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# Lightweight Directory Access Protocol (LDAP) Modify-Increment Extension

## Status of This Memo

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## Abstract

This document describes an extension to the Lightweight Directory Access Protocol (LDAP) Modify operation to support an increment capability. This extension is useful in provisioning applications, especially when combined with the assertion control and/or the pre-read or post-read control extension.

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## 1. Background and Intended Use

The Lightweight Directory Access Protocol (LDAP) [RFC4510] does not currently provide an operation to increment values of an attribute. A client must read the values of the attribute and then modify those values to increment them by the desired amount. As the values may be updated by other clients between this add and modify, the client must

be careful to construct the modify request so that it fails in this case, and upon failure, to re-read the values and construct a new modify request.

This document extends the LDAP Modify Operation [RFC4511] to support an increment values capability. This feature is intended to be used with either the LDAP pre-read or post-read control extensions [RFC4527]. This feature may also be used with the LDAP assertion control extension [RFC4528] to provide test-and-increment functionality.

In this document key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in BCP 14 [RFC2119].

## 2. The Modify-Increment Extension

This document extends the LDAP Modify request to support a increment values capability. Implementations of this extension SHALL support an additional ModifyRequest operation enumeration value increment (3), as described herein. Implementations not supporting this extension will treat this value as they would an unlisted value, e.g., as a protocol error.

The increment (3) operation value specifies that an increment values modification is requested. All existing values of the modification attribute are to be incremented by the listed value. The modification attribute must be appropriate for the request (e.g., it must have INTEGER or other increment-able values), and the modification must provide one and only one value. If the attribute is not appropriate for the request, a constraintViolation or other appropriate error is to be returned. If multiple values are provided, a protocolError is to be returned.

Servers supporting this feature SHOULD publish the object identifier (OID) 1.3.6.1.1.14 as a value of the 'supportedFeatures' [RFC4512] attribute in the root DSE. Clients supporting this feature SHOULD NOT use the feature unless they know the server supports it.

## 3. LDIF Support

To represent Modify-Increment requests in LDAP Data Interchange Format [RFC2849], the ABNF [RFC4234] production <mod-spec> is extended as follows:

```
mod-spec =/ "increment:" FILL AttributeDescription SEP
     attrval-spec "-" SEP
```

For example,

```
# Increment uidNumber
dn: cn=max-assigned uidNumber,dc=example,dc=com
changetype: modify
increment: uidNumber
uidNumber: 1
-
```

This LDIF fragment represents a Modify request to increment the value(s) of uidNumber by 1.

## 4. Security Considerations

General LDAP security considerations [RFC4510], as well as those specific to the LDAP Modify [RFC4511], apply to this Modify-Increment extension. Beyond these considerations, it is noted that introduction of this extension should reduce application complexity (by providing one operation for what presently requires multiple operations) and, hence, it may aid in the production of correct and secure implementations.

## 5. IANA Considerations

Registration of the following values [RFC4520] have been completed.

### 5.1. Object Identifier

The IANA has assigned an LDAP Object Identifier to identify the LDAP Modify-Increment feature, as defined in this document.

```
Subject: Request for LDAP Object Identifier Registration
Person & email address to contact for further information:
    Kurt Zeilenga <kurt@OpenLDAP.org>
Specification: RFC 4525
Author/Change Controller: Author
Comments:
    Identifies the LDAP Modify-Increment feature
```

### 5.2. LDAP Protocol Mechanism

The following LDAP Protocol Mechanism has been registered.

```
Subject: Request for LDAP Protocol Mechanism Registration
Object Identifier: 1.3.6.1.1.14
Description: Modify-Increment
Person & email address to contact for further information:
    Kurt Zeilenga <kurt@openldap.org>
```

Usage: Feature
Specification: RFC 4525
Author/Change Controller: Kurt Zeilenga <kurt@openldap.org>
Comments: none

### 5.3. LDAP Protocol Mechanism

The IANA has assigned an LDAP ModifyRequest Operation Type (3) [RFC4520] for use in this document.

Subject: Request for LDAP Protocol Mechanism Registration
ModifyRequest Operation Name: increment
Description: Modify-Increment
Person & email address to contact for further information:
Kurt Zeilenga <kurt@openldap.org>
Usage: Feature
Specification: RFC 4525
Author/Change Controller: Kurt Zeilenga <kurt@openldap.org>
Comments: none

## 6. References

### 6.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC4234] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", RFC 4234, October 2005.

[RFC2849] Good, G., "The LDAP Data Interchange Format (LDIF) - Technical Specification", RFC 2849, June 2000.

[RFC4510] Zeilenga, K., Ed., "Lightweight Directory Access Protocol (LDAP): Technical Specification Road Map", RFC 4510, June 2006.

[RFC4511] Sermersheim, J., Ed., "Lightweight Directory Access Protocol (LDAP): The Protocol", RFC 4511, June 2006.

[RFC4512] Zeilenga, K., "Lightweight Directory Access Protocol (LDAP): Directory Information Models", RFC 4512, June 2006.

### 6.2. Informative References

[RFC4520] Zeilenga, K., "Internet Assigned Numbers Authority (IANA) Considerations for the Lightweight Directory Access Protocol (LDAP)", BCP 64, RFC 4520, June 2006.

[RFC4527] Zeilenga, K., "Lightweight Directory Access Protocol (LDAP) Read Entry Controls", RFC 4527, June 2006.

[RFC4528] Zeilenga, K., "Lightweight Directory Access Protocol (LDAP) Assertion Control", RFC 4528, June 2006.

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