FAQ

Canton Network Quickstart FAQ | 2025

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CN-QS Frequently Asked Questions

System Requirements & Setup

Have the best technologies been selected for the CN-QS?

The QS is designed to help teams become familiar with CN application development by providing scaffolding to kickstart development. The QS application is intended to be incrementally extended by you to meet your specific business needs. Once you are familiar with the QS, please review the technology choices and the application design to determine what changes are needed - technology and design decisions are ultimately up to you. Please be aware that the Canton Network Quickstart (CN-QS) is a rapidly evolving work in progress.

What are the minimum system requirements to run CN-QS LocalNet?

The CN-QS requires Docker Desktop with at least 25 GB of memory allocated to run `LocalNet` properly. If your machine has less memory, consider declining Observability when prompted during setup.

Which browsers are supported for running CN-QS?

Chromium browsers such as Chrome, Edge, and Firefox are recommended. Safari has known issues with local URLs and should be avoided. You may also use the same browser with one user in incognito mode and the other in standard mode.

How should I test `Participant` and `User` interactions on `LocalNet` and `DevNet`?

For testing multiple users, use separate browsers or one browser in standard mode and another in incognito to avoid session/cookie interference.

How do I handle authentication for JFrog Artifactory?

You need to create a `~/.netrc` file with the following format:

```
machine digitalasset.jfrog.io
login <your-email>
password <your-api-key>
```

Set permissions with `chmod 600 ~/.netrc`

For more information see the Installation Guide.

Why is Nix-shell unable to download my SSL certificate?

The Nix prerequisite may introduce hurdles to installation if your enterprise runs behind a corporate proxy. If `nix-shell` is not found, then verify that

`/nix/var/nix/profiles/default/etc/ssl/certs/ca-bundle.crt`

contains your corporate CA.

CN, PQS, Daml Shell and other CN-QS related services run on a user-supplied JVM. CN-QS assumes that you have access to JVM v17+ with access to the internet. If your organization operates behind a web proxy then JVM may not have automatic knowledge of the corporate certificate. In these instances, JVM must be instructed to trust the certificate.

If Nix-related errors occur, verify that the correct certificates exist by looking at the log file.

```
$ sudo HOME=/var/root
NIX_SSL_CERT_FILE=/nix/var/nix/profiles/default/etc/ssl/certs/ca-bundle.crt
/nix/store/dfqs9x0l0r4dn7zjp1hymmv9wvpp9x2k-nix-2.26.2/bin/nix-channel --update
nixpkgs
```

If the log returns an error message such as:

```
error: unable to download
'https://nixos.org/channels/nixpkgs-unstable': SSL peer certificate
or SSH remote key was not OK (60)
```

Then the required corporate CA does not exist. Request your corporate CA from your organization's tech administrator and merge the certificate into the Nix `certs ca-bundle.crt`.

If you need additional support, the Nix reference manual offers guidance regarding the order at which cert files are detected and used on the host, as well as environment variables to override default file locations.

Graham Christensen's Determinate Systems blog offers a solution for Nix corporate TLS certificates problems on MacOS. The NixOS team forked this solution as an experimental installer that is stable on most operating systems.

Should I build with make or gradle?

The gradle daemon has been disabled to prevent parallel processing of transcodegen.

Gradle tasks had been known to create order and concurrency issues which caused files to get cleaned too early. Always prefer to use the `make` commands.

How do I resolve a "build failed with an exception failure"?

If `make install-daml-sdk` results in:

```
Task :daml:unpackDamlSdk FAILED

FAILURE: Build failed with an exception
```

Then you may have a corrupted `daml-sdk snapshot`. In most cases, deleting the identified tarball snapshot will resolve the issue in subsequent installation attempts.

This error may occur if `make install-daml-sdk` is interrupted.

A failure of this kind will end in:

```
https://digitalasset.jfrog.io/artifactory/sdk-ee/3.2.0-snapshot.20241031.13398.0.vf95d2607/daml-sdk-3.2.0-snapshot.20241031.13398.0.vf95d2607-macos-x86_64-ee.tar.gz to /Users/USER/Code/cn-quickstart/quickstart/daml/.sdk/daml-sdk-3.2.0-snapshot.20241031.13398.0.vf95d2607-macos-x86_64-ee.tar.gz

> Task :daml:unpackDamlSdk FAILED

FAILURE: Build failed with an exception.

* What went wrong:

Execution failed for task ':daml:unpackDamlSdk'.

> java.io.EOFException
```

To resolve this error, copy the faulty `.tar.gz` file with directory path as shown in *your* terminal and `rm` it:

```
rm /Users/USER/Code/cn-quickstart/quickstart/daml/.sdk/daml-sdk-3.2.0-snapshot.20241031.13398.0.vf95d2607-macos-x86_64-ee.tar.gz
```

💡 `USER` in `/Users/USER/` will display your username. Copy and paste from your terminal. NOT this FAQ.

Reattempt `make install-daml-sdk`.

How do I resolve Docker containers that fail unexpectedly?

Starting the CN QS while running Docker Desktop version 4.38.0 may result in `java.lang.NullPointerException` errors:

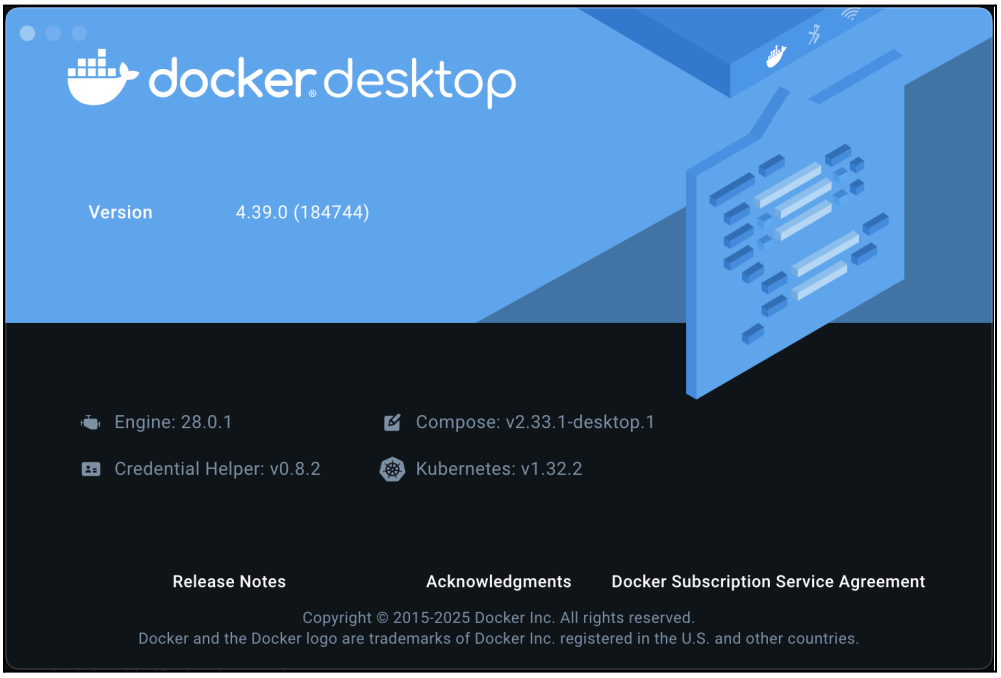
```
2025-01-31 15:12:55,705 ERROR [41  lity] FixedSizeBlockingPool [] Pool object could not be added due to exception:
```

```
java.lang.NullPointerException: Cannot invoke
"jdk.internal.platform.CgroupInfo.getMountPoint()" because
"anyController" is null [ ] Exception in thread
"Native-Process-Pool-1-17"
```

This error indicates that ORDS containers (an Oracle web client in Java) cannot properly load during startup.

First, verify that you are not running Docker Desktop version 4.38.0 (181591).

To view the version number, open Docker Desktop. In the top menu, select **Docker Desktop -> About**.



If you are running Version 4.38.0 then upgrade Docker Desktop and make a new attempt.

If you'd like to learn more about this issue, visit JDK Bug System.

Common Issues & Troubleshooting

How can I check if my CN-QS deployment is running correctly?

Use `make status` to see all running containers and their health status.

What should I do if containers show as "unhealthy" after startup?

The most common cause is insufficient memory allocation to Docker. Try:

1. Increase Docker memory allocation to at least 25 GB
2. Run `make stop` followed by `make clean-all`
3. Run `make setup` and turn off `observability`
4. Restart with `make start`

How can I monitor system metrics?

You can use Grafana at http://localhost:3030/ to monitor system metrics if `observability` is enabled.

For more information see the Observability and Troubleshooting Overview.

What should I do if I need to completely reset my environment?

Execute the following commands in order:

1. `make stop`
2. `make clean-all`
3. `make setup` (to reconfigure environment options)
4. `make start`

`Make build can't find the env file?`

If you receive an error message such as

```
Couldn't find env file: /Users/USER/development/canton/cn-quickstart/quickstart/.env.local
make: *** [build-docker-images] Error 15
```

Run `make setup` to create the `.env.local` file.

Development & Testing

How do I access the Daml Shell for debugging?

Run `make shell` from the quickstart directory. This provides access to useful commands like:

- `active` - shows summary of contracts
- `active quickstart:Main:Asset` - shows Asset contract details
- `contract [contract-id]` - shows full contract details

How can I monitor application logs and traces?

The CN-QS provides several observability options:

1. Direct container logs: `docker logs <container-name>`
2. Grafana dashboards: http://localhost:3030/
3. Consolidated logs view in Grafana

Infrastructure & Environment

What's the difference between LocalNet and DevNet deployment?

`LocalNet` runs everything locally including a Super Validator and Canton Coin wallet, making it more resource intensive but self-contained.

`DevNet` connects to actual decentralized Global Synchronizer infrastructure operated by Super Validators. `DevNet` requires less local resources but needs whitelisted VPN access and connectivity.

For more information see the Project Structure Guide.

What is ScratchNet?

ScratchNet is a persistent Canton Network environment that supports team collaboration while maintaining centralized control. It fills the gap between a single-developer LocalNet (constrained by one laptop's resources) and a fully decentralized DevNet (maintained by Super Validators). Development teams typically deploy ScratchNet on a shared server to enable longer-running instances with persistent data storage across development sessions. Learn more about ScratchNet in the Exploring the Demo Guide.

How can I find out the migration_id of DevNet?

Go to https://sync.global/sv-network/ and look for the `migration_id` value.

Do I need VPN access to use CN-QS?

VPN access is only required for `DevNet` connections. You need either:

- Access to the DAML-VPN
- Access to a SV Node that is whitelisted on the CN. Contact your sponsoring Super Validator agent for connection information.

For more information see the Exploring the Demo Guide.

How do I log in with Keycloak?

The CN QS uses Keycloak for authentication. If you have issues with logging in with Keycloak credentials, you may begin troubleshooting by running make status to verify the Keycloak service is running.

Keycloak should show healthy.

```
keycloak   quay.io/keycloak/keycloak:26.1.0   "/opt/keycloak/bin/k…"   keycloak
17 minutes ago   Up 17 minutes (healthy)   8080/tcp, 8443/tcp, 9000/tcp
```

Keycloak credentials are set in .env with the following credentials:
Username: AUTH_APP_USER_WALLET_ADMIN_USER_NAME (e.g. alice)
Password: AUTH_APP_USER_WALLET_ADMIN_USER_PASSWORD (e.g. abc123)

The Keycloak user must have the same ID as the ledger user's ID. This should be reflected in the default behavior.

Best Practices & Common Pitfalls

How should I handle multiple user testing in the local environment?

Best practices include:

1. Use separate browsers for different users
2. Follow proper logout procedures between user switches
3. Be aware that even incognito mode in the same browser may have session interference
4. Consider using the make commands for testing specific operations (e.g., `make create-app-install-request`)

Database & Query Access

What's the recommended way to query ledger data?

The Participant Query Store (PQS) is recommended for querying ledger data.

CN-QS Make Target Reference

Target	Description
`build`	Build frontend, backend, Daml model and docker images
`build-frontend`	Build the frontend application
`build-backend`	Build the backend service
`build-daml`	Build the Daml model

`create-app-install-request`	Submit an App Install Request from the App User participant node
`restart-backend`	Build and restart the backend service
`restart-frontend`	Build and restart the frontend application
`start`	Start the application and observability services if enabled
`stop`	Stop the application and observability services
`stop-application`	Stop only the application, leaving observability services running
`restart`	Restart the entire application
`status`	Show status of Docker containers
`logs`	Show logs of Docker containers
`tail`	Tail logs of Docker containers
`setup`	Configure local development environment (enable DevNet/LocalNet, Observability)
`console-app-provider`	Start the Canton console. Connects to running app provider ledger
`console-app-user`	Start the Canton console. Connects to running app user ledger
`clean-console`	Stop and remove the Canton console container
`shell`	Start Daml Shell
`clean-shell`	Stop and remove the Daml Shell container
`clean`	Clean the build artifacts
`clean-docker`	Stop and remove application Docker containers and volumes
`clean-application`	Like clean-docker, but leave observability services running
`clean-all`	Stop and remove all build artifacts, Docker containers and volumes

`install-daml-sdk`	Install the Daml SDK
`generate-NOTICES`	Generate the NOTICES.txt file
`update-env-sdk-runtime-version`	Helper to update DAML_RUNTIME_VERSION in .env based on daml/daml.yaml sdk-version

UI Opening Commands

Target	Description
`open-app-ui`	Open the Application UI in the active browser
`open-observe`	Open the Grafana UI in the active browser
`open-sv-gateway`	Open the Super Validator gateway UI in the active browser
`open-sv-wallet`	Open the Super Validator wallet UI in the active browser
`open-sv-interface`	Open the Super Validator interface UI in the active browser
`open-sv-scan`	Open the Super Validator Scan UI in the active browser
`open-app-user-wallet`	Open the App User wallet UI in the active browser

LocalNet URLs

URL	Description
`http://localhost:3000`	Main application UI
`http://localhost:3030`	Grafana observability dashboard (if enabled)
`http://localhost:4000`	Super Validator gateway - lists available web UI options

`http://wallet.localhost:2000`	Canton Coin wallet interface
`http://sv.localhost:4000`	Super Validator Operations
`http://scan.localhost:4000`	Canton Coin Scan web UI - shows balances and validator rewards
`http://localhost:7575`	Ledger API service
`http://localhost:5003`	Validator API service

In `DevNet` mode, Super Validator and wallet services are hosted externally rather than locally. The exact URLs for those services are provided by your sponsoring Super Validator.