

B. Korver  
Xythos  
L. Dusseault  
Xythos  
C. Warner  
Netezza  
July 2003

Internet Draft  
Document: [draft-ietf-webdav-quota-02.txt](#)  
Expires: January 2004

## Quota and Size Properties for DAV Collections

### Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of [Section 10 of RFC2026](#).

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/lid-abstracts.txt>

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

### Abstract

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

### Table of Contents

Introduction.....	<a href="#">2</a>
DAV:quota-available-bytes.....	<a href="#">3</a>
DAV:quota-used-bytes.....	<a href="#">4</a>
DAV:quota-assigned-bytes.....	<a href="#">4</a>
Example PROPFIND request and response.....	<a href="#">5</a>
Error reporting.....	<a href="#">6</a>
Notes.....	<a href="#">6</a>
Security Considerations.....	<a href="#">7</a>

Internationalization Considerations.....	<a href="#">7</a>
IANA Considerations.....	<a href="#">7</a>

Dusseault Expires July 2003 1

DAV Collection Size and Quota July 2003

Intellectual Property.....	<a href="#">8</a>
Acknowledgements.....	<a href="#">8</a>
References.....	<a href="#">9</a>
Author's Addresses.....	<a href="#">9</a>

## Introduction

### 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 [RFC 2119](#) [[RFC2119](#)].

### 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.

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

- Sometimes the storage service charges according to quota
- Sometimes the storage service is provided free, but the storage service provider has limited storage space (e.g. [www.sharemation.com](#) and university-provided student accounts)
- 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 quota-available on collections. Further, client software should have some way of fairly reliably determining how much storage space is already counted towards that quota.

In addition to displaying the quota-available and quota-used on collections, this specification does not forbid these properties on any resource.

## Solution Overview

The approach to meeting the requirements and scenarios outlined above is to define three live properties. This specification can be

Korver

Expires January 2004

2

DAV Collection Size and Quota

July 2003

met on a server by implementing both quota-available and quota-used on collections only. Implementing both quota-available and quota-used on all resources is RECOMMENDED.

None of these properties need be returned in a <DAV:allprop> request though the server may include them. 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 quota-available and quota-used definitions below borrow heavily from the quota definitions in the NFS [[RFC3010](#)] specification.

### 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 file or directory before further allocations will be refused. It is understood that this space may be consumed by allocations to other files or directories.

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 quota-available on a file or directory approaches 0, further allocations to that file or directory 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 quota-available, 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.

Korver

Expires January 2004

3

DAV Collection Size and Quota

July 2003

The value of this property is protected. A 403 Forbidden response is RECOMMENDED for attempts to write a protected property.

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 file or directory 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 file or directory in the set will count against the quota-available. 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 quota-available.

Note that there may be a number of distinct but overlapping sets of files or directories for which a quota-used 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.

#### DAV:quota-assigned-bytes

Name: quota-assigned-bytes

Namespace: DAV:

Purpose: Indicates the amount of storage assigned.

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

The DAV:quota-assigned-bytes property value is the amount of storage space potentially either assigned to or requested for this file or directory, measured in octets. DAV:quota-assigned-bytes is primarily intended to support implementations that allow quota to be PROPPATCHed or configured by some other means.

The value of this property will usually be protected, although a user with sufficient privileges may be permitted to change the

Korver

Expires January 2004

4

DAV Collection Size and Quota

July 2003

value. The property is useful even if it is protected. A 403 Forbidden response is RECOMMENDED for attempts to write a protected property. This property will usually be read-only for instance because a user's quota should generally not be configurable by other users.

Support for this property is OPTIONAL.

Note that a resource may show more quota-used than its quota-assigned appears to allow, and that quota-available MUST never be greater than the value of quota-assigned.

As an example of quota-assigned, imagine a quota system where each collection may have a quota assigned and where a resource contained in a collection is subject to the quota constraints of all parent collections. Assume the administrator creates a collection A and gives it a quota-assigned of 500KB and then creates a sub-collection B which is given quota-assigned of 1000KB. In this case, the initial quota-available for B is 500KB, not 1000KB, since the constraint on A applies to B as well.

	DAV:quota-assigned-bytes	DAV:quota-available-bytes
/A	500KB	500KB
/A/B	1000KB	500KB

Note that this is only one example quota system, and that other quota systems are possible.

#### Example PROPFIND request and response

##### Request:

```
PROPFIND /~milele/public/ HTTP/1.1
Depth: 0
Host: www.sharemation.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>
```

Korver Expires January 2004 5

DAV Collection Size and Quota July 2003

```
<D:href>http://www.sharemation.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>
```

#### 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) is forbidden 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:storage-quota-reached/> precondition tag.

Example error response:

```
HTTP/1.1 507 Insufficient Storage
Content-Length: 100
Content-Type: text/xml
```

```
<?xml version="1.0">
<error xmlns="DAV:">
  <storage-quota-reached/>
</error>
```

## Notes

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

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

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

Korver

Expires January 2004

6

DAV Collection Size and Quota

July 2003

- 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.

- 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](#)].

- The total size of a collection, DAV:quota-used-bytes, is not necessarily a sum of the DAV:getcontentlength properties for resources stored in the collection.

- 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 its 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.

## 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.

If a server chooses to make the DAV:quota-assigned-bytes writable by clients with sufficient authorization, then it is opening up a certain amount of near-administration functionality to clients. However, it is not required for the DAV:quota-assigned-bytes property to be writeable by any clients, so a server can easily avoid this consideration.

## Internationalization Considerations

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

## IANA Considerations

There are no IANA considerations.



## Intellectual Property

The following notice is copied from [[RFC2026](#)], and describes the position of the IETF concerning intellectual property claims made against this document.

The IETF takes no position regarding the validity or scope of any intellectual property 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; neither does it represent that it has made any effort to identify any such rights. Information on the IETF's procedures with respect to rights in standards-track and standards-related documentation can be found in [BCP-11](#). Copies of claims of rights made available for publication 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 implementors or users of this specification can be obtained from the IETF Secretariat.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights which may cover technology that may be required to practice this standard. Please address the information to the IETF Executive Director.

## Acknowledgements

Stefan Eissing, Jim Luther, Julian Reschke, and Jim Whitehead and provided valuable comments on this document.

## References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2026] Bradner, S., "The Internet Standards Process ± Revision 3", [BCP 9](#), [RFC2026](#), October 1996.
- [RFC2518] Goland, Y., Whitehead, E., Faizi, A., Carter, S., and Jensen, D., "HTTP Extensions for Distributed Authoring -- WebDAV", [RFC2518](#), February 1999.
- [RFC3010] Shepler S., B. Callaghan, D. Robinson, R. Thurlow, C. Beame, M. Eisler, D. Noveck, "NFS version 4 Protocol", [RFC3010](#), December 2000.

## Author's Addresses

Brian Korver  
Xythos Software, Inc.  
25 Maiden Lane, Suite 200      Phone: 1-415-248-9033  
San Francisco, CA, USA      Email: briank@xythos.com

Lisa Dusseault  
Xythos Software, Inc.  
25 Maiden Lane, Suite 200      Phone: 1-415-248-9004  
San Francisco, CA, USA      Email: lisa@xythos.com

Clark Warner  
Netezza Corporation  
200 Crossing Blvd.      Phone: 1-508-665-6800 x889  
Framingham, MA 01702      Email: webdav@thewarners.com

Korver

Expires January 2004

9

-brian  
briank@xythos.com