DNS Bidirectional Fallback: Hybrid Resolution With Legacy DNS Compatibility

by Nick Clark | Published March 27, 2026 | PDF

The adaptive index does not require a complete replacement of DNS to be useful. It provides bidirectional fallback: resolution attempts the adaptive namespace first, then falls back to DNS when the adaptive namespace does not contain the requested name, and vice versa. This hybrid approach enables incremental adoption where new naming capabilities coexist with the existing internet naming infrastructure indefinitely.

What It Is

DNS bidirectional fallback is a resolution strategy that bridges the adaptive namespace and the legacy DNS hierarchy. When a client requests a name, the resolution stack first queries the adaptive index. If the adaptive index can resolve the name, it returns the result with full governance metadata. If the adaptive index does not contain the name, the resolver falls back to standard DNS resolution.

The fallback also works in reverse: DNS queries for names that have been migrated to the adaptive namespace can be redirected through bridge records that point DNS resolvers to the adaptive index's entry point for that name. This allows DNS clients to reach adaptive-namespace resources without modification.

Why It Matters

Any replacement for DNS that requires complete, simultaneous adoption is not viable. The internet runs on DNS. Billions of devices, applications, and services depend on DNS resolution. A new naming system must coexist with DNS during any transition period, which in practice means indefinitely.

Bidirectional fallback removes the adoption barrier. Organizations can move individual namespaces to the adaptive index as their governance requirements demand, while retaining DNS for everything else. No flag day is required. No breaking change is imposed. Adoption proceeds at the pace of operational need.

How It Works Structurally

The resolution stack maintains a priority order: adaptive index first, DNS second. When a name resolution request arrives, the local resolver checks whether the name falls within any adaptive namespace scope it is aware of. If yes, it queries the adaptive index through the standard stepwise delegation process. If the adaptive index returns a result, resolution is complete.

If the adaptive index does not contain the name, or if the resolver is not aware of any adaptive scope for the name's prefix, it falls back to standard DNS resolution using conventional recursive or iterative queries. The fallback is transparent to the client application.

For the reverse direction, DNS zones can include bridge records, such as SRV or TXT records, that indicate the authoritative adaptive index entry point for a given name prefix. DNS-only clients follow these records to reach adaptive namespace resources through a bridge resolver that translates between DNS queries and adaptive index resolution.

What It Enables

DNS fallback enables the adaptive index to deliver immediate value without waiting for ecosystem-wide adoption. An organization can deploy adaptive indexing for its internal namespace governance while maintaining DNS for external communication. A platform can use adaptive aliasing for its service mesh while keeping DNS for customer-facing domains.

This hybrid model means the adaptive index does not compete with DNS for universal adoption. It supplements DNS where DNS falls short, governance, mutation, structural adaptation, and scoped authority, while preserving DNS where DNS works adequately.

Adaptive Indexing All 21 steps →

Resolution without global consensus. Anchor-governed self-organization.

Patent
US 19/326,036 · published
Primary Technical Disclosure

Secondary Technical

Applications (General)

Applications (Specific)

Model for What Permanent Data Means Over Time.○ Ceramic Built Mutable Data Streams for Web3. The Governance of Those Streams Is Still Not Local.○ Kubernetes Service Discovery Resolves Within Clusters. Cross-Cluster Namespace Is Central.○ Amazon Route 53 Is the Most Reliable DNS on Earth. It Is Still DNS Architecture.○ HashiCorp Nomad Distributes Scheduling. The Namespace That Organizes It Is Still Central.○ ZooKeeper Coordinates Distributed Systems. The Coordinator Is a Single Point of Authority.○ etcd Stores the State of Kubernetes. The State Store Has No Scoped Governance.○ Consul KV Distributes Configuration. The Distribution Authority Is Still Central.○ Raft Made Consensus Understandable. It Did Not Make Consensus Scope-Aware.○ Paxos Proved Consensus Is Possible. It Did Not Address Namespace Governance.○ Cosmos Tendermint Enabled Sovereign Blockchains. The Namespace Between Them Is Ungoverned.○ AWS Cloud Map Discovers Services. The Discovery Authority Lives in One Region's Control Plane.○ Azure Traffic Manager Routes Globally. The Routing Authority Is Centrally Defined.○ GCP Service Directory Centralizes Service Registration. Registration Is Not Governance.○ Netlify DNS Simplifies Deployment Routing. The Namespace Authority Is Still Netlify's.○ Vercel's Edge Network Executes at the Boundary. Routing Authority Does Not.○ Bunny CDN Delivers Content Globally. Cache Governance Is Still Central.○ KeyCDN Optimized Content Delivery. The Delivery Namespace Is Centrally Controlled.○ Limelight Networks Built Private Infrastructure for Delivery. The Namespace Governance Is Still Central.○ StackPath Combined CDN With Edge Computing. Namespace Authority Remained Central.○ Envoy Proxy Made Service Mesh Data Planes Programmable. The Control Plane Still Governs.○ NGINX Powers the Web's Reverse Proxy Layer. Its Configuration Is Statically Defined.○ Traefik Discovers Services Automatically. The Discovery Namespace Is Still External.○ Linkerd Simplified the Service Mesh. The Namespace It Meshes Is Still Kubernetes.○ Namecheap Made Domain Registration Accessible. Domain Governance Remains the Registrar Model.○ GoDaddy Registered More Domains Than Anyone. The Namespace Model Has Not Changed.○ DNSimple Made DNS Management Developer-Friendly. The Governance Model Is Still DNS.○ Datadog Observes Everything. The Namespace It Observes Has No Governed Structure.○ Grafana Unified Observability Visualization. The Data Namespace It Queries Has No Governed Structure.○ Prometheus Defined Cloud-Native Monitoring. Its Metric Namespace Has No Governance Layer.○ New Relic Pioneered APM. The Telemetry Namespace It Built Is Centrally Indexed.○ Splunk Indexes Machine Data at Scale. The Index Namespace Is Centrally Administered.
Adaptive Indexing overview →
AQ
deterministic
autonomy

Legal

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- Inventive Steps
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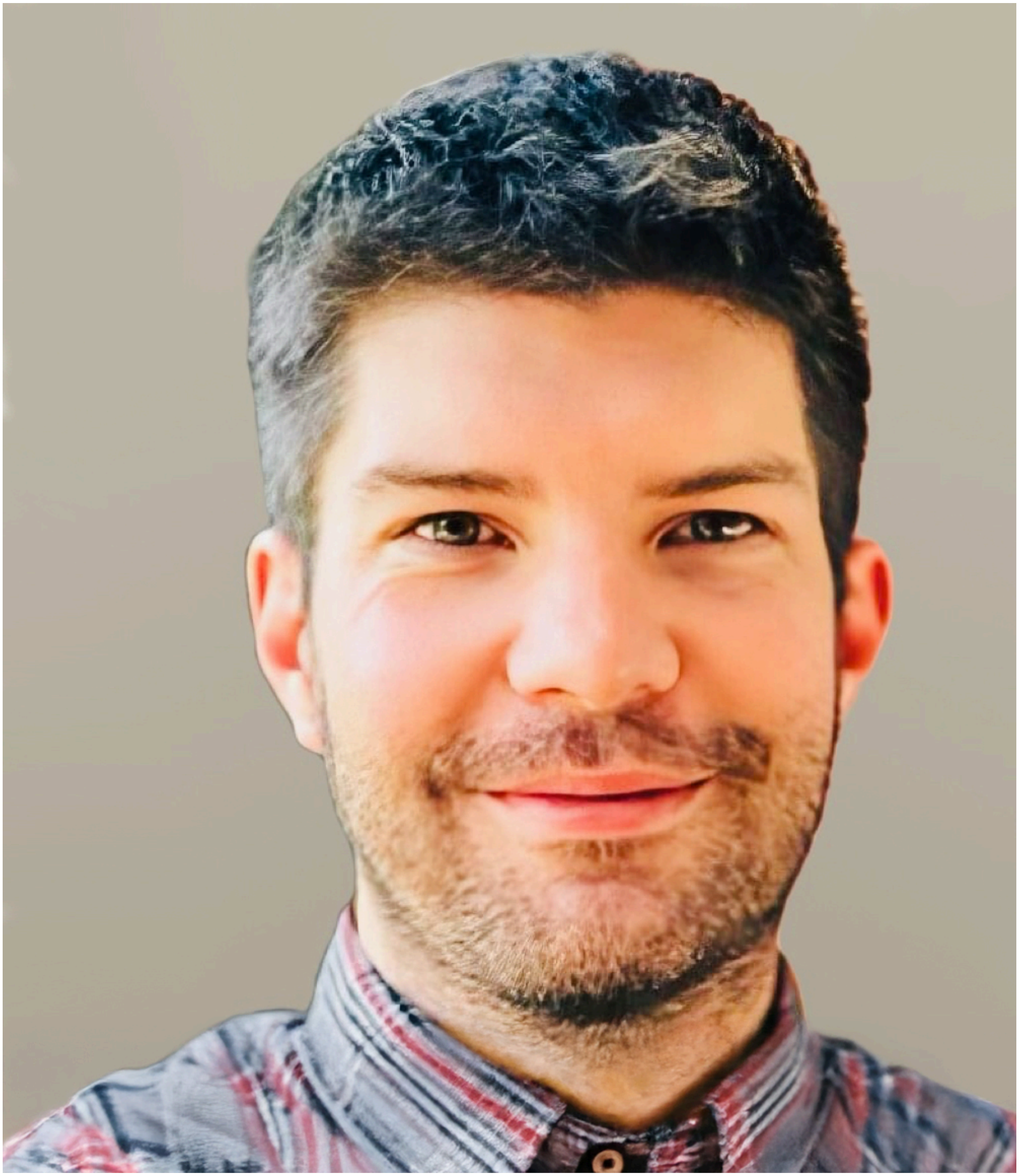
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