



Polkadot.

Saison été : Substratosphere



Devenez un validateur Polkadot



Meetups B612 Crypto Lyon

- Série de meetup initié François Guezengar (Dapps Nation)
- A venir, saison été animé par



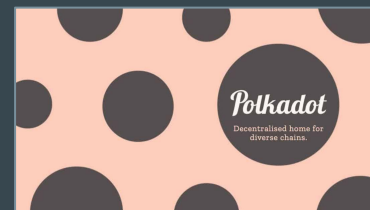
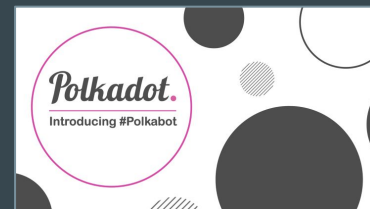
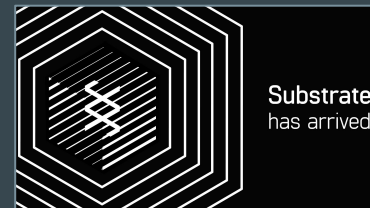
François Branciard



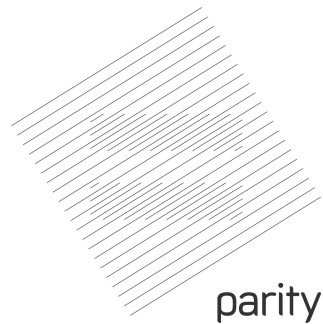
Vladimir Ostapenco

Saison Été : Substratosphere

- Découverte de Substrate
 - B612 - 12/06/2019
- Découverte de Polkadot
 - B612 - 19/06/2019
- Devenez un validateur Polkadot sur le testnet
 - B612 - 26/06/2019



Who is involved?



Polkadot in 1 sentence

Polkadot is a heterogeneous multi-chain technology.

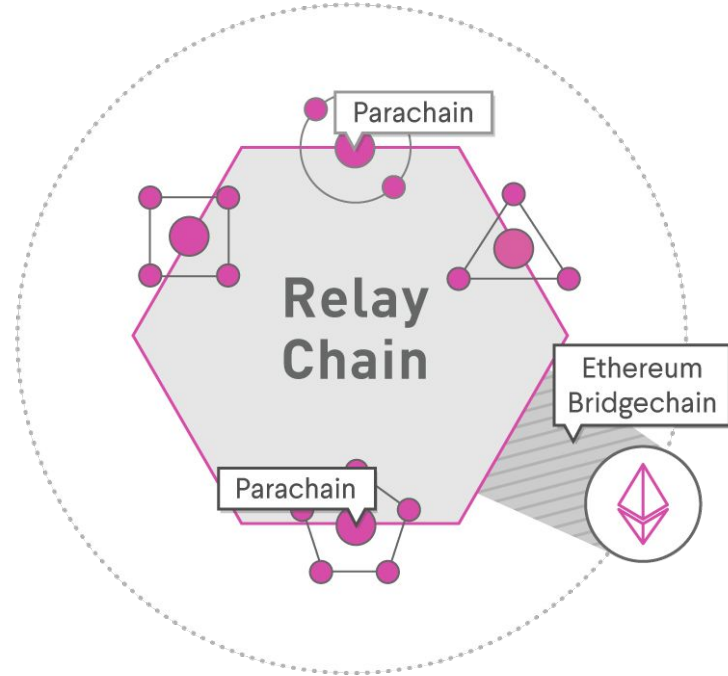
<https://polkadot.network/>



POLKADOT APPROACH

○ ○ ○ ○ RELAY-CHAIN
provides pooled security and
passes messages

○ ○ ○ ○ PARACHAINS
contain logic and handle
transactions



RELAY CHAIN



Only consensus and governance functionality



Parachain validation logic



Polkadot

PARACHAINS



Fully validated state machines



Independent public bridge chains



Independent private bridge chains



WHO POWERS IT?



VALIDATORS

Verify parachain transactions and pass messages



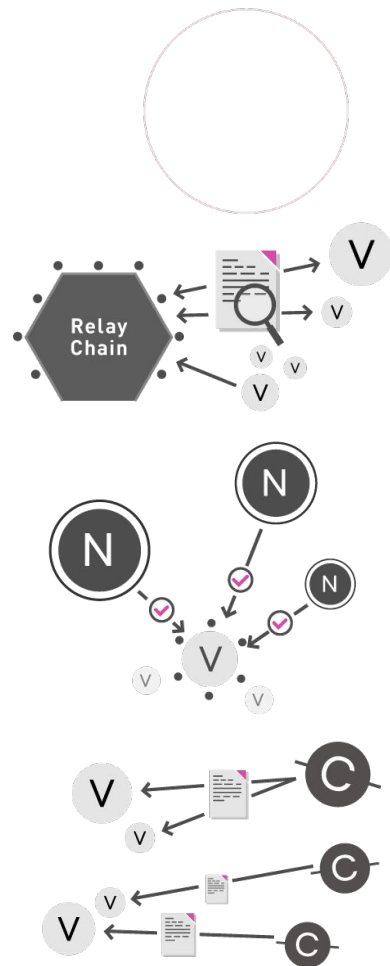
NOMINATORS

Select good validators and increase economic security



COLLATORS

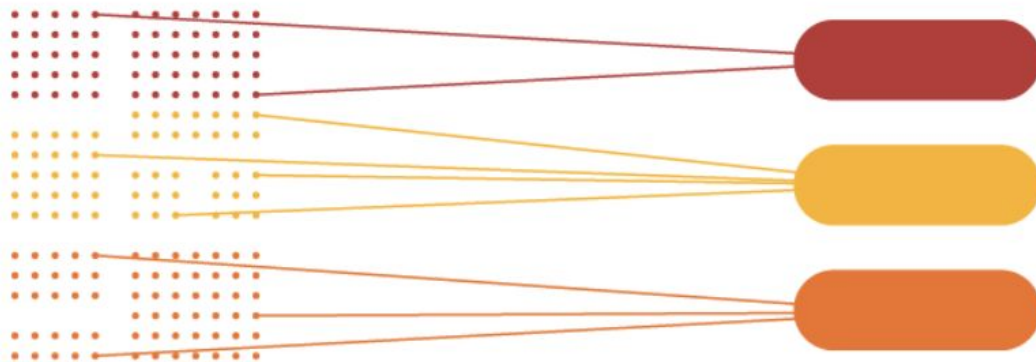
Prepare parachain candidates and proofs of validity



Nomination

Nominators

Validators



*So you want to stake on
Polkadot?*

Polkadot

Why stake?

Avoid inflation, take rewards

- 10% inflation/year @ genesis
- 50% targeted active staking
- ~20% annual return

Polkadot

Why not stake?

- Tokens locked for ~12 weeks
- Punishment in case of validator found to be misbehaving
- Designed to be minimal when “accidental” and non-dangerous for the network
- Heavy when safety/liveness of network is jeopardised

Polkadot

Types of staking

Two types of staking:

- Validation
- Nomination

Staker can also be idle

Polkadot

Validation

- Run a secure node
- Good connectivity
- 24/7 uptime
- Must be one of 1,000 selected:
- Total backing must be sufficiently high
- ~5,000 DOTs
- Backing can be yours or from nominators

Polkadot

Nomination

- Approve of (entrust DOTs to) one or more validators
- For highest payout chances, select less-popular, competent validators
- Popular validators will be oversubscribed and share fewer rewards
- Incompetent validators risk slashing

Polkadot

How does it work?

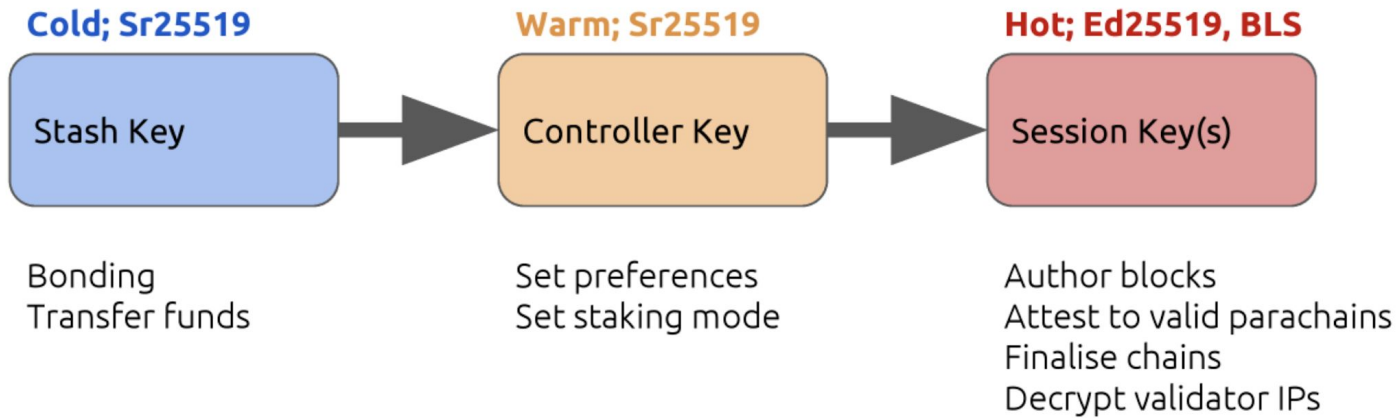
- Algorithm used to intelligently share each nominator's backing between approved validators
- Top 1,000 validators selected
- Algorithm maximises the **minimally backed validator of those selected.**

Polkadot

Economics

- Payout proportional to minimally backed validator
- Punishment proportional to backing of validator
- Validator slashed as much as possible before nominators

In terms of risk/reward, **natural propensity to move towards less popular validators**



Polkadot

Keys

Two accounts: **stash** and **controller**

Stash

- Cold/frozen (paper)
- Only used to transfer funds out

Controller

- Warm (secure device)
- Change options
- Set session keys
- Set staking mode

Polkadot

Keys

Several further keys agglomerated into the **Session key**

- Ed25519 key for Aura (and later BABE)
- BLS key for GRANDPA
- Potentially others for parachain validity attestations

Polkadot

(S)election

- New validator set chosen every 24 hour “era”
- Smart algorithm used to pair nominators with validators optimally
- Nominators stake split recorded for determining rewards and punishments

Demo

- Polkadot Testnet Explorer
 - <https://polkadot.js.org/apps/#/explorer>
- Polkadot Telemetry
 - <https://telemetry.polkadot.io/#list/Alexander>

Ressources

- <https://wiki.polkadot.network/en/latest/polkadot/learn/staking/>
- <https://slides.com/paritytech/validating-in-polkadot/#/>
- <https://www.youtube.com/watch?v=4Wz6FHqaTLk>

Annexes



STASH

5GjSqN...W6VMZL

26Jx2N

STASH

total 1.125 DOT
available 1.125 DOT

transactions 0
crypto type sr25519



SESSION

5CECpH...ZsYWW1

SESSION

total 0
available 0

transactions 0
crypto type ed25519



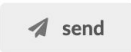
CONTROLLER

5HpcYd...HQvCCc

add tags

total 0
available 0

transactions 0
crypto type sr25519



Bonding Preferences

stash account



STASH

5GjSqNLs6QnzMQH4gBFY... ▼

controller account ?



CONTROLLER

5HpcYdafmpW6H4yRjtxk... ▼

value bonded ?

1.12311

DOT ▼

payment destination ?

Stash account (increase the amount at stake) ▼

Cancel

or

Bond

staking.bond

► Take the origin account as a stash and lock up `value` of its balance. `controller` will be the account that controls it. The dispatch ori...

sending from my account



STASH

5GjSgNLs6QnzMQH4gBFYxpy57oZUZbM...

controller: Address



CONTROLLER

5HpcYdafmpW6H4yRjtXkXwPQzYWiC...

value:
Compact<BalanceOf>

1.123

DOT

payee: RewardDestination

Staked

- Fees includes the transaction fee and the per-byte fee
- Fees totalling 2.450m DOT will be applied to the submission
- 2.450m DOT total transaction amount (fees + value)

unlock account with password



Cancel

or

Sign and Submit

Staking overview

Account actions



+ New stake



stash

STASH

available 0



controller

CONTROLLER

available 0

Set Session Key

or

Nominate



bonded 1.123 DOT

reward destination **staked**

Set Session Key

controller account



CONTROLLER

5HpcYdafmpW6H4yRjtxk...

session key ?



SESSION

5CECpHRRNatpqPbXL47v... ▼

Cancel

or

Set Session Key



stash

STASH 

available 0



controller

CONTROLLER 

available 995.280m DOT



session

SESSION SEED 

available 0

Validate

or

Nominate



bonded 1.123 DOT

reward destination staked



stash

STASH 

available 0



controller

CONTROLLER 

available 995.280m DOT



session

SESSION SEED 

available 0

Validate

or

Nominate



Unbond funds

Change controller account

Change reward destination

Change session account

bonded 1.123

reward destination staked

Set validator preferences

stash account



STASH

5GjSqNLs6QnzMQH4gBFY...

controller account



CONTROLLER

5HpcYdafmpW6H4yRjtxk...

automatic unstake threshold ?

3

reward commission ?

0

DOT ▼

Cancel

or

Validate

staking.validate

► Declare the desire to validate for the origin controller. Effects will be felt at the beginning of the next era. The dispatch origin for this ...

sending from my account



CONTROLLER

5HpcYdafmpW6H4yRjtxkXwPQzYWiCd4...

prefs: ValidatorPrefs {"unstakeThreshold":3,"validatorPayment":0}

- Fees includes the transaction fee and the per-byte fee
- Fees totalling 2.050m DOT will be applied to the submission
- 2.050m DOT total transaction amount (fees + value)

Cancel

or

Sign and Submit

validators

37/42

waiting

2

last block

 1,889,412

session

 34/50

era

 234/600

validators



VALIDATOR (STASH)

5DuiZF...YEqrri

bonded 500.000 DOT (+1.775 DOT)

► Nominators (7)



VALIDATOR (STASH)

5DqAzP...hgu9pd

bonded 500.000 DOT (+99.999m DOT)

► Nominators (1)



VALIDATOR (STASH)

5Dyp3Z...mtcyJe

bonded 500.000 DOT



VALIDATOR (STASH)

5CAPBz...58hxsx

bonded 500.000 DOT



VALIDATOR (STASH)

5Crash...nQpdNo

bonded 51.003 DOT

controller/session

5GeJHN...AwK1Ez



controller/session

5DPWln...NtRv4S



controller/session

5H4787...zc2P5x



controller/session

5Dn8F1...sinXsE



controller

5FZMFE...kCh3H1



session

5H5Wrw...9QBzeU



next up



STASH

5GjSqN...W6VMZL

bonded 1.123 DOT



INTENTION (STASH)

5D7e9g...CBKrJX

bonded 50.000f DOT

controller

CONTROLLER



session

SESSION SEED



controller/session

5D7e9g...CBKrJX



prer
unts
ess book
sfer
ng
ocracy
ncil



stash
STASH

Reported offline 8 times, last at #1,914,027



controller
CONTROLLER
available 489.770m DOT



session
SESSION SEED
available 0

Validate

or

Nominate



bonded 1.123 DOT

reward destination **staked**