Domain Names

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

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Registering a Domain Name
Rights and Obligations of Domain Name Registrants

Review Terminology related to domain names

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

The Root Zone

Types of Top Level Domains

Registering a Domain Name

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
• 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”.

Learn.icann.org

- Any other parts identify sub-sections within the Domain Name.
Anatomy of a domain Name

www.learn.icann.org

Top Level
Second Level
Third Level
Domain Name System

Root

.org
.ca
.burin
 餐厅

icann

www
learn
Domain Name Space

ROOT

Managed by Internet Assigned Names Authority (IANA)

.org
Managed by Public Interest Registry (PIR)

icann
Managed by ICANN

www

learn
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\textsuperscript{nd} level name is
  – ....

  – End result is the IP address of the place your are interested in.
Recursive Domain Name Resolution

- **ROOT**: Managed by Internet Assigned Names Authority (IANA)
- **.org**: Managed by Public Interest Registry (PIR)
- **icann**: Managed by ICANN
  - **www**
  - **learn**
ATLAS III Prep Webinar

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

- NASA Ames Research Center
  Mountain View
- Internet Systems Consortium, Inc.
  Palo Alto
- Information Sciences Institute
  Marina Del Rey
- Internet Corporation for Assigned Names and Numbers
  Los Angeles
- University of Maryland
  College Park MD
- VeriSign Naming and Directory Services
  Dulles VA
- U.S. Army Research Lab
  Aberdeen MD
- VeriSign Naming and Directory Services
  Dulles VA
- Autonomica/ NORDUnet
  Stockholm
- WIDE Project
  Tokyo; Seoul; Paris
- Reseaux IP Européens - Network Coordination Centre
  London
- U.S. DOD Network Information Center
  Vienna VA
- Cogent Communications
  Herndon VA; Los Angeles; New York City; Chicago
980 Instances throughout the world
Example of a Root Zone Entry

**Registry Entry for .Hamburg**

**Operator**
Hamburg Top-Level-Domain GmbH
Gertigstrasse 28, Hamburg, 22303
Germany

**Contacts**
Oliver Joachim Sueme
Hamburg Top-Level-Domain GmbH
Gertigstrasse 28, Hamburg, 22303
Germany
Email: os@dothamburg.de
Voice: +49 40 27806736
Fax: +49 40 380 89 810

Martin Schlucksbier
TLD-BOX Registrydienstleistungen
Jakob-Haringer-Strasse 8
5020 Salzburg
Austria
Email: iana@tld-box.at
Voice: +43 662 2345 48730

**Technical configuration**
NS a.dns.nic.hamburg (194.0.25.21 2001:678:20:0:0:0:0:21)
DS 53866 8 2 AF2F53F6B523F31C04A741B3826D27CBAE16F4BA6F...
DS 26479 8 1 1C9F5D68C413E8A9A2C8E1C1637B8A4DA2CA6827
DS 26479 8 2 4A48334EF87D7FC156E86E5A2B2682FCF0679ED6FC...
DS 53866 8 1 D26808AE1E19086BCF5FC88D59066C3AD22F2E56

**Metadata**
http://www.dothamburg.de
whois.nic.hamburg
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)

www.majorbank.se = 1.2.3.4

Get page
Login page

ISP
Majorbank (Registrant)

Username / Password
Account Data

webserverw
ww @
1.2.3.4

DNS Server

DNS Resolver
DNS caching at local Internet Service Provider

Caching Responses for Efficiency

www.majorbank.se = 1.2.3.4

DNS Resolver

Get page
Login page

webserverw
ww @ 1.2.3.4

Username / Password
Account Data
The Problem: DNS Cache Poisoning Attack

www.majorbank.se = ? 5.6.7.8

Get page
Login page
Username / Password
Error

DNS Resolver → DNS Server

www.majorbank.se = 1.2.3.4
Attacker
www.majorbank.se = 5.6.7.8

Attacker
webserver
ww @ 5.6.7.8

Password database
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\textsuperscript{nd} 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](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
### 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  
- **Fax:** +1.2122862860  
- **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  
- **Fax:** +1.2122862860  
- **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  
- **Fax:** +1.3028304630  
- **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
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, SURELY YOU WANT 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.
Lots of domain names are registered with the intent to take possibly unfair advantage of IP rights (specifically trademarks)

- face-book.com
- g00gle.com
- coke.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!
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?
Other Useful Resources

- eConsumer: http://www.econsumer.gov/
- ICANN: https://www.icann.org
  - https://atlarge.icann.org
- ICANN At-Large (representing the interests of individual users) community:
  - https://atlarge.icann.org
Gracias
Merci
Thank You