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A Registry for SMTP Enhanced Mail System Status Codes

Status of This Memo

Abstract

The specification for enhanced mail system status codes, RFC 3463, establishes a new code model and lists a collection of status codes. While it anticipated that more codes would be added over time, it did not provide an explicit mechanism for registering and tracking those codes. This document specifies an IANA registry for mail system enhanced status codes, and initializes that registry with the codes so far established in published standards-track documents, as well as other codes that have become established in the industry.

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1. Introduction

Enhanced Status Codes for SMTP were first defined in [RFC1893], which was subsequently replaced by [RFC3463]. While it anticipated that more codes would be added over time (see section 2 of [RFC3463]), it did not provide an explicit mechanism for registering and tracking those codes. Since then, various RFCs have been published and internet drafts proposed that define additional status codes. However, without an IANA registry, conflicts in definitions have begun to appear.

This RFC defines such an IANA registry and was written to help prevent further conflicts from appearing in the future. It initializes the registry with the established standards-track enhanced status codes from [RFC3463], [RFC3886], [RFC4468], and [RFC4954]. In addition, this document adds several codes to the registry that were established by various internet drafts and have come into common use, despite the expiration of the documents themselves.

As specified in [RFC3463], an enhanced status code consists of a three-part code, with each part being numeric and separated by a period character. The three portions are known as the class sub-code, the subject sub-code, and the detail sub-code. In the tables, a wildcard for the class sub-code is represented by an X, a wildcard for a subject sub-code is represented by an XXX, and a wildcard for a detail sub-code is represented by a YYY. For example, 3.XXX.YYY has an unspecified subject sub-code and an unspecified status code, and X.5.0 is has an unspecified class sub-code. (This is a change from [RFC3463], which uses XXX for both the subject sub-code and detail sub-code wildcards.)

2. IANA Considerations

2.1. SMTP Enhanced Status Codes Registry

IANA has created the registry "SMTP Enhanced Status Codes". The SMTP Enhanced Status Codes registry will have three tables:

- Class Sub-Codes
  Each of the entries in this table represent class sub-codes and all have an unspecified subject sub-code and an unspecified detail sub-code.

- Subject Sub-Codes
  Each of the entries in this table represent subject sub-codes and all have an unspecified class sub-code and an unspecified detail sub-code.

- Enumerated Status Codes
  Each of the entries in this table represent the combination of a subject sub-code and a detail sub-code. All entries will have an unspecified class sub-code, a specified subject sub-code, and a specified detail sub-code.

Each entry in the tables will include the following. (The sub-code tables will not have the Associated Basic Status Code entries.)

Code:	The status code. For example, 3.XXX.YYY is a class sub-code with an unspecified subject sub-code and an unspecified detail sub-code, and X.5.0 is an enumerated status code with an unspecified class sub-code.
Summary: or Sample Text:	For class and subject sub-codes, this is the summary of the use for the sub-code shown in section 2 of [RFC3463]. For enumerated status codes, this is an example of a message that might be sent along with the code.
Associated Basic Status Code:	For enumerated status codes, the basic status code(s) of [RFC2821] with which it is usually associated. This may also have a value such as "Any" or "Not given". NOTE: This is a non-exclusive list. In particular, the entries that list some basic status codes for an Enhanced Status Code might allow for other basic status codes, while the entries denoted "Not given" can be filled in by updating the IANA registry through updates to this document or at the direction of the IESG.
Description:	A short description of the code.
Reference:	A reference to the document in which the code is defined. This reference should note whether the relevant specification is standards-track, best current practice, or neither, using one of "(Standards track)", "(Best current practice)" or "(Not standards track)".

Submitter:	The identity of the submitter, usually the document author.
Change Controller:	The identity of the change controller for the specification. This will be "IESG" in the case of IETF-produced documents.

An example of an entry in the enumerated status code table would be:

Code:	X.0.0
Sample Text:	Other undefined Status
Associated basic status code:	Any
Description:	Other undefined status is the only undefined error code. It should be used for all errors for which only the class of the error is known.
Reference:	RFC 3463 (Standards track)
Submitter:	G. Vaudreuil
Change controller:	IESG.

2.2. Review Process for New Values

Entries in this registry are expected to follow the "Specification Required" model ([RFC5226]) although, in practice, most entries are expected to derive from standards-track documents. Non-standards-track documents that specify codes to be registered should be readily available. The principal purpose of this registry is to avoid confusion and conflicts among different definitions or uses for the same code.

2.3. Registration Updates

Standards-track registrations may be updated if the relevant standards are updated as a consequence of that action. Non-standards-track entries may be updated by the listed change controller. Only the entry's short description or references may be modified in this way, not the code or associated text. In exceptional cases, any aspect of any registered entity may be updated at the direction of the IESG (for example, to correct a conflict).

2.4. Initial Values

The initial values for the class and subject sub-code tables are to be populated from section 2 of [RFC3463]. Specifically, these are the values for 2.XXX.YYY, 4.XXX.YYY, and 5.XXX.YYY for the Class Sub-Code table, and the values X.0.YYY, X.1.YYY, X.2.YYY, X.3.YYY, X.4.YYY, X.5.YYY, X.6.YYY, and X.7.YYY for the Subject Sub-Code table. The code, sample text, and description for each entry are to be taken from [RFC3463]. Each entry is to use [RFC3463] as the reference, submitted by G. Vaudreuil, and change controlled by the IESG. There are no associated detail sub-code values for the class and subject sub-code tables.

The initial values for the Enumerated Status Code table is to be populated from:

1. sections 3.1 through 3.8 of [RFC3463], (X.0.0, X.1.0 through X.1.8, X.2.0 through X.2.4, X.3.0 through X.3.5, X.4.0 through X.4.7, X.5.0 through X.5.5, X.6.0 through X.6.5, and X.7.0 through X.7.7),

2. section 3.3.4 of [RFC3886] (X.1.9),

3. X.6.6 found in section 5 of [RFC4468], (but not X.7.8 found in the same section),

4. and X.5.6, X.7.8, X.7.9, X.7.11, and X.7.12, found in section 6 of [RFC4954] (using the text from X.5.6, 5.7.8, 5.7.9, 5.7.11, and 4.7.12).

Each entry is to be designated as defined in the corresponding RFC, submitted by the corresponding RFC author, and change controlled by the IESG. Each of the above RFCs is a standards-track document.

The initial values for the Associated Basic Status Code for each of the above initial enhanced status codes is given in the following table.

As noted above, this table is incomplete. In particular, the entries that have some basic status codes might allow for other detail sub-status codes, while the entries denoted "Not given" can be filled in by updating the IANA registry through updates to this document or at the direction of the IESG.

Enh. Status Code	Assoc. Basic Status Code	Enh. Status Code	Assoc. Basic Status Code	Enh. Status Code	Assoc. Basic Status Code
X.0.0	Any	X.1.0	Not given	X.1.1	451, 550
X.1.2	Not given	X.1.3	501	X.1.4	Not given
X.1.5	250	X.1.6	Not given	X.1.7	Not given
X.1.8	451, 501	X.1.9	Not given	X.2.0	Not given
X.2.1	Not given	X.2.2	552	X.2.3	552
X.2.4	450, 452	X.3.0	221, 250, 421, 451, 550, 554	X.3.1	452
X.3.2	453	X.3.3	Not given	X.3.4	552, 554
X.3.5	Not given	X.4.0	Not given	X.4.1	451
X.4.2	421	X.4.3	451, 550	X.4.4	Not given
X.4.5	451	X.4.6	Not given	X.4.7	Not given
X.5.0	220, 250, 251, 252, 253, 451, 452, 454, 458, 459, 501, 502, 503, 554	X.5.1	430, 500, 501, 503, 530, 550, 554, 555	X.5.2	500, 501, 502, 550, 555
X.5.3	451	X.5.4	451, 501, 502, 503, 504, 550, 555	X.5.5	Not given
X.5.6	500	X.6.0	Not given	X.6.1	Not given
X.6.2	Not given	X.6.3	554	X.6.4	250
X.6.5	Not given	X.6.6	554	X.7.0	220, 235, 450, 454, 500, 501, 503, 504, 530, 535, 550

X.7.1	451, 454, 502, 503, 533, 550, 551	X.7.2	550	X.7.3	Not given
X.7.4	504	X.7.5	Not given	X.7.6	Not given
X.7.7	Not given	X.7.8	535, 554	X.7.9	534
X.7.10	523	X.7.11	524, 538	X.7.12	422, 432
X.7.13	525	X.7.14	535, 554		

Table 1

The following additional definitions have been registered in the enumerated status code table. These entries have been used in the industry without any published specification.

Code: X.7.10
Sample Text: Encryption Needed
Associated basic status code: 523
Description: This indicates that an external strong privacy layer is needed in order to use the requested authentication mechanism. This is primarily intended for use with clear text authentication mechanisms. A client that receives this may activate a security layer such as TLS prior to authenticating, or attempt to use a stronger mechanism.
Reference: RFC 5248 (Best current practice)
Submitter: T. Hansen, J. Klensin
Change controller: IESG

Code: X.7.13
Sample Text: User Account Disabled
Associated basic status code: 525
Description: Sometimes a system administrator will have to disable a user's account (e.g., due to lack of payment, abuse, evidence of a break-in attempt, etc.). This error code occurs after a successful authentication to a disabled account. This informs the client that the failure is permanent until the user contacts their system administrator to get the account re-enabled. It differs from a generic authentication failure where the client's best option is to present the passphrase entry dialog in case the user simply mistyped their passphrase.
Reference: RFC 5248 (Best current practice)
Submitter: T. Hansen, J. Klensin
Change controller: IESG

Code: X.7.14
Sample Text: Trust relationship required
Associated basic status code: 535, 554
Description: The submission server requires a configured trust relationship with a third-party server in order to access the message content. This value replaces the prior use of X.7.8 for this error condition, thereby updating [RFC4468].
Reference: RFC 5248 (Best current practice)
Submitter: T. Hansen, J. Klensin
Change controller: IESG

3. Security Considerations

As stated in [RFC1893], use of enhanced status codes may disclose additional information about how an internal mail system is implemented beyond that available through the SMTP status codes.

Many proposed additions to the response code list are security related. Having these registered in one place to prevent collisions will improve their value. Security error responses can leak information to active attackers (e.g., the distinction between "user not found" and "bad password" during authentication). Documents defining security error codes should make it clear when this is the case so SMTP server software subject to such threats can provide appropriate controls to restrict exposure.

4. Acknowledgements

While the need for this registry should have become clear shortly after [RFC3463] was approved, the growth of the code table through additional documents and work done as part of email internationalization and [RFC2821] updating efforts made the requirement much more clear. The comments of the participants in those efforts are gratefully acknowledged, particularly the members of the ietf-smtp@imc.org mailing list. Chris Newman and Randy Gellens provided useful comments and some text for early versions of the document.

5. References

5.1. Normative References

[RFC2821] Klensin, J., "Simple Mail Transfer Protocol", RFC 2821, April 2001.

[RFC3463] Vaudreuil, G., "Enhanced Mail System Status Codes", RFC 3463, January 2003.

[RFC3886] Allman, E., "An Extensible Message Format for Message Tracking Responses", RFC 3886, September 2004.

[RFC4468] Newman, C., "Message Submission BURL Extension", RFC 4468, May 2006.

[RFC4954] Siemborski, R. and A. Melnikov, "SMTP Service Extension for Authentication", RFC 4954, July 2007.

5.2. Informative References

[RFC1893] Vaudreuil, G., "Enhanced Mail System Status Codes", RFC 1893, January 1996.

[RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 5226, May 2008.

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