

# CacheServe

Deliver fast, reliable and secure Internet services with the DNS leader



Akamai DNSi CacheServe has formed the foundation for the world's fastest and most reliable Internet networks by enabling self-defending DNS infrastructure that shields networks and subscribers from cyberthreats.

For more than 15 years, CacheServe has offered exceptional availability, extraordinary stability, and superior security. CacheServe technology maximizes the power of server hardware and is consistently ahead of alternatives with numerous innovations that make networks faster and less costly to operate:

- Performance optimizations reduce query latency and maximize availability of nameservers on the Internet to improve responsiveness of applications and services.
- Fine-grained policies manage unwanted traffic and form the basis for premium services to secure and personalize home and business network access.
- Unmatched defenses deter hackers from corrupting DNS data with cache poisoning attacks that can impact subscribers.
- Embedded features gather DNS query and server telemetry data to support operations, planning, and business initiatives.
- Industry-best reports provide an at-a-glance view of DNS resolution and server status and comprehensive drill-downs to details.
- Simple DNS extensions permit better mapping between content sources and requesters to improve the user experience and minimize impact of content delivery.

Coupled with responsive 24/7 commercial support, staffed with experts steeped in Communication Service Provider (CSP) requirements, networks built with CacheServe always deliver the quality Internet experience subscribers demand. Hundreds of millions of subscribers in over 40 countries rely on it every day for fast, reliable, and secure internet access.

## Leading Performance

CacheServe software running on a commodity server answers more than 1.4 million queries per second, so legacy DNS resolvers can be consolidated to reduce capital and recurring costs (e.g., rack space, power, cooling). Innovative features protect servers and ensure availability, allowing further network simplification by eliminating equipment such as load balancers and firewalls.

Low-latency query resolution delivers the best possible subscriber experience for every application and service. Additional CacheServe features retain cached records for popular web resources when authoritative nameservers are unavailable, and automatically refresh them when authorities come back online. DNS servers have become common targets, and other enhancements automatically reduce stress on nameservers under attack with highly targeted dynamic rate-limiting of recursive queries.

## Precision Policies Protect Networks

Precision Policies protect networks from abuse by precisely targeting unwanted DNS traffic and ensuring good queries are always answered. Policy triggers operate on incoming queries or outgoing answers for comprehensive coverage. Careful software design ensures extremely high performance, and low latency even when sophisticated policies are actively filtering traffic. Other solutions impair resolver performance, miss unwanted traffic, and cause collateral damage by over-filtering queries and disrupting the subscriber experience.

## KEY FEATURES

- Leading performance, low latency DNS resolution
- Policy framework for fine-grained control over query traffic
- Unique cache poisoning defenses protect subscribers
- Easy to read reports with real time system and operational data
- Efficient collection and scalable management of DNS and telemetry data

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Optional dynamic feeds leverage precision policies to protect networks from DNS-DDoS, bots, malware, and DNS tunnels (ThreatAvert); or enable security and personalization services for households (Secure Consumer) and small businesses (Secure Business).

## Unmatched Cache Poisoning Defenses Protect Subscribers

CacheServe cache poisoning defenses remain the most effective in the industry. They stood up against Kaminsky's infamous attack, substantially slowing its progress when other resolvers were corrupted in minutes. Vulnerabilities such as the one announced by JPRS (JPCERT-AT-2014-0016) are also covered.

## Scalable Data Management, Rich Telemetry and Reporting

Data is essential for operations, and DNS data provides a completely different view of network activity based on web destinations rather than IP-level statistics obtained from sources like Net-Flow. CacheServe gathers DNS query data outside the resolution "fast path" to avoid impacting performance. Detailed telemetry data covering server operating statistics is also collected. Since resolvers in CSP networks may serve tens of thousands of users and generate prodigious amounts of data, configurable filters can be applied to reduce the volume.

CacheServe incorporates a data management architecture based on open solutions that have been proven in the world's largest networks, delivering operational excellence at web scale and speed. Live-streamed data from CSP resolvers network-wide is aggregated and made available to reporting (described below) and other systems. The resilient architecture provides nonstop availability to power a nonstop customer experience. Optional connectors to open Big Data systems (e.g., Splunk, Hadoop) or purpose-built applications can be used to derive additional operational, security, and business insights.

CacheServe offers extensive real-time reports covering essential operating metrics for instant verification that servers are operating within normal ranges, and to anticipate capacity requirements. When unusual activity is detected, operators can easily drill down to identify the root cause. Additional analytics tools provide the ability to search, filter, group, and post-process data. Custom dashboards and reports can be created in minutes to display query or system data in a user-defined format to meet unique operational requirements. Tag-based reports let operations staff configure views of their DNS server topology that match their unique requirements.

## Content-aware DNS Resolution

For service providers considering deployment of distributed Content Delivery Network (CDN) caches across their networks, EDNS0 client subnet (ECS), a draft RFC, can potentially improve the alignment of content sources with preferred network capacity to reduce transit path costs. Equivalence class, a unique CacheServe feature, incorporates the respective provider and CDN network topologies to substantially reduce the load on resolvers (cached entries) that would otherwise be introduced with ECS.



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