

HOW TO GET NEXT BILLION PEOPLE ON INTERNET

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The 7.5 billion people of the world embrace different cultures, geographies, religions, and languages. Just 370 million people are native English speakers. Most of Internet building blocks are in English or let's say ASCII. When it comes to the Internet, language becomes important. Google+KPMG joint study shows that Internet users in India grew CAGR of 41% in between 2011 to 2016 to reach 234 million at the end of 2017. This growth has resulted in Indian language users surpassing English users.

The vernacular content is getting consumed by people in their preferred way, however, still, users are expected to know a bit of English, as without typing the domain name they cannot reach to a website or send an email.

The major barrier is for those people who do not know English or those who prefer to work in their own language without depending on any other language. We

need Internet infrastructure to be well aware of different scripts, the smart web and email applications need to cater for those that are less smart to ensure that the message gets through, even if the address is not understandable by the recipients.

While recognizing this need of multi-lingual Internet and bridging the digital divide between English and non-English populations so that the non-english population can be upgraded to exploit the power of Internet, a passionate community of individuals in 1996 starting talking about this and IDN (Internationalized Domain Name) took birth.

What is IDN?

An internationalized domain name (IDN) is an Internet domain name that contains at least one label that is displayed in software applications, in whole or in part, in a language-specific script or alphabet, such as Arabic, Chi-



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nese, Cyrillic, Tamil, Hindi or the Latin alphabet-based characters with diacritics or ligatures, such as French. These writing systems are encoded by computers in multi-byte Unicode. Internationalized domain names are stored in the Domain Name System as ASCII strings using Punycode transformation, so that पत्रिका.भारत in Hindi becomes xn--11b3arz5ee0h.xn--h2brj9c, почта.ру in Cyrillic becomes xn--80a1acny.xn--placf and 支持@电邮.在线 in Chinese becomes xn--@-8f5b97d4u2azm6a.xn--3ds443g.

ICANN took IDN initiative quite positively and IDN adoption started from year 2010 with ccTLDs in the Arabic alphabet for Egypt, Saudi Arabia and the United Arab Emirates. India adopted IDN in 2014 with .भारत (Hindi equivalent of India) and NIXI launched domain registration in 15 Indian languages. Anyone can register Indian IDN through godil.in website.

What is Punycode?

Punycode is a way to represent Unicode within the limited character subset of ASCII used for Internet host names. Using Punycode, host names containing Unicode characters are transcoded to a subset of ASCII consisting of letters, digits, and hyphen (the Letter-Digit-Hyphen (LDH) subset, as it is called). So when an IDN domain gets configured in DNS system, the domain name is configured using punycode not in Unicode part of domain. To explain it better we can take an example of Hindi IDN पत्रिका.भारत and its punycode will be xn--11b3arz5ee0h.xn--h2brj9c.

As we all know, domain names are primarily used for two critical applications, 1) Website and 2) Email. Email was very important part for better adoption of the IDNs hence

EAI (Email Address Internalization) protocol was finalised and in 2014 Google announced their gmail platform to be compatible with email address created on IDNs. In Jan 2018 Microsoft servers started advertising SMTPUTF8 to support and exchange of EAI mails.

What is EAI?

An Email address has two parts. The local part (sometimes called the mailbox) and the domain name. EAI is the protocol that allows email addresses to have non-ASCII characters i.e either in Mailbox name or Domain name or both. A Hindi language email address संपर्क@डेटामेल.भारत is an example of valid email address. More information about EAI can also be found on <https://uasg.tech>.

The real life problem arises with EAI compliant email software and non-EAI compliant software co-exists in the email world. This creates a challenge to deliver an EAI email to non-EAI compliant email server and this led to another need of innovation and protocol to solve the problem. ICANN supported Universal Acceptance Steering Group (UASG.TECH) in their recent meeting in Hongkong and China announced the best practice to do Downgrading with Aliasing, So that both servers can communicate and exchange emails flawlessly.

What is Downgrading with Aliasing?

Internationalization (UTF8SMTP) extension allows UTF-8 characters in SMTP envelope and mail header fields. To avoid rejecting internationalized Email messages when a server in the delivery path does not support the UTF8SMTP extension, some sort of converting mechanism is required. This is known as Downgrading mechanism for Email Address Internationalization.

If you are looking to tap into markets and untapped population as new market and segment of customers, adopting IDN+EAI may be the game changer for you and many businesses

So when an EAI compliant server tries to deliver an email containing Unicode characters in the envelope and the recipient server does not announce UTF8SMTP support, the sender server MUST downgrade and change the email address to its ASCII alias email address so that email gets delivered without any problem.

Upgrading People (Bridging the digital divide)

In the times to come, our large global population will have access to Internet as we all do today. People who are deprived because of language barrier, will enjoy the power of Internet without any further limitations. We can imagine that IDN + EAI + Aliasing are going to create massive impact on the entire Internet infrastructure, its adoption at mass scale and impacting billions of people life positively.

100 billion \$ opportunity:

Currently almost 75% of the world population is not able to use internet because of many barriers and language barrier is the biggest of all. If you are looking to tap into markets and untapped population as new market and segment of customers, adopting IDN+EAI may be the game changer for you and many businesses. Register your IDN now, get your EAI activated and serve the market which has never been server before. **CR**