

# Practical Paranoia™ macOS 10.13

## Security Essentials

- ✓ The Easiest
- ✓ Step-By-Step
- ✓ Most Comprehensive
- ✓ Guide To Securing Data and Communications
- ✓ On Your Home and Office macOS Computer

Marc L. Mintz, MBA-IT, ACTC, ACSP

**TPP**  
The Practical Paranoid

Practical Paranoia: macOS 10.13 Security Essentials

Author: Marc Mintz

Copyright © 2016, 2017, 2018 by The Practical Paranoid, LLC.

Notice of Rights: All rights reserved. No part of this document may be reproduced or transmitted in any form by any means without the prior written permission of the author. For information on obtaining permission for reprints and excerpts, contact the author at [marc@thepracticalparanoid.com](mailto:marc@thepracticalparanoid.com), +1 888.504.5591.

Notice of Liability: The information in this document is presented on an *As Is* basis, without warranty. While every precaution has been taken in the preparation of this document, the author shall have no liability to any person or entity with respect to any loss or damage caused by or alleged to be caused directly or indirectly by the instructions contained in this document, or by the software and hardware products described within it. It is provided with the understanding that no professional relationship exists, and no professional security or Information Technology services have been offered between the author or the publisher and the reader. If security or Information Technology expert assistance is required, the services of a professional person should be sought.

Trademarks: Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Where those designations appear in this book, and the author was aware of a trademark claim, the designations appear as requested by the owner of the trademark. All other product names and services identified in this document are used in editorial fashion only and for the benefit of such companies with no intention of infringement of trademark. No such use, or the use of the trade name, is intended to convey endorsement or other affiliation within this document.

Editions: v1.0 20170918 • v1.01 20170923 • v1.1 20171001 • v1.2 20171022 • v1.3 20180325 • v2 20180420

Cover design by Ed Brandt

ISBN-10: 1976513650

ISBN-13: 978-1976513657

# Dedication

*To Candace,  
without whose support and encouragement  
this work would not be possible*



# Contents At A Glance

Dedication.....	3
Contents At A Glance.....	5
Contents In Detail.....	7
1 Thank You for Studying Practical Paranoia!.....	19
2 Introduction.....	21
3 Data Loss.....	33
4 Passwords.....	63
5 System and Application Updates.....	105
6 User Accounts.....	119
7 Storage Device.....	151
8 Sleep and Screen Saver.....	163
9 Malware.....	169
10 Firewall.....	209
11 Firmware Password.....	221
12 Lost or Stolen Device.....	225
13 Local Network.....	251
14 Web Browsing.....	297
15 Email.....	387
16 Apple ID and iCloud.....	487
17 Documents.....	509
18 Voice, Video, and Instant Message Communications.....	561
19 Internet Activity.....	585
20 Social Media.....	635
21 When It Is Time to Say Goodbye.....	701
22 Miscellaneous.....	713
23 The Final Word.....	723
macOS 10.13 Security Checklist.....	725
Revision Log.....	731
Index.....	733



# Contents In Detail

Dedication.....	3
Contents At A Glance.....	5
Contents In Detail.....	7
1 Thank You for Studying Practical Paranoia!.....	19
2 Introduction.....	21
2.1 Who Should Study This Course.....	22
2.2 What is Unique About This Course and Book.....	23
2.3 Why Worry?.....	25
2.4 Reality Check.....	26
2.5 About the Author.....	28
2.6 Practical Paranoia Updates.....	29
2.6.1 Newsletter.....	29
2.6.2 Blog.....	29
2.6.3 Facebook.....	29
2.6.4 Practical Paranoia Paperback Book Upgrades.....	29
2.6.5 Practical Paranoia Kindle Updates.....	30
2.6.6 Practical Paranoia Online Live Student Edition Updates.....	30
2.7 Notes for Instructors, Teachers, & Professors.....	31
2.8 Update Bounty.....	32
3 Data Loss.....	33
3.1 The Need for Backups.....	34
3.1.1 Assignment: Format the Backup Drive for Time Machine or Carbon Copy Cloner.....	39
3.1.2 Assignment: Configure Time Machine.....	42
3.1.3 Assignment: Integrity Test the Time Machine Backup.....	44
3.1.4 Assignment: Install and Configure Carbon Copy Cloner.....	46
3.1.5 Assignment: Test Run the First Clone Backup.....	53
3.1.6 Assignment: Encrypt the Clone Backup.....	56
3.1.7 Assignment: Integrity Test the Clone Backup.....	59
4 Passwords.....	63
4.1 The Great Awakening.....	64
4.2 Strong Passwords.....	65

## Contents In Detail

4.2.1	Assignment: Create a Strong User Account Password.....	68
4.3	Keychain.....	73
4.3.1	Assignment: View an Existing Keychain Record.....	77
4.4	Challenge Questions.....	80
4.4.1	Assignment: Store Challenge Q&A in the Keychain.....	80
4.4.2	Assignment: Access Secure Data from Keychain.....	83
4.5	Harden the Keychain.....	86
4.5.1	Assignment: Harden the Keychain With a Timed Lock.....	86
4.6	Synchronize Keychain Across macOS and iOS Devices.....	89
4.6.1	Assignment: Activate iCloud Keychain Synchronization.....	89
4.7	LastPass.....	94
4.7.1	Assignment: Install LastPass.....	94
4.7.2	Assignment: Use LastPass to Save Website Authentication Credentials.....	98
4.7.3	Assignment: Use LastPass to Auto Fill Website Authentication .....	100
4.8	Password Policies.....	101
4.8.1	Assignment: Password Policies with macOS Server.....	101
5	System and Application Updates.....	105
5.1	System Updates.....	106
5.1.1	Assignment: Configure Apple System and Application Update Schedule.....	107
5.2	Manage Application Updates With MacUpdate Desktop.....	110
5.2.1	Assignment: Install and Configure MacUpdate Desktop.....	110
5.2.2	Assignment: Application Updates with MacUpdate Desktop	115
5.3	Additional Reading.....	117
6	User Accounts.....	119
6.1	User Accounts.....	120
6.2	Never Log in As an Administrator.....	122
6.2.1	Assignment: Enable the Root User.....	122
6.2.2	Assignment: Login as the Root User.....	126
6.2.3	Assignment: Change the Root User Password.....	129
6.2.4	Assignment: Disable the Root User.....	130
6.2.5	Assignment: Create an Administrative User Account.....	130
6.2.6	Assignment: Change from Administrator to Standard User...	132
6.3	Application Whitelisting and More with Parental Controls.....	134

## Contents In Detail

6.3.1	Assignment: Configure a Parental Controls Account .....	135
6.3.2	Assignment: View Parental Controls Logs.....	146
6.4	Policy Banner.....	148
6.4.1	Assignment: Create a Policy Banner .....	148
7	Storage Device .....	151
7.1	Block Access to Storage Devices .....	152
7.1.1	Assignment: Disable USB, FireWire, and Thunderbolt Storage Device Access .....	152
7.1.2	Assignment: Enable USB, FireWire, and Thunderbolt Storage Device Access .....	153
7.2	FileVault 2 Full Disk Encryption.....	154
7.2.1	Assignment: Boot into Target Disk Mode.....	155
7.2.2	Assignment: Boot into Recovery HD Mode .....	155
7.2.3	Assignment: Boot into Single-User Mode.....	156
7.2.4	Assignment: Enable and Configure FileVault 2 .....	156
7.3	FileVault Resistance to Brute Force Attack.....	160
7.4	Remotely Access and Reboot a FileVault Drive .....	161
7.4.1	Assignment: Temporarily Disable FileVault.....	161
8	Sleep and Screen Saver .....	163
8.1	Require Password After Sleep or Screen Saver .....	164
8.1.1	Assignment: Require Password After Sleep or Screen Saver ...	164
9	Malware.....	169
9.1	Anti-Malware .....	170
9.1.1	Assignment: Install and Configure Bitdefender (Home Users Only) .....	174
9.1.2	Assignment: Install and Configure Bitdefender GravityZone Endpoint Security (Business Users).....	190
9.2	Additional Reading .....	207
10	Firewall.....	209
10.1	Firewall 210	
10.1.1	Assignment: Activate the Firewall .....	211
10.1.2	Assignment: Close Unnecessary Ports .....	214
11	Firmware Password .....	221
11.1	EFI Chip .....	222
11.1.1	Assignment: Enable the Firmware Password.....	222
11.1.2	Assignment: Test the Firmware Password .....	223

## Contents In Detail

11.1.3	Assignment: Remove the Firmware Password .....	223
12	Lost or Stolen Device.....	225
12.1	Find My Mac .....	226
12.1.1	Assignment: Activate and Configure Find My Mac.....	226
12.1.2	Assignment: Use Find My Mac From A Computer .....	233
12.1.3	Assignment: Use Find My Mac From An iPhone or iPad .....	237
12.2	Prey 240	
12.2.1	Assignment: Enable the Guest User Account.....	240
12.2.2	Assignment: Create a Prey Account .....	241
12.2.3	Assignment: Install Prey .....	244
12.2.4	Assignment: Configure Prey .....	246
13	Local Network.....	251
13.1	Ethernet Broadcasting .....	252
13.2	Ethernet Insertion.....	253
13.3	Wi-Fi Encryption Protocols .....	254
13.4	Routers: An Overview.....	256
13.4.1	Assignment: Determine Your Wi-Fi Encryption Protocol.....	257
13.4.2	Assignment: Secure an Apple Airport Extreme Base Station..	259
13.4.3	Assignment: Configure WPA2 On a Non-Apple Router.....	263
13.5	Use MAC Address to Limit Wi-Fi Access .....	267
13.5.1	Assignment: Restrict Access by MAC Address on an Apple Airport.....	267
13.5.2	Assignment: Restrict Access by MAC Address to A Non-Apple Router .....	275
13.6	Router Penetration .....	284
13.6.1	Assignment: Verify Apple Airport Port Security Configuration 285	
13.6.2	Assignment: Verify Non-Apple Airport Router Security Configuration.....	291
14	Web Browsing .....	297
14.1	HTTPS 298	
14.1.1	Assignment: Install HTTPS Everywhere .....	300
14.2	Choose a Browser .....	302
14.3	Private Browsing.....	304
14.3.1	Assignment: Safari Private Browsing .....	304
14.3.2	Assignment: Firefox Private Browsing.....	306

## Contents In Detail

14.3.3	Assignment: Google Chrome Incognito Mode .....	307
14.4	Secure Web Searches.....	309
14.4.1	Assignment: Make DuckDuckGo Your Safari Search Engine.	309
14.4.2	Assignment: Make DuckDuckGo Your Firefox Search Engine 310	
14.4.3	Assignment: Make DuckDuckGo Your Chrome Search Engine 311	
14.5	Clear History .....	313
14.5.1	Assignment: Clear the Safari History .....	313
14.5.2	Assignment: Clear the Firefox Browsing History .....	314
14.5.3	Assignment: Clear the Chrome History .....	315
14.6	Browser Plug-Ins .....	317
14.6.1	Assignment: Install TrafficLight Plug-In for Safari.....	317
14.6.2	Assignment: Install TrafficLight Plug-In for Google Chrome	320
14.6.3	Assignment: Install TrafficLight For Firefox.....	322
14.6.4	Assignment: Find and Remove Extensions from Safari .....	324
14.6.5	Assignment: Find and Remove Extensions from Chrome.....	325
14.6.6	Assignment: Find and Remove Add-Ons from Firefox .....	326
14.7	Fraudulent Websites .....	328
14.8	Do Not Track.....	332
14.8.1	Assignment: Secure Safari.....	333
14.8.2	Assignment: Secure Firefox.....	334
14.8.3	Assignment: Secure Chrome.....	336
14.8.4	Assignment: Install Ghostery for Safari.....	338
14.8.5	Assignment: Install Ghostery for Chrome .....	340
14.8.6	Assignment: Install Ghostery for Firefox .....	344
14.9	Adobe Flash and Java .....	352
14.9.1	Assignment: Configure Oracle Java for Automatic Updates...	352
14.10	Web Scams .....	356
14.10.1	Recovering From A Web Scam.....	356
14.11	Tor 359	
14.11.1	Assignment: Install Tor for Anonymous Internet Browsing...	361
5.1.1	Assignment: Configure Tor Preferences.....	371
14.12	Onion Sites and the Deep Web.....	382
14.13	Have I Been Pwned .....	383
14.13.1	Assignment: Has Your Email Been Hacked.....	383

## Contents In Detail

14.13.2	Assignment: What To Do Now That You Have Been Breached	386
15	Email.....	387
15.1	The Killer App.....	388
15.2	Phishing.....	389
15.3	Email Encryption Protocols .....	391
15.4	TLS and SSL With Mail App .....	392
15.4.1	Assignment: Determine if Sender and Recipient Use TLS.....	392
15.5	Require Google Mail to be TLS Secured .....	395
15.5.1	Assignment: Configure Google G-Suite Mail for Only TLS....	395
15.6	HTTPS with Web Mail.....	397
15.6.1	Assignment: Configure Web Mail to Use HTTPS.....	397
15.7	End-To-End Secure Email With ProtonMail .....	398
15.7.1	Assignment: Create a ProtonMail Account.....	399
15.7.2	Assignment: Create and Send an Encrypted ProtonMail Email	403
15.7.3	Assignment: Receive and Respond to a ProtonMail Secure Email	407
15.8	End-To-End Secure Email With GNU Privacy Guard .....	412
15.8.1	Assignment: Install GPG and Generate a Public Key .....	413
15.8.2	Assignment: Add Other Email Addresses to a Public Key .....	418
15.8.3	Assignment: Configure GPGMail Preferences.....	424
15.8.4	Assignment: Install a Friend's Public Key .....	426
15.8.5	Assignment: Send a GPG-Encrypted and Signed Email .....	427
15.8.6	Assignment: Receive a GPG-Encrypted and Signed Email.....	429
15.8.7	Assignment: Encrypt and Sign Files with GPGServices .....	431
15.9	End-To-End Secure Email With S/MIME.....	437
15.9.1	Assignment: Acquire a Free Class 1 S/MIME Certificate.....	438
15.9.2	Assignment: Acquire A Class 3 S/MIME Certificate for Business Use.....	445
15.9.3	Assignment: Purchase a Class 3 S/MIME Certificate for Business Use.....	454
15.9.4	Assignment: Install a Business S/MIME Certificate.....	465
15.9.5	Assignment: Exchange Public Keys with Others .....	469
15.9.6	Assignment: Send S/MIME Encrypted Email.....	472
15.10	Virtru Email Encryption .....	475

## Contents In Detail

15.10.1	Assignment: Create a Free Virtru for Gmail Account.....	476
15.10.2	Assignment: Send Encrypted Gmail With Virtru.....	482
15.10.3	Receive and Reply to a Virtru-Encrypted Email .....	484
16	Apple ID and iCloud.....	487
16.1	Apple ID and iCloud.....	488
16.1.1	Assignment: Create an Apple ID.....	489
16.1.2	Assignment: Enable 2-Factor Authentication .....	494
16.1.3	Sign in to Your iCloud Account.....	503
17	Documents.....	509
17.1	Document Security.....	510
17.2	Password Protect a Document Within Its Application .....	511
17.2.1	Assignment: Encrypt an MS Word Document .....	511
17.3	Encrypt a PDF Document.....	514
17.3.1	Assignment: Convert a Document to PDF for Password Protection.....	514
17.4	Encrypt a Folder for Only macOS Use.....	517
17.4.1	Assignment: Create an Encrypted Disk image .....	517
17.5	Encrypt A Folder for Cross Platform Use With Zip.....	521
17.5.1	Assignment: Encrypt A File or Folder Using Zip .....	521
17.5.2	Assignment: Open an Encrypted Zip Archive.....	527
17.6	Cross-Platform Disk Encryption.....	529
17.6.1	Assignment: Download and Install VeraCrypt .....	529
17.6.2	Assignment: Configure VeraCrypt.....	536
17.6.3	Assignment: Create a VeraCrypt Container .....	542
17.6.4	Assignment: Mount an Encrypted VeraCrypt Container .....	554
18	Voice, Video, and Instant Message Communications .....	561
18.1	Voice, Video, and Instant Messaging Communications .....	562
18.2	HIPAA Considerations .....	564
18.3	Wire 565	
18.3.1	Assignment: Install Wire .....	565
18.3.2	Assignment: Invite People to Wire .....	570
18.3.3	Assignment: Import Contacts into Wire .....	575
18.3.4	Assignment: Secure Instant Message a Wire Friend. ....	576
5.1.2	Assignment: Secure Voice Call with A Wire Friend .....	580
18.3.5	Assignment: Secure Video Conference with a Wire Friend ....	583
19	Internet Activity.....	585

## Contents In Detail

19.1	Virtual Private Network.....	586
19.2	Gateway VPN.....	587
19.2.1	Assignment: Search for a VPN Host .....	591
19.3	NordVPN.....	593
19.3.1	Assignment: Create a NordVPN Account .....	593
19.3.2	Assignment: Configure IKEv2 VPN With NordVPN .....	598
19.4	Resolving Email Conflicts with VPN.....	604
19.5	Mesh VPN.....	605
19.6	LogMeIn Hamachi .....	606
19.6.1	Assignment: Create a LogMeIn Hamachi Account.....	606
5.1.3	Assignment: Add Users to a Hamachi VPN Network.....	619
19.6.2	Assignment: File Sharing Within a Hamachi VPN Network..	629
19.6.3	Assignment: Screen Share Within Hamachi VPN.....	631
19.6.4	Assignment: Exit the Hamachi VPN Network.....	633
20	Social Media.....	635
20.1	What, me worry?.....	636
20.2	Protecting Your Privacy On Social Media.....	637
20.3	Facebook.....	638
20.3.1	Assignment: Facebook Security and Login .....	638
20.3.2	Assignment: Facebook Privacy Settings.....	643
20.3.3	Assignment: Timeline and Tagging Settings .....	645
20.3.4	Assignment: Facebook Manage Blocking.....	646
20.3.5	Assignment: Facebook Public Posts .....	648
20.3.6	Assignment: Facebook Apps.....	650
20.3.7	Assignment: What Does Facebook Know About You.....	660
20.4	LinkedIn .....	666
20.4.1	Assignment: LinkedIn Account Security.....	666
20.4.2	Assignment: Find What LinkedIn Knows About You.....	673
20.5	Google 675	
20.5.1	Assignment: Manage Your Google Account Access and Security Settings.....	675
20.5.2	Assignment: Enable Google 2-Step Verification.....	692
20.5.3	Find What Google Knows About You .....	697
21	When It Is Time to Say Goodbye.....	701
21.1	Preparing a Computer for Sale or Disposal.....	702
21.1.1	Assignment: Prepare Your Mac For Sale Or Disposal.....	702

## Contents In Detail

21.1.2	Assignment: Secure Erase the Drive .....	706
21.1.3	Assignment: Install macOS 10.13.....	711
22	Miscellaneous.....	713
22.1	Date and Time Settings .....	714
22.2	Assignment: Configure Date & Time .....	715
22.3	Securing Hardware Components .....	717
22.4	National Institute of Standards and Technology (NIST) .....	719
22.4.1	NIST-Specific Security Settings .....	719
22.5	United States Computer Emergency Readiness Team (US-CERT) .....	721
23	The Final Word .....	723
23.1	Additional Reading .....	724
	macOS 10.13 Security Checklist .....	725
	Revision Log.....	731
	Index.....	733



## 19 Internet Activity

*If you go to a coffee shop or at the airport, and you're using open wireless, I would use a VPN service that you could subscribe for 10 bucks a month. Everything is encrypted in an encryption tunnel, so a hacker cannot tamper with your connection.*

–Kevin Mitnick<sup>1</sup>

### What You Will Learn In This Chapter

- Virtual Private Network (VPN)
- Search for a VPN host
- Install and configure VPN
- Create a mesh VPN
- File share within a Hamachi VPN
- Resolve email conflicts with VPN

---

<sup>1</sup> [https://en.wikipedia.org/wiki/Kevin\\_Mitnick](https://en.wikipedia.org/wiki/Kevin_Mitnick)

## 19.1 Virtual Private Network

In case you have been sleep reading through this book, let me repeat my wake-up call: *They are watching you on the Internet. They* may be the automated governmental watchdogs (of your own or another country), government officials (again, of your own or another country), bored staff at an Internet Service Provider or broadband provider, a jealous (and slightly whackadoodle) ex, high school kids driving by your home or office or sitting on a hill several miles away, or criminals.

Regardless, your computer and data are at risk.

Perhaps one of the most important steps that can be taken to protect you is to encrypt the entire Internet experience all the way from your computer, through your broadband provider, to a point where your surfing, chat, webcam, email, etc. cannot be tracked or understood. This is accomplished using a technology called *VPN-Virtual Private Network*<sup>2</sup>.

---

<sup>2</sup> [http://en.wikipedia.org/wiki/Virtual\\_private\\_network](http://en.wikipedia.org/wiki/Virtual_private_network)

## 19.2 Gateway VPN

There are two fundamental flavors of VPN. The most common is called a *gateway VPN* (mesh VPN is discussed later.) Historically, gateway VPN involved the use of a VPN appliance resident at an organization. Telecommuting staff can use the gateway so the Internet acts like a very long Ethernet cable connecting their computer to the office network. In addition, all data traveling between the user's computer and the gateway is military-grade encrypted. The downside to this strategy is that these appliances are relatively expensive (from \$600 to several thousand dollars), and they require significant technical experience to configure correctly.

In greater detail the concept works like this:

1. Your computer has VPN software installed and configured to connect to a VPN server at the office. This server is connected to your office network. macOS/OS X comes with VPN software built into the Network System Preferences that works with many of the commercially available VPN servers, including the most popular—Cisco. Other VPN servers require their own proprietary client software to be installed.
2. On your computer, you open the VPN software and instruct it to connect to the VPN server. This typically requires entering your authentication credentials of user name and password, along with a long key.
3. The VPN server authenticates you as an allowed account and begins the connection between itself and your computer.
4. As you send data from your computer to the network connected to the VPN server (typically the regular business network), all of it is military-grade encrypted. When the data is received at the VPN server or at your computer, the VPN software decrypts it.
5. Once your data reaches the VPN server, it is then forwarded to the appropriate service on your organizations network (file server, printer, mail server, etc.)

Although this may sound a bit complex, all a user must do is enter a name, password, and key. Everything else is invisible. The only indicator that anything is

different is that speed slower than normal. This is due to the overhead of encryption/decryption process.

We can use this same strategy so that instead of securely exchanging data with our office server, we can securely surf the Internet. The workflow is just slightly different:

1. Your computer has VPN software configured to connect to a VPN server that is not associated with your office, but is just another server “on the Internet.”
2. On your computer, you open the VPN software and instruct it to connect to the VPN server. If you are using our recommended software, it is pre-configured with all the settings necessary—nothing much more to do but launch.
3. The VPN server authenticates you as an allowed account and begins the connection between itself and your computer.
4. As you surf the web, all data is military-grade encrypted. When the data is received at the VPN server or your computer, the VPN software decrypts it.
5. Once your data reaches the VPN server, it is then forwarded to the appropriate service on the Internet.

Using this strategy (a VPN Internet server), all your Internet traffic is military-grade encrypted between your computer and the VPN server. It is not possible to decipher any of your traffic (user names, passwords, data) or even the type of data coming and going.

One downside is that once the data exits the VPN server, it is readable. However, your data is intermingled with thousands of other user’s data, making the process of tweezing out your data a task that perhaps only the NSA can accomplish.

Another concern is that some VPN providers maintain user activity logs. This is law in most countries, so that government agencies can review who is doing what through the VPN. Ideally, you want to work only with a VPN provider operating in a country doesn’t require logs, and in fact, do not keep logs.

There are thousands of VPN Internet Servers available. Most of them are free. I don’t recommend using the free services for two reasons:

1. You get what you pay for (typically here today, gone tomorrow, unstable, etc.)

2. You don't know who is listening at the server side of things. Remember, your data is fully encrypted up to the server. But once the data reaches the server on the way to the Internet, it is readable. There needs to be a high degree of trust for the administration of the VPN server. I see no reason to have such trust with free services.

There are hundreds of legitimate VPN hosts. Thousands of illegitimate VPN hosts. When determining the best VPN provider for your use, there are some key variables to look for:

- **Privacy Jurisdiction.** Does the VPN host have to comply with US National Security Letters, or other governmental requirements for disclosure of your information? If you don't care about the government access to all of your Internet information, this doesn't apply. If you do care, the geographical location of the host headquarters becomes important.
- **Logs.** Are logs kept on client activities? In many countries, it is required by law that all Internet providers maintain logs of client activities. If so, although the logs may not record *what* you were doing, they keep a record of *where* you traveled. It is ideal to have a VPN provider that keeps no logs whatsoever.
- **Speed.** How fast is your Internet experience? Using VPN introduces a speed penalty due to the encryption/decryption process, as well as the need to process all incoming and outgoing packets through a server instead of point-to-point. VPN providers can reduce this penalty in several ways, including; faster servers, reducing the clients:server ratio, better algorithms, filtering content to remove advertisements and cookies, and faster server internet connections.
- **Support.** VPN adds a layer of complexity to your Internet activities. Should something not work correctly, you don't want to be the one troubleshooting. Ideally, your VPN provider has 24/7/365 chat support. Even better if they offer telephone support.
- **Cross-Platform Support.** Most of us have more than one device. Perhaps a Windows and macOS/OS X computer, an Android phone, and an Apple iPad. It would be madness to have to use a different VPN product for each of these. Look for a provider that supports all your current and potential devices.

- **Multi-Device Support.** Most, but not all, providers now offer from 3-5 concurrent device licensing. This allows your VPN service to be operational on all your devices at the same time. Providers that offer only single-device licensing may be quite costly should you have multiple devices.
- **DNS-Leak Protection.** Although VPN encrypts all data that comes and goes from your device, before you can reach out to the Internet to connect to your email, a website, or text, your device must connect to a DNS server for guidance on where to find the mail, web, or text server. If you are using your default DNS server (typically one by your Internet broadband provider, data between your system and the DNS server is not encrypted *and* is recorded. It is ideal if your VPN provider offered their own DNS servers. Using this strategy, then the data between your device and the DNS server is now either encrypted, or is not logged.
- **VPN Protocol.** There are several network protocols that may be used for encryption. We currently recommend IKEv2. This is the most current, and the only protocol with the ability to automatically activate upon accessing the Internet, and deactivate when not in use.
- **Pricing.** This is sometimes directly related to the quality of service, and occasionally directly related to the greediness of those running the business. Look for reasonable pricing for the services offered, as well as how many concurrent connections you are allowed. Some hosts allow only 1 connection. Others offer 6 or more. This would allow for you to have your computer, phone, tablet connected via VPN, as well as those of a family member.

Right about now you may be asking yourself: *If VPN is so great, why doesn't everyone know about and use it?*

Great question! As with everything else in life, there is bad that comes with the good. Each person needs to weigh the pros and cons for each situation for themselves. I personally *always* have VPN active, but I'm *always* doing work! I hope you don't have that disease. There are two primary downsides to VPN. It slows down your Internet performance. Often by 50% or more. If all I want to do were to stream Netflix to my computer, I'd turn VPN off to reduce the pauses induced by a slow Internet connection. Second, if you have selected a VPN server outside of your home country, you may have unintended consequences due to the

Internet servers thinking you are resident in that other country. For example, Google searches will be displayed in the language native to that country. This is considered a feature of the *Proxy Server* function built into VPN, and is used by those in restrictive countries to view news across the border that are normally filtered out by their home country.

### 19.2.1 Assignment: Search for a VPN Host

In this assignment, you search for at least three VPN hosts that best meet your needs.

1. Based on the list of criteria listed above, make a list of VPN Host *must-haves*, and *prefer-to-haves*.
2. Open a web browser to <https://thatoneprivacysite.net/simple-vpn-comparison-chart/>, or for a more detailed checklist, <https://thatoneprivacysite.net/vpn-comparison-chart/>.
3. Click the Show <pop-up menu> entries, and then select All.

VPN SERVICE	PRIVACY Jurisdiction	PRIVACY Logging	PRIVACY Activism	TECHNICAL Serv Conf	TECHNICAL Security	TECHNICAL Availability	BUSINESS Website	BUSINESS Pricing	BUSINESS Ethics
3Monkey	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Red
AceVPN	Red	Red	Red	Red	Yellow	Yellow	Yellow	Yellow	Red
ActiVPN	Red	Red	Green	Yellow	Green	Green	Green	Green	Red
AirVPN	Red	Red	Red	Yellow	Green	Green	Green	Yellow	Red
Anonine	Red	Red	Red	Yellow	Yellow	Green	Red	Yellow	Yellow
AnonVPN	Red	Green	Yellow	Red	Yellow	Yellow	Red	Green	Yellow
Anonymizer	Red	Red	Yellow	Green	Yellow	Yellow	Red	Green	Yellow
AnonymousVPN	Green	Red	Red	Green	Yellow	Green	Green	Yellow	Red
Astrill	Green	Red	Red	Red	Yellow	Yellow	Red	Yellow	Red
Avast	Yellow	Red	Red	Green	Yellow	Yellow	Green	Yellow	Yellow
Secureline	Yellow	Red	Red	Green	Yellow	Yellow	Green	Yellow	Yellow

- To sort by your first must-have, click in that column header. For this assignment, click on Privacy Logging.

**THAT ONE PRIVACY SITE** Simple VPN Comparison Chart

Show  entries Search:

	VPN SERVICE	PRIVACY Jurisdiction	PRIVACY Logging	PRIVACY Activism	TECHNICAL Serv Conf	TECHNICAL Security	TECHNICAL Availability	BUSINESS Website	BUSINESS Pricing	BUSINESS Ethics
Welcome	AzireVPN	Green	Yellow	Green	Green	Green	Green	Green	Green	Green
	BlackVPN	Green	Green	Green	Green	Green	Green	Green	Green	Green
VPN Section	BolehVPN	Green	Green	Green	Green	Green	Green	Green	Green	Green
	CactusVPN	Green	Green	Red	Red	Green	Green	Green	Green	Red
Email Section	FrootVPN	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
	IVPN	Green	Green	Green	Green	Green	Green	Green	Green	Green
Reviews / Blog	LiquidVPN	Red	Green	Red	Green	Green	Green	Green	Green	Red
	Mullvad	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
FAQs	oVPN.se	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
	SecureVPN.to	Red	Green	Green	Green	Green	Green	Green	Green	Green
Donate	VPNSecure	Green	Green	Green	Green	Green	Green	Green	Green	Green
	BlazingVPN	Red	Green	Green	Yellow	Green	Green	Green	Green	Yellow
Contact	NordVPN	Green	Green	Green	Green	Green	Green	Green	Green	Red

- To sub-sort by a second must-have feature, hold down the Shift key, and then click on the header matching that must-have. For this assignment, click on Privacy Jurisdiction.

**THAT ONE PRIVACY SITE** Simple VPN Comparison Chart

Show  entries Search:

	VPN SERVICE	PRIVACY Jurisdiction	PRIVACY Logging	PRIVACY Activism	TECHNICAL Serv Conf	TECHNICAL Security	TECHNICAL Availability	BUSINESS Website	BUSINESS Pricing	BUSINESS Ethics
Welcome	BlackVPN	Green	Green	Green	Yellow	Green	Green	Green	Green	Green
	BolehVPN	Green	Green	Green	Green	Green	Green	Green	Green	Green
VPN Section	CactusVPN	Green	Green	Red	Red	Green	Green	Green	Green	Red
	AzireVPN	Green	Green	Green	Green	Yellow	Green	Green	Green	Green
Email Section	FrootVPN	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
	Mullvad	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
Reviews / Blog	oVPN.se	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
	IVPN	Green	Green	Green	Green	Green	Green	Green	Yellow	Green
FAQs	VPNSecure	Green	Green	Green	Green	Green	Green	Green	Green	Yellow
	SecureVPN.to	Red	Green	Green	Green	Green	Green	Green	Green	Yellow

- By performing a sort and sub-sort, we have filtered potential hosts from almost 200, to just a few.
- From the few hosts meeting these minimum requirements, view their websites to evaluate if any meet your needs.
- Outside of this course, you may sign-up with one or more of the hosts meeting your needs, put its service through an evaluation, unsubscribe and request a refund if they don't meet with your expectations, or keep them if they meet your needs.

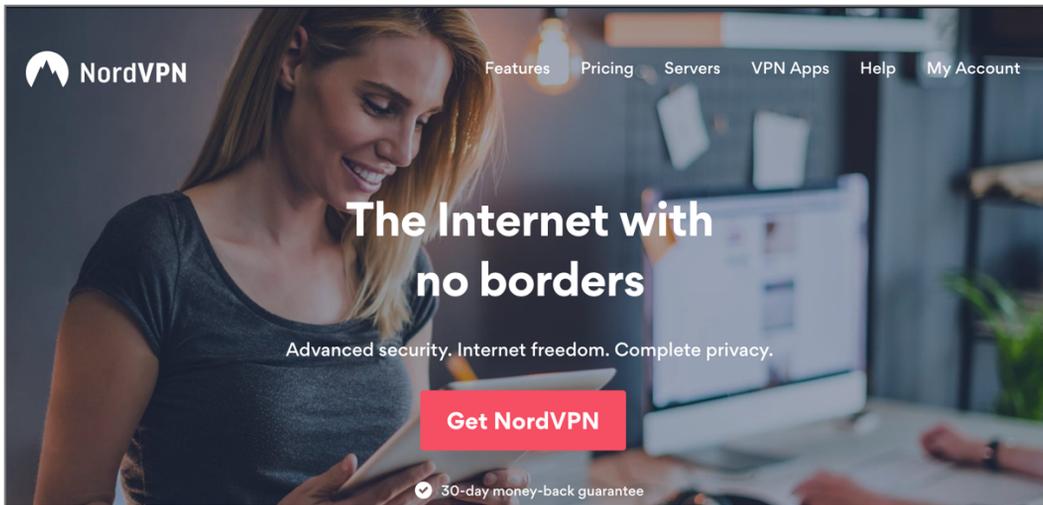
## 19.3 NordVPN

One of our favorite VPN providers is *NordVPN*<sup>3</sup>. They offer a free 3-day trial account, with subscriptions as short as a month, as long as two years. With this you get servers in almost every country you can name, use on multiple devices, unlimited bandwidth, and highly responsive bandwidth, specialized VPN servers, and a great price.

### 19.3.1 Assignment: Create a NordVPN Account

In this assignment, you create a paid account with *NordVPN.com*, and then configure VPN services.

1. To open a free 3-day trial account, open a browser and then visit <https://free.nordvpn.com/>. Skip to step 6 below.
2. To open a paid subscription account, open a browser, visit NordVPN at <https://nordvpn.com>, and then select the *Get NordVPN* button.



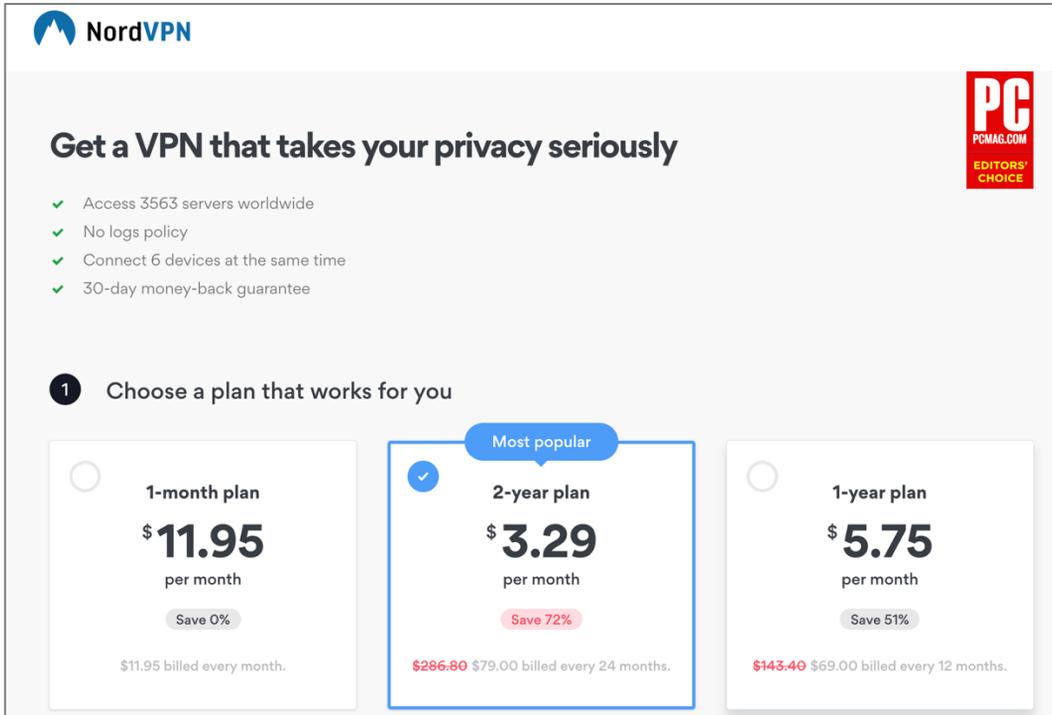
---

<sup>3</sup> <https://nordvpn.com>

## 19 Internet Activity

### 3. Select a subscription plan.

- Note: All subscription plans are 30-day money-back guaranteed.



The screenshot shows the NordVPN website. At the top left is the NordVPN logo. The main heading is "Get a VPN that takes your privacy seriously". Below this are four bullet points: "Access 3563 servers worldwide", "No logs policy", "Connect 6 devices at the same time", and "30-day money-back guarantee". On the right side, there is a red badge that says "PC MAG.COM EDITORS' CHOICE". Below the heading is a section titled "1 Choose a plan that works for you". There are three plan cards: "1-month plan" for \$11.95 per month (Save 0%), "2-year plan" for \$3.29 per month (Save 72%), and "1-year plan" for \$5.75 per month (Save 51%). The 2-year plan is highlighted with a blue border and a "Most popular" badge. Below each plan card, the total cost for the term is shown: \$11.95 billed every month, \$286.80 (\$79.00 billed every 24 months), and \$143.40 (\$69.00 billed every 12 months).

### 4. Scroll down to *Create secure account*. Enter your email address to be used for this account.



The screenshot shows the "2 Create secure account" section. It features a label "Email" above a text input field. The input field contains the placeholder text "name@example.com".

## 19 Internet Activity

5. Scroll down to *Select your preferred method of payment*, enable your payment option, fill in the required information, and then click the *Continue* button.

3 Select your preferred method of payment SECURE SERVER

PayPal 

Credit card    

Crypto currencies   

Other  支付宝 ALIPAY

6. The *Check your email* window appears. Check your email.

 NordVPN

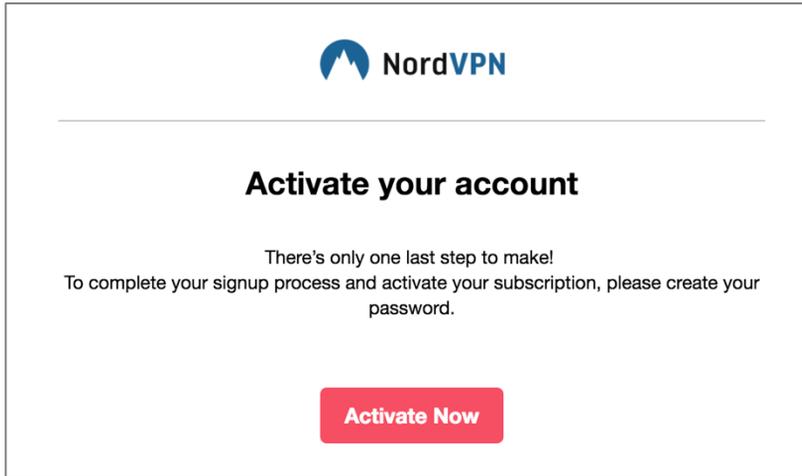
## Check your email

We have received your payment and sent a confirmation link to [marcmintz@gmail.com](mailto:marcmintz@gmail.com)  
Check your inbox to complete the signup process and activate your subscription.

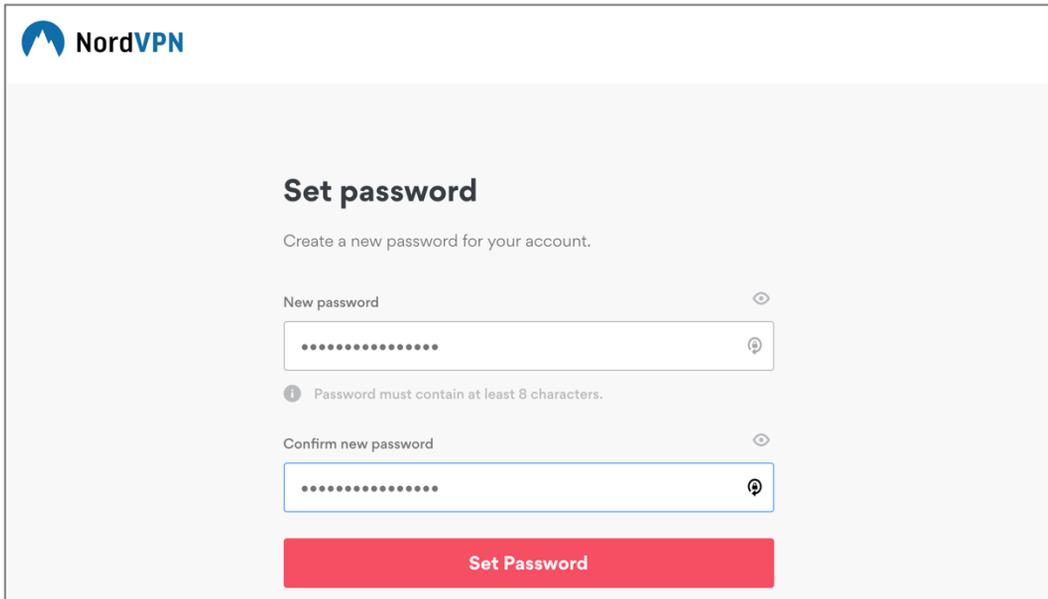


## 19 Internet Activity

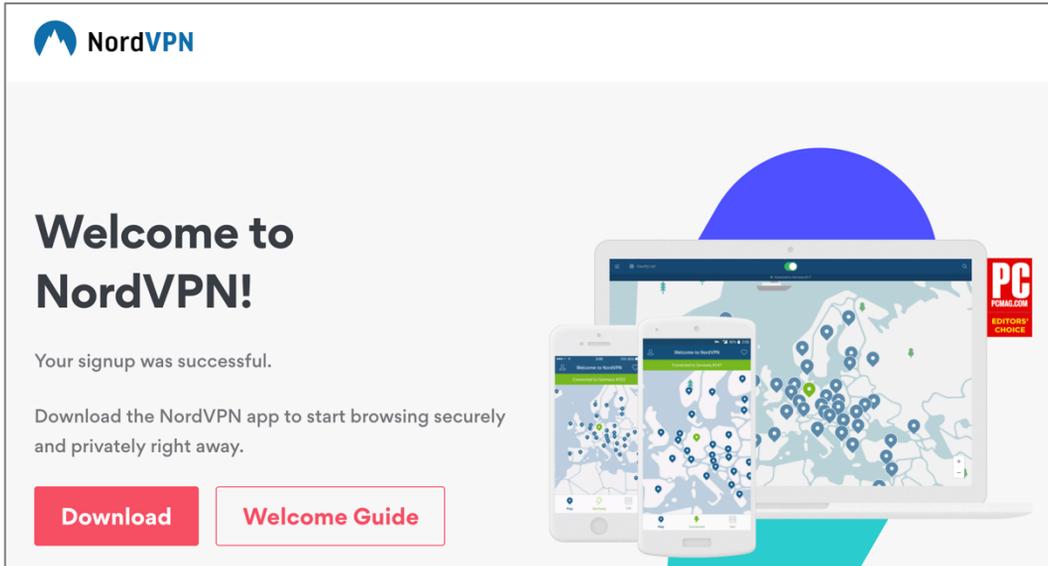
7. Open the email from NordVPN, and then click the *Activate Now* button.



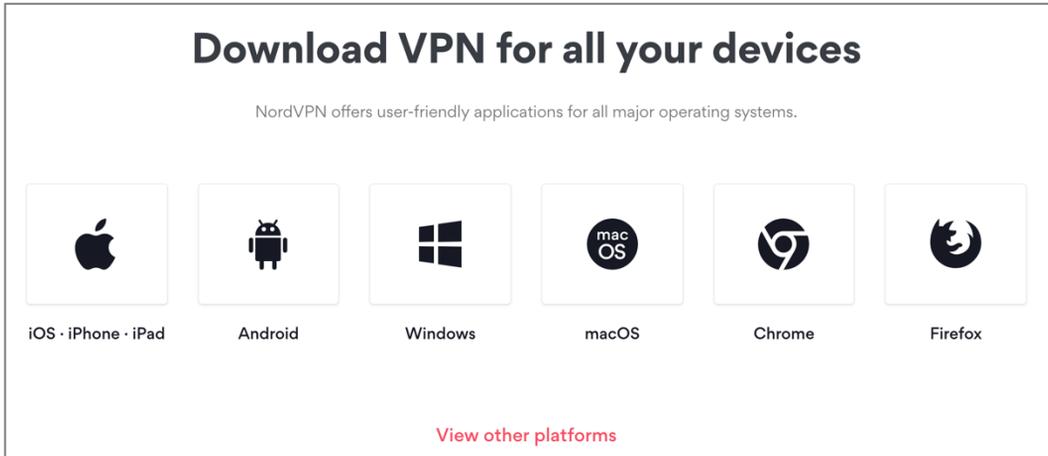
8. At the *Set password* page, create a password for your NordVPN account, and then click the *Set Password* button.



9. At the *Welcome to NordVPN* page, click the *Download* button.

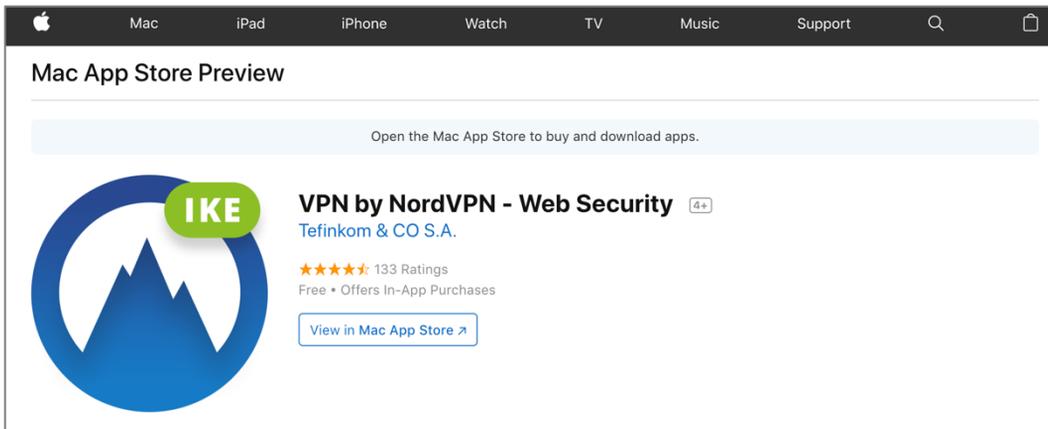


10. At the *Download VPN for all your devices*, click the *macOS* button.



11. Although NordVPN offers multiple different VPN protocols, we recommend using IKEv2. This is the most modern, possibly the most secure protocol available. It is also the only protocol that will automatically reconnect to the VPN server in the event the connection is lost. Click *View in Mac App Store* button.

## 19 Internet Activity



12. When in the App Store, click *Download* to install the NordVPN IKEv2 utility.

### 19.3.2 Assignment: Configure IKEv2 VPN With NordVPN

We recommend using the IKEv2<sup>4</sup> protocol for VPN, both for its strong encryption, and for its automatic activation when accessing the Internet.

In this assignment, you configure a VPN connection with NordVPN using the IKEv2 protocol.

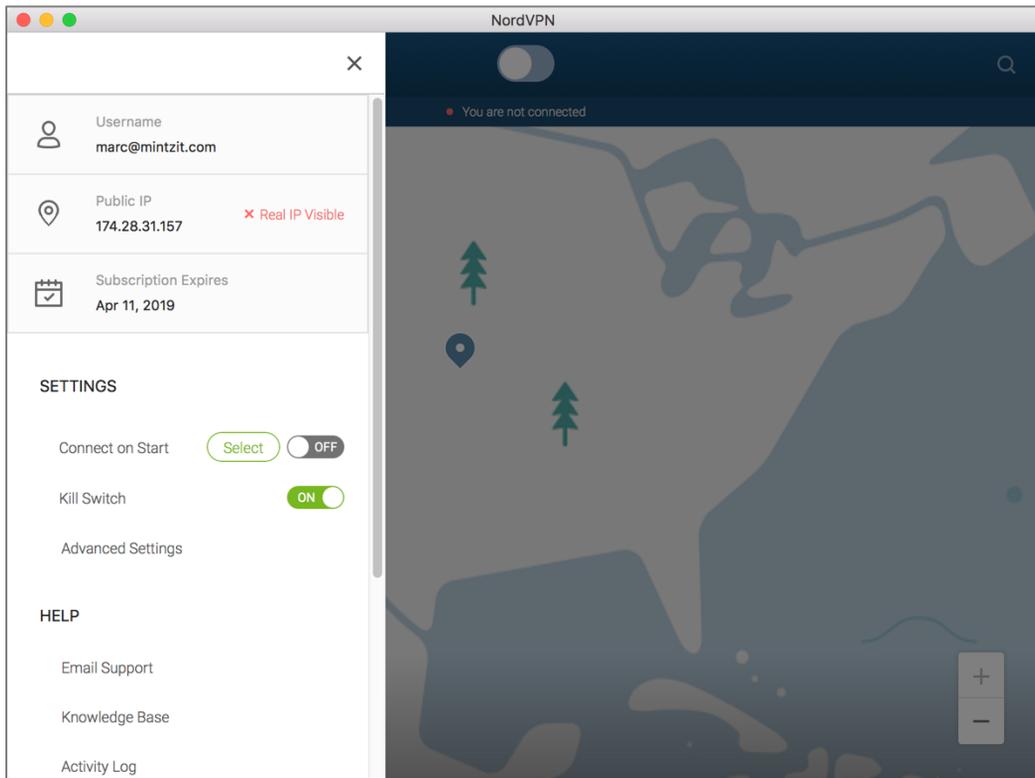
1. Open the *NordVPN* application, found in the */Applications* folder.
2. At the prompt, enter your NordVPN account name and password.

---

<sup>4</sup> [https://en.wikipedia.org/wiki/Internet\\_Key\\_Exchange](https://en.wikipedia.org/wiki/Internet_Key_Exchange)

## 19 Internet Activity

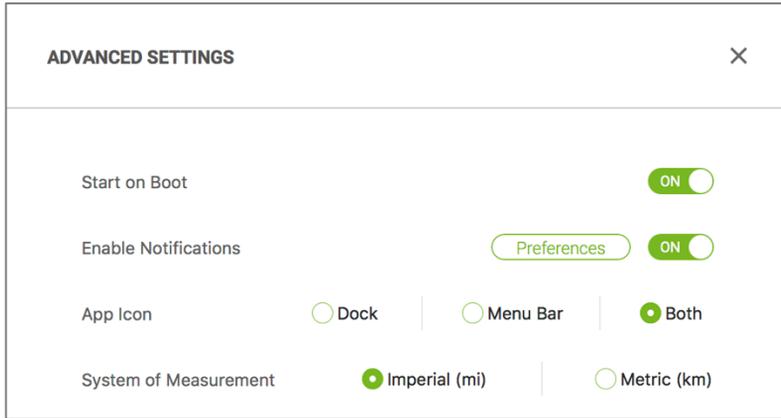
3. Click the *Preferences* (3 lines) icon in the top left corner. NordVPN preferences will open in the sidebar.



4. Enable *Connect on Start*. Now you don't have to remember to start VPN on login.
5. Enable *Kill Switch*. In the event your connection to the VPN server breaks, and IKEv2 cannot reconnect, your connection to the internet will be stopped so that no sensitive information will be transmitted unencrypted.

## 19 Internet Activity

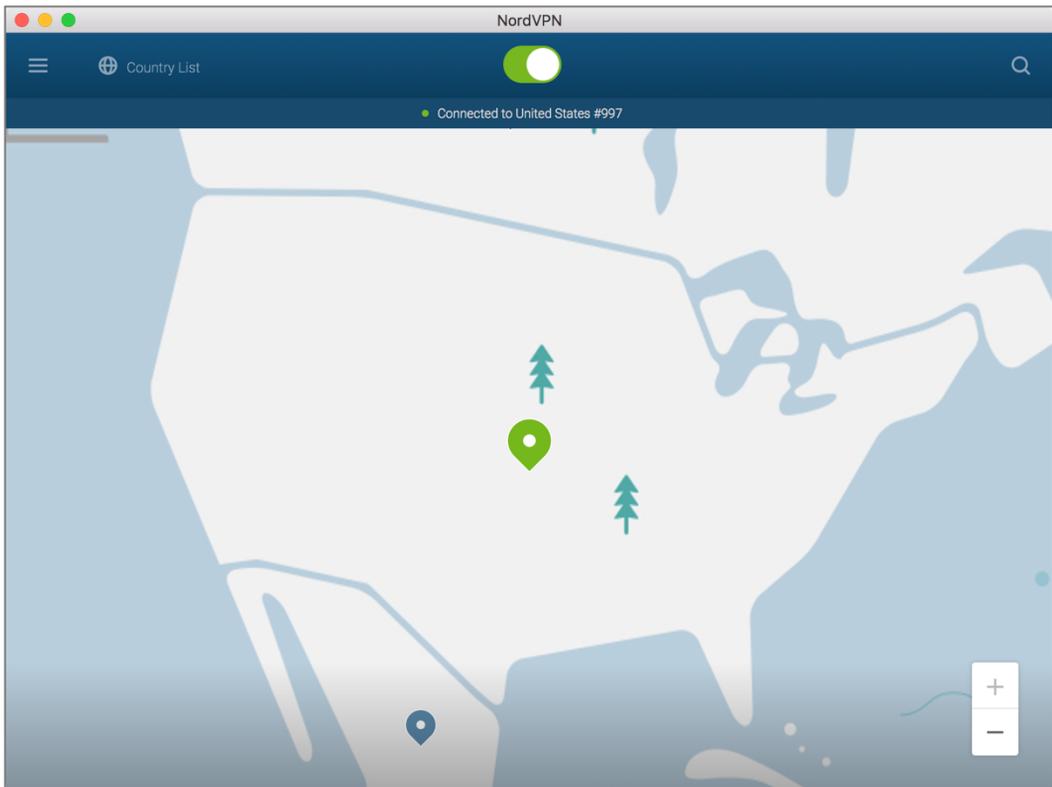
6. Click *Advanced Settings*.



7. Enable *Start on Boot*.
8. Enable *Enable Notifications*, and then click *Preferences* to configure how you wish NordVPN to send notifications.
9. Close *Notification Preferences*
10. Set *App Icon* to *Both*.
11. Click the X to close NordVPN preferences.
12. In the top left corner of the NordVPN window, click *Country List*, and then select which country's server to use. Using a server in your own country results in faster Internet. Using a server in a different country (such as Switzerland or Panama), may provide better security and privacy from government oversight.

## 19 Internet Activity

13. NordVPN will automatically connect, as seen in the green switch at top center of the window.



### **NordVPN Interface**

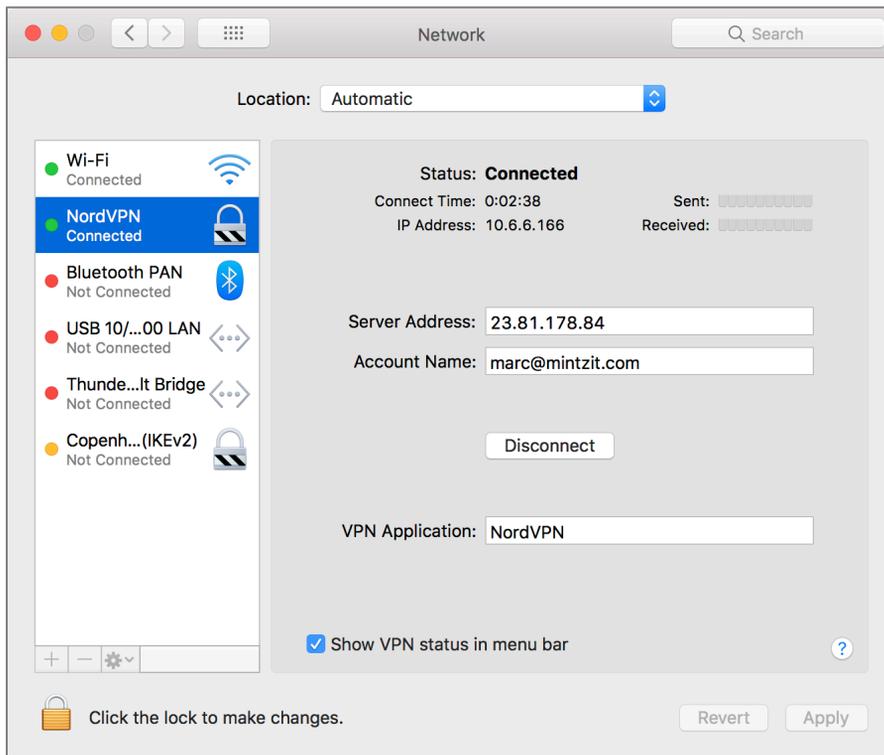
There are three places to view your NordVPN activity, each with slightly different controls:

## 19 Internet Activity

- *NordVPN* app. This can be accessed from the Dock (to open the app), and from the menu bar, to connect, disconnect, and select a server.

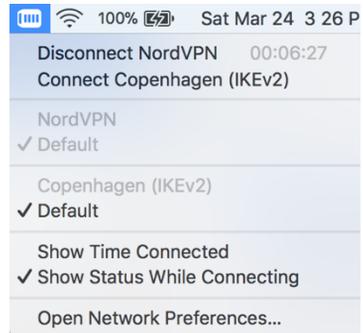


- *System Preferences > Network*. There isn't much to do here, but thought you should see it.



## 19 Internet Activity

- *VPN* menu icon. If you enable *Show VPN status in menu bar* in the Network System Preferences (see above screen shot), you will be able to view and control NordVPN from here as well.



## 19.4 Resolving Email Conflicts with VPN

Some email servers will send up a red flag and then block user access to email when the user switches to a VPN connection. This is a good thing as it indicates the email provider is highly sensitive to any possible security breach. In all cases there is a resolution available, although the steps to take will vary with each provider.

As an example, I have outlined below what occurs when using VPN with a Gmail account, and how to gain access to your email after the blockage.

1. The user starts a VPN program to encrypt all data between the user's computer and the Internet.
2. The user attempts to receive Gmail.
3. Google sees attempted access from an unknown machine (the Proxy Server), and blocks access to the account.
4. Both an email and a text from Google are sent notifying the user of suspicious activity.
5. Select the link in either message.
6. The first support file opens. Select the link.
7. In the authentication window, enter your email and password, and then select the *Sign In* button.
8. Another support window opens, explaining the next steps to take. Select the Continue button.
9. The final support window opens. Following the instructions, return to your email application and access your Gmail within 10 minutes. This will provide Google with the authentication to release your account.

## 19.5 Mesh VPN

Another way in which VPN can be configured is a *mesh VPN*. This strategy places multiple computers within the same virtual network regardless of where they are geographically located on the Internet. All the computers operate as if they are on the same physical network, and all traffic between each of the computers is military-grade encrypted. Mesh VPN is ideal for groups of people to exchange files, screen share, and access databases from each other, while maintaining full privacy from the outside world.

We now have software that enables mesh networks for a trivial cost. Keep in mind that VPN is only as secure as the provider, and the vendor of choice is a US company, subject to US federal laws and National Security Letters giving the NSA full access to logs and data crossing the vendor servers.

## 19.6 LogMeIn Hamachi

LogMeIn<sup>5</sup> is a US-based company with a line of top-grade cloud services. They are best known for their *LogMeIn* remote support software, allowing technical support staff both attended and unattended access to client and server computers.

One of their lesser-known, but game-changing products is *Hamachi*<sup>6</sup>. Hamachi is a cloud-based VPN, eliminating the need for expensive VPN boxes. As if that weren't enough, it also allows for three different types of VPN configurations: Gateway, mesh, and hub & spoke. We will restrict discussion here to the mesh option.

As of this writing, Hamachi is free for use with 5 or fewer nodes (computers). Up to 32 nodes on one network is available for \$29/year. Up to 256 nodes on a network is available for \$119/year.

### 19.6.1 Assignment: Create a LogMeIn Hamachi Account

In this assignment, you create a LogMeIn Hamachi account, so that you can deploy a free Hamachi network for up to 5 computers. Should you eventually need more computers on the network, your account can easily be upgraded at any time.

---

<sup>5</sup> <https://logmein.com>

<sup>6</sup> <https://secure.logmein.com/products/hamachi/>

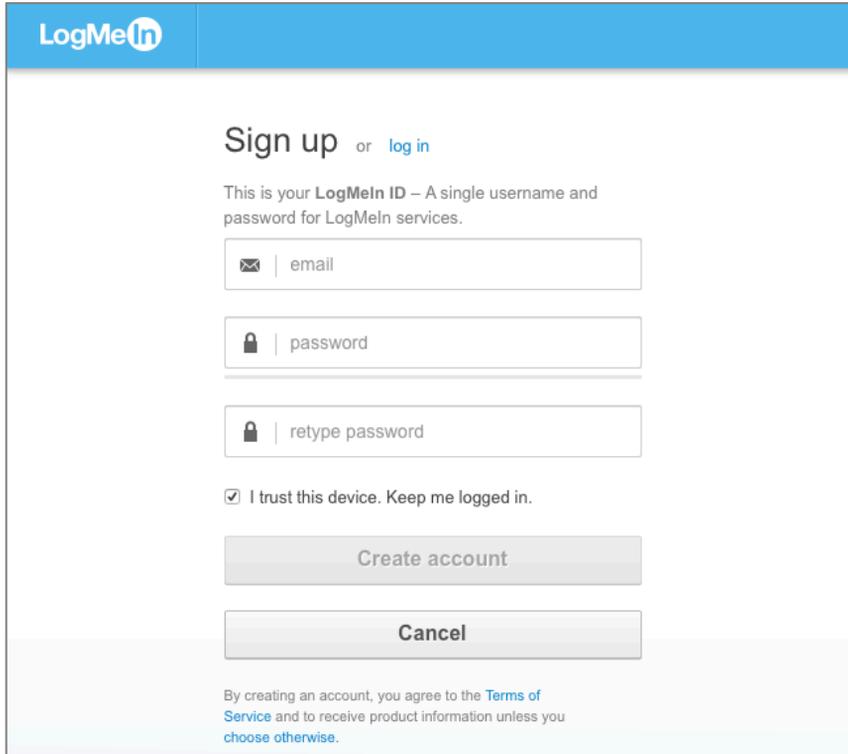
## 19 Internet Activity

1. Open a browser, and go to the Hamachi home page at <https://secure.logmein.com/products/hamachi/default.aspx>. The Hamachi home page opens. Click the *Sign up* link.



## 19 Internet Activity

2. Select the *Try it Free* button. In the *Sign Up* field, enter all requested information, and then select the *Create Account* button.



The screenshot shows the LogMeIn sign-up interface. At the top left is the LogMeIn logo. The main heading is "Sign up or log in". Below this is a sub-heading: "This is your LogMeIn ID – A single username and password for LogMeIn services." There are three input fields: "email" (with an envelope icon), "password" (with a lock icon), and "retype password" (with a lock icon). A checkbox labeled "I trust this device. Keep me logged in." is checked. Below the fields are two buttons: "Create account" and "Cancel". At the bottom, there is a disclaimer: "By creating an account, you agree to the Terms of Service and to receive product information unless you choose otherwise."

3. In the *Complete Your Registration* page, enter all requested information, and then select the *Register* button.

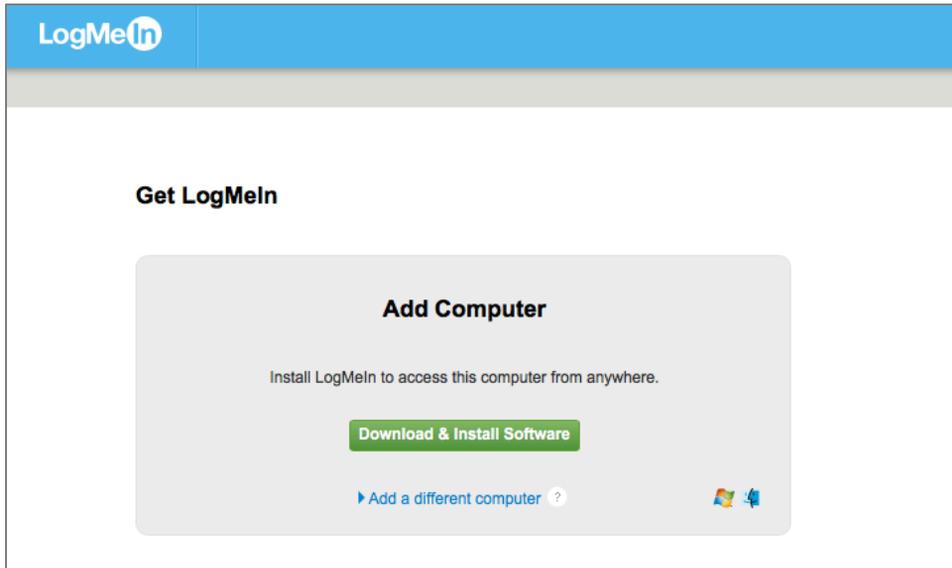
LogMeIn

## Complete your registration

[Register](#) [Skip](#)

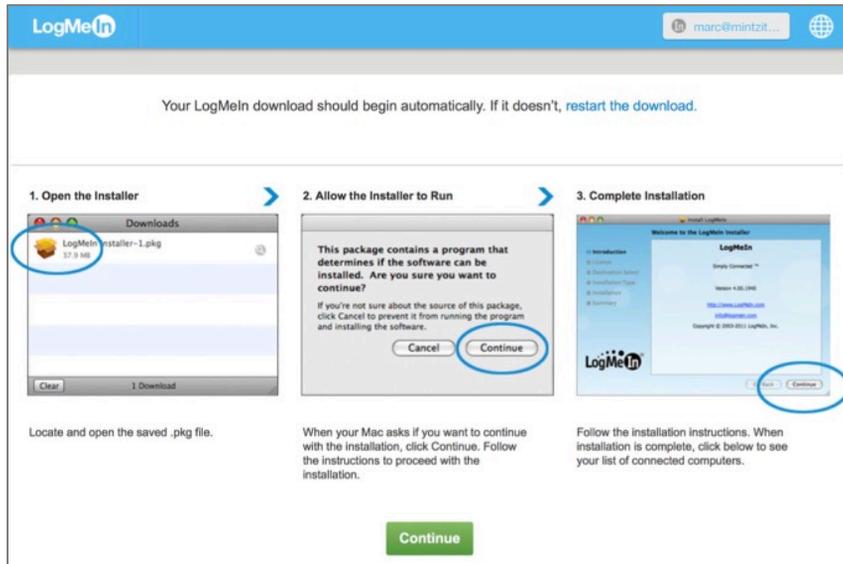
## 19 Internet Activity

4. At the *Get LogMeIn* page, select the *Download and Install Software* button to install the software on this computer. If you don't need the software on this computer, but want to install on other computers, click the *Add a different computer link*, and then follow the on-screen instructions.



## 19 Internet Activity

- The software will begin to download, and the guide page will appear. **Do not** select the *Continue* button quite yet.



- Go to your Downloads folder, and open the *LogMeIn Installer.app*. Enable the *I have read and agree...* checkbox, and then select the *Install* button.



## 19 Internet Activity

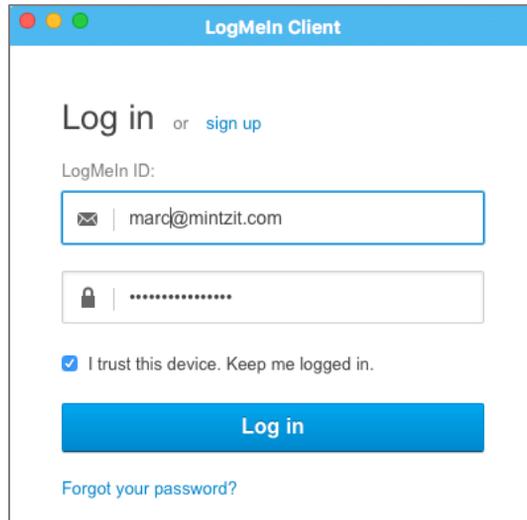
7. At the authentication prompt, enter an administrator username and password, and then select the *Install* button.
8. At the prompt, enter a name for your computer, and then select the *Continue* button.



9. At The *Installation Was Successful* pane, select the *Finish* button.

## 19 Internet Activity

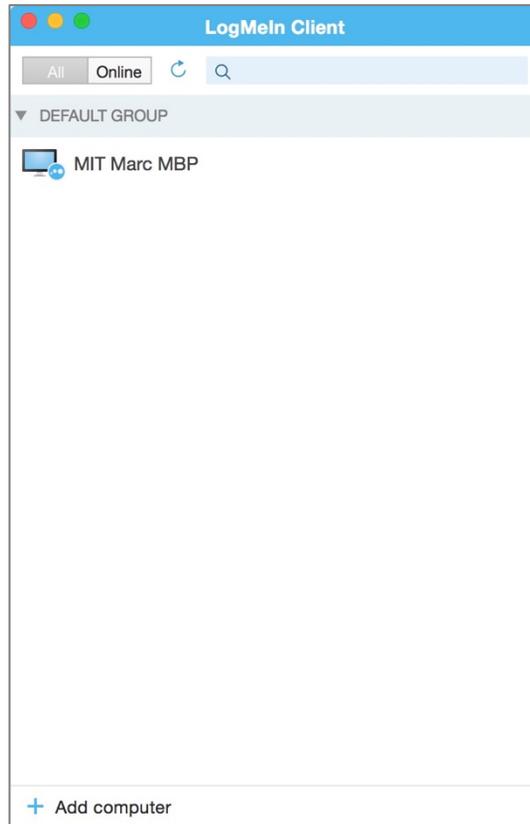
10. The *LogMeIn Client Log In* window appears. Enter the same email and password used to create the account, and then select the *Log In* button.



The screenshot shows a window titled "LogMeIn Client" with a blue header bar. Below the header, the text "Log in or sign up" is displayed. Underneath, the label "LogMeIn ID:" is followed by a text input field containing an envelope icon and the email address "marc@mintzit.com". Below this is a password input field with a lock icon and a series of dots representing the password. A checkbox is checked, with the text "I trust this device. Keep me logged in." to its right. At the bottom, there is a large blue button labeled "Log in" and a link that says "Forgot your password?"

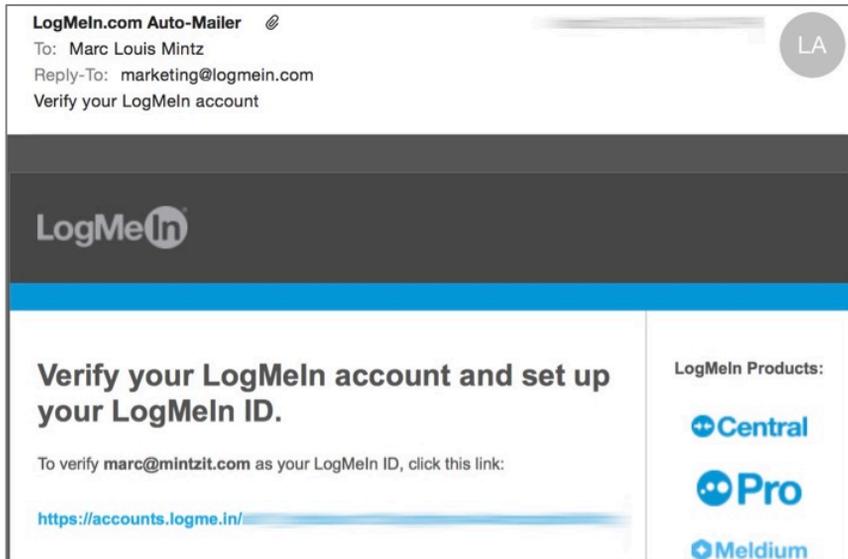
## 19 Internet Activity

11. The *LogMeIn Client* window will now display all users who are members of this network (currently, just yourself.) To add additional users, skip to step 13.



## 19 Internet Activity

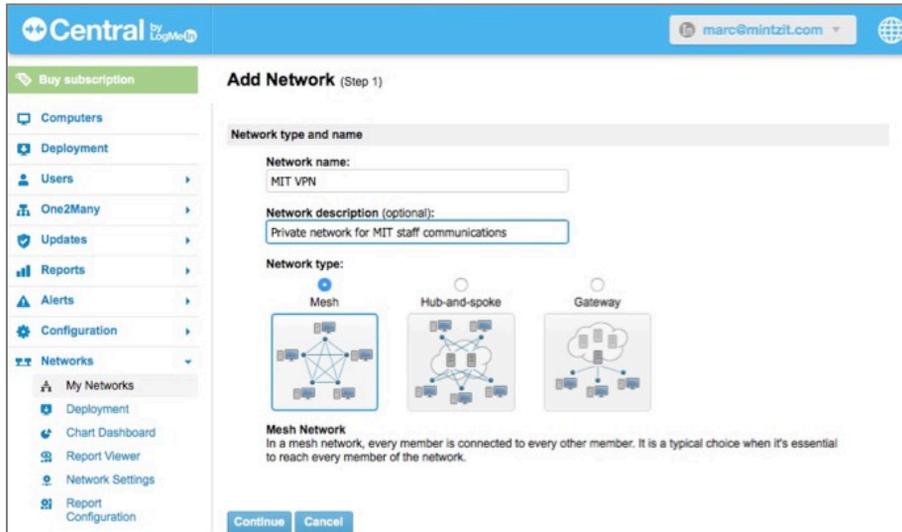
12. Open your email to check for a verification message from LogMeIn. Click the reply link.



13. Returning to your browser, in the *Hamachi* screen, select *Networks > My Networks*, and then select *Create Networks*.

The screenshot displays the Central by LogMeIn dashboard. The top navigation bar includes the 'Central by LogMeIn' logo, a user profile dropdown for 'marc@mintzit.com', and a globe icon. A left-hand sidebar contains a menu with categories: 'Buy subscription', 'Computers', 'Deployment', 'Users', 'One2Many', 'Updates', 'Reports', 'Alerts', 'Configuration', and 'Networks'. Under 'Networks', the 'My Networks' sub-menu is expanded, showing options like 'Deployment', 'Chart Dashboard', 'Report Viewer', 'Network Settings', and 'Report Configuration'. A yellow banner at the top right announces 'Planned System Maintenance' for Saturday, April 18th, 2015, with a 30-minute downtime. Below this, a section titled 'Get Started Now with On-Demand VPN Connectivity' provides instructions on deploying LogMeIn Hamachi. Three main action cards are visible: 'Deploy Hamachi' (with a button), 'Create Networks' (with a button and a red rectangular highlight around its diagram), and 'Add Clients' (with a button). The 'Create Networks' card includes a diagram of three interconnected nodes and the text: 'Set up virtual networks: mesh, hub-and-spoke or gateway.' At the bottom left, there are social media icons for Facebook, Twitter, and LinkedIn, and a 'Community' link. At the bottom right, there is a 'Buy Hamachi Subscriptions' button.

14. In the *Add Network* page, in the *Network Name* field, give your network a human-readable name, select the *Network Type* (in this example, we are creating a *Mesh* network), and then select the *Continue* button.



15. In *Add Network (Step 2)*, in *Join Requests*:

- In *Join Requests*, specify how users will be able to join the VPN network. If security is a concern, we recommend *Must be approved* to keep strangers out.
- In *Network password*, configure if a password is required to join the network. Assuming all user computers have strong passwords, and full-disk encryption, it would be extremely unlikely anyone other than the authorized user would be attempting network connection. However, if security is a concern, enable the password requirement, and then set a strong password.
- In *Subscription*, specify what subscription level is requested. For the purposes of this assignment, select *Multi-network via Control (up to 5 members, any number of networks.)*

## 19 Internet Activity

16. Select the *Continue* button.

The screenshot shows the 'Add Network' (Step 2) interface in the Central by LogMeIn application. The left sidebar contains a navigation menu with options: Buy subscription, Computers, Deployment, Users, One2Many, Updates, Reports, Alerts, Configuration, Networks (expanded to show My Networks, Deployment, Chart Dashboard, Report Viewer, Network Settings, Report Configuration), Backup, and Bulletin Board. The main content area is titled 'Add Network (Step 2)' and includes the following sections:

- Join Requests:** Radio buttons for 'Accept automatically', 'Must be approved' (selected), and 'Members can be added on the web only'.
- Network password:** A checkbox 'A password is required to join this network' is unchecked. Below are input fields for 'Network password' and 'Confirm password'. A note states: 'Clients requesting to join the network must enter the password. If you do not set a password, we recommend setting the Join Request behavior to Must be approved or Members can be added on the web only.'
- Subscription:** Radio buttons for 'Multi-network via Central (up to 5 members, any number of networks)' (selected), 'Buy Standard (up to 32 members per network) - \$29.00/year', 'Buy Premium (up to 256 members per network) - \$119.00/year', and 'Buy Multi-network (up to 256 members, any number of networks) - \$199.00/year'.

At the bottom of the main content area are 'Continue' and 'Cancel' buttons.

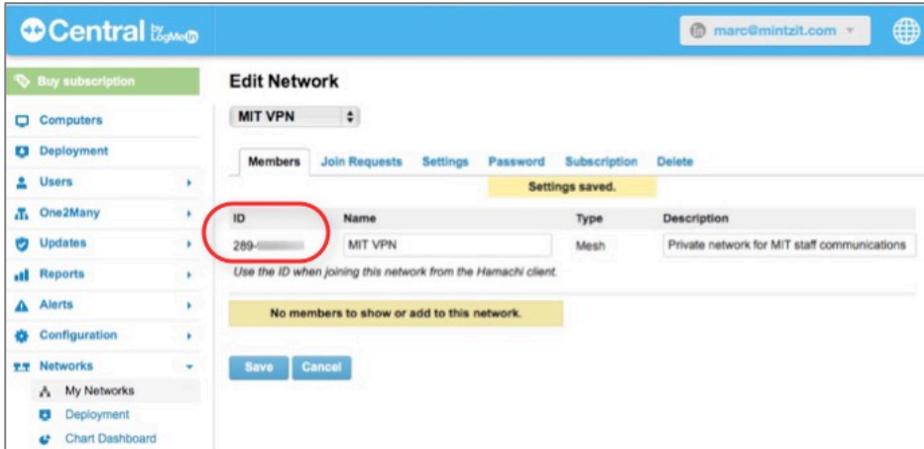
17. The *Add Network (Step 3)* appears. Select the *Finish* button.

The screenshot shows the 'Add Network' (Step 3) interface in the Central by LogMeIn application. The left sidebar is identical to the previous screenshot. The main content area is titled 'Add Network (Step 3)' and includes the following sections:

- Network: MIT VPN:** A diagram shows a central server icon connected to several client computer icons. Text reads: 'Select computers to join this network.' Below the diagram, it says: 'Clients from other accounts can also request to join this network from the client interface. Read more'.
- Select network members:** A yellow box contains the text: 'No eligible members to list.'

At the bottom of the main content area are 'Finish' and 'Cancel' buttons.

18. In the *Edit Network* page, make note of your network *ID*, as this will be used when joining the network. Select the *Save* button.



Congratulations, your account is created and you are ready to add users to your mesh VPN network.

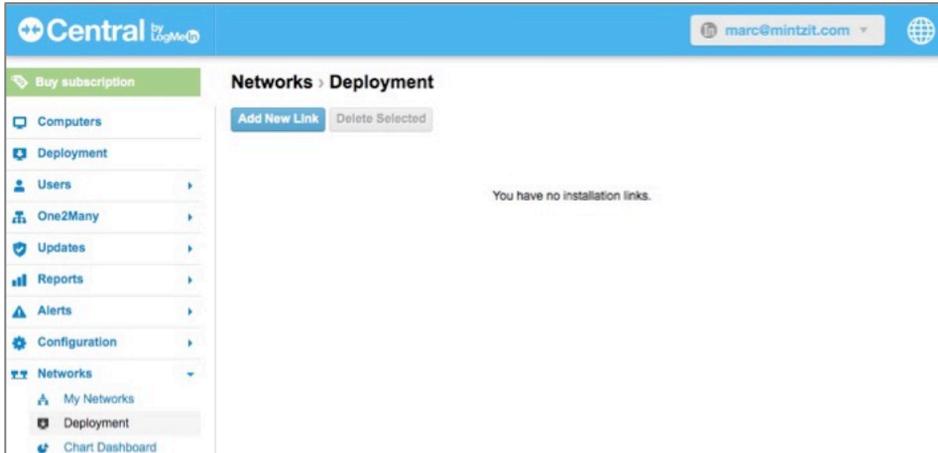
### 5.1.3 Assignment: Add Users to a Hamachi VPN Network

In this assignment, you add users to the Hamachi VPN network created in the previous assignment.

- Prerequisite: Completion of the previous assignment.
1. Open a browser and go to <https://secure.logmein.com>, and then login with your username and password. The *LogMeIn Central* page appears.

## 19 Internet Activity

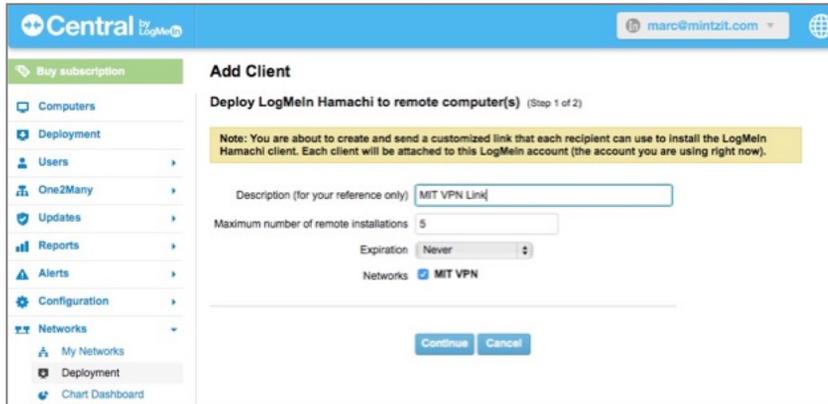
2. Select the *Networks > Deployment* link, and then select the *Add New Link* button.



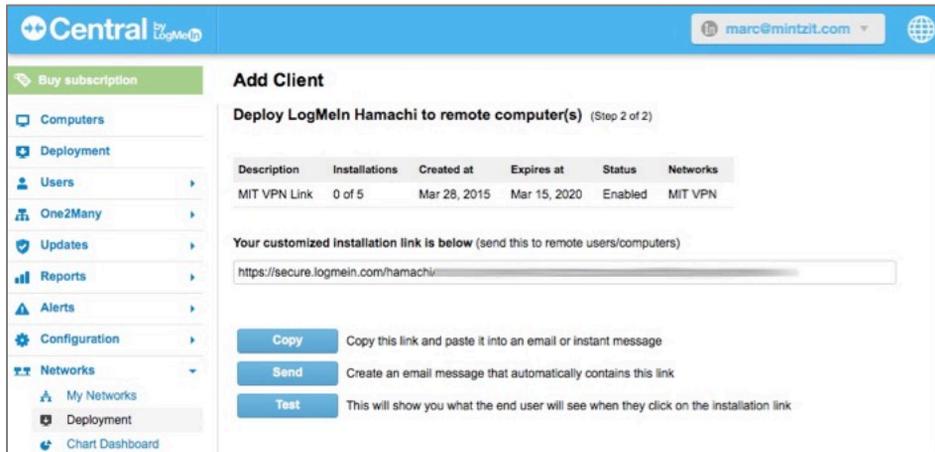
3. In the *Add Client* page, you will create a link that can be used to allow a custom installation of Hamachi.
  - In the *Description* field, enter information for your own reference.
  - In the *Maximum number of remote installations* field, enter, well, the maximum number of installations permitted (with a free account, this is 5.)
  - In the *Expiration* pop-up, specify when the link expires.
  - In *Networks*, enable the checkbox for the network this link will be used.

## 19 Internet Activity

4. Select the *Continue* button.



5. The *Add Client* link page appears. You have the option to *Copy* or *Send* the link. For our assignment, select *Send*.



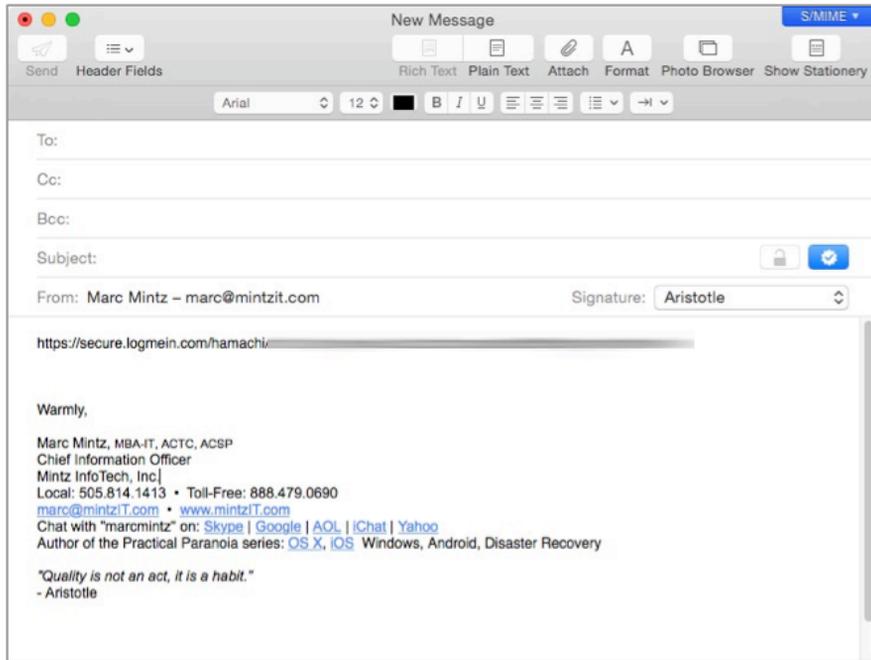
The default email client will open, with the link pre-entered in the body area, awaiting entry of recipient(s) and a message.

6. Enter recipient address(es).
7. Enter a subject.
8. Enter additional information in the body area explaining what to do next. Something like: *Listed below is a link to download LogMeIn Hamachi. This*

## 19 Internet Activity

*software will allow all of us to create a private encrypted network within which we may continue our plans for world domination.*

9. Send the email.



10. When the recipient clicks the link, they are taken to the *Hamachi Installer* page. Enable the *I have received this link from a trusted source* check box, and then select the *Continue* button.



11. At the *Download* page, select the *Download Now* button.



12. The *LogMeIn Hamachi Installer* will download. Once complete, launch the installer, enable the *I have read...* check box, and then select the *Install* button.

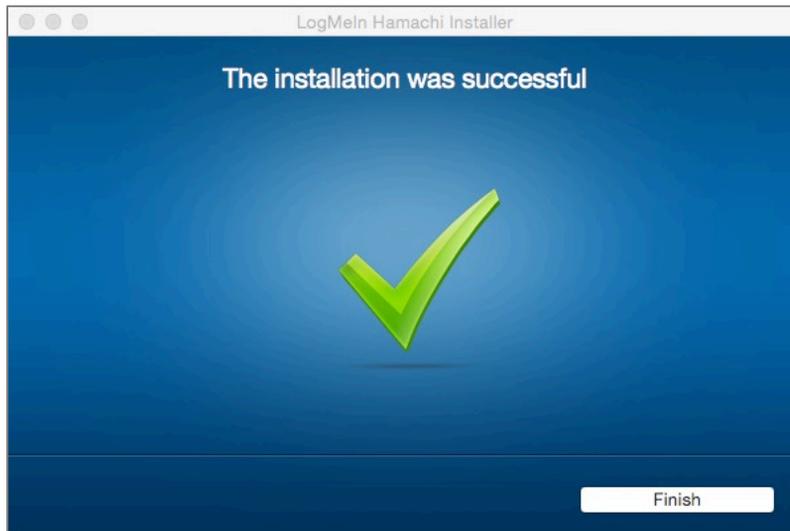


## 19 Internet Activity

13. The *Attach client to LogMeIn account* screen appears. Select the *Next* button.

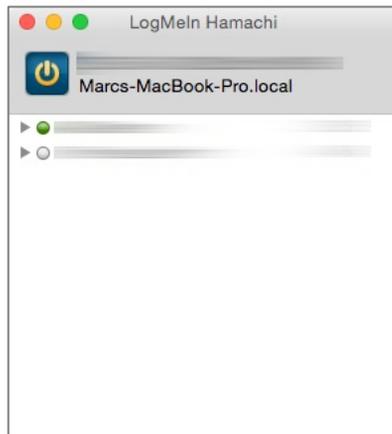


14. When the installation completes, select the *Finish* button.



## 19 Internet Activity

15. Open *LogMeIn Hamachi*.app, located in */Applications/LogMeIn Hamachi*. In my case, there are networks that I currently belong to listed, one of which I am connected (the green button), and one I am not connected with (white button). Neither of which is the MIT VPN network (yet).
- If your target network appears in the *LogMeIn Hamachi* window with a green button, all is done!
  - If your target network doesn't appear in the *LogMeIn Hamachi* window, we have a few more steps to complete.

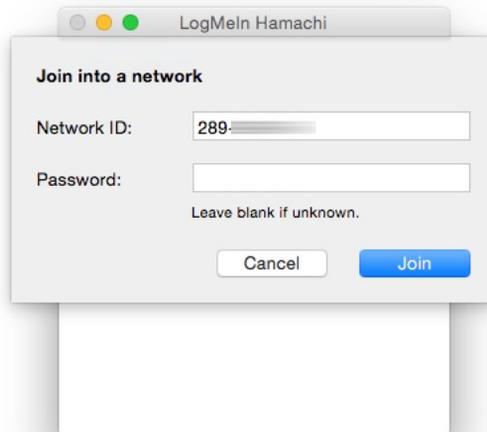
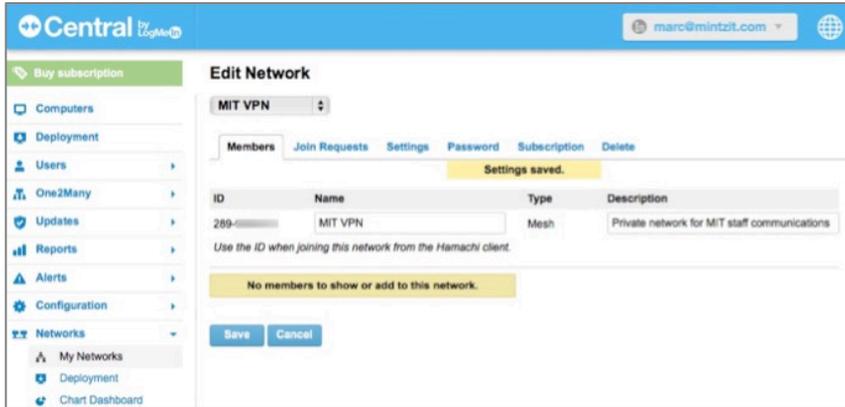


16. In LogMeIn Hamachi select *Network* menu > *Join an existing network...*

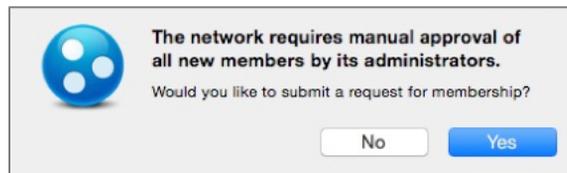


## 19 Internet Activity

17. Enter the *Network ID* as displayed in step 18 of the previous exercise, and then select the *Join* button.

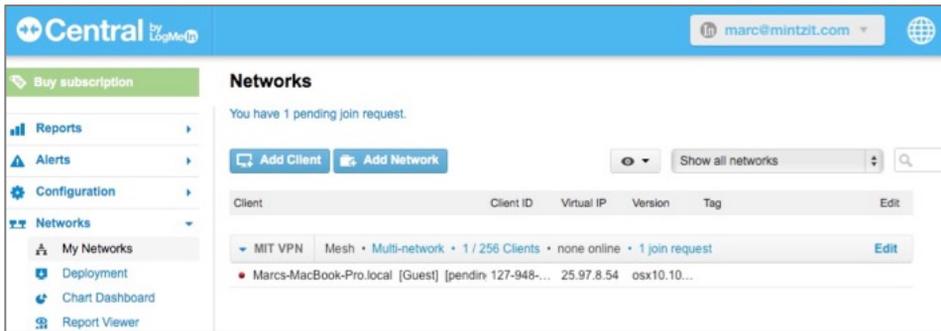


18. At the dialog box asking *Would you like to submit a request for membership?* Select the *Yes* button.

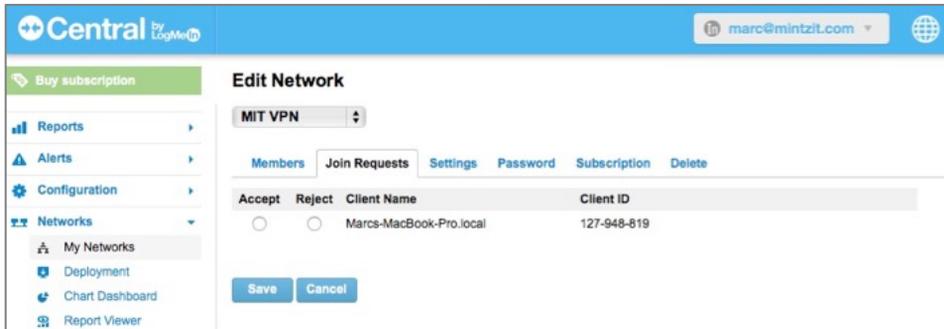


## 19 Internet Activity

- Back at your computer, or the computer used to administer this network, in the *LogMeIn Central* page > *Networks* > *My Networks* will be found all the users who have received and responded to their links from the previous steps. Select the *Edit* link.

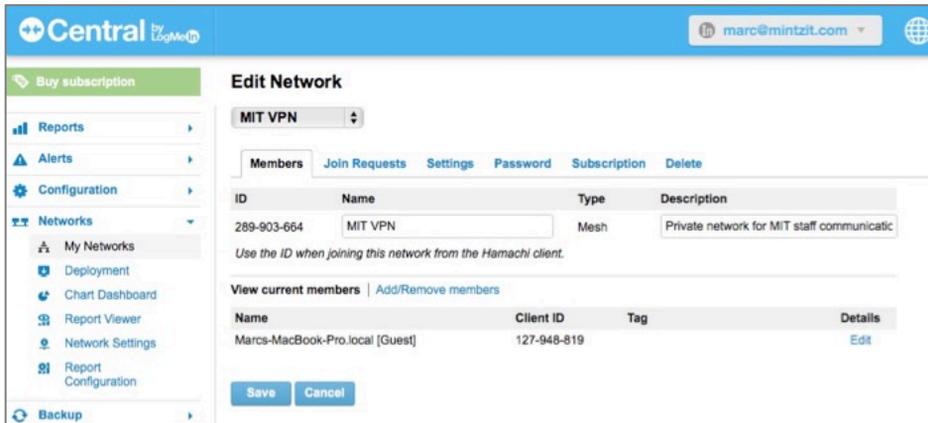


- In the *Edit Network* page, select *Join Requests*. If the pending join request is from someone who should join the network, select the *Accept* radio button. If they are someone who should not join the network, select the *Reject* radio button, and then select the *Save* button.

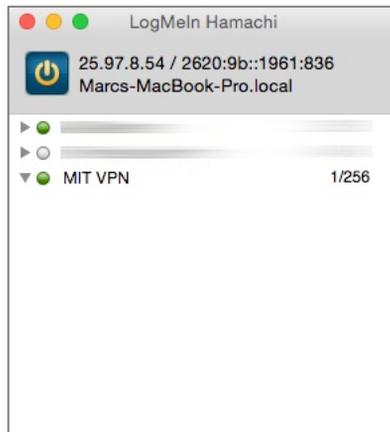


## 19 Internet Activity

21. In the *LogMeIn Central* page > *Networks* > *My Networks* > *Members* you will see that this user is now part of the group.



22. Returning to the user who has just been accepted into the group, their Hamachi window will now reflect they are part of the network (the network appears in the window) and that they are actively joined to the network (green button next to the network name.)



*Awesome!* You have your first member of the VPN network. Of course, you can't do anything with just one person. The value of VPN comes with additional members. Repeat the steps in this assignment to have at least one more computer part of your network, and then move on to the next assignment.

## 19.6.2 Assignment: File Sharing Within a Hamachi VPN Network

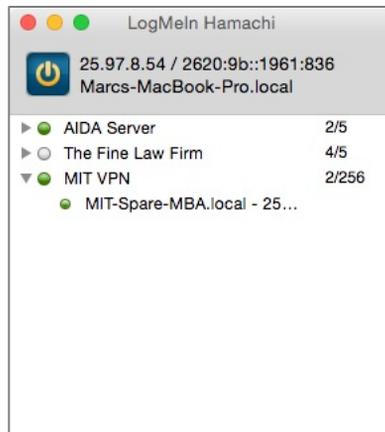
In this assignment, you file share within a Hamachi VPN network.

- Prerequisite: Completion of the previous assignment.

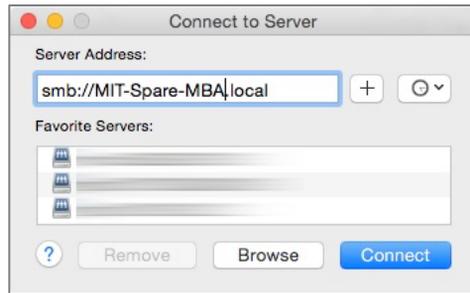
In the typical macOS network environment, one Mac can see another Mac over the network using an automatic discovery protocol, *Bonjour*. This protocol isn't in effect over a VPN connection, so we will need a different method of accessing other computers for file sharing and other network activities.

Before we begin, please make sure the other computer has *System Preferences > Sharing > File Sharing* enabled, that SMB file sharing is enabled, and that you know a username/password allowed to file share.

1. Launch *Hamachi*, and verify the target computer is showing as *Online*. In this example, the other computer is named *MIT-Spare-MBA.local*.



2. On your macOS/OS X computer, in the *Finder*, select the *Go* menu > *Connect to Server*. Enter *afp://<name of computer>* (to create an *Apple Filing Protocol* connection), or *smb://<name of computer>* (to create a *Server Message Block* connection) and then select the *Connect* button.
  - Although AFP<sup>7</sup> is the legacy standard of communication between Apple computers. As of OS X 10.10, Apple is moving away from it in favor of SMB, the long-time Windows standard. SMB<sup>8</sup> is the preferred protocol for macOS. You will likely have faster network throughput using SMB.



3. When the *Authentication* window appears, select *Registered User*, and then enter your authorized *Name* and *Password*, and then select the *Connect* button.



<sup>7</sup> [https://en.wikipedia.org/wiki/Apple\\_Filing\\_Protocol](https://en.wikipedia.org/wiki/Apple_Filing_Protocol)

<sup>8</sup> [https://en.wikipedia.org/wiki/Server\\_Message\\_Block](https://en.wikipedia.org/wiki/Server_Message_Block)

## 19 Internet Activity

4. The available volumes (sharepoints) will appear. Select the desired volume, and then select the OK button.



5. The volume will mount to your desktop. Double-click to open and navigate it just as if it were located on your physical network.
6. To file share, all you need do is drag and drop between your computer drives and the mounted volume.
7. When you are ready to disconnect from the remote computer, drag the mounted volume into the *Eject* Dock icon.

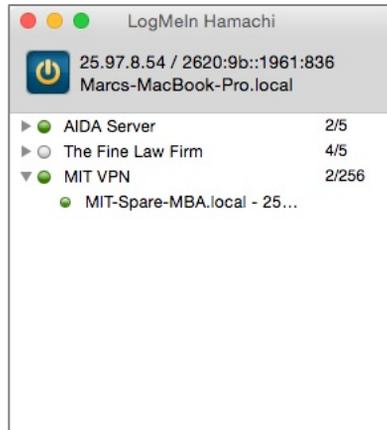
### 19.6.3 Assignment: Screen Share Within Hamachi VPN

In this assignment, you screen share within the Hamachi VPN environment. If you have followed the previous assignment, then screen sharing is almost identical to file sharing.

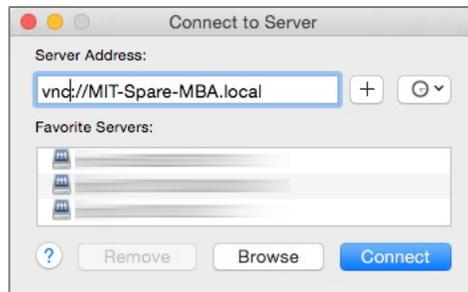
Before we begin, please make sure the other computer has *System Preferences > Sharing > Screen Sharing* enabled, and that you know a username/password allowed to screen share.

## 19 Internet Activity

1. Launch *Hamachi*, and verify the target computer is showing as *Online*. In this example, the other computer is named *MIT-Spare-MBA.local*.



2. On your macOS/OS X computer, in the *Finder*, select the *Go* menu > *Connect to Server*. Enter *vnc://<name of computer>* (to create a *Virtual Network Control* connection), and then select the *Connect* button.



## 19 Internet Activity

3. At the authentication prompt, enter the authorized *Name* and *Password*, and then select the *Connect* button.

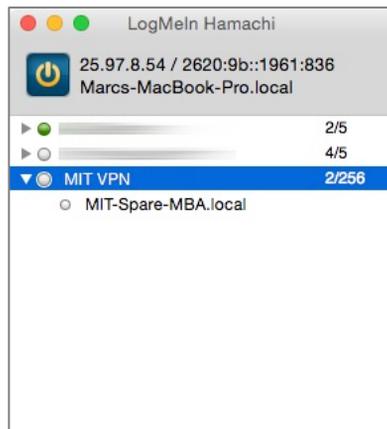


4. The screen of the remote computer will appear. You will be able to control it with your mouse and keyboard.
5. To exit out of screen sharing, close the *screen sharing* window.

### 19.6.4 Assignment: Exit the Hamachi VPN Network

In this assignment, you stop VPN so that you are no longer connected to the VPN network.

1. On your computer, in the Hamachi window, right-click on the connected network name, and then select *Go Offline* menu. The network button will turn from green to white, indicating you are no longer connected.



2. You may now *Quit* LogMeIn Hamachi.

Great work! You can now create a military-grade, encrypted network, on the fly, so that your friends or business associates can share files, screen share, etc. without fear of data or activities being spied upon.

# Revision Log

20180420, v2.0

- The majority of chapters have been edited for updated information.
- *Chapter 2.6* renumbered for readability.
- *Chapter 4.5.1 Assignment: Harden the Keychain with a Different Password* removed. As of macOS 10.13.4 the login keychain password cannot be changed from the user account login password.
- *Chapter 19.3 NordVPN* revised to create a free trial account.
- *Chapter 20.3 Facebook* heavily edited to reflect the revised privacy and timeline settings.
- *Chapter 20.4 LinkedIn* heavily edited to reflect the revised privacy settings.
- *Chapter 20.5 Google* heavily edited to reflect the revised privacy and Takeout options.

20180325, v 1.3

- *Chapter 4.8 Password Policies* added.
- *Chapter 12.1 Find My Mac* has been slightly edited.
- *Chapter 14.8 Do Not Track* has been edited to reflect changes in Ghostery, and the Chrome extension installation process.
- *Chapter 15.7 End-To-End Secure Email With GNU Privacy Guard* rewritten to reflect the major update of GPGTools.
- *Chapter 19.3 NordVPN* is rewritten from scratch from our previous recommended VPN host.

20171022, v1.2

- *Chapter 14 Web Browsing* is rewritten.

## Revision Log

- *Chapter 15 Email*, added *hacked-emails.com* for checking if your email account was included in site breaches.
- *Chapter 16 Apple ID and iCloud*, added that Two-Factor Authentication can use either text messaging or voice call.
- *Chapter 19 Internet Activity*, changed the recommended VPN provider to *Perfect-Privacy.com*.

20171001, v1.1

- Updated chapter *Documents > Encrypt A Folder for Cross Platform Use With Zip* to use Keka, instead of the depreciated macOS built-in tools.

20170923, v1.01

- Updated chapter *When It Is Time To Say Goodbye*

20170918, v1.0

Initial release

# Index

- 2-Factor Authentication 488, 489, 728
- 2-step verification ..... 90, 692, 697
- 802.1x ..... 253, 255
- access point ..... 257
- administrative 122, 130, 132, 133, 212
- administrator 58, 122, 131, 133, 227, 230, 260
- Administrator ..... 120, 122, 132, 134
- AES ..... 76, 255, 541, 547
- Airport ..... 35, 36, 259, 260, 262, 267, 272, 274
- Al Gore ..... 561
- Andrew S. Tanenbaum ..... 713
- Android ..... 529, 589
- Anonymous Internet Browsing .. 361
- antenna ..... 252
- anti-malware ..... 108, 134, 170, 171
- Antivirus 170, 174, 175, 177, 182, 185, 201
- App Store ..... 108, 109, 237, 488
- Apple ID .. 71, 90, 108, 233, 237, 487, 488, 489, 508
- Application Updates ..... 110, 115
- Assignment 39, 42, 44, 46, 53, 56, 59, 68, 77, 80, 83, 86, 89, 94, 98, 100, 101, 107, 110, 115, 122, 126, 129, 130, 132, 135, 146, 148, 152, 153, 155, 156, 161, 164, 174, 190, 211, 214, 222, 223, 226, 233, 237, 240, 241, 244, 246, 257, 259, 263, 267, 275, 285, 291, 300, 304, 306, 307, 309, 310, 311, 313, 314, 315, 317, 320, 322, 324, 325, 326, 333, 334, 336, 338, 340, 344, 352, 361, 371, 383, 386, 392, 395, 397, 399, 403, 407, 413, 418, 424, 426, 427, 429, 431, 438, 445, 454, 465, 469, 472, 476, 482, 489, 494, 511, 514, 517, 521, 527, 529, 536, 542, 554, 565, 570, 575, 576, 580, 583, 591, 593, 598, 606, 619, 629, 631, 633, 638, 643, 645, 646, 648, 650, 660, 666, 673, 675, 692, 702, 706, 711, 715
- Aung San Suu Kyi ..... 387
- AV Comparatives ..... 170
- Avira ..... 172
- Backblaze ..... 38
- backup .34, 35, 36, 37, 44, 59, 60, 237
- Ban Ki-moon ..... 151
- Benjamin Franklin ..... 119, 297
- Bitdefender .. 171, 174, 177, 185, 190, 201
- Blog ..... 29
- Boot Camp ..... 170, 171
- broadcasting ..... 226, 252
- Broadcasting ..... 252
- Carbon Copy Cloner .. 36, 39, 46, 47, 48, 53, 54, 57
- Carbonite ..... 38
- Certificate Authorities ..... 437

## Index

- Challenge Question ..... 80
- Cisco ..... 66
- CISPA ..... 25
- Clear History ..... 313
- clone ..... 36, 37, 58, 59, 60, 61
- Clone ..... 51, 52, 53, 54, 56, 57, 58, 59
- Comodo 438, 442, 445, 452, 454, 455, 465, 467
- Computer theft ..... 34
- Cookies ..... 309
- crack ..... 65
- Criminal activities ..... 34
- Deep Web ..... 382
- Disk Decipher ..... 529
- Disk Utility ..... 39, 517
- DMZ ..... 284
- Do Not Track ..... 332
- DoD ..... 706, 707, 711
- DoE ..... 706, 711
- Dr. Seuss ..... 701
- DuckDuckGo ..... 309, 310, 311
- Ed Snowden ..... 382
- EDS ..... 529
- EFI Chip ..... 222
- Elayne Boosler ..... 221
- Elbert Hubbard ..... 163
- email ..... 403
- Email 99, 387, 391, 398, 407, 412, 416, 418, 420, 427, 429, 437, 438, 439, 440, 442, 446, 447, 463, 464, 465, 467, 468, 604, 731
- Encrypt... 58, 299, 431, 434, 435, 511, 514, 517, 521
- Encrypted Data Store ..... 529
- encrypted email... 391, 412, 413, 469, 470, 471, 472
- encryption 58, 59, 154, 159, 252, 254, 298, 391, 397, 398, 510, 511, 514
- Encryption... 154, 254, 257, 391, 436, 519
- Entropy ..... 34
- Erase ..... 237
- Ethernet ..... 233, 252, 253
- Facebook 29, 67, 98, 99, 100, 121, 134, 562, 636, 638, 643, 644, 645, 650, 666
- Facetime ..... 562
- FAT ..... 551
- FBI ..... 25
- FileVault ..... 56, 58, 59, 154, 156, 157, 159, 226, 510, 707, 726
- FileVault 2 . 56, 58, 59, 154, 156, 226, 510
- Find My iPhone... 234, 235, 237, 238, 239
- Find My Mac 226, 227, 233, 235, 237, 241
- Find My Mac? ..... 226
- Fire ..... 34
- firewall ..... 210, 211, 212, 256
- Firewall. 211, 212, 213, 215, 216, 217
- FireWire ..... 35, 39, 152, 153
- Firmware 221, 222, 223, 226, 285, 726
- firmware password ..... 223
- Firmware Password .... 159, 222, 223, 224, 726
- Flash ..... 25
- Gateway VPN ..... 587
- General Douglas MacArthur ..... 251
- George Carlin ..... 33
- Ghostery 333, 338, 340, 341, 344, 345, 346, 348

## Index

- GNU Privacy Guard.....398, 412, 731
- Google Hangouts ..... 562, 563
- GPA .....413
- GPG .....412, 413, 414, 418, 419, 426, 427, 428, 429, 431, 437, 469, 472
- GPG Keychain Access.418, 419, 426, 431
- GPG Public Key.....413
- Gpg4win.....413
- GPGMail.....424
- GPGTools..... 413, 426
- Gravity Zone .....171
- GravityZone . 190, 192, 193, 197, 200
- G-Suite ..... 38
- Guest.....121, 135, 226, 229, 231, 233, 726
- Hamachi606, 607, 619, 620, 621, 622, 625, 628, 629, 631, 632, 633, 634
- HaveIBeenPwned.....383
- haystack..... 66, 69
- HIPAA ..... 38
- Honore de Balzac .....169
- Hot Corners .....167
- https ..... 66, 69, 298, 299, 392, 397
- HTTPS ..... 299, 300, 391, 397, 727
- HTTPS Everywhere .....299, 300, 362
- Hypertext Transport Layer
  - Secure.....391
- iCloud70, 71, 72, 89, 90, 93, 157, 158, 226, 233, 234, 487, 488, 489, 504, 505, 507, 728
- Incognito Mode.....304
- infected..... 66
- Insertion.....252, 253, 264, 276
- Integrity Test..... 44
- Integrity Testing.....59
- iOS..... 89, 412, 437, 529
- ipconfig .....270, 271, 279, 280
- iTunes.....489
- Java.....25
- Joseph Heller .....21
- Keka ..... 521, 522, 524, 525, 527
- keychain .....89
- Keychain70, 73, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 93, 258, 416, 419, 426, 427, 443, 444, 468, 725
- LAN .....256, 257
- LastPass .....67, 94, 95, 98, 100
- LinkedIn.....666
- Linux..... 359, 360, 412, 413, 529, 551
- Local Area Network.....256
- LogMeIn606, 610, 611, 613, 614, 615, 619, 621, 624, 625, 627, 628, 634
- MAC Address .....267, 274
- Mac OS Extended.....519, 551
- MacKeeper.....331
- MacUpdate ..... 110, 114, 115, 116
- MacUpdate Desktop..... 110, 115
- maintenance ..... 36, 122
- malware..... 122, 170
- Malware..... 34, 170
- Managed with Parental Controls121, 134, 135
- Marc L. Mintz ..... 21, 27, 28, 63
- Mintz's extrapolation of Sturgeon's Revelation.....24
- modem .....256
- Newsletter .....29
- NIST.....23, 547, 719, 721
- NordVPN.....593, 598

## Index

- NSA.. 23, 64, 222, 223, 547, 588, 605,  
706, 723
- NTP.....714, 715, 716
- Onion sites .....382
- Onion Sites .....382
- Parallels..... 171, 363
- Parental Controls 121, 134, 135, 136,  
146, 147
- passphrase ..... 66
- password.. 25, 58, 65, 66, 68, 69, 122,  
131, 133, 154, 158, 222, 223, 226,  
237, 253, 254, 260, 262, 392, 397,  
399, 488, 511, 517, 518, 519
- Password.....65, 68, 222, 262, 511
- Password Policies..... 101, 719
- permissions .....122
- PGP ..... 412, 437
- phishing ..... 25, 170
- Phishing .....389
- port..... 210, 284
- Port forwarding.....284
- Ports.....214
- Power surges ..... 34
- Practical Paranoia Book Upgrades29
- Practical Paranoia Updates ..... 29
- Pretty Good Privacy .....412
- Prey ..... 240, 241
- private browsing.....304
- ProtonMail... 398, 399, 403, 405, 407
- public key.....418
- Public Key.... 412, 413, 418, 423, 426,  
427, 429, 469, 470, 471, 472
- RADIUS.....253
- RAM-Resident Malware.....284
- Recovery HD.....53, 56, 222, 223, 708
- Recovery Key ..... 58
- Root..... 120, 122, 126, 129, 130
- router .....256, 257, 284, 285
- Router ..... 263, 284, 291
- S/MIME437, 438, 445, 454, 456, 461,  
464, 465, 469, 470, 472
- Sabotage ..... 34
- Screen Saver ..... 164, 167
- screensaver .....168
- SEC.....38
- Secure Socket Layer .....298
- Seneca .....105
- Server..... 35, 36, 252, 253
- SHA.....547
- Sharing Only .....121
- Single User Mode .....222
- Skype..... 562, 563
- sleep . 54, 59, 165, 166, 168, 267, 304,  
586
- Sleep ..... 159, 164, 167
- software 35, 38, 65, 66, 122, 170, 252,  
399
- SSL.....298, 392
- Standard..... 121, 133, 135, 415, 544
- Static electricity.....34
- stealth.....214
- switch.....256
- Symantec..... 25, 412
- System Updates .....105
- Tails359, 360, 361, 363, 381, 728, 729
- Takeout .....697, 731
- Target Disk Mode .....222
- Terrorist activities ..... 34
- theft ..... 25, 34, 35
- Theodore Roosevelt .....209
- Theodore Sturgeon .....24
- thepracticalparanoid.....470

## Index

- Thomas Jefferson ..... 63  
Thomas Sowell .....225  
Thunderbolt..... 35  
Time Machine..35, 36, 37, 39, 42, 43,  
44, 45, 46, 725  
TKIP .....255  
TLS..... 391, 392  
Tor359, 360, 361, 362, 363, 364, 365,  
366, 367, 369, 370, 371, 381, 382,  
727, 728  
TorBrowser ..... 363, 364, 369, 371  
Trafficlight.....320  
TrafficLight . 185, 186, 187, 201, 202,  
203  
Trojan horses ..... 25, 170  
TrueCrypt..... 529, 538  
Two-Step Verification.....508  
USB ..... 35, 39, 152, 153  
US-CERT .....106  
User Accounts .....119  
VeraCrypt.... 529, 536, 537, 541, 542,  
543, 544, 554, 555, 557, 558  
Virtru....475, 476, 477, 478, 480, 482,  
483, 484, 485  
virtual machine.....170  
Virtual Machine ..... 171, 363  
Virtual Private Network254, 299, 586  
viruses.....25  
VMware Fusion.....171  
VPN .....254, 259, 299, 586, 587, 588,  
589, 590, 593, 604, 605, 606, 617,  
619, 625, 628, 629, 631, 633, 728  
war driving .....25  
Water damage.....34  
Web Mail .....397  
WEP .....254, 257  
Whitelisting.....134  
Wi-Fi25, 226, 233, 252, 253, 254, 257,  
258, 259  
William Blum.....509  
William Hazlitt .....487  
Windows..... 152, 170, 171, 172, 270,  
279, 359, 412, 413, 529, 551, 589,  
630  
Wire .....565, 576, 578, 580  
worms.....25, 170  
WPA ..... 254, 255, 257  
WPA2 ..... 254, 255, 257, 259, 262  
zero-day exploits .....26



# Mintz InfoTech, Inc.

when, where, and how you want IT

Technician fixes problems.

**Consultant delivers solutions.**

Technician answers questions.

**Consultant asks questions, revealing core issues.**

Technician understands your equipment.

**Consultant understands your business.**

Technician costs you money.

**Consultant contributes to your success.**

**Let us contribute to your success.**

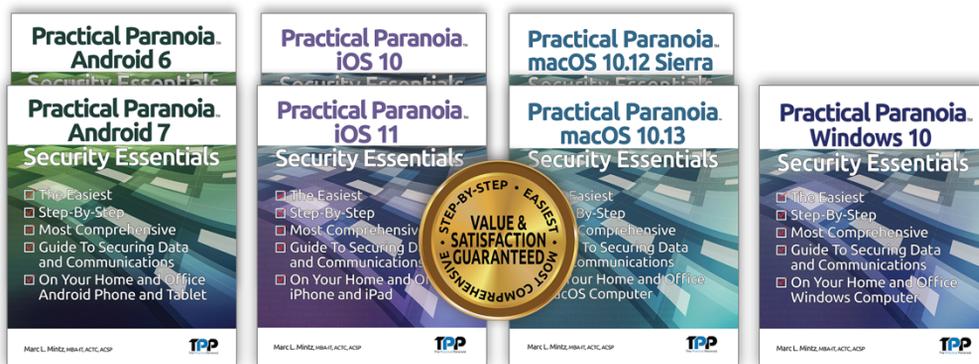
Mintz InfoTech, Inc. is uniquely positioned to be your Virtual CIO and provide you and your organization comprehensive technology support. With the only MBA-IT consultant and 100% certified staff in New Mexico, our mission is to provide small and medium businesses with the same Chief Information and Security Officer resources otherwise only available to large businesses.

Mintz InfoTech, Inc.

Toll-free: +1 888.479.0690 • Local: 505.814.1413  
info@mintzIT.com • <https://mintzit.com>

# Practical Paranoia Workshops & Books

4 Years Undisputed #1 Best, Easiest, & Most Comprehensive Cybersecurity Series



This is an age of government intrusion into every aspect of our digital lives, criminals using your own data against you, and teenagers competing to see who can crack your password the fastest. Every organization, every computer user, everyone should be taking steps to protect and secure their digital lives.

The *Practical Paranoia: Security Essentials Workshop* is the perfect environment in which to learn not only *how*, but to actually *do* the work to harden the security of your macOS and Windows computers, and iPhone, iPad, and Android devices.

Workshops are available online and instructor-led at your venue, as well as tailored for on-site company events.

Each Book is designed for classroom, workshop, and self-study. Includes all instructor presentations, hands-on assignments, software links, and security checklist. Available from Amazon (both print and Kindle format), and all fine booksellers, with inscribed copies available from the author.

Call for more information, to schedule your workshop, or order your books!

The Practical Paranoid, LLC  
+1 888.504.5591 • [info@thepracticalparanoid.com](mailto:info@thepracticalparanoid.com)  
<https://thepracticalparanoid.com>