

In-situ Flow Information Telemetry (iFIT) Framework

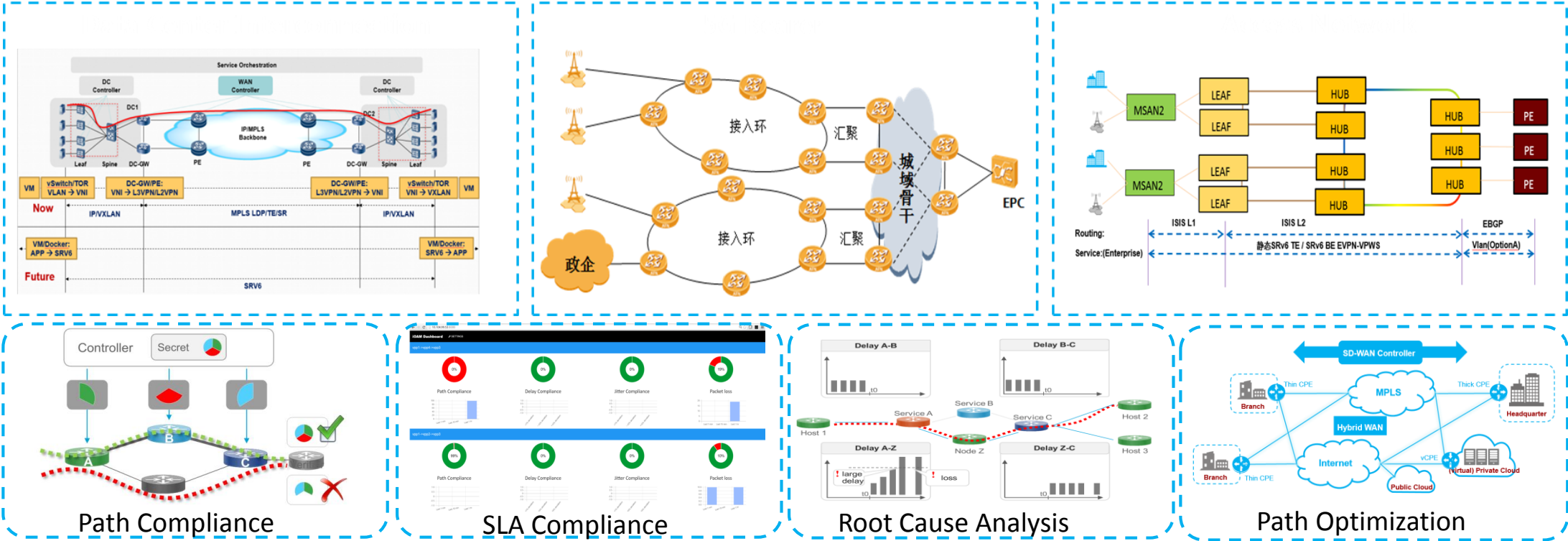
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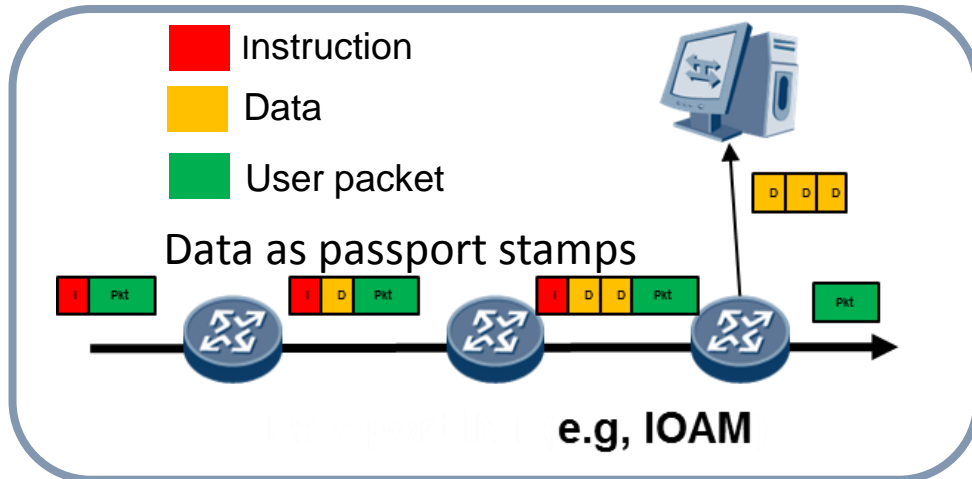
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Data Plane Telemetry Requirements

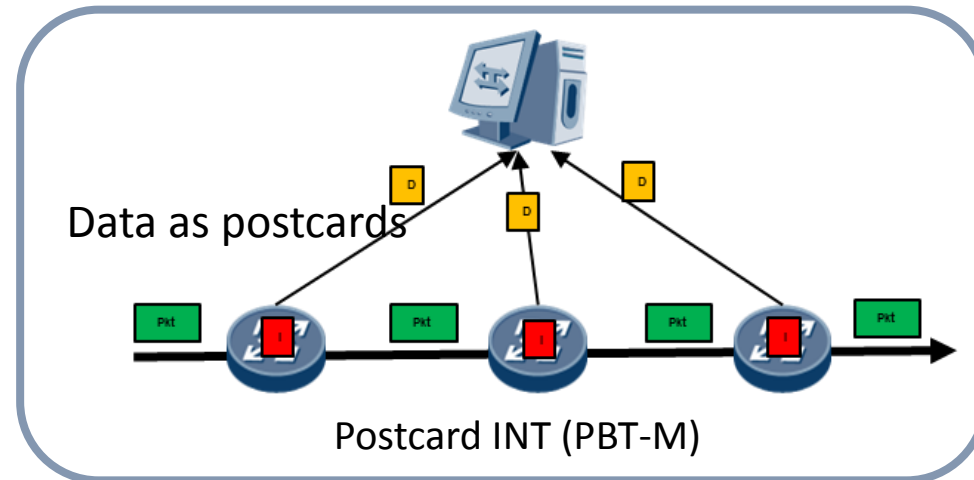
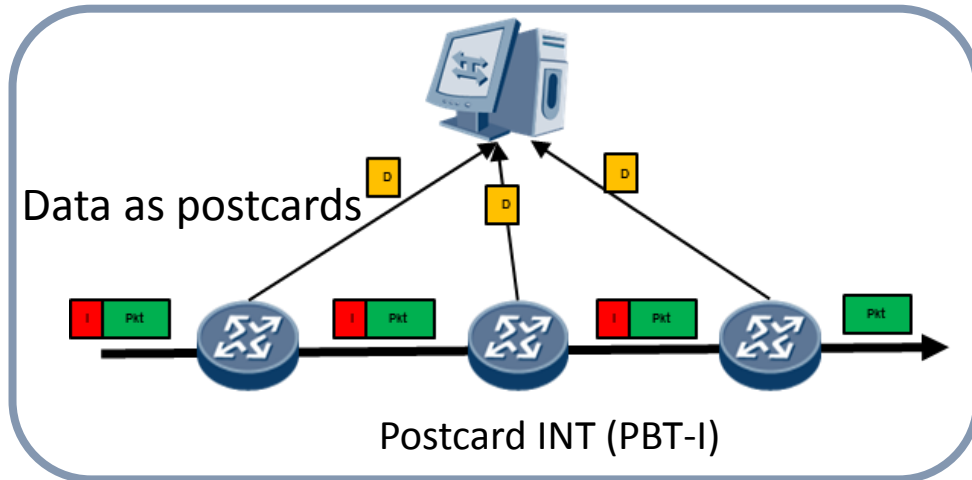


Data Plane Telemetry Techniques



Tradeoffs

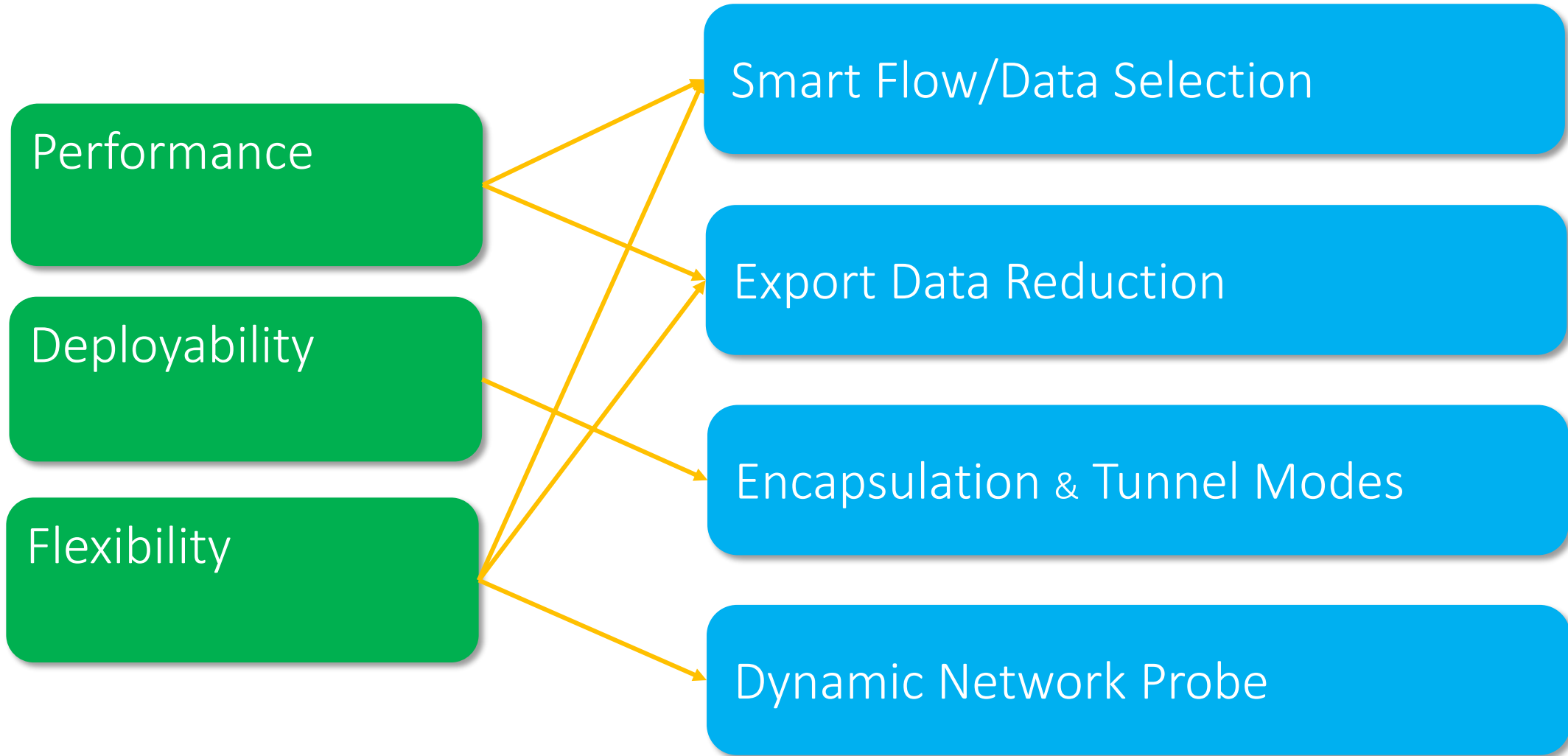
- **Performance Impact**
 - Observer Effect
- **Encapsulation and Overhead**
 - Scalability
- **Security**
- **Configuration and correlation**



Challenges for Deployment in Carrier Networks

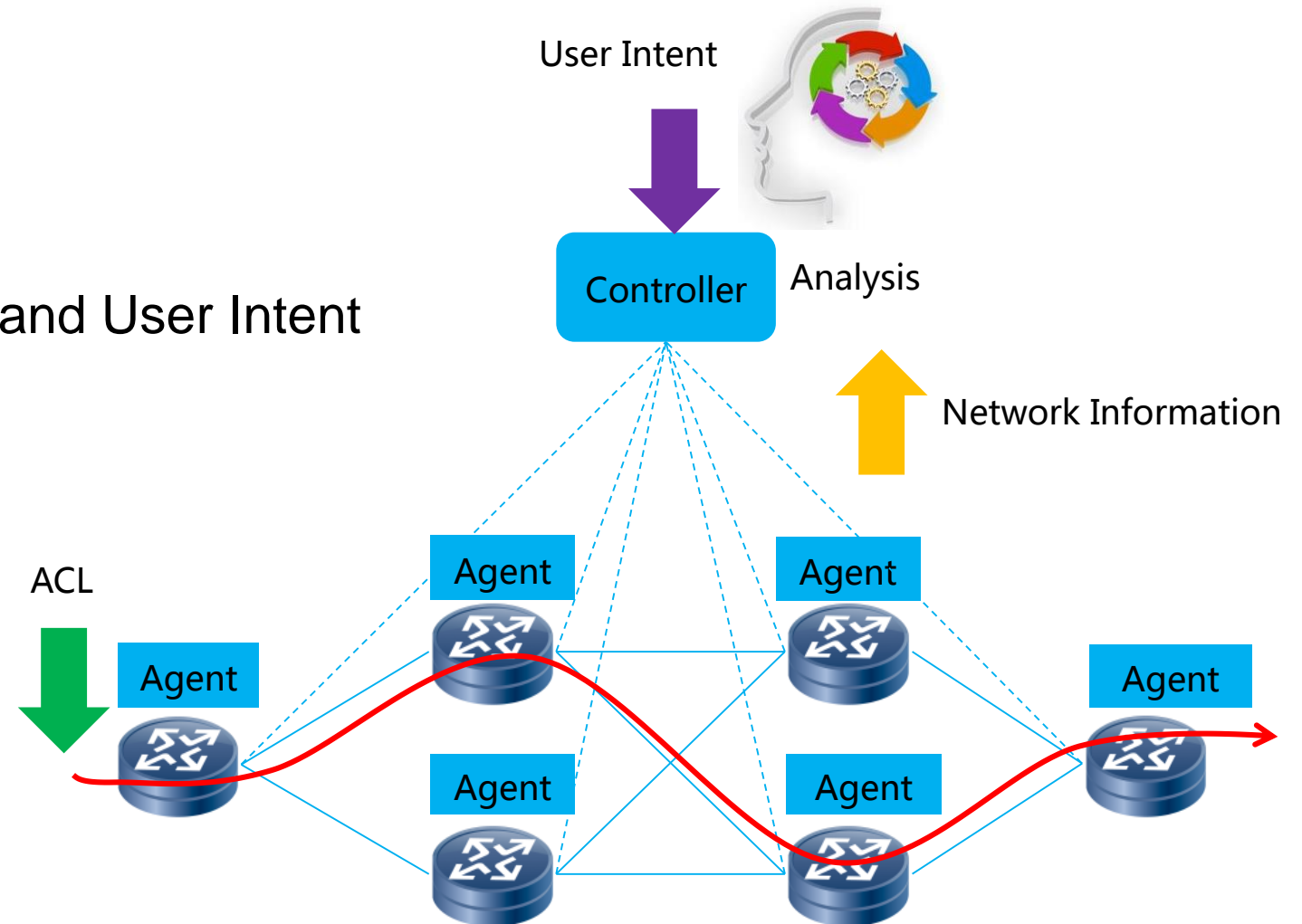
- Performance
 - Forwarding impact due to packet processing
 - Bandwidth and server overload due to exported data
- Limited data flexibility and extensibility
- Deployment issues
 - Encapsulation
 - Tunnel

iFIT Solution Framework



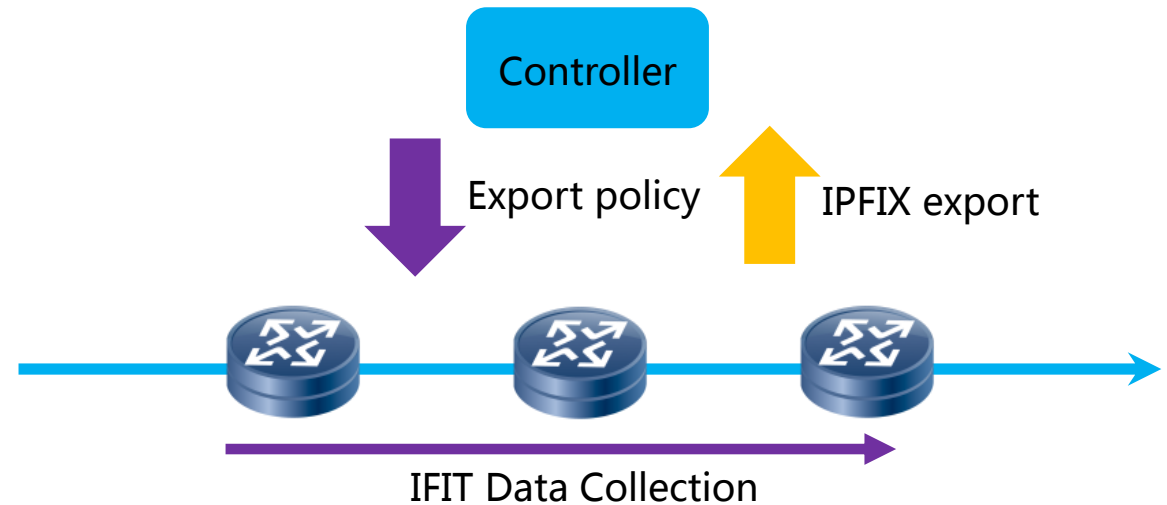
Smart Flow/Data Selection

- Collect Network Information
 - Flow sketch
 - Network condition
- Analyze the Network Information and User Intent
 - Target flows
 - Packet sample rate
 - Collected data set
- Apply Policies
 - ACL
 - Configuration

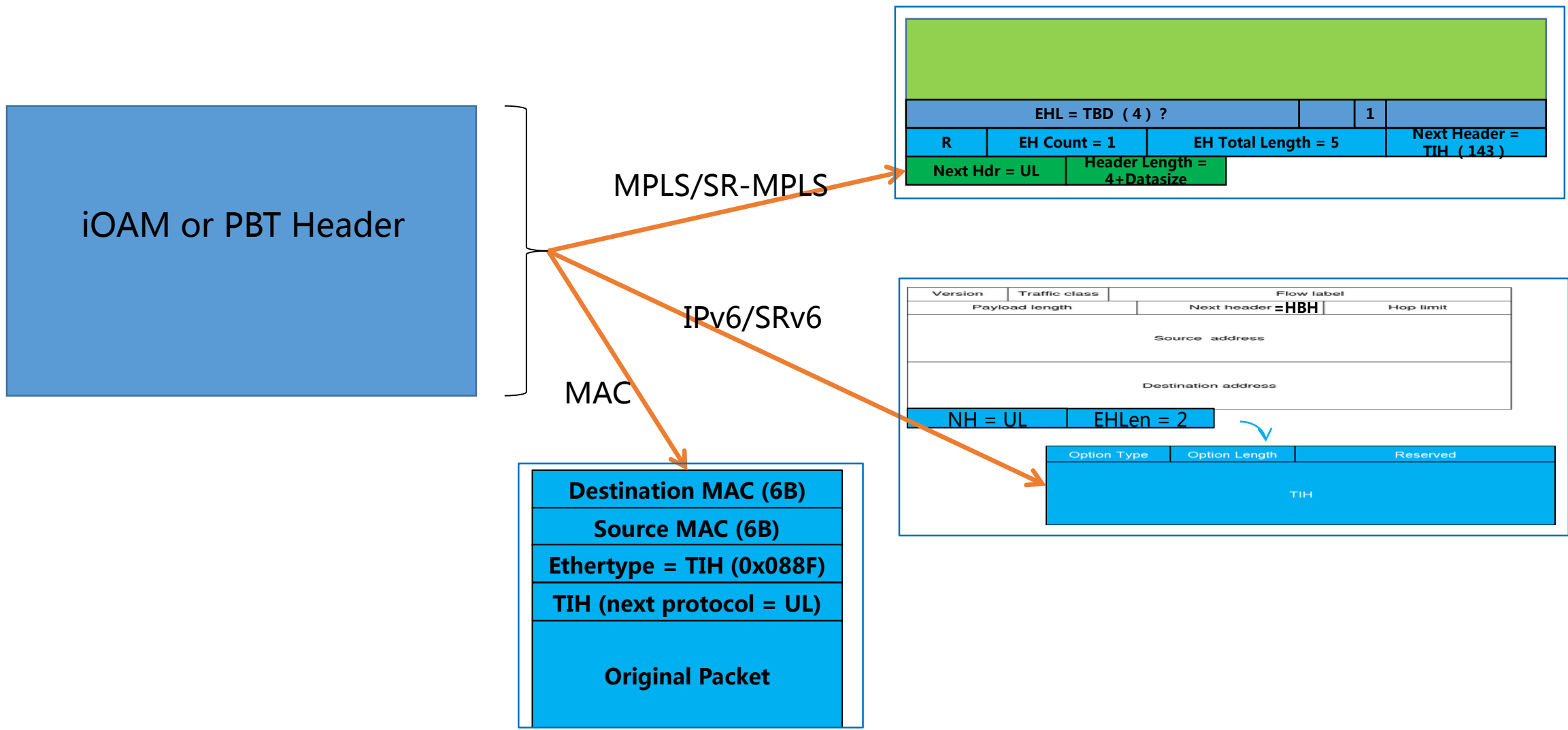


Export Data Reduction

- Batch
- Dedup and compression
- Policy-based export
 - On change
 - On exception
 - On timeout
 - On threshold

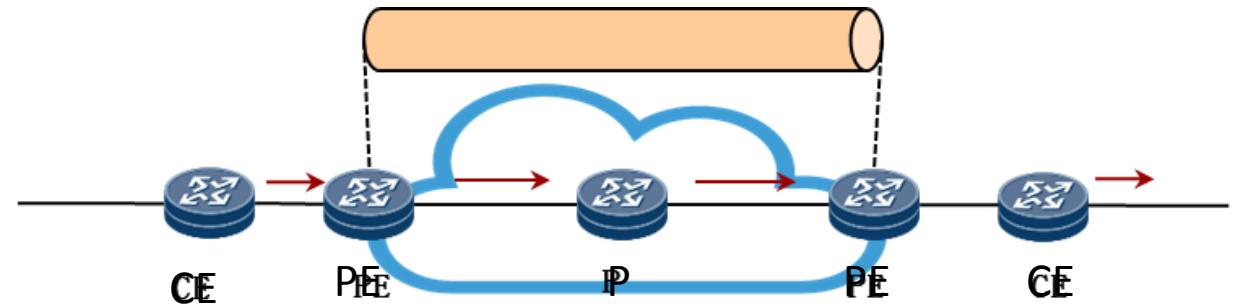


Encapsulation



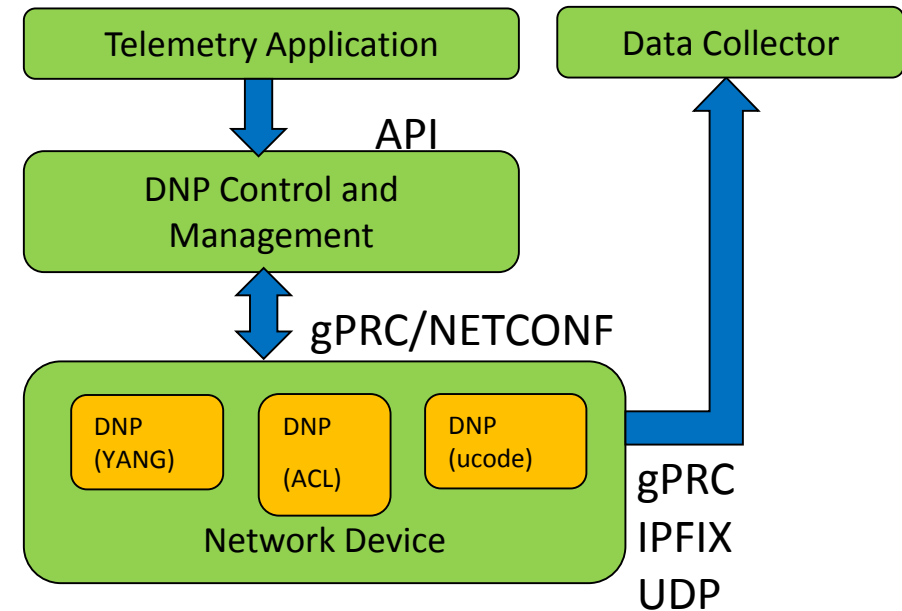
Tunnel Modes

- Uniform Model
 - True E2E data
- Pipe Model
 - Tunnel as a single logical node to customer
 - Tunnel provider can do INT independently



Dynamic Network Probes

- Runtime data customization and processing through configuration and programming
 - Data processing near or in network device for system efficiency and cost
- Applied for
 - Flow/Data Filter and Statistics
 - Event Monitoring
 - Data Processing



Discussion & Next Steps

- Collect feedbacks
 - What other challenges for carrier network data plane telemetry?
 - What other suggestions to make the framework more complete?
- Demonstrate prototype in carrier networks based on the framework
- Future work
 - Data consumption
 - Cross domain operation