoption Program (TAP) prior to that. This time around, we had only our experiences within the TAP program to drive us and had to rely on our much-valued networks to fill in the gaps—and there were many more gaps!

It's not doing them justice by simply naming those who helped us here; some of this book could simply not have been written without help from those in the following list. Some chapters were being written while the code was still wet and being tested in the TAP program, and indeed one or two of the chapters have undergone complete rewrites during this period, not because the information was wrong, but because the product fundamentally changed prior to release! Some of the people here implemented the first deployments of Lync Server 2013 in the world.

In company alphabetical order, we are extremely grateful to the following people:

Actiance: Robin Smith

AudioCodes: Yaniv Epstein, Ran Inbar

Dell: Ari Protheroe

Formicary: Howard Travers, Angeline Cheng, Daanish Khan

Grey Convergence: Art C Ho, Russ Kirk (MVP for Lync)



HP: Taufique Ahmed, Jeff Leads

Microsoft: Joanne Warden, John McCabe (a key resource!), Gareth Bridges, Chris Stevenson, BJ Haberkorn, Brian Crum, Bryan Nyce, Dave Howe, Nick Smith

Plantronics: Declan Doyle

Polycom: Takeshi Ishimaru, Mike Stacy

Sennheiser: Paul Turner, Charlotte Gaskin

SMART Technologies: Jennifer Thornton, Mark Knowler

SNOM: Tim Koehler, Jan Boguslawski, Paul Jamieson

Big thanks to the sample hardware we were able to use to capture some of the scenarios in the book as well as the early access to firmware for the devices.

Throughout the process, we have been supported, guided, and cajoled (we needed mostly more of this) by a superb team at Sybex: Kim Wimpsett, Dassi Zeidel, Mariann Barsolo, and Pete Gaughan. Apologies again for missing probably every deadline we agreed upon; it was in the best interests to have the book contain the most reliable and accurate information possible!

Of course, no technical book can be released without thorough cross-checking, and for that we are very grateful to Lester Hewitt from Dell, our technical editor, who spent many hours going through the material, replicating our examples to ensure technical accuracy and in several areas correcting our approach as well as advising on many of the examples and real-world usage scenarios.

For all of those who provided feedback, be they verbally or via reviews, corrections, criticisms, and direct email, we thank you; we've tried to incorporate more of what you liked and less of what you didn't in this version. Keep the feedback coming!

We said it in the last book, and repeat it again here because we firmly believe in the power of the user groups and local communities. This is where the knowledge resides. As much as we'd love to cover everything here, we simply don't have the time or the space to do so. The amount of guidance we see coming from the TAP community and the questions being asked directly drove some of the content within this book. Feedback we get from delivering and attending training courses—we listen to it all!

There are many other people we'd like to thank within Microsoft, specifically the community around LCS/OCS and Lync, the Microsoft Certified Master community, and the *original* COE team—guys (and gals), you have helped us many times (and continue to do so); hopefully we can continue to be members of these valuable communities.

Our advice to others: If you work for Microsoft, join these communities; they're invaluable. If you don't, join your local UC user group. These guys reach out via the user groups or Tech Ed. Catch up with these people; they don't bite!

Our thanks go to all involved in helping to create this book.

—Keith Hanna and Nathan Winters

# About the Authors



**Keith Hanna** started university life at Sheffield University studying software engineering but finished by graduating from Queen's University, Belfast, in computer science. His first "real" job was with Lucas Aerospace as a software developer working on aircraft engine control systems—it wasn't rocket science, but it was close! Moving to England from Ireland, Keith helped to design and deploy a communications system for the emergency services but found his calling in Windows-based application design and support, eventually making his way to Microsoft, where he has been for over six years, working in a number of roles from engineer to consultant and currently in service delivery. He has contributed several articles to TechNet as well as several chapters in the *Lync 2010 Resource Kit*. He has written training courses for OCS R2 and Lync as well as exam questions. He is a Microsoft Certified Master. He's not aware of any life outside work, and he will be keen to discover if such a thing exists now that the book is finished.



**Nathan Winters** has worked in IT since graduating from the Royal College of Music (RCM) in 2003, where he studied the clarinet! His first job was at the RCM, migrating from Exchange 5.5 and Windows NT4 to Exchange and Windows Server 2003. Nathan has since worked in a variety of roles for Microsoft partners, including consultancy and practice management. He now works for Microsoft UK as a presales technical specialist. Throughout 2012 and 2013, Nathan has been a regular speaker at industry conferences such as TechEd and Exchange Connections in both Europe and the United States. Before joining Microsoft, Nathan was active in the UK technical community, running the Exchange user group (MMMUG) and writing numerous articles for *Windows IT Pro* magazine and the MExchange.org website, among others. He was awarded as a Microsoft MVP between 2006 and 2011. Nathan's next book, *Microsoft Exchange Server 2013: Design, Deploy and Deliver an Enterprise Messaging Solution*, will be published by Wiley in the summer of 2013. On the rare occasions when he is not working, he enjoys wildlife photography and badminton.



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# Introduction

With the release of Lync Server 2010, the Sybex Mastering series has moved into the world of Microsoft's Unified Communications (UC) platform. With the release of Lync 2010, we moved into the third generation of a platform that provides a comprehensive set of functionality, which has placed it consistently in the top right of the Gartner Magic Quadrant for UC.

With the update of Lync Server 2010 to Lync Server 2013, it was necessary to revisit the content. Some will be familiar, but there are significant changes to justify a new version of the book. We've also taken the opportunity to expand the device coverage because devices are very much the heart of a Lync deployment from the user perspective, and after all, without users, there'll be no need for solutions.

With this in mind, we set out to reinforce any prior knowledge you might have of the server platform, but not to assume any, and thereby take you on a journey from the key fundamentals of Lync Server 2013 all the way through deployment and finally to how best to integrate Lync with third-party systems.

We have attempted to ensure that you can gain insight into real-world environments both through the use of lab systems that represent those that might be found in an enterprise network and also through the use of real-world case studies that highlight examples of our day-to-day experience as consultants to some of the world's largest organizations.

## What You Need to Run Lync Server 2013

As you read through this book, you will find that there are a range of components that all come together to make Lync function. These include the Lync Server software, the Lync client, and the supporting technology from Microsoft Windows Server 2008 R2 and Microsoft SQL Server 2008 R2. Of course, there are additional pieces that can be integrated, such as gateway devices, telephone devices, and software components such as Exchange and SharePoint.

With this much complexity, you may be wondering how on earth you are going to be able to get started with learning Lync. In addition to all the components, you will find when looking at the published minimum system requirements for Lync that the main Front End (or Standard Edition) servers require a minimum of 32GB of RAM and 12 CPU cores. We cover all this in depth in Chapter 5, but no doubt you will think that is rather a challenge for a lab. Well, don't worry! It is perfectly possible to set up a very capable lab system on a single machine. In fact, while writing this book, we ran our numerous lab systems on a variety of hardware, ranging from Dell desktops with 16GB of RAM and a pair of fast hard drives for the virtual machines to Dell Tower server hardware with 24GB and four hard drives. All in all, this is equipment that is well within the reach of any enterprise looking to get up to speed with Lync and something that anyone studying IT for their career can get hold of for not ridiculous sums.

Within the constraints of the hardware mentioned, we created our labs using Microsoft Hyper-V technology to virtualize many machines. The labs ranged from two machines covering a domain controller and a single Lync server all the way up to the migration lab, which had both OCS and Lync installed with full external communication and Mediation servers for connectivity to the PSTN, where we were running 10 servers on our single piece of hardware. So while for production use you must take care to size things according to best practice, in the lab you can learn a great deal with a single server, Hyper-V, some public IP addresses, public certificates, and a SIP trunk—which are all readily available for affordable amounts of money.

## What's Inside

This book is arranged in six main sections, with a couple of appendixes. The six main areas focus on key elements that help build your knowledge of Lync, starting with fundamentals that get you up to speed. We then move through getting your first Lync system up and running to administering your system. At that point, the book takes a deep look into using Lync as your telephony platform before moving on to cover how to integrate Lync into other systems, and we then finish with a look at Lync mobile clients. The appendixes wrap up the Bottom Line learning entries from the book and conclude by taking a step back from the technical elements to discuss changes Lync may require to your business and how to make sure you have a successful implementation.

When first picking up a new book, people frequently jump straight to a chapter that answers some immediate need or interest. We have attempted to build concepts throughout this book, with most of the later chapters making the assumption that you are familiar with the previous material. We have, of course, referenced that earlier material wherever possible in case you need to brush up, but as a general recommendation, we suggest that if you're new to Lync, you will have the most success by reading through the chapters in order.

### Part 1: Fundamentals

This section covers the background information that will help you understand what makes Lync tick.

**Chapter 1: What's in Lync?** This chapter runs through Lync from top to bottom, covering key concepts, features, and where Lync sits in the history of real-time communication products from Microsoft.

**Chapter 2: Standards and Protocols** Like any technical product, Lync is underpinned by numerous protocols and standards that enable it to operate and interoperate with other platforms. This chapter focuses in particular on Session Initiation Protocol (SIP), which enables the majority of Lync communications.

**Chapter 3: Security** Security is front of mind for all administrators these days. In this chapter, we outline the threats to Lync and explain its architecture in a security-focused manner that will enable you to discuss requirements with your security team. We also cover some of the administrative practices needed to help you administer Lync securely.

**Chapter 4: Clients** Without clients, any server product would be pretty useless! In this chapter, we look at the clients available on a PC, Mac, and browser, and we dive deep into how the clients connect to Lync.



## **Part 2: Getting Lync Up and Running**

This section is where you actually get hands on with Lync. We cover planning and sizing and then both the installation and upgrade processes.

**Chapter 5: Planning Your Deployment** While we are all keen to dive in and start playing with the nuts and bolts, planning is essential to ensure that you achieve what is required. This chapter shows you how to plan utilizing the available tools, and it helps you understand the Lync prerequisites, enabling you to choose which hardware to use and how high availability in the latest version is implemented.

**Chapter 6: Installation** By the end of this chapter, you should have installed your first Lync system. We take you through preparing your underlying server OS to publishing Lync to the Internet with all the steps in between!

**Chapter 7: Migration and Upgrades** Lync is the latest in a line of real-time communications products from Microsoft. This chapter shows you how to get from the earlier Office Communications Server 2007 R2 or Lync Server 2010 to Lync Server 2013.

## **Part 3: Administration**

Having planned and installed Lync, we now move on to look at administration. These chapters cover PowerShell, explain admin roles and policies, and even look at troubleshooting.

**Chapter 8: Introduction to PowerShell, the Lync Management Shell, and Regular Expressions** PowerShell is what underpins the whole management interface of Lync. In this chapter, you learn what PowerShell is, how to use it, and more important, how to work with Lync using PowerShell.

**Chapter 9: Role-Based Access Control** Role-based access control (RBAC) changes the granularity and ease with which an administrator can be granted permissions required for their job and only their job, allowing specific delegation of functionality to groups of people. This chapter shows you how Lync implements RBAC and how to use it to implement secure administration of Lync.

**Chapter 10: User Administration** Having looked at PowerShell and RBAC, the two main concepts underpinning administration, in this chapter, we show how to manage users, enabling, disabling, and configuring them both individually and through policy to use the Lync features they require.

**Chapter 11: Archiving and Monitoring** Lync enables communication, and in many organizations communications must be archived. This chapter covers how Lync does this with the Archiving role. It also covers the way in which you can inspect the communication passing through Lync, not only for quality but also more traditionally, showing who spoke with whom. Finally, we cover how to monitor the Lync service as a whole using System Center Operations Manager (SCOM).

**Chapter 12: Troubleshooting** As with any system, there will be times when things don't work as they should. This chapter works through key troubleshooting concepts and then looks at the tools available in Lync and how to use them when trouble strikes.

## Part 4: Voice

Lync is the first product from Microsoft that can truly claim to be a full-fledged telephony system (PBX). This section focuses on using Lync as your PBX, taking you from basic phone calls through to complex automated call distribution systems.

**Chapter 13: Getting Started with Voice** Lync provides all the capability needed to be a large enterprise telephony platform. This chapter introduces you to the world of the PBX. It covers the features available in Lync and the architecture that supports them.

**Chapter 14: Call Admission Control** One of the biggest considerations when utilizing data networks for audio and video communication is bandwidth usage. Call Admission Control enables you to map out your network and protect it from overuse. This chapter shows you how to do this with Lync.

**Chapter 15: E911 and Location Information Services** Especially in North America, the ability to locate the origin of a phone call and provide that information to the emergency services is mandatory. This chapter discusses how to provide this functionality with Lync; it also shows how those outside North America can use this innovative technology.

**Chapter 16: Extended Voice Functionality** Lync can be used for far more than just basic phone calls. This chapter looks at how to implement your own audio-conferencing bridge, how to set up your own mini call center or help desk, and how to deal with other voice scenarios, such as the need to park calls for others to pick up and to deal with calls to people who have left your company.

## Part 5: Integration

One of the huge benefits of Lync being a software platform is that it is very easy to extend and integrate with other systems. This section covers that extensibility by looking at the way Lync integrates with both Microsoft and non-Microsoft products.

**Chapter 17: Exchange and SharePoint** While Lync by itself contains a huge amount of technology, it is enhanced even further through tight integration with other Microsoft products. This chapter covers the provision of voice mail and presence integration with Exchange and presence integration and workflow with SharePoint.

**Chapter 18: Hybrid Deployments** In this chapter, we look at a new deployment option with Lync Server 2013, hybrid deployment, where server infrastructure is deployed on premises but the users' accounts are based in the cloud. We look at how to install and configure the on-premises side of things as well as the call flows with different scenarios of user locations.

**Chapter 19: Third-Party Integration** In this chapter, we cover Lync as it sits at the center of a unified communications system. We cover integration with third-party PBXs, gateways (including the deployment of Survivable Branch Appliances), and videoconferencing systems. We look at extending Lync with third-party software and show how to deploy the XMPP gateway to allow communication with a wide range of IM clouds, including Jabber and Google.

## Part 6: Devices

**Chapter 20: Mobility** In this chapter we look at the functionality delivered by the mobile device clients for Windows Phone, iOS (iPhone and iPad), and Android. Cumulative Update 1 is required for the Lync 2013 mobile client, so we also have a look at the functionality received if the Lync 2010 mobile clients are still being used.

**Chapter 21: Telephony Devices** The final chapter of this book covers the range of user devices, starting with simple USB headsets all the way through to third-party room-based conference systems. We take a focused look at the Lync Phone Edition and non-Lync Phone Edition (3PIP, Third-Party IP Phone) devices and how to configure the environment to support them.

## Appendixes

There are three appendixes. The first covers all the learning points from throughout the book, and the second discusses how to successfully adopt Lync in your organization. The third appendix provides examples of how Persistent Chat can be used.

**Appendix A: The Bottom Line** Throughout the book, the Bottom Line section appears at the end of each chapter. It asks relevant questions to help test your understanding of the material in that chapter. This appendix covers all those questions and includes the answers so you can verify yours.

**Appendix B: Adoption** While this book has focused on the technology that is Lync, there is another major aspect to utilizing Lync: how do you get Lync adopted in your organization? Without a proper plan and a great team that includes people ranging from very senior personnel to those using the technology every day, you may not have great success deploying Lync. This appendix discusses some of the key elements that come together to enable a business to successfully adopt Lync.

**Appendix C: Using Persistent Chat Effectively** Previously known as Group Chat and seen by many as the “black sheep” of the application, Persistent Chat now has a fully integrated deployment method as well as a fully integrated single-client approach for users. Here we take a look at several use cases for Persistent Chat and how they can be implemented.

## The Mastering Series

The Mastering series from Sybex provides outstanding instruction for readers with intermediate and advanced skills in the form of top-notch training and development for those already working in their field and clear, serious education for those aspiring to become pros. Every Mastering book includes the following:

- ◆ Real-World Scenarios, ranging from case studies to interviews that show how the tool, technique, or knowledge presented is applied in actual practice.
- ◆ Skill-based instruction, with chapters organized around real tasks rather than abstract concepts or subjects.
- ◆ Self-review test questions, so you can be certain you’re equipped to do the job right.

## Conventions Used in This Book

Before you set off into the world of Lync described in this book, there is one final piece of information that we want you to know.

Throughout the book, we used various methods to describe things. In particular, we had many discussions about how best to describe the tools used to administer Lync. As you will see, there are two main interfaces: a web-based control panel called Lync Server Control Panel (LSCP) and a command-line shell called the Lync Server Management Shell (LSMS), which is based on PowerShell. In the book, we used the terms *Control Panel* and *LSCP* interchangeably to describe the Lync Server Control Panel and *PowerShell* to describe the Lync Server Management Shell. Please don't confuse this use of PowerShell with the standard Microsoft PowerShell shell, which is installed on Windows Server 2008 R2 by default. When working with Lync, unless explicitly stated otherwise, you should be using the Lync Server Management Shell.

### HYBRID VOICE

As this book goes to press Microsoft has announced the removal of the Hybrid Deployment functionality (see Chapter 18). The exact reasons behind this are not yet known, however, one of the aims of the deployment scenario was to reduce the amount of hardware required to be deployed on premises, as servers would be hosted in the cloud. With the ability of Lync to collocate Mediation servers and Front End servers on the same physical hardware, this aim is difficult to meet, so it may be simply that the ability to move users to the cloud, whilst working, doesn't provide enough benefits to justify further investment in this functionality.

### CAPACITY PLANNING

The capacity planning figures used in this book for Standard Edition quote 2,500 users per server. This is from the Microsoft guidance. Since completing the planning guidance, Microsoft has clarified this to state that the 2,500 users is the preferred number for Standard Edition servers as it allows 2 Standard Edition servers to act as backups for each other, and fully cope with 100 percent of the load in the event of a disaster. By implication, this means that a Standard Edition server can cater for 5,000 users—similar to what we had in previous versions—however, as functional disaster recovery has such a large focus with Lync Server 2013, the numbers have been revised to include this.

## How to Contact the Authors

We welcome feedback from you about this book. Obviously, it's always nice to get messages about what you liked about the book, but we also welcome suggestions for improvements we could make in future editions. You can reach Keith by writing to [hannakeith@hotmail.com](mailto:hannakeith@hotmail.com), and you can reach Nathan at [nathan@clarinathan.co.uk](mailto:nathan@clarinathan.co.uk). If you are looking for information about future articles or speaking engagements, visit Nathan's blog: [www.nathanwinters.co.uk](http://www.nathanwinters.co.uk).

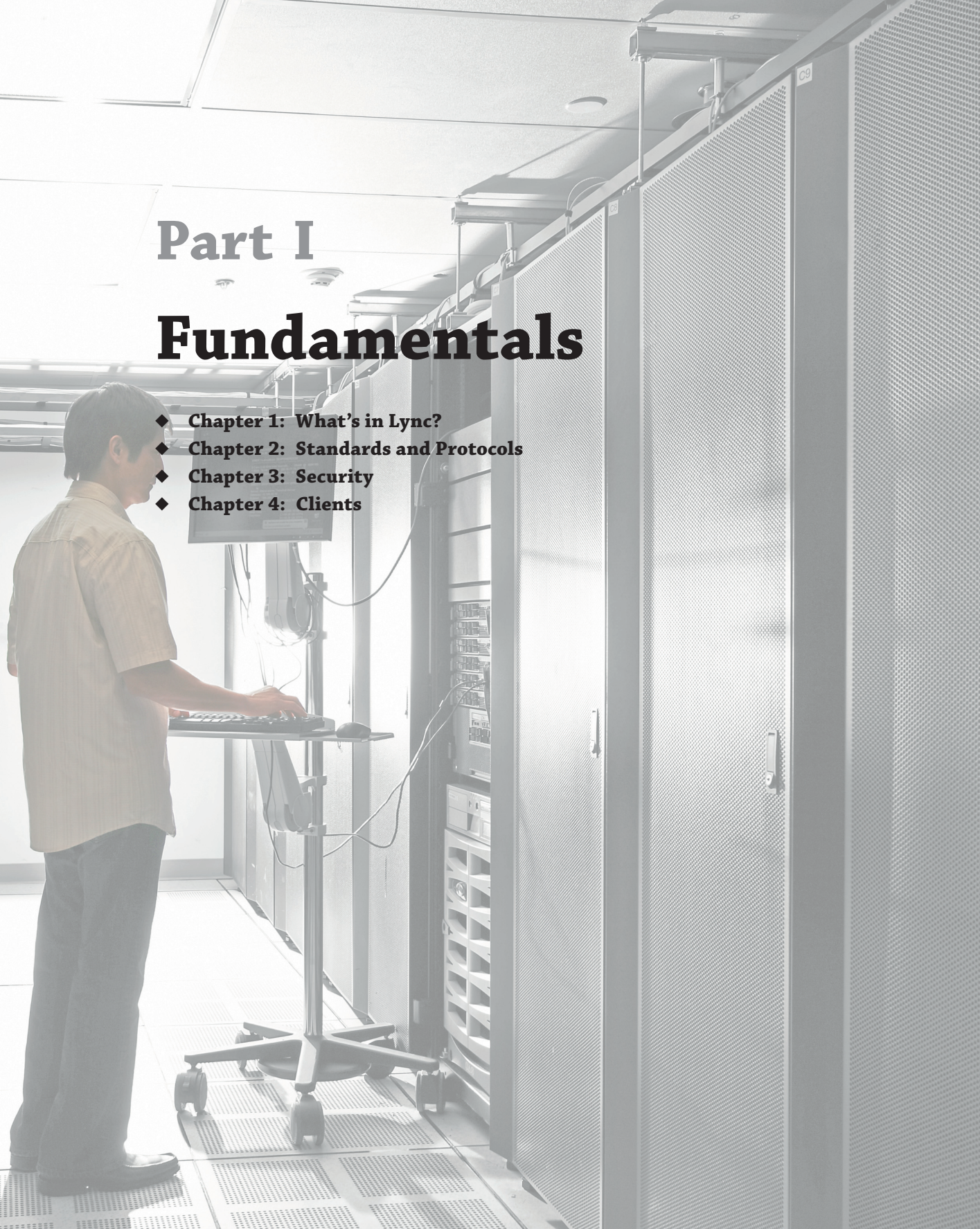
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# Part I

# Fundamentals

- ◆ **Chapter 1: What's in Lync?**
- ◆ **Chapter 2: Standards and Protocols**
- ◆ **Chapter 3: Security**
- ◆ **Chapter 4: Clients**







A person in a light-colored shirt is seen from the side, looking at a computer monitor in a server room. The room is filled with server racks and cables. The text 'Chapter 1' is overlaid on the image.

## Chapter 1

# What's in Lync?

Lync Server 2013 is the latest in the line of the Communications Server platforms from Microsoft. The platform originally started with Live Communications Server 2003 (some would say with Exchange Conference Server 2000!) and continued through Live Communications Server 2005, Office Communications Server (OCS) 2007, Office Communications Server 2007 R2, and the first incarnation of Lync: Lync Server 2010. This latest version extends the capabilities even further than those introduced with Lync Server 2010.

For those of you experienced with Lync Server 2010 (or indeed previous versions of OCS/LCS), this chapter will call out some of the core capabilities introduced in previous versions as well as the new capabilities specific to Lync 2013, so some of this content may be a refresher to knowledge you already have.

In this chapter, you will learn to:

- ◆ Describe the features of the client
- ◆ Describe the features of the server
- ◆ Describe the voice features

## Understanding the Lync 2013 Client

As an administrator, the first thing you'll see is the Setup tool; however, the users will see the client. Therefore, understanding what the client can and will provide is important for administrators trying to sell the business justification. It is also important in terms of what policies will need to be configured to enable (or disable) features. Lync 2013 is so much more than a simple instant messaging (IM) tool or a phone, and treating it as either end of the messaging scale will impact the way you deploy it to users. At one end, the IM capabilities can be deployed quite simply, whereas the phone integration will take significant planning and should not be underestimated. Some of the additional training capabilities freely provided by Microsoft are covered in Appendix B, "Adoption."

With OCS (and to some extent LCS), the user experience was made up of a number of clients:

- ◆ Communicator
- ◆ Live Meeting
- ◆ Group Chat

Lync 2010 consolidated the Communicator and Live Meeting clients into one; however, that still left the Group Chat client as a separate installation requirement. We know a number of large financial institutions that have a heavy reliance upon the Group Chat functionality and have been asking for some time for the consolidation of this client. Well, it's finally come. Group Chat (now known as Persistent Chat) is incorporated into the Communicator client, so there's only a single installation required. Indeed, more than that is the decision to make Persistent Chat a "full" function of Lync Server 2013 rather than a download add-on as it was previously — more on this later.

Chapter 20, "Mobile Devices," covers in detail the new Lync 2013 Mobility capability; this was first introduced with Cumulative Update 4 in Lync Server 2010.

With the 2013 edition, Lync has had a facelift; new features introduced with Lync 2013, such as user photos, have been further improved, and other features have been moved around to make them easier to find for users.

In addition, device selection has been considered with Lync 2013 clients being adapted to tablet devices as well as the expected mobile and desktop/laptop-style devices.

There is also the expected transition to the Windows 8 user interface (UI). Although Lync is still supported on previous versions of Windows, the look and feel has become more consistent with the Windows 8 UI.

The Communicator client is also now part of the Office suite and is no longer available separately. Figure 1.1 shows the client when a user is first logged in.

**FIGURE 1.1**  
The client startup screen

