@serve.zone/remoteingress

remoteingress allows a cluster to be on some computer behind a NAT, and have a RemotePublicConnector runing on a small VPS running somewhere in the cloud.

- readme.md for @serve.zone/remoteingress
- changelog.md for @serve.zone/remoteingress

readme.md for @serve.zone/remoteingress

Edge ingress tunnel for DcRouter — tunnels **TCP and UDP** traffic from the network edge to a private DcRouter/SmartProxy cluster over encrypted TLS or QUIC connections, preserving the original client IP via PROXY protocol. Includes **hub-controlled nftables firewall** for IP blocking, rate limiting, and custom firewall rules applied directly at the edge.

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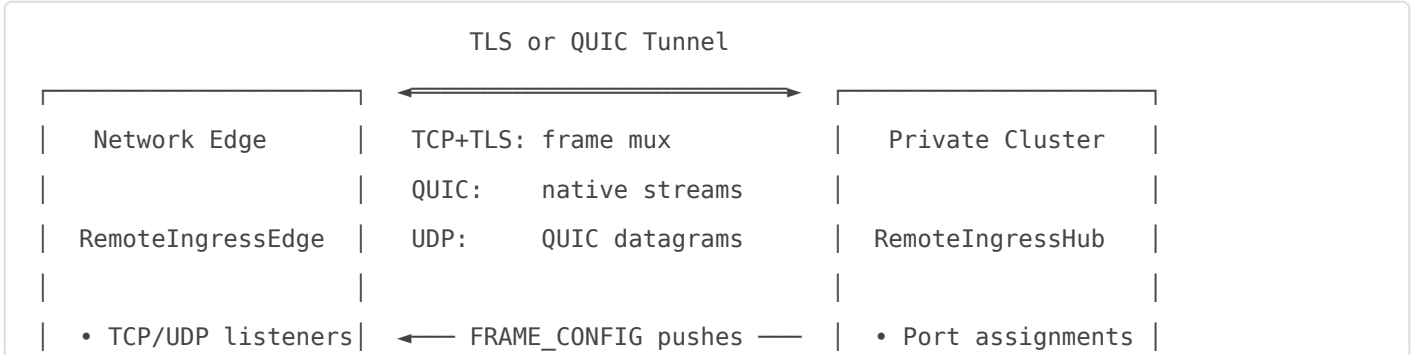
Install

```
pnpm install @serve.zone/remoteingress
```

Architecture

`@serve.zone/remoteingress` uses a **Hub/Edge** topology with a high-performance Rust core and a TypeScript API surface:



Component	Role
RemoteIngressEdge	Deployed at the network edge (VPS, cloud instance). Runs as root. Listens on hub-assigned TCP/UDP ports, tunnels traffic to the hub, and applies hub-pushed nftables rules (IP blocking, rate limiting). All config is hot-reloadable at runtime.
RemoteIngressHub	Deployed alongside DcRouter/SmartProxy in a private cluster. Accepts edge connections, demuxes streams/datagrams, and forwards each to SmartProxy with PROXY protocol headers so the real client IP is preserved. Pushes all edge config (ports, firewall) via a single API.
Rust Binary (`remoteingress-bin`)	The performance-critical networking core. Managed via `@push.rocks/smartrust` RustBridge IPC — you never interact with it directly. Cross-compiled for `linux/amd64` and `linux/arm64`.

⚡ Key Features

- **Dual transport** — choose between TCP+TLS (frame-multiplexed) or QUIC (native stream multiplexing, zero head-of-line blocking)
- **TCP + UDP tunneling** — tunnel any TCP connection or UDP datagram through the same edge/hub pair
- **PROXY protocol v1 & v2** — SmartProxy sees the real client IP for both TCP (v1 text) and UDP (v2 binary)
- **Hub-controlled firewall** — push nftables rules (IP blocking, rate limiting, custom firewall rules) to edges as part of the same config update that assigns ports — powered by `@push.rocks/smartnftables`
- **Multiplexed streams** — thousands of concurrent TCP connections over a single tunnel
- **QUIC datagrams** — UDP traffic forwarded via QUIC unreliable datagrams for lowest possible latency
- **Shared-secret authentication** — edges must present valid credentials to connect
- **Connection tokens** — encode all connection details into a single opaque base64url string
- **STUN-based public IP discovery** — edges automatically discover their public IP via Cloudflare STUN
- **Auto-reconnect** with exponential backoff if the tunnel drops

- **Dynamic runtime configuration** — the hub pushes ports, firewall rules, and rate limits to edges at any time via a single `updateAllowedEdges()` call
- **Event-driven** — both Hub and Edge extend `EventEmitter` for real-time monitoring
- **3-tier QoS** — control frames, normal data, and sustained (elephant flow) traffic each get their own priority queue
- **Adaptive flow control** — per-stream windows scale with active stream count to prevent memory overuse
- **UDP session management** — automatic session tracking with 60s idle timeout and cleanup
- **Crash recovery** — automatic restart with exponential backoff if the Rust binary crashes unexpectedly

Usage

Both classes are imported from the package and communicate with the Rust binary under the hood.

Setting Up the Hub (Private Cluster Side)

```
import { RemoteIngressHub } from '@serve.zone/remoteingress';

const hub = new RemoteIngressHub();

// Listen for events
hub.on('edgeConnected', ({ edgeId }) => console.log(`Edge ${edgeId} connected`));
hub.on('edgeDisconnected', ({ edgeId }) => console.log(`Edge ${edgeId} disconnected`));
hub.on('streamOpened', ({ edgeId, streamId }) => console.log(`Stream ${streamId} from
${edgeId}`));
hub.on('streamClosed', ({ edgeId, streamId }) => console.log(`Stream ${streamId} closed`));

// Start the hub — listens for edge connections on both TCP and QUIC (same port)
await hub.start({
  tunnelPort: 8443,        // port edges connect to (default: 8443)
  targetHost: '127.0.0.1', // SmartProxy host to forward traffic to
});

// Register allowed edges with TCP and UDP listen ports + firewall config
await hub.updateAllowedEdges([
  {
```

```
    id: 'edge-nyc-01',
    secret: 'supersecrettoken1',
    listenPorts: [80, 443],        // TCP ports the edge should listen on
    listenPortsUdp: [53, 51820],   // UDP ports (e.g., DNS, WireGuard)
    stunIntervalSecs: 300,
    firewallConfig: {
      blockedIps: ['192.168.1.100', '10.0.0.0/8'],
      rateLimits: [
        { id: 'http-rate', port: 80, protocol: 'tcp', rate: '100/second', perSourceIP: true },
      ],
      rules: [
        { id: 'allow-ssh', direction: 'input', action: 'accept', sourceIP: '10.0.0.0/24',
destPort: 22, protocol: 'tcp' },
      ],
    },
  },
  {
    id: 'edge-fra-02',
    secret: 'supersecrettoken2',
    listenPorts: [443, 8080],
  },
]);

// Dynamically update ports and firewall — changes are pushed instantly to connected edges
await hub.updateAllowedEdges([
  {
    id: 'edge-nyc-01',
    secret: 'supersecrettoken1',
    listenPorts: [80, 443, 8443],    // added TCP port 8443
    listenPortsUdp: [53],            // removed WireGuard UDP port
    firewallConfig: {
      blockedIps: ['192.168.1.100', '10.0.0.0/8', '203.0.113.50'],  // added new blocked IP
      rateLimits: [
        { id: 'http-rate', port: 80, protocol: 'tcp', rate: '200/second', perSourceIP: true },
      ],
    },
  },
]);
```

```
// Check status
const status = await hub.getStatus();
// { running: true, tunnelPort: 8443, connectedEdges: [...] }

await hub.stop();
```

Setting Up the Edge (Network Edge Side)

The edge can connect via **TCP+TLS** (default) or **QUIC** transport. Edges run as **root** so they can bind to privileged ports and apply nftables firewall rules.

Option A: Connection Token (Recommended)

```
import { RemoteIngressEdge } from '@serve.zone/remoteingress';

const edge = new RemoteIngressEdge();

edge.on('tunnelConnected', () => console.log('Tunnel established'));
edge.on('tunnelDisconnected', () => console.log('Tunnel lost — will auto-reconnect'));
edge.on('publicIpDiscovered', ({ ip }) => console.log(`Public IP: ${ip}`));
edge.on('portsAssigned', ({ listenPorts }) => console.log(`TCP ports: ${listenPorts}`));
edge.on('firewallConfigUpdated', () => console.log('Firewall rules applied'));

await edge.start({
  token: 'eyJoIjoiaHViLmV4YW1wbGUuY29tIiwi...',
});
```

Option B: Explicit Config with QUIC Transport

```
import { RemoteIngressEdge } from '@serve.zone/remoteingress';

const edge = new RemoteIngressEdge();

await edge.start({
  hubHost: 'hub.example.com',
  hubPort: 8443,
  edgeId: 'edge-nyc-01',
  secret: 'supersecrettoken1',
  transportMode: 'quic',  // 'tcpTls' (default) | 'quic' | 'quicWithFallback'
```

```
});

const edgeStatus = await edge.getStatus();
// { running: true, connected: true, publicIp: '203.0.113.42', activeStreams: 5, listenPorts:
[80, 443] }

await edge.stop();
```

Transport Modes

Mode	Description
`'tcpTls'`	**Default.** Single TLS connection with frame-based multiplexing. Universal compatibility.
`'quic'`	QUIC with native stream multiplexing. Eliminates head-of-line blocking. Uses QUIC datagrams for UDP traffic.
`'quicWithFallback'`	Tries QUIC first (5s timeout), falls back to TCP+TLS if UDP is blocked by the network.

Connection Tokens

Encode all connection details into a single opaque string for easy distribution:

```
import { encodeConnectionToken, decodeConnectionToken } from '@serve.zone/remoteingress';

// Hub operator generates a token
const token = encodeConnectionToken({
  hubHost: 'hub.example.com',
  hubPort: 8443,
  edgeId: 'edge-nyc-01',
  secret: 'supersecrettoken1',
});
// => 'eyJoIjoiaHViLmV4YW1wbGUuY29tIiwi...'

// Edge operator decodes (optional — start() does this automatically)
const data = decodeConnectionToken(token);
// { hubHost: 'hub.example.com', hubPort: 8443, edgeId: 'edge-nyc-01', secret: '...' }
```

Tokens are base64url-encoded — safe for environment variables, CLI arguments, and config files.

□□ Firewall Config

The `firewallConfig` field in `updateAllowedEdges()` works exactly like `listenPorts` — it travels in the same `FRAME_CONFIG` frame, is delivered on initial handshake and on every subsequent update, and is applied atomically at the edge using `@push.rocks/smartnftables`. Each update fully replaces the previous ruleset.

Since edges run as root, the rules are applied directly to the Linux kernel via nftables. If the edge isn't root or nftables is unavailable, it logs a warning and continues — the tunnel works fine, just without kernel-level firewall rules.

Config Structure

```
interface IFirewallConfig {
  blockedIps?: string[];           // IPs or CIDRs to block (e.g., '1.2.3.4', '10.0.0.0/8')
  rateLimits?: IFirewallRateLimit[];
  rules?: IFirewallRule[];
}

interface IFirewallRateLimit {
  id: string;                      // unique identifier for this rate limit
  port: number;                    // port to rate-limit
  protocol?: 'tcp' | 'udp';       // default: both
  rate: string;                    // e.g., '100/second', '1000/minute'
  burst?: number;                  // burst allowance
  perSourceIP?: boolean;           // per-client rate limiting (recommended)
}

interface IFirewallRule {
  id: string;                      // unique identifier for this rule
  direction: 'input' | 'output' | 'forward';
  action: 'accept' | 'drop' | 'reject';
  sourceIP?: string;               // source IP or CIDR
  destPort?: number;               // destination port
  protocol?: 'tcp' | 'udp';
  comment?: string;
}
```

Example: Rate Limiting + IP Blocking

```
await hub.updateAllowedEdges([
  {
    id: 'edge-nyc-01',
    secret: 'secret',
    listenPorts: [80, 443],
    firewallConfig: {
      // Block known bad actors
      blockedIps: ['198.51.100.0/24', '203.0.113.50'],

      // Rate limit HTTP traffic per source IP
      rateLimits: [
        { id: 'http', port: 80, protocol: 'tcp', rate: '100/second', burst: 50, perSourceIP:
true },
        { id: 'https', port: 443, protocol: 'tcp', rate: '200/second', burst: 100,
perSourceIP: true },
      ],

      // Allow monitoring from trusted subnet
      rules: [
        { id: 'monitoring', direction: 'input', action: 'accept', sourceIP: '10.0.0.0/24',
destPort: 9090, protocol: 'tcp', comment: 'Prometheus scraping' },
      ],
    },
  },
]);
```

API Reference

`RemoteIngressHub`

Method / Property	Description
`start(config?)`	Start the hub. Config: `{ tunnelPort?, targetHost?, tls?: { certPem?, keyPem? } }`. Listens on both TCP and UDP (QUIC) on the tunnel port.
`stop()`	Graceful shutdown.

Method / Property	Description
`updateAllowedEdges(edges)`	Set authorized edges. Each: `{ id, secret, listenPorts?, listenPortsUdp?, stunIntervalSecs?, firewallConfig? }`. Port and firewall changes are pushed to connected edges in real time.
`getStatus()`	Returns `{ running, tunnelPort, connectedEdges: [...] }`.
`running`	`boolean` — whether the Rust binary is alive.

Events: `edgeConnected`, `edgeDisconnected`, `streamOpened`, `streamClosed`, `crashRecovered`, `crashRecoveryFailed`

`RemoteIngressEdge`

Method / Property	Description
`start(config)`	Connect to hub. Accepts `{ token }` or `{ hubHost, hubPort, edgeId, secret, bindAddress?, transportMode? }`.
`stop()`	Graceful shutdown. Cleans up all nftables rules.
`getStatus()`	Returns `{ running, connected, publicIp, activeStreams, listenPorts }`.
`running`	`boolean` — whether the Rust binary is alive.

Events: `tunnelConnected`, `tunnelDisconnected`, `publicIpDiscovered`, `portsAssigned`, `portsUpdated`, `firewallConfigUpdated`, `crashRecovered`, `crashRecoveryFailed`

Token Utilities

Function	Description
`encodeConnectionToken(data)`	Encodes connection info into a base64url token.
`decodeConnectionToken(token)`	Decodes a token. Throws on malformed input.

Interfaces

```
interface IHubConfig {
  tunnelPort?: number;   // default: 8443
  targetHost?: string;   // default: '127.0.0.1'
  tls?: {
    certPem?: string;    // PEM-encoded TLS certificate
```

```
    keyPem?: string;     // PEM-encoded TLS private key
  };
}

interface IEdgeConfig {
  hubHost: string;
  hubPort?: number;      // default: 8443
  edgeId: string;
  secret: string;
  bindAddress?: string;
  transportMode?: 'tcpTls' | 'quic' | 'quicWithFallback';
}

interface IConnectionTokenData {
  hubHost: string;
  hubPort: number;
  edgeId: string;
  secret: string;
}
```

Wire Protocol

TCP+TLS Transport (Frame Protocol)

The tunnel uses a custom binary frame protocol over a single TLS connection:

```
[stream_id: 4 bytes BE][type: 1 byte][length: 4 bytes BE][payload: N bytes]
```

Frame Type	Value	Direction	Purpose
`OPEN`	`0x01`	Edge → Hub	Open TCP stream; payload is PROXY v1 header
`DATA`	`0x02`	Edge → Hub	Client data (upload)
`CLOSE`	`0x03`	Edge → Hub	Client closed connection
`DATA_BACK`	`0x04`	Hub → Edge	Response data (download)
`CLOSE_BACK`	`0x05`	Hub → Edge	Upstream closed connection

Frame Type	Value	Direction	Purpose
`CONFIG`	`0x06`	Hub → Edge	Runtime config update (JSON: ports + firewall config)
`PING`	`0x07`	Hub → Edge	Heartbeat probe (every 15s)
`PONG`	`0x08`	Edge → Hub	Heartbeat response
`WINDOW_UPDATE`	`0x09`	Edge → Hub	Flow control: edge consumed N bytes
`WINDOW_UPDATE_BACK`	`0x0A`	Hub → Edge	Flow control: hub consumed N bytes
`UDP_OPEN`	`0x0B`	Edge → Hub	Open UDP session; payload is PROXY v2 header
`UDP_DATA`	`0x0C`	Edge → Hub	UDP datagram (upload)
`UDP_DATA_BACK`	`0x0D`	Hub → Edge	UDP datagram (download)
`UDP_CLOSE`	`0x0E`	Either	Close UDP session

QUIC Transport

When using QUIC, the frame protocol is replaced by native QUIC primitives:

- **TCP connections:** Each tunneled TCP connection gets its own QUIC bidirectional stream. No framing overhead.
- **UDP datagrams:** Forwarded via QUIC unreliable datagrams (RFC 9221). Format: `[session_id: 4 bytes][payload]`. Session open uses magic byte `0xFF`: `[session_id: 4][0xFF][PROXY v2 header]`.
- **Control channel:** First QUIC bidirectional stream carries auth handshake + config updates using `[type: 1][length: 4][payload]` format.

Handshake Sequence

1. Edge opens a TLS or QUIC connection to the hub
2. Edge sends: `EDGE <edgeId> <secret>\n`
3. Hub verifies credentials (constant-time comparison) and responds with JSON: `{"listenPorts":[...],"listenPortsUdp":[...],"stunIntervalSecs":300,"firewallConfig":{...}}\n`
4. Edge starts TCP and UDP listeners on the assigned ports
5. Edge applies firewall config via nftables (if present and running as root)
6. Data flows — TCP frames/QUIC streams for TCP traffic, UDP frames/QUIC datagrams for UDP traffic

QoS & Flow Control

Priority Tiers (TCP+TLS Transport)

Tier	Frames	Behavior
Control	PING, PONG, WINDOW_UPDATE, OPEN, CLOSE, CONFIG	Always drained first. Never delayed.
Data	DATA/DATA_BACK from normal streams, UDP frames	Drained when control queue is empty.
Sustained	DATA/DATA_BACK from elephant flows	Lowest priority with guaranteed **1 MB/s** drain rate.

Sustained Stream Classification

A TCP stream is classified as **sustained** (elephant flow) when:

- Active for **>10 seconds**, AND
- Average throughput exceeds **20 Mbit/s** (2.5 MB/s)

Once classified, its flow control window locks to 1 MB and data frames move to the lowest-priority queue.

Adaptive Per-Stream Windows

Each TCP stream has a send window from a shared **200 MB budget**:

Active Streams	Window per Stream
1–50	4 MB (maximum)
51–200	Scales down (4 MB → 1 MB)
200+	1 MB (floor)

UDP traffic uses no flow control — datagrams are fire-and-forget, matching UDP semantics.

Example Scenarios

1. □□ Expose a Private Cluster to the Internet

Deploy an Edge on a public VPS, point DNS to its IP. The Edge tunnels all TCP and UDP traffic to the Hub running inside your private cluster. No public ports needed on the cluster.

2. □□ Multi-Region Edge Ingress

Run Edges in NYC, Frankfurt, and Tokyo — all connecting to a single Hub. Use GeoDNS to route users to their nearest Edge. PROXY protocol ensures the Hub sees real client IPs regardless of which Edge they entered through.

3. □□ UDP Forwarding (DNS, Gaming, VoIP)

Configure UDP listen ports alongside TCP ports. DNS queries, game server traffic, or VoIP packets are tunneled through the same edge/hub connection and forwarded to SmartProxy with a PROXY v2 binary header preserving the client's real IP.

```
await hub.updateAllowedEdges([
  {
    id: 'edge-nyc-01',
    secret: 'secret',
    listenPorts: [80, 443],       // TCP
    listenPortsUdp: [53, 27015],  // DNS + game server
  },
]);
```

4. □□ QUIC Transport for Low-Latency

Use QUIC transport to eliminate head-of-line blocking — a lost packet on one stream doesn't stall others. QUIC also enables 0-RTT reconnection and connection migration.

```
await edge.start({
  hubHost: 'hub.example.com',
  hubPort: 8443,
  edgeId: 'edge-01',
  secret: 'secret',
```

```
  transportMode: 'quicWithFallback', // try QUIC, fall back to TLS if UDP blocked
});
```

5. □□ Token-Based Edge Provisioning

Generate connection tokens on the hub side and distribute them to edge operators:

```
import { encodeConnectionToken, RemoteIngressEdge } from '@serve.zone/remoteingress';

const token = encodeConnectionToken({
  hubHost: 'hub.prod.example.com',
  hubPort: 8443,
  edgeId: 'edge-tokyo-01',
  secret: 'generated-secret-abc123',
});
// Send `token` to the edge operator — a single string is all they need

const edge = new RemoteIngressEdge();
await edge.start({ token });
```

6. □□ Centralized Firewall Management

Push firewall rules from the hub to all your edge nodes. Block bad actors, rate-limit abusive traffic, and whitelist trusted subnets — all from a single control plane:

```
await hub.updateAllowedEdges([
  {
    id: 'edge-nyc-01',
    secret: 'secret',
    listenPorts: [80, 443],
    firewallConfig: {
      blockedIps: ['198.51.100.0/24'],
      rateLimits: [
        { id: 'https', port: 443, protocol: 'tcp', rate: '500/second', perSourceIP: true,
burst: 100 },
      ],
      rules: [
        { id: 'allow-monitoring', direction: 'input', action: 'accept', sourceIP:
```

```
'10.0.0.0/8', destPort: 9090, protocol: 'tcp' },
      ],
    },
  },
]);
// Firewall rules are applied at the edge via nftables within seconds
```

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changelog.md for @serve.zone/remoteingress

2026-03-27 - 4.15.3 - fix(core)

harden UDP session handling, QUIC control message validation, and bridge process cleanup

- cap UDP session creation and drop excess datagrams with warnings to prevent unbounded session growth
- periodically prune closed datagram sessions on the hub and reject oversized QUIC control messages to avoid resource exhaustion
- clean up spawned edge and hub bridge processes on startup failure, remove listeners on stop, and avoid restarting after shutdown during backoff

2026-03-26 - 4.15.2 - fix(readme)

adjust tunnel diagram alignment in the README

- Improves formatting consistency in the Hub/Edge topology diagram.

2026-03-26 - 4.15.1 - fix(readme)

clarify unified runtime configuration and firewall update behavior

- Updates the architecture and feature descriptions to reflect that ports, firewall rules, and rate limits are pushed together in a single config update
- Clarifies that firewall configuration is delivered via FRAME_CONFIG on handshake and subsequent updates, with atomic full-rule replacement at the edge
- Simplifies and reorganizes README wording around edge and hub responsibilities without changing implementation behavior

2026-03-26 - 4.15.0 - feat(edge,hub)

add hub-controlled nftables firewall configuration for remote ingress edges

- add firewallConfig support to allowed edge definitions, handshake responses, and runtime config updates
- emit firewallConfigUpdated events from the Rust bridge and edge runtime when firewall settings change
- initialize SmartNftables on edges, apply blocked IPs, rate limits, and custom rules, and clean up nftables rules on stop
- document centralized firewall management, root requirements, and new edge events in the README

2026-03-26 - 4.14.3 - fix(docs)

refresh project metadata and README to reflect current ingress tunnel capabilities

- update package metadata description and keywords to better describe edge ingress, TLS/QUIC transport, and SmartProxy integration
- revise README terminology, API docs, and feature list to document crash recovery, bindAddress support, and current event names
- improve README formatting and examples for architecture, wire protocol, QoS, and token usage

2026-03-26 - 4.14.2 - fix(hub-core)

improve stream shutdown handling and connection cleanup in hub and edge

- Cancel edge upload loops immediately when the hub closes a stream instead of waiting for the window stall timeout.
- Reduce stalled stream timeouts from 120s to 55s to detect broken connections faster.
- Allow hub writer tasks to shut down gracefully before aborting to avoid unnecessary TCP resets.
- Enable TCP keepalive on hub upstream connections to detect silent SmartProxy failures.
- Remove leaked QUIC UDP session entries when setup fails or sessions end.
- Rename npmextra.json to .smartconfig.json and update package packaging references.

2026-03-21 - 4.14.1 - fix(remoteingress edge/hub crash recovery)

prevent duplicate crash recovery listeners and reset saved runtime state on shutdown

- Removes existing exit listeners before re-registering crash recovery handlers for edge and hub processes.
- Clears saved edge and hub configuration on stop to avoid stale restart state.
- Resets orphaned edge status intervals and restarts periodic status logging after successful crash recovery.

2026-03-20 - 4.14.0 - feat(quic)

add QUIC stability test coverage and bridge logging for hub and edge

- adds a long-running QUIC stability test with periodic echo probes and disconnect detection
- enables prefixed bridge logging for RemoteIngressHub and RemoteIngressEdge to improve runtime diagnostics

2026-03-20 - 4.13.2 - fix(remoteingress-core)

preserve reconnected edge entries during disconnect cleanup

- Guard edge removal so disconnect handlers only delete entries whose cancel token is already cancelled
- Prevents stale TCP and QUIC disconnect paths from removing a newer connection after an edge reconnects

2026-03-19 - 4.13.1 - fix(remoteingress-core)

default edge transport mode to QUIC with fallback

- Changes the default transport mode in edge connections from TCP/TLS to QUIC with fallback when no transport mode is explicitly configured.

2026-03-19 - 4.13.0 - feat(docs)

document TCP and UDP tunneling over TLS and QUIC

- update package description to reflect TCP and UDP support and TLS or QUIC transports
- refresh README architecture, features, and usage examples for UDP forwarding, QUIC transport, and PROXY protocol v1/v2 support

2026-03-19 - 4.12.1 - fix(remoteingress-core)

send PROXY v2 headers for UDP upstream sessions and expire idle UDP sessions

- Adds periodic idle UDP session expiry in edge tunnel and QUIC loops, including UDP close signaling for expired tunnel sessions.
- Sends the PROXY v2 header as the first datagram for UDP upstream connections in both standard and QUIC hub paths.
- Updates the UDP node test server to ignore the initial PROXY v2 datagram per source before echoing payload traffic.

2026-03-19 - 4.12.0 - feat(remoteingress-core)

add UDP tunneling over QUIC datagrams and expand transport-specific test coverage

- Implement QUIC datagram-based UDP forwarding on both edge and hub, including session setup, payload routing, and listener cleanup
- Enable QUIC datagram receive buffers in client and server transport configuration
- Add UDP-over-QUIC tests and clarify existing test names to distinguish TCP/TLS, UDP/TLS, and QUIC scenarios

2026-03-19 - 4.11.0 - feat(remoteingress-core)

add UDP tunneling support between edge and hub

- extend edge and hub handshake/config updates with UDP listen ports
- add UDP tunnel frame types and PROXY protocol v2 header helpers in the protocol crate
- introduce UDP session management on the edge and upstream UDP forwarding on the hub
- add Node.js integration tests covering UDP echo and concurrent datagrams
- expose UDP listen port configuration in the TypeScript hub API

2026-03-19 - 4.10.0 - feat(core,edge,hub,transport)

add QUIC tunnel transport support with optional edge transport selection

- adds a shared transport module with QUIC configuration helpers, control message framing, and PROXY header handling
- enables the hub to accept QUIC connections on the tunnel port alongside existing TCP/TLS support
- adds edge transportMode configuration with quic and quicWithFallback options and propagates it through restarts
- includes end-to-end QUIC transport tests covering large payloads and concurrent streams

2026-03-18 - 4.9.1 - fix(readme)

document QoS tiers, heartbeat frames, and adaptive flow control in the protocol overview

- Adds PING, PONG, WINDOW_UPDATE, and WINDOW_UPDATE_BACK frame types to the protocol documentation
- Describes the 3-tier priority queues for control, normal data, and sustained traffic
- Explains sustained stream classification and adaptive per-stream window sizing

2026-03-18 - 4.9.0 - feat(protocol)

add sustained-stream tunnel scheduling to isolate high-throughput traffic

- Introduce a third low-priority sustained queue in TunnelIo with a forced drain budget to prevent long-lived high-bandwidth streams from starving control and normal data frames.
- Classify upload and download streams as sustained after exceeding the throughput threshold for the minimum duration, and route their DATA and CLOSE frames through the sustained channel.
- Wire the new sustained channel through edge and hub stream handling so sustained traffic is scheduled consistently on both sides of the tunnel.

2026-03-18 - 4.8.19 - fix(remoteingress-protocol)

reduce per-stream flow control windows and increase control channel buffering

- Lower the initial and maximum per-stream window from 16MB to 4MB and scale adaptive windows against a 200MB total budget with a 1MB minimum.
- Increase edge and hub control frame channel capacity from 256 to 512 to better handle prioritized control traffic.
- Update flow-control tests and comments to reflect the new window sizing and budget behavior.

2026-03-17 - 4.8.18 - fix(rust-protocol)

switch tunnel frame buffers from Vec to Bytes to reduce copying and memory overhead

- Add the bytes crate to core and protocol crates

- Update frame encoding, reader payloads, channel queues, and stream backchannels to use Bytes
- Adjust edge and hub data/control paths to send framed payloads as Bytes

2026-03-17 - 4.8.17 - fix(protocol)

increase per-stream flow control windows and remove adaptive read caps

- Raise the initial per-stream window from 4MB to 16MB and expand the adaptive window budget to 800MB with a 4MB floor
- Stop limiting edge and hub reads by the adaptive per-stream target window, keeping reads capped only by the current window and 32KB chunk size
- Update protocol tests to match the new adaptive window scaling and budget boundaries

2026-03-17 - 4.8.16 - fix(release)

bump package version to 4.8.15

- Updates the package.json version field from 4.8.13 to 4.8.15.

2026-03-17 - 4.8.13 - fix(remoteingress-protocol)

require a flush after each written frame to bound TLS buffer growth

- Remove the unflushed byte threshold and stop queueing additional writes while a flush is pending
- Simplify write and flush error logging after dropping unflushed byte tracking
- Update tunnel I/O comments to reflect the stricter flush behavior that avoids OOM and connection resets

2026-03-17 - 4.8.12 - fix(tunnel)

prevent tunnel backpressure buffering from exhausting memory and cancel stream handlers before TLS shutdown

- stop self-waking and writing new frames while a flush is pending to avoid unbounded TLS session buffer growth under load
- reorder edge and hub shutdown cleanup so stream cancellation happens before TLS close_notify, preventing handlers from blocking on dead channels
- add load tests covering sustained large transfers, burst traffic, and rapid stream churn to verify tunnel stability

2026-03-17 - 4.8.11 - fix(remoteingress-core)

stop data frame send loops promptly when stream cancellation is triggered

- Use cancellation-aware tokio::select! around data channel sends in both edge and hub stream forwarding paths
- Prevent stalled or noisy shutdown behavior when stream or client cancellation happens while awaiting frame delivery

2026-03-17 - 4.8.10 - fix(remoteingress-core)

guard tunnel frame sends with cancellation to prevent async send deadlocks

- Wrap OPEN, CLOSE, CLOSE_BACK, WINDOW_UPDATE, and cleanup channel sends in cancellation-aware tokio::select! blocks.
- Avoid indefinite blocking when tunnel, stream, or writer tasks are cancelled while awaiting channel capacity.
- Improve shutdown reliability for edge and hub stream handling under tunnel failure conditions.

2026-03-17 - 4.8.9 - fix(repo)

no changes to commit

2026-03-17 - 4.8.8 - fix(remoteingress-core)

cancel stale edge connections when an edge reconnects

- Remove any existing edge entry before registering a reconnected edge
- Trigger the previous connection's cancellation token so stale sessions shut down immediately instead of waiting for TCP keepalive

2026-03-17 - 4.8.7 - fix(remoteingress-core)

perform graceful TLS shutdown on edge and hub tunnel streams

- Send TLS close_notify before cleanup to avoid peer disconnect warnings on both tunnel endpoints
- Wrap stream shutdown in a 2 second timeout so connection teardown does not block cleanup

2026-03-17 - 4.8.6 - fix(remoteingress-core)

initialize disconnect reason only when set in hub loop break paths

- Replace the default "unknown" disconnect reason with an explicitly assigned string and document that all hub loop exits set it before use
- Add an allow attribute for unused assignments to avoid warnings around the deferred initialization pattern

2026-03-17 - 4.8.5 - fix(repo)

no changes to commit

2026-03-17 - 4.8.4 - fix(remoteingress-core)

prevent stream stalls by guaranteeing flow-control updates and avoiding bounded per-stream channel overflows

- Replace bounded per-stream data channels with unbounded channels on edge and hub, relying on existing WINDOW_UPDATE flow control to limit bytes in flight
- Use awaited sends for FRAME_WINDOW_UPDATE and FRAME_WINDOW_UPDATE_BACK so updates are not dropped and streams do not deadlock under backpressure
- Clean up stream state when channel receivers have already exited instead of closing active streams because a bounded queue filled

2026-03-17 - 4.8.3 - fix(protocol,edge)

optimize tunnel frame handling and zero-copy uploads in edge I/O

- extract hub frame processing into a shared edge handler to remove duplicated tunnel logic
- add zero-copy frame header encoding and read payloads directly into framed buffers for client-to-hub uploads
- refactor TunnelIo read/write state to avoid unsafe queue access and reduce buffer churn with incremental parsing

2026-03-17 - 4.8.2 - fix(rust-edge)

refactor tunnel I/O to preserve TLS state and prioritize control frames

- replace split TLS handling with a single-owner TunnelIo to avoid handshake and buffered read corruption
- prioritize control frames over data frames to prevent WINDOW_UPDATE starvation and flow-control deadlocks
- improve tunnel reliability with incremental frame parsing, liveness/error events, and corrupt frame header logging

2026-03-17 - 4.8.1 - fix(remoteingress-core)

remove tunnel writer timeouts from edge and hub buffered writes

- Drops the 30 second timeout wrapper around writer.write_all and writer.flush in both edge and hub tunnel writers.
- Updates error logging to report write failures without referring to stalled writes.

2026-03-17 - 4.8.0 - feat(events)

include disconnect reasons in edge and hub management events

- Add reason fields to tunnelDisconnected and edgeDisconnected events emitted from the Rust core and binary bridge
- Propagate specific disconnect causes such as EOF, liveness timeout, writer failure, handshake failure, and hub cancellation
- Update TypeScript edge and hub classes to log and forward disconnect reason data
- Extend serialization tests to cover the new reason fields

2026-03-17 - 4.7.2 - fix(remoteingress-core)

add tunnel write timeouts and scale initial stream windows by active stream count

- Wrap tunnel frame writes and flushes in a 30-second timeout on both edge and hub to detect stalled writers and trigger faster reconnect or cleanup.
- Compute each stream's initial send window from the current active stream count instead of using a fixed window to keep total in-flight data within the 32MB budget.

2026-03-17 - 4.7.1 - fix(remoteingress-core)

improve tunnel failure detection and reconnect handling

- Enable TCP keepalive on edge and hub connections to detect silent network failures sooner
- Trigger immediate reconnect or disconnect when tunnel writer tasks fail instead of waiting for liveness timeouts
- Prevent active stream counter underflow during concurrent connection cleanup

2026-03-16 - 4.7.0 - feat(edge,protocol,test)

add configurable edge bind address and expand flow-control test coverage

- adds an optional bindAddress configuration for edge TCP listeners, defaulting to 0.0.0.0 when not provided
- passes bindAddress through the TypeScript edge client and Rust edge runtime so local test setups can bind to localhost
- adds protocol unit tests for adaptive stream window sizing and window update frame encoding/decoding
- introduces end-to-end flow-control tests and updates the test script to build before running tests

2026-03-16 - 4.6.1 - fix(remoteingress-core)

avoid spurious tunnel disconnect events and increase control channel capacity

- Emit TunnelDisconnected only after an established connection is actually lost, preventing false disconnect events during failed reconnect attempts.
- Increase edge and hub control-channel buffer sizes from 64 to 256 to better prioritize control frames under load.

2026-03-16 - 4.6.0 - feat(remoteingress-core)

add adaptive per-stream flow control based on active stream counts

- Track active stream counts on edge and hub connections to size per-stream flow control windows dynamically.
- Cap WINDOW_UPDATE increments and read sizes to the adaptive window so bandwidth is shared more evenly across concurrent streams.
- Apply the adaptive logic to both upload and download paths on edge and hub stream handlers.

2026-03-16 - 4.5.12 - fix(remoteingress-core)

improve tunnel liveness handling and enable TCP keepalive for accepted client sockets

- Avoid disconnecting edges when PING or PONG frames cannot be queued because the control channel is temporarily full.
- Enable TCP_NODELAY and TCP keepalive on accepted client connections to help detect stale or dropped clients.

2026-03-16 - 4.5.11 - fix(repo)

no changes to commit

2026-03-16 - 4.5.10 - fix(remoteingress-core)

guard zero-window reads to avoid false EOF handling on stalled streams

- Prevent upload and download loops from calling read on an empty buffer when flow-control window remains at 0 after stall timeout
- Log a warning and close the affected stream instead of misinterpreting Ok(0) as end-of-file

2026-03-16 - 4.5.9 - fix(remoteingress-core)

delay stream close until downstream response draining finishes to prevent truncated transfers

- Waits for the hub-to-client download task to finish before sending the stream CLOSE frame
- Prevents upstream reads from being cancelled mid-response during asymmetric transfers such as git fetch
- Retains the existing timeout so stalled downloads still clean up safely

2026-03-16 - 4.5.8 - fix(remoteingress-core)

ensure upstream writes cancel promptly and reliably deliver CLOSE_BACK frames

- listen for stream cancellation while waiting on upstream write timeouts so FRAME_CLOSE does not block for up to 60 seconds
- replace try_send with send().await when emitting CLOSE_BACK frames to avoid silently dropping close notifications when the data channel is full

2026-03-16 - 4.5.7 - fix(remoteingress-core)

improve tunnel reconnect and frame write efficiency

- Reuse the TLS connector across edge reconnections to preserve session resumption state and reduce reconnect latency.
- Buffer hub and edge frame writes to coalesce small control and data frames into fewer TLS records and syscalls while still flushing each frame promptly.

2026-03-16 - 4.5.6 - fix(remoteingress-core)

disable Nagle's algorithm on edge, hub, and upstream TCP sockets to reduce control-frame latency

- Enable TCP_NODELAY on the edge connection to the hub for faster PING/PONG and WINDOW_UPDATE delivery
- Apply TCP_NODELAY on accepted hub streams before TLS handling
- Enable TCP_NODELAY on SmartProxy upstream connections before sending the PROXY header

2026-03-16 - 4.5.5 - fix(remoteingress-core)

wait for hub-to-client draining before cleanup and reliably send close frames

- switch CLOSE frame delivery on the data channel from try_send to send().await to avoid dropping it when the channel is full
- delay stream cleanup until the hub-to-client task finishes or times out so large downstream responses continue after upload EOF
- add a bounded 5-minute wait for download draining to prevent premature termination of asymmetric transfers such as git fetch

2026-03-15 - 4.5.4 - fix(remoteingress-core)

preserve stream close ordering and add flow-control stall timeouts

- Send CLOSE and CLOSE_BACK frames on the data channel so they arrive after the final stream data frames.
- Log and abort stalled upload and download paths when flow-control windows stay empty for 120 seconds.
- Apply a 60-second timeout when writing buffered stream data to the upstream connection to prevent hung streams.

2026-03-15 - 4.5.3 - fix(remoteingress-core)

prioritize control frames over data in edge and hub tunnel writers

- Split tunnel/frame writers into separate control and data channels in edge and hub
- Use biased select loops so PING, PONG, WINDOW_UPDATE, OPEN, and CLOSE frames are sent before data frames
- Route stream data through dedicated data channels while keeping OPEN, CLOSE, and flow-control updates on control channels to prevent keepalive starvation under load

2026-03-15 - 4.5.2 - fix(remoteingress-core)

improve stream flow control retries and increase channel buffer capacity

- increase per-stream mpsc channel capacity from 128 to 256 on both edge and hub paths
- only reset accumulated window update bytes after a successful try_send to avoid dropping flow-control credits when the update channel is busy

2026-03-15 - 4.5.1 - fix(protocol)

increase per-stream flow control window and channel buffers to improve high-RTT throughput

- raise the initial stream window from 256 KB to 4 MB to allow more in-flight data per stream
- increase edge and hub mpsc channel capacities from 16 to 128 to better absorb throughput under flow control

2026-03-15 - 4.5.0 - feat(remoteingress-core)

add per-stream flow control for edge and hub tunnel data transfer

- introduce WINDOW_UPDATE frame types and protocol helpers for per-stream flow control
- track per-stream send windows on both edge and hub to limit reads based on available capacity
- send window updates after downstream writes to reduce channel pressure during large transfers

2026-03-15 - 4.4.1 - fix(remoteingress-core)

prevent stream data loss by applying backpressure and closing saturated channels

- replace non-blocking frame writes with awaited sends in per-stream tasks so large transfers respect backpressure instead of dropping data
- close and remove streams when back-channel or data channels fill up to avoid TCP stream corruption from silently dropped frames

2026-03-03 - 4.4.0 - feat(remoteingress)

add heartbeat PING/PONG and liveness timeouts; implement fast-reconnect/backoff reset and JS crash-recovery auto-restart

- protocol: add FRAME_PING and FRAME_PONG and unit tests for ping/pong frames
- edge (Rust): reset backoff after successful connection, respond to PING with PONG, track liveness via deadline and reconnect on timeout, use Duration/Instant helpers
- hub (Rust): send periodic PING to edges, handle PONGs, enforce liveness timeout and disconnect inactive edges, use tokio interval and time utilities
- ts: RemoteIngressEdge and RemoteIngressHub: add crash-recovery auto-restart with exponential backoff and max attempts, save/restore config and allowed edges, register/remove exit handlers, ensure stop() marks stopping and cleans up listeners
- minor API/typing: introduce TAllowedEdge alias and persist allowed edges for restart recovery

2026-02-26 - 4.3.0 - feat(hub)

add optional TLS certificate/key support to hub start config and bridge

- TypeScript: add tls.certPem and tls.keyPem to IHubConfig and include tlsCertPem/tlsKeyPem in startHub bridge command when both are provided
- TypeScript: extend startHub params with tlsCertPem and tlsKeyPem and conditionally send them
- Rust: change HubConfig serde attributes for tls_cert_pem and tls_key_pem from skip to default so absent PEM fields deserialize as None
- Enables optional provisioning of TLS certificate and key to the hub when provided from the JS side

2026-02-26 - 4.2.0 - feat(core)

expose edge peer address in hub events and migrate writers to channel-based, non-blocking framing with stream limits and timeouts

- Add peerAddr to ConnectedEdgeStatus and HubEvent::EdgeConnected and surface it to the TS frontend event (management:edgeConnected).
- Replace Arc<Mutex<WriteHalf>> writers with dedicated mpsc channel writer tasks in both hub and edge crates to serialize writes off the main tasks.
- Use non-blocking try_send for data frames to avoid head-of-line blocking and drop frames with warnings when channels are full.
- Introduce MAX_STREAMS_PER_EDGE semaphore to limit concurrent streams per edge and reject excess opens with a CLOSE_BACK frame.
- Add a 10s timeout when connecting to SmartProxy to avoid hanging connections.
- Ensure writer tasks are aborted on shutdown/cleanup and propagate cancellation tokens appropriately.

2026-02-26 - 4.1.0 - feat(remoteingress-bin)

use mimalloc as the global allocator to reduce memory overhead and improve allocation performance

- added mimalloc = "0.1" dependency to rust/crates/remoteingress-bin/Cargo.toml
- registered mimalloc as the #[global_allocator] in rust/crates/remoteingress-bin/src/main.rs
- updated Cargo.lock with libmimalloc-sys and mimalloc package entries

2026-02-26 - 4.0.1 - fix(hub)

cancel per-stream tokens on stream close and avoid duplicate StreamClosed events; bump @types/node devDependency to ^25.3.0

- Add CancellationToken to per-stream entries so each stream can be cancelled independently.
- Ensure StreamClosed event is only emitted when a stream was actually present (guards against duplicate events).
- Cancel the stream-specific token on FRAME_CLOSE to stop associated tasks and free resources.
- DevDependency bump: @types/node updated from ^25.2.3 to ^25.3.0.

2026-02-19 - 4.0.0 - BREAKING CHANGE(remoteingress-core)

add cancellation tokens and cooperative shutdown; switch event channels to bounded mpsc and improve cleanup

- Introduce tokio-util::sync::CancellationToken for hub/edge and per-connection/stream cancellation, enabling cooperative shutdown of spawned tasks.
- Replace unbounded mpsc channels with bounded mpsc::channel(1024) and switch from UnboundedSender/Receiver to Sender/Receiver; use try_send where non-blocking sends are appropriate.
- Wire cancellation tokens through edge and hub codepaths: child tokens per connection, per-port, per-stream; cancel tokens in stop() and Drop impls to ensure deterministic task termination and cleanup.
- Reset stream id counters and clear listener state on reconnect; improved error handling around accept/read loops using tokio::select! and cancellation checks.
- Update Cargo.toml and Cargo.lock to add tokio-util (and related futures entries) as dependencies.
- BREAKING: public API/types changed — take_event_rx return types and event_tx/event_rx fields now use bounded mpsc::Sender/mpsc::Receiver instead of the unbounded variants; callers must adapt to the new types and bounded behavior.

2026-02-18 - 3.3.0 - feat(readme)

document dynamic port assignment and runtime port updates; clarify TLS multiplexing, frame format, and handshake sequence

- Adds documentation for dynamic port configuration: hub-assigned listen ports, hot-reloadable via FRAME_CONFIG frames
- Introduces new FRAME type CONFIG (0x06) and describes payload as JSON; notes immediate push of port changes to connected edges
- Clarifies that the tunnel is a single encrypted TLS multiplexed connection to the hub (preserves PROXY v1 behavior)
- Specifies frame integer fields are big-endian and that stream IDs are 32-bit unsigned integers
- Adds new events: portsAssigned and portsUpdated, and updates examples showing updateAllowedEdges usage and live port changes

2026-02-18 - 3.2.1 - fix(tests)

add comprehensive unit and async tests across Rust crates and TypeScript runtime

- Added IPC serialization tests in remoteingress-bin (IPC request/response/event)
- Added serde and async tests for Edge and Handshake configs and EdgeEvent/EdgeStatus in remoteingress-core (edge.rs)
- Added extensive Hub tests: constant_time_eq, PROXY header port parsing, serde/camelCase checks, Hub events and async TunnelHub behavior (hub.rs)
- Added STUN parser unit tests including XOR_MAPPED_ADDRESS, MAPPED_ADDRESS fallback, truncated attribute handling and other edge cases (stun.rs)
- Added protocol frame encoding and FrameReader tests covering all frame types, payload limits and EOF conditions (remoteingress-protocol)
- Added TypeScript Node tests for token encode/decode edge cases and RemoteIngressHub/RemoteIngressEdge class basics (test/*.node.ts)

2026-02-18 - 3.2.0 - feat(remoteingress (edge/hub/protocol))

add dynamic port configuration: handshake, FRAME_CONFIG frames, and hot-reloadable listeners

- Introduce a JSON handshake from hub -> edge with initial listen ports and stun interval so edges can configure listeners at connect time.
- Add FRAME_CONFIG (0x06) to the protocol and implement runtime config updates pushed from hub to connected edges.
- Edge now applies initial ports and supports hot-reloading: spawn/abort listeners when ports change, and emit PortsAssigned / PortsUpdated events.
- Hub now stores allowed edge metadata (listen_ports, stun_interval_secs), sends handshake responses on auth, and forwards config updates to connected edges.
- TypeScript bridge/client updated to emit new port events and periodically log status; updateAllowedEdges API accepts listenPorts and stunIntervalSecs.
- Stun interval handling moved to use handshake-provided/stored value instead of config.listen_ports being static.

2026-02-18 - 3.1.1 - fix(readme)

update README: add issue reporting/security section, document connection tokens and token utilities, clarify architecture/API and improve examples/formatting

- Added an 'Issue Reporting and Security' section linking to community.foss.global for bug/security reports and contributor onboarding.
- Documented connection tokens: encodeConnectionToken/decodeConnectionToken utilities, token format (base64url), and examples for hub and edge provisioning.
- Clarified Hub/Edge usage and examples: condensed event handlers, added token-based start() example, and provided explicit config alternative.
- Improved README formatting: added emojis, rephrased architecture descriptions, fixed wording and license path capitalization, and expanded example scenarios and interfaces.

2026-02-17 - 3.1.0 - feat(edge)

support connection tokens when starting an edge and add token encode/decode utilities

- Add classes.token.ts with encodeConnectionToken/decodeConnectionToken using a base64url compact JSON format
- Export token utilities from ts/index.ts
- RemoteIngressEdge.start now accepts a { token } option and decodes it to an IEdgeConfig before starting
- Add tests covering export availability, encode→decode roundtrip, malformed token, and missing fields
- Non-breaking change — recommend a minor version bump

2026-02-17 - 3.0.4 - fix(build)

bump dev dependencies, update build script, and refresh README docs

- Bumped devDependencies: @git.zone/tsbuild ^2.1.25 → ^4.1.2, @git.zone/tsbundle ^2.0.5 → ^2.8.3, @git.zone/tsrun ^1.2.46 → ^2.0.1, @git.zone/tstest ^1.0.44 → ^3.1.8, @push.rocks/tapbundle ^5.0.15 → ^6.0.3, @types/node ^20.8.7 → ^25.2.3
- Bumped runtime dependency: @push.rocks/qenv ^6.0.5 → ^6.1.3
- Changed build script: replaced "tsbuild --web --allowimplicitany" with "tsbuild tsfolders --allowimplicitany" (kept tsrust invocation)
- README updates: added RustBridge notes (localPaths must be full file paths), production binary naming conventions, rust core uses ring as rustls provider; removed emoji from example console output; clarified stunIntervalSecs is optional; renamed example status variable to edgeStatus; minor wire-protocol formatting and wording/legal text tweaks

2026-02-17 - 3.0.3 - fix(rust,ts)

initialize rustls ring CryptoProvider at startup; add rustls dependency and features; make native binary lookup platform-aware

- Install rustls::crypto::ring default_provider at startup to ensure ring-based crypto is available before any TLS usage.
- Add rustls dependency to remoteingress-bin and update remoteingress-core rustls configuration (disable default-features; enable ring, logging, std, tls12).
- Adjust TS classes to prefer platform-suffixed production binaries, add exact fallback names, and include explicit cargo output paths for release/debug.
- Cargo.lock updated to include rustls entry.

2026-02-16 - 3.0.2 - fix(readme)

Document Hub/Edge architecture and new RemoteIngressHub/RemoteIngressEdge API; add Rust core binary, protocol and usage details; note removal of ConnectorPublic/ConnectorPrivate (breaking change)

- Adds comprehensive README describing v3 Hub↔Edge topology and usage examples
- Introduces Rust core binary (remoteingress-bin) and RustBridge IPC via @push.rocks/smartrust
- Documents custom multiplexed binary frame protocol over TLS and PROXY protocol v1 for client IP preservation

- Notes STUN-based public IP discovery and cross-compiled linux/amd64 and linux/arm64 binaries
- Calls out removal/rename of ConnectorPublic/ConnectorPrivate to RemoteIngressHub/RemoteIngressEdge (breaking API change)
- Updates install instruction to use pnpm and expands API reference, events, and examples

2026-02-16 - 3.0.1 - fix(remoteingress)

no changes detected in diff; no code modifications to release

- No files changed in the provided diff.
- No release or version bump required based on current changes.

2026-02-16 - 3.0.0 - BREAKING CHANGE(remoteingress)

migrate core to Rust, add RemoteIngressHub/RemoteIngressEdge JS bridge, and bump package to v2.0.0

- Added Rust workspace and crates: remoteingress-protocol, remoteingress-core, remoteingress-bin (IPC management mode via JSON over stdin/stdout).
- Implemented protocol framing, PROXY v1 header builder, and async FrameReader in remoteingress-protocol.
- Implemented hub and edge tunnel logic in Rust including TLS handling, PROXY parsing, and STUN public IP discovery.
- Added TypeScript runtime bridge classes RemoteIngressHub and RemoteIngressEdge that use @push.rocks/smartrust to spawn/manage the Rust binary.
- Removed legacy connector public/private TS files and simplified ts/index exports to expose hub/edge classes.
- Updated package.json: bumped version to 2.0.0, adjusted description, added tsrust build step, new dependency @push.rocks/smartrust and keywords, and included dist_rust in files/glob.
- Added rust build config for cross-target linkers and new Cargo.toml manifests for the workspace.

2024-04-14 - 1.0.2 - 1.0.4 - releases

Version-only tag commits (no code changes) for recent releases.

- 1.0.2 (2024-03-24) — release tag / version bump only
- 1.0.3 (2024-04-14) — release tag / version bump only
- 1.0.4 (2024-04-14) — release tag / version bump only

2024-04-14 - 1.0.3 - core

Core updates and fixes.

- fix(core): update

2024-04-14 - 1.0.2 - core

Core updates and fixes.

- fix(core): update

2024-03-24 - 1.0.1 - core

Core updates and fixes.

- fix(core): update