Deploy an EVM <-> SVM Warp Route

Prerequisites

Ensure you have the following installed and configured:

- Hyperlane Monorepo
- Rust (latest stable version)
- Yarn and Node.js (latest stable version)
- Solana CLI tools

Walkthrough

Step 1: Create the Warp Route Directory

1. In./rust/sealevel/environments{environment}
2. , create a directory calledwarp-routes
3. Insidewarp-routes
4. , create a new directory for your Warp Route deployment, e.g., e.g.environments/mainnet3/warp-routes/pzeth
5. Optional:
6. If you want to, open a PR to thehyperlane-registry
7. with metadata to associate with the synthetic token in the Warp Route. Examplehere
8. .
9.
    - Tip:
10.
    - Although not critical, for theimage
11.
    - field try to pick a source that is unlikely to break the URL

Step 2: Deploy on the SVM Side

1. From here on, to deploy on the SVM side you can also follow our official guide for tipsDeploy SVM Warp Route
2. Createtoken-config.json
3. for the SVM configuration, e.g.
4. {
5. "solana"
6. :
7. {
8. "type"
9. :
10. "synthetic"
11. ,
12. "decimals"
13. :
14. 9
15. ,
16. "name"
17. :
18. "Renzo Restaked LST"
19. ,
20. "symbol"
21. :
22. "pzETH"
23. ,
24. "uri"
25. :
26. "https://raw.githubusercontent.com/hyperlane-xyz/hyperlane-registry/12660fd34d30e960a748d87408a8d88f634f7454/deployments/warp_routes/pzETH/ethereum-solana-metadata.json"
27. ,
28. "interchainGasPaymaster"
29. :
30. "5FG1TUuhXGKdMbbH8uHEnUghazD4aVfEPAgKLNGNx3SL"
31. ,
32. "remoteDecimals"

33. :
34. 18
35. }
36. }
37.
    - Often EVM tokens have 18 decimals, which are too large for the SVM. The pattern is to bridge them into SOL as 9 decimals. This can be done usingremoteDecimals: 18
38.
    - .
39. Run the deployment command:
40. cargo
41. run --
42. -k
43. ~/solana-mainnet-deployer-keypair.json warp-route deploy
44. \
45. --warp-route-name pzeth
46. \
47. --environment
48. mainnet3
49. \
50. --environments-dir
51. ..
52. /environments
53. \
54. --built-so-dir
55. ..
56. /
57. ..
58. /target/deploy
59. \
60. --token-config-file
61. ..
62. /environments/mainnet3/warp-routes/pzeth/token-config.json
63. \
64. --chain-config-file
65. ..
66. /environments/mainnet3/chain-config.json
67. \
68. --ata-payer-funding-amount
69. 50000000

Step 3: Deploy on the Ethereum Side

1. Deploy the Ethereum Warp Route contract, which will also enroll the SVM router based on the yaml token config.
2.
    1. Check out the monorepo branch from thisPR#4447
3.
    1. Build the TS code from project root:yarn && yarn build
4.
    1. Run the CLI from source:yarn workspace @hyperlane-xyz/cli hyperlane
5.
    1. Create a YAML Warp Route configuration file using this template and steps:
6.
    1.
        - SetinterchainSecurityModule: "0x0000000000000000000000000000000000000000"
7.
    1.
        - to use the default ISM set in the destination chain Mailbox
8.
    1.
        - Set thegas
9.
    1.
        - to a ceiling of the compute units you expect the SVM message delivery transaction to take. For instance, Hyperlane Warp Routes have gas set to300
10.
    1.
        - . It's important for this to be an upper limit - the relayer will not deliver Warp Route transfer messages

otherwise, because senders would pay an insufficient amount to have them delivered.

11.
    1. ethereum:
12.
    1. interchainSecurityModule: "0x0000000000000000000000000000000000000000"
13.
    1. isNft: false
14.
    1. mailbox: "0xc005dc82818d67AF737725bD4bf75435d065D239"
15.
    1. owner: "0xa7ECcdb9Be08178f896c26b7BbD8C3D4E844d9Ba"
16.
    1. token: "0xa0b86991c6218b36c1d19d4a2e9eb0ce3606eb48"
17.
    1. type: collateral
18.
    1. gas: 300000
19.
    1. eclipsemainnet:
20.
    1. foreignDeployment: "D6k6T3G74ij6atCtBiWBs5TbFa1hFVcrFUSGZHuV7q3Z"
21.
    1. mailbox: "EitxJuv2iBjsg2d7jVy2LDC1e2zBrx4GB5Y9h2Ko3A9Y"
22.
    1. owner: "9bRSUPjfS3xS6n5EfkJzHFTRDa4AHLda8BU2pP4HoWnf"
23.
    1. interchainSecurityModule: "0x0000000000000000000000000000000000000000"
24.
    1. type: synthetic
25.
    1. gas: 300000
26.
    1. Deploy using the Hyperlane CLI:
27.
    1.
        - Run the deploy command, pointing to your YAML Warp Route config:yarn workspace @hyperlane-xyz/cli hyperlane warp deploy --config /path/to/config/warp-route-deployment.yaml
28.
    1.
        - You'll have the deployment artifact logged by the command, and also stored in your filesystem registry (currently~/.hyperlane
29.
    1.
        -).
30.
    1. Confirm the deployment using the Hyperlane CLI:
31.
    1. cast call 0x1D622da2ce4C4D9D4B0611718cb3BcDcAd008DD4
32.
    1. 'routers(uint32)(bytes32)'
33.
    1. DESTINATION_DOMAIN
34.
    1. --rpc-url
35.
    1. (
36.
    1. rpc ethereum
37.
    1.)
38.
    1. 1399811149
39.
    1. 0xe9792265ec273ffc17731af890d3e9963e9d744e7b99f02491911ce1bb75b8cb

Step 4: Update the SVM token-config.json

1. Back to Solana tooling now, update thetoken-config.json

2. with the foreign deployment:
3. The fields forethereum
4. should be set to values from the Warp Route contract artifact.token
5. should be set tocollateralAddressOrDenom
6. (the address of the token being bridge), andforeignDeployment
7. should be set toaddressOrDenom
8. (the address of the Warp Route contract, likeHypERC20Collateral
9.).
10. {
11. "solana"
12. :
13. {
14. "type"
15. :
16. "synthetic"
17. ,
18. "decimals"
19. :
20. 9
21. ,
22. "name"
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24. "Renzo Restaked LST"
25. ,
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31. :
32. "https://raw.githubusercontent.com/hyperlane-xyz/hyperlane-registry/12660fd34d30e960a748d87408a8d88f634f7454/deployments/warp_routes/pzETH/ethereum-solana-metadata.json"
33. ,
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37. ,
38. "remoteDecimals"
39. :
40. 18
41. }
42. ,
43. "ethereum"
44. :
45. {
46. "type"
47. :
48. "collateral"
49. ,
50. "decimals"
51. :
52. 18
53. ,
54. "token"
55. :
56. "0x8c9532a60e0e7c6bbd2b2c1303f63ace1c3e9811"
57. ,
58. "foreignDeployment"
59. :
60. "0x1D622da2ce4C4D9D4B0611718cb3BcDcAd008DD4"
61. }
62. }

Step 5: Deployment

1. Run the final deployment command:

```
cargo run -- -k ~/solana-mainnet-deployer-keypair.json warp-route deploy \
  --warp-route-name pzeth \
  --environment mainnet3 \
  --environments-dir .. /environments \
  --built-so-dir .. / .. /target/deploy \
  --token-config-file .. /environments/mainnet3/warp-routes/pzeth/token-config.json \
  --chain-config-file .. /environments/mainnet3/chain-config.json \
  --ata-payer-funding-amount 50000000
```

Edit this page Previous Deploy an SVM Warp Route Next Manage Warp Route Limits on xERC20 and FiatToken