

Experience with 8 bit label in JP Zone

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IEPG Meeting

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Overview

- Introduction
- Specification
- Result of Survey
- Observed effects

Introduction

Brief history of Japanese JP Domain name (JDN)

- 2000/11 Started DNS testbed by RACE
- 2001/02 Started registration of JDN
- 2001/05 Started DNS resolution service by
RACE for registered JDN
- 2003/03 Standardization of IDN
- 2003/07 Started DNS resolution service by Punycode
- 2003/09 Finished DNS resolution service by RACE
- 2004/02 Started Japanese JP-Navi service
- 2004/07 Around 42,000 JDNs

Current situation of JDN

- Registrants want to use JDN actively
- However, if registrants advertise JDN, it will cause an unfavorable situation because JDN/IDN-aware Web browsers are not deployed widely yet
 - Windows Internet Explorer, which has more than 90% market share, is not JDN/IDN-aware yet
 - Registrants have difficulty in supporting users who met an access error
- The state is “difficult case” even if registrants want to use
 - Chicken and Egg problem

JPRS is doing

- Utilize JDN much more
 - Perform JDN promotion actively
- Deploy JDN/IDN-aware environment
 - Introduction of technologies and counter measures through media and so on
 - Influence to vendors such as browser, OS, PC manufacturers and mobile phone carriers

Objectives of Japanese JP-navi

- By using DNS
 - Inform users to use JDN/IDN-aware Web browsers
 - Decrease 8bit label DNS queries
- Because JDN/IDN-aware Web browsers are not deployed widely yet
 - Users happen to see unexpected error, but they can not understand the reason
 - JDN registrants want to utilize their JDN, but it is hard to get understanding of users that JDN/IDN-aware application is required
 - Without deployment of JDN/IDN-aware environment, it continues 8bit label DNS queries

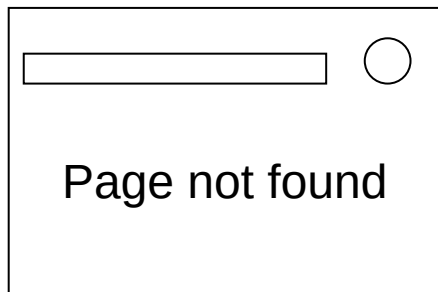
Before and after

Before Japanese JP-navi

- ① Users type JDN to JDN/IDN-unaware Web browser
“http://日本語.jp/”



- ② Browser cause an error

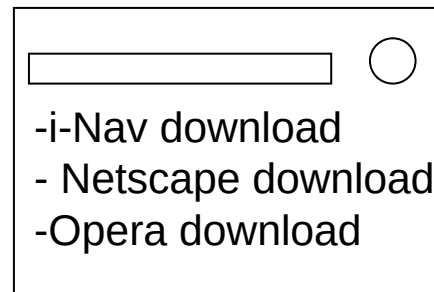


After Japanese JP-navi

- ① Users type JDN to JDN/IDN-unaware Web browser
“http://日本語.jp/”



- ② **Browser browses a web site which inform users JDN/IDN-aware environments**



Before starting Japanese JP-navi

- Explained specification and result of our survey to Japanese Internet community
 - Highlighting that **this is a temporary service**
- Opened 3 weeks public comment period simultaneously
 - From 19 Jan 2004 to 6 Feb 2004
- Started on 18 Feb 2004

Specification

Overview

- Only when JDN registrant **wishes**, adds UTF-8 encoded JDN onto JP zone
 - Japanese JP-navi is opt-in
 - Requires existence of NS
 - Adds A and MX RRs
- When users type JDN through JDN/IDN-unaware Web browser, a certain Web page is shown
 - To navigate i-Nav™ plug-in download page
 - To introduce JDN/IDN-aware browsers such as Opera and Netscape Navigator

Example of the Page

日本語JPナビ

[このページはなぜ表示されるのか](#)

ご利用のブラウザでは日本語JPDメイン名のサイトにアクセスできませんでした

日本語JPDメイン名のサイトにアクセスするには、対応したWebブラウザやプラグインをインストールすることをお勧めします(対応したWebブラウザでアクセスした場合、このページは表示されなくなります)。

日本語JPDメイン名に対応したブラウザやプラグインを今すぐインストール

Internet Explorer をご利用の場合 (Windowsのみ)	▶▶ i-Nav™(プラグイン)をインストールする
Netscape をご利用の場合 (Windows, Mac, Linux 対応)	▶▶ Netscapeの最新版をインストールする
Opera をご利用の場合 (Windows, Linux 対応)	▶▶ Operaの最新版をインストールする

上記のソフトウェアがインストールできない場合、以下のリンクをクリックすることで目的のサイトにアクセスできます。

- <http://日本語JPDメイン名.jp/>

株式会社日本レジストリサービス

[このサービスの詳細](#)

[日本語JPDメイン名について](#)

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RRs added onto JP

- A and MX RRs for UTF-8 encoded JDN and with www

xn--wgv71a119e.jp. NS	ns. xn--wgv71a119e.jp.
日本語.jp. A	10.10.10.10
	MX 10 not-exist.jp.
www.日本語.jp. A	10.10.10.10
	MX 10 not-exist.jp.

 - AAAA is not provided
- Basically, 4 RRs are added per domain
 - In maximum, 12 RRs are added if the JDN includes alphabet
 - To support compatible characters of alphabets

ASCII	“JPRS会社.jp”
Full-width (Upper)	“JPRS会社.jp”
Half-width (lower)	“jprs会社.jp”
 - If JDN includes digit and/or hyphen, 8 RRs are added

ASCII	“123-会社.jp”
Full-width	“123－会社.jp”

Treatment of SMTP

- Due to A RR addition, SMTP connection is expected
 - To avoid receiving E-Mail, add MX RR which does not exist to make immediate error
- There are MTAs that try to connect A if connect to MX failed (RFC2821 violation)
 - No SMTP service provided
 - Not to record any connection
 - RFC2821 incompliant MTAs will retry for a several days
- SMTP connection may be rare (our assumption)
 - MTA will cause error during address format checking

Result of Survey

UTF-8 8bit label treatment in DNS

- 8bit is permitted as a protocol, but there are very few operational experiences

- Cite from RFC1035, 3.1 Name space definitions

Although **labels can contain any 8 bit values** in octets that make up a label...

- Target of survey on UTF-8 8bit label treatment on DNS servers
 - Authoritative server
 - BIND, which is used as authoritative server of JP DNS
 - Cache server
 - BIND, dnscache and Windows DNS service, which is widely used in Japan

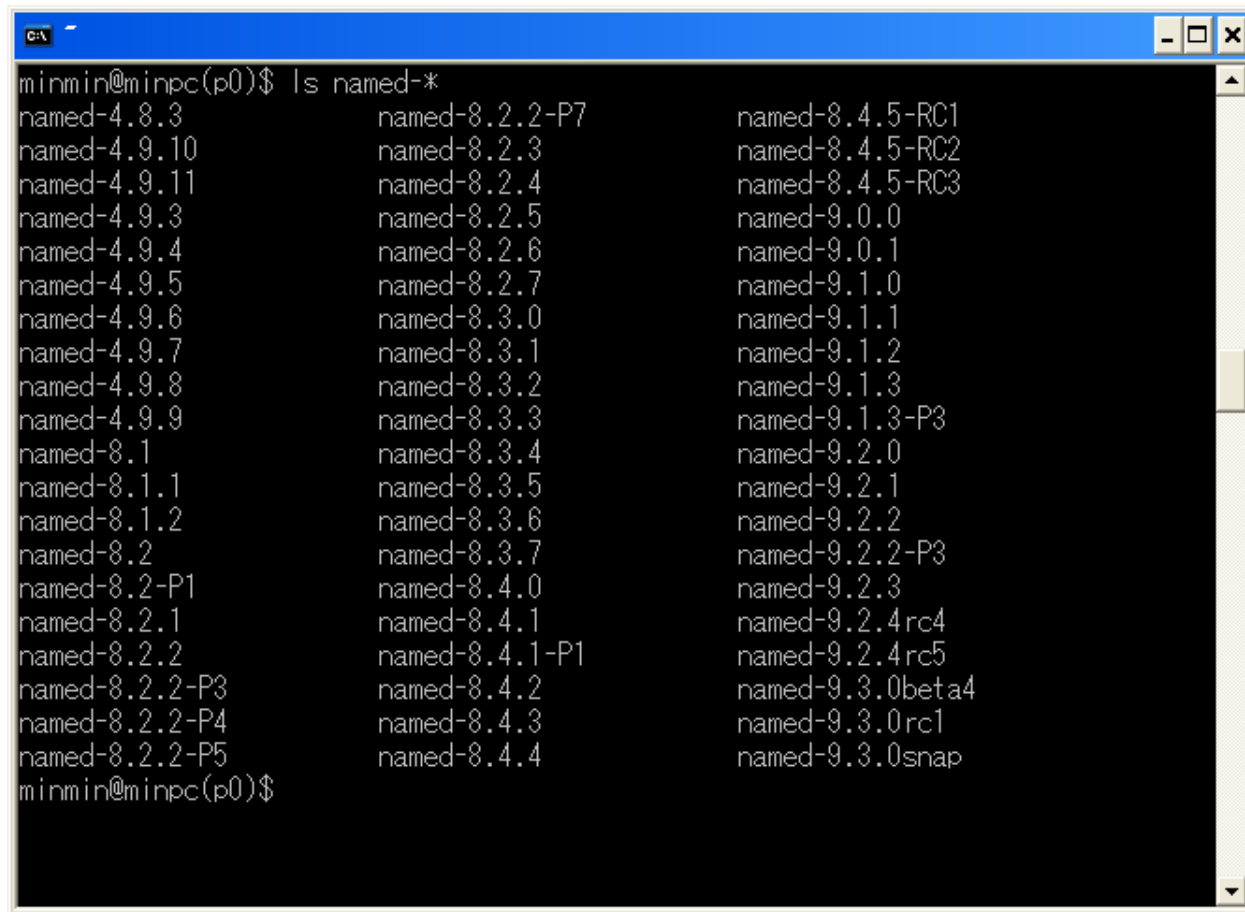
Items of the 8bit label survey

- Can contain A and MX RRs
- Can zone transfer
- Can hold a lot of 8bit label
- Can hold a long label (up to 63 octets)
- No influence to 7bit queries
- 8bit label and its masked 7bit label are distinguished completely
 - Both authoritative and cache server

Results of the 8bit label survey

- No problem was found for authoritative servers used in JP DNS
 - Also no problem was found for NSD, tinydns and other versions of BIND
- No problem was found for BIND (as a cache) available from ISC's ftp site
 - Works fine even on BIND Version 4.8.3
 - Excluded non release (Alpha, beta and RC) versions of BIND 9 series to decrease target (for time constraints)
- No problem was found for dnscache (djbdns)
- No problem was found for Windows DNS service if 8bit label is UTF-8
 - Another encodings were not responded
- No problem was found for SOHO routers (NAT boxes) as far as availed

Example: Current test environment



```

minmin@minpc(p0)$ ls named-*
named-4.8.3          named-8.2.2-P7      named-8.4.5-RC1
named-4.9.10         named-8.2.3         named-8.4.5-RC2
named-4.9.11         named-8.2.4         named-8.4.5-RC3
named-4.9.3          named-8.2.5         named-9.0.0
named-4.9.4          named-8.2.6         named-9.0.1
named-4.9.5          named-8.2.7         named-9.1.0
named-4.9.6          named-8.3.0         named-9.1.1
named-4.9.7          named-8.3.1         named-9.1.2
named-4.9.8          named-8.3.2         named-9.1.3
named-4.9.9          named-8.3.3         named-9.1.3-P3
named-8.1            named-8.3.4         named-9.2.0
named-8.1.1          named-8.3.5         named-9.2.1
named-8.1.2          named-8.3.6         named-9.2.2
named-8.2            named-8.3.7         named-9.2.2-P3
named-8.2-P1         named-8.4.0         named-9.2.3
named-8.2.1          named-8.4.1         named-9.2.4rc4
named-8.2.2          named-8.4.1-P1     named-9.2.4rc5
named-8.2.2-P3       named-8.4.2         named-9.3.0beta4
named-8.2.2-P4       named-8.4.3         named-9.3.0rc1
named-8.2.2-P5       named-8.4.4         named-9.3.0snap
minmin@minpc(p0)$
  
```

TIPS: Using UTF-8 on DNS

- In dig, '¥' followed 3digits decimal can represent arbitrary code
 - Example for lookup A RR of “**日本語**.jp” in UTF-8
 - dig '¥230¥151¥165¥230¥156¥172¥232¥170¥158.jp' a
 - Using UTF-8 directly is also available if your command line accepts it
- BIND's zone file notation is the same

Observed effects

Case study: Campaign of a famous beverage maker

- A Japanese famous beverage maker used a JDN for a product's campaign
 - <http://生茶.jp/> in addition to <http://namacha.jp/>
- Campaign period
 - Jun 15 09:00 to Jul 31 21:00 (JST)
- Medias to have been used to advertise JDN
 - Posters inside store
 - Posters on vending machine
 - Advertisement in magazines

Access count of Japanese JP-navi

