

Quota and Size Properties for DAV Collections
draft-ietf-webdav-quota-05

Status of this Memo

This document is an Internet-Draft and is subject to all provisions of [Section 3 of RFC 3667](#). By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she become aware will be disclosed, in accordance with [RFC 3668](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at <http://www.ietf.org/ietf/1id-abstracts.txt>.

The list of Internet-Draft Shadow Directories can be accessed at <http://www.ietf.org/shadow.html>.

This Internet-Draft will expire on July 23, 2005.

Copyright Notice

Copyright (C) The Internet Society (2005).

Abstract

WebDAV servers are frequently deployed with quota (size) limitations. This document discusses the properties and minor behaviors needed for clients to interoperate with quota (size) implementations on WebDAV repositories.

Table of Contents

1.	Introduction	3
1.1	Notational Conventions	3
1.2	Requirement for quotas	3
2.	Solution Overview	3
3.	DAV:quota-available-bytes	4
4.	DAV:quota-used-bytes	5
5.	Example PROPFIND request and response	6
6.	Error reporting	6
7.	Notes	7
8.	Security Considerations	8
9.	Internationalization Considerations	8
10.	IANA Considerations	8
11.	Acknowledgements	8
12.	References	8
12.1	Normative References	8
12.2	Informative References	9
	Authors' Addresses	9
	Intellectual Property and Copyright Statements	10

1. Introduction

1.1 Notational Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

1.2 Requirement for quotas

WebDAV servers based on [[RFC2518](#)] have been implemented and deployed with quota restrictions on collections and users, so it makes sense to standardize this functionality to improve user experience and client interoperability. This specification requires WebDAV because it requires PROPFIND support and relies on the WebDAV definition of collections and properties, including the definitions for live and protected properties (see [section 1.4.2 of \[RFC3253\]](#) for the definition of protected properties).

The reasons why WebDAV servers frequently have quotas enforced are the same reasons why any storage system comes with quotas.

- o Sometimes the storage service charges according to quota
- o Sometimes the storage service is provided free, but the storage service provider has limited storage space (e.g. university-provided student accounts)
- o Even in cases where the storage can be upgraded, the storage managers may choose to limit quota in order to encourage users to limit the files they store on the system and to clean up obsolete files. (e.g. IT departments within corporations)

In order to work best with repositories that support quotas, client software should be able to determine and display the DAV:quota-available-bytes on collections. Further, client software should have some way of fairly reliably determining how much storage space is already counted towards that quota.

2. Solution Overview

The approach to meeting the requirements and scenarios outlined above is to define two live properties. This specification can be met on a server by implementing both DAV:quota-available-bytes and DAV:quota-used-bytes on collections only. Implementing both DAV:quota-available-bytes and DAV:quota-used-bytes on all resources is RECOMMENDED.

A <DAV:allprop> PROPFIND request SHOULD NOT return any of the properties defined by this document. However, these property names MUST be returned in a <DAV:propname> request for a resource that supports the properties, except in the case of infinite limits which are explained below.

The DAV:quota-available-bytes and DAV:quota-used-bytes definitions below borrow heavily from the quota definitions in the NFS [[RFC3530](#)] specification.

3. DAV:quota-available-bytes

Name: quota-available-bytes

Namespace: DAV:

Purpose: Indicates the maximum amount of additional storage available to be allocated to a resource.

DTD: <!ELEMENT quota-available-bytes (#PCDATA) >

The DAV:quota-available-bytes property value is the value in octets representing the amount of additional disk space beyond the current allocation that can be allocated to this resource before further allocations will be refused. It is understood that this space may be consumed by allocations to other resources.

Support for this property is REQUIRED on collections, and OPTIONAL on other resources. A server SHOULD implement this property for each resource that has the DAV:quota-used-bytes property.

Clients SHOULD expect that as the DAV:quota-available-bytes on a resource approaches 0, further allocations to that resource may be refused. A value of 0 indicates that users will probably not be able to perform operations that write additional information (e.g. a PUT inside a collection), but may be able to replace through overwrite an existing resource of equal size.

Note that there may be a number of distinct but overlapping limits, which may even include physical media limits. When reporting DAV:quota-available-bytes, the server is at liberty to choose any of those limits but SHOULD do so in a repeatable way. The rule may be configured per repository, or may be "choose the smallest number".

If a resource has no quota enforced or unlimited storage ("infinite limits"), the server MAY choose not to return this property (404 Not Found response in Multi-Status), although this specification RECOMMENDS that servers return some appropriate value (e.g. the

amount of free disc space). A client cannot entirely assume that there is no quota enforced on a resource that does not have this property, but might as well act as if there is no quota.

The value of this property is protected (see [section 1.4.2 of \[RFC3253\]](#) for the definition of protected properties). A 403 Forbidden response is RECOMMENDED for attempts to write a protected property, and the server SHOULD include an XML error body as defined by DeltaV [\[RFC3253\]](#) with the `<DAV:cannot-modify-protected-property/>` precondition tag.

4. DAV:quota-used-bytes

Name: quota-used-bytes

Namespace: DAV:

Purpose: Contains the amount of storage counted against the quota on a resource.

DTD: `<!ELEMENT quota-used-bytes (#PCDATA) >`

The DAV:quota-used-bytes value is the value in octets representing the amount of space used by this resource and possibly a number of other similar files or directories, where the set of "similar" meets at least the criterion that allocating space to any resource in the set will count against the DAV:quota-available-bytes. It MUST include the total count including usage derived from sub-resources if appropriate. It SHOULD include metadata storage size if metadata storage is counted against the DAV:quota-available-bytes.

Note that there may be a number of distinct but overlapping sets of files or directories for which a DAV:quota-used-bytes is maintained (e.g. "all files with a given owner", "all files with a given group owner", etc.). The server is at liberty to choose any of those sets but SHOULD do so in a repeatable way. The rule may be configured per repository.

Support for this property is REQUIRED on collections, and OPTIONAL on other resources. A server SHOULD implement this property for each resource that has the DAV:quota-available-bytes property.

Support for this property enhances the client experience, because together with DAV:quota-available-bytes, the client has a chance of managing its files to avoid running out of allocated storage space. Clients may not be able to calculate the value as accurately on their own, depending on how total space used is calculated by the server.

5. Example PROPFIND request and response

Request:

```
PROPFIND /~milele/public/ HTTP/1.1
Depth: 0
Host: www.example.com
Content-Type: text/xml
Content-Length: xxx

<?xml version="1.0" ?>
<D:propfind xmlns:D="DAV:">
  <D:prop><D:quota-available-bytes/><D:quota-used-bytes/></D:prop>
</D:propfind>
```

Response:

```
HTTP/1.1 207 Multi-Status
Date: Tue, 16 Oct 2001 22:13:39 GMT
Content-Length: xxx
Content-Type: text/xml; charset=UTF-8

<?xml version="1.0" encoding="utf-8" ?>
<D:multistatus xmlns:D="DAV:">
<D:response>
  <D:href>http://www.example.com/~milele/public/</D:href>
  <D:propstat>
    <D:prop>
      <D:quota-available-bytes>596650</D:quota-available-bytes>
      <D:quota-used-bytes>403350</D:quota-used-bytes>
    </D:prop>
    <D:status>HTTP/1.1 200 OK</D:status>
  </D:propstat>
</D:response>
</D:multistatus>
```

6. Error reporting

WebDAV [[RFC2518](#)] defines the status code 507 (Insufficient Storage). This status code SHOULD be used when a client request (e.g. a PUT, PROPFIND, MKCOL, MOVE or COPY) fails because it would exceed their allotted quota. In order to differentiate the response from other storage problems, the server SHOULD include an XML error body as defined by DeltaV [[RFC3253](#)] with the <DAV:quota-not-exceeded/> precondition tag.

Example error response:

```
HTTP/1.1 507 Insufficient Storage
Content-Length: xxx
Content-Type: text/xml

<?xml version="1.0">
<error xmlns="DAV:">
  <quota-not-exceeded/>
</error>
```

7. Notes

Server implementations store and account for their data in many different ways. Some of the challenges:

- o Some server implementations find it prohibitive to count storage used for metadata, others may choose to do so for better accounting.
- o Older versions of resources may be stored as well.
- o Variants of one resource may exist with different content lengths
- o Content may be dynamically generated.
- o Resource bodies can be compressed
- o Some resources may be stored for "free", not counting against quota.

Since server storage accounting can vary so much, clients should expect the following:

- o The size of a file on the client's file system, or in a PUT message, may not correspond to the amount of storage required by the server to store the resource. Thus, the client cannot predict with 100% accuracy whether a given file will be allowed given the storage quota.
- o Deleting or overwriting a resource may not free up the same amount of storage as indicated by the DAV:getcontentlength property defined in [[RFC2518](#)] for the resource. If deleting a resource does not free up any space, the file may have been moved to a "trash" folder or "recycle bin", or retained as in versioning systems ([[RFC3253](#)]).

- o The total size of a collection, DAV:quota-used-bytes, may not be a sum of the DAV:getcontentlength properties for resources stored in the collection.
- o On some systems where quota is counted by collection and not by user, a quota on a sub-collection may be larger than the quota on the parent collection that contains it. For example, the quota on /~milele/ may be 100 MB, but the quota on /~milele/public/ may be unlimited. This allows the space used by /~milele/public/ to be as large as the quota on /~milele/ allows (depending on the other contents of /~milele/) even if the quota on /~milele/ is changed. Thus, even when the quota on a parent collection is changed, it is not necessarily required to change the quota on every child or descendant collection.

8. Security Considerations

A hacker may prefer to store files in collections with a large quota. This isn't strictly a security concern because it doesn't make it any easier to store files. On the other hand, the DAV:quota-used-bytes property may make it easier to detect tampering or misuse.

9. Internationalization Considerations

Quota is counted in Arabic numerals expressed in strings. There are no internationalization considerations.

10. IANA Considerations

There are no IANA considerations.

11. Acknowledgements

Stefan Eissing, Geoff Clemm, Jim Luther, Julian Reschke, Jim Whitehead, among others, have provided valuable comments on this document.

12. References

12.1 Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2518] Goland, Y., Whitehead, E., Faizi, A., Carter, S. and D. Jensen, "HTTP Extensions for Distributed Authoring -- WebDAV", [RFC 2518](#), February 1999.

- [RFC3253] Clemm, G., Amsden, J., Ellison, T., Kaler, C. and J. Whitehead, "Versioning Extensions to WebDAV (Web Distributed Authoring and Versioning)", [RFC 3253](#), March 2002.

12.2 Informative References

- [RFC3530] Shepler, S., Callaghan, B., Robinson, D., Thurlow, R., Beame, C., Eisler, M. and D. Noveck, "Network File System (NFS) version 4 Protocol", [RFC 3530](#), April 2003.

Authors' Addresses

Brian Korver
Xythos Software
One Bush Street
Suite 600
San Francisco, CA 94104
US

Phone: +1 415 248-3800
Email: briank@xythos.com

Lisa Dusseault
Open Source Applications Foundation
543 Howard Street
5th Floor
San Francisco, CA 94105
US

Phone: +1 415 946-3040
Email: lisa@osafoundation.org

Intellectual Property Statement

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in [BCP 78](#) and [BCP 79](#).

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at <http://www.ietf.org/ipr>.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Disclaimer of Validity

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright Statement

Copyright (C) The Internet Society (2005). This document is subject to the rights, licenses and restrictions contained in [BCP 78](#), and except as set forth therein, the authors retain all their rights.

Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.

