IETF 125 Hackathon

Agentic Inter-Domain Routing

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Yihao Chen, **Shenglin Jiang,** Yangfei Guo
Zhongguancun Laboratory

Evolution of Inter-Domain Routing

1989

BGP1(RFC 1105)

Path Vector routing

TCP-based sessions

…

1990

BGP 2(RFC 1163)

Protocol refinements

Improved stability

…

1991

BGP 3(RFC 1267)

CIDR support

Route aggregation

…

1994

BGP 4(RFC 1771, 4271)

Current inter-domain routing standard

Multiprotocol Extension (MP-BGP, RFC 4760)

…

Ongoing

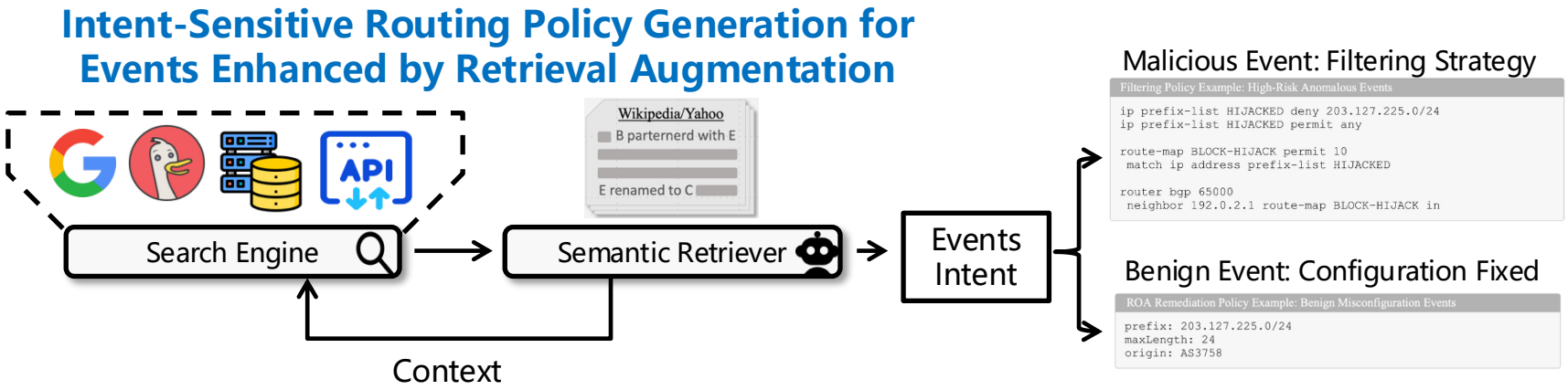
Post-BGP

- Security Enhancement
(RPKI (RFC 6480), BGPsec (RFC 8205))
- Observability
(BMP (RFC 7854))
- Core Protocol Extensions
(FlowSpec, BGP-LS, Communities…)

Towards Agentic IDR：AI-assisted analysis, anomaly detection, and automated policy optimization
— building on the observability and security foundations established by GROW, SIDROPS, and IDR

Agentic Inter-Domain Routing Policies

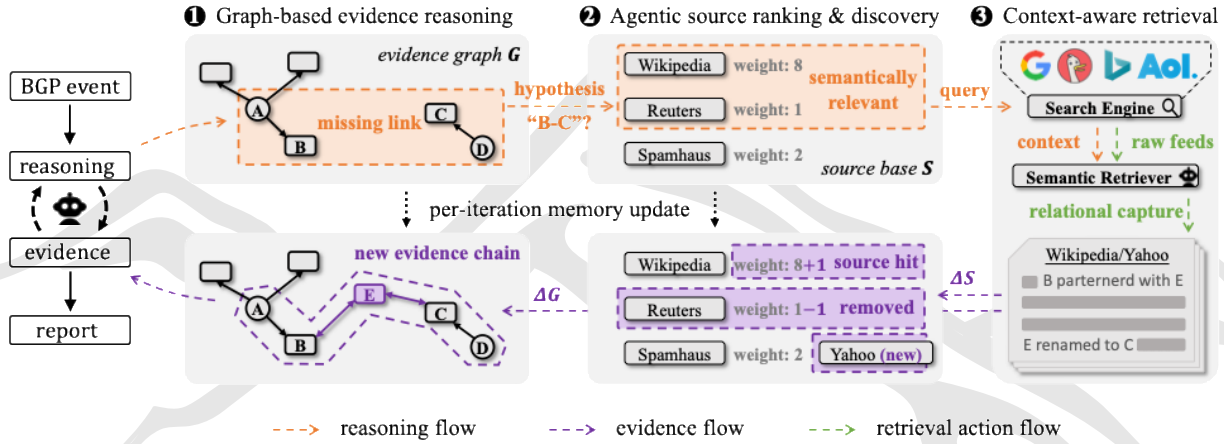
- **Challenge:** Routing anomalies exhibit diverse and complex characteristics.
- **Approach:** Through multi-round knowledge retrieval and trusted evidence fusion, the system iteratively converges on the contextual semantics of routing anomalies and derives interpretable event intent. Based on the inferred event intent, differentiated routing policies are adaptively generated, ensuring consistency between anomaly semantics and policy generation.



Agentic Inter-Domain Routing Policies

Core Features:

- Multi-Source Knowledge Management: Efficient acquisition and evaluation of routing knowledge
- Knowledge Graph–Enabled Event Reasoning: Intuitive discovery of evidence chains for complex routing incidents
- Intent-Aware Agentic Routing Policy: Adaptive mitigation for diverse routing anomalies



Agentic Inter-Domain Routing Policies

Event Intent Recognition

Event Type	Number	Percentage	Routes	Source ASes	Vantage Points	Countries Involved
High-Risk Anomalous	12	26.7%	102	22	34	12
Benign Misconfiguration	33	73.3%	331	29	50	15
Total	**45**	**100%**	**433**	**51**	**50**	**24**

Validation Set

Model	TP	TN	Accuracy	Precision	Recall	F1
Claude Sonnet 4.6	10	32	0.933	0.909	0.833	0.870
GPT-5.2	10	30	0.889	0.833	0.833	0.833
Gemini 3.1 Pro Preview	8	31	0.867	0.800	0.667	0.727
Qwen3 Max Thinking	10	30	0.889	0.833	0.833	0.833
DeepSeek V3.2	8	30	0.844	0.800	0.667	0.727

Event Intention Recognition Results

Various models have achieved good performance on all indicators, with the highest F1 value reaching 0.870, corresponding to approximately 93.3% discrimination accuracy

Response Policy Actionability

Across all correctly identified events, generated policies achieve full syntactic and semantic validity

Event Type	Policy
High-Risk Anomalous	Route Filtering
Benign Misconfiguration	ROA Remediation

Metric	Successes	Success Rate
Syntactic Correctness	42	100%
Semantic Consistency	42	100%

Filtering Policy Example: High-Risk Anomalous Events

```
ip prefix-list HIJACKED deny 203.127.225.0/24
ip prefix-list HIJACKED permit any

route-map BLOCK-HIJACK permit 10
 match ip address prefix-list HIJACKED

router bgp 65000
 neighbor 192.0.2.1 route-map BLOCK-HIJACK in
```

ROA Remediation Policy Example: Benign Misconfiguration Events

```
prefix: 203.127.225.0/24
maxLength: 24
origin: AS3758
```

Agentic Inter-Domain Routing

GitHub repos: https://github.com/IDRNG

Mailing list: idrng@irtf.org

Administrator: idrng-owner@irtf.org

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