BLUECAT™

Edge Resolver

Hybrid and multicloud resolution

Challenge

Organizations adopting hybrid and multicloud environments are trying to keep up with visibility and control of hybrid-cloud DNS resolution that is highly fragmented. Solving the challenges of increased complexity and reliability issues, which can cause network downtime, requires a dramatic shift toward DNS automation.

Solution

Edge Resolver eliminates these challenges by automating DNS mapping and delivering reliable, unified resolution across diverse environmentas, ensuring seamless integration and performance at scale. Seamless DNS resolution across all environments

Benefits

- Unified DNS map that simplifies resolution enterprise wide
- Real-time DNS agility for hybrid environments
- Accelerate configuration for conditional forwarding

Contact us

Ensuring reliable DNS for hybrid and multicloud applications and services

Hybrid cloud adoption offers enterprises the flexibility to build agile applications across scalable cloud platforms and on-premises infrastructure, but the rapid pace of change often overwhelms network teams. According to Enterprise Management Associates, only 28% of cloud and networking professionals have strong visibility into changes across these environments, leading to unreliable query resolution and operational strain. As hybrid environments grow more complex, solving this challenge requires more innovative and automated solutions.

Network teams can avoid costly outages and improve DNS reliability if they can find a way to provide the best DNS answer depending on whether they are in an on-premises network or in one of the cloud environments. DNS data can include private links in Microsoft Azure or the addition and location change of DNS zones in on-premises or multicloud environments. Without a hybrid-cloud-aware solution, DNS can take needless latency penalties and manual changes to conditional forwarding rules can make DNS updates error-prone and risky.

This solution brief presents how network teams can embrace complexity and make DNS elastic for hybrid cloud environments by activating Edge Resolver in BlueCat Edge. Focusing on BlueCat's automation of an intelligent unified map for all DNS, this brief focuses on a hybrid cloud use case for latency sensitive applications and services that includes a graphic illustration using query flow.

Solution overview

Edge Resolver is BlueCat's latest DNS evolution in Intelligent Forwarding, designed to embrace complexity and optimize DNS resolution for hybrid cloud environments. It bridges the gap between cloud-native and on-premises networks by creating a unified map of DNS zones, reducing time to configuration and errors to deliver unprecedented reliability. Acting as the DNS recursion layer, Edge Resolver automates zone discovery across all environments—on-premises, multicloud, and third-party services—ensuring real-time accuracy as changes occur. Making BlueCat Edge hybrid-cloud aware, it streamlines query resolution paths, minimizes round-trip times, and eliminates conditional forwarding rules.

With Edge Resolver, network teams only need to manage a single namespace, providing consistent and efficient resolution across all resources. This unique approach makes DNS elastic, enabling it to adapt to constantly evolving environments without the risk of DNS failures. Through continuous polling and integration with BlueCat Integrity and public cloud DNS, Edge Resolver ensures an always-updated, reliable DNS resolution experience for critical applications and services.

In short, Edge Resolver simplifies and accelerates DNS resolution, and ensures DNS remains fault-tolerant and reliable in hybrid-cloud environments.

Use cases

In order to leverage Edge Resolver for hybrid-cloud use cases, network teams will need to activate the network and cloud module/package in BlueCat Edge. By activating these modules, BlueCat Service Points can be configured to use one namespace that points to the Edge Resolver service.

To resolve client or critical app and service queries, BlueCat Edge uses an always-on discovery service, to discover and save DNS data into one resolution map from the following sources:

- Zones owned by BlueCat Integrity's on-premises resources
- AWS Route 53 owned zones across accounts, regions, and VPCs
- Microsoft Azure DNS owned zones across Azure regions and VNETs
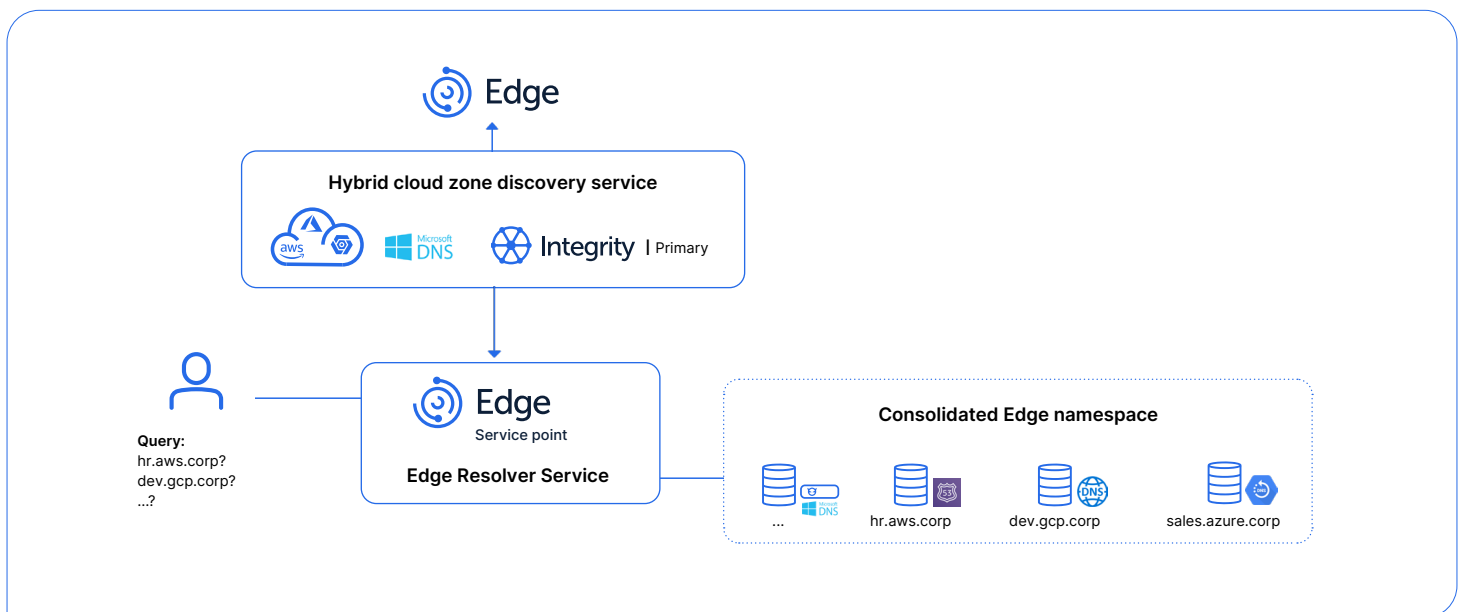- Google Cloud DNS owned zones across cloud locations

Figure 1. Polling for DNS data changes and resolving queries with one namespace

Making resolution more reliable for complicated CNAME chains or private links

Complicated CNAME chains can provide some latency issues for DNS resolution, especially in hybrid environments where queries traverse multiple servers across on-premises, public, and cloud networks. Regardless of how many DNS servers there are, BlueCat Edge caches the answer to deliver the most direct path to resolution.
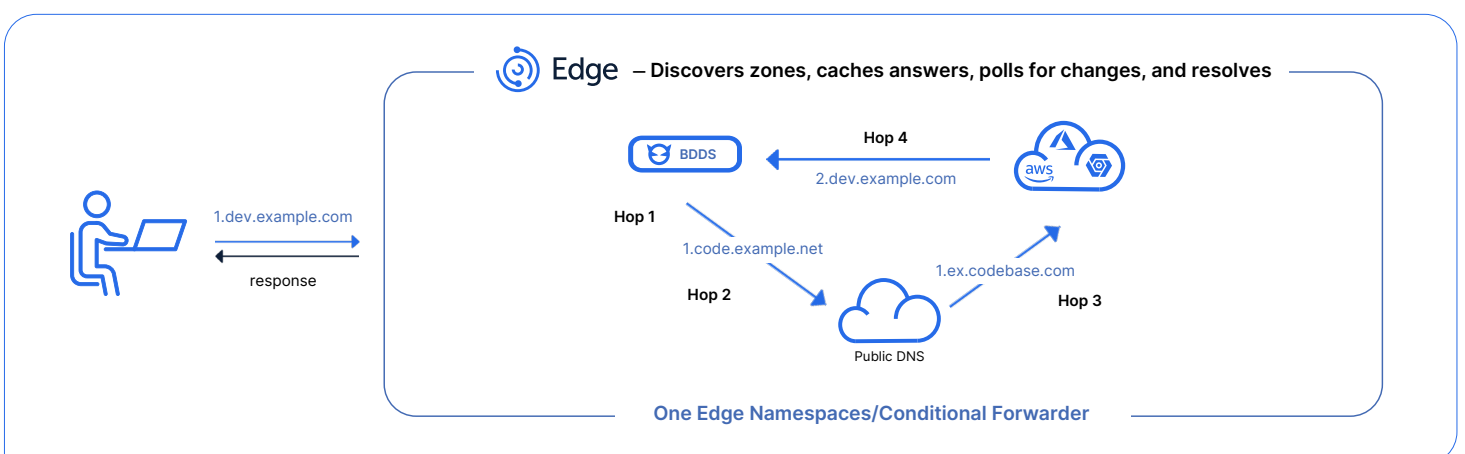

Figure 2. Full DNS recursion for multi-cloud and on premises CNAME chasing

As seen in figure 2, above, a bank employee needs to access a bank application by querying 1.dev.example.com.

- The DNS query starts at the on-premises DNS server, which identifies a CNAME record pointing to a public DNS server.
- The public server then forwards the query to a cloud DNS server managing another CNAME that finally redirects back to the on-premises DNS server for the correct resolution.

With Edge Resolver, this complexity is eliminated. By creating a unified map of all DNS zones, Edge Resolver bypasses unnecessary recursive steps, resolving queries directly and reducing latency. For the bank employee, this means instant access to the development environment without delays, ensuring a seamless and reliable experience.

Keeping up with location changes to DNS data

Let's continue with the bank employee example. In another instance of querying to access the application, the CloudOps team decides to make changes to the zones involved in this CNAME chain. Traditionally, the network team would not be made aware of these changes in real time, potentially impacting the bank employee's access or causing downtime for other critical services. Manual updates to conditional forwarding rules would typically be required, leading to delays and an increased risk of misconfigurations.

As seen in figure 3, above, CloudOps and NetOps can make multiple changes to what environments host zones. With Edge Resolver, the manual conditional forwarding rule challenges are eliminated, as it dynamically discovers and updates the unified DNS map in real time, avoiding manual dependencies and ensuring uninterrupted access and increased reliability.
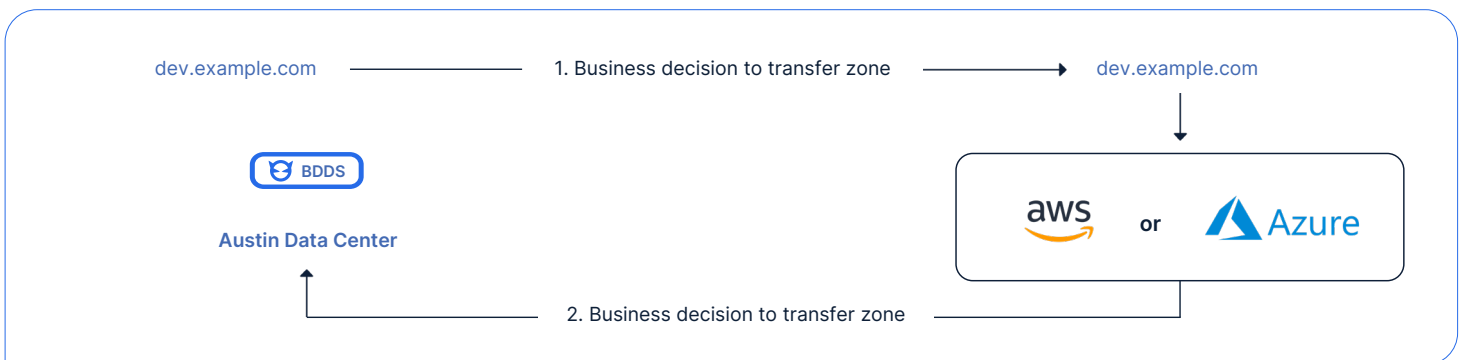

Figure 3. Transferring zones across silos of DNS

Reliable visibility and control to enforce security and compliance
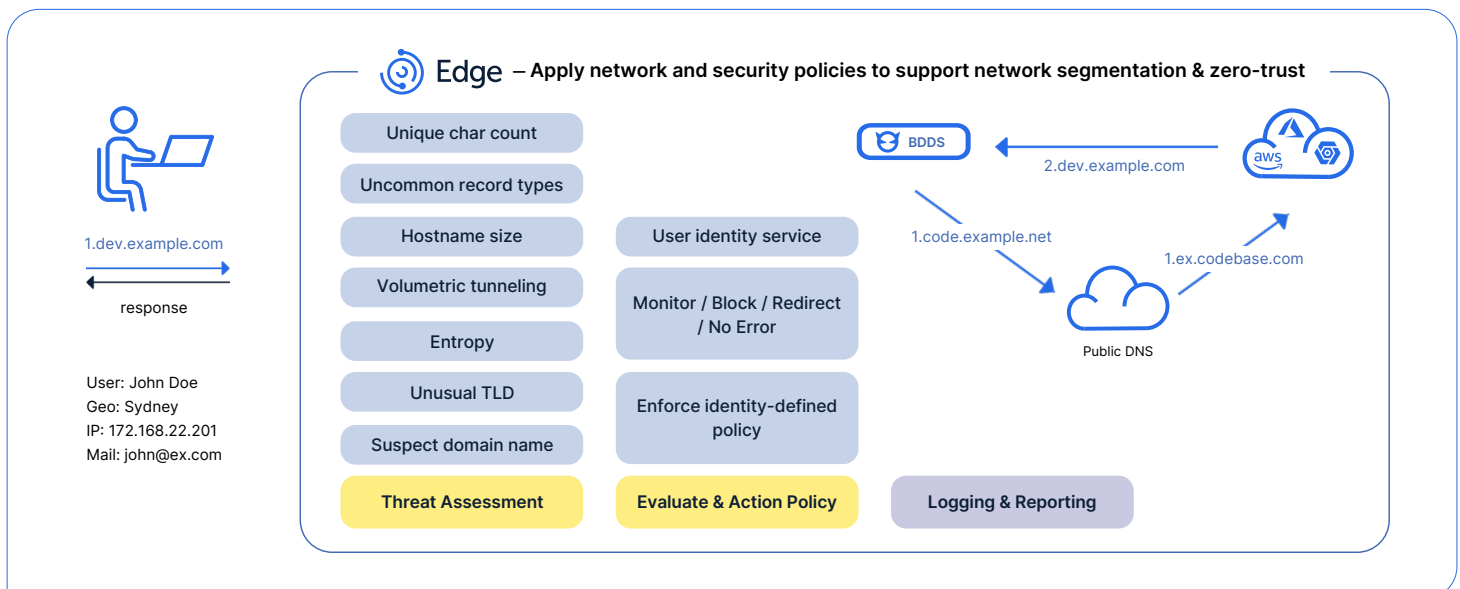

Figure 4. DNS security applied to every query

Edge adds a much-needed layer of visibility, control, and detection for DNS. Edge gives network and IT teams unprecedented access to DNS query data, allowing them to establish smarter network policies, optimize traffic, and meet stringent compliance and logging requirements. Edge also plays a critical role in the overall security of enterprise networks, enabling security teams to leverage the DNS data that Edge captures as yet another layer of intelligence and protection.

Out of the box, BlueCat Edge allows you to create policies for network segmentation that supports Zero trust. As seen in figure 4, network teams can enhance security by activating the security module/package in BlueCat Edge to:

- Segment DNS: Segment endpoints with network policies and to limit access to resources
- Stop threats: Create DNS policies to alert and block bad domains, tunneling, hijacking, and DDoS attacks
- Block queries: Add an identity provider to block policies and control DNS activity across all user devices

Key differentiators

There are four major differences between BlueCat Edge Resolver and other DNS resolvers.

1. Unified DNS map for hybrid environments: Edge Resolver consolidates DNS zones from on-premises, cloud, and multi-vendor environments into a single resolution map. This unified map ensures streamlined DNS resolution across complex infrastructures.

2. Cloud-aware and agnostic: Edge Resolver integrates effortlessly with AWS, Azure, GCP, and other cloud services. It ensures consistent DNS performance across multicloud and hybrid environments without vendor lock-in.

3. Seamless Integration with BlueCat Integrity: Edge Resolver is fully integrated with BlueCat Integrity and introduces intelligent resolution services. This integration improves DNS management while delivering optimized performance and reliability.

4. Optimized Query Resolution Paths: By bypassing unnecessary recursive layers, Edge Resolver resolves queries directly and reduces round-trip times. This results in faster responses and improved performance for latency-sensitive applications.

Solution benefits

Network teams enjoy several benefits when using Edge Resolver as a solution for DNS resolution. They include:

- **Increased reliability.** Edge Resolver knows exactly where each DNS zone is, regardless of delegations, eliminating multiple query steps and significantly speeding up resolution for delegated zones and multi-hop queries.

- **Simplified DNS resolution.** Unify DNS zones from multiple cloud and on-premises environments, creating a single, cohesive, and intelligent DNS resolution system that reduces configuration complexity.

- **Hybrid cloud-awareness.** Edge Resolver continuously polls for changes in DNS data, ensuring real-time accuracy and seamless resolution in fast-paced hybrid networks.

- **Accelerate configuration.** Edge Resolver eliminates managing multiple forwarding rules; discovered zones or changes are automatically resolved within a single namespace, saving time and boosting efficiency.

Next steps

Start ensuring reliable DNS for hybrid and multicloud applications and services with Edge Resolver.

Contact us