

Corda Network Foundation

Corda Pre-Production Network Service Level Agreement (SLA)

June 2019

Corda Network Foundation

1.0 Introduction

This document defines standard Service Levels offered by the Corda Network Foundation in operating Pre-Production facilities for organisations testing Corda Network implementations ahead of on-boarding to the production Corda Network.

Like Corda Network, the Pre-Production Network is governed by the Corda Network Foundation, on behalf of its participants. The Foundation appoints an operator of the network, who undertakes all day-to-day activities associated with delivering the network services described in Section 2 of this document. The operator is currently R3.

Participants accept the service levels contained within this document upon signing of the Corda Pre-Production Network Terms of Use, unless otherwise stipulated in such Terms of Use.

The difference between Pre-Production, Production and Testnet environments is described below.

Corda Pre-Production Network:

For owners of tested CorDapps with a firm plan to take them into production, a bespoke Pre-Production environment is provided by the Corda Network Foundation, where such CorDapps can be further tested in the network configuration they will experience in production, utilising relevant Corda Network Services (including the Identity Manager and trusted notaries).

Corda Pre-Production is not intended for customers' full test cycles, as it is expected that the bulk of CorDapp testing will occur in simpler network configurations run by the CorDapp provider, or operating within Corda Testnet, but is available for testing of functionally complete and tested CorDapps in realistic network settings.

Pre-Production is therefore more aligned to the testing of the operational characteristics of networked CorDapps rather than their specific functional features. Realistic test data is therefore expected to be used and may include data copied from production environments and hence representing real world entities and business activities.

It will be up to the introducer of such data to ensure that relevant data protection legislation is complied with and, in particular, that the terms and conditions under which Corda Network Services processes such data is suitable for their needs. All test data will be cleared down from Corda Network Services on the completion of testing.

Corda Network Production:

Corda Network Live (Production) is a long-lived environment supporting real business activity conducted on the Corda Network. It will be a global network, governed by the independent Corda Network Foundation and operating under a single set of rules. Operators of CorDapps in any jurisdiction will need to ensure that their usage of the Corda Network complies with any local rules and legislation to which they are subject, and the Foundation will seek to define a set of rules are not in conflict with such local rules or legislation, as far as is practicable. Corda Network Live will support real-world assets, real-world identities and legally enforceable contracts between counterparties. Data will be long-lived and immutable. As such, the security model for Corda Network Live will need to be consistent with the high value (and risk) of the activities going on within its applications.

Corda Testnet:

An environment where any individual or company can experiment with Corda, set up and run a Corda node, create, find, deploy and test applications (CorDapps) and interact with other users of those CorDapps. Testnet is meant to be to all intents and purposes a mirror of the production Corda Network, with global participation and a kaleidoscope of participants, applications, business networks and service providers operating in a single network environment. It is fundamentally intended to be a play and practice area, with no surrounding legal framework, security model or other ability to support enforceable and safe business contracts or activity.

There will be no real world assets and any data entered through Testnet applications should be true test data and not represent real world entities. Any data entered to Testnet is at the risk of the entity entering such data and Corda Testnet provides no guarantees or SLAs around the security or longevity of such data. Corda Testnet is intended as a springboard for Corda Network Live, although it is not under the control of the Corda Foundation.

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This document defines:

- Services included in the Corda Network Pre-Production environment
- The appropriate service levels for each service
- Actions on non-performance / remediation

This Agreement is valid from date of issue of a Corda Network Pre-Production participation certificate.

Scope

This document applies only to the Corda Network Pre-Production environment and its constituent services as defined herein.

Assumptions

- Support processes and incident severity levels are detailed in bespoke support agreements or standard support user guide.
- Expected participant and transaction volumes for the period of use have been previously communicated to the Corda Network Foundation, and agreed as suitable for this standard SLA.
- Period of usage of the Pre-Production environment will be agreed in advance. At the end of that period, in the absence of further agreement, participant certificates will be revoked and any data held by the Foundation removed from Corda Pre-Production Network, and returned to participant if previously agreed.
- A start date for usage of the services has been agreed at least 4 weeks in advance.
- Other participants may be accessing the specified services during the usage period.
- There is no limit to the number of CorDapps or business networks any particular participant can run or be part of in the Corda Pre-Production Network environment, although each is subject separately to the terms of this agreement

2.0 Service Descriptions

For the most up to date, detailed information about the services which Corda Network Foundation provides, consult: <https://corda.network/about/concepts.html>

3.0 Service Levels

This service level agreement applies during the period of access to the Corda Pre-Production Network, agreed with the Foundation in advance of entry.

3.1 Performance

The following SLAs and performance levels apply as minimum standards of performance.

Identity Manager

Turnaround of certificate signing requests is measured from time of the acknowledged receipt of a correctly formatted signing request by the Corda Network Operator, to the time at which we return a response onto the outbound network. The Identity Manager process can handle multiple certificate signing requests in parallel.

The Identity Manager process requires the participant to respond to a confirmation request from the Operator – who cannot control the timescale of such a response.

The Identity Manager may reject the certificate signing request if the data is not constructed according to the standards set out in the User Guide. Amended CSRs will be subject to the same SLAs as new certificate signing requests.

Participants requesting recertification, either to generate new keys, or to amend information on an existing and valid certificate, will start a new node and request a new certificate in exactly the same way as the original certificate and this will be subject to the same service levels.

Details such as the IP address of the node, can be changed by sending a new configuration file directly to the Network Map server (see below).

The service levels below are dependent on receiving a correctly formatted CSR.

- **95%** of valid (see User Guide) Certificate Signing Requests will be completed within 2 working days provided the participant responds to the confirmation request within 24 hours, subject to the below
- A maximum of **50** CSRs can be handled in parallel (across all participants in the environment) without impacting the above service level
- Should the number of outstanding CSRs exceed 50 in any one period the corresponding service level for that period will increase to 10 days
- Certificate revocation requests to the Doorman from a Business Network Operator or a participant will be turned around within five working days, up to a maximum of 10 in any one day

The service levels above only apply during normal hours of business (see section 3.2).

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Network Map Service

Turnaround of Network Map updates as a result of successful certification of a new node is measured from the time a certificate is issued from the doorman to the time at which the updated Network Map is placed upon on the distribution site(s). Participants are responsible for updating their own nodes with the revised information.

- **95%** of Network Map updates for new nodes will be completed within 1 hour of the certificate signing request being approved by the Doorman
- **95%** of Network Map updates for resigning nodes will be completed within 1 hour of the certificate revocation request being executed by the Doorman
- **95%** of IP address changes will be added to the network map within 15 minutes of the network map server receiving the new information from the relevant Participant Node
- Should the number of outstanding Network Map updates exceed 1000 in any one period the corresponding service level for that period will increase to 2 hours

The service levels above only apply during normal hours of business (see 3.2).

Notary

The turnaround time for transaction notarization request is measured from the inbound request is received on CNF infrastructure to the point at which the reply leaves CNF infrastructure and assumes correctly formatted and structured notarization requests.

Notarization requests are treated individually, in sequence of receipt, by the notary working from an inbound queue. The speed of processing of requests depends on the complexity of the transactions received in particular the number of input states.

- The notarization system will operate at a maximum end-to-end throughput (as defined above) of 4000 transactions per hour (for transactions with an average of 10 or less input states)
- The notarization system will operate at an average end-to-end throughput (as defined above) of 2000 transactions per hour (for transactions with an average of 10 or less input states)
- The number of transactions for which an incorrect response is given by the notary (input state consumed but indicated as not consumer and vice versa) will be less than 1 in 100,000,000
- 95% of transactions with 10 or less input states will be notarised within 60 secs of the previous notarization completing

The service levels above only apply during normal hours of business (see 3.2).

3.2 Availability

Uptime

- Normal business hours are considered as from 00:30 UTC+0 to 21:30 UTC+0 excluding weekends and bank holidays
- Services will be available during normal business hours
- On UK, US and Singapore bank holidays availability is not supported during the normal office hours of the impacted location(s): (08:30 to 17:30 in local time – adjusted for seasonal variation)

Scheduled Downtime / Service Window

- The normal maintenance window will be each Wednesday at a time to be advertised at least 5 days in advance

Unscheduled Downtime

- Outside of scheduled maintenance periods all services are designed to be continuously available and operate with hot-cold back-up (see recovery section)
- Each service will operate with 99% availability during normal business hours

Back-ups

- Back-ups will occur daily overnight from the hours of 02:00 UTC+0 to 03:00 UTC+0

Recovery Time Objective

- In the event of a failure of any service the recovery time objective will be 2 hours (within normal business hours) from the point of detection.
- CNF cannot guarantee any particular fix meets this objective but will issue hourly updates on progress to all affected participants

Recovery Point Objective

- In the event of a failure, data will be recovered to the point of last backup
- Transactions occurring after the previous back-up may need to be replayed

3.3 Data Retention

- Test data created in the Corda Network UAT environment as a result of customer activities under this agreement will be held by customer nodes and CNF databases supporting the Notary, Network Map and Doorman Services.
- At the end of the pre-agreed UAT usage period CNF retains the right to remove such data held in its own databases
- Such data as CNF controls can be held for future periods of testing if agreed at least 14 days in advance of the end of the pre-agreed usage period, and subject to separate commercial negotiation (a reasonable fee will apply, based on CNF's assessment of incremental costs)

3.4 Release Management

- The Foundation operates a single Corda Pre-Production Network with the intention of simulating the conditions applying in the single production Corda Network.
- It is important that Corda Network production is able to take advantage of new releases without undue delay and so the normal mode of operation is for services in both production and pre-production environments to be regularly upgraded.
- Since Corda from version 3.1 onward is fully backwards compatible releases that impact the pre-production services offered by CNF do not require customer nodes to upgrade.
- CNF will post intention to upgrade its own services one calendar month in advance of the event on r3.com and will conduct its own testing in a separate environment before making the upgrade. Customers will be invited to support such testing by operating test nodes in such an environment. It may not be possible to test with every CorDapp, nor should it be necessary
- CNF will make the upgrade on a specified day published on corda.network as per the notification period above. Customer services may be impacted and such impact will be notified in the upgrade communication. In the rare event of issues arising, they should be handled through the normal support channels

3.5 Network Parameter Updates

- All Corda Network participants have agreed to operate with a common set of network-wide parameters that each of their nodes downloads, alongside the network map.
- From time to time these network parameters need updating. The update process incorporates a node polling activity that ensures all node operators see the requested changes in advance and can vote to accept / not accept.
- CNF will consult with customers should there be disagreement over the proposed changes but reserves the right to progress the update if the majority of participants are in agreement that it should go ahead and reasonable attempts have been made to address any concerns of participants rejecting the change.
- Details of the update process can be found in the User Guide which can be obtained from uatdoorman@r3.com.
- Execution of an agreed update should be transparent to users, and during normal working hours. Updates will be advertised at least ten working days in advance
- Updates will be required whenever the following occur:
 - A new public notary is added to the environment
 - A participant whitelists a new contract
 - The minimum platform version is upgraded
 - The maximum message and / or transaction sizes are increased
 - The network epoch value is increased
 - The event horizon is changed (the amount of time a node can be un-contactable before being retired from the network)
- Further details can be found at <https://www.docs.corda.net> under Corda Networks / Network Map

3.6 Business Continuity

- CNF has fully redundant data center capabilities for all of its services, utilizing Microsoft Azure Cloud infrastructure.
- CNF has a disaster recovery policy which is reviewed and tested semi-annually.
- CNF has a comprehensive security policy incorporating specific security incident management procedures

3.7 Support

CNF supports Corda Pre-Production Network Services as follows:

Hours Of Service:

Support desk is open during normal business hours.

Classification of Errors.

Errors will be classified by CNF, in discussion with the customer, in accordance with the Support Handbook found here: <https://r3-cev.atlassian.net/wiki/spaces/SKB/pages/990544103/The+Corda+Software+Support+Services+Handbook>

Resolution of Errors and Support Requests:

The Pre-Production network will operate according to the service levels documented in the Support Handbook.

It should be noted that, unless agreed by an CNF director and according to special circumstances, Severity 1 incidents cannot arise from any UAT activity and only Severity 2 to 4 incidents apply.

3.8 SLA reporting

Formal SLA reporting will not be operated for the Corda Pre-Production Network environment. CNF will monitor service level performance internally and make changes as required either to maintain service levels or to modify them, at the Foundation's discretion.

3.9 In the event of SLA breach

- Penalties will not apply for SLA non-performance during the pilot period.
- If customers test plans are severely disrupted as a direct result of persistent issues with the Corda Pre-Production Network Services or Corda Software, then representation to the CNF for appropriate repatriation of any fees payable for pre-production services can be made.