



# UBUNTU SECURITY BEST PRACTICE

## LERN HOW TO IMPLEMENT SECURITY ON LINUX

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**Linux Geek, Opensource Enthusiast, Security Hobbies**

RHCT, RHCSAv5-v7, RHCEv5-v7, RHCVA, RHCI, RHCX, RHCSA-RHOS, RHCJA, CEI, CEH, CHFI, CND, EDRP, CCNA, MCTCNA, Security+, Network+, VCA, vExpert 2017-2018

**Vice President Operation & Services – PT Biznet Gio Nusantara**



## CYBER SECURITY 101

An Introduction about Cyber Security  
Perimeter in general

1

2

## LINUX SECURITY

Learn more about security Principal on  
Linux Operating System

## HARDENING

Deep dive learn about security  
implementation on Ubuntu Operating System

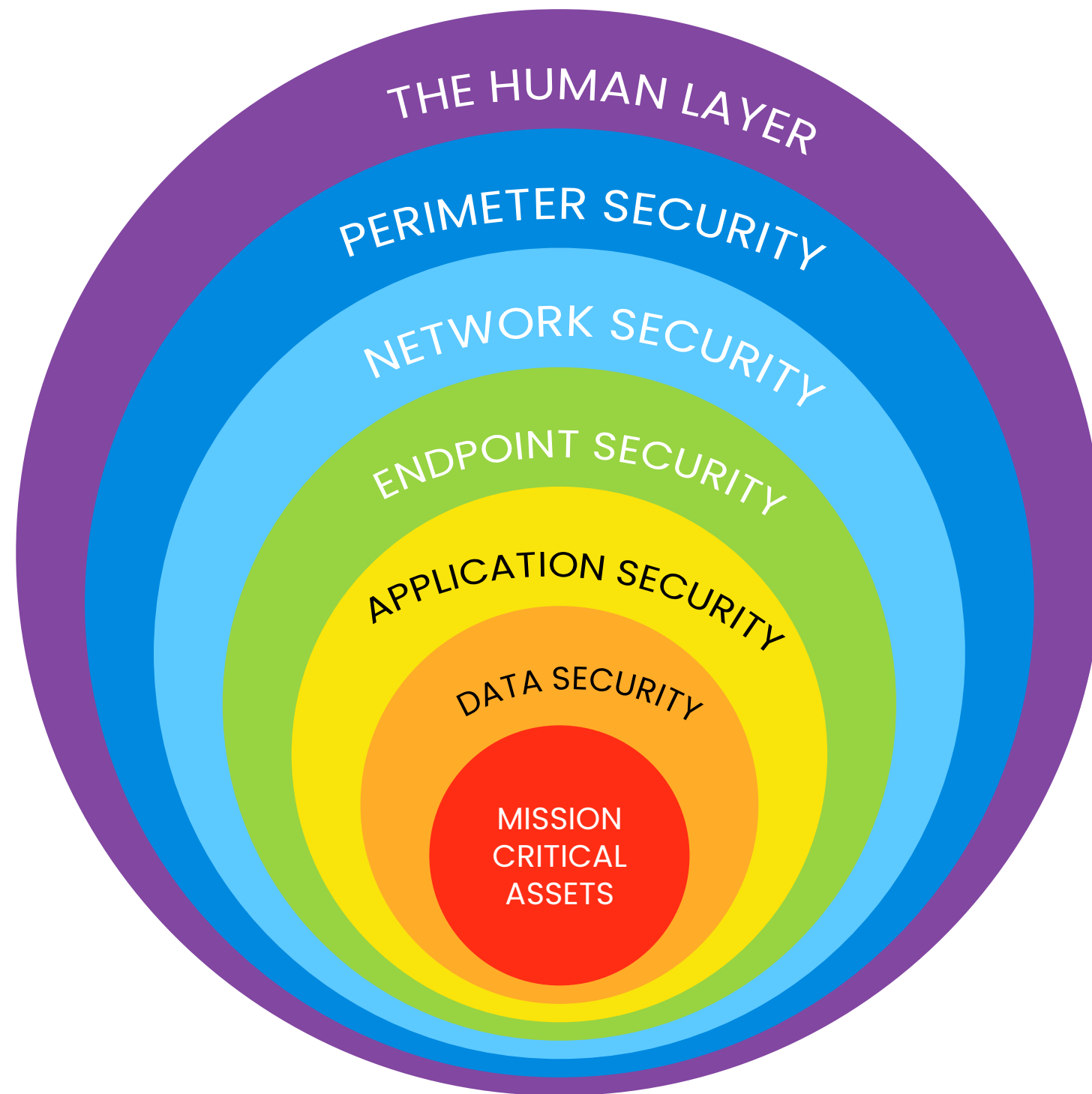
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4

## Q & A

Ask a question and win merchandize  
from Biznet Gio

# CYBER SECURITY 101



1

Human Layer: Training

2

Perimeter: Firewalls, Spamfilters,  
Intrusion Detection / Prevention

3

Network: Secure Design & Topology,  
VLANs, Multi-Layer Firewalls/Switchers

4

Endpoint: Anti-virus, Software Firewalls,  
Breach Detection Agents

5

Application: Patching, Updates

6

Data: Encryption at rest and in motion

7

Mission Critical: Backups, Response and  
Recovery Plans



# 1

## Human Layer: Training

Security awareness training is a **strategy used by IT and security professionals** to prevent and mitigate user risk. These programs are designed **to help users and employees understand the role** they play in helping to combat information security breaches.

Ex: Certified Secure Computer User (CSCU)



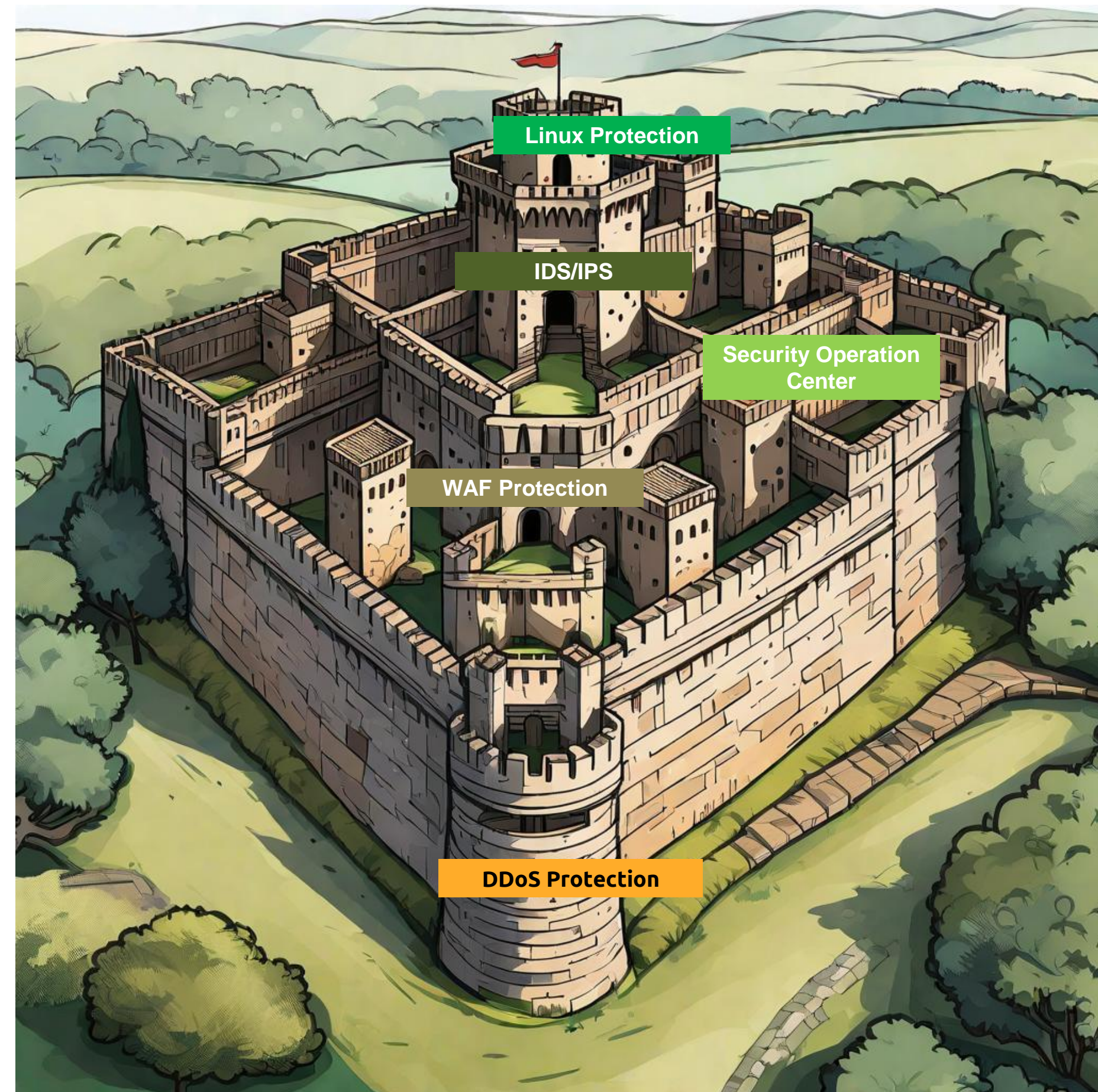


2

## Perimeter: Firewalls, Spamfilter, Intrusion Detection/Prevention, WAF, etc

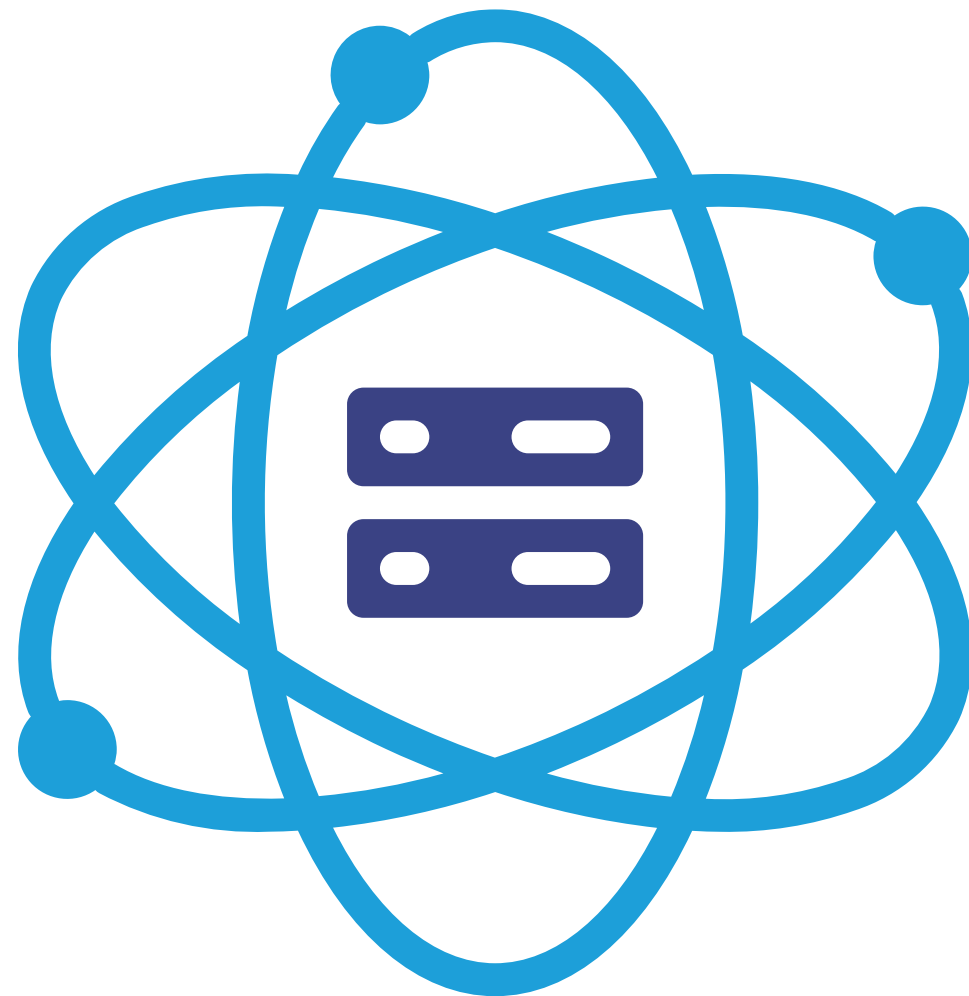
The perimeter layer stops most attackers.

**It stops the spam, the petty thief, the automatic scanning tools ran by anonymous curious cats**





# LINUX SECURITY



## Know your system(s)

The first principle is about knowing what your system is supposed to do.

**What is its primary role, what software packages does it need and who needs access?**

### Security Measures:

- Password policy
- Proper software patch management
- Configuration management
- Documentation

# LINUX SECURITY

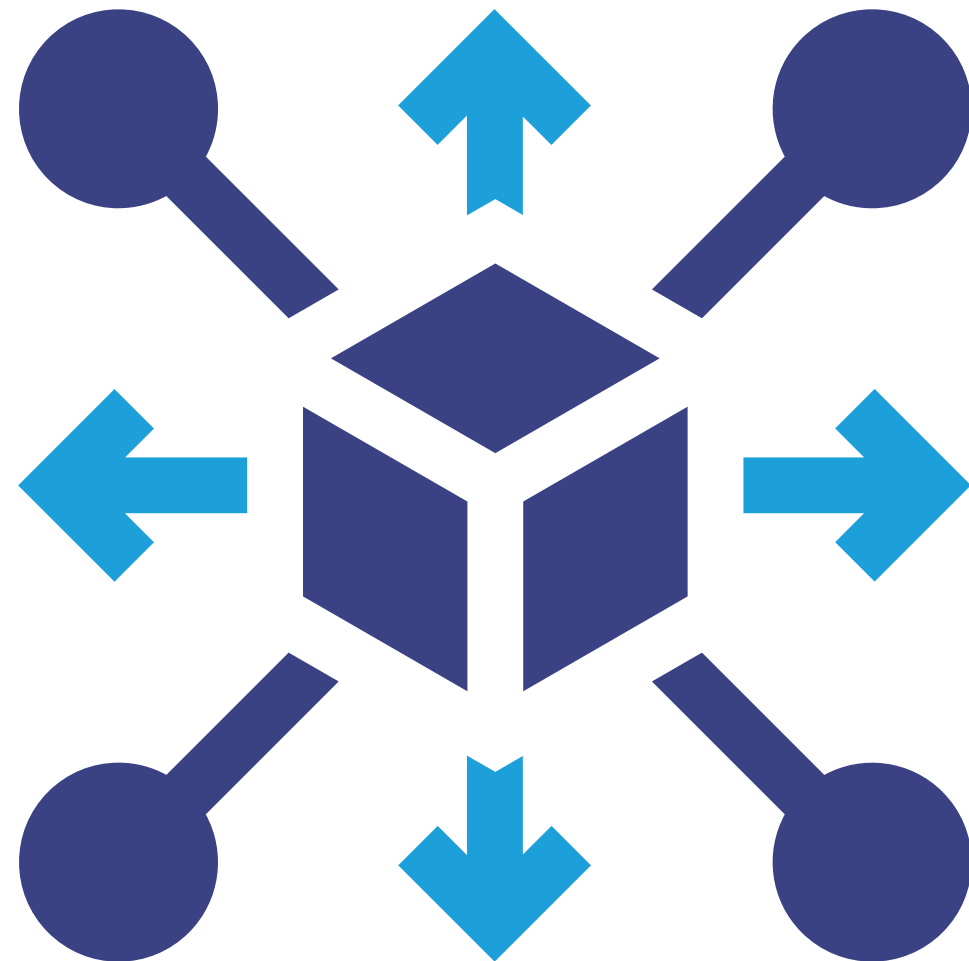
## Least Amount of Privilege

Each process running, or package installed, might become a target. Security professionals call this the “**attack surface**”.

What you want is to minimize this attack surface by removing unneeded components, limit access and by default use a “deny unless” strategy.

### Security Measures:

- Use minimal/basic installation
- Only allow access to people who really need it





## Perform Defense in Depth



Protect the system by applying several layers of security. This principle is named “**defense in depth**” and can be compared with an onion: to get to the core, you have to peel of **layer by layer**. One broken defense might help us protect against full compromise.

### Security Measures:

- IPtables / Nftables
- Hardening of software components

# LINUX SECURITY

## Protection is Key, Detection is a Must



Security focuses on the protection of assets. While this is a primary objective, we should consider that one day our defenses are broken. Therefore we want to know this as soon as possible, so we can properly act. This is where principle 3 and 4 both are linked. **Set-up proper detection methods, similar to the trip wires used by the military.**

### Security Measures:

- Linux audit framework
- Remote Logging
- Create backups and test them

# LINUX SECURITY



## Know your Enemy

You can only protect a system the right way.  
If you know what threats you are facing.

**Why would this system be a target and who would be targeting it?**

Perform a risk analysis and determine what potential threats your system might endure.



# CIS HARDENING

## CIS compliance with Ubuntu Pro Plan

Ubuntu contains native tooling to automate compliance and auditing with the Center for Internet Security (CIS) benchmarks.

**The Center for Internet Security (CIS), develops the CIS benchmark documents for Ubuntu LTS releases.** As these documents contain a large number of hardening rules, compliance and auditing can be very efficient when using the Ubuntu native tooling that is **available to subscribers of Ubuntu Pro.**

With Ubuntu 20.04 we introduce the **Ubuntu Security Guide (USG)** an easy to use tool **for compliance and auditing that replaces our older tooling.** See the following sections for more information.



PROFILE NAME	CORRESPONDING CIS PROFILE
cis_level1_workstation	Level 1 Workstation profile
cis_level1_server	Level 1 Server profile
cis_level2_workstation	Level 2 Workstation profile
cis_level2_server	Level 2 Server profile

# CIS HARDENING

## Use Cloud Provider CIS Image

Many cloud provider like Biznet Gio Cloud provide CIS Hardened image, this is the easy way to use Secure Image in the Cloud Environment



Dashboard

Compute

• NEO Virtual Compute

• NEO Lite

• NEO Metal

• NEO Metal PX

Storage & Backup

Web

Domain

AI & ML

Others

Billing & Payment

Hanya Bulan Ini! Hemat 23% Langganan NEO Virtual Compute untuk satu tahunan [S&K berlaku](#)  
Gunakan Kode Promo: **23ENDCOMPUTE**

### Create Virtual Compute

Virtual Compute Name

CIS Ubuntu

Region

West Java 2

Zone

az-01

Image

Operating System

Snapshot

CentOS 7.5 CIS 1.0

# CIS HARDENING

## CIS Ubuntu Linux 22.04 LTS Benchmark

CIS Benchmarks focus on technical configuration settings used **to maintain and/or increase the security of the addressed technology**, and they should be used in conjunction with other essential cyber hygiene tasks like:

- Monitoring the base operating system for vulnerabilities and quickly updating with the latest security patches
- Monitoring applications and libraries for vulnerabilities and quickly updating with the latest security patches

**At the CIS Benchmarks are designed as a key component of a comprehensive cybersecurity program.**





# CIS HARDENING



## CIS Ubuntu Linux 22.04 LTS Benchmark

### Initial Setup

**Items in this section are advised for all systems**, but may be difficult or require extensive preparation after the initial setup of the system

### Services

While applying system updates and patches helps correct known vulnerabilities, one of the best ways to protect the system against as yet unreported vulnerabilities is to **disable all services that are not required for normal system operation**

# CIS HARDENING

## CIS Ubuntu Linux 22.04 LTS Benchmark



### Networking Configuration

This section **provides guidance** on for securing the network configuration of the system through kernel parameters, access list control, and firewall settings

### Access

**Authentication and Authorization**

### System Maintenance

Recommendations in this section are intended as **maintenance and are intended to be checked** on a frequent basis to ensure system stability

# CIS HARDENING



## CIS CAS Lite (free version)

CIS-CAT Lite is the free **assessment tool developed by the CIS** (Center for Internet Security, Inc.).

CIS-CAT Lite helps users implement secure configurations for multiple technologies. With unlimited scans available via CIS-CAT Lite.

### **With CIS-CAT Lite, We Can Easily:**

- Instantly check your systems against CIS Benchmarks.
- Receive a compliance score 1-100.
- Follow remediation steps to improve your security.



# CIS HARDENING

## CIS CAS Lite (free version)

### 1 Information

Target System Name \*

yhs-cis-ubuntu

Target System Type \*

Linux

Port \*

22

Username \*

yusufhadiwinata

Password

Private key file

C:\Users\yusufhadiwinata\Documents\rsa.ppk

IP Address / Hostname \*

192.168.1.1

Temporary Path

### 2 Benchmarks

Available

Benchmark

CIS Controls Assessment Module - Implementation Group 1 for Windows 10 v1.0.3  
 CIS Controls Assessment Module - Implementation Group 1 for Windows Server v1.0.0  
 CIS Google Chrome Benchmark v2.1.0  
 CIS Microsoft Windows 10 Enterprise Benchmark v2.0.0  
 CIS Microsoft Windows 10 Stand-alone Benchmark v2.0.0  
 CIS Ubuntu Linux 20.04 LTS Benchmark v2.0.1

Selected

Grayed out selections have interactive values

Benchmark

CIS Ubuntu Linux 20.04 LTS Benchmark v2.0.1

Level 1 - Server

Level 2 - Server

Level 1 - Workstation

Level

### 3 Configuration Assessment

- ✓ CIS-CAT Pro Assessor loaded
- ✓ Platform Applicability assessed
- ✓ Checklist Rules evaluated
- ✓ Connected to assessment target
- System Characteristics collected
- ✓ Checklist Results generated
- ✓ Assessment started
- ✓ Definitions evaluated
- ✓ Assessment Results written

Assessment complete  
 Assessment 1 out of 1

```

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```

Welcome to CIS-CAT Pro Assessor; built on 09/27/2023 12:52 PM

This is the Center for Internet Security Configuration Assessment Tool, v4.34.0  
 At any time during the selection process, enter 'q!' to exit.

# CIS HARDENING

## CIS CAS Lite (free version)

### Summary :

Description	Tests						Scoring		
	Pass	Fail	Error	Unkn.	Man.	Exc.	Score	Max	Percent
<b>1 Initial Setup</b>	40	15	0	0	3	0	40.0	55.0	73%
1.1 <a href="#">Filesystem Configuration</a>	24	3	0	0	0	0	24.0	27.0	89%
1.1.1 <a href="#">Disable unused filesystems</a>	5	0	0	0	0	0	5.0	5.0	100%
1.1.2 <a href="#">Configure /tmp</a>	3	1	0	0	0	0	3.0	4.0	75%
1.1.3 <a href="#">Configure /var</a>	2	0	0	0	0	0	2.0	2.0	100%
1.1.4 <a href="#">Configure /var/tmp</a>	3	0	0	0	0	0	3.0	3.0	100%
1.1.5 <a href="#">Configure /var/log</a>	3	0	0	0	0	0	3.0	3.0	100%
1.1.6 <a href="#">Configure /var/log/audit</a>	3	0	0	0	0	0	3.0	3.0	100%
1.1.7 <a href="#">Configure /home</a>									
1.1.8 <a href="#">Configure /dev/shm</a>									
1.2 <a href="#">Filesystem Integrity Checking</a>									
1.3 <a href="#">Configure Software and Patch Management</a>									
1.4 <a href="#">Secure Boot Settings</a>									
1.5 <a href="#">Additional Process Hardening</a>									
1.6 <a href="#">Mandatory Access Control</a>									
1.6.1 <a href="#">Configure AppArmor</a>									
1.7 <a href="#">Command Line Warning Banners</a>									
1.8 <a href="#">GNOME Display Manager</a>									
<b>2 Services</b>									
2.1 <a href="#">Configure Time Synchronization</a>									
2.1.1 <a href="#">Ensure time synchronization is in use</a>									
2.1.2 <a href="#">Configure chrony</a>									
2.1.3 <a href="#">Configure systemd-timesyncd</a>									
2.1.4 <a href="#">Configure ntp</a>									
2.2 <a href="#">Special Purpose Services</a>									
2.3 <a href="#">Service Clients</a>									

### CIS Ubuntu Linux 20.04 LTS Benchmark v2.0.1

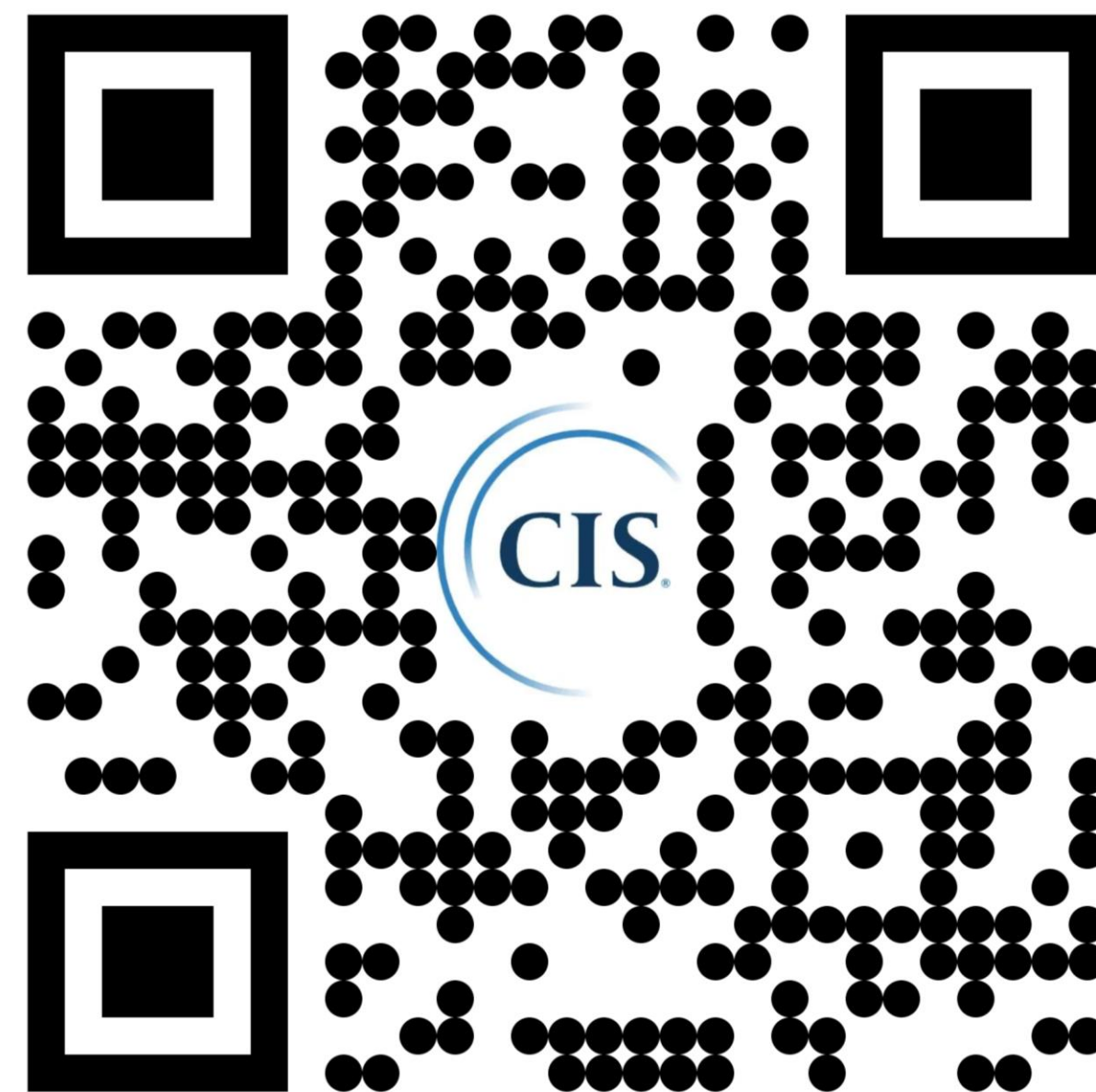
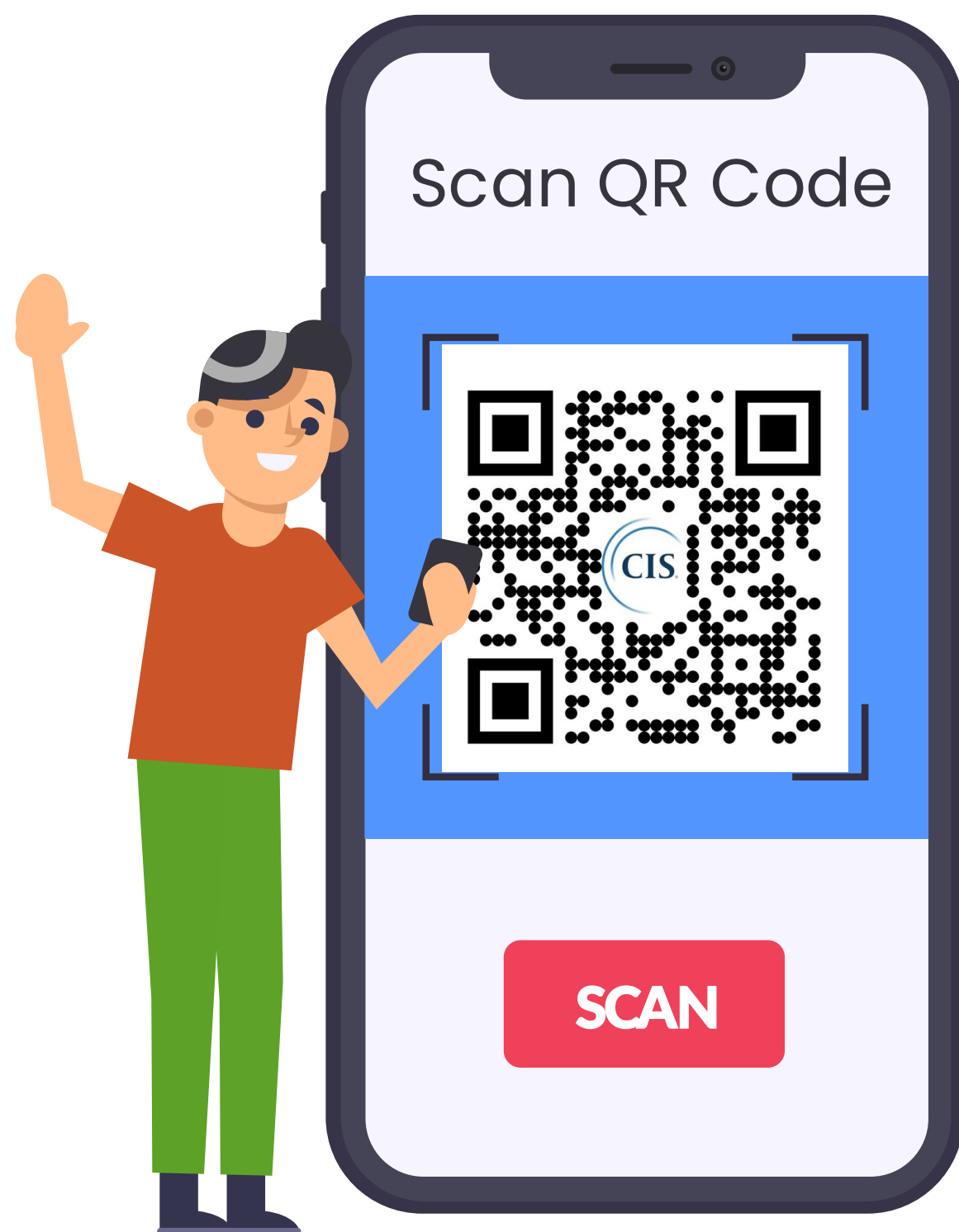
- Level 1 - Server
- Wednesday, October 4 2023 21:57:14
- Assessment Duration: 1 minute, 4 seconds

<b>5 Logging and Auditing</b>	7	4	0	0	8	0	7.0	11.0	64%
5.1 <a href="#">Configure Logging</a>	7	3	0	0	8	0	7.0	10.0	70%
5.1.1 <a href="#">Configure journald</a>	3	2	0	0	5	0	3.0	5.0	60%
5.1.1.1 <a href="#">Ensure journald is configured to send logs to a remote log host</a>	2	0	0	0	2	0	2.0	2.0	100%
5.1.2 <a href="#">Configure rsyslog</a>	4	0	0	0	3	0	4.0	4.0	100%
5.2 <a href="#">Configure System Accounting (auditd)</a>	0	1	0	0	0	0	0.0	1.0	0%
5.2.1 <a href="#">Ensure auditing is enabled</a>	0	0	0	0	0	0	0.0	0.0	0%
5.2.2 <a href="#">Configure Data Retention</a>	0	0	0	0	0	0	0.0	0.0	0%
5.2.3 <a href="#">Configure auditd rules</a>	0	0	0	0	0	0	0.0	0.0	0%
5.2.4 <a href="#">Configure auditd file access</a>	0	1	0	0	0	0	0.0	1.0	0%
<b>6 System Maintenance</b>	22	2	0	0	1	0	22.0	24.0	92%
6.1 <a href="#">System File Permissions</a>	11	1	0	0	1	0	11.0	12.0	92%
6.2 <a href="#">Local User and Group Settings</a>	11	1	0	0	0	0	11.0	12.0	92%
<b>Total</b>	127	79	0	0	23	0	127.0	206.0	62%

**Note:** Actual scores are subject to rounding errors. The sum of these values may not result in the exact overall score.

The 'Exc' column only applies to Exceptions that are generated using CIS-CAT Pro Dashboard and is not utilized by CIS-CAT Pro Assessor.

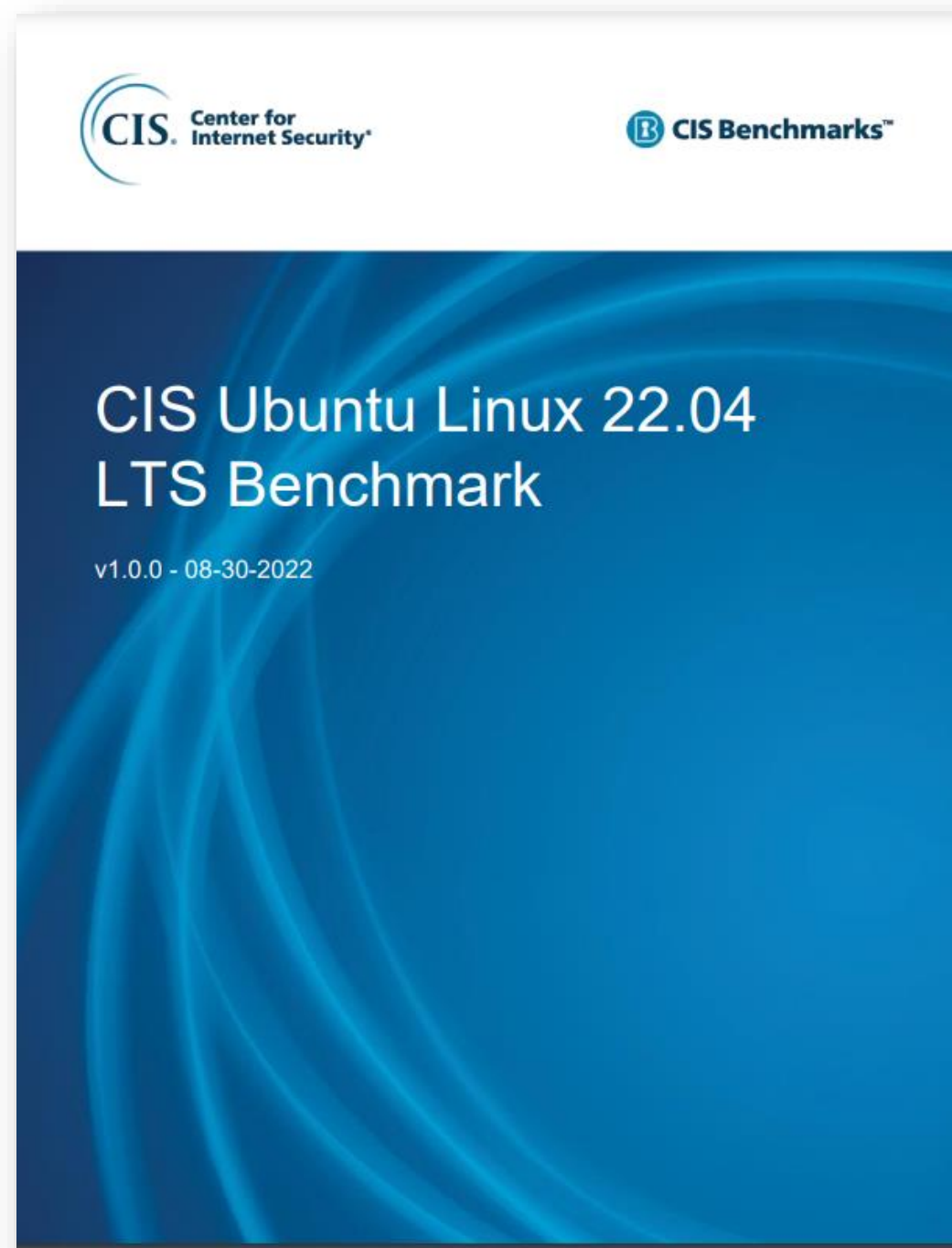
# CIS HARDENING DOC



**CIS Ubuntu Linux 22.04 LTS Ben**



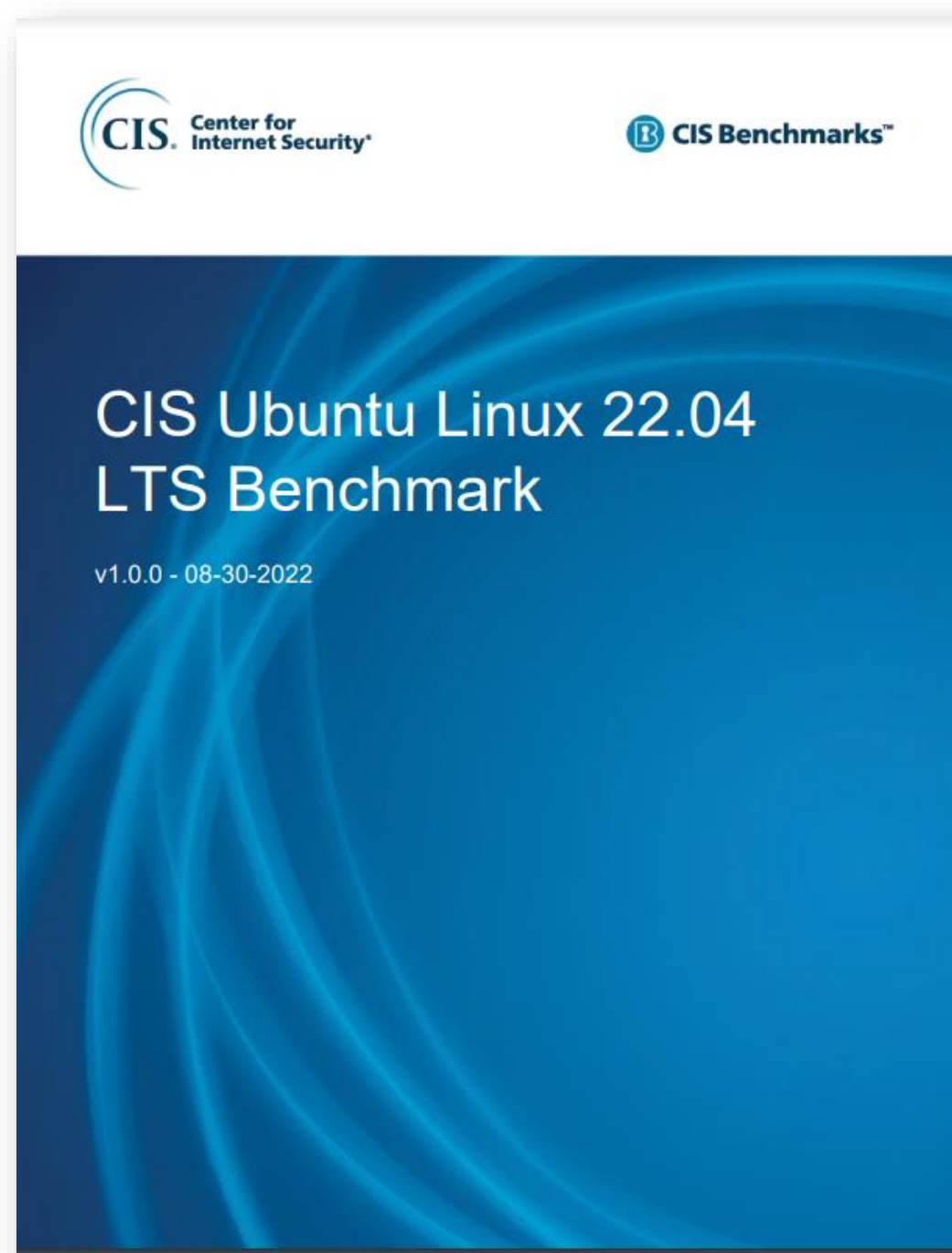
# UBUNTU HARDENING



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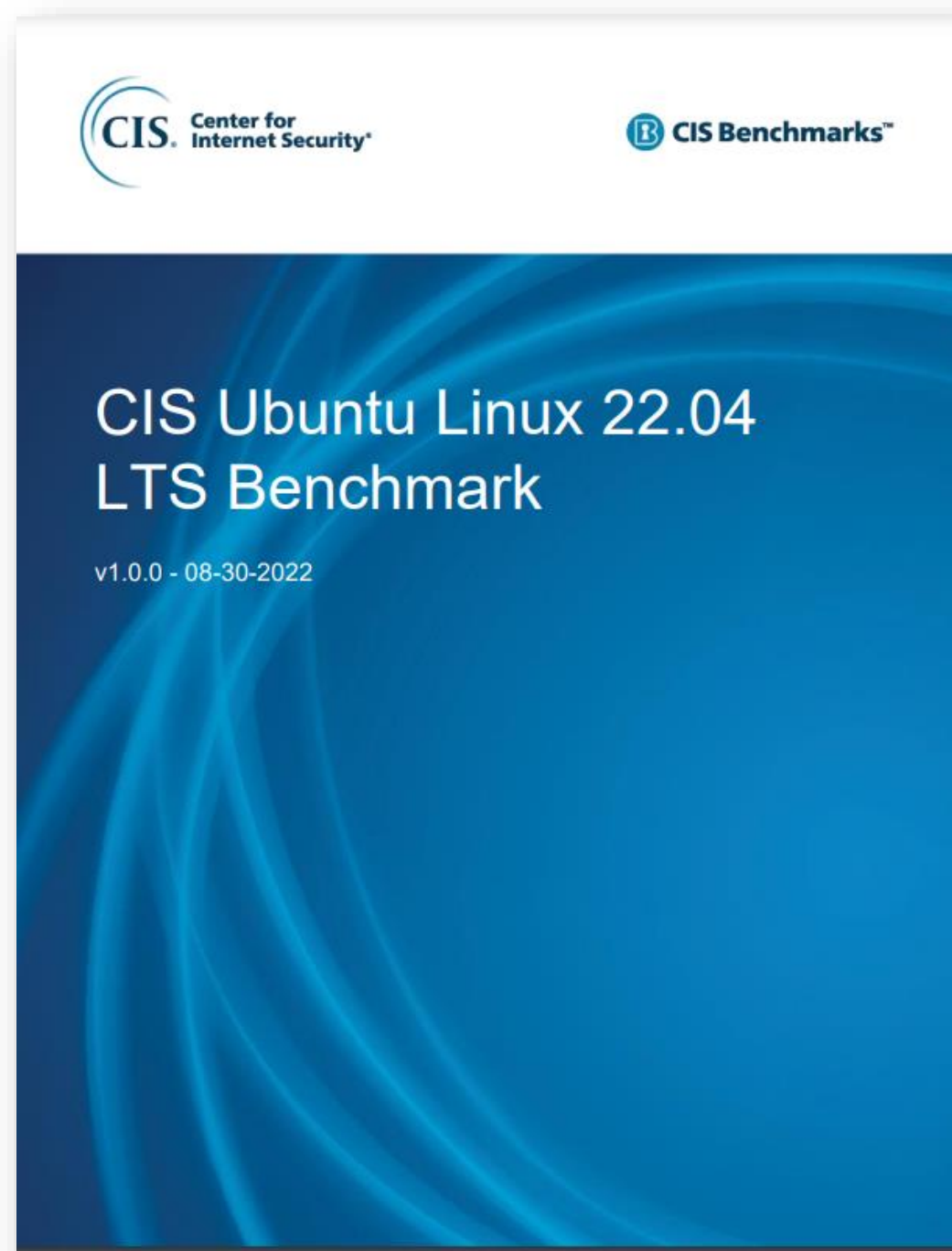
# UBUNTU HARDENING



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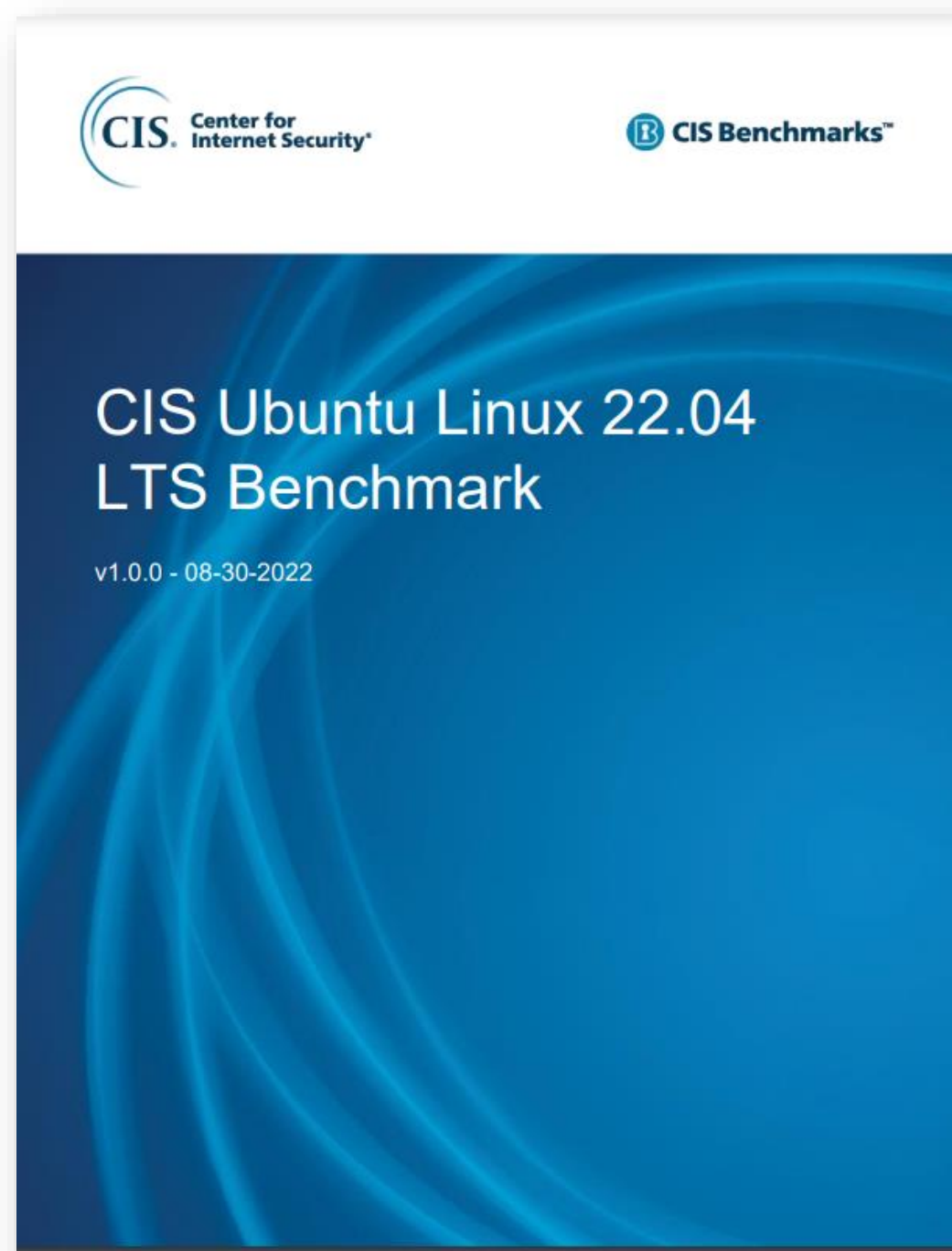
# UBUNTU HARDENING



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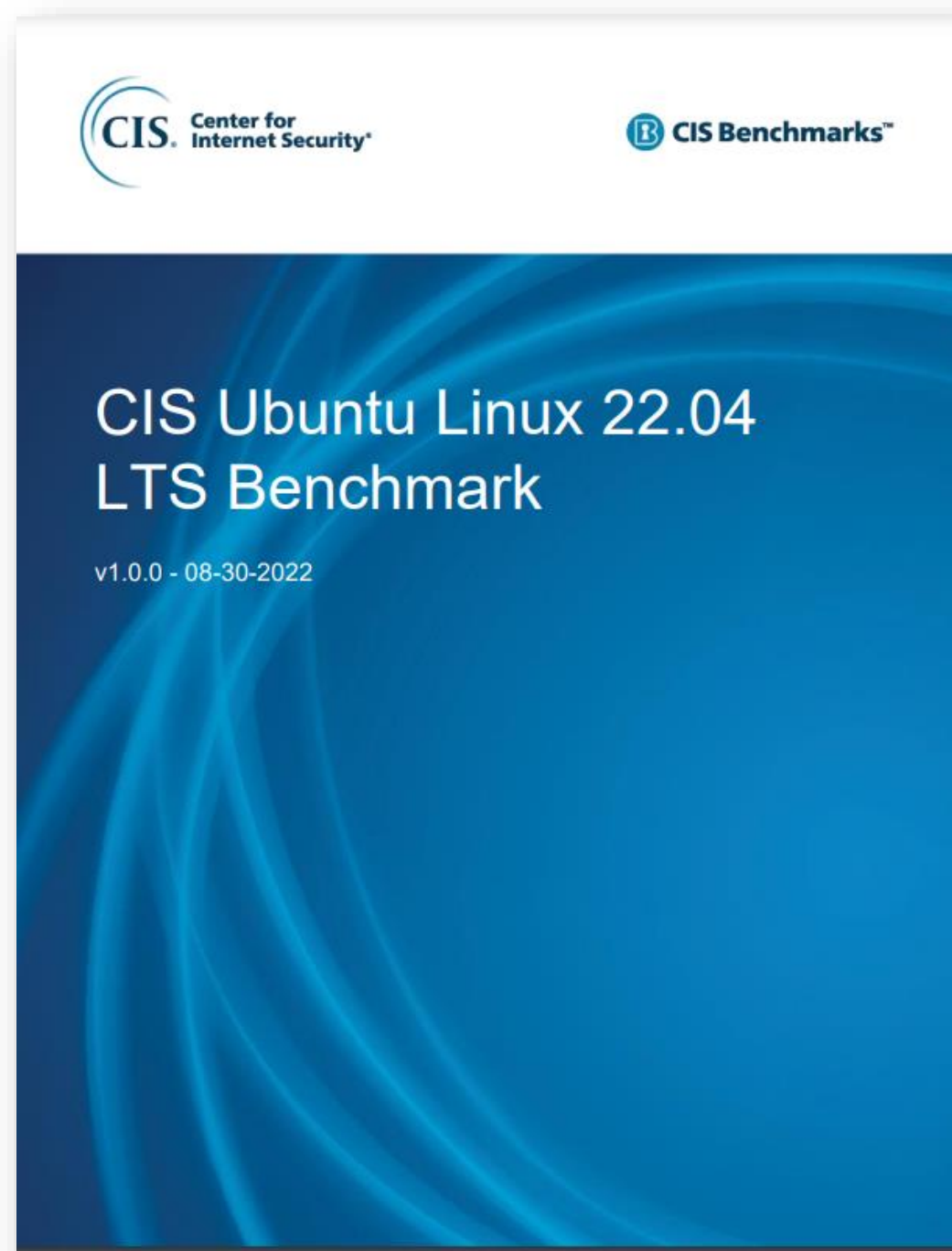
# UBUNTU HARDENING



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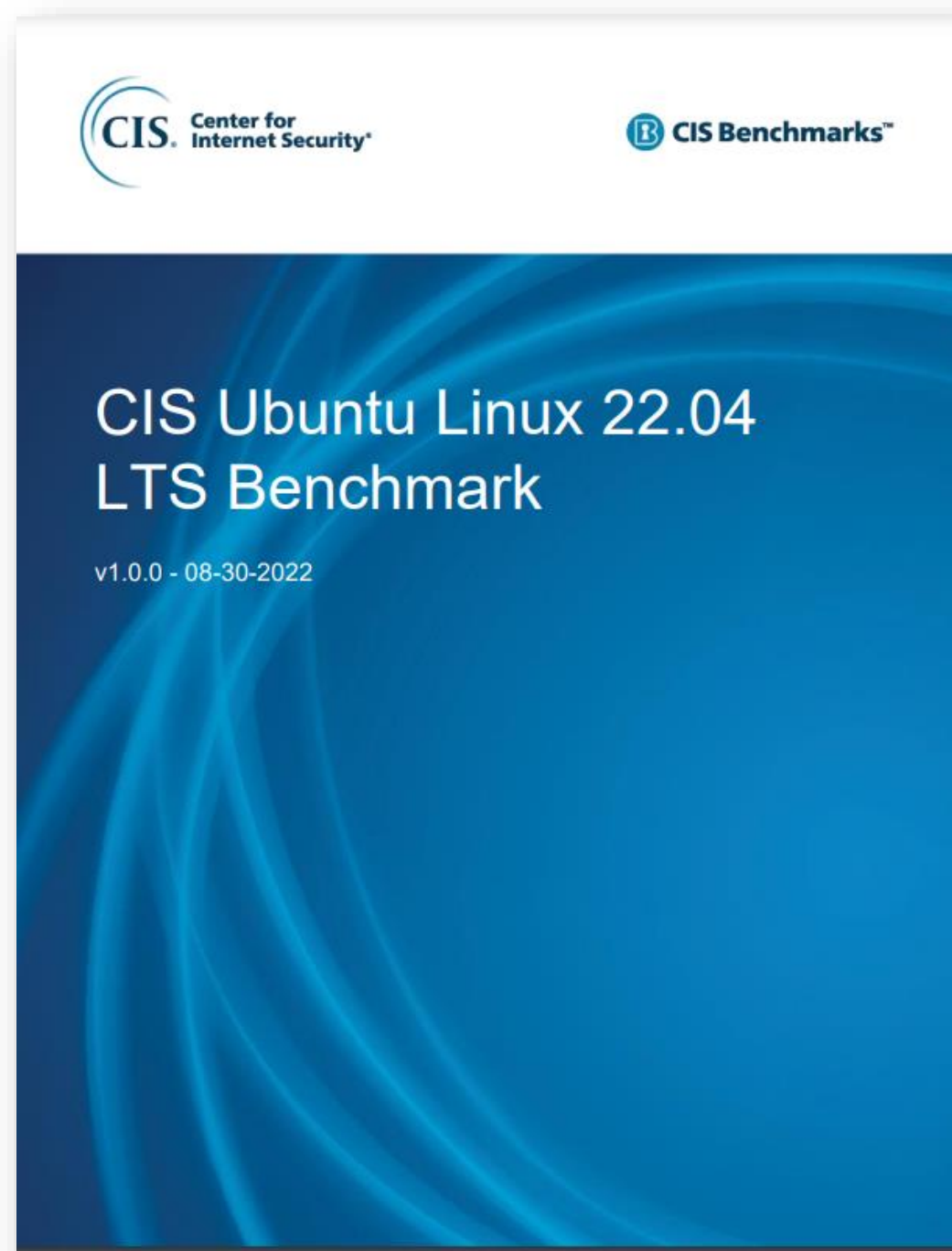
# UBUNTU HARDENING



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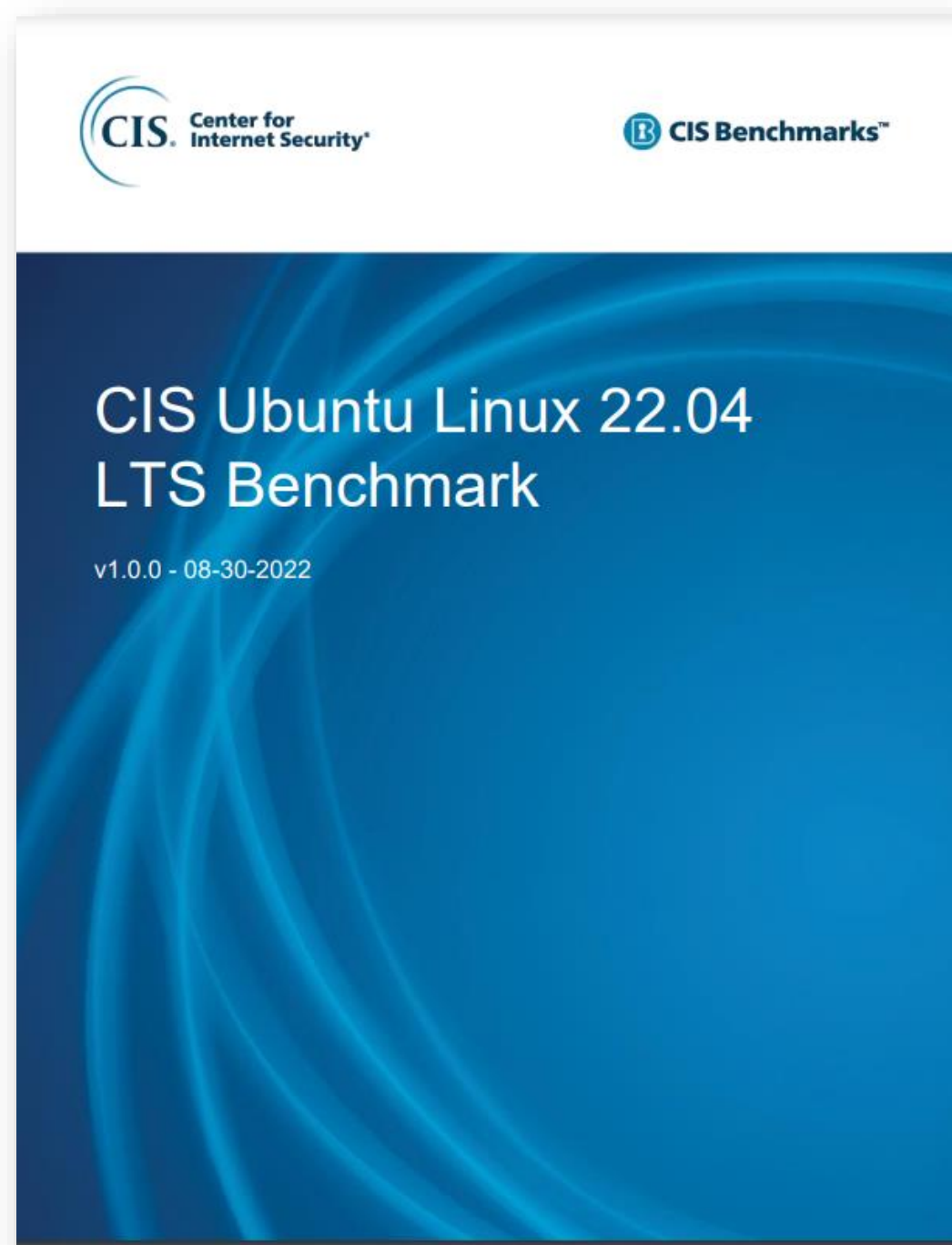
# UBUNTU HARDENING



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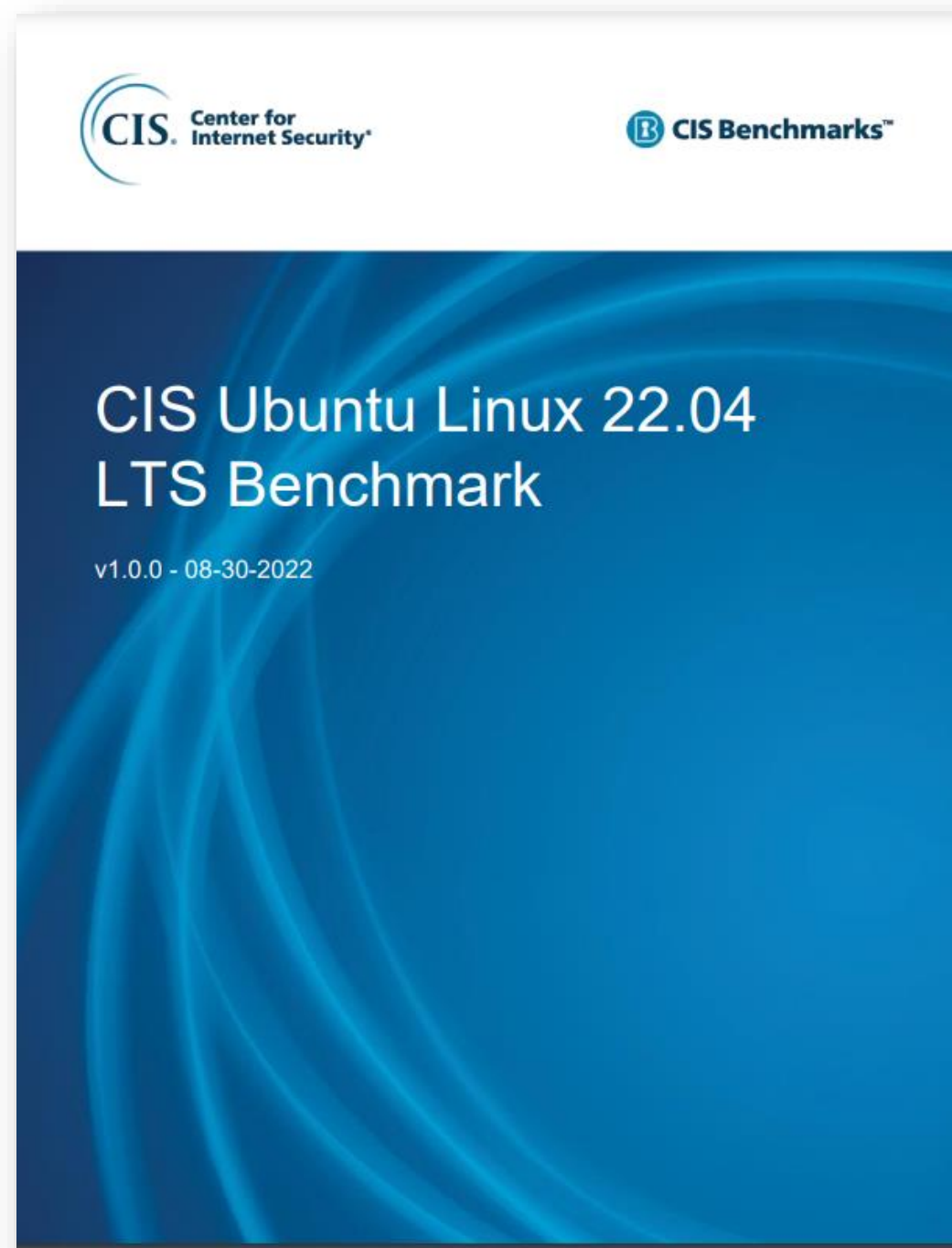
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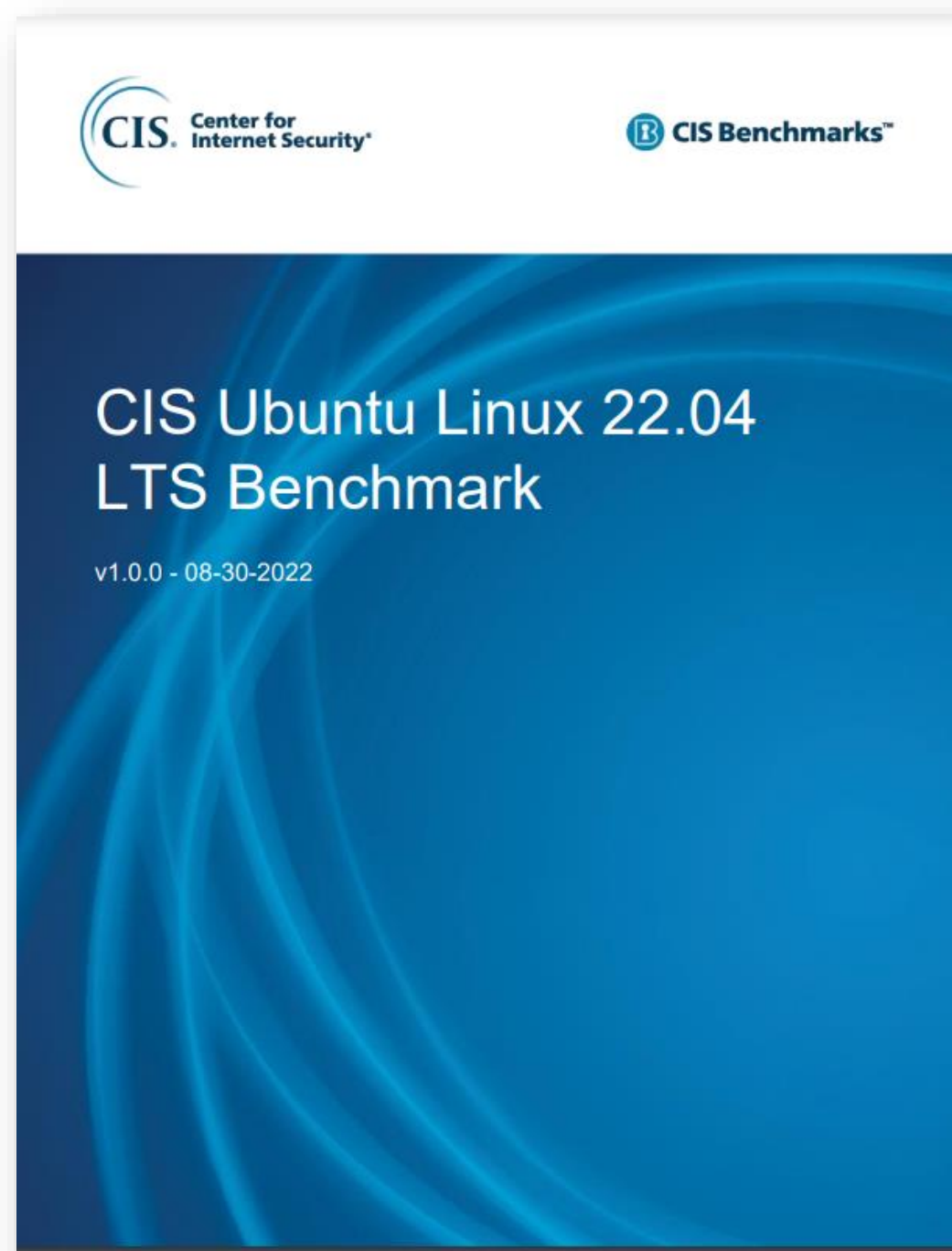
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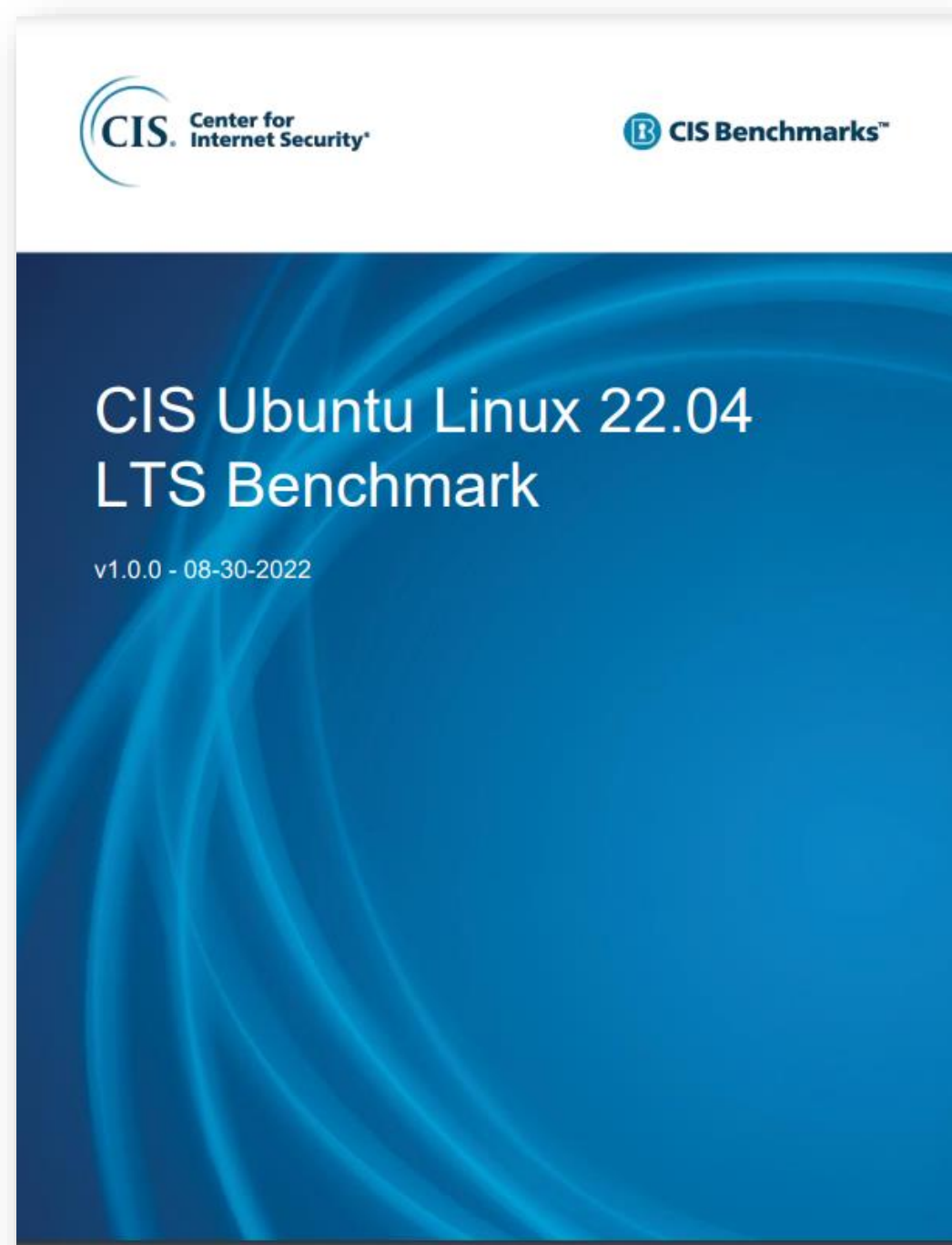


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