

Domain Names and Internationalized Domain Names

Internet

- Connecting Millions of resources
- Variety of Devices



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IP Address: Source for Connection

- Every computer on the public Internet has a unique numeric address
- A way to identify machines on a network
- A unique identifier for each resource

IP Address: **127.98.65.90**



IP Address Continued...

- Connect to other devices
- Allows transfers of files and e-mail

IP Address: **127.98.65.90**

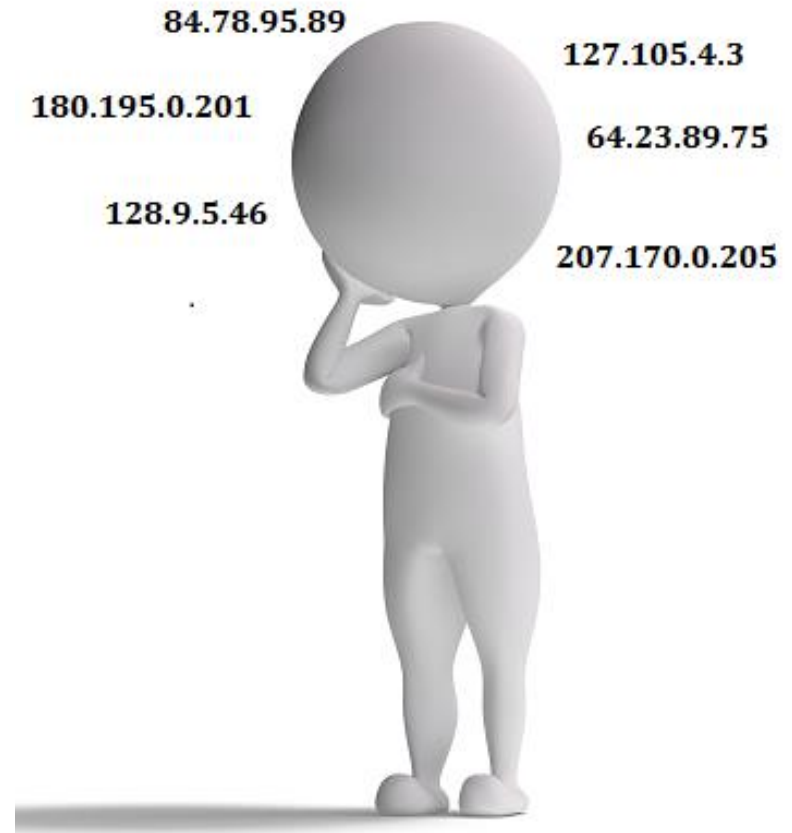


IP Address: **190.08.78.09**



Problem with IP Addresses

- IP Addresses are the complex string of numbers.
- Difficult to remember.



Domain Name System

- The DNS maps IP addresses into unique alphanumeric addresses called domain names
- A domain name is string of characters which is easy-to-remember “handle” to connect to a computer over internet
- domain name is really just a pointer to an IP address



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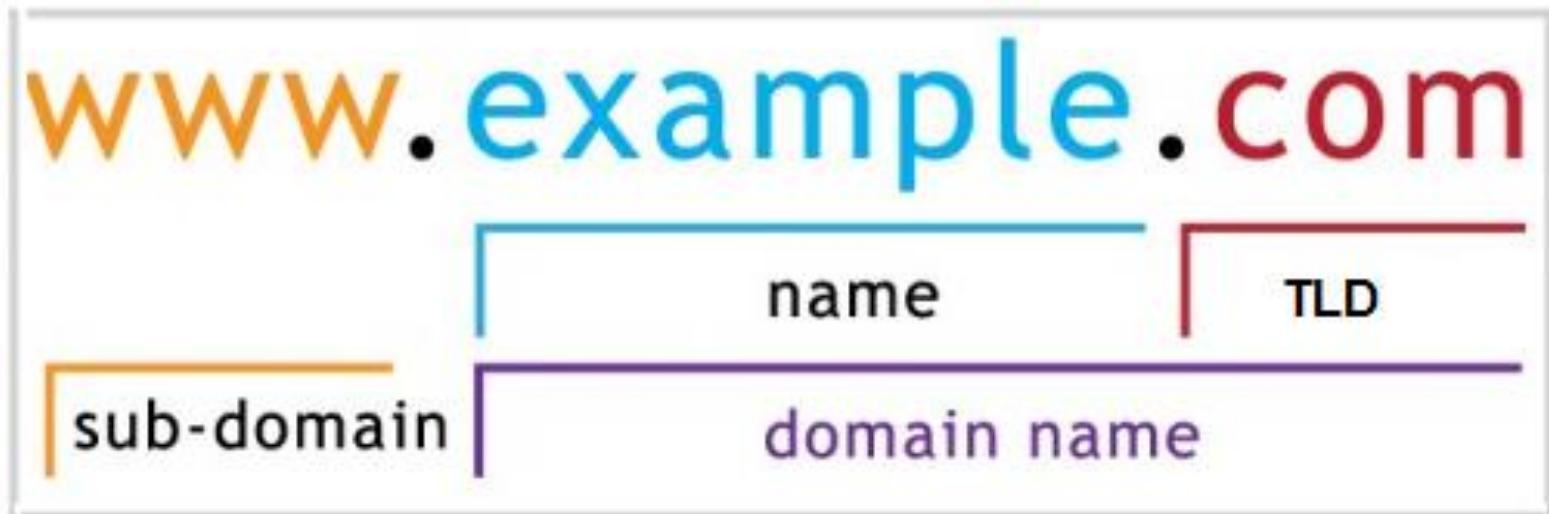
What Exactly Happens

- You see in your browser's address bar:
 - www.example.com
- Your browser sees as
 - 92.50.128.35

Anatomy of a Domain Name

- A domain name consists of multiple strings separated by “.”
- Each string separated by “.” is called a “Label”

e.g. www, example, com



Anatomy of Domain Name continued...

- Top Level Domain (TLD)
 - The rightmost part of domain name
 - Only delegated to responsible organizations
 - Can be ccTLD (Country Code TLD) or gTLD (Generic TLD)



Anatomy of Domain Name continued...

- Country Code Top Level Domain
 - Country specific domains
 - e.g. “.in” (India), “.jp” (Japan), “.cn” (China)
- Generic Top Level Domains
 - General purpose domains
 - e.g. “.com”, “.org”



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Anatomy of Domain Name continued..

- Second Level Domain
 - the "name" that you register along with the TLD
 - e.g. “example.com” “icann.org”

The diagram shows the domain name "example.com" with "example" in blue and ".com" in red. A blue bracket underneath "example" is labeled "name", and a red bracket underneath ".com" is labeled "TLD".

Anatomy of Domain Name continued...

- Sub Domain
 - Part of a larger domain. They are optional
 - Based on the user's choice
- e.g.
 - mail.google.com
 - maps.google.com
 - images.google.com
 - plus.google.com
 - drive.google.com

Internationalized Domain Names

- Domain name in your native language or script.
- Allow characters from different scripts, beyond the letters (a to z), digits (0 to 9) and hyphen (-)

भारतभाषा.भारत (case of IDN.IDN in Hindi)

भारतभाषा.com (case of IDN.ASCII in Hindi)

ભારતભાષા.ભારત (case of IDN.IDN in Gujarati)

सीडैक.भारत

ਸੀਡਕੈ.ਭਾਰਤ

સીડેક.ભારત

ਸੀਡੈਕ.ਭਾਰਤ

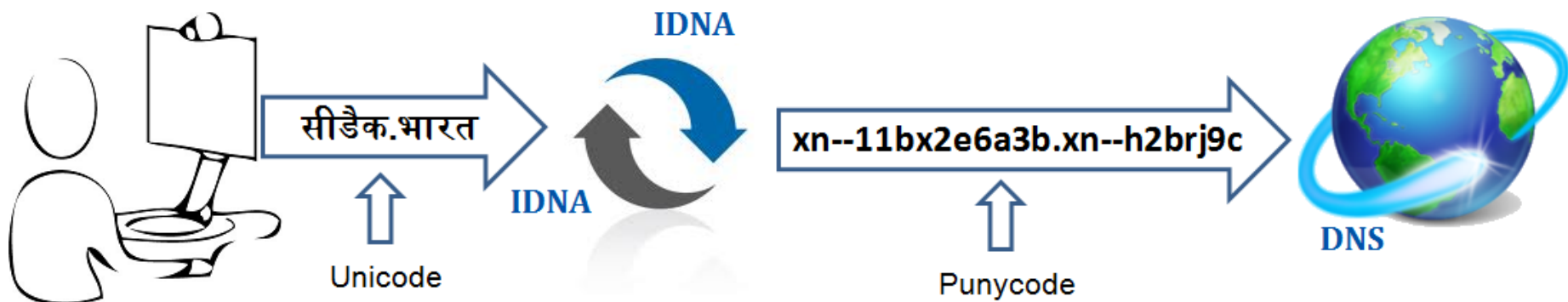
Need for IDNs

- Up till now domain names could be allowed in Latin characters only.
- IDNs open new horizons to have domain names in multiple languages or scripts.
- An opportunity for everyone in the world to be able to access the Internet in their native language



How IDN works in Domain Name System

- DNS can only understand Latin characters, hyphens and digits.
- Internationalized Domain Name is converted to Punycode (sequence of Latin characters, digits and hyphen) which is then given to the DNS for processing.



Challenges

- Phishing
 - Phishing is the way of obtaining user credentials like credit card details and other confidential details by pretending to be a trustworthy entity.

Actual Websites

paypal.com
sbicard.com

Phished Websites

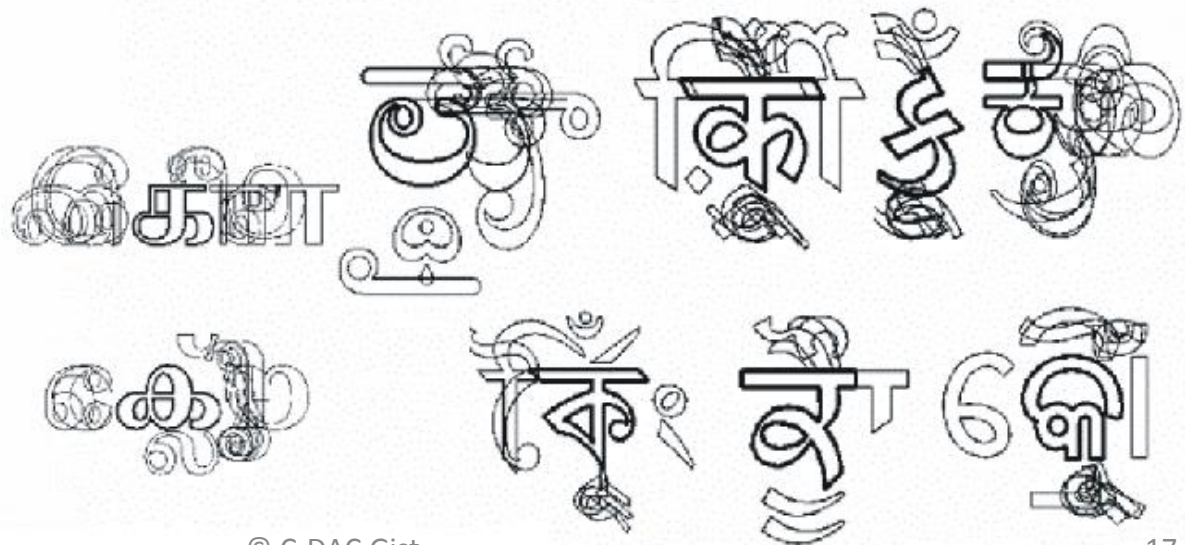
paypa1.com
sbicards.com



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IDN -Indian Language Perspective

- Complexity of Indian Languages pose several issues to IDN.
- The number of visual variations possible with Indian Languages are enormous



Variants: Scope for Phishing

www.मुद्रा.भारत

द + ्र + र = द्र

dra

www.मुद्रा.भारत

द + ्र + न = द्र

dna

www.मुद्रा.भारत

द + ्र + ग = द्र

dga

Akshar Rules

- Indian languages are Akshar driven
- Akshar is the basic entity in Indian languages derived from Brahmi
- Well formed Akshar
 - किताब.भारत
- Malformed Akshar
 - िकिताब.भारत
- Proper rules should be followed for the formation of the correct Akshar

Neo Brahmi GP - Focus Area

- ICANN launched the New gTLD Program
- Deal with the Root Zone (Label for Top Level Domain)
- Work On
 - Permissible set of code points
 - Visually similar variant strings
 - Whole label evaluation rules (WLEs) (Valid Akshar Formation)

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