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## Registration and Administration Recommendations for Chinese Domain Names

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### Abstract

Many Chinese characters in common use have variants, which makes most of the Chinese Domain Names (CDNs) have at least two different forms. The equivalence between Simplified Chinese (SC) and Traditional Chinese (TC) characters is very important for CDN registration. This memo builds on the basic concepts, general guidelines, and framework of RFC 3743 to specify proposed registration and administration procedures for Chinese domain names. The document provides the information needed for understanding and using the tables defined in the IANA table registrations for Simplified and Traditional Chinese.

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## 1. Introduction

With the standardization of Internationalized Domain Names for Application (IDNA, described in [RFC3490], [RFC3491], and [RFC3492]), internationalized domain names (IDNs), i.e., those that contain non-ASCII characters, are included in the DNS, and users can access the Internet with their native languages, most of which are not English. However, many languages have special requirements, which are not addressed in the IDNA RFCs. One way to deal with some of the remaining issues involves grouping characters that could be confused together as "variants". The variant approach is discussed in RFC 4290 [RFC4290] and specifically for documents written in Chinese, Japanese, or Korean (CJK documents), in the so-called "JET Guidelines" RFC 3743 [RFC3743]. Readers of this document are assumed to be familiar with the concepts and terminology of the latter. The guidelines specified in this document provide a set of specific tables and methods required to apply the JET Guidelines to Chinese characters. For example, changes were made in the forms of a large number of Chinese characters during the last century to simplify writing and reading. These "Simplified" characters have been adopted in some Chinese-speaking communities, while others continue to use the "Traditional" forms. On the global Internet, if IDNA were used alone, there would be considerable potential for confusion if the two forms were not considered together. Consequently, effective use of Chinese Domain Names (CDNs) requires variant equivalence, as described in RFC 3743, to handle character differences between Simplified and Traditional Chinese forms.

Chinese variant equivalence itself is very complicated in principle (please read [C2C] for further information). When it comes to the usage of Chinese domain names, the basic requirement is to match the user perception of Chinese characters between Simplified Chinese (SC) and Traditional Chinese (TC) forms. When users register SC or TC domain names, they will wish to obtain the other forms (Traditional or Simplified, respectively) as well, and expect others to be able to access the website or other resources in both forms.

This document specifies a solution for Chinese domain name registration and administration that has been adopted and deployed by CNNIC (the top-level domain registry for "CN") and TWNIC (the top-level domain registry for "TW") to manage Simplified Chinese and Traditional Chinese domain name equivalence. In the terminology of RFC 3743, this solution is based on Internationalized Domain Labels (IDLs).

## 2. Terminology

This document adopts the terminologies that are defined in RFC 3743. It is not possible to understand this document without first understanding the concepts and terminology of RFC 3743, including terminology introduced in its examples. Additional terminology is defined later in this document.

### 2.1. Chinese Characters

This document suggests permitting only a subset of Chinese characters in Chinese Domain Names (CDNs) and hence in the DNS. When this document discusses Chinese characters, it only refers to the subset of the characters in the first column of the current IANA registration tables for Chinese as discussed in Section 2.3 and Section 2.4. These are defined, in detail, in [LVT-SC] and [LVT-TC]. Of course, characters excluded from these tables are still valid Chinese characters. However, this document strongly suggests that registries do not permit any registration of Chinese characters that are not listed in the tables. The tables themselves will be updated in the future if necessary.

### 2.2. Chinese Domain Name Label (CDNL)

If an IDN label includes at least one Chinese character, it is called a Chinese Domain Name (CDN) Label. CDN labels may contain characters from the traditional letter-digit-hyphen (LDH) set as well as Chinese characters.

### 2.3. Simplified Chinese Variant Table (SCVT)

Based on RFC 3743 [RFC3743], a language table for Simplified Chinese has been defined [LVT-SC]. It can be used for the registration of Simplified Chinese domain names. The key feature of this table is that the preferred variant is the SC character, which is used by Chinese mainland users or defined in Chinese-related standards.

### 2.4. Traditional Chinese Variant Table (TCVT)

Similarly, a language table has been defined for Traditional Chinese [LVT-TC]. It is also based on the rules of RFC 3743. It can be used for registration of Traditional Chinese domain names. The preferred variant is the TC character, which is used by Taiwan users or defined in related standards.

### 2.5. Original Chinese Domain Name Label (OCDNL)

The Chinese Domain Name Label that users submit for registration.

## 3. Procedure for Registration of Chinese Domain Name Labels

### 3.1. Terminology and Context

This document adopts the same procedure for Chinese Domain Name Label (CDNL) registration as the one defined for more general IDN labels in section 3.2.3 of RFC 3743 [RFC3743]. The terminology and notation used below, and the steps that are mentioned, derive from that document. In particular, "CV" is the character variant associated with an input character ("IN") and a language table. The language tables used here are those for Chinese as spoken and written in the Chinese mainland (ZH-CN) and on Taiwan (ZH-TW). "PV" is the selected Preferred Variant.

### 3.2. Procedure in Terms of the RFC 3743 Model

The first column of the Simplified Chinese Variant Table (SCVT) is the same as the first column of the corresponding Traditional Chinese Variant Table (TCVT) and so are the third columns of both tables. Consequently, the CV(IN, ZH-CN) will be same as the CV(IN, ZH-TW) after Step 3; the PV(IN, ZH-CN) is in SC form, and the PV(IN, ZH-TW) is in TC form. As a result, there will not be more than three records (i.e., for the original label (OCDNL), the Simplified Chinese (SC) form, and the Traditional Chinese (TC) form) to be added into the zone file after applying this procedure. In other words, the procedure does not generate labels that contain a mixture of Simplified and Traditional Chinese as variants.

The set of languages associated with the input (IN) is both ZH-CN and ZH-TW by default. The procedure for CDNL registration uses the optional registry-defined rules provided in RFC 3743 for optional processing, with the understanding that the rules may vary for different registries supporting CDNs. The motivation for such rules is described below.

The preferred variant(s) is/are TC in TCVT, and SC in SCVT. There may be more than one preferred variant for a given valid character.

### 3.3. RFC 3743 Optional Registry Processing

In actuality, while IDNA, and hence RFC 3743, process characters one at a time, the actual relationship between the valid code point and the preferred variant is contextual: whether one character can be substituted for another depends on the characters with which it is associated in a label or, more generally, in a phrase. In particular, some of the preferred variants make no sense in combination with other characters; therefore, those combinations should not be added into the Zone file (described as "ZV" or zone variants in RFC 3743). If desired, it should be possible to define and implement rules to reduce the preferred variant labels to only plausible ones. This could be done, for example, with some artificial intelligence tools, or with feedback from the registrant, or with selection based on frequency of occurrence in other texts. To illustrate one possibility, the OCDNL could be required to be TC-only or SC-only, and if there is more than one preferred variant, the OCDNL will be used as the PV, instead of the PV produced by the algorithm.

To reemphasize, the tables in [LVT-SC] and [LVT-TC] follow the table format and terminologies defined in [RFC3743]. If one intends to implement Chinese domain name registrations based on these two tables or ones similar to them, a complete understanding of RFC 3743 is needed for the proper use of those tables.

## 4. Security Considerations

This document is subject to the same security considerations as RFC 3743, which defines the table formats and operations. As with that base document, part of its intent is to reduce the security problems that might be caused by confusion among characters with similar appearances or meanings. While it will not introduce any additional security issues, additional registration restrictions such as those outlined in Section 3 may further reduce potential problems.

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