



Certified Hyperledger Sawtooth Administrator Candidate Handbook

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Overview

About Hyperledger

Hyperledger is an open source collaborative effort created to advance cross-industry blockchain technologies. It is a global collaboration, hosted by The Linux Foundation, including leaders in finance, banking, Internet of Things, supply chains, manufacturing and Technology.

Scope of Certifications

Hyperledger offers a certification program that allows candidates to demonstrate their competence in deploying and operating a Hyperledger Sawtooth network through the command line.

The purpose of the Certified Hyperledger Sawtooth Administrator (CHSA) certification is to provide assurance that CHSAs can effectively build a secure Hyperledger Sawtooth network for commercial deployment.

To achieve certification, a candidate will need to pass a performance-based exam that tests their ability to install, configure, operate, manage, and troubleshoot the nodes on a secure commercial Hyperledger Sawtooth Network..

For exam security, candidates must verify their identity and are monitored by a proctor during the exam session via streaming audio, video, and screensharing feeds. The screensharing feed allows proctors to view candidates' desktops (including all monitors). The audio, video, and screen sharing feeds will be stored for a limited period of time in the event that there is a subsequent need for review. Certification is issued upon a candidate passing the required exam.

The CHSA Certification focuses on the skills required to be a successful Hyperledger Sawtooth Administrator in industry today.

This CHSA exam curriculum includes these general domains and their weights on the exam:

- Install 10%
- Lifecycle 25%
- Configuration 25%
- Troubleshooting 20%
- Permissioning, Identity Management and Security 20%

Candidate Requirements

Testing Equipment: Hardware and Environment

Exams are delivered online and closely monitored by proctors via webcam, audio, and remote screen viewing. Candidates must provide their own front-end hardware to take exams, including a computer with:

- Chrome or Chromium browser
- reliable internet access
- webcam
- microphone

The workstation on which the hardware (i.e. desktop or laptop) is placed must, aside from the required hardware, reveal a clean surface with no obstructions overhead or underneath. Candidates should ensure that their webcam is capable of being moved in case the proctor requests that the Candidate pan their surroundings to check for potential violations of exam policy.

- If multiple Candidates are taking an exam at the same time in one location, then at least four feet (1.2 meters) of empty space on all sides must be enforced or privacy partitions must be installed.

Hardware Compatibility Check

Candidates should run the [WebDelivery Compatibility Check Tool](#) provided by the Exam Proctoring Partner to verify that their hardware meets the minimum requirements. The tool is located at <https://www.examslocal.com/ScheduleExam/Home/CompatibilityCheck>. Select “Linux Foundation” as the Exam Sponsor and “CHSA” as the Exam. (At this time, only Chrome and Chromium browsers are supported.)

Candidate Identification and Authentication

Candidates are required to provide government-issued photo identification before the Exam can be launched. Any current, non-expired government ID containing Candidate’s photo and full name of Candidate in the Latin alphabet may be used for identity verification. Examples of acceptable forms of government-issued photo ID include, but are not limited to:

- passport
- government-issued driver’s license/permit
- national identity card
- state- or province-issued identity card

If a current, non-expired government ID containing Candidate’s photo and full name of Candidate in the Latin alphabet is not available, the candidate may provide to the proctor a notarized English translation of the ID along with the non-Latin character photo ID.

If you have questions about whether your photo ID is acceptable please contact:
certificationsupport@hyperledger.org.

Eligibility

Candidates must test as an individual. Certification is only available for natural persons, not corporations or other legal entities.

Age

Candidates must be 18 years of age or older to be eligible for testing or certification. Candidates under the age of 18 years old are considered underage minors and are not eligible for testing or certification even with parental consent. Hyperledger reserves the right to impose additional restrictions to comply with local data protection laws.

Accommodations for Special Needs

If a candidate has special needs that need to be taken into account during exam administration, they must notify Hyperledger at least two (2) weeks in advance so any accommodating measures can be arranged.

Statement of Non-Discrimination

Hyperledger endorses the principles of equal opportunity. Eligibility criteria for certification as a Certified Hyperledger Sawtooth Administrator (CHSA) is applied equally to all individuals regardless of age, race, religion, gender, national origin, veteran status, or disability.

Certification and Confidentiality Agreement

Candidates are required to accept the terms of the [Hyperledger Certification and Confidentiality Agreement](#). This is a legally-binding agreement that applies to all exams. Acceptance and adherence to this agreement is required in order to be exposed to the exam and to be officially certified. Candidates must first accept the terms and conditions of the Hyperledger Certification and Confidentiality Agreement **during the registration process** and **again prior to testing**. Failure to accept the terms of this agreement will result in a terminated exam and forfeiture of the entire exam fee.

Exam Registration

Registering for an exam gives users the eligibility to schedule and then take the exam. Registering does not equal scheduling. Registration must be completed before scheduling is possible.

To register for the exam, go to [Certified Hyperledger Sawtooth Administrator product page](#).

Click the “Register for Exam” button to go to the checkout page for the exam. Users can choose to complete the checkout process as a guest or click the “Log In” link under the Email Address field to complete checkout with a Linux Foundation ID account. (The email field will not appear if the user is already logged in.)

To complete checkout as guest, enter the email address of the exam candidate in the Email Address field. Make sure to enter the email address correctly, to ensure you receive your order confirmation.

- If the purchase is being made on behalf of someone else, e.g. Purchasing Dept of company is making the purchase on behalf of employee, make sure to enter the email address of the intended recipient (i.e. the person taking exam) in the Email Address field. The rest of the Billing Info (e.g. company, address) should be used to enter the details pertaining to the credit card being used for payment.

During checkout, users will additionally be prompted to enter payment information and read and accept the [Terms and Conditions for Exam Registration](#) and [Hyperledger Agreement](#) in order to complete checkout.

When checkout is successfully completed, candidates will be redirected to [My Portal](#), where they can view the next steps required to schedule and take their exam. (The order does take up to 15 minutes to be processed across the systems, so please wait at least 15 minutes before attempting to schedule.) Candidates will also receive an order confirmation email for their exam registration purchase and will receive an exam instructions email. Unless otherwise specified, eligibility to schedule and take an exam expires 12 months from the date of the order.

Exam Fees and Payment

The cost per exam is \$300 USD. Only credit card payment can be used for payment of exam fees. All major credit cards will be accepted.

Volume discounts are available for companies with multiple candidates. Please contact Hyperledger for more information: certificationsupport@hyperledger.org.

Refund Policy

Candidates have up to three (3) business days following payment of exam registration fees or up to 24 hours prior to a scheduled exam reservation, *whichever comes first*, to request a full refund on exam registration fees.

Refunds will not be given and rescheduling will not be allowed in event of no-shows or if an exam is terminated early or could not be started on time due to [exam misconduct](#).

Refund Process

Candidates should first check that they are eligible for a refund per the [refund policy](#) and then follow the appropriate process below to request a refund:

- **Candidates who have not yet scheduled an exam reservation:** contact certificationsupport@hyperledger.org, and provide the order number from the purchase and the Linux Foundation ID username or email address used to complete the purchase.
- **Candidates who have already scheduled an exam reservation:** first, cancel the exam reservation at least 24 hours before the scheduled start time of the reservation. Once the reservation is canceled, contact certificationsupport@hyperledger.org, and provide the order number from the purchase and the Linux Foundation ID username or email address used to complete the purchase.

****Hyperledger cannot issue a refund if there is an Exam reservation scheduled in the system.****

Linux Distribution

The Certified Hyperledger Sawtooth Administrator (CHSA) exam is released on Ubuntu 16.

My Portal

Candidates can access My Portal at any time by going to <https://portal.linuxfoundation.org/portal>

Once a candidate has logged into My Portal, they will be able to view the status of their certification efforts under the Certifications tab, as well as to download receipts for exam registrations. Use the blue Refresh button located to the right of “Certification Status” to pull in recently made changes or if the window has been left open for an extended time. (Certain changes may require several minutes to populate, such as date and time for newly scheduled exam reservations.)

Status Settings for Certifications

The Certification -CHFA - listed in the Certifications tab of the Portal will have its status displayed to the far right.

The status settings that may appear for certifications include:

Status	Description
Not Certified - Register for Exam	User has not yet purchased registration for a certification exam. Use the “Register for Exam” link to purchase registration for an Exam and start the process towards getting certified.
Items Pending	User has registered for a certification exam, but still needs to complete items toward getting certified. While in this status, an Exam Prep Checklist panel will be presented on the left that guides the user through the remaining items requiring completion. An Exam Info panel will be presented on the right that provides more details on an exam as the steps in the Exam Prep Checklist are completed (e.g. distribution selected, exam date and time scheduled, exam results, etc.).
Not Passed	User has taken the exam, but their exam score was below the score required to pass. An Exam Info panel containing details on the exam taken will be presented and a link to “Re-Register” for the exam is provided.
Active	User has achieved or renewed certification and expiration of certification has not yet passed. Certificates for the specific certifications in Active status will be available for download.
Expired	User achieved or renewed certification previously, but the certification has since expired.
Revoked	User has had their certification revoked.

Exam Prep Checklist

If the Exam Prep Checklist is displayed, it indicates a candidate has taken the first step of registering for an exam, but still has more steps to complete (e.g. scheduling an exam date) before they can take the exam. Candidates should use the Exam Prep Checklist to review and complete the steps necessary to take the exam. When items in the checklist have been completed, a green checkmark will appear next to the item. Red crosses indicate items which remain to be completed.

The items on the Exam Prep Checklist include the following:

- Register for Exam

- Check System Requirements
- Schedule Exam
- Get Candidate Handbook
- Verify Name
- Important Tips
- Take Exam

The “help” next to each item can be clicked on to get more information on a specific item/step.

Register for Exam

Register for Exam will already be checked as complete when the Exam Prep Checklist is presented.

Check System Requirements

Candidates must check that the system on which they plan to take their exam meets the minimum requirements for taking the exam. Clicking on the Check System Requirements link in the Exam Prep Checklist will direct a candidate to a Compatibility Check Tool. To use the tool, the candidate should select “Linux Foundation” as the Exam Sponsor and “CHSA” as the Exam. The tool will allow the candidate to determine if their system meets the minimum requirements or if anything is needed to bring their system up to the required specifications.

The portal cannot determine the results of the Compatibility Check Tool; it can only determine if the candidate has accessed the tool by clicking on the Check System Requirements link provided in the Exam Prep Checklist.

If the Compatibility Check Tool reveals that a candidate’s system does not meet minimum requirements, it is the candidate’s responsibility to bring their system up to the necessary specifications or to procure a system that does meet the minimum requirements **before** they take their exam.

Candidates may access the Check System Requirements link even after it has been marked as complete. This allows candidates to re-check a system after changes have been made or to check new systems.

Schedule Exam

Use the Schedule Exam link to be directed and automatically logged in to the Exam Proctoring Partner’s scheduling site. Once authenticated and logged in, candidates may search for the exam by Exam Title (Certified Hyperledger Sawtooth Administrator), Code (CHSA) or Sponsor Name (The Linux Foundation) and they can then select from available Dates and Times* for an exam reservation.

During scheduling, candidates will also be prompted to use the Check Compatibility Tool to confirm that their system meets minimum requirements needed for the exam, and to read and accept the terms of [Hyperledger Certification and Confidentiality Agreement](#). Once all steps have been completed successfully, the exam reservation will be confirmed. Email notification will be sent to the candidate regarding their confirmed exam reservation. (Candidates who have set up exclusive email whitelists should add <http://it.psionline.com> to their list of acceptable domains.)

***Please note that exams require a 24-hour lead time to allow for preparation of the virtual machines, so the earliest possible reservation date will be the following business day.** Additionally, the latest possible date possible in the scheduling calendar is 60 days out. If a later reservation is desired, candidate will need to wait until their desired date is less than 60 days out to schedule.

Canceling or Rescheduling

Once a candidate has scheduled an exam reservation, they may cancel or reschedule the reservation up to 24 hours before the start time of the reservation. Reservation changes are not possible within 24 hours before the start time. No-shows forfeit the money paid for an exam registration.

Candidates should refer to the Cancel and Reschedule Instructions provided in the exam reservation confirmation email from the Exam Proctoring Partner, or follow the steps below:

- Login to www.examslocal.com/linuxfoundation with your Linux Foundation ID
- Click on "My Exams"
- Click on the scheduled Exam and then click on Cancel or Reschedule button

Get Candidate Handbook

All candidates are expected to read and familiarize themselves with this Candidate Handbook. In My Portal, Candidates may click on the Get Candidate Handbook to access the Handbook. Once the link is clicked on, the item is marked as completed. Candidates may access the Download Candidate Handbook link even after it has been marked as completed. This allows Candidates to re-download or review the Candidate Handbook at later dates if needed.

Verify Name

Candidates must click on the Verify Name link to ensure that the First and Last Name listed on their Linux Foundation ID account matches their government-issued photo ID. Make sure these values do not change before the exam has been taken.

The First and Last Name attached to a Linux Foundation ID are provided to the exam proctor so that proctors can verify the identity of the candidate against the government-issued photo ID presented by candidate.

Important Tips

Candidates are encouraged to review the list of Important Tips downloadable from My Portal for a smooth exam experience. Candidates can access My Portal at any time by going to <https://portal.linuxfoundation.org/portal>

Take Exam

Once a Candidate has completed the necessary steps in the Exam Prep Checklist, the Take Exam link will be made available in the checklist. At the time of their scheduled reservation, candidates may click on this link to be automatically logged in to the Exam Proctoring Partner's site.

Alternatively, candidates may click on the link provided in the Exam Reservation Confirmation and reminder emails sent by the Exam Proctoring Partner or go directly to <http://www.examslocal.com/linuxfoundation>. Login with your Linux Foundation ID account when prompted.

Once logged in, click on My Exams and select the exam from the left margin to get started.

Exam Info Panel

The Exam Info Panel in My Portal provides the following details on a specific exam registration, as well as links to perform certain actions for the exam:

- **Download Receipt:** download receipt for the exam registration
- **Expiration:** the last date on which exam can be taken; after this date, the candidate's eligibility to take the exam expires
- **Distribution:** the distribution for the exam will be displayed here
- **Exam Date:** once a candidate schedules an exam reservation, the date and time of that reservation will be displayed here; if candidate has not yet scheduled an exam, "Unscheduled" will be displayed
 - **"Schedule Exam"** link: candidate may use the Schedule Exam link to access the Exam Proctoring Partner's scheduling site in order to [schedule an Exam Date](#)
 - **"Take Exam"** link: on the scheduled exam date and time, the candidate may use the Take Exam link to login to their exam session on the Exam Proctoring Partner's site
- **My Score*:** the score that the candidate earned on the exam
- **Score Needed to Pass*:** the minimum score needed to pass the exam

*These items only appear once an exam has been graded.

Certification Info Panel

When a candidate has passed an exam and successfully achieved certification, a Certification Info panel will be made available to the candidate in My Portal. The Certification Info panel provides the following details on the candidate's certification:

- **Certificate ID Number:** this is the ID number listed on the candidate's certificate
- **Achieved/Renewed On:** this is the date that the candidate achieved or if applicable, renewed their certification
- **Expires On:** the date on which candidate's certification is scheduled to expire
- **My Score:** the score that the candidate earned on the exam they passed to achieve Certification
- **Score Needed to Pass:** the minimum score needed to pass the exam
- Actions Panel
 - Download **Certificate**
 - Download **Exam Receipt**

Exam Description

Certification exams from Hyperledger require the candidate to use the command line to demonstrate their competence in deploying and operating a Hyperledger Sawtooth network.

Exams are delivered entirely online and closely monitored by proctors via webcam, audio, and remote screen viewing. This gives Candidates the freedom to take their exam at the place and time of their choosing (subject to meeting the conditions stipulated in [Candidate Requirements](#) section of this document).

There is no need for the candidate to install or have Linux running on their local machine. Instead, a server is provisioned for the candidate's use during the exam. The candidate logs into an exam console via a web browser; within that console, the candidate will communicate with the proctor, view exam questions/objectives, and access the server provisioned for their use during the exam.

Launching Exam

At the time of a candidate's scheduled exam reservation, the candidate can login to My Portal and click on the [Take Exam](#) link to be directed to the Exam Proctoring Partner's site. Candidates may also go to the URL provided in the confirmation and reminder emails from the Exam Proctoring Partner, which is <https://www.examslocal.com/linuxfoundation>. The candidate will be prompted to authenticate via their Linux Foundation ID login.

Once authenticated and logged in, the candidate should click on My Exams, select the appropriate exam listed in the left margin, and click the Launch Exam button (see [Reporting](#)

[Issues with Launching Exam](#)). Clicking the Launch Exam button will open the Exam Console in a new browser tab and the candidate may then close all other tabs and browsers.

Once in the Exam Console, the candidate will be prompted through a check-in process by the proctor. The check-in process includes the following:

- sharescreen, webcam, and microphone
- present valid government-issued photo ID that matches the name listed on the Exam reservation (the Proctor will request that Candidate hold up their ID to the webcam)
- read and accept the [Exam Rules](#) and the terms and conditions of [Hyperledger Cert & Confid Agreement](#)

Upon completing the check-in process and when the proctor has verified that the candidate's workstation environment and surroundings meet the requirements stipulated in [Candidate Requirements](#), the proctor will release the exam so that the candidate can view exam content and begin working on their exam server. The countdown timer for the exam does not start until the proctor releases the exam.

Reporting Issues with Launching Exam

If the Launch Exam button does not appear or is not accessible within the 5-minute period following the Exam reservation's scheduled start time, the candidate should contact the exam Proctoring Partner's Support team using one of the following options:

- "Online - Click here to get help" - this opens the chat support function
- Support menu item in the top nav bar - call one of the support phone numbers

The Candidate must contact the Exam Proctoring Partner's Support team within 15 minutes of the scheduled start time for their reservation to report an issue. Otherwise, they will be marked as a "No Show" for the Exam.

Exam Console Format

The Exam Console is composed of three main areas:

1. **Exam Console functions** (menu bar across the top of the exam console) – houses functions to turn on screen- and webcam-sharing, start chat with proctor, and to access Exam Controls that include options to **Show Testing Rules**, **Pause** or **End Exam**, **Refresh Exam Window**, **Reset Console**, and access the **Notepad**. (See [Guidelines and Tips for Use of the Help Center](#) below.)
2. **Content Panel** (left) – contains exam objectives (the exam questions, tasks, etc.); describes the point value of an objective; and displays a countdown timer for the exam.
3. **Linux Server Terminal** (right) – panel that displays the terminal of a Linux server. (See [Guidelines and Tips for Use of the Linux Server Terminal](#) below.)

Candidates will need to perform the exam objectives listed in the Content Panel by executing command-line tasks on the Linux server terminal. Proctors will be able to see the candidate's desktop and view the candidate through the webcam.

Guidelines and Tips for Exam Console Functions in Top Menu Bar

- To turn on webcam-sharing, click **Camera** from top menu.
- To turn on screensharing, click **Desktop** from top menu.
- To ask the proctor a question during the exam, select **Live Chat** from top menu.
- Clicking Exam Controls from top menu offers the following choices:
 - **Show Testing Rules:** select this to review the exam rules during an exam.
 - **Refresh Exam Window:** use to refresh the Linux Server Terminal without reloading the entire web page.
 - For example, if the Linux Server Terminal is experiencing latency issues that are not affecting the other functions of the Exam Console or Content panel, clicking the Refresh Exam Window button may help.
 - **Reset Console:** use to reset the HTML terminal application and to flush all firewall settings on the candidate's server.
 - **Pause Exam:** use to request break from proctor. (Note: the exam timer continues to run through even if proctor approves break request.)
 - **End Exam:** Candidate can use this to indicate to proctor they are ready to end the exam.
 - **Notepad:** use this to make notes during the exam, e.g. keeping a list of items to revisit. Please note that notes entered here will not be retained or accessible after the exam has ended.

Guidelines and Tips for Use of the Content Panel

- Exam objectives can be navigated linearly using the back and forth arrows or by using the navigation drop down menu at the bottom of the Content Panel.
- The timer in the content panel starts out at 120 minutes (CHSA) when the exam is released. Requesting a break via the Pause Exam function will not stop the timer.
 - Important Note: When a candidate's connection to the exam console has to be restarted, it can cause the timer in the content panel to be reset to the beginning balance of 120 minutes . The proctor keeps the ultimate timer for the exam. The candidate should check with the proctor for a true reading of time remaining in the exam if there is any doubt or in cases where the timer has reset.
- The default language for exam objectives is English.

Guidelines and Tips for Use of the Linux server terminal

These instructions can also be pulled up during the exam by typing "man If_exam" in the command line.

1. Root privileges can be obtained by running 'sudo -i'.
2. You should avoid rebooting node-1, as the supporting infrastructure will take around 15 minutes to start, and stabilize. You are free to reboot any node other than node-1 at any time.
3. Do not stop or tamper with the certerminal or sshd configuration and process on node-1 as this will END YOUR EXAM SESSION.
4. Do not block incoming ports 8080/tcp, 4505/tcp and 4506/tcp. This includes firewall rules that are found within the distribution's default firewall configuration files as well as interactive firewall commands.
5. Use Ctrl+Alt+W instead of Ctrl+W.
 - Ctrl+W is a keyboard shortcut that will close the current tab in Google Chrome.
6. Ctrl+C and Ctrl+V are not supported in your exam terminal, nor is copy and pasting large amounts of text. To copy and paste limited amounts of text (1-2 lines) please use;
 - For Linux: select text for copy and middle button for paste (or both left and right simultaneously if you have no middle button).
 - For Mac: ⌘+C to copy and ⌘+V to paste.
 - For Windows: Ctrl+Insert to copy and Shift+Insert to paste.
7. Installation of services and applications included in this exam may require modification of system security policies to successfully complete.
8. Only a single terminal console is available during the exam. Terminal multiplexers such as GNU Screen and tmux can be used to create virtual consoles.
9. To change the font size in the terminal please use the native Chrome keys: Ctrl and '+' or Ctrl and '-'.
10. You should avoid changing the locale of the system during your exam.
11. You should not manipulate the firewall of node-1, or tamper with any of the running lxd or dnsmasq processes.

Be sure to also review how you can [Practice Using the Exam's Browser-Based Linux Server Terminal](#) listed under [Exam Preparation](#).

Duration of Exams

Candidates have two (2) hours to complete a Certified Hyperledger Sawtooth Administrator (CHSA) exam.

As candidates proceed through the exam, a countdown timer is displayed at the top of the Content panel. The countdown timer does not start until proctor has released the exam to candidate (see [Launching Exam](#)). Additionally, the timer does not stop during requested breaks, and can sometimes reset to the beginning balance when candidate's connection to exam

console has to be restarted. Candidates can confirm the time remaining with the proctor directly. Please note that the proctor's system (which isn't visible to the candidate) is the system of record for time spent so in the unlikely event that your onscreen timer gets reset it does not affect your available time.

Language

Exam objectives (i.e. exam questions and tasks) are available in English.

Exam Scoring and Notification

Exams are scored automatically, usually within 24 hours of completion. Results will be emailed 36 hours from the time that the exam was *completed*. Results will also be made available on My Portal.

Exams are graded for results. There may be more than one way to perform an objective on an Exam and unless otherwise specified, the candidate can pick any available path to perform the objective as long as it produces the correct result.

Hyperledger will use statistical analyses of exam data ("Data Forensics") to identify patterns indicative of test fraud including cheating and piracy. Hyperledger reserves the right to invalidate an exam score and certification result if review of an Exam record reveals scoring inaccuracies (attributable to or the Exam Proctoring Partner) or response patterns indicative of possible misconduct or measurement error. If Hyperledger determines that an exam score is invalid due to issues that are beyond the control of the candidate, the candidate will be advised of options to retake the exam at no charge.

Exam Results - Pass

Upon passing an exam and if all other requirements for certification have been met, candidates will be granted the certification relevant to the Exam. For example, passing the CHSA Exam means a candidate will be granted CHSA Certification.

Formal notice of successful certification from Hyperledger will be emailed within 3 business days of meeting program requirements. The notice will provide a Certificate ID number and include a pdf copy of the certificate, in addition to instructions on accessing additional Certification Marks.

Exam Results - No Pass

If eligible per the Retake Policy, candidates who do not achieve a passing score on their first attempt will be granted a free retake. Be sure to review the [Retake Policy](#) in full to understand eligibility and deadlines for the free retake. Instructions will be provided in the Exam Results notification on how to redeem the free retake.

If the free retake has been exhausted or if the exam is not eligible for free retake, candidates may register and pay to take the exam again, with no discount given for such additional retakes.

Candidates may also wish to consider taking optional training to help them prepare for the certification exam.

Exam Rescoring Requests

Though we cannot guarantee the availability of rescoring for an exam server, candidates may make a request for an exam to be rescored up to 2 days following the date on which the exam was taken. The fee for rescoring an exam is \$50 USD and may be paid via credit card.

Rescoring requests should be made via email to certificationsupport@hyperledger.org and must include the Candidate name, Linux Foundation ID, Exam Title, and Date exam was taken.

If the rescoring results in a change from No Pass to Pass on the exam, the rescoring fee will be refunded.

Retake Policy

For certification exams purchased directly from Hyperledger one (1) free retake per exam purchase will be granted in the event that a passing score is not achieved and Candidate has not otherwise been deemed ineligible for certification or retake. Unless otherwise indicated in the exam order, the free retake must be completed within 12 months of the date of the original exam purchase. After the free retake has been exhausted or the deadline to complete the free retake has passed, Candidates may register and pay to take the exam again, with no discount given for such additional retakes.

For purchases made through an Authorized Training Partner (ATP), please contact the ATP regarding eligibility for a free retake.

Exam Rules and Policies

Candidates MUST start their exam no later than 15 minutes after the scheduled start time. If a candidate does not start their exam within 15 minutes of the scheduled start time, they will be automatically marked as a no-show and no refund or rescheduling will be allowed. (See [Reporting Issues with Launching Exam.](#))

Before the exam can be released, candidates are presented with rules regarding their [testing location](#) and [candidate conduct](#) during the exam, and with the policy on [warnings and Exam terminations](#). The Proctor cannot release the exam until the candidate has indicated that they have read, understood and accept these rules.

Testing Location Rules

- Room must be quiet, private and well lit
- Bright lights or windows should not be positioned behind the Candidate
- Testing from public spaces such as coffee shops, stores, etc. is not allowed
- No one other than the candidate can be present in the room
- Desk must be clear of all notes and electronics

Candidate Conduct Rules During Exam

- Candidate should review the exam content instructions that are presented in the command line terminal; candidate can also type “man lf_exam” in the command line to view instructions again at any time during the exam
- Candidate is not allowed to communicate with anyone other than the proctor during the exam
- No other person may be in the exam room with the Candidate during the exam
- Candidate is not allowed to read the questions out loud, to themselves, during the exam
- Candidate is not allowed to leave their desk or step out of view of the webcam, unless they have been granted specific permission by the proctor
- Candidate is not allowed to eat, drink, or chew gum (Tip: request a break if you are needing a drink)
- Candidate is not allowed to wear any electronic device in their ears, on their face or on their body*
During the exam, Candidate may only run one application - the Chrome/Chromium browser in which the exam is shown
- Candidate is not allowed to look away from their exam console screen for extended periods of time
- Candidate must refrain from making excessive and/or repetitive noise
- Candidate must refrain from covering their mouth and/or face.
- Candidate is not allowed to write or enter input on anything (whether paper, electronic device, etc.) outside of the exam console screen
- Candidates must comply with any requests from the proctor. If candidate fails to comply, the exam will be terminated

*unless medically necessary

Policy on Tools and Resources Allowed During Exams

The following tools and resources are allowed during the exam as long as they are used by candidate to work independently on exam objectives (i.e. not used for 3rd party assistance or research) and are accessed from the shared screen which the proctor can observe (accessing resources which are not visible to the proctor will be treated as a serious violation).

Candidate may:

- review the Exam content instructions that are presented in the command line terminal.
- type “man lf_exam” in the command line to view instructions again at any time during the Exam.
- Candidates may use their Chrome or Chromium browser to open one additional tab in order to access assets at <https://sawtooth.hyperledger.org/docs/core/releases/1.0.5/> and its subdomains. No other tabs may be opened and no other sites may be navigated to. *The allowed site above may contain links that point to external sites. It is the responsibility of the candidate not to click on any links that cause them to navigate to a domain that is not allowed.*
- use the Notepad feature accessible in the top menu bar of the exam console (notes entered here will not be retained or accessible after the exam has ended)

The following resources are forbidden during the exam:

- Use of devices other than the exam desktop
- Notes
- Documentation
- Notepads (other than what’s provided within the exam browser tab)
- Course manuals
- Devices external to computer on which they are taking the exam, including but not limited to: mobile phones, PDAs, wearable computers, smart glasses, smart watches
- Exam-specific assets, meaning those created by (or with the assistance of) those with prior exposure to the exam content and for the purpose of providing specific assistance to a candidate taking the CHSA exam.

Policy on Warnings and Exam Terminations

Certain kinds of violations will result in a warning from the proctor, while certain other violations result in IMMEDIATE TERMINATION OF THE EXAM WITHOUT WARNING.

If a warning is issued by the proctor, the exam will be paused until the candidate is able to amend or resolve the observed violation.

If a candidate is found to be in violation of the same rule more than twice or is found to be in violation more than four times on any combination of rules, the exam will be terminated immediately.

The following actions will result in IMMEDIATE TERMINATION OF THE EXAM WITHOUT WARNING:

- Candidate refuses to comply with a proctor request
- Candidate is observed to be copying exam content, whether with software, external device(s), manual transcription, or other means

- Candidate steps out of view of the webcam for extended amount of time without the proctor's permission
- Someone other than the candidate is observed to complete or assist with any part of the exam
- A discrepancy exists between the input on a candidate's screen and the candidate's observed activity

Exam Misconduct

Candidates engaging in exam misconduct will not be allowed to complete the exam or receive an exam result. Such candidates may also be barred from taking any other Hyperledger Exam and if applicable, may have their Hyperledger Certification withdrawn. Refunds will not be given and rescheduling will not be allowed if an exam is terminated early or could not be started on time due to exam misconduct. Misconduct may, at any time, result in application of sanctions.

Examples of Exam Misconduct include but are not limited to:

- Failing to comply with the [Exam Rules and Policies](#)
- Disseminating actual exam content by any means, including, but not limited to, web postings, formal or informal test preparation or discussion groups, chat rooms, reconstruction through memorization, study guides, or any other method, as well as providing Exam content or information to any person not expressly authorized by Hyperledger to receive such content or information (including but not limited to a Hyperledger employee who is not part of the Certification Program staff).
- Copying or otherwise transferring, modifying, making derivative works of, reverse engineering, decompiling, disassembling, or translating any exam or any part thereof.
- Seeking and/or obtaining unauthorized access to examination materials (this includes using recollections of others of materials from previous administrations of any exam, a.k.a. braindump material, and/or any unauthorized publication of exam questions with or without answers)
- Using falsified or altered certificates, score reports, or other documents or electronic media to misrepresent certification status
- Allowing another person, or an organization in which you are not actively involved, to use your certification credentials to obtain employment or promotions
- Providing falsified information, documentation or statements as a means of a false identity, false address or solicitation of someone to take a test on another's behalf
- Giving, receiving, or obtaining unauthorized assistance during the examination or attempting to do so
- Making notes of any kind during the exam, whether on paper or via digital means other than via note taking feature provided within the exam browser tab
- Possession of non-authorized items during the exam
- Providing or accepting improper assistance on your exam or exams taken by others
- Removing or attempting to remove exam material (in any format)
- Intentionally or otherwise repeatedly causing a disturbance of any kind during the exam

- Tampering with the exam server and its environment or attempting to use it for any function other than taking a Hyperledger exam
- Modifying and/or altering the results and/or score report for this exam or any other exam record
- Violating the exam retake policy described on The Linux Foundation website at <https://training.linuxfoundation.org/about/policies/certification-exam-retake-policy>
- Using computer scripts to register for exams
- Misconduct as determined by Data Forensics (see “[Exam Scoring and Notification](#)”)
- Failing to adhere to any Hyperledger or Exam Proctoring Partner policy, procedure, rule, or instruction
- Using profanity, threatening to harm, bully or in any way harass any Linux Foundation or Exam Proctoring Partner employee or contractor (whether verbally or in writing, including through electronic communications or external web postings)
- Otherwise violating the terms of the [Hyperledger Certification & Confidentiality Agreement](#)

Certificates and Certification

Certified Candidates (“Certificants”) receive a Certificate ID number and a certificate indicating their successful completion of the requirements necessary to achieve the title, CHSA, indicated on their certificate. Certifications expire 24 months from the date that a certificant successfully passes their certification exam, unless revoked earlier for cause or certificant successfully completes certification renewal requirements.

The primary method for confirming the status of a certification is to use Hyperledger’s [Certification Verification Tool](#).

While their certification status is active,

- CHSA certificants may use the term Certified Hyperledger Sawtooth Administrator to refer to themselves

Certificate

The CHSA Certificate lists the following information:

- Name of the Candidate who obtained the certificate
- Title of Certification (e.g. Certified Hyperledger Sawtooth Administrator)
- Certificate ID number
- Date of Completion (i.e. date Exam was passed)

Certification Verification Tool

Hyperledger provides a [verification tool](#) that allows users (e.g. potential employers or clients) to validate the status of an individual’s certification. To submit a query on this verification tool, a

user must enter the Certificate ID number and the Last Name listed on the certificate of a successfully certified individual. (The Last Name must be entered exactly as listed on the Certificate, including any special characters.) The result for a successfully submitted query will include the full name of certificant, certification title and status (active/inactive), and the date that the certification was achieved.

Certification Expiration

Certifications expire 24 months from the date that the Program Certification requirements are met by a candidate. Certificants must meet [renewal requirements](#) prior to the expiration date of their current certification in order to maintain active certification. If certification renewal requirements are not completed before the expiration date, certification will be revoked.

Certification Revocation

Hyperledger will revoke certification if you fail to comply with Certification renewal requirements. In addition, Hyperledger may, in its sole discretion, revoke any and all certifications you may have earned, and permanently ban you from earning future certifications, under any of the following circumstances:

- Threatens to harm, bully or in any way harass any Hyperledger or Exam Proctoring Partner employee or contractor (whether verbally or in writing, including through electronic communications or external web postings);
- Breaches the terms and conditions of [Hyperledger Certification and Confidentiality Agreement](#)
- Is determined by Hyperledger to have undertaken or participated in [Exam Misconduct](#) or violated the [Professional Code of Conduct](#);
- Has been convicted of a crime that the Hyperledger deems, in its sole discretion, in any way harms or affects Hyperledger or the program's reputation, goodwill or security; or
- Has lost or settled a civil case in which Hyperledger is the plaintiff and the claim arose from any alleged damage to Hyperledger, its brand, goodwill or reputation.

Certification Renewal Requirements

Hyperledger certifications are valid for 2 years and candidates may keep certification valid by completing the renewal requirement option below. Renewal requirements must be completed prior to the expiration of the certification.

Options to meet certification renewal requirements:

- **Retake the exam.** Candidates have the option to retake and pass the same exam to keep their certification valid. The certification will become valid for 2 years starting on the date the exam is retaken and passed.

Professional Code of Conduct

Candidates, before and after certification, shall:

- Perform duties with objectivity, due diligence and professional care.
- Access private information on computer systems only when it is necessary in the course of technical duties. Maintain the privacy and confidentiality of information obtained in the course of your activities unless disclosure is required by legal authority. Such information shall not be used for personal benefit or released to inappropriate parties.
- Provide service in your areas of competence, being honest and forthright about any limitations of their experience and education. Maintain competency in your respective fields and agree to undertake only those activities you can reasonably expect to complete with the necessary skills, knowledge and competence.
- Strive to ensure the necessary integrity, reliability, and availability of the systems for which you are responsible.
- Design and maintain each system in a manner consistent with the purpose of the system to the organization.
- Inform appropriate parties of the results of work performed including the disclosure of all significant facts known to you that, if not disclosed, may distort the reporting of the results.
- Not engage in deceptive financial practices such as bribery, double billing, or other improper financial practices.
- Obey all laws governing your work, unless, in exceptional circumstances, such compliance is inconsistent with the public interest.
- Promote no interest adverse to your employer or client, unless a higher ethical concern is being compromised; in that case, inform the employer or another appropriate authority of the ethical concern.
- Avoid entering into conflicting obligations with one client, such as obligations of confidentiality, availability for work, or otherwise, which conflict with obligations to another client.
- Not unlawfully discriminate or knowingly permit unlawful discrimination on the basis of race, national origin, sex, sexual orientation, religion, age or disability in: (1) hiring, promoting, discharging, or otherwise determining the conditions of employment of any person; or (2) accepting or terminating representation of any client.
- Identify, document, and report significant issues of social concern, of which you are aware, in software or related documents, to the employer or the client.
- Ensure that you have no other professional or contractual obligations that are inconsistent with this Code of Conduct.

Exam Preparation

Examination Content Outline

An overview of domains and competencies for the Certified Hyperledger Sawtooth Administrator Exam [can be found here](#)

Studying for the Exam

Hyperledger certification exams are performance-based, which means the only way to ‘study’ for them is to practice, practice, practice. The overview of domains and competencies listed for each certification exam provides guidance on the topics covered in an exam. Candidates are encouraged to gain as much hands-on experience as possible in order to build mastery using the command line (since the exam terminal does not use the graphical interface). As indicated in [Other Resources](#), there are many forums, both online and offline, which prospective candidates may find useful in building skills on their chosen distribution.

Some candidates, especially those who are newer to Hyperledger, may also find it valuable to complete a formal training course. Hyperledger provides (via The Linux Foundation) optional test preparation courses that cover the relevant material.

These are prepared by an independent team using the publicly available content outline for exams. They do not claim to provide specific coverage of exam items, nor do they claim to make it faster, cheaper or easier to pass the exam.

Candidates may also choose training from 3rd-party training providers, all of whom have access to the same content outline as the Hyperledger course development team.

Info on the Exam’s Browser-Based Linux Server Terminal

Since the exam terminal is delivered in your browser, it will behave slightly different than an SSH client or local install. Aside from the known issues with certain keyboard shortcuts already mentioned in the [“Guidelines and Tips for Use of the Linux server terminal”](#) section, there may be some other keyboard shortcuts that present issues for some candidates.

Appeals

Appeals policy

In the event that sanctions are imposed, e.g. for [Exam Misconduct](#), candidates will have thirty (30) calendar days from the date of their notification letter to file an appeal. A Certification Appeals Submission Form will also be provided. If the Candidate believes they have valid grounds for an appeal, they may complete the submission requirements for the Certification Appeals Submission Form and submit it as instructed.

Incomplete submissions and submissions received after the thirty (30) calendar period will not be considered. If Hyperledger determines that a written request for appeal is filed within the allowable time and follows required guidelines for consideration, and the original sanction decision is upheld by Hyperledger, such appeal and the information submitted by the Candidate will be forwarded to the Hyperledger Certification Appeals Committee for consideration.

Appeals Decisions

You may expect to receive a written response from Hyperledger within ninety (90) calendar days after the Appeals Committee meets. Decisions rendered by the Appeals Committee are final.

Copyright

All exam questions are the property of Hyperledger and are protected by copyright. Most national laws provide severe civil and criminal penalties for the unauthorized reproduction, distribution, or exhibition of copyrighted materials.

Customer Support

For questions regarding the Certified Hyperledger Sawtooth Administrator exam and certification program, please review this list of [Frequently Asked Questions \(FAQ\)](#).

If your question is not answered there, you may submit a support ticket by sending an email to certificationsupport@hyperledger.org.