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Service Binding Mapping for Background Requests  
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## Abstract

This document defines a new SvcParamKey for use in Service Binding (SVCB) and HTTPS DNS resource records which enables authoritative DNS servers to indicate that a client can use an alternative endpoint for "background" requests. By providing this information, clients can make informed decisions about which service endpoints to use based on their specific applications needs at the time of making connections.

## About This Document

This note is to be removed before publishing as an RFC.

The latest revision of this draft can be found at <https://gakiwate.github.io/draft-gakiwate-dnsop-svc-bg-priority-parameter/draft-gakiwate-dnsop-svc-bg-priority-parameter.html>. Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-gakiwate-dnsop-svc-bg-priority-parameter/>.

Discussion of this document takes place on the Domain Name System Operations mailing list (<mailto:dnsop@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/dnsop/>. Subscribe at <https://www.ietf.org/mailman/listinfo/dnsop/>.

Source for this draft and an issue tracker can be found at <https://github.com/gakiwate/draft-gakiwate-dnsop-svc-bg-priority-parameter>.

## Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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## Table of Contents

1. Introduction . . . . .	2
2. Conventions and Definitions . . . . .	3
3. Motivation . . . . .	3
4. The "bg-priority" SvcParamKey . . . . .	4
4.1. Client Behavior . . . . .	4
4.2. Example Use . . . . .	5
4.3. Operational Considerations . . . . .	5
5. Security Considerations . . . . .	6
6. IANA Considerations . . . . .	6
6.1. SVCB Service Parameter . . . . .	6
7. Normative References . . . . .	6
Acknowledgments . . . . .	6
Authors' Addresses . . . . .	7

## 1. Introduction

The SVCB and HTTPS resource records (RRs) provide clients with instructions to connect to a service while avoiding transient connections to a suboptimal default server [SVCB]. However, server deployments may wish clients to interact with a service differently depending on the context in which they are operating. For instance, consider a weather application. When running in the background, the application may retrieve data infrequently and can thus tolerate higher latency. In contrast, when an user is actively interacting with the application, the same requests now require low-latency

responses from nearby servers. Traditionally, such use cases are handled by provisioning distinct endpoints --- one for "interactive" requests and another for "background" requests. This approach does not work in scenarios where a service with a single hostname needs to be used for both "background" and "interactive" requests. Moreover, this static partitioning imposes rigid service delineation and prevents clients from adapting dynamically. In practice, a client may, based on local context, dynamically determine that a request typically considered "interactive" can be fulfilled using a latency-tolerant path, thereby improving resource utilization and reducing operational cost.

This document defines a new `SvcParamKey`, `bg-priority` (short for "background priority"), to enable clients to dynamically discover service endpoints suited for latency-tolerant requests. The presence of `bg-priority=1` on a service endpoint signals that it is optimized for background requests and can be selected as needed by clients. This key allows clients to filter down to endpoints that apply to them at the time of using DNS answers to establish connections.

## 2. Conventions and Definitions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

## 3. Motivation

In modern network environments, deployment scenarios often involve diverse types of application traffic, such as interactive video conferencing, real-time gaming, and background file synchronization, each with distinct performance requirements. Interactive traffic typically demands low latency and high responsiveness, whereas background traffic prioritizes throughput and efficiency over immediacy. Moreover, where in the network environment these demands can be reliably and efficiently met also differ.

The `bg-priority` `SvcParamKey` enables authoritative DNS servers to signal these distinctions, thereby allowing clients to route traffic intelligently. This capability is particularly valuable in load-balancing resource-constrained scenarios, where providers can allocate interactive traffic to low-latency, high-performance servers while directing background requests to higher-latency but more cost-effective underutilized servers.

Allowing clients explicit control over which service level to use benefits a range of stakeholders, including service operators, by improving quality of service (QoS), optimizing resource utilization, and enhancing end-user experience.

#### 4. The "bg-priority" SvcParamKey

The bg-priority SvcParamKey, short for "background priority," is used to indicate that a service endpoint described in an SVCB or HTTPS record is optimized for background, latency-tolerant traffic. The presentation value for bg-priority SHALL be either 0 or 1.

A value of 1 indicates that the endpoint is designated for background requests, while a value of 0 indicates that the endpoint may be optimized for interactive or real-time requests. If the bg-priority parameter is absent, then the client must assume that the endpoint is designated for both background and interactive requests. The wire format for the bg-priority parameter is a single 1-octet value, with only the values 0x00 and 0x01 currently defined.

##### 4.1. Client Behavior

The bg-priority SvcParamKey in SVCB and HTTPS records indicates that the service operator recommends the use of a particular endpoint for background, latency-tolerant requests. Upon receiving RRs containing the bg-priority key, clients should treat it as a signal to guide endpoint selection based on their current operational context.

To use SVCB or HTTPS RRs, a client first determines whether the current network request is suitable for background handling. The mechanism for making this determination is implementation specific and left to the discretion of the client. For example, a client may provide an explicit signalling interface that allows an application or user to indicate a given request is background in nature. The client may also rely on the local operational context to infer whether background handling is appropriate.

If the client determines background handling to be appropriate, the client filters the RRSet to include only those records with bg-priority=1. If not, the client filters the RRSet to include only those records with bg-priority=0. A record that does not include the bg-priority key is considered to be suitable for all traffic types and should always be included.

Once the client filters the SVCB / HTTPS RRs based on this designation, it proceeds with the remaining records using standard selection logic [SVCB]. If no suitable records remain after filtering, SVCB resolution is considered to have failed, and the

client should fallback appropriately. To avoid unintended resolution failures, service operators should ensure that if any service in a set contains the `bg-priority` key, then at least one service exists for each `bg-priority=0` and `bg-priority=1`, or else at least one service exists without the `bg-priority` key to catch all traffic.

#### 4.2. Example Use

A service that supports endpoints optimized for background i.e., latency-tolerant requests can advertise support to clients using the `bg-priority` `SvcParamKey` as illustrated below:

```
svc.example.com 7200 IN HTTPS 1 . (
    alpn=h2, bg-priority=0 )
svc.example.com 7200 IN HTTPS 2 background.svc.example.com (
    alpn=h2, bg-priority=1, mandatory=bg-priority )
```

In this example, a client that determines a request is suitable for background handling filters the SVCB / HTTPS RRs to select only those records with `bg-priority=1`. In this case, only one RR satisfies the constraint, and the client uses the `background.svc.example.com` endpoint despite its higher `SvcPriority` (i.e., lower preference) compared to the other advertised RR. If a client does not support the `bg-priority` key, the client will ignore it and continue using the default endpoint (`SvcPriority=1`) as before. The service operator can use `mandatory=bg-priority` for the background designated RR to ensure that a client lacking support will skip this RR entirely.

#### 4.3. Operational Considerations

If a service operator does not explicitly include `bg-priority=0` in the default HTTPS RR (as shown in the example above), a client that filters for background-eligible endpoints will treat both RRs as valid matches. This is because a record without the `bg-priority` key is considered suitable for all traffic types. After filtering, the client will proceed with standard SVCB selection logic and prefer the record with the lowest `SvcPriority`. In such cases, the client will select the default endpoint, even if an endpoint optimized for background requests is available.

To avoid unintended selection behavior, service operators should be cautious when mixing RRs that include `bg-priority` key with those that omit it. Explicitly setting `bg-priority` can help ensure more predictable client behavior.

Additionally, partitioning traffic across different service tiers may interfere with connection pooling in some client implementations. This could lead to increased connection overhead or degraded

performance in scenarios that rely heavily on connection reuse. Service operators should evaluate the impact on connection management when deploying bg-priority based routing.

## 5. Security Considerations

TODO: Security considerations

## 6. IANA Considerations

### 6.1. SVCB Service Parameter

Once standardized, this document would ask to add the following entry to the "Service Parameter Keys (SvcParamKeys)" registry.

Number	Name	Meaning	Change Controller	Reference
TBD	bg-priority	Endpoint is suitable for background traffic		(this document)

Table 1

## 7. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/rfc/rfc2119>>.
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- [SVCB] Schwartz, B., Bishop, M., and E. Nygren, "Service Binding and Parameter Specification via the DNS (SVCB and HTTPS Resource Records)", RFC 9460, DOI 10.17487/RFC9460, November 2023, <<https://www.rfc-editor.org/rfc/rfc9460>>.

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