Go实现gtihub地址：https://github.com/cosmos/ibc-go
Rust实现github地址：https://github.com/cosmos/ibc-rs
solidity实现github地址：https://github.com/hyperledger-labs/yui-ibc-solidity

文档地址：https://ibc.cosmos.network/；https://ibc.cosmos.network/
relayer地址：https://github.com/cosmos/relayer
ibc协议：https://ibcprotocol.org/
跨链安全：https://github.com/informalsystems/cross-chain-validation
官网地址：https://cosmos.network/features
博客：https://blog.cosmos.network/

ibc Specs规格文档：https://github.com/cosmos/ibc ；https://github.com/cosmos/ibc/tree/main/spec

IBC跨链前端界面：https://app.emeris.com/welcome
IBC跨链标准描述：https://github.com/cosmos/ibc
IBC跨链慈善机构：https://sparkibc.zone/

IBC的Rust实现代码：https://hermes.informal.systems/； https://github.com/informalsystems/ibc-rs：
Rust实现博客介绍https://informal.systems/blog/paving-the-way-for-a-v1-release-of-ibc-rs

IBC跨链浏览器：https://ibc.jobscan.io/home
OpenIBC：https://www.openibc.com/；https://twitter.com/OpenIBC；https://github.com/open-ibc
IBC-Summit：https://www.ibcsummit.org/

IBC 可视化工具：
MapOfZones 更直观的展示了链与链互连通道:https://mapofzones.com/
Mintscan 更详细的展示了中继器的相关信息:https://hub.mintscan.io/chains/overview
IOBScan 更便捷的可以通过交易哈希进行搜索:https://ibc.iobscan.io/home

一.Contents

1. **Core IBC Implementation**

   1.1 ICS 02 Client

   1.2 ICS 03 Connection

   1.3 ICS 04 Channel：channelupgrade:https://github.com/cosmos/ibc/blob/main/spec/core/ics-004-channel-and-packet-semantics/UPGRADES.md

2. 1.4 ICS 05 Port

   1.5 ICS 23 Commitment

   1.6 ICS 24 Host

3. **Applications**

   2.1 ICS 20 Fungible Token Transfers

   2.2 ICS 27 Interchain Accounts

   2.3 ICS-029-fee-payment：https://github.com/cosmos/ibc/tree/master/spec/app/ics-029-fee-payment

   2.4 ICS-030-middleware：https://github.com/cosmos/ibc/tree/master/spec/app/ics-030-middleware

   2.5 ICS-721-nft-transfer：https://github.com/cosmos/ibc/tree/master/spec/app/ics-721-nft-transfer

   增加一个ibc跨链路由：https://github.com/cosmos/ibc-go/pull/373/files

   IBC的app：https://github.com/cosmos/ibc-go

   async-icq；interchain-queries；query；packet-forward-middleware；recovery；ibc-rate-limit

App

Interchain Standard Number	Standard Title	Stage	Implementations	Maintainer
20	Fungible Token Transfer	Candidate	ibc-go	Protocol team
27	Interchain Accounts	Candidate	ibc-go	Protocol team
28	Cross-Chain Validation	Draft		Protocol team
29	General Relayer Incentivization Mechanism	Candidate	ibc-go	Protocol team
30	IBC Application Middleware	N/A	N/A	Protocol team
31	Cross-Chain Queries	Draft	N/A	Protocol team
32	Interchain Queries	Candidate	async-icq	Strangelove Ventures
100	Interchain Atomic Swap	Candidate	ibcswap	Side Labs
721	Non-Fungible Token Transfer	Candidate	nft-transfer	IRIS Network

callback插件介绍：https://ibc.cosmos.network/architecture/adr-008-app-caller-cbs
Evmos：Evmos will be among the first chains to implement callbacks middleware @IBCProtocol：
https://twitter.com/EvmosOrg/status/1710218376696778839
博客介绍：https://www.ibcprotocol.dev/blog/callbacks-middleware-evmos-case-study
代码：https://github.com/cosmos/ibc-go/tree/main/modules/apps/callbacks

4.Light Clients

3.1 ICS 07 Tendermint

3.2 ICS 06 Solo Machine

3.3 :https://github.com/cosmos/ibc-go/tree/main/modules/light-clients/08-wasm

3.4 :https://github.com/cosmos/ibc-go/tree/main/modules/light-clients/09-localhost

5. IBC Relayer
Go语言实现的relayer：https://github.com/cosmos/relayer
Rust语言实现的relayer：https://github.com/informalsystems/ibc-rs/tree/master/relayer；https://github.com/informalsystems/hermes
Typescript语言实现的IBC Relayer：https://github.com/confio/ts-relayer

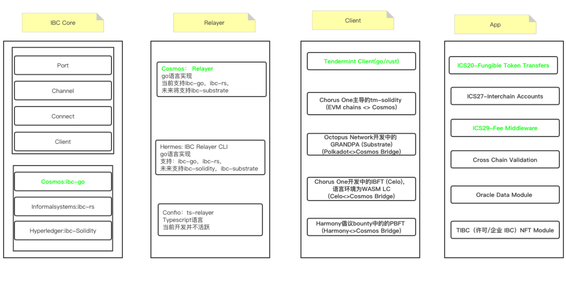
二.Roadmap
For an overview of upcoming changes to ibc-go take a look at the roadmap.

三：生态项目：

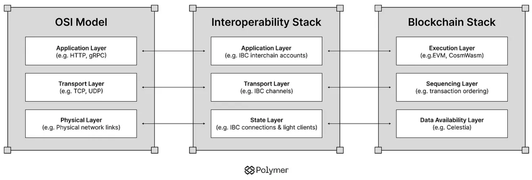
In the table below `app` refers to IBC application modules for custom use cases and `middleware` refers to modules that wrap an IBC application enabling custom logic to be executed.

Description	Repository
An application that enables on chain querying of another IBC enabled chain utilizing `baseapp.Query`. Both chains must have implemented the query application and ICA (for queries requiring consensus).	ICQ
An application that enables on chain querying of another IBC enabled chains state without the need for the chain being queried to implement the application.	interchain-queries
An application that enables on chain querying of another IBC enabled chains state without the need for the chain being queried to implement the application. Similar to the interchain-queries application in the row above but without callbacks.	query
An application that enables cross chain NFT transfer.	NFT Transfer (ICS 721)
Middleware enabling a packet to be sent to a destination chain via an intermediate chain, e.g. going from Juno to Osmosis via the Hub.	packet-forward-middleware
Middleware enabling the recovery of tokens sent to unsupported addresses.	recovery
Middleware that limits the in or out flow of an asset in a certain time period to minimise the risks of cross chain token transfers.	IBC-rate-limiting

四：IBC-工程：



五：
IBC 协议的 3 个核心层及其与互联网的类比：
- 应用 <> HTTP、gRPC ⇒ IBC 跨链账户。
- 传输 <> TCP、UDP ⇒ IBC 通道。
- 状态 <> 物理网络 ⇒ IBC 连接和轻客户端。



Polymer