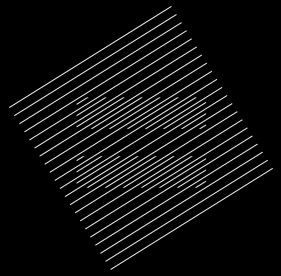
Substrate & Parachain Workshop



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Substrate is a FRAMEWORK for

BUILDING BLOCKCHAINS

Parachain Workshop

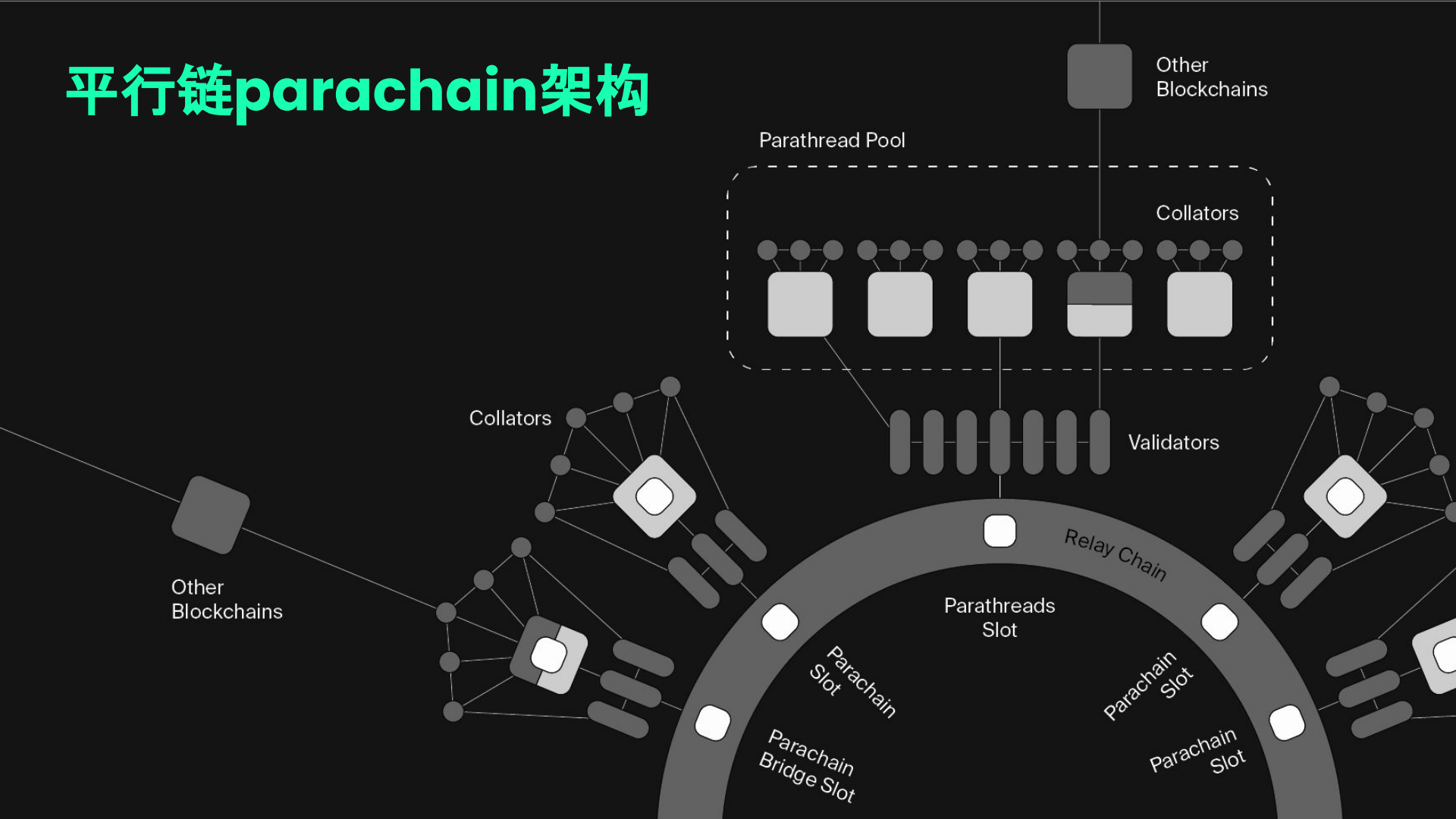
环境准备 - Build Relay Chain

```
# Clone the Polkadot Repository

git clone https://github.com/paritytech/polkadot.git

# Switch into the Polkadot directory

cd polkadot

git checkout 93f0029

# Setup proper Rust version for compiling this workshop

rustup install nightly-2020-10-06

rustup target add wasm32-unknown-unknown --toolchain nightly-2020-10-06

# Build the Relay Chain Node

cargo +nightly-2020-10-06 build --release

./target/release/polkadot --help
```

环境准备 - Build Parachain Template

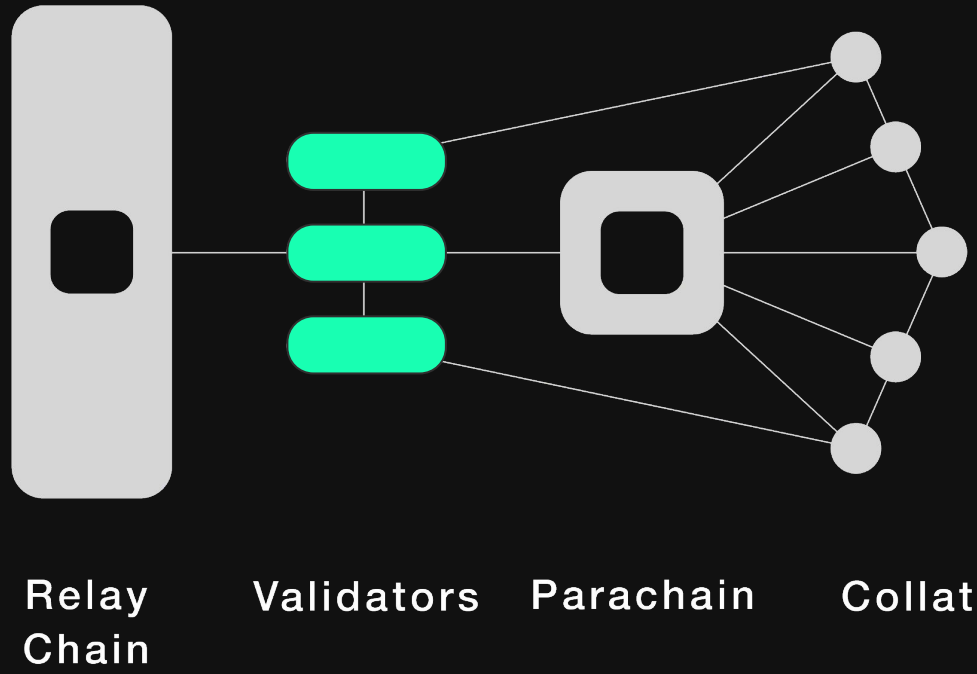
```
# Clone the Parachain Template

git clone https://github.com/substrate-developer-hub/substrate-parachain-template.git

# Switch into the Parachain Template directory

cd substrate-parachain-template

git checkout 9506b93

# Build the parachain template collator

cargo build --release

# Print the help page to ensure the node built correctly

./target/release/parachain-collator --help
```

平行链parachain架构



平行链block构造逻辑

- Collators构造Proof of Validating blocks (PoVBlock)
- 每个平行链的validator(在relaychain上)选择一个 PoVBlock并且做验证
- 验证的结果会在relaychain的所有validator中广播
- Validator相互再验证其他平行链的结果
- 获得大多数validator许可的PoVBlock会被包括在relaychain中
- 平局？掷硬币!



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平行链block构造逻辑

- **平行链可以允许运行自己的共识逻辑：**
  - BABE
  - AURA
  - POW
  - Sassafras

- 这可以帮助减低PoVBlocks的提交数量
-
- 可以帮助设计更好的平行链激励策略
-
- 最后哪一个PoVBlock将会被写入Relaychain还是由validator决定的

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Build the spec

./target/release/polkadot build-spec --chain rococo-local --disable-default-bootnode > rococo-custom-plain.json

以上命令仅用于展示，本次workshop的spec请下载 https://github.com/ParityAsia/Wuhan-workshop/blob/master/rococo-3.json到polkadot和substrate-parachain-template目录下。

Note：自己生成的json文件必须以rococo作为开头命名

Start Relay Chain

Switch into the Polkadot directory and start the node

cd polkadot

./target/release/polkadot --chain rococo-3.json --tmp --ws-port 9944 --port 30333 --alice

./target/release/polkadot --chain rococo-3.json --tmp --ws-port 9955 --port 30334 --bob # New Terminal

./target/release/polkadot --chain rococo-3.json --tmp --ws-port 9966 --port 30335 --charlie # New Terminal

链状态页面：https://polkadot.js.org/apps/#/?rpc=ws://localhost:9944

Start Parachain

```
# 获得链的初始状态

cd substrate-parachain-template

./target/release/parachain-collator export-genesis-state --parachain-id 200 > para-200-genesis


# 获得链的wasm

./target/release/parachain-collator export-genesis-wasm > para-200-wasm


# 启动parachain

./target/release/parachain-collator --ws-port 9977 --port 30336 --tmp --parachain-id 200 --validator -- \

--chain rococo-3.json
```

Register Parachain

真实环境中，通过auction模块来决定parachain slot的分配，这里为了展示我们使用sudo（超级权限）来快速注册

打开Polkadotjs页面，注册路径：**Apps > Sudo > Registrar > registerPara**

Polkadotjs前端配置：

Settings -> Developer

```
{
    "Address": "AccountId",
    "LookupSource": "AccountId"
}
```

Cross Chain Message

HMP (Horizontal Message Passing)

在平行链之间传递的消息

VMP(Vertical Message Passing)

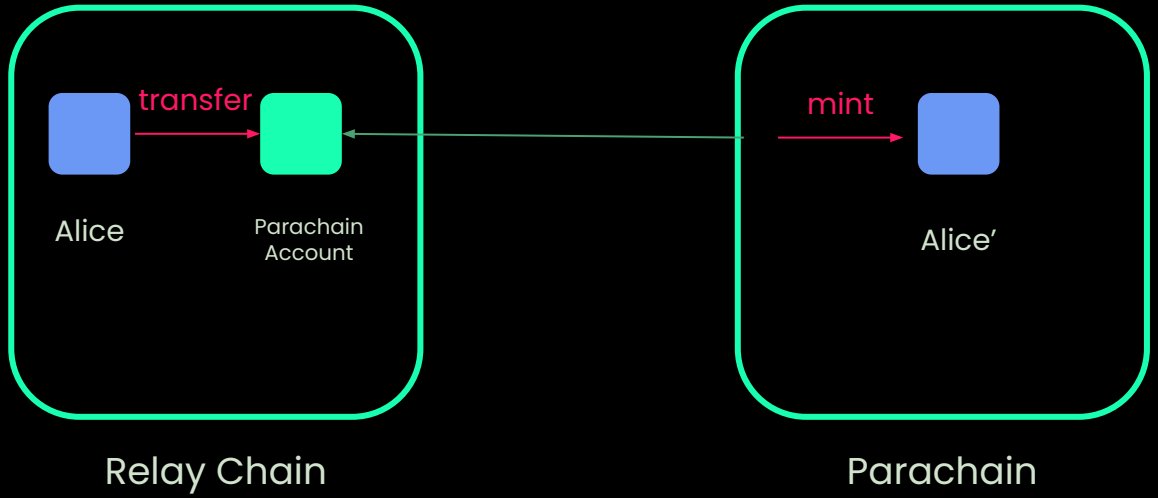
在Relay Chain和Parachain之间传递的消息

- DMP (Downward Message Passing)
- UMP (Upward Message Passing)

VMP

Relay Chain <-> Parachain

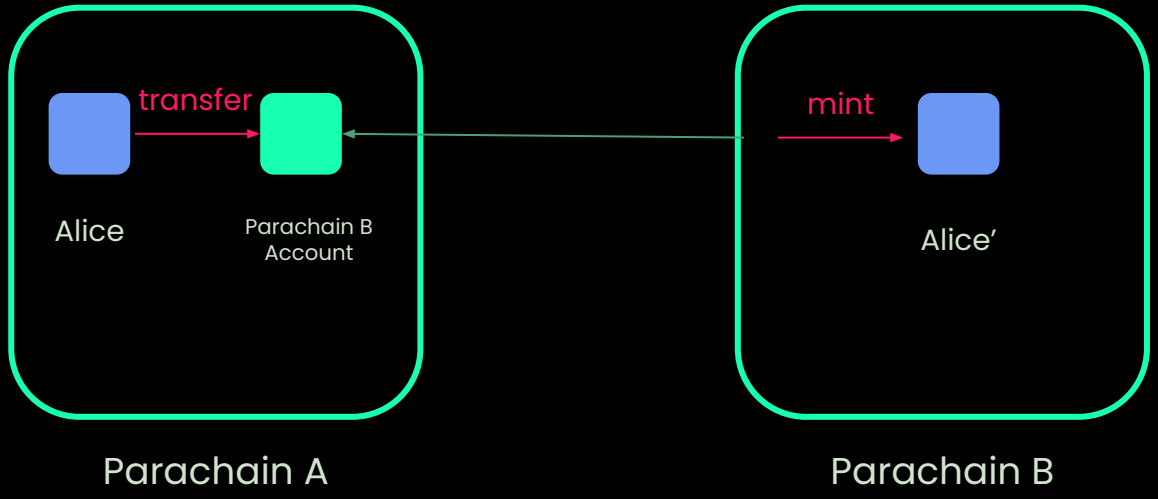
Depository Model



HMP

Parachain <-> Parachain

Depository Model



今天开始建立你自己的区块链

https://substrate.dev

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Thanks.

Any Questions?