

In OMNeT++, to statistically analyze packet loss rate, you need to collect and analyze information about packet transmission and reception in the network. To implement the statistics for packet loss rate, you can monitor and record events of packet sending and receiving in the C++ module. Here are example steps and code to achieve this:

- **Define Signals:** Define signals for packet sent and received events in the C++ module.

```
protected:
    simsignal_t packetSentSignal;
    simsignal_t packetReceivedSignal;

public:
    // Register signals in the initialize() method
    virtual void initialize() override {
        packetSentSignal = registerSignal("packetSent");
        packetReceivedSignal = registerSignal("packetReceived");
    }
```

- **Emit Signals:** Emit signals when packets are sent and received.

```
// Emit signal when a packet is sent
emit(packetSentSignal, packet);

// Emit signal when a packet is successfully received
emit(packetReceivedSignal, packet);
```

- **Statistics for Packet Loss Rate:** In the C++ module, count the number of packets sent and received to calculate the packet loss rate.

```
protected:
    long packetsSent = 0;
    long packetsReceived = 0;

public:
    virtual void handleMessage(cMessage *msg) override {
        if (msg is a packet to be sent) {
            packetsSent++;
            emit(packetSentSignal, msg);
            // send the packet...
        } else if (msg is a received packet) {
            packetsReceived++;
            emit(packetReceivedSignal, msg);
            // process the packet...
        }
    }
```

```

    }

    // Calculate packet loss rate at the end of the module or periodically
    virtual void finish() override {
        double packetLossRate = packetsSent == 0 ? 0 : (double)(packetsSent -
packetsReceived) / packetsSent;
        EV << "Packet Loss Rate: " << packetLossRate << endl;
        // Optionally record the result as a scalar
        recordScalar("Packet Loss Rate", packetLossRate);
    }

```

- **Configure INI File:** Enable vector recording in the `.ini` file to collect data on packet sending and receiving during the simulation.

```

**.packetSentSignal:vector-recording = true
**.packetReceivedSignal:vector-recording = true

```

Please note that this example code provides a basic framework, and the specific implementation may need to be adjusted according to your specific simulation scenario and requirements. The packet loss rate is calculated by comparing the number of packets sent and successfully received. This is a simple example, and the actual implementation might require more complex logic, especially when dealing with complex scenarios like network errors, retransmissions, etc.