

DNSGO@IPGO

2023.07.24 | APIGA (Day 1)

[www.asia](http://www.asia)  
Asian #InspirAsian



**.asia**  
**#RiseWithAsia**

**What is “.asia”?**

[www.domain.asia](http://www.domain.asia)



Every .Asia Domain Contributes to Internet Development in Asia

The image displays a vertical stack of eight browser window screenshots, each showing a different website with a .asia domain. From top to bottom, the websites are:

- Relief.Asia**: Features a black ribbon icon and text for Myanmar Cyclone (2008.05.03) and Sichuan Earthquake (2008.05.12).
- Information Society Innovation Fund - ISIF**: Includes a search bar and navigation links for wiki, blog, calendar, and mail.
- www.creativecommons.asia**: Displays the Creative Commons logo and the text "creative commons.asia".
- www.itrc.hkics.org.hk/prog**: Shows the logo for ITRC (Information Technology Resource Centre) and navigation links.
- Asian Open Source Software Centre - OSS.Asia**: Features the text "OSS.ASIA" and "Asia Open Source Software Centre".
- GI GI = One Laptop Per Child = OLPC.Asia**: Includes a logo with a laptop and child, and the text "四川孩子的希望，中國孩子的希望" and "每普一電腦".
- NetMission.Asia**: Shows a large banner for the "NetMission Ambassadors program" with a logo of a person and a heart, and navigation links like "The Organizer", "The Program", "Application", "Exchange Opportunity", "Enquiries", "Blog", and "Seminar Series".
- NetMission.Asia**: A smaller screenshot showing "Seminar series" and "Ambassadors program" with a logo of two people.



NETMISSION.asia

ICANN SINGAPORE NIGHT





HOW DO I GET STARTED IN INTERNET GOVERNANCE?

HAZWANY JAMALUDDIN, MALAYSIA



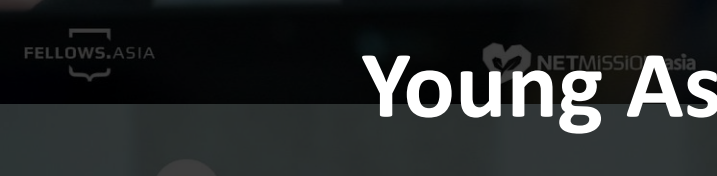
GOVERNMENTS ALONE CAN'T LAY OUT THE ENTIRE INFRASTRUCTURE. REGULATED PUBLIC-PRIVATE PARTNERSHIPS ARE THE KEY TO SUCCESS.

ROHAN WADHWA, INDIA



IS THERE ALWAYS A DOMINANT MINORITY RULING OVER A MAJORITY?

MIRA FAJRIYAH, INDONESIA



# Young Asians Setting Out to Change the World



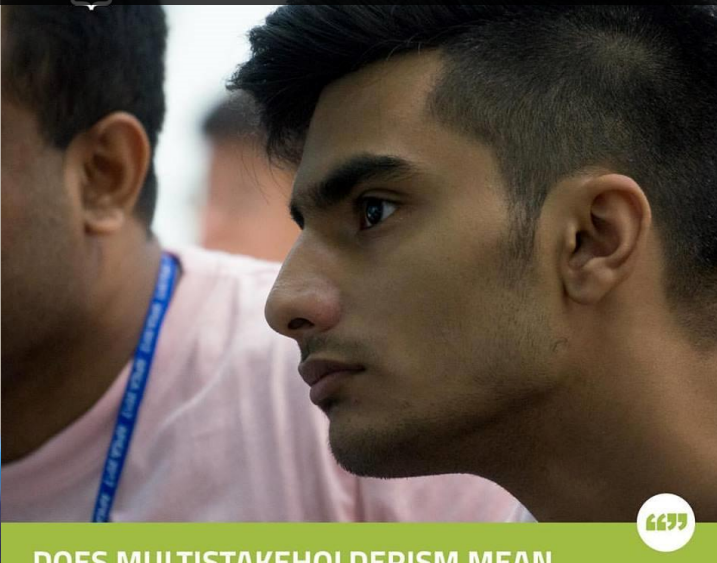
IGF MAY NOT HAVE DIRECT POWER BUT IDEAS CAN BE EMERGED FROM THESE FORUMS.

ADITYA GARG, INDIA



EVERYONE'S VOICE SHALL BE HEARD INCLUDING THE MINOR

CHARMAINE LO, HONG KONG

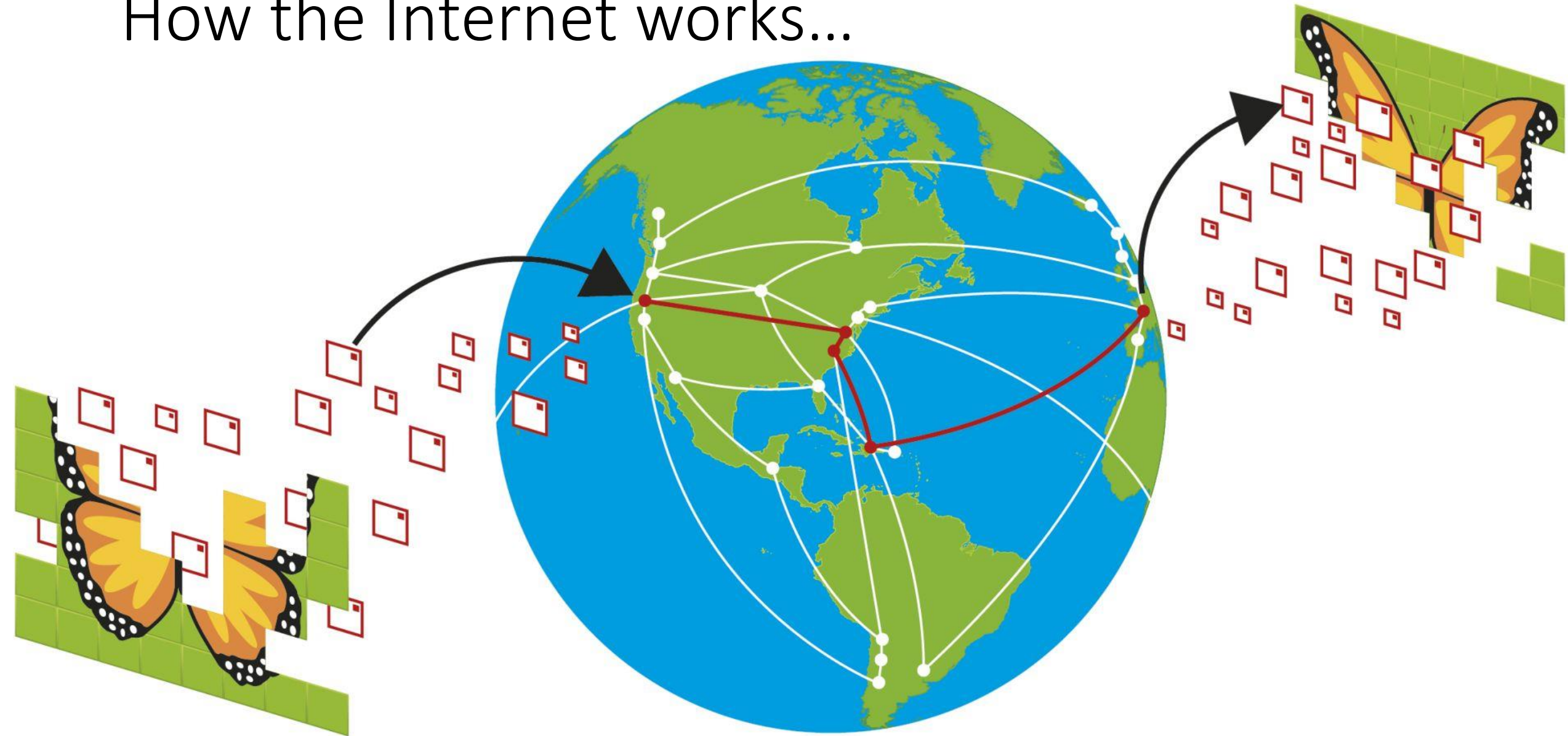


DOES MULTISTAKEHOLDERISM MEAN EQUAL FOOTING FOR ALL STAKEHOLDERS?

WALEED BIN ARSHAD, PAKISTAN



# How the Internet works...



Sender of packet  
you@apiga.asia

Recipient of packet  
me@ajitora.asia  
[www.ajitora.asia](http://www.ajitora.asia)

Browser (URL Bar) / Email Client (Email Address @domain.part)

192.16.00.12



The Internet

192.00.00.75

Domain Names (DNS)

Data HTTP

4. Application

User Datagram Protocol (UDP) / Transmission Control Protocol (TCP)

IP Addresses (IP)

Data HTTP TCP IP

2. Internet TCP/IP

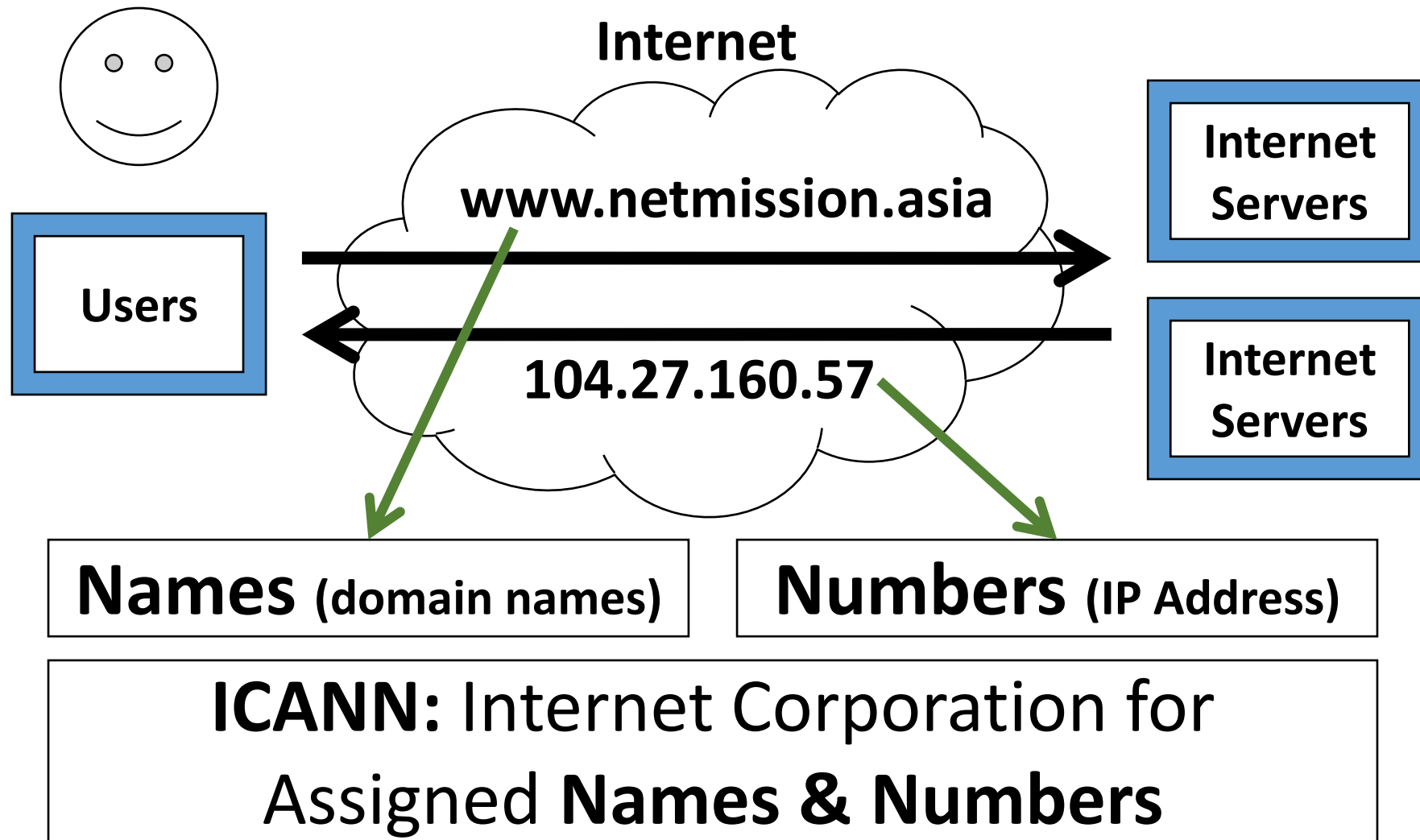
1. Network Access

Data HTTP TCP IP Ethernet

1. Network Access

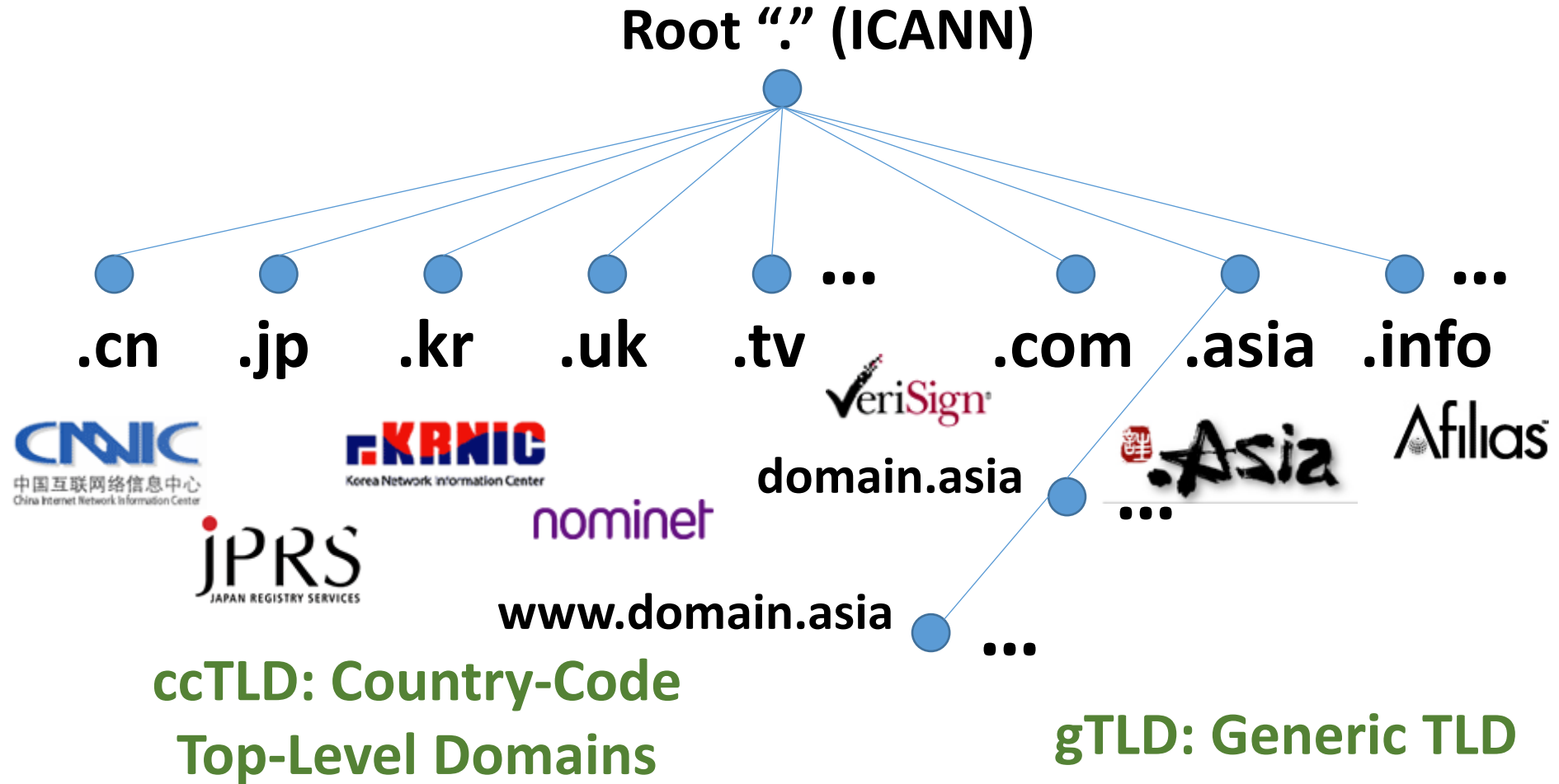
1010101011100001101000101

# How the Internet Works





# .ASIA in the Global DNS



# The Syntax of Domain Names & URLs

.....5th.4th.3rd Level    2nd Level Domain    Top Level Domain  
Domains                      ●                      (2LD)                      ●                      (TLD)

www.netmission.asia

with.love.from.asia

protocol://domain-host/path

https://www.registry.asia/policy/document.html

Uniform Resource  
Locator (URL)

kisa.kr

ftp://naver.co.kr/user

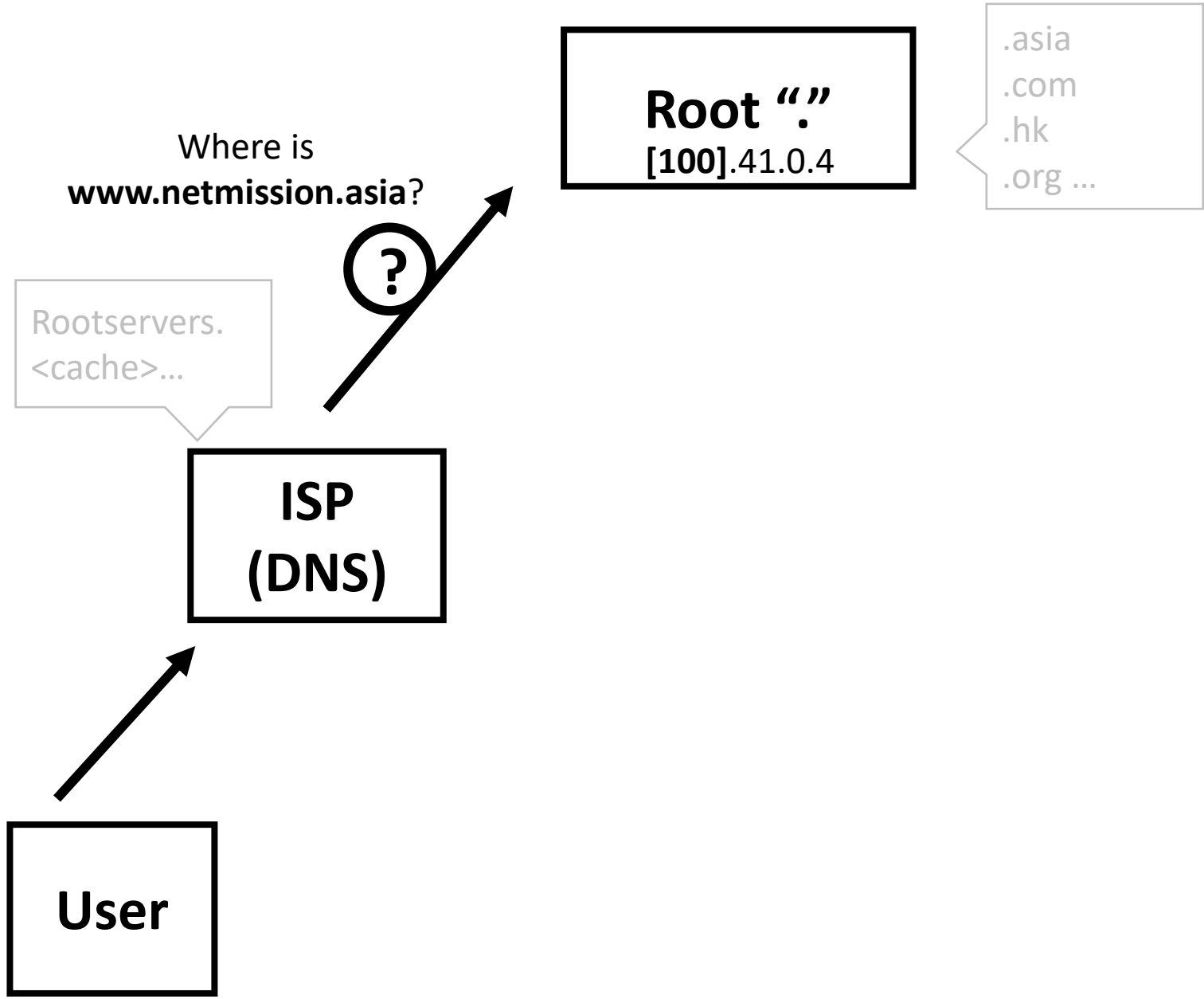
← 2nd Level Domain  
Registry (.co.kr)

mailto:inbox@ABCs.kids

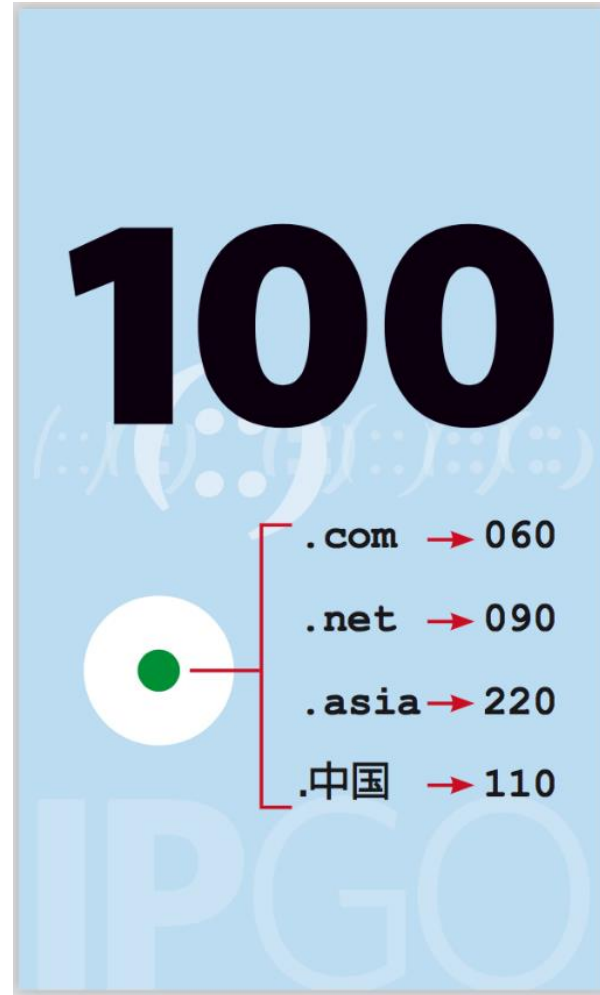
家政网.网站



www.asia



# Root Server [.]



# DNS Query

- Query:
- Where is: [www.netmission.asia](http://www.netmission.asia)
- Response (From Root):
- **I don't know**
- But **.asia** is at:

# TLD [.asia] Registry

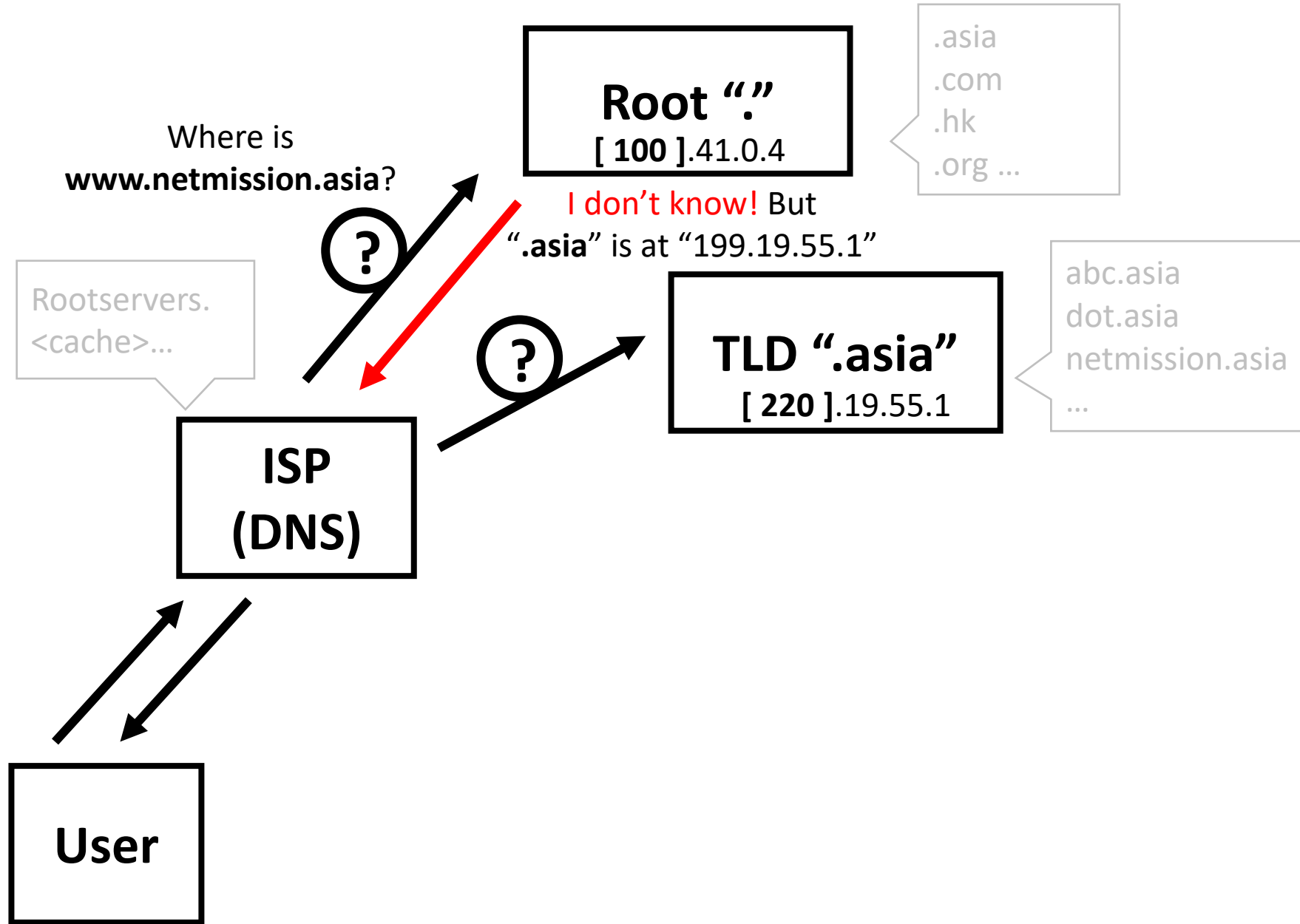
**220**

**.asia**

---

sxxxxx.asia	→	###
sxxxxxx.asia	→	###
sxx.asia	→	###
netmission.asia	→	146
sxxxx.asia	→	###
sx.asia	→	###

---



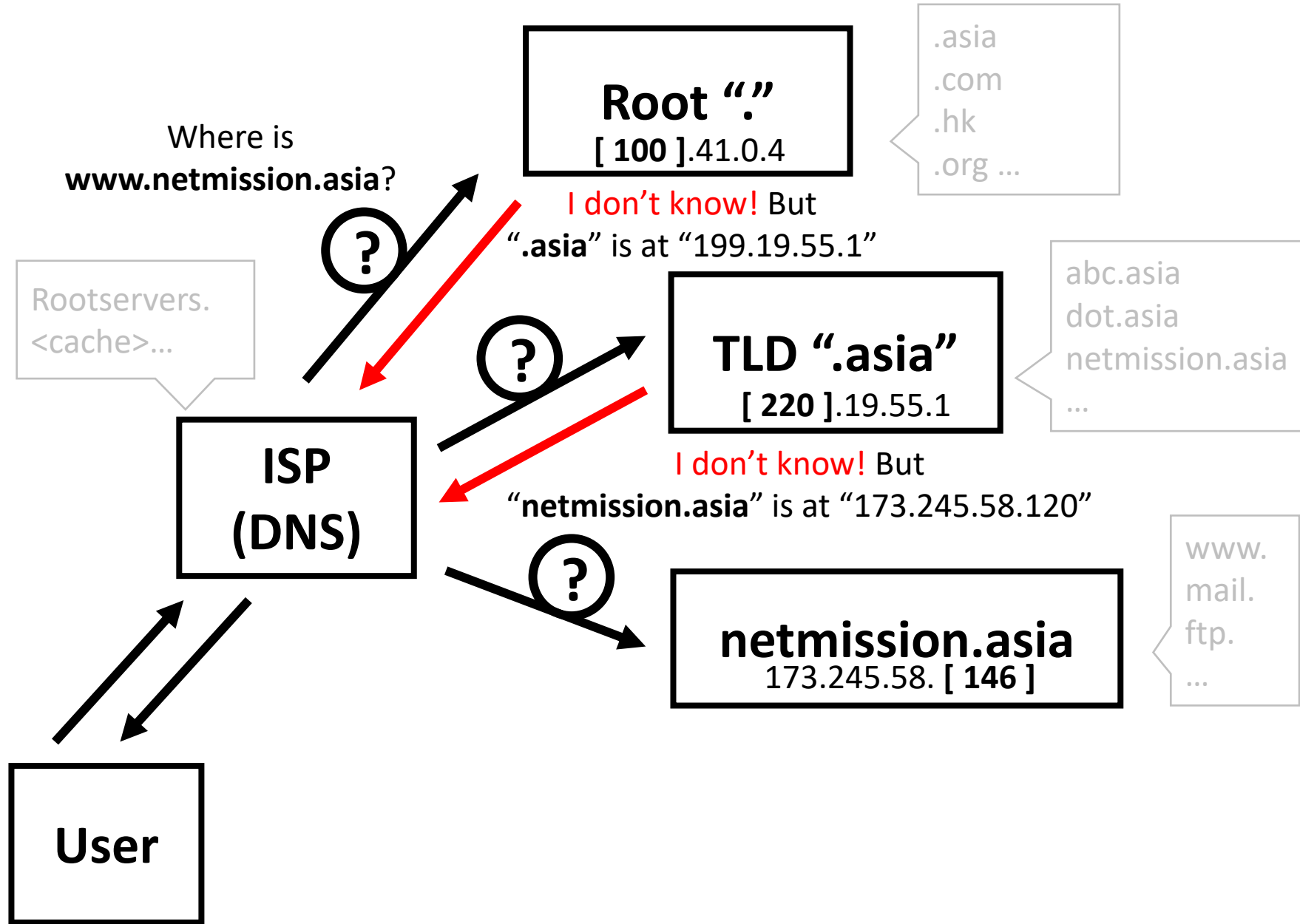
# DNS Query

- Query:
- Where is: [www.netmission.asia](http://www.netmission.asia)
- Response (From .asia Top Level Domain “TLD”):
- **I don't know**
- But **netmission.asia** is at:



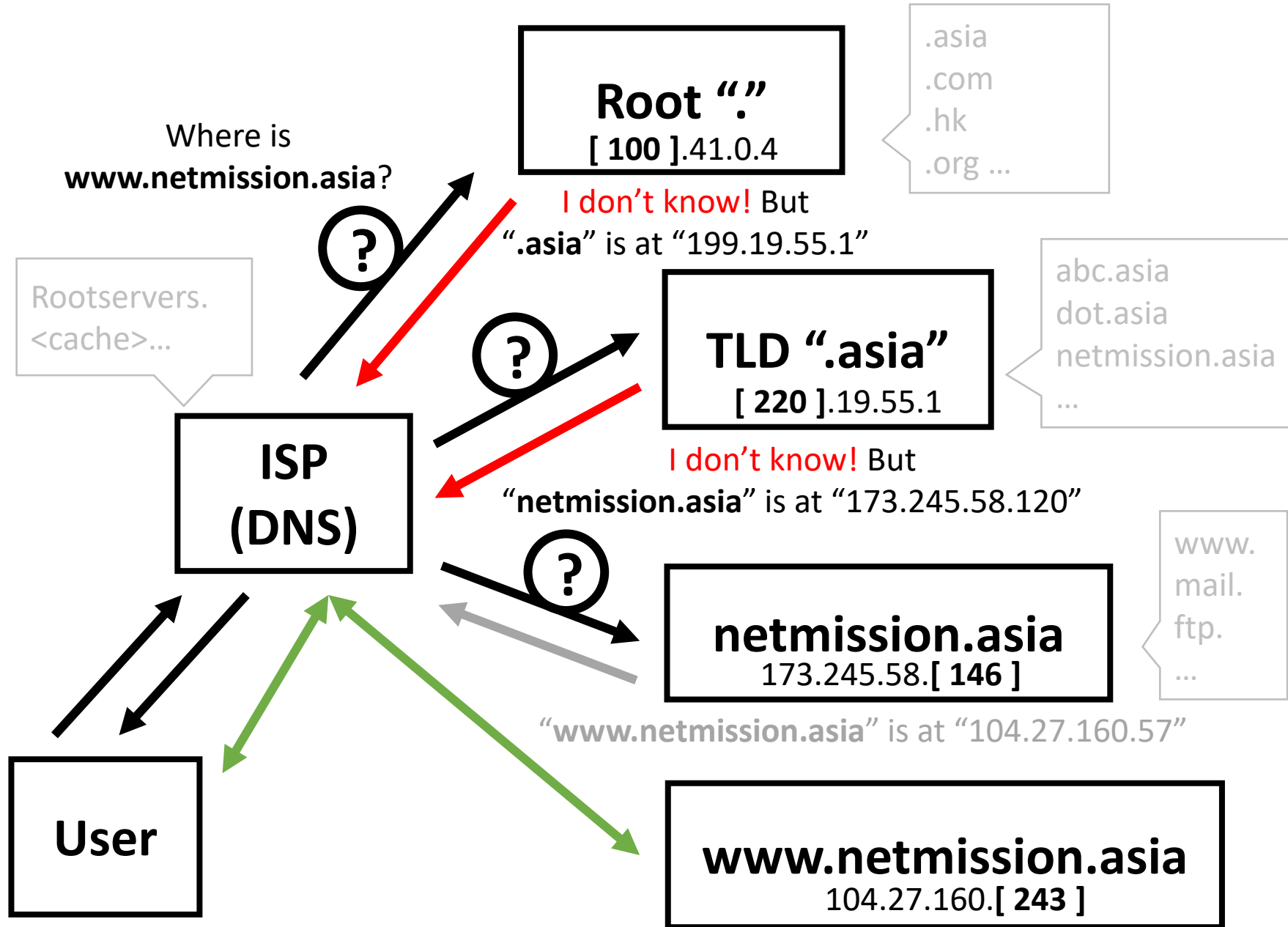
# 2<sup>nd</sup> Level Domain [netmission.asia] Name Server





# DNS Query

- Query:
- Where is: [www.netmission.asia](http://www.netmission.asia)
- Response (From netmission.asia Name Server):
- **www.netmission.asia** is at:

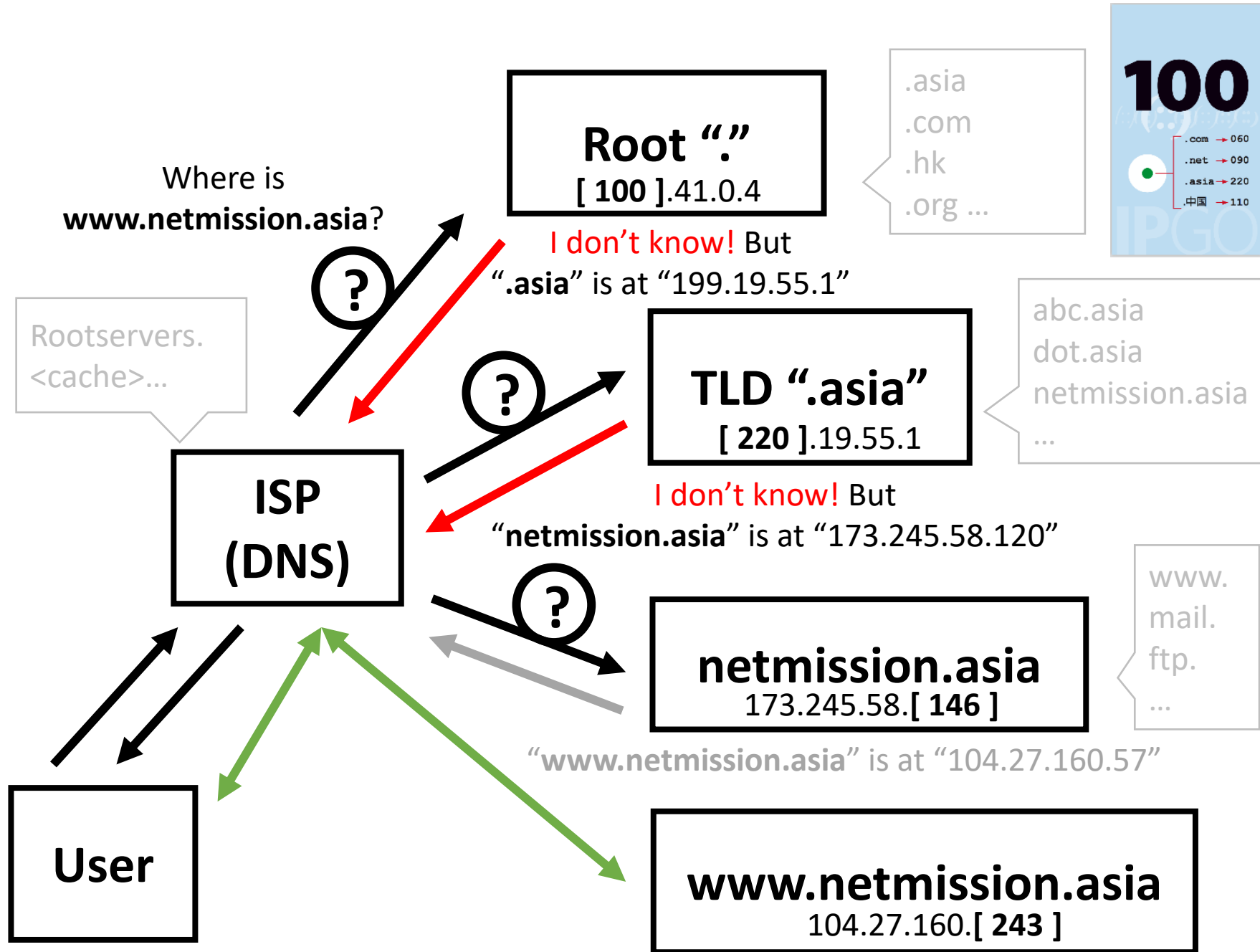


# Man in the Middle Attack

DNS Poisoning

# DNS Query

- Query:
- Where is: [www.netmission.asia](http://www.netmission.asia)
- Response (From netmission.asia Name Server):
- **.asia** is at:

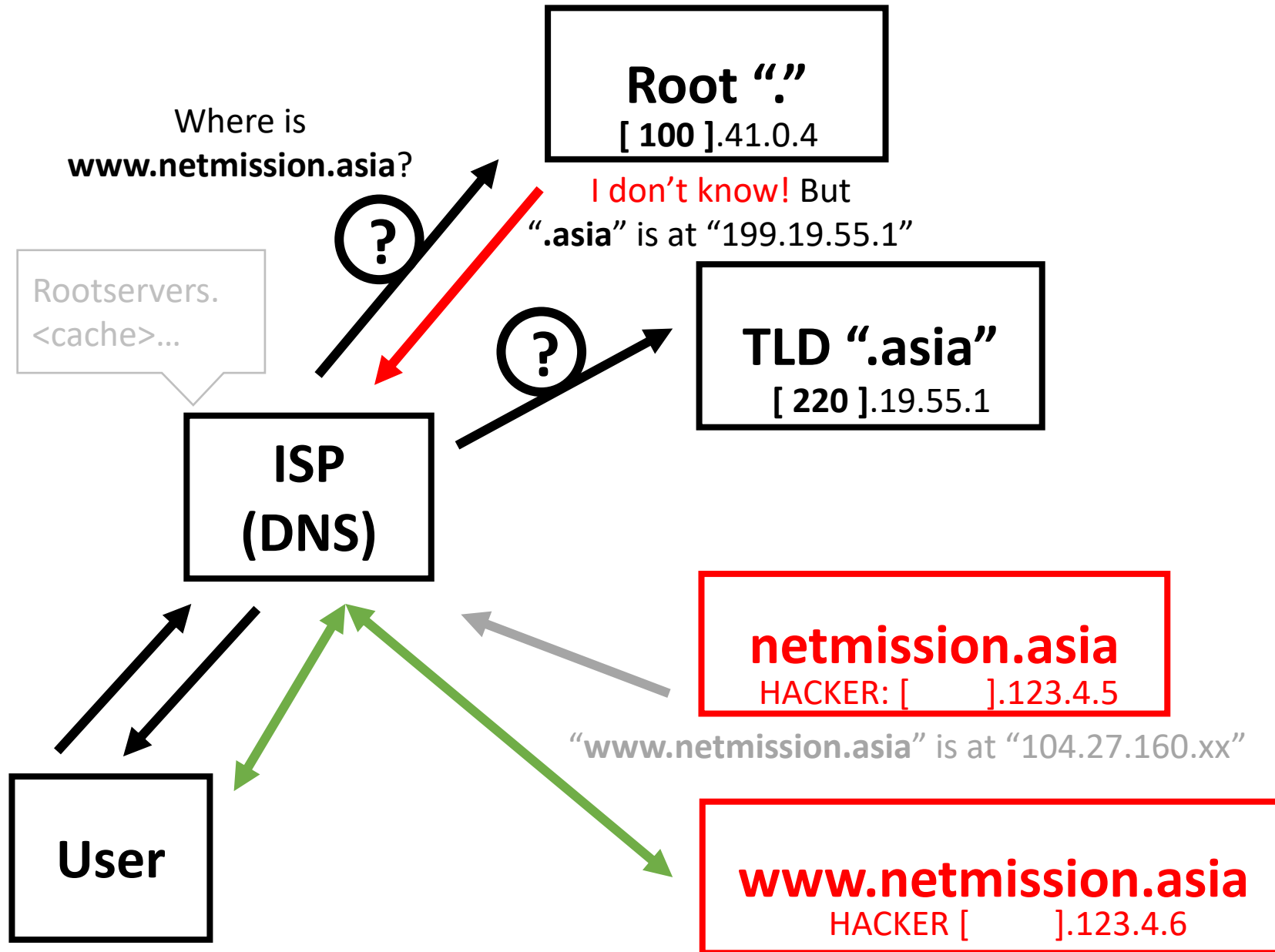


# DNS Query

- Query:
- Where is: [www.netmission.asia](http://www.netmission.asia)
  
- Response (From Root):
- **I don't know**
- But **.asia** is at:

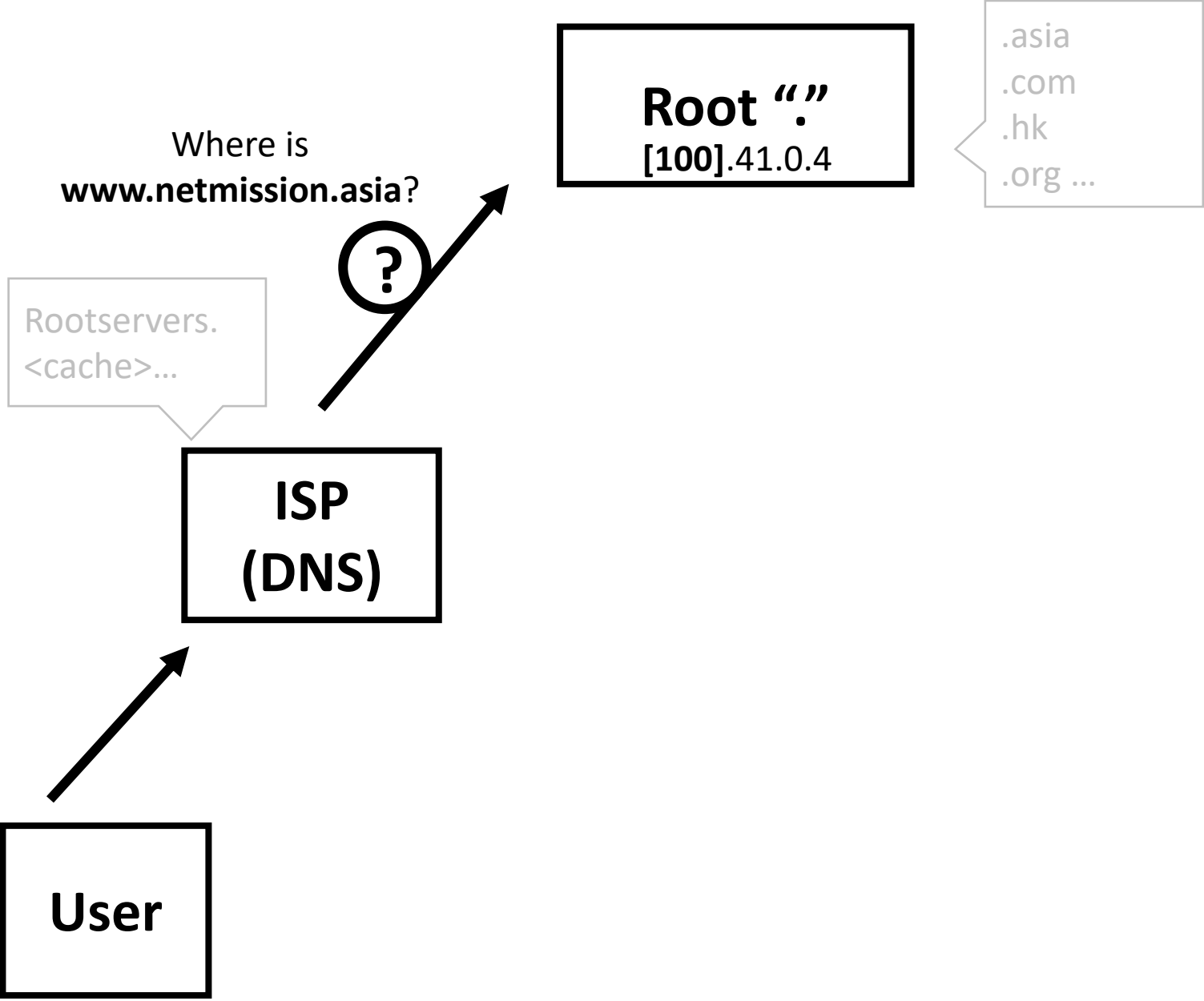


# Man in the Middle Attack (DNS Poisoning)



# DNS Security Extensions (DNSSEC)

- **Signing & Distribution/Depositing of Certificates:**
  1. Root → Internet At Large (ISPs)
  2. TLD (.asia) → Root
  3. netmission.asia → .asia TLD
- **Resolution Path:**



# DNS Query

- Query:
- Where is: [www.netmission.asia](http://www.netmission.asia)
- Response (From Root):
- **I don't know**
- But **.asia** is at:
- **AND** here is the **.asia Certificate**
- as received by the Root

# DNS Query

- Query:
- Where is: [www.netmission.asia](http://www.netmission.asia)
- Response (From .asia Top Level Domain “TLD”):
- **I don't know**
- But **netmission.asia** is at:
- **AND** here is the **netmission.asia Certificate**
- as received by .asia TLD

# DNS Security Extensions (DNSSEC)

- **Signing & Distribution/Depositing of Certificates:**

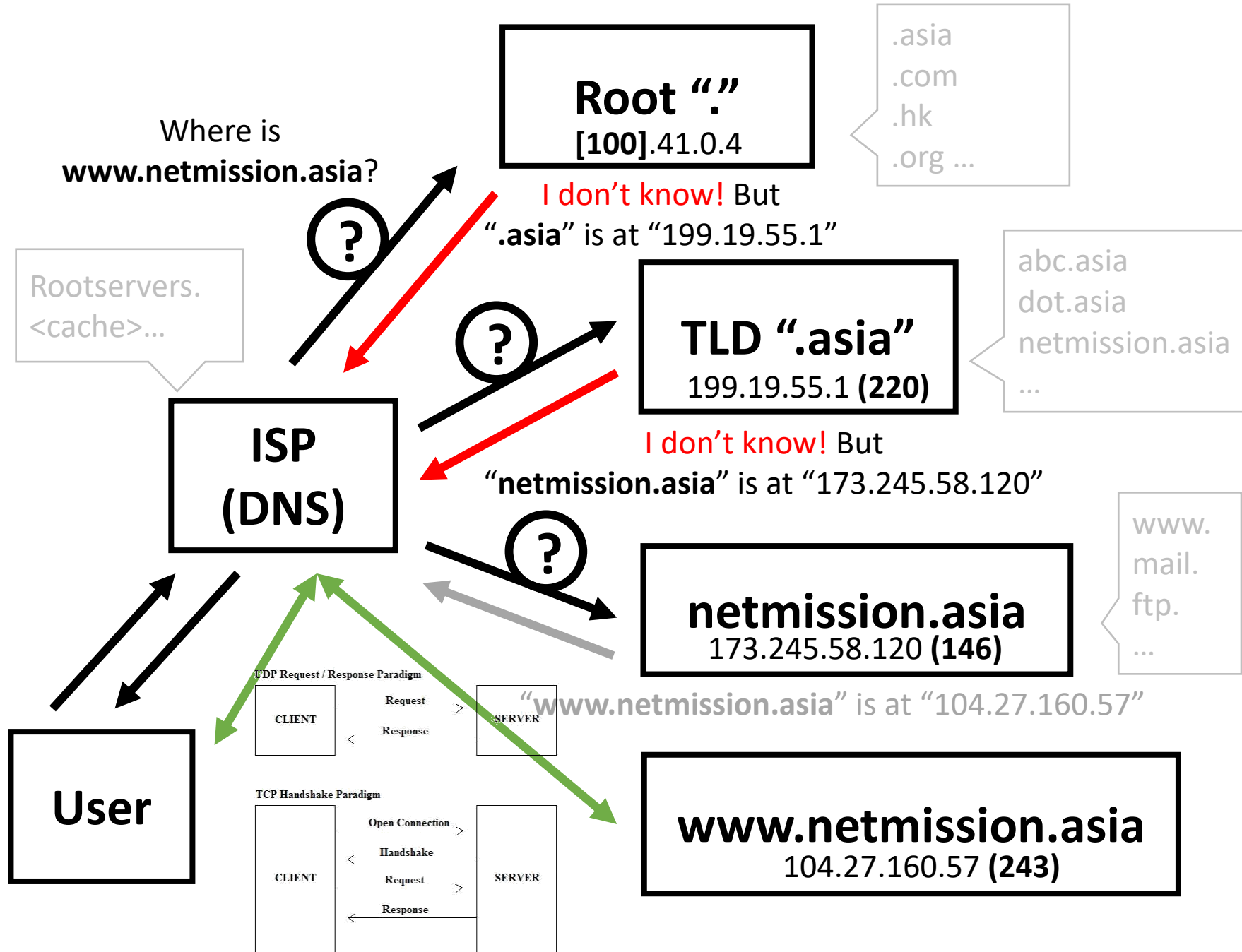
1. Root → Internet At Large (ISPs)
2. TLD (.asia) → Root
3. netmission.asia → .asia TLD

- **Resolution Path:**

1. Root → response + TLD (.asia) Certificate
2. TLD (.asia) → response + **netmission.asia** Certificate

- **Verification Logic:**

- ISP **already has** Root Cert → Verify response from **Root** for **.asia**
- Uses **.asia** Cert **obtained from Root** → Verify response from **.asia TLD** for **netmission.asia**
- Uses **netmission.asia** Cert **obtained from .asia TLD** → verify response from **netmission.asia** for **www.netmission.asia**





# Internet Corporation for Assigned Names and Numbers





# Internet Governance (Names & Numbers)

## ICANN: Internet Corporation for Assigned Names & Numbers

### Names

### Numbers

#### ccTLD

#### gTLD

#### IP Addresses

#### Protocol #

#### 253 country-code Top Level Domains:

- .CN – China
- .JP – Japan
- .KR – Korea
- .UK – United Kingdom
- .US – United States
- ...

#### 22 generic TLDs (14 new):

- .COM .NET .ORG
- .ARPA .MIL .INT .EDU
- .GOV
- 2001 (+7): .INFO .BIZ
- .AERO .MUSEUM .COOP
- .NAME .PRO
- 2004 (+7): .TRAVEL .ASIA
- .CAT .TRAVEL .TEL .MOBI
- .POST
- 2012 (1000+): .KIDS, .SPA...

#### Regional Internet Registries

- APNIC (Asia Pacific)
- ARIN (North America)
- LACNIC (Latin America)
- RIPE (Europe)
- AFRINIC (Africa)

#### Internet Engineering Task Force (IETF)

- Port Numbers
- Protocol Parameters
- Repositories
- etc.

**.ASIA**

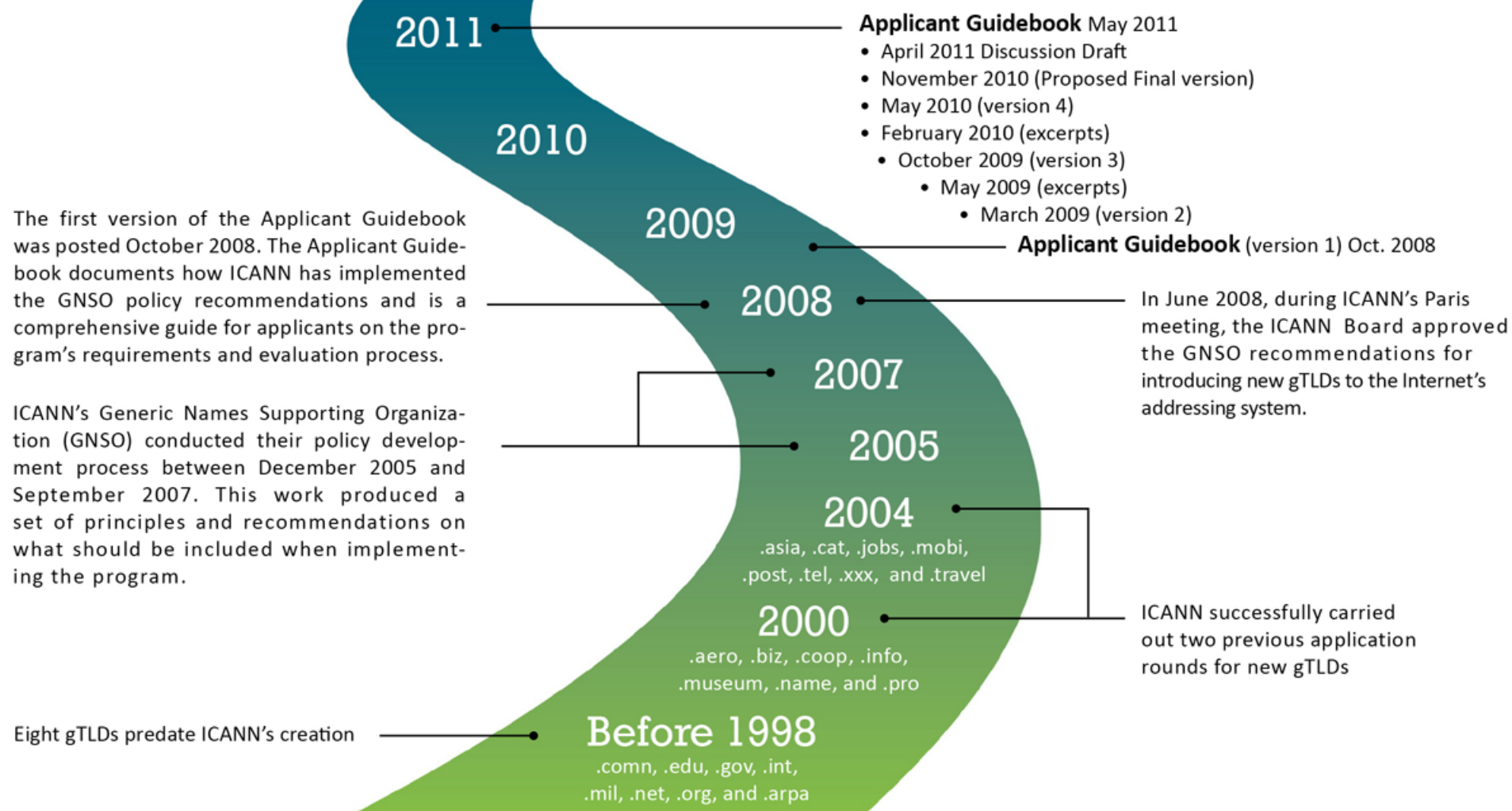


# History

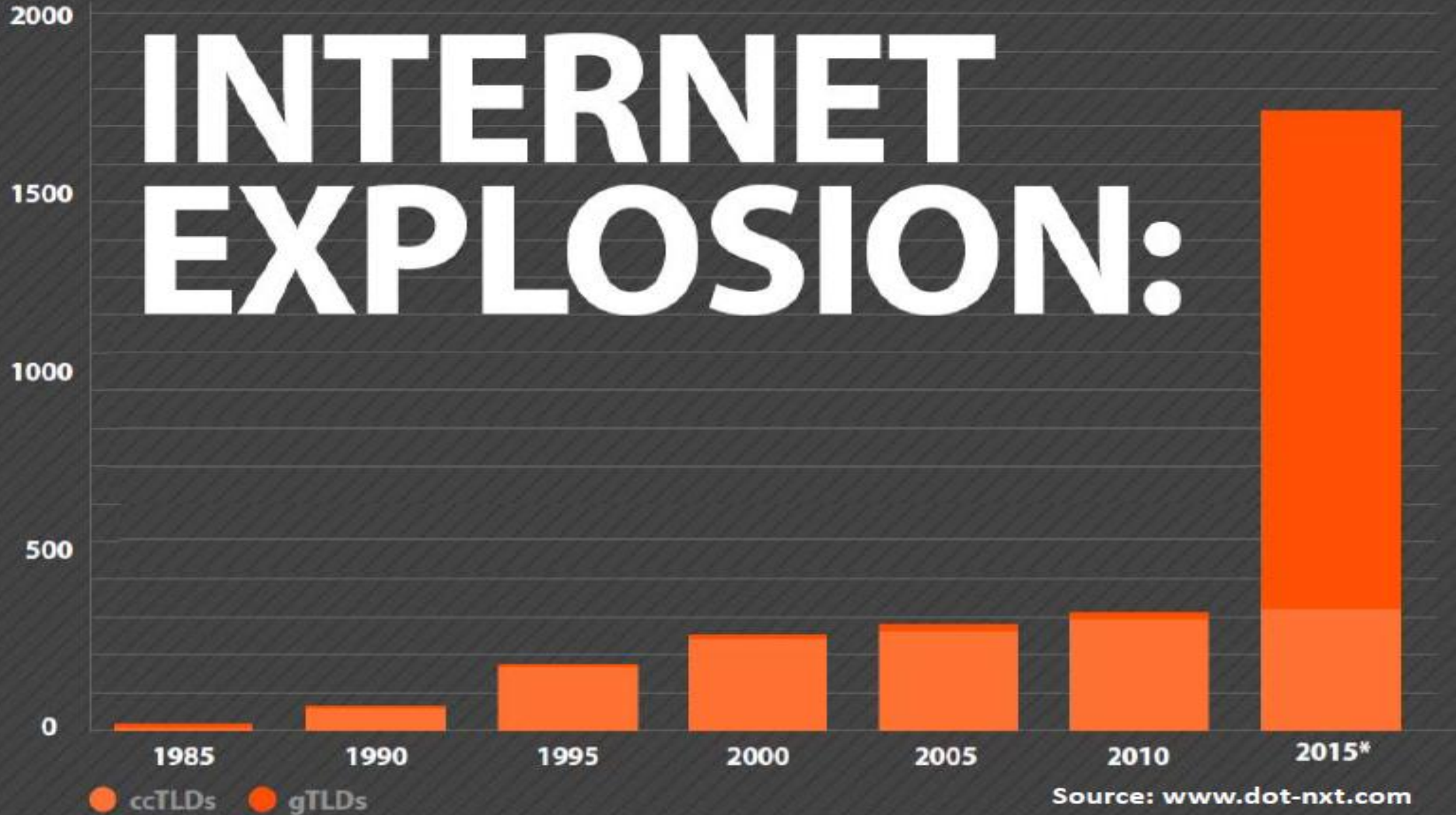
It's a long process...



The Applicant Guidebook has gone through several iterations in draft form and is the result of years of careful implementation of GNSO policy recommendations and thoughtful review and feedback from the ICANN stakeholder community. Each version of the Applicant Guidebook was posted for public comment. More than one thousand public comments have been reviewed and considered, making the program what it is today.



# INTERNET EXPLOSION:



● ccTLDs ● gTLDs

Source: [www.dot-nxt.com](http://www.dot-nxt.com)

1930 total number of applications received

911

North America

675

Europe

New gTLD Global  
Distribution /  
Imbalance

24

South America

17

Africa

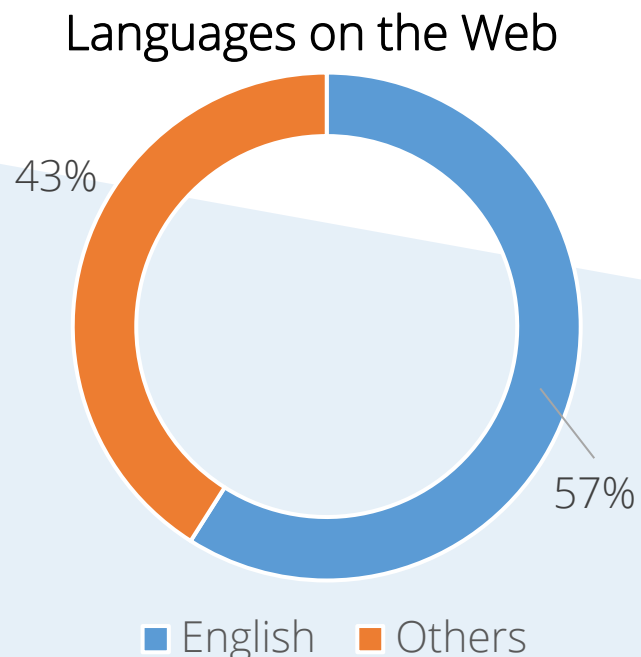
303

Asia Pacific



# We Live in a Multilingual World!

Globally, language usage is diverse. English comes **third in terms of native speakers** around the world, after Mandarin and Spanish. English represents 57% of the total written content online and the percentage is decreasing.



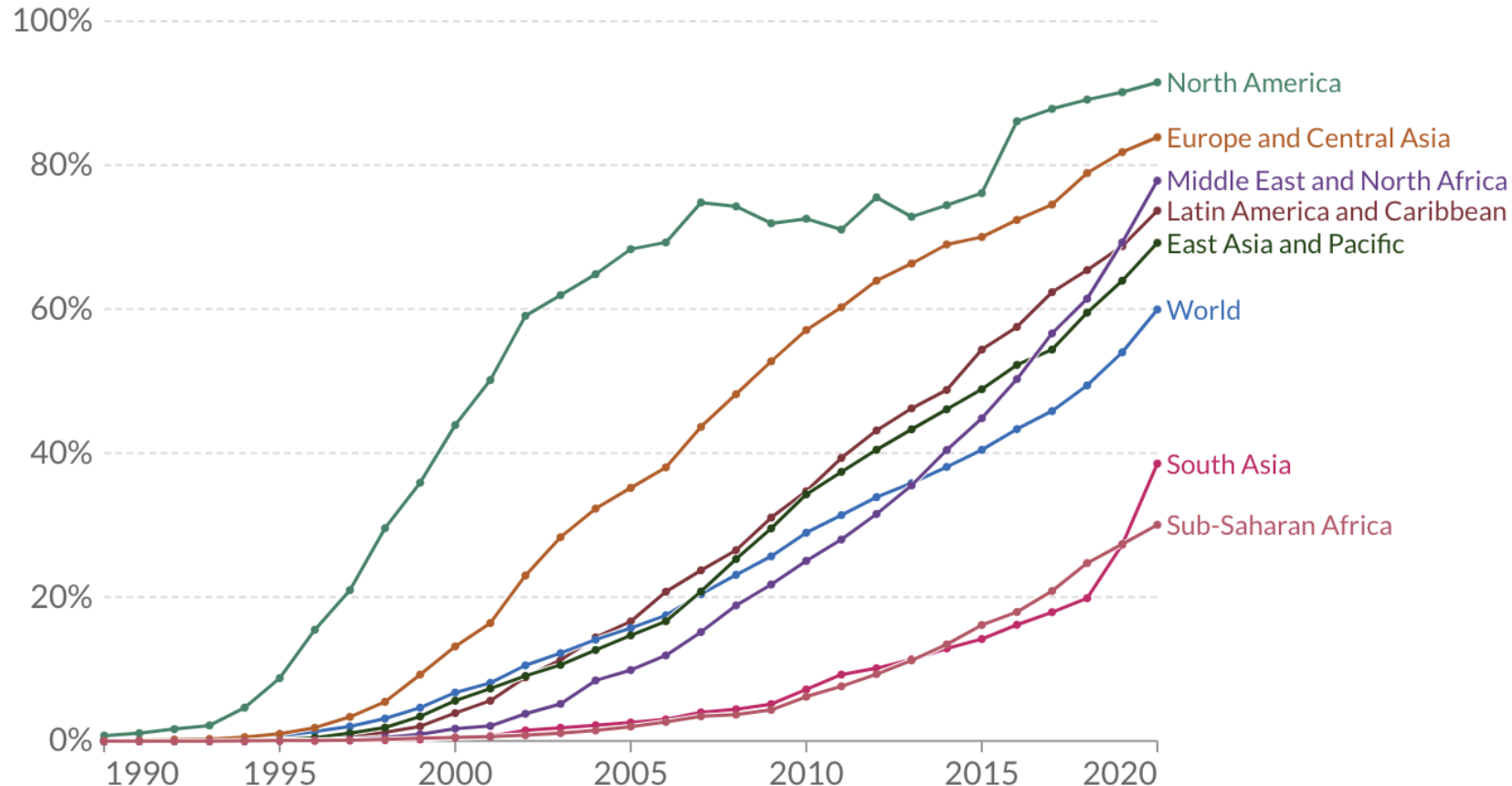
Source:  
[https://w3techs.com/technologies/history\\_overview/content\\_language](https://w3techs.com/technologies/history_overview/content_language).

Language	Native Speakers
Mandarin	1300 million
Spanish	475 million
English	373 million
Arabic	362 million
Hindi	344 million
Bengali	234 million
Portuguese	232 million
Russian	154 million
Japanese	125 million

Source:  
<https://www.babbel.com/en/magazine/the-10-most-spoken-languages-in-the-world>

# Internet Access Globally

The next billion Internet users will come from communities speaking a diverse set of languages.



Source: International Telecommunication Union (via World Bank)

OurWorldInData.org/internet • CC BY

Share of the population who used the Internet in the last three months.

청운체육관.asia

에어로빅

T.87-8366

태권도



성원돼지집  
국밥 찜 수육 T83-6603 지하

정원.ASIA  
83-8686

성원.ASIA  
T61-6106 1F



매일회지

산지직송  
자연산활어

Local Businesses are Known in their Local Language  
Internationalized Domain Names (IDN)

중화요리  
TEL: 262-8082 8000

제일화재  
261-0616~7

이름과이노교습소  
284-6611 1층상가

성원감자탕  
감자탕.불판전 T81-3953 지하

치킨 전문점  
체인점문의: 051)311-9288

www.domainname.asia  
www.नाम.asia

www.नाम.असिअ

**U-Label**  
Native Form /  
Unicode Label

**Unicode**  
*ISO10646 Standard*

U+0928 U+093E U+092E U+0905 U+0938 U+093F U+0905

**Punycode**  
*IETF IDN Standard*

xn--l2bm1c

xn--l1ba6m2a

www.xn--l2bm1c.xn--l1ba6m2a

**A-Label**  
ACE (ASCII  
Compatible  
Encoding)

Punycode / IDNA prefix

“xn--”



書籍 商标 机构 セール 通販 游戏 谷歌  
 政务 在线 娱乐 公益 中文网 一号店 亚马逊  
 संगठन फ़ाउन्डेशन 商城 嘉里大酒店 网址 グーグル  
 католик 佛山 點看 中信 企业 家電 淡马锡  
 ストア 盛貿飯店 点看 手机 香港電訊 همراه 食品 天主教  
 健康 大拿 招聘 信息 手机 بازار 닷컴 ابوظبي 餐厅 дети  
 慈善 网站 盛貿飯店 微博 香格里拉 诺基亚  
 org 网店 工行 手表 ポイント 政府  
 购物 移动 八卦 深圳 新闻 网络  
 大众汽车 联通 网络 欧莱雅 сайт 普利司通  
 電訊 盈科 网站 世界 广东 点看 通用电气公司  
 クラウド 集团 公司 三星 嘉里 アマゾン  
 我爱你 珠宝 机构体制



.Future...

# Evolution of the Internet

2006

Generic  
(22 total)

.com	.edu
.org	.net
.aero	.asia
.mobi	.travel

Country Code  
(Over 200 total)

.uk	.jp
.de	.fr
.cn	.in
.br	.mx

2016

Generic  
(**Over 1,200 total**)

.com	.edu	.org
.net	.asia	.travel
.bank	.bar	.club
.car	.global	.london
.rio	.vote	.sky
.संगठन	.在线	.ابوظبي
.닷컴	.ストア	.дети

Country Code  
(Nearly 300 total)

.uk	.jp
.de	.cn
.in	.br
.φ	.台灣
.한국	.ଭାରତ

# How to Use Different Scripts in Domain Names

- © A **Repertoire** is a subset of possible Unicode code points based on IDNA2008.

HEX	C	J	K	V	HEX
4E50 J 4.4	乐 G0-4056				4E64 Z 5.3
4E51 J 4.5	乘	乘	乘		4E65 Z 5.3
4E52 J 4.5	兵	兵	兵	兵	4E66 Z 5.3
4E53 J 4.5	兵	兵	兵	兵	4E67 Z 5.4
4E54 J 4.5	乔	乔			4E68 Z 5.5
4E55 J 4.6	席		席		4E69 Z 5.5
4E56 J 4.7	乖	乖	乖	乖	4E6A Z 5.5
4E57 J 4.8	乘	乘	乘	乘	4E6B Z 5.5
4E58 J 4.9	乘	乘	乘	乘	4E6C Z 5.5
4E59 Z 5.0	乙	乙	乙	乙	4E6D Z 5.5
4E5A Z 5.0	L	L	L	L	4E6E Z 5.5

060	061	062	063	064	065
0	␣	␣	␣	␣	␣
1	␣	␣	␣	␣	␣
2	␣	␣	␣	␣	␣
3	␣	␣	␣	␣	␣
4	␣	␣	␣	␣	␣
5	␣	␣	␣	␣	␣
6	␣	␣	␣	␣	␣
7	␣	␣	␣	␣	␣
8	␣	␣	␣	␣	␣

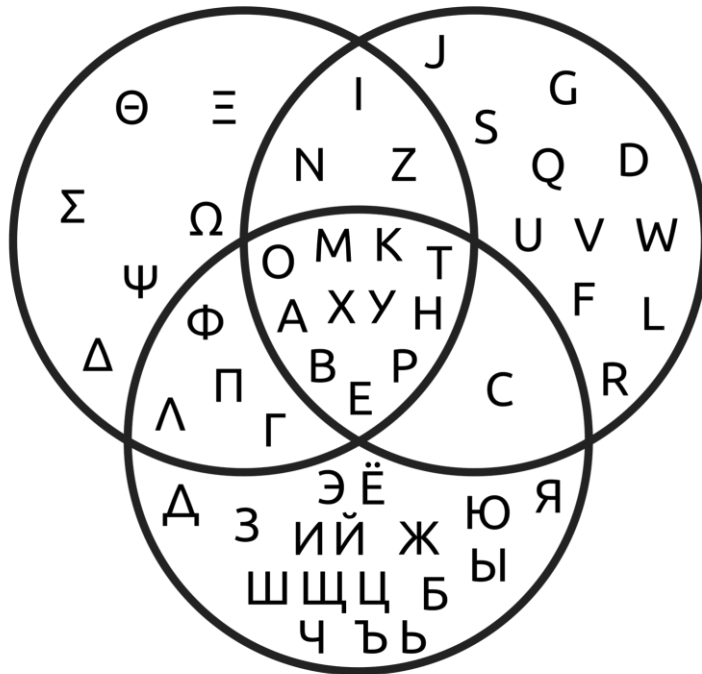
  

120	121	122	
0	U	h	w
1	U	h	w
2	U	h	w
3	U	h	w
4	U	h	w
5	U	h	w
6	U	h	w
7	U	h	w

090	091	092	093	094	095	096	097
0	ं	ऐ	ठ	र	ी	ॐ	ॠ
1	ँ	ऑ	ड	ऱ	ु	ं	ृ
2	ं	ओ	ढ	ल	ॢ	ॣ	ँ
3	ः	ओ	ण	ळ	॥	॥	ँ
4	ऐ	औ	त	ळ	॥	॥	आ
5	अ	क	थ	व	ँ	ँ	॥
6	आ	ख	द	श	ॢ	ॣ	अ
7	इ	ग	घ	ष	ॢ	ॣ	अ
8	ई	घ	न	स	ॢ	ॣ	र
9	उ	ड	न	ह	ँ	ख	३

## HOMOGLYPHIC ATTACK



- Homoglyph = look alike character
  - E.g. 0, O; 1, l, I, etc.
- Multilingual / Internationalization aspect
  - E.g. “-” (hyphen/dash) and “一” (Chinese character “one”)
  - E.g. “A” (English capital A) and “Α” (Greek capital A)

# wikipedia.org



*Can you spot the fraud in this link?*

wikipedia.org



*The “e” and “a” are replaced with Cyrillic letters rather than Latin ones.*

# IDN Variant Policies

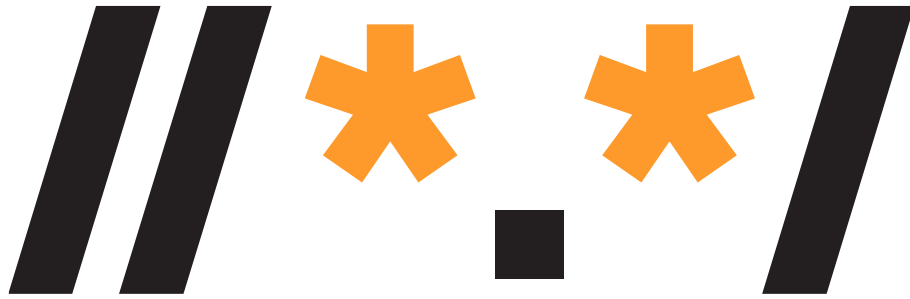
- Simplified and Traditional Chinese
  - Uses Across Chinese / Japanese (Kanji) / Korean (Hanja)



- Homoglyphs / Homographs
  - **expo.space** → Cyrillic (Russian characters)
  - **expo.space** → Latin (English characters)
  - 1 / l / I and 0 / O







# Universal Acceptance

Firefox Welcome to Facebook - Log In, Sign Up ...

https://www.facebook.com/index.php?stype=lo&lh=Ac9ocPt4jyR2w6pz

facebook

Email or Phone Password

Keep me logged in Forgot your password?

Log In

Heading out? Stay connected  
Visit facebook.com on your mobile phone.

Get Facebook Mobile

Sign Up  
It's free and always will be.

First Name: Using IDN

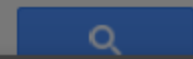
Last Name: [Redacted]

Your Email: someone@idndomain.中國

Re-enter Email: someone@idndomain.中國

New Password: [Redacted]

Please enter a valid email address.



New Message

To 中文名字@中文域名.頂級域 \*

Cc

From Edmon Chung <edmonchung@gmail.com> ▾

Subject

Sans Serif | ↑↓ | **B** | *I* | U | A | [List Icons] | [Quote Icon] | [Link Icon]

Send | A | [Attachment Icon] | +



**Goal:** All valid domain names and email addresses work in all software applications.

**Impact:** Promote consumer choice, enhance trust, improve competition, and provide broader access to end users.

# Categories Affected and UA Readiness

<p>UA-ready</p>	<p>http://soap.organic</p> <p>Welcome to organic</p> <p><b>SOAP</b></p> <p>We make the best soap in the world. It's 100% organic.</p>	<p>http://tokyo.ストア</p> <p>TOKYO</p> <p>当社の製品を購入します</p> 	<p>http://bank.com</p> <p>Bank</p> <p>Email <input type="text" value="测试@普遍.世界"/></p> <p>✓ Email validated. Account created.</p>
<p>Not ready</p>	<p>http://soap.organic</p> <p><b>X</b></p>	<p>http://tokyo.ストア</p> <p><b>X</b></p>	<p>http://bank.com</p> <p>Bank</p> <p>Email <input type="text" value="测试@普遍.世界"/></p> <p><b>X</b> Not a valid email address.</p>

☞ Unicode@IDN, right to left scripts

بى چىچى بى چىچى



Accept



Validate



Process



Store

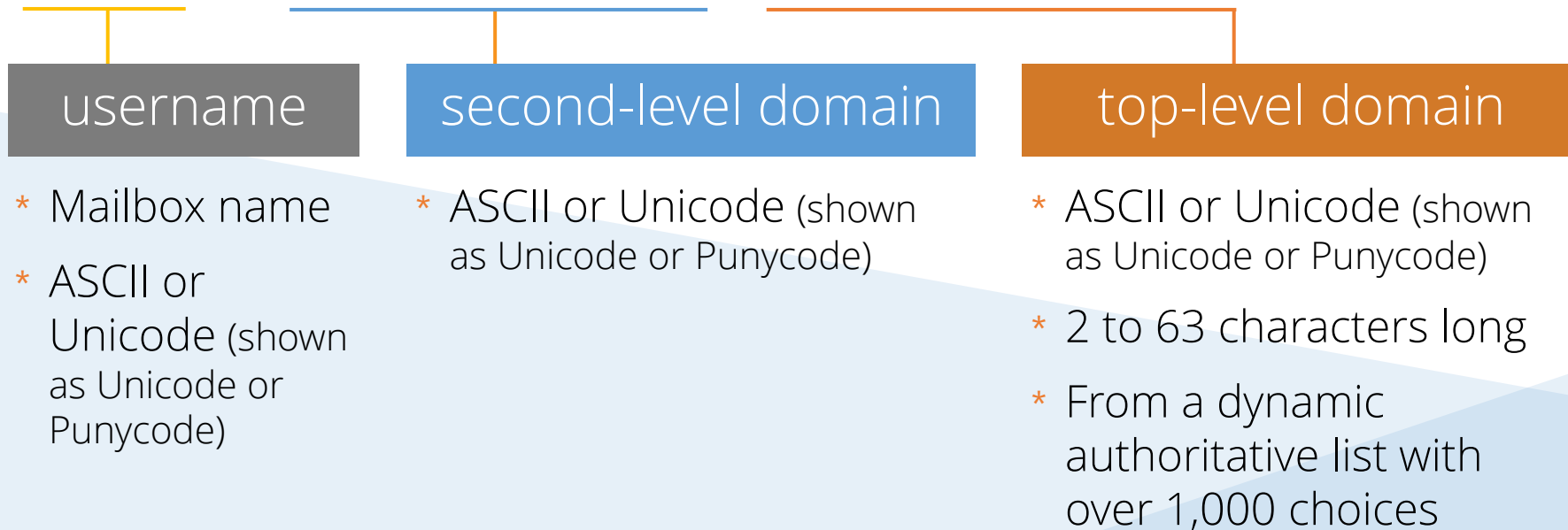


Display

# Anatomy of an Email Address

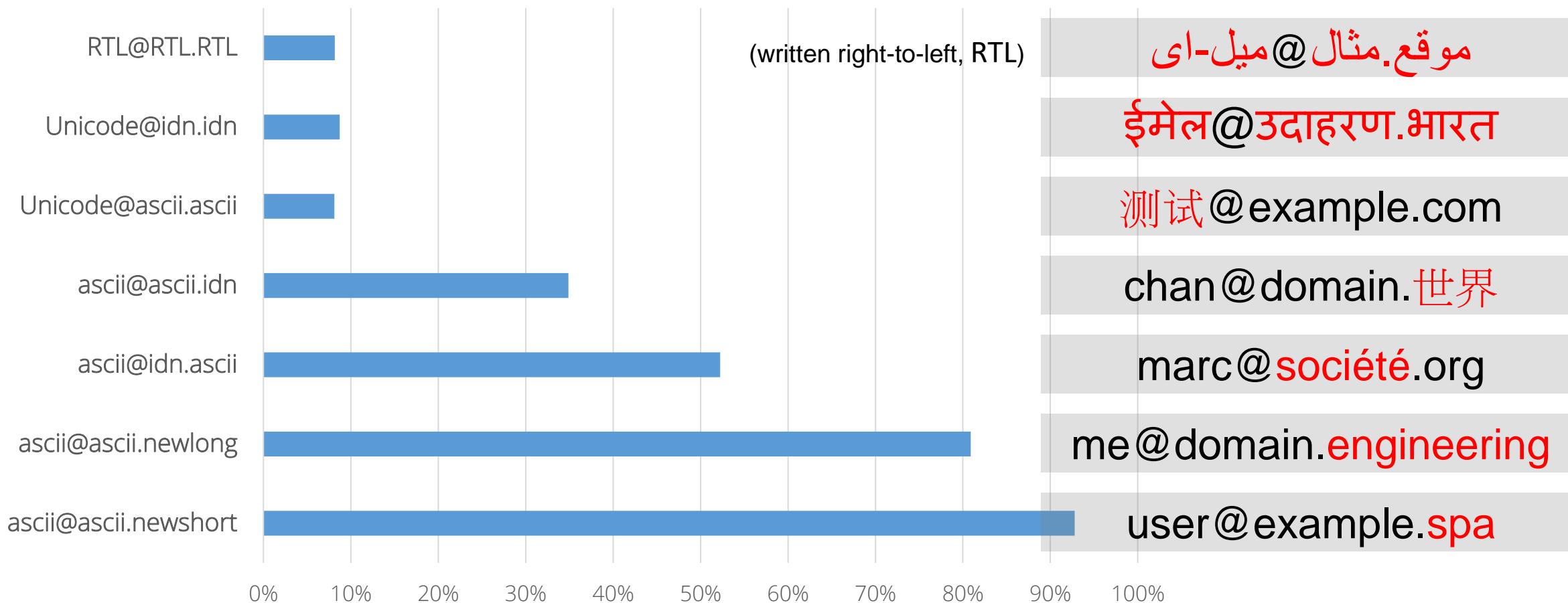
user @ domainname . TLD

用戶 @ 普遍接受-测试 . 世界



# Categories Affected by & Extent of UA Issues

EAI Acceptance Rates in Form Fields on 2000 Websites



Source: UASG039 at <https://uasg.tech>, published in 2022

# Global Universal Acceptance Day

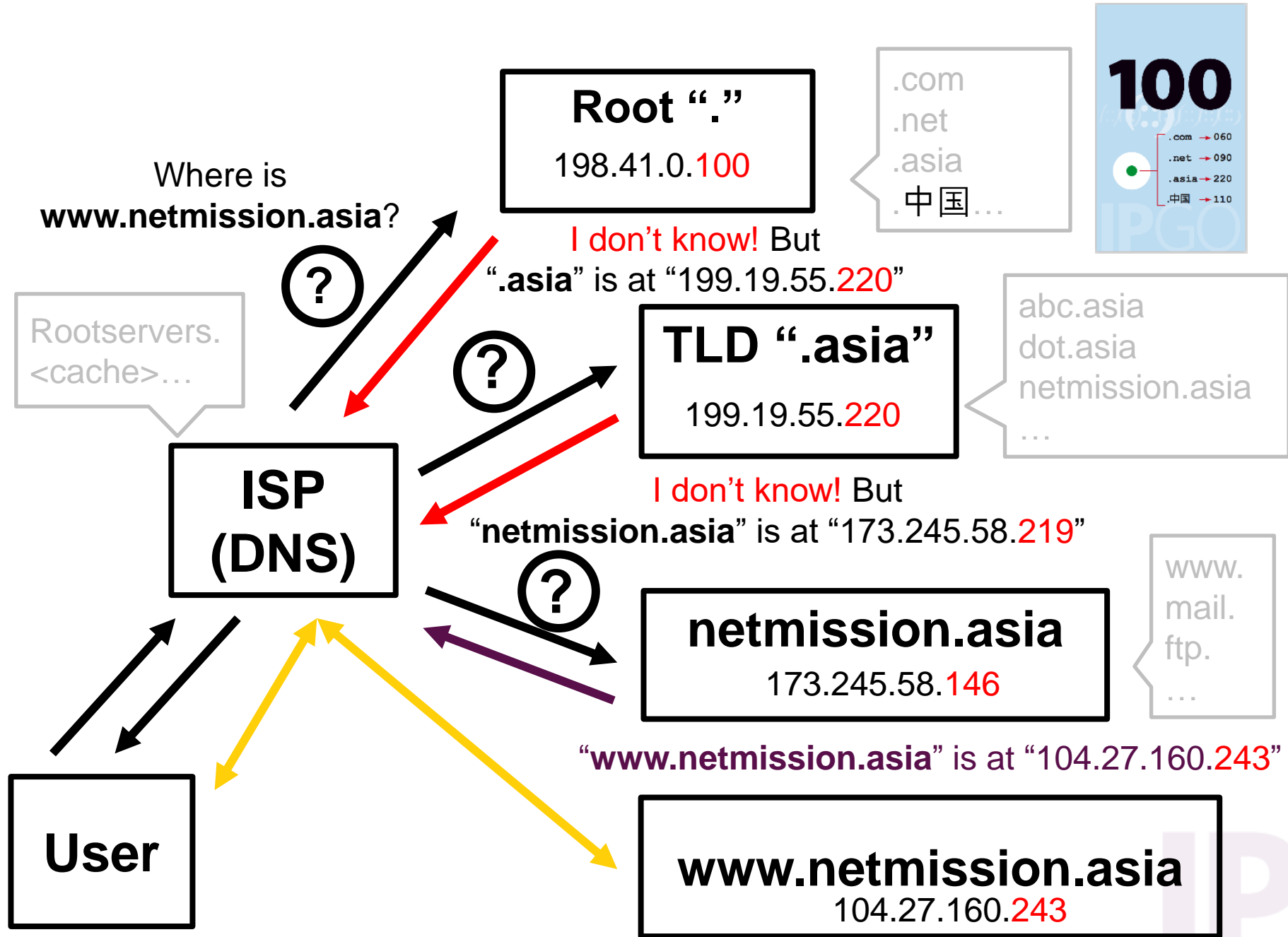
#Internet4All

27th March, 2023 New Delhi



# Global Universal Acceptance Day

#Internet4All





Every .Asia Domain  
Contributes to Internet  
Development in Asia

Thank You! | [info@dot.asia](mailto:info@dot.asia)



[www.asia](http://www.asia)

**Asian** #GenerAsian

# Universal Acceptance at ICANN

## Making Progress

