

# Domain Names

**ATLAS III preparatory course**  
based on ICANN-LEARN Module:  
Domain Names Demystified

# Agenda

1

Review Terminology  
related to domain  
names

2

Describe how  
domain names and  
the Domain Name  
System (DNS) work

3

The Root Zone

4

Types of Top Level  
Domains

5

Registering a Domain Name

6

Rights and Obligations of  
Domain Name Registrants

# What is a Domain Name

- ICANN.ORG is an example of a domain name
  - It is the prime way that resources on the Internet can be located by humans
- The Physical Internet uses numbers to identify things (Internet Protocol (IP) address):
  - IPv4: 192.0.43.7
  - IPv6: 2001:500:88:200::7
- The Domain Name System (DNS) maps domain name addresses to IP numbers



# learn.icann.org

org:

- Right-most part, the Top Level Domain (TLD) identifies the Registry that manages these names

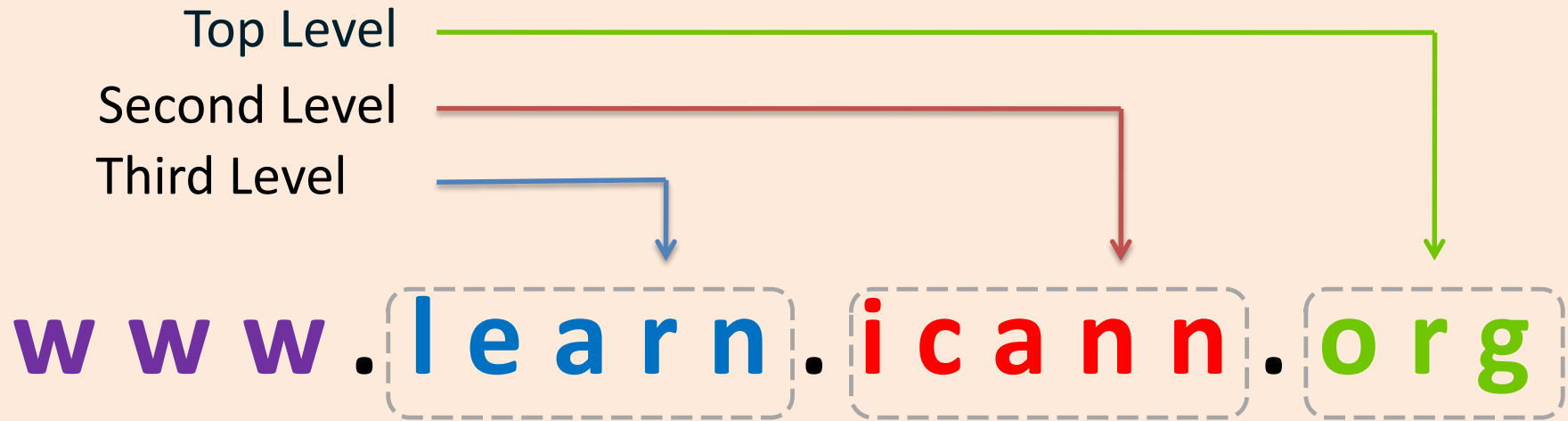
icann.org

- Next part (in most cases) combined with the TLD is the “Domain Name”.

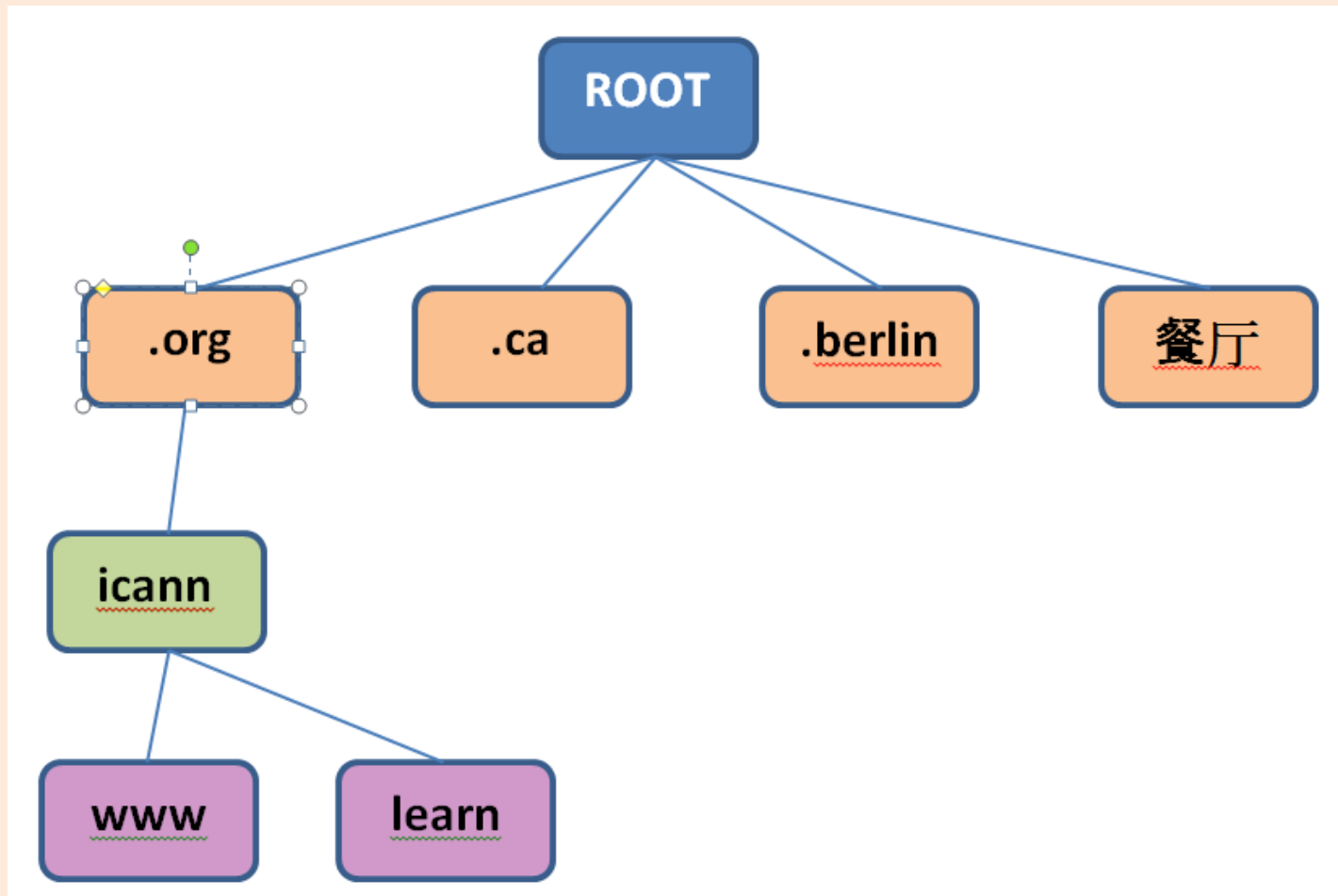
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- Any other parts identify sub-sections within the Domain Name.

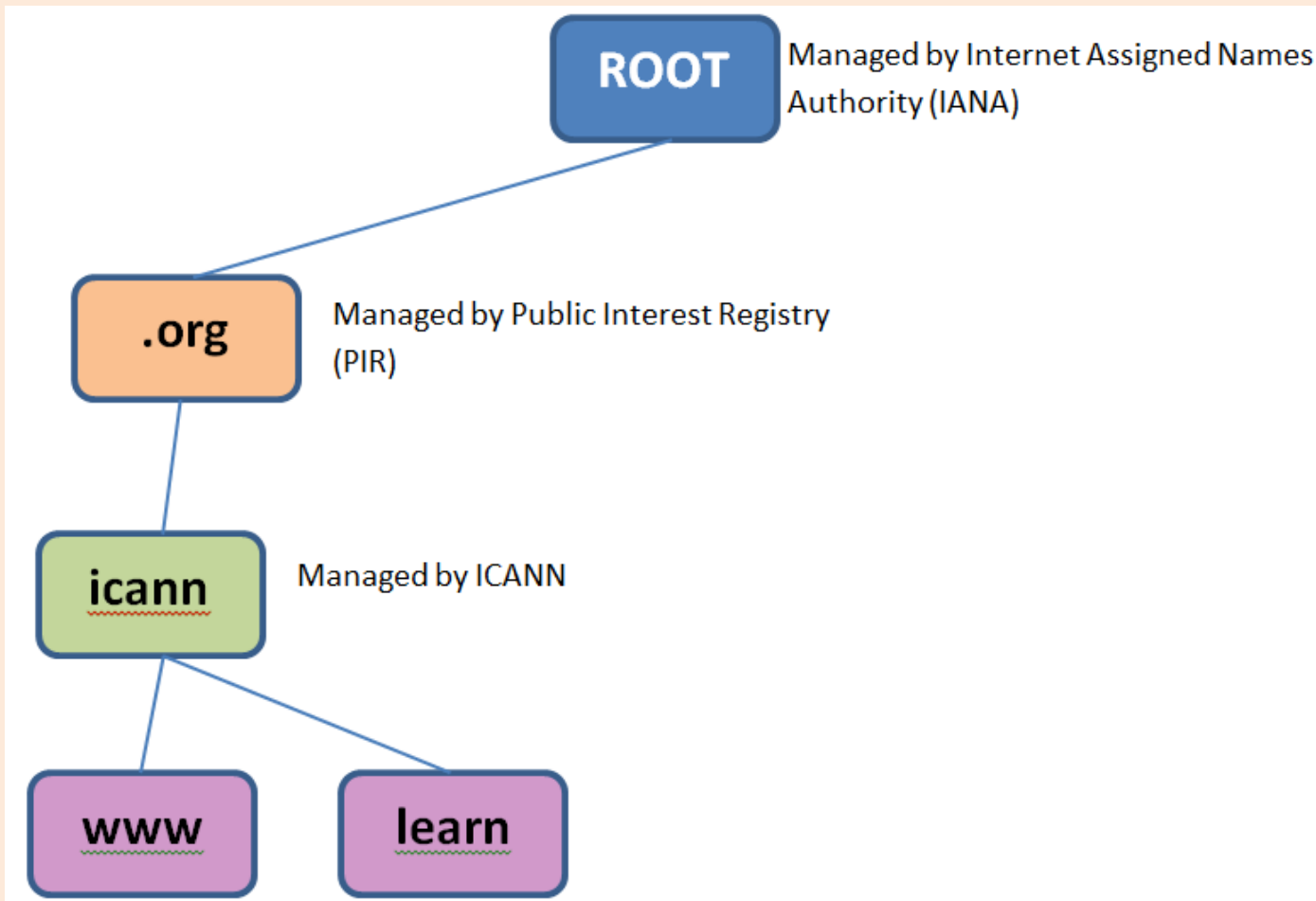
# Anatomy of a domain Name



# Domain Name System



# Domain Name Space



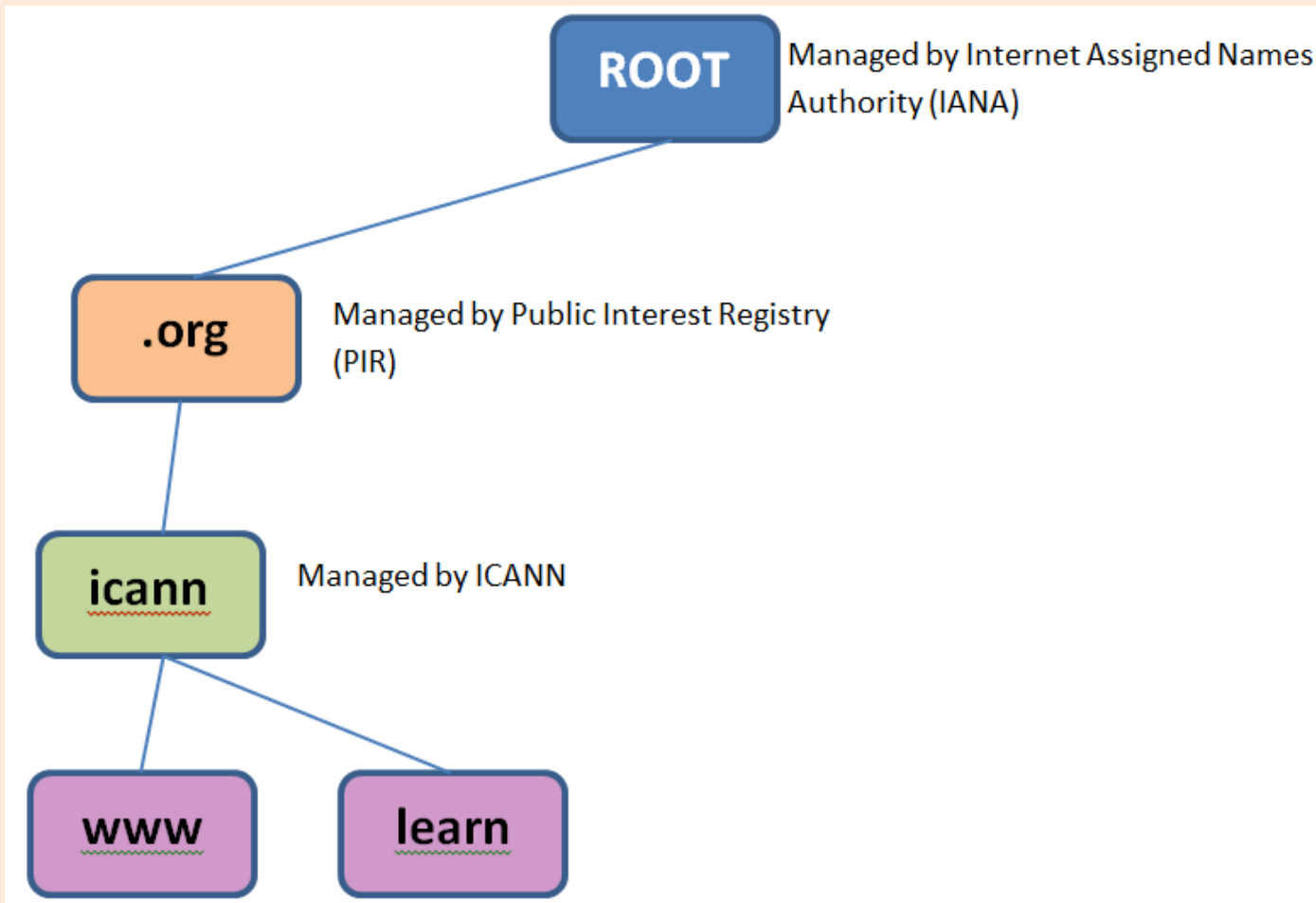


# DNS Name Resolution

- The Resolver in your computer asks where a domain name is.
  - It talks to other resolvers (perhaps at your ISP)
  - First they find out where the TLD is
  - Then they ask the TLD where the 2<sup>nd</sup> level name is
  - ....
  - End result is the IP address of the place your are interested in.



# Recursive Domain Name Resolution





1 → where is  
www.iana.org?

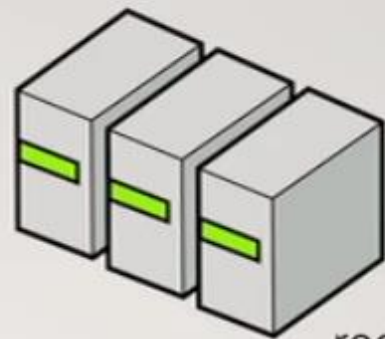
← 2 don't know, ask  
the org servers

3 → where is  
www.iana.org?

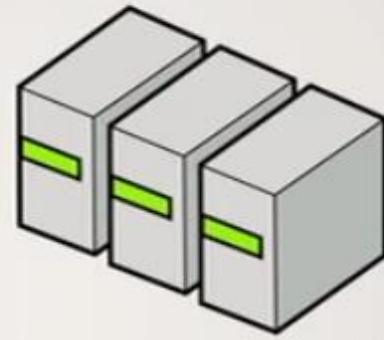
← 4 don't know, ask  
the iana.org servers

5 → where is  
www.iana.org?

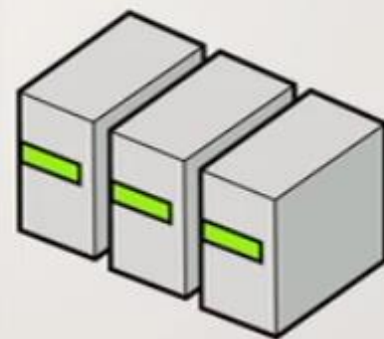
← 6 www.iana.org is  
at 192.0.2.0



root servers



org servers

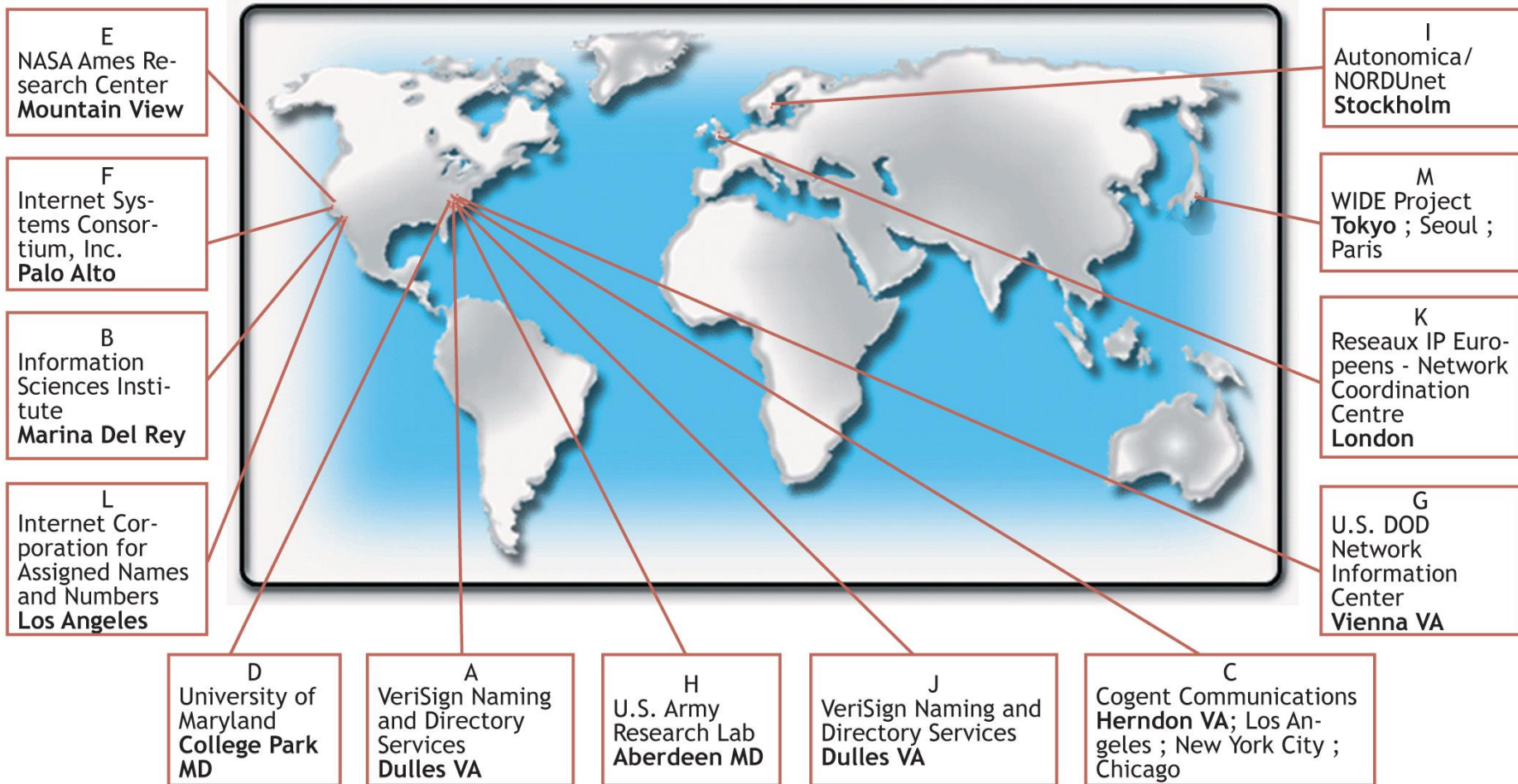


iana.org servers

# Root Zone

- Identifies what Top Level Domains (TLDs) exist
- Managing the Root Zone is one of the primary responsibilities of IANA and ICANN.
  - IANA accepts changes to the list of TLDs and the details of who manages each one, where to find its directory and other information (including DNSSEC)
  - IANA distributes new version of the Root for distribution to the Root Server Operators.

# Root Servers



# 980 Instances throughout the world



# Example of a Root Zone Entry

REGISTRY ENTRY FOR .HAMBURG			
<b>Operator</b>	<b>Hamburg Top-Level-Domain GmbH</b> Gertigstrasse 28, Hamburg, 22303 Germany		
<b>Contacts</b>	<table><tbody><tr><td><b>Oliver Joachim Sueme</b> Hamburg Top-Level-Domain GmbH Gertigstrasse 28, Hamburg, 22303 Germany Email: os@dothamburg.de Voice: +49 40 27806736 Fax: +49 40 380 89 810</td><td><b>Martin Schlicksbier</b> TLD-BOX Registrydienstleistungen Jakob-Haringer-Strasse 8 5020 Salzburg Austria Email: iana@tld-box.at Voice: +43 662 2345 48730</td></tr></tbody></table>	<b>Oliver Joachim Sueme</b> Hamburg Top-Level-Domain GmbH Gertigstrasse 28, Hamburg, 22303 Germany Email: os@dothamburg.de Voice: +49 40 27806736 Fax: +49 40 380 89 810	<b>Martin Schlicksbier</b> TLD-BOX Registrydienstleistungen Jakob-Haringer-Strasse 8 5020 Salzburg Austria Email: iana@tld-box.at Voice: +43 662 2345 48730
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<b>Technical configuration</b>	NS a.dns.nic.hamburg (194.0.25.21 2001:678:20:0:0:0:21) NS b.dns.nic.hamburg (193.170.61.10 2001:62a:a:2000:0:0:0:10) NS c.dns.nic.hamburg (193.170.187.10 2001:62a:a:3000:0:0:0:10) DS 53866 8 2 AF2F53F6B523F31C04A741B3826D27CBAE16F4BA6F... DS 26479 8 1 1C9F5D68C413E8A9A2C8E1C1637B8A4DA2CA6827 DS 26479 8 2 4A48334EF87D7FC156E886E5A2B2682FCF0679ED6FC... DS 53866 8 1 D26808AE1E19086BCF5FC88D59066C3AD22F2E56		
<b>Metadata</b>	<a href="http://www.dothamburg.de">http://www.dothamburg.de</a> <a href="http://whois.nic.hamburg">whois.nic.hamburg</a>		

# DNSSEC

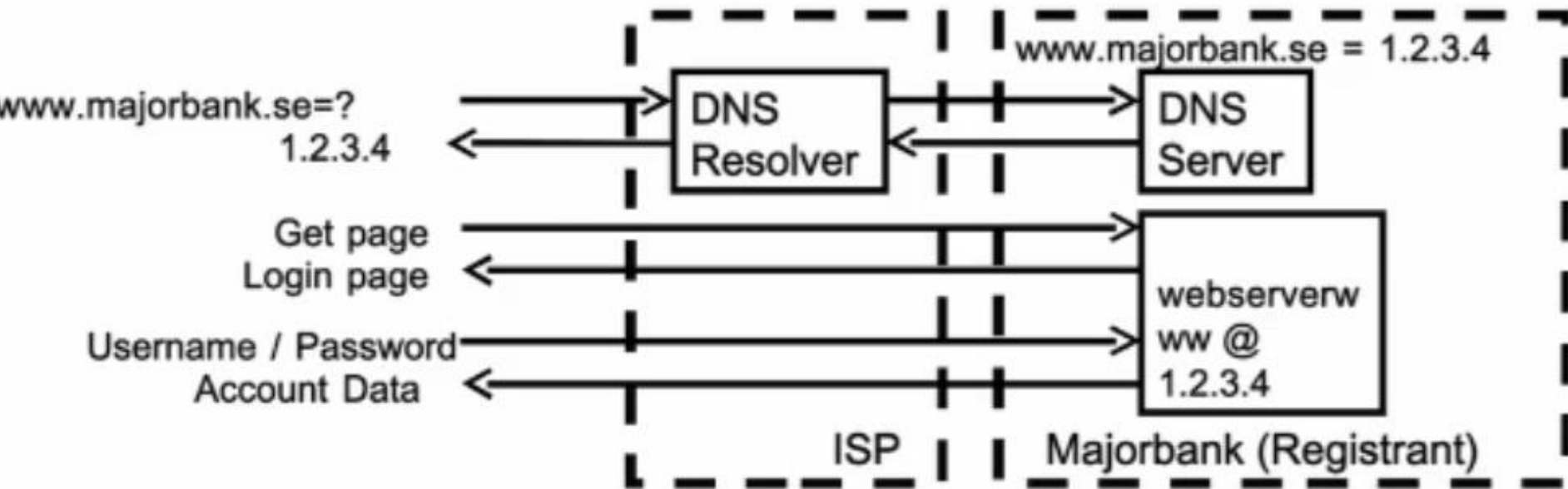
## Domain Name System Security Extensions (DNSSEC)

- Used to protect the Root Zone
- Used to protect many TLDs
- May be used to protect domain names

“Protect” means that someone who takes the trouble to check can detect if the entry has been tampered with. **Many do not check!**

# DNS resolver working normally

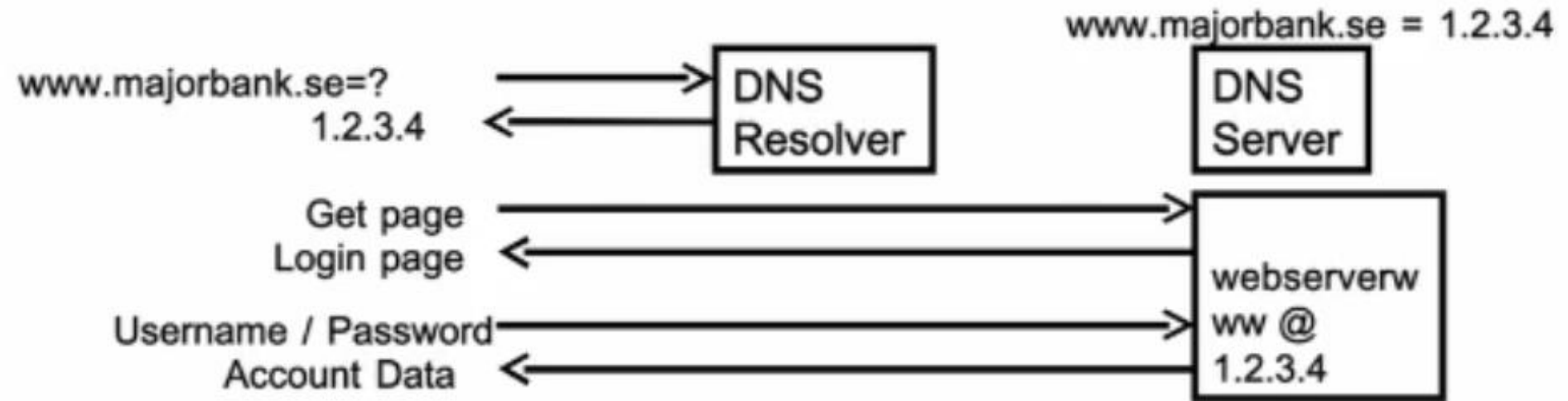
## The Internet's Phone Book – Domain Name System (DNS)



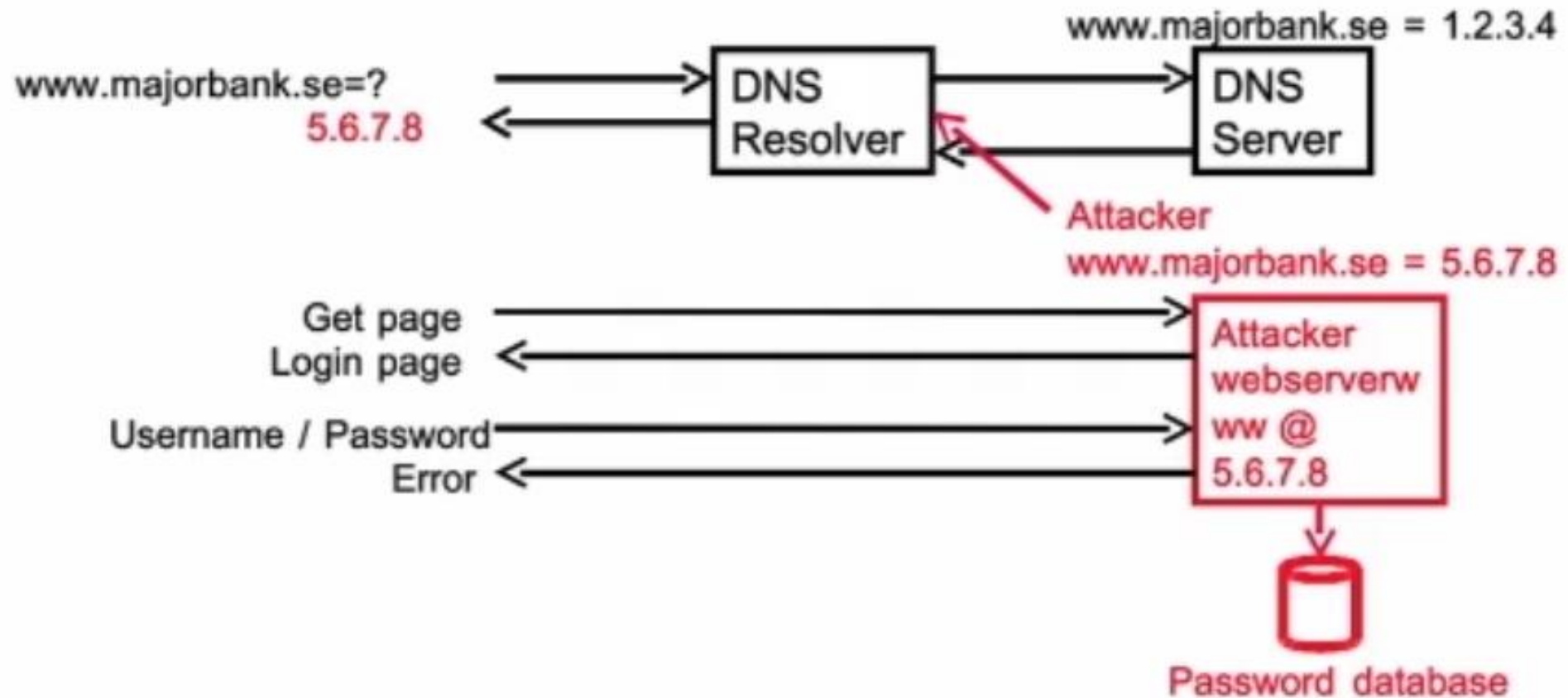


# DNS caching at local Internet Service Provider

## Caching Responses for Efficiency

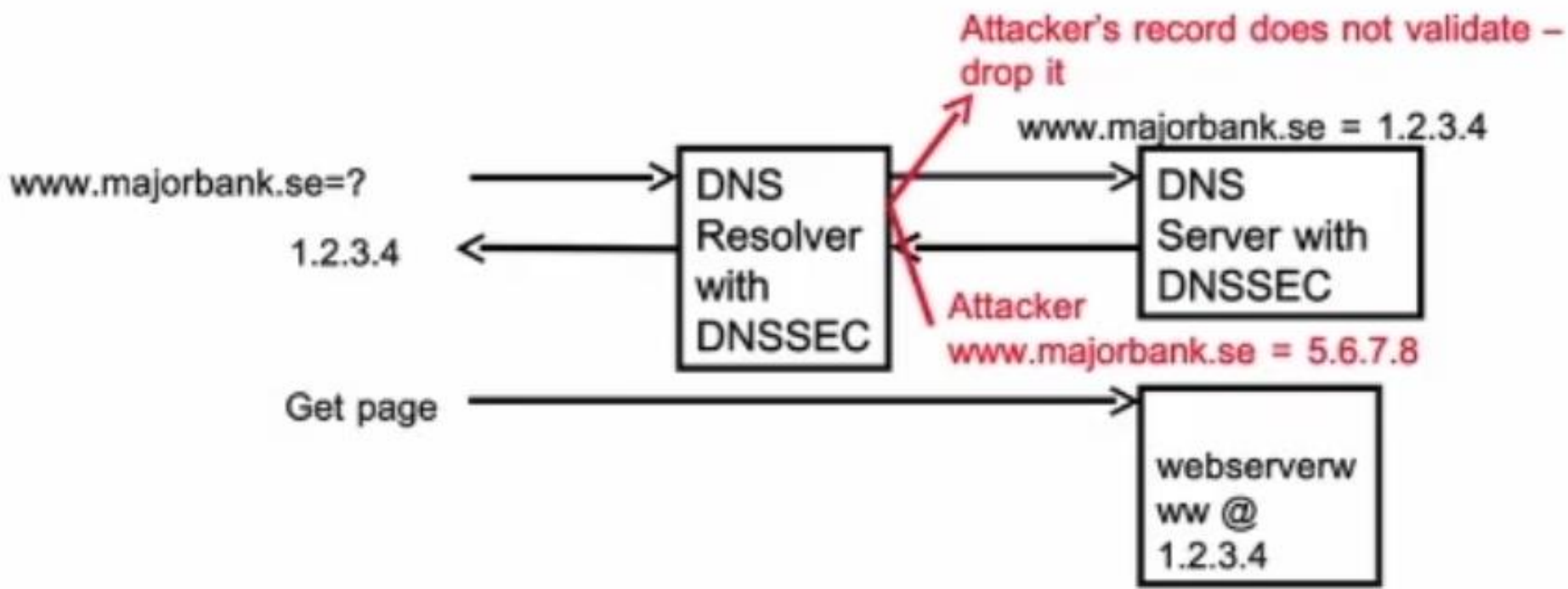


# The Problem: DNS Cache Poisoning Attack





# Securing The Phone Book – DNS Security Extensions (DNSSEC)



# Types of Top Level Domain (TLDs)

## Each managed by a “Registry”

- Country Code TLDs (ccTLDs)
  - Managed on behalf of countries and territories
  - **Each sets its own rules (subject to not breaking the Internet!)**
    - **You need to consult with them!**
  - Includes IDN ccTLDs
- Generic TLDs (gTLD)
  - Managed by private entities under contract to ICANN
  - ICANN sets overall rules
  - Many TLDs “open” – anyone may register a name. Some have specific eligibility rules
  - With few exceptions, you cannot go to the Registry to get a name. You must use a “Registrar”
- Legacy TLDs: .edu, .int, .gov, .mil, .arpa

# Registrars

- Accredited by ICANN
- Authorized by Registry to offer specific TLDs
- You may deal directly with a Registrar or with a Reseller. Resellers may have resellers!
- In general prices set by Registrars and Resellers.
- Registrars (and resellers) compete with each other, possible having other (related) business offerings. Registrars often operate a DNS server that you may use if you wish.



# A name of your own!

- Primarily related to gTLD
- ccTLDs processes similar, but each decided upon by the ccTLD Manager



# How to register a Domain Name

- Choose the top-level domain and your second-level domain
- Select a registrar or reseller with which to register
- Check the availability of your choice
- Decide on the length of registration (1 year, etc.)
- Complete the registration procedures, including payment
  
- A domain name is just a name, not a web site or other service

# Top Level Domains

- .com, .net, .org
- .biz, .info, .aero, .travel, museum, .asia
- .bank, .accountants, .africa, .bmw, .cancerresearch, .melbourne, .nokia, .shoes
- ccTLDs
- IDNs
  
- Rules vary
- Prices vary



# Select a domain name

- Once you select a TLD, time to select the 2<sup>nd</sup> level name
  - Do I want my domain name to say something about myself, my organization, or my business?
  - Do I want a distinctive domain name that sets itself apart from others?
  - Do I want a descriptive domain name that imparts important information?
  - Do I want a second-level domain that is easy to remember?

# Select a Registrar

- For gTLDs, accredited by ICANN
  - <https://www.icann.org/registrar-reports/accredited-list.html>.
- Some target specific audiences, languages, regions.
- Many have resellers acting on their behalf
- Many registrars and resellers ALSO offer Web services and/or e-mail.
- Prices vary!



# I want blahblahblah.com!

- Is it available, or does someone else already have it.
- WHOIS is the answer!
- <http://whois.icann.org>



# WHOIS entries

Showing results for: *blahblahblah.com*

Original Query: blahblahblah.com

## Contact Information

### Registrant Contact

Name: Domain Administrator  
Organization: Conde Nast Publications Inc.  
Mailing Address: One World Trade Center, New York NY 10007 US  
Phone: +1.2122862860  
Ext:  
Fax: +1.2122862860  
Fax Ext:  
Email: domain\_admin@advancemags.com

### Admin Contact

Name: Domain Administrator  
Organization: Advance Magazine Group  
Mailing Address: One World Trade Center, New York NY 10007 US  
Phone: +1.2122862860  
Ext:  
Fax: +1.2122862860  
Fax Ext:  
Email: domain\_admin@advancemags.com

### Tech Contact

Name: Domain Administrator  
Organization: Advance Magazine Group Technical Services  
Mailing Address: 801 Pencader Dr, Newark DE 19702 US  
Phone: +1.3028304630  
Ext:  
Fax: +1.3028304630  
Fax Ext:  
Email: domains@condenast.com



# I REALLY want blahblahblah.com!

- Going to blahblahblah.com with my browser doesn't work!
- Perhaps it is being used only for e-mail.
- Perhaps it is not being used at all.
  - MANY domain names are registered but not used.
- Perhaps you can buy it from the owner.



# blahblahblah-today.com



# blahblahblah-today.com

The requested second-level domain was not found in the Registry or Registrar's WHOIS Server.

No domains found.

# Registration Process

- Provide contact information
- Select period (1-10 years)
- Pay
  
- It's yours!
  
- You are now a "Registrant"!



# A bit more about prices

They can vary. A LOT!

- Registry policies
- Registrar practices
- Perceived high value
- Bundled services
  - Web site
  - E-mail

# Your personal Information

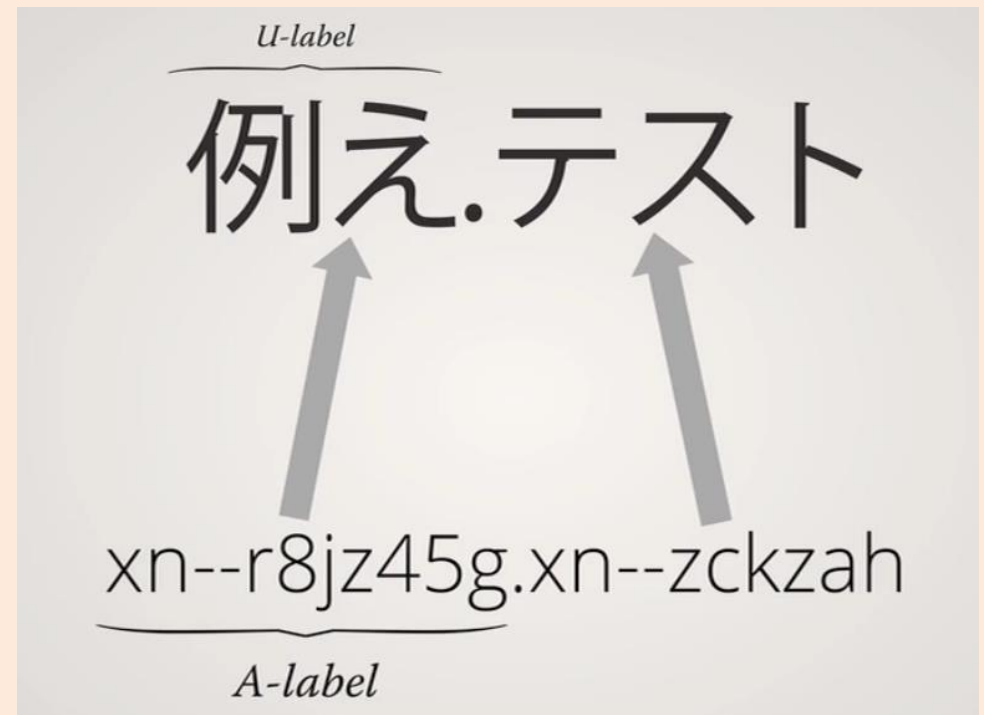
- You must provide contact information to register a domain
- Some may be displayed if someone else asks about that domain.
  - European General Data Protection Regulations (GDPR) has reduced amount displayed
- Proxy Services

# Domain Name Scams

- Once you have a domain name, you may receive:
  - Messages telling you to renew
    - If from YOUR registrar, they are legitimate
    - If from others, probably a scam
  - Search engine optimization – making it sound like it is something you **MUST** do.
  - Since you own [alangreenberg.org](http://alangreenberg.org), **SURELY YOU WANT** [alangreenberg.stuff!](http://alangreenberg.stuff!)
  - Other scams...

# Internationalized TLDs

- Fast Track ccTLDs
- gTLDs



# Non-English names

- Using Latin characters, anything is ok.
- <http://räksmörgås.josefsson.org>
- <http://仁生荷花.asia/>
- <https://रजिस्ट्री.भारत/>
  - <https://www.रजिस्ट्री.भारत/>

# Variants

- .org = .Org = .oRG = .ORG
- .餐厅 = “Restaurant” in Simplified Chinese
- .餐廳 = “Restaurant” in Traditional Chinese
  - The DNS treats them differently!

Still trying to figure out how to do this properly!

- For more information see the IDN Tables:  
<https://www.iana.org/domains/idn-tables>



# Rights of a Domain Name Registrant

- You can use your domain name
  - Subject to any restrictions associated with the TLD
  - Subject to applicable laws

[For gTLDs]

- You should expect to be notified about renewals (Presuming you gave valid contact info)
- Renewal pricing should be on the registrar's web site (but it can change!)

# Obligations of a Registrant

- Provide accurate contact information
- KEEP IT UP TO DATE!
- Do not use domain name for illegal purposes or to attempt to defraud others, including other registrants – including infringing intellectual property rights.
- Keep track of renewal dates.



# Name Renewal

- Should be renewed PRIOR to expiration.
- [gTLDs] If not renewed prior to expiration, you have a 10 days to renew. The name will STOP working during this period. Pricing may be higher but must be published ahead of time
  - Some registrars and registries MAY give you more time
  - Prices MAY go up
  - You may lose the domain name with no recourse.

# Transfer

- You can transfer your domain name to another registrar
  - There is no fee, but you must renew for at least one more year.
  - Some restrictions may apply to transfers of very new names or those near renewal time.
- You can “sell” your rights to a domain name to another registrant.
  - There are companies that will sell (or auction) a domain name for you.

# Intellectual Property Issues - 1

- Lots of domain names are registered with the intent to take possibly unfair advantage of IP rights (specifically trademarks)
  - face-book.com
  - g00gle.com
  - c0k3.com
    - If the K looks a bit funny, it is because all 4 letters in the name are in Russian. It LOOKS like the word “coke” but it is not!

# Intellectual Property Issues - 2

- The Uniform Dispute Resolution Process (UDRP) and Uniform Rapid Suspension (URS) process are designed to allow such problems to be considered and hopefully resolved.
- For New gTLDs, the Trademark Clearing House (TMCH) allows TM owners to register their name and get priority access to names.

# This is Complicated!

Where can I go for help?

- Your Registrar's Help Desk
- ICANN's web site:
  - <https://whois.icann.org> (multiple languages)
  - <https://www.icann.org/compliance/complaint>
  - Problem with a Registrar?
    - <https://www.icann.org/news/announcement-2007-03-06-en>

# Other Useful Resources

- Australia's Competition and Consumer Commission:  
<https://www.accc.gov.au/>
- eConsumer: <http://www.econsumer.gov/>
- ICANN:
  - <https://www.icann.org>
- ICANN At-Large (representing the interests of individual users) community:
  - <https://atlarge.icann.org>
- United States Federal Trade Commission:
  - <https://www.ftc.gov>
- Printed Material (English, Spanish, French)  
<https://www.icann.org/resources/files/domain-names-beginners-guide-2010-12-06-en>

*Gracias*

*Merci*

*Thank You*