

# IANA

## Important, but not for what they do

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## Giving Away the Internet!

**Four states sue to stop internet transition**

**DONALD TRUMP COMES OUT AGAINST OBAMA'S UNITED NATIONS INTERNET TAKEOVER**

**Obama gives away the internet and, with it, our liberty**

**Obama Should Not Put Free Speech on Internet at Risk by Giving Up US Oversight**

*Don't give away the Internet's First Amendment, ALG President to testify to Senate Commerce Committee*

[Arguments Over Internet Governance Transition Get Even More Stupid](#)

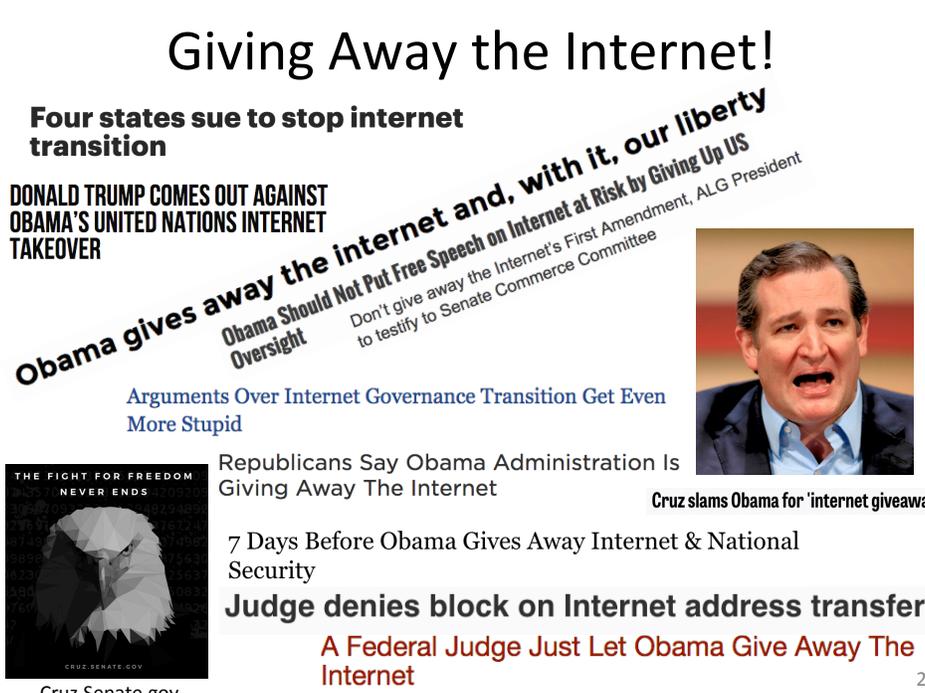
**Republicans Say Obama Administration Is Giving Away The Internet**

**Cruz slams Obama for 'internet giveaway'**

**7 Days Before Obama Gives Away Internet & National Security**

**Judge denies block on Internet address transfer**

**A Federal Judge Just Let Obama Give Away The Internet**



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Cruz.Senate.gov

## Once Upon a Time

- Started with Network Working Group - 1968  
Ad-hoc group *“concerned with the HOST software, the strategies for using the network, and initial experiments with the network”* RFC 3
- Then RFCs – 1969  
Jon Postel RFC series editor
- Then coordinating socket numbers – 1972  
Jon Postel coordinator  
**Internet Assigned Numbers Authority (IANA)**  
name – RFC 1060 in 1988  
Joyce K. Reynolds listed as the IANA contact



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## Then more than sockets

- IP addresses & Protocol Parameters  
RFC 739 – 1977
- IP address are too hard to use  
DNS: RFC 882/3 – 1982
- Hierarchy is your friend – DNS root & common TLDs:  
RFC 920 – 1984
- All the IANA parts in place by 1984  
Jon & Joyce @ USC-ISI  
Funded by U.S. government  
e.g. 1988 DARPA contract with ISI, extended in 1997



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## ARPA Networking Research

- ARPA wanted to share large (expensive) computers among researchers
- Decided to use “packet-based” design
- Used non-dedicated logical connections  
Permitted multiple conversations on same physical connection
- Packet networking concept came from Paul Baran at RAND  
Designed to survive nuclear attack



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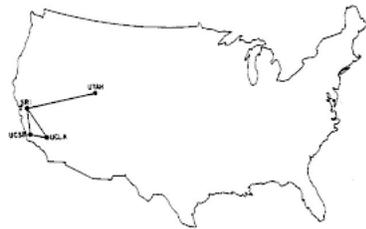
## Packet Switched Networking

- Split transmission into chunks (a.k.a., packets)
- Each packet proceeds on its own through the network, no state kept in network switches
- No assumptions made about underlying transport network  
Packets may be lost, reordered, duplicated
- Packet network just forwards the bits
- No service guarantees  
Reliability, quality, security ...



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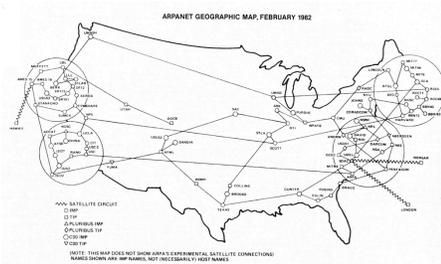
## ARPA Built a Network



1969

Prove of concept  
and production  
network to share  
computers

1982



Commercial packet switched networks followed by mid 1990s - the interconnected packet switched networks became the **Internet**

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## But “no one” cared for decades

- Well, the Internet folk did
- But the traditional telcom and corporate networking people and companies did not  
Its just a **toy** – no QoS, no guarantees, no security, no one in charge
- So the regulators did not care




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## IANA Steady State 1984-1995

- Protocol Parameters  
Database maintenance (only) for IETF
- IP addresses & ASNs  
Allocate blocks to RIRs (who defined their own policies)  
Network Solutions, RIPE-NCC, APNIC
- DNS  
RFC 920 TLDs + .net + .int + root servers (“oversee”)  
RFC 1591: Domain Name System Structure and Delegation  
*There are a set of what are called "top-level domain names" (TLDs). These are the generic TLDs (EDU, COM, NET, ORG, GOV, MIL, and INT), and the two letter country codes from ISO-3166. It is **extremely unlikely** that any other TLDs will be created. – Jon Postel, March 1994*



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## The Internet has few needs

- The IANA functions are the **only** central functions required to keep the Internet working

Record protocol parameters

Allocate blocks of IP addresses & ASNs

Configure the DNS root

- Everything else is cooperation

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# \$\$\$\$\$

- 1993: Network Solutions won NSF RFP to register domain names in .com, .net & .org
- Sept. 1995: NSF OKed Network Solutions charging for domain name registrations - \$100/2 years  
About 100K .com names in 1995  
Would be 1M by 1999
- **Money to be minted!**
- But Network Solutions was the only game in town  
Some ccTLDs also saw the lure  
E.g. .tv



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## DNS and the other two

- IANA dealt with three topics
- But DNS was the only one of interest to most people  
It was where the money was  
It was where the Trademark issues were  
It was where the lawyers were  
It was where the politicians were  
It was where the policy wonk wannabees were  
Its all the news media could grok (or think they did)



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## More TLDs?

- Firestorm over charging for domain names
- Fall 1995: Postel floated idea of adding new TLDs  
To create competition
- Nov. 1995: ISOC DNS restructure proposal  
draft-isoc-dns-role-00.txt  
IAB & ISOC chairs, Jon Postel & Nick Trio co-authors  
Move gTLD management under ISOC  
Register new gTLDs  
note – called iTLD “international top level domains”



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## IAHC

- May 1996: Postel – proposed ad hoc DNS working groups for DNS issues  
draft-postel-iana-itld-admin  
Also proposed 150 new gTLDs in first year, 30/year afterward
- Nov. 1996: International Ad-Hoc Committee (IAHC) formed by ISOC & IANA  
Representatives from IAB, NSF, WIPO, ITU, INTA  
Report & MoU published in Feb. 1997  
Recommended establishing 7 new TLDs  
Recommended Registrar/Registry model  
> 200 signers of the MoU



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## Incoming!

- Feb. 1997: Image Online Design sued IANA

i.e. Jon Postel

Claimed he had reneged on an oral promise to sell them .web

Sued to stop IAHC plan

Which included .web



- Jul. 1997: Eugene Kashpureff rerouted InterNIC website to AlterNIC using DNS cache poisoning

AlterNIC was an alternative DNS tree

**Alternic**

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## Dept. of Commerce RFC

- 2 July 1997: *Request for Comments on the Registration and Administration of Internet Domain Names* (62 FR 35896)



- Requested comment on principles including:

*The private sector, with input from governments, should develop stable, consensus-based self-governing mechanisms for **domain name registration** and management that adequately defines responsibilities and maintains accountability.*

- 430 comments received

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## Meanwhile

- Jon worked on a proposal of his vision of a “institutionalized” IANA
- Consulted with many in IETF
- Consulted with Ira Magaziner (DoC)
- Semi-final by end of 1997



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## Reengineering the Internet

- Conference in London, Jan. 26-29 1998
- Ira Magaziner foreshadowed U.S. government approach



Question in Q&A – Why not just give IANA to the ITU?

Magaziner: Internet moves too fast for governments

- Jon could not make it, in his stead I presented:  
*Institutionalizing the IANA Functions To Deliver a Stable and Accessible Global Internet for Mission Critical Business Traffic and Transactions*

Copy on [www.sobco.com](http://www.sobco.com) (Google for it if interested)

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## Green Paper

- 20 Feb. 1998: *Improvement of Technical Management of Internet Names and Addresses; Proposed Rule*
- Informed by IAHC-MoU, but not a clone



We propose the creation of a *private*, not-for-profit corporation (the new corporation) to *manage the coordinated functions* in a stable and open institutional framework. The new corporation should operate as a private entity for the benefit of the Internet as a whole.

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## Green Paper, contd.

- Authority:
  1. To set policy for and direct the *allocation of number blocks* to regional number registries for the assignment of Internet addresses;
  2. To oversee the operation of an *authoritative root server system*;
  3. To oversee policy for determining, based on objective criteria clearly established in the new organization's charter, the circumstances under which *new top-level domains* are added to the root system; and
  4. To coordinate the development of other *technical protocol parameters* as needed to maintain universal connectivity on the Internet.
- i.e., all of IANA, not just DNS, but *just IANA*
- > 400 comments received



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## White Paper



- 10 June '98: *Management of Internet Names and Addresses* (63 FR 31741)
- “Statement of Policy”

*Internet stakeholders are invited to work together to form a new, private, not-for-profit corporation to manage DNS functions*

- 1) set policy for and direct **allocation of IP number blocks** to regional Internet number registries;
  - 2) oversee operation of the authoritative Internet **root server system**;
  - 3) oversee policy for determining the circumstances under which **new TLDs** are added to the root system; and
  - 4) coordinate the assignment of other Internet **technical parameters** as needed to maintain universal connectivity on the Internet.
- the new corporation could be funded by domain name registries, regional IP registries, or other entities identified by the Board.*

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## Self Appointed Community Reviews

- *International Forum on the White Paper*  
Meetings in Reston, Geneva, Singapore, & Buenos Aires
- *Boston Working Group*
- ...
- Thousands of attendees
- Talking about a very different concept than just the IANA technical functions
- Assumed “**the Internet manager**”
- i.e., wanting to fill **a needed vacuum**



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## ICANN Proposal

- Jon developed a specific proposal for an *Internet Corporation for Assigned Names and Numbers*
- 2 Oct. 1998: proposal submitted
- 16 Oct. 1998: Jon died
- 20 Oct. 1998: DoC said they would accept Jon's proposal (with tweaks)
- 26 Oct 1998: 1<sup>st</sup> ICANN board meeting  
Closed door meeting  
Set a pattern?
- 21 Nov 1998: ICANN incorporated
- 25 Nov. 1998: DoC & ICANN sign 10-year MoU



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## ICANN MoU

- *In the **DNS Project**, the parties will jointly design, develop, and test the mechanisms, methods, and procedures to carry out the following **DNS management functions**:*
  - a. Establishment of policy for and direction of the allocation of **IP number blocks**;*
  - b. Oversight of the operation of the authoritative **root server system**;*
  - c. Oversight of the policy for determining the circumstances under which **new top level domains** would be added to the root system;*
  - d. Coordination of the assignment of other **Internet technical parameters** as needed to maintain universal connectivity on the Internet; and*
  - e. Other activities necessary to coordinate the specified DNS management functions, as agreed by the Parties.*

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## Translated ICANN MoU

- Translated into action items
- The DoC signs off on any changes to the DNS root zone file
  - i.e., the file that lists the TLDs and of the IP addresses of the nameservers for each of the TLDs

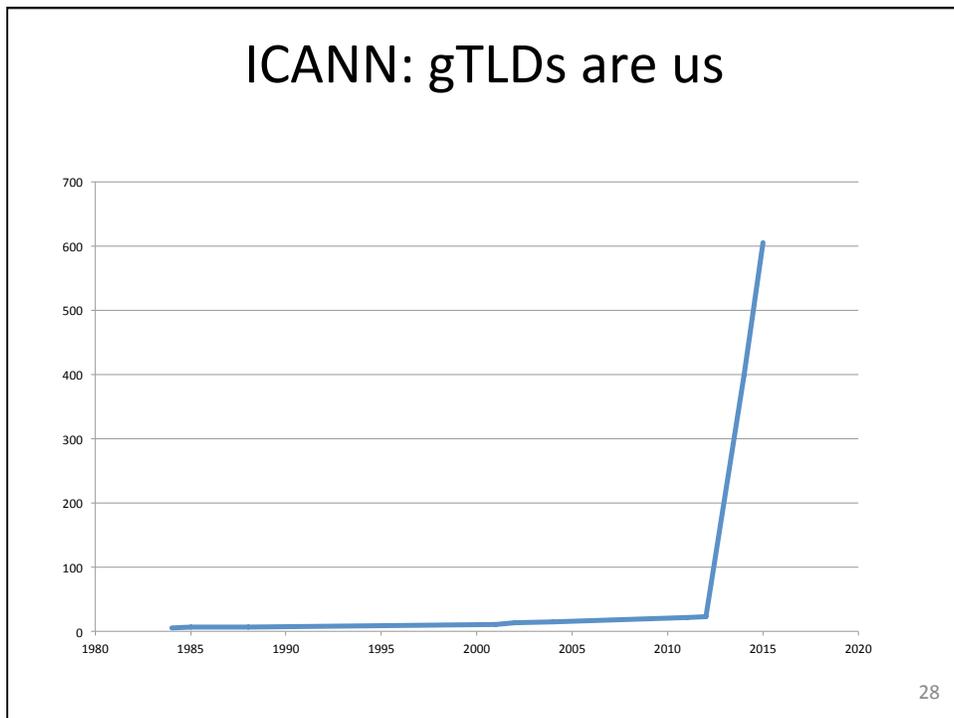
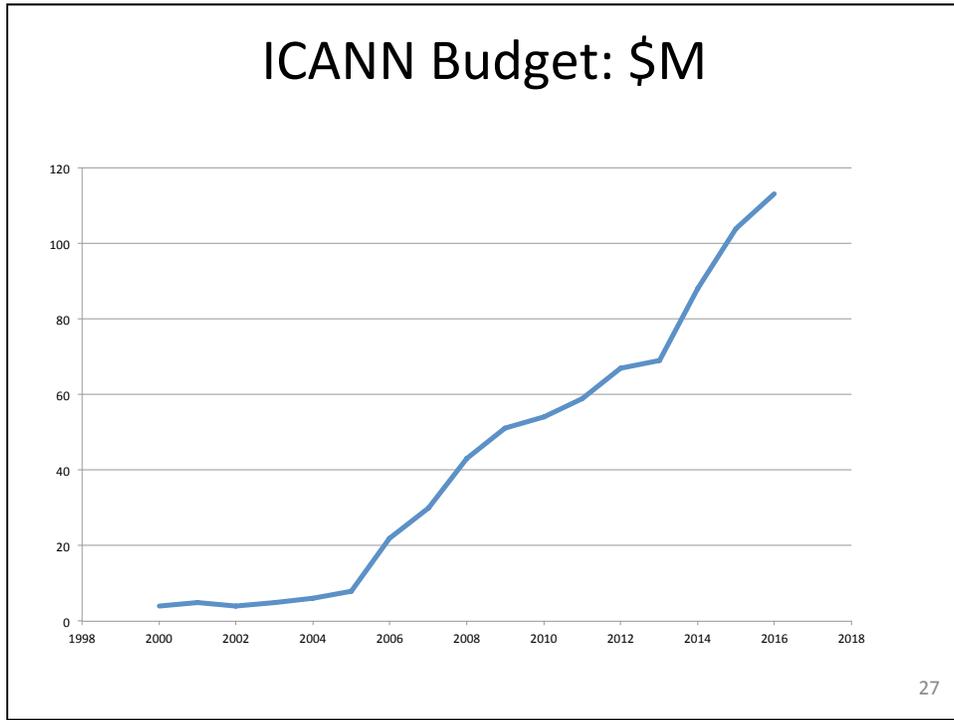


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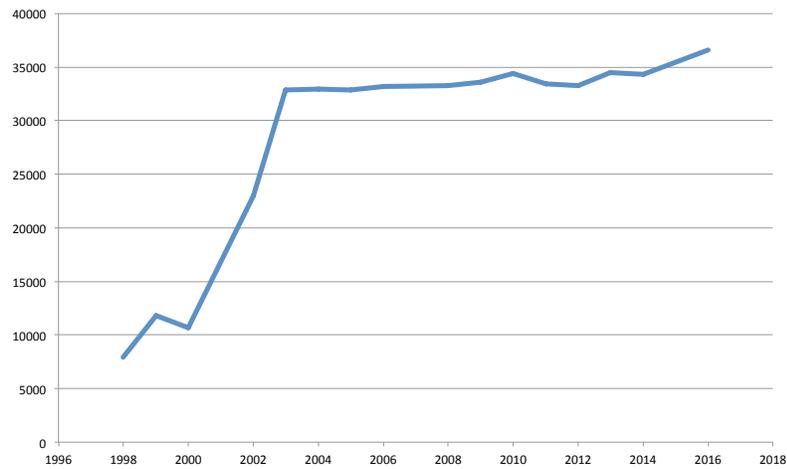
## ICANN's functions

- ICANN was created by Jon Postel to “institutionalize the IANA”
  - i.e., deal with the technical bookkeeping functions and “overseeing” the DNS root server system
- Jon also expected ICANN to decide on new TLDs
  - Involves contracts with TLD operators
- ICANN has to deal with trademark issues coming out of domain name registrations
- ICANN also consults on DNS security issues

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## ICANN Bylaws: Words



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## I am Ignoring

- WSIS 
- Various ITU and ITU-T proposals 
- IGF 
- ...
- Mostly ignoring ICANN community support
  - Blew a lot of good will at start
  - Too often seen as secretive & capricious
  - General I\* view is that its better than any foreseeable alternative

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## Environmental Changes

- Sep. 2001: India, Brazil, and South Africa (IBSA) proposed that the UN undertake governance of the Internet



- Jun. 2013: Edward Snowden

- Oct. 2013: I\* - *Montevideo Statement on the Future of Internet Cooperation*

Time to move away from US government IANA oversight

- Apr. 2014: NetMundial Initiative



Self anointed 25-member council to perform **Internet governance** (because there still is none)

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## The Beginning of the End of the Beginning

- 14 Mar. 2014: *NTIA Announces Intent to Transition Key Internet Domain Name Functions*



- Requests **one** IANA transition plan

- *The transition proposal must have broad community support and address the following four principles:*

*Support and enhance the **multistakeholder model**;*

*Maintain the **security, stability, and resiliency** of the Internet DNS;*

*Meet the needs and expectation of the **global customers and partners of the IANA services**; and,*

*Maintain the **openness of the Internet**.*

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## Transition Proposal Requirements

- Parties to be Involved

*Internet Engineering Task Force (IETF)*



I E T F

*The Internet Architecture Board (IAB)*



I A B

*The Internet Society (ISOC)*



*The Regional Internet Registries (RIRs)*



NRO

*Top level domain name operators*



VERISIGN

*VeriSign*

*And other interested global stakeholders.*

- NTIA will **not accept a proposal** that replaces the NTIA role with a **government-led or an inter-governmental organization** solution.

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## ICANN Accountability

- Major concern – who/what will hold ICANN accountable after the transition? 
- Fall 2014: *ICANN Accountability and Governance Cross Community Working Group (CCWG)* created to work on an accountability and governance plan
- Accountability mechanism developed and accepted
- Following proper process, the ICANN community has significant powers:

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## Community Powers

*Reject ICANN Budgets, IANA Budgets or Strategic/Operating Plans.*

*Reject changes to ICANN's Standard Bylaws.*

*Approve changes to new Fundamental Bylaws, Articles of Incorporation and ICANN's sale or other disposition of all or substantially all of ICANN's assets.*

*Remove an individual ICANN Board Director.*

*Recall the entire ICANN Board.*

*Initiate a binding Independent Review Process (where a panel decision is enforceable in any court recognizing international arbitration results).*

*Reject ICANN Board decisions relating to reviews of the IANA functions, including the triggering of Post Transition IANA separation.*

*The rights of inspection and investigation*

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## Towards a Transition Proposal

- Jan 2015 to Feb. 2016 IANA customers develop transition proposal
- 10 Mar. 2016: Transition Proposal submitted to NTIA
- 9 June 2016: NTIA agrees plan meets requirements



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## Meanwhile

- 10 Apr. 2014: US. House subcommittee hold hearing on transition – no outcome
  - 17 Sep. 2015: NTI extends IANA contract to 30 Sep. 2016
  - 14 Dec. 2015: US Congress blocks NTIA from relinquishing responsibility for Internet DNS functions at least until September 30, 2016
  - Spring 2016-Sep. 2016: some in congress try to extend transition block
- Because, they said, the Internet, as we know it, would end



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## Done Deal

- 27 May 2016: ICANN changed its Bylaws to implement accountability plan
- 30 Sep 2016: the congress block to action and existing IANA contract expired
- 1 Oct 2016: the beginning of an independent IANA
- Can not now be undone
  - Even if Trump wanted to - Can not un-expire a contract
  - FCC might have some say in the US but not elsewhere
- Note: if the transition had not happened – forces in the UN would likely have voted to take it over



Internet Assigned Numbers Authority

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## Technical Functions

- Just the IANA – **nothing more (e.g. no content!)**
  - Protocol parameters
  - IP address blocks
  - Root DNS zone file
  - New TLDs
- The IANA performs coordination functions, not governance
- The functions IANA performs are operationally critical, but unimportant otherwise
- What the IANA **does not do** is what is at issue



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## Internet governance

- Something as important as the Internet **MUST** already be governed – right?
- There must be some group or some one that ensures the Internet functions, it is open to free speech and to commerce – right?

**There is no Internet governance!**

(No one cared until it was too late.)

Which is where the problem lies

- But is it a problem that needs fixing?

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