สยามชำนาญกิจ
SIAM CHAMNAN KIT

Programming for UA Universal Acceptance

Somkiat Puisungnoen

Somkiat | Home

Somkiat Puisungnoen

Update Info 1 | View Activity Log 10+ | ...

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When did you work at Opendream?

22 Pending Items

Intro

Software Craftsmanship

Software Practitioner at สยามชำนาญกิจ พ.ศ. 2556

Agile Practitioner and Technical at SPRINT3r

Post | Photo/Video | Live Video | Life Event

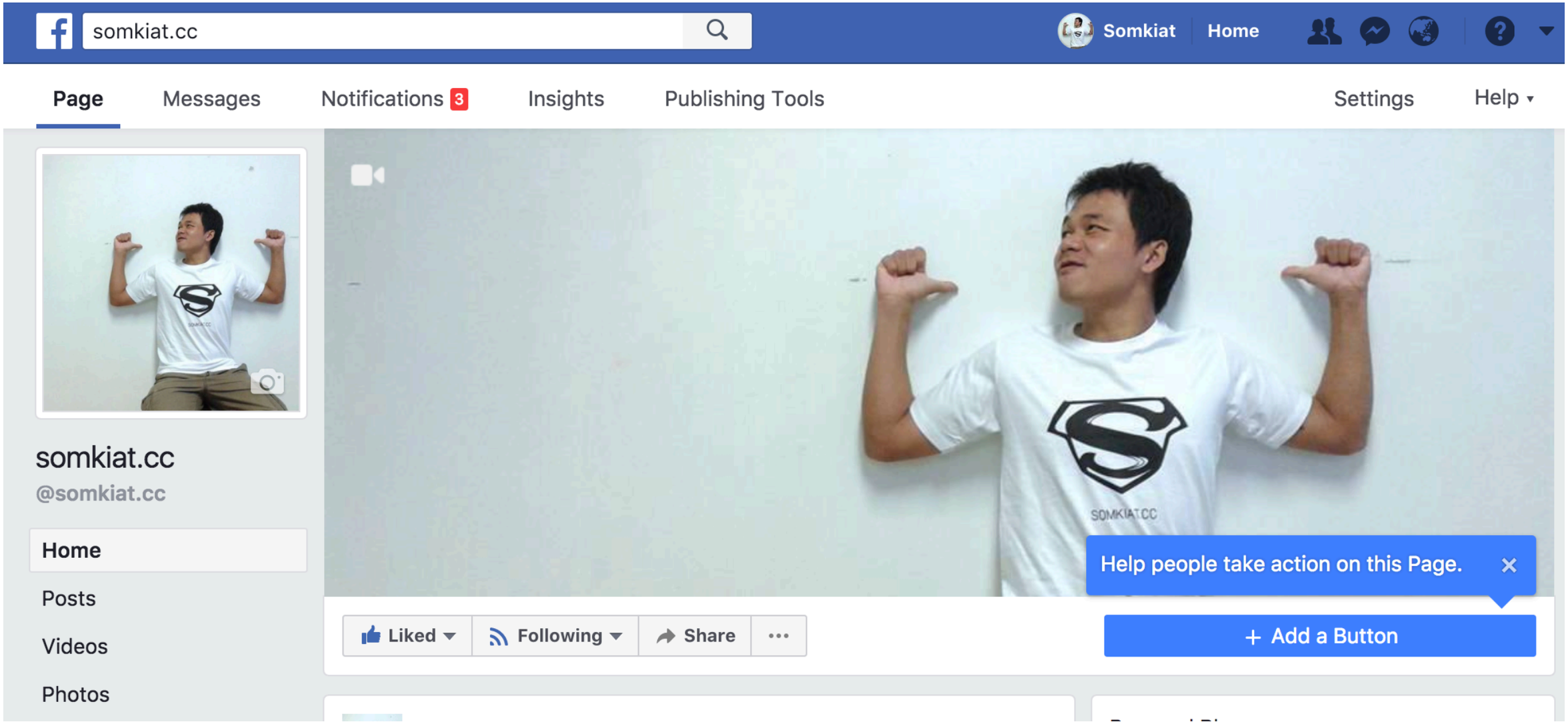
What's on your mind?

Public | Post

Somkiat Puisungnoen

15 mins · Bangkok ·

Java and Bigdata



Programming for UA

Scopes

Domain name
Email address

Scopes

Internationalized Domain Names (IDNs)
Email Address Internationalization (EAI)

Domain name

Cases	Example
New top-level domain	sky, tech, shop, online, site
Longer top-level domain	lifeinsurance
Internationalized	ไทยร่วมใจ.com example.ไทย

https://data.iana.org/TLD/tlds-alpha-by-domain.txt

List of top-level Domain (TLD)

```
# Version 2021082000, Last Updated Fri Aug 20 07:07:01 2021 UTC
AAA
AARP
ABARTH
ABB
ABBOTT
ABBVIE
ABC
ABLE
ABOGADO
ABUDHABI
AC
ACADEMY
ACCENTURE
ACCOUNTANT
ACCOUNTANTS
ACO
ACTOR
AD
ADAC
ADS
```

https://data.iana.org/TLD/tlds-alpha-by-domain.txt

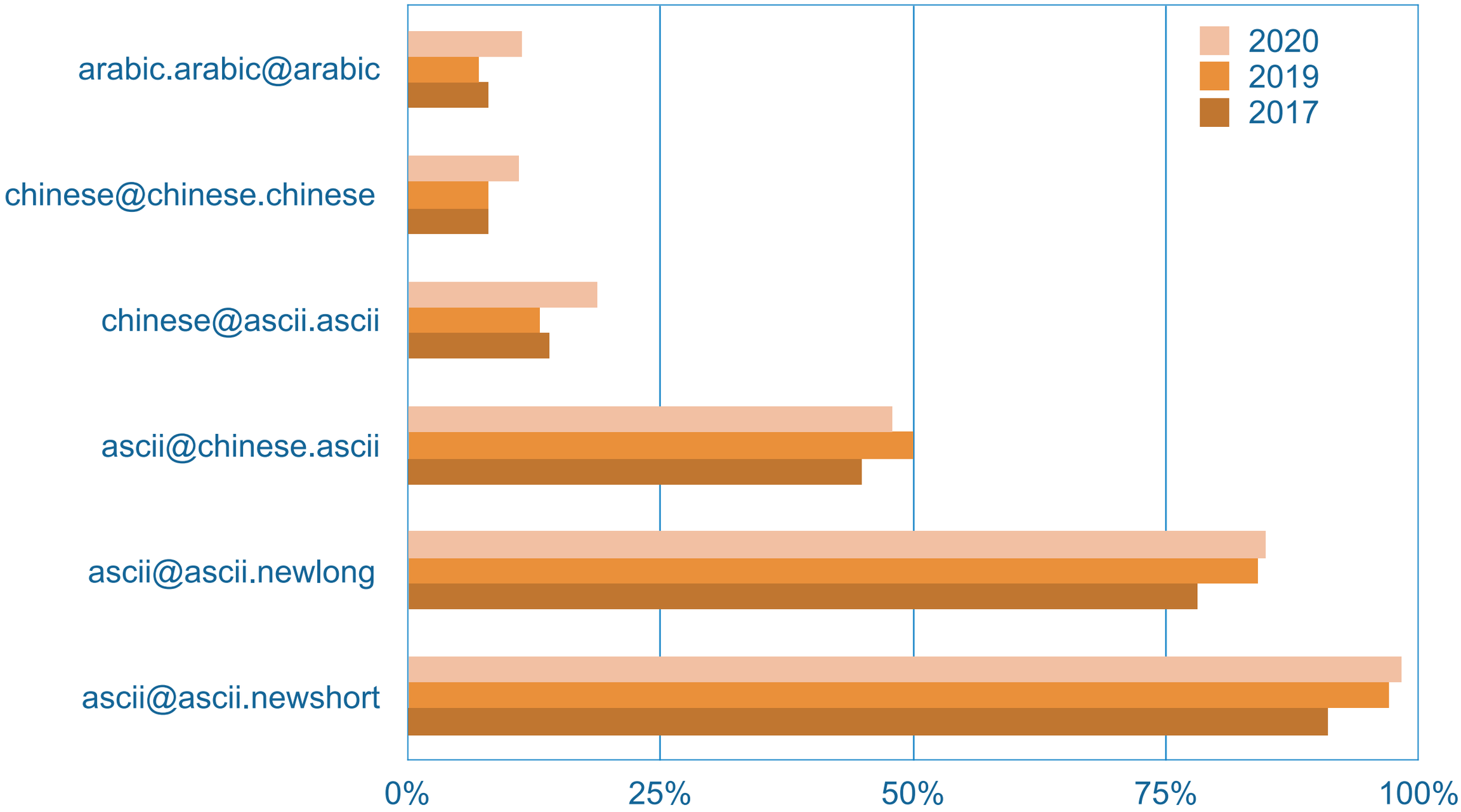
>=5 characters

```
$wget -qO - http://data.iana.org/TLD/tlds-alpha-by-domain.txt |
awk 'length($0) >= 5'
```

Internationalized Email Address (EAI)

Format	Example
ASCII@IDN	marc@société.org
UTF8@ASCII	ईमेल@example.com
UTF8@IDN	测试@普遍接受-测试.世界
UTF@IDN	موقع.مثال@ميل-اى

Usages by website globally



https://uasg.tech/wp-content/uploads/documents/UASG027-en-digital.pdf

Programming for UA

Tasks for programmer

Validate input
Processing
Store data
Display data

Libraries and framework

Domain name

Language	Framework/Library
Java	Commons Validator
Java	Guava
Java	ICU
Java	JRE
Python3	Django_auth
Python3	Encodings_Idna
Python3	Idna
Rust	Idna

For email address

Java	ICU
Java	Javamail/JakartaMail
Java	JRE
Javascript	Idna-uts46
Javascript	Nodemailer
Javascript	Validator
Python3	Django_auth
Python3	Email_Validator
Python3	Encodings_Idna
Python3	Idna
Python3	Smtplib
Rust	Idna
Rust	Lettre

Language	Framework/Library
C	libcurl
C	libidn2
C#	Mailkit
C#	Microsoft
Go	Idna
Go	Mail
Go	Smtp
Java	Commons-Validator
Java	Guava

https://uasg.tech/wp-content/uploads/documents/UASG018A-en-digital.pdf

Example

Working with domain name
Working with Email address

Validate input

Start with data for test cases

https://uasg.tech/wp-content/uploads/documents/UASG033-en-digital.pdf

Validate domain name

21	IDN.IDN	විශ්ව-සම්මුති-පිරික්සුම.ලංකා	Sinhala
22	IDN.IDN	பொது-ஏற்பு-சோதனை.சிங்கப்பூர்	Tamil
23	IDN.IDN	యూనివర్సల్-ఆమోదం-పరీక్ష.భారత్	Telugu
24	IDN.IDN	ยูเอทดสอบ.ไทย	Thai
25	IDN.IDN	普遍适用测试.我爱你	Simplified Chinese
26	IDN.IDN	普遍適用測試.台灣	Traditional Chinese
27	IDN.ASCII	ሁለንአቀፍ-ተቀባይነት-ሙከራ.com	Ethiopic
28	IDN.ASCII	ការសាកល្បងទទួលយកជាអន្តរជាតិ.com	Khmer
29	IDN.ASCII	အလုံးစုံလက်ခံမှုစမ်းသပ်ချက်.com	Myanmar

https://uasg.tech/wp-content/uploads/documents/UASG004-en-digital.pdf

Validate email address

50	Unicode@IDN.IDN	ഇമെയിൽ-പരിശോധന@സാർവത്രിക-സ്വീകാര്യതാ-പരിശോധന.ഭാരതം	Malayalam
51	Unicode@IDN.IDN	ଇମେଇଲ-ଟେଷ୍ଟ@ୟୁନିଭରସାଲ-ଏକସେପ୍ଟ୍ୟ-ଟେଷ୍ଟ.ଭାରତ	Oriya
52	Unicode@IDN.IDN	ඉ-තැපැල්-පිරික්සුම@විශ්ව-සම්මුති-පිරික්සුම.ලංකා	Sinhala
53	Unicode@IDN.IDN	மின்னஞ்சல்-சோதனை@பொது-ஏற்பு-சோதனை.சிங்கப்பூர்	Tamil
54	Unicode@IDN.IDN	ఇమెయిల్-పరీక్ష@యూనివర్సల్-ఆమోదం-పరీక్ష.భారత్	Telugu
55	Unicode@IDN.IDN	อีเมลทดสอบ@ยูเอทดสอบ.ไทย	Thai
56	Unicode@IDN.IDN	电子邮件测试@普遍适用测试.我爱你	Simplified Chinese
57	Unicode@IDN.IDN	電子郵件測試@普遍適用測試.台灣	Traditional Chinese

https://uasg.tech/wp-content/uploads/documents/UASG004-en-digital.pdf

Let’s coding
for Domain name

Coding with Java

java.net.InetAddress
Apache commons validator (TLD outdated)
ICU (International Components for Unicode)

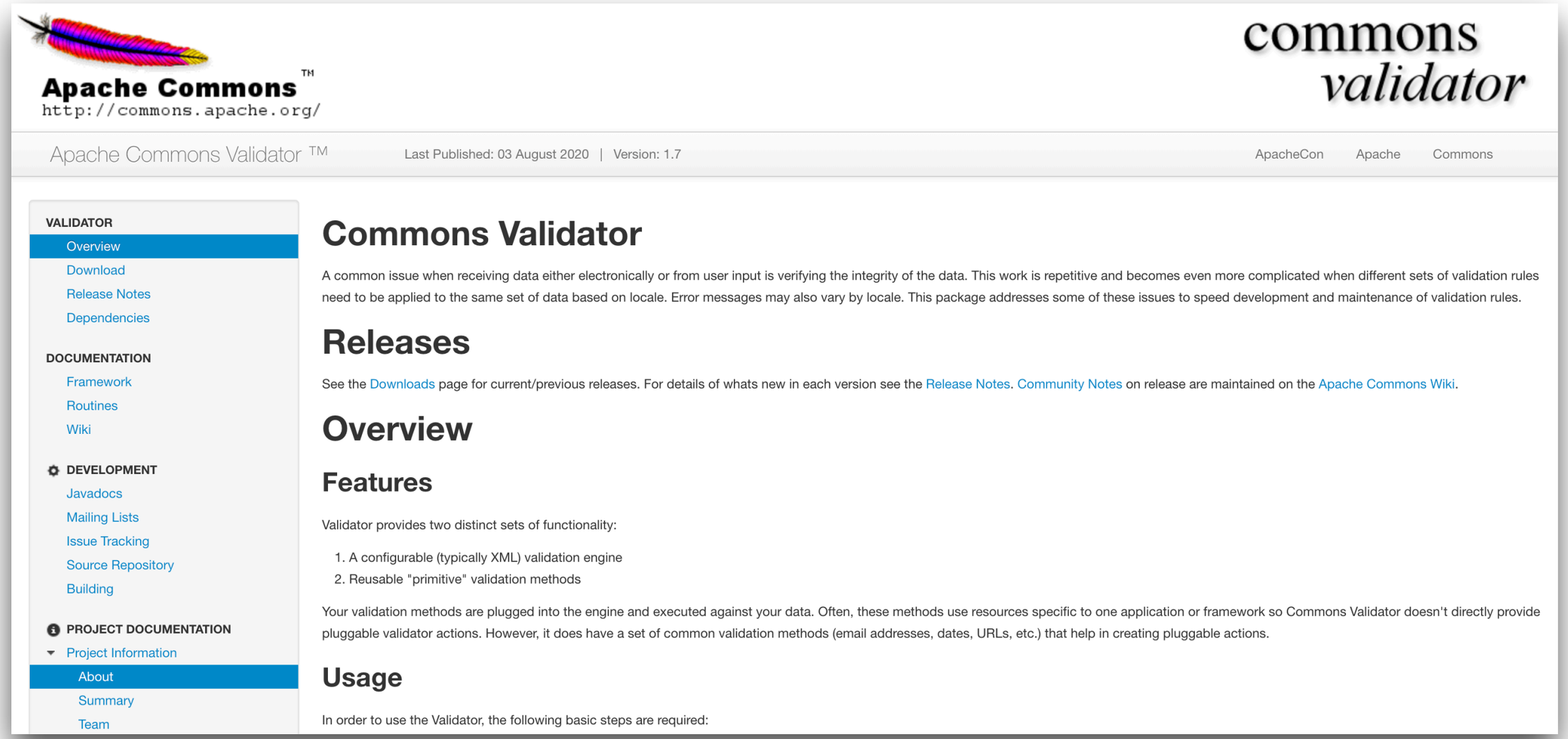
Popular libraries

“Regular Expression”

Library	Occurrence (projects)	Status
hibernate-validator	62963	Not UA-Ready. RegEx via annotations; Hibernate implementation of*validation-api*.
validation-api	25190	Not UA-Ready. RegEx via annotations.
springfox-bean-validators	12501	Not UA-Ready. RegEx via annotations; SpringFox implementation of*validation-api*.
commons-validator	4906	Not UA-Ready. Relies on a static list of TLDs from 2017.
icu4j	886	UA-Ready. IDNA2008.
libidn	29	Not UA-Ready. IDNA2003, deprecated and ported to the Java language as “*java.net.IDN*”.

https://uasg.tech/wp-content/uploads/documents/UASG033-en-digital.pdf

Apache common validator



https://commons.apache.org/proper/commons-validator/

ICU4J

ICU - International Components for Unicode

Navigation

Unicode
About ICU
· ICU Home
· Download ICU
Demos & Tools
· ICU4C Demos
· ICU Collation Demo
· ICU4J Demos
· Data Customizer
Documents
· User Guide
· ICU4C Readme
· ICU4J Readme

ICU-TC Home Page

News

Do you need ICU to work on EBCDIC platforms?

- ICU4C used to work on IBM mainframes (OS/390, z/OS) and other native-EBCDIC platforms (OS/4
- This has not been tested since ICU 59 moved to C++11 (2017). Apparently there are now C++11 co
- **We need help**: Someone needs to build ICU4C on such a machine, fix C++ compiler issues (if any machine into our CI). We will assist you, especially with EBCDIC-specific character and string hanc
- **Otherwise we will remove the support code for non-ASCII-family platforms.** (ICU-21672)
- Please contact us via the icu-support mailing list. See the thread "ICU users: Do you need ICU to w

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Special Notice About Branch Renaming: On 2021-March-24 we renamed the `master` branch to `main` bra

If you have a local git clone of the repo, you need to rename your default branch:

```
$ git branch -m master main

$ git fetch origin
```

http://site.icu-project.org/home

Library	Occurrence in projects	Status
idna	70789	UA-Ready. IDNA2008.
validators	1660	Not UA-Ready. Email validation based on Django validator; URL validation based on RegEx.
email_validator	1178	UA-Ready. IDNA2008.
pyicu	243	UA-Ready. IDNA2008.
idna_ssl	10	UA-Ready. IDNA2008.

Dataset: 450 million dependency files; occurrence in entire dataset: 70,813; approx. 37%.

https://uasg.tech/wp-content/uploads/documents/UASG033-en-digital.pdf

Very easy with Go

Use IDNA package

Documentation

Overview

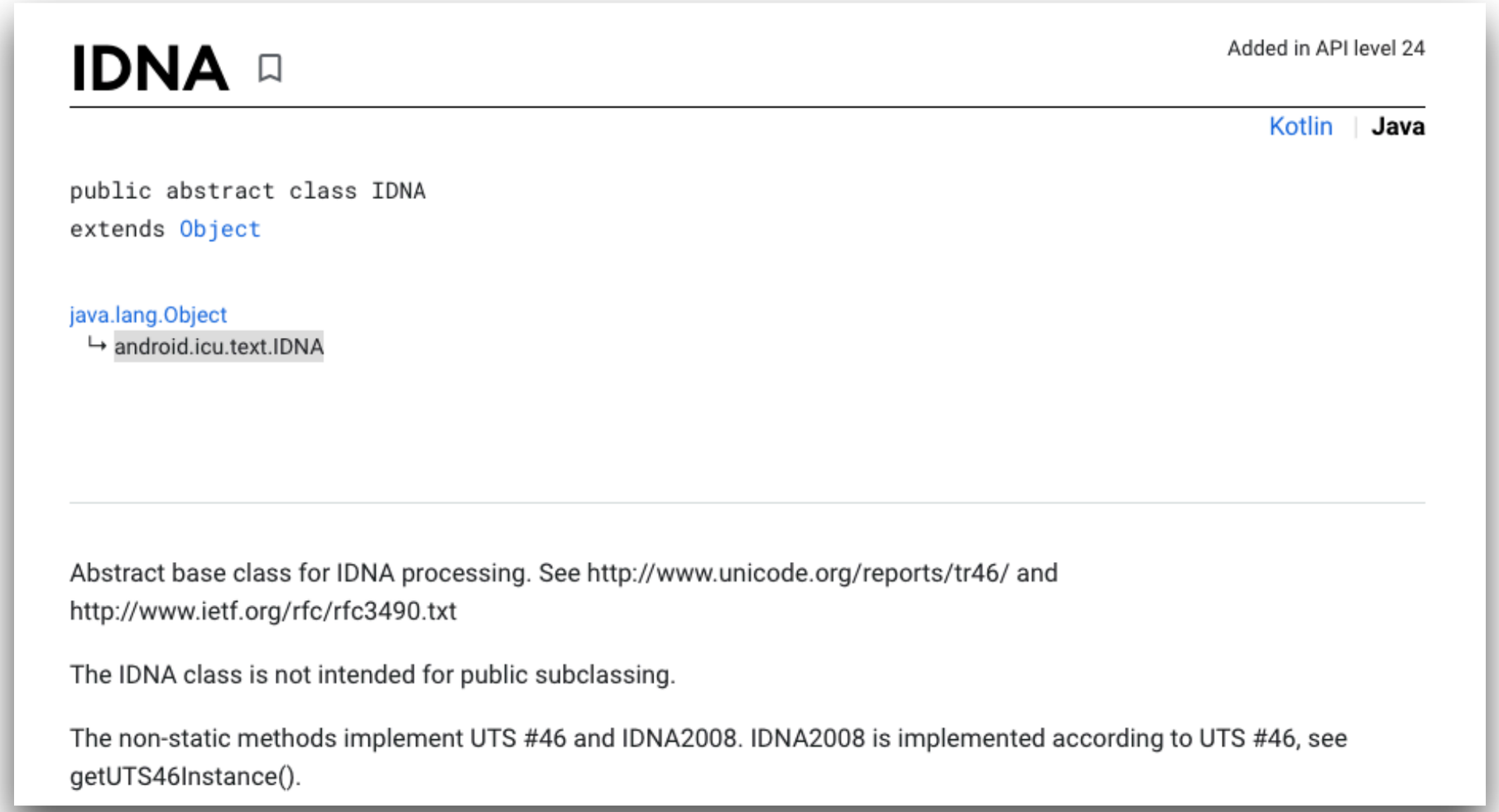
Package idna implements IDNA2008 using the compatibility processing defined by UTS (Unicode Technical Standard) #46, which defines a standard to deal with the transition from IDNA2003.

IDNA2008 (Internationalized Domain Names for Applications), is defined in RFC 5890, RFC 5891, RFC 5892, RFC 5893 and RFC 5894. UTS #46 is defined in https://www.unicode.org/reports/tr46. See https://unicode.org/cldr/utility/idna.jsp for a visualization of the differences between these two standards.

https://pkg.go.dev/golang.org/x/net/idna

Android application

Use class IDNA



IDNA

Added in API level 24

Kotlin | **Java**

```
public abstract class IDNA
extends Object
```

java.lang.Object
↳ android.icu.text.IDNA

Abstract base class for IDNA processing. See http://www.unicode.org/reports/tr46/ and http://www.ietf.org/rfc/rfc3490.txt

The IDNA class is not intended for public subclassing.

The non-static methods implement UTS #46 and IDNA2008. IDNA2008 is implemented according to UTS #46, see getUTS46Instance().

https://developer.android.com/reference/android/icu/text/IDNA

Normalized before process

ไทยร่วมใจ.com xn--82c3a4adfy1rc3b.com

Normalized before process

With python + idna

```
import idna

before = 'ไทยร่วมใจ.com'
nomalized = idna.encode(before)
displayed = idna.decode(nomalized)
```

https://pypi.org/project/idna/

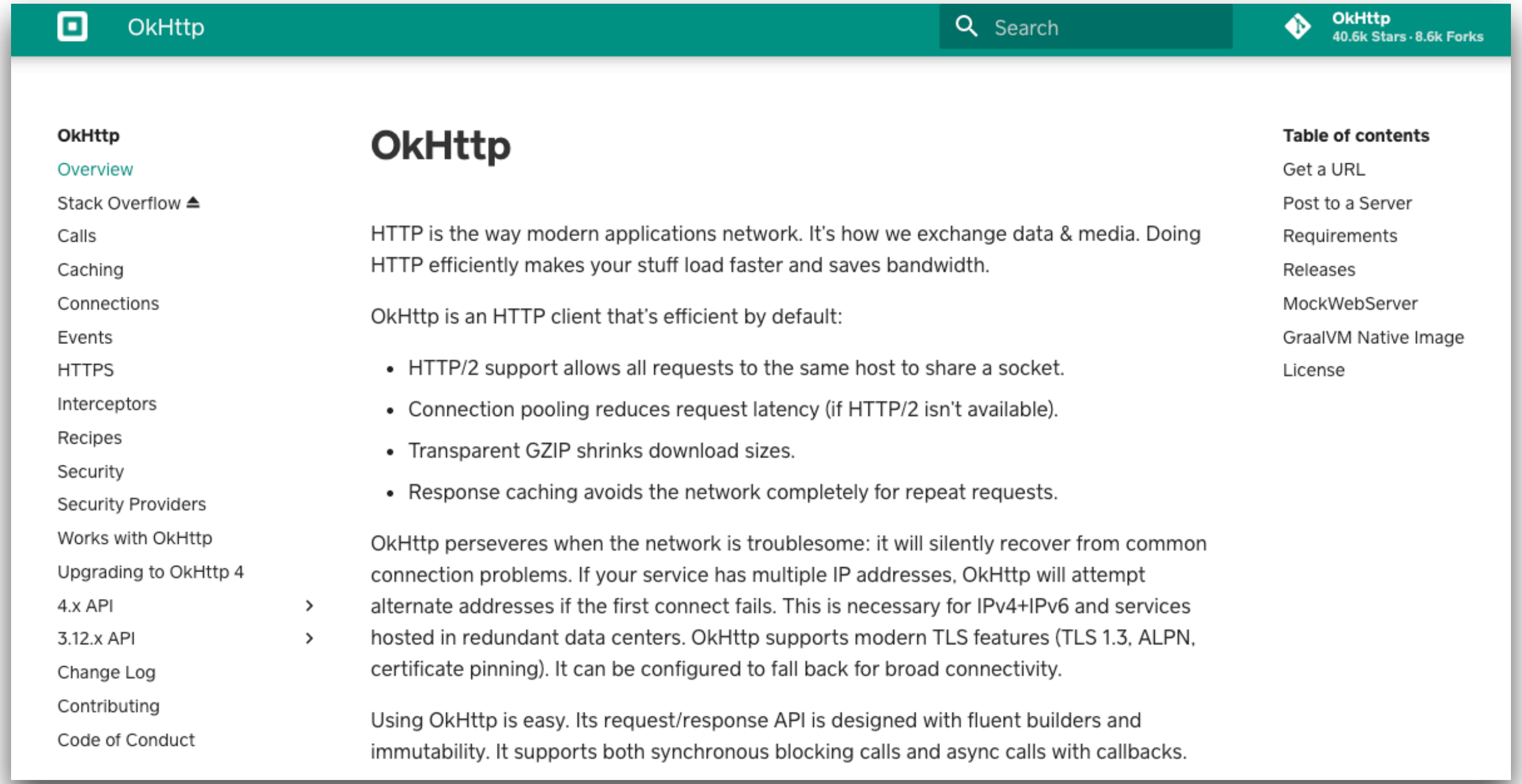
Making an HTTP request

Making an HTTP request

Coding with Java

HttoURLConnection
Apache HTTP Client
OkHTTP
Java 11 HTTP Client (not prepare UTF8)
Google Java HTTP Client

Working with OkHTTP



https://square.github.io/okhttp/

Working with OkHTTP

```
public boolean callByDomain02(String domainName) {
    OkHttpClient httpClient = new OkHttpClient();
    Request request = new Request.Builder().url("http://" + domainName).build();
    try {
        Response response = httpClient.newCall(request).execute();
        return true;
    } catch (IOException e) {
        return false;
    }
}
```

https://square.github.io/okhttp/

Working with Email address (EAI)

Validate email format

Regular expression
Use libraries or framework

Regular Expression

From OWASP validation Regex Repository

[^[a-zA-Z0-9_+&*-]+(?:\.[a-zA-Z0-9_+&*-]+)*@(?:[a-zA-Z0-9-]+\.)+[a-zA-Z]{2,7}$]

https://owasp.org/www-community/OWASP_Validation_Regex_Repository

Regular Expression

Not support EAI
Not support ASCII TLD longer than 7
Not support U-labels in IDN TLD

Code Example

```java
public class EmailValidation {

    public boolean isValidWithRegex(String email) {
        return email.matches(".*@+.*\\..*");
    }

    public boolean isValidWithRegex02(String email) {
        String regex = "^[a-zA-Z0-9_+&*-]+(?:\\.[a-zA-Z0-
        return email.matches(regex);
    }
```

Use Libraries

Jakarta Mail
Apache Commons Validator
EmailValidator4J

Apache Commons Validator

```
public boolean isValidWithApacheCommons(String email) {
    EmailValidator emailValidator = EmailValidator.getInstance();
    return emailValidator.isValid(email);
}
```

Send Email …

Send email to SMTP server

Sending Email

Jakarta Mail

Simple Java Mail (Jakarta Mail wrapper)

Example

```
public boolean send(String email) {

    // 1. Validate email
    if(!isEmailValid(email)) {
        throw new RuntimeException("Email invalid");
    }

    // 2. Validate Domain name from email
    String domain = email.substring(email.lastIndexOf("@") + 1);
    ValidateDomain validateDomain = new ValidateDomain();
    if(!validateDomain.isValidWithICU4j(domain)) {
        throw new RuntimeException("Domain invalid");
    }

    // 3. Send email
    return true;
}
```

Working with Spring Boot

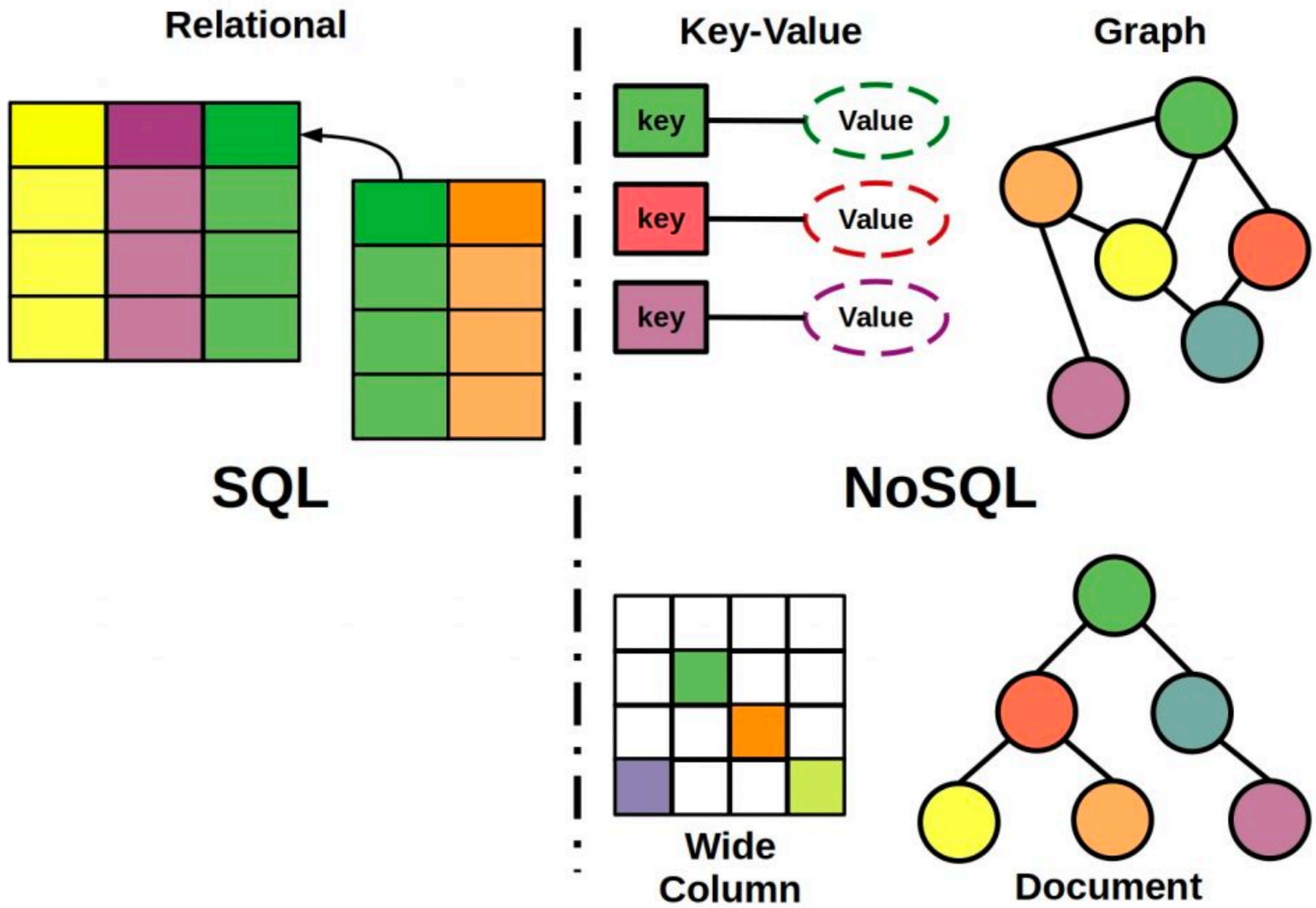
TODO

Size of domain name to max (255)
Use string type

Store data in Database

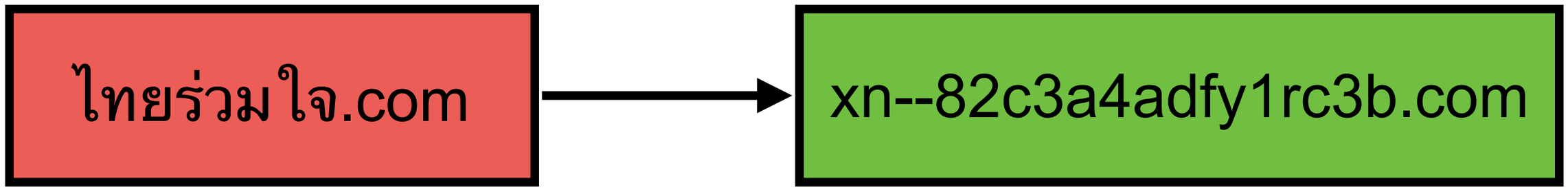
Domain and email

SQL and NoSQL



SQL

Size of domain name to max (255)
Use string type
Convert domain to A-label (normalised)



Summary

Suggestions

Validation for IDA, EAI

UA input is complicated

prefer basic validation

Suggestions

Never rely on a static list of TLDs.
Use String type to hold data
Convert domain to A-label when passing to library
Use a UA-conformant library/framework

Suggestions

Make sure to do normalization of input before store, compare and process

Suggestions

Do unit and system testing of UA

https://uasg.tech/wp-content/uploads/documents/UASG004-en-digital.pdf

Thank you
Q/A