

# Root DNS Update

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WIDE PROJECT / 東京大学

M-ROOT は以下の組織によって運用されています



株式会社日本レジストリサービス



# Root DNS / Root Zone とは

毎年なのでいいですよ？

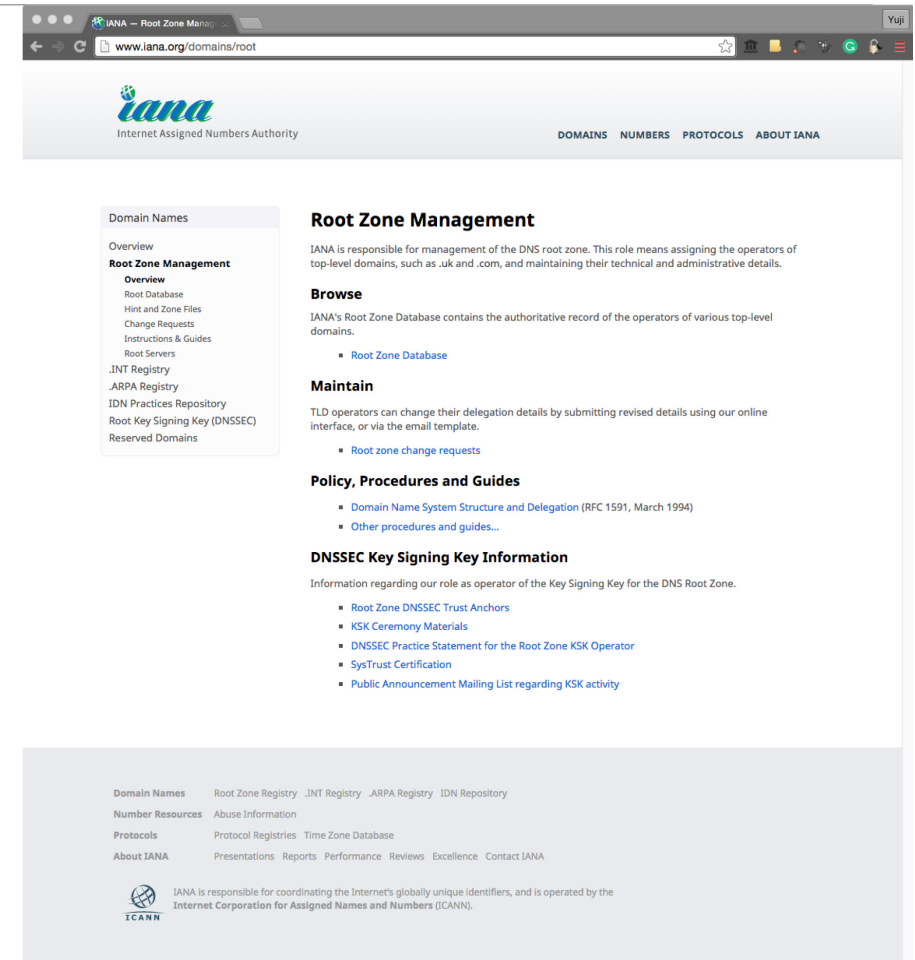
- DNS データベースツリーの起点となる DNS サーバです
- 全てのゴミデータはここに来ます

いわゆる“TLD (Top Level Domain)”の集合データである“Root Zone”を持った Authoritative DNS サーバです

- 13組織によって運営されています
- “Root DNS サーバ”を運用しているだけです
- “Root Zone”の中身に関しては何も感知しておりません

Root Zone は誰が管理？

- IANA です



The screenshot shows the IANA Root Zone Management website. The page title is "IANA - Root Zone Management" and the URL is "www.iana.org/domains/root". The IANA logo is at the top left, and navigation links for "DOMAINS", "NUMBERS", "PROTOCOLS", and "ABOUT IANA" are at the top right. The main content area is divided into several sections: "Domain Names" (with a sub-section for "Root Zone Management Overview"), "Root Zone Management" (with an "Overview" section), "Browse" (with a link to "Root Zone Database"), "Maintain" (with a link to "Root zone change requests"), "Policy, Procedures and Guides" (with links to "Domain Name System Structure and Delegation (RFC 1591, March 1994)" and "Other procedures and guides..."), and "DNSSEC Key Signing Key Information" (with links to "Root Zone DNSSEC Trust Anchors", "KSK Ceremony Materials", "DNSSEC Practice Statement for the Root Zone KSK Operator", "SysTrust Certification", and "Public Announcement Mailing List regarding KSK activity"). A footer section contains links for "Domain Names", "Number Resources", "Protocols", and "About IANA", along with the ICANN logo and a statement: "IANA is responsible for coordinating the Internet's globally unique identifiers, and is operated by the Internet Corporation for Assigned Names and Numbers (ICANN)."

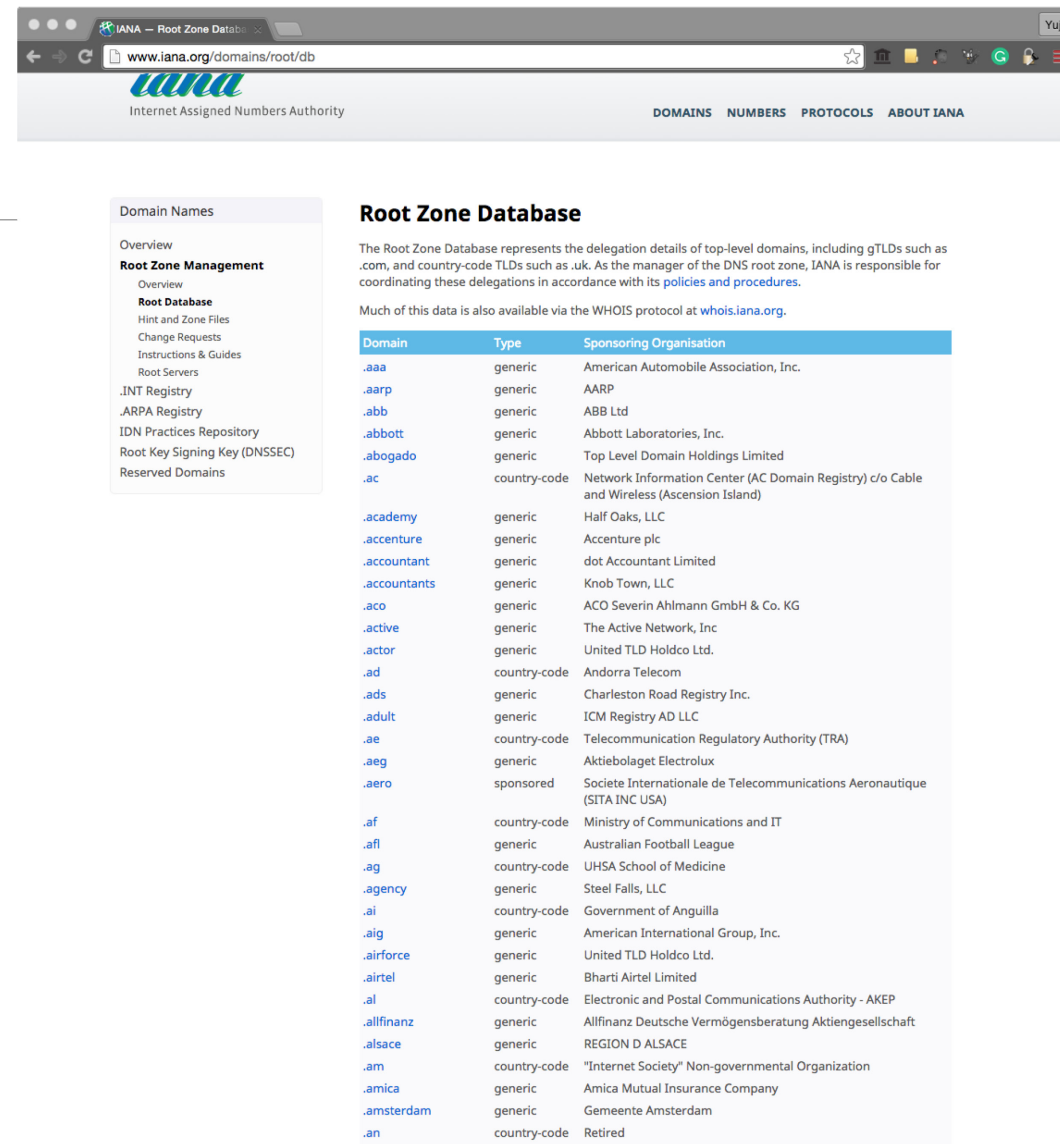
# 現在の TLD

以前は gTLD と ccTLD が登録されていました

今は多くの種類の TLD が

ご存知の

- .jp
- .jprs
- .tokyo
- .toshiba
- .nec
- .nissan
- .toyota
- .ninja



The screenshot shows the IANA Root Zone Database website. The page title is "Root Zone Database" and the URL is "www.iana.org/domains/root/db". The page content includes a navigation menu with "DOMAINS", "NUMBERS", "PROTOCOLS", and "ABOUT IANA". A sidebar on the left lists "Domain Names" and "Root Zone Management" options. The main content area displays a table of domain types and sponsoring organizations.

Domain	Type	Sponsoring Organisation
.aaa	generic	American Automobile Association, Inc.
.aarp	generic	AARP
.abb	generic	ABB Ltd
.abbott	generic	Abbott Laboratories, Inc.
.abogado	generic	Top Level Domain Holdings Limited
.ac	country-code	Network Information Center (AC Domain Registry) c/o Cable and Wireless (Ascension Island)
.academy	generic	Half Oaks, LLC
.accenture	generic	Accenture plc
.accountant	generic	dot Accountant Limited
.accountants	generic	Knob Town, LLC
.aco	generic	ACO Severin Ahlmann GmbH & Co. KG
.active	generic	The Active Network, Inc
.actor	generic	United TLD Holdco Ltd.
.ad	country-code	Andorra Telecom
.ads	generic	Charleston Road Registry Inc.
.adult	generic	ICM Registry AD LLC
.ae	country-code	Telecommunication Regulatory Authority (TRA)
.aeg	generic	Aktiebolaget Electrolux
.aero	sponsored	Societe Internationale de Telecommunications Aeronautique (SITA INC USA)
.af	country-code	Ministry of Communications and IT
.afi	generic	Australian Football League
.ag	country-code	UHSA School of Medicine
.agency	generic	Steel Falls, LLC
.ai	country-code	Government of Anguilla
.aig	generic	American International Group, Inc.
.airforce	generic	United TLD Holdco Ltd.
.airtel	generic	Bharti Airtel Limited
.al	country-code	Electronic and Postal Communications Authority - AKEP
.allfinanz	generic	Allfinanz Deutsche Vermögensberatung Aktiengesellschaft
.alsace	generic	REGION D ALSACE
.am	country-code	"Internet Society" Non-governmental Organization
.amica	generic	Amica Mutual Insurance Company
.amsterdam	generic	Gemeente Amsterdam
.an	country-code	Retired

# Root DNS を運用している組織

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A : Verisign, Inc.

B : Information Sciences Institute

C : Cogent Communications

D : University of Maryland

E : NASA Ames Research Center

F : Internet Systems Consortium, Inc.

G : U.S. DOD Network Information Center

H : U.S Army Research Lab.

I : Netnod

J : Verisign, Inc.

K : RIPE NCC

L : ICANN

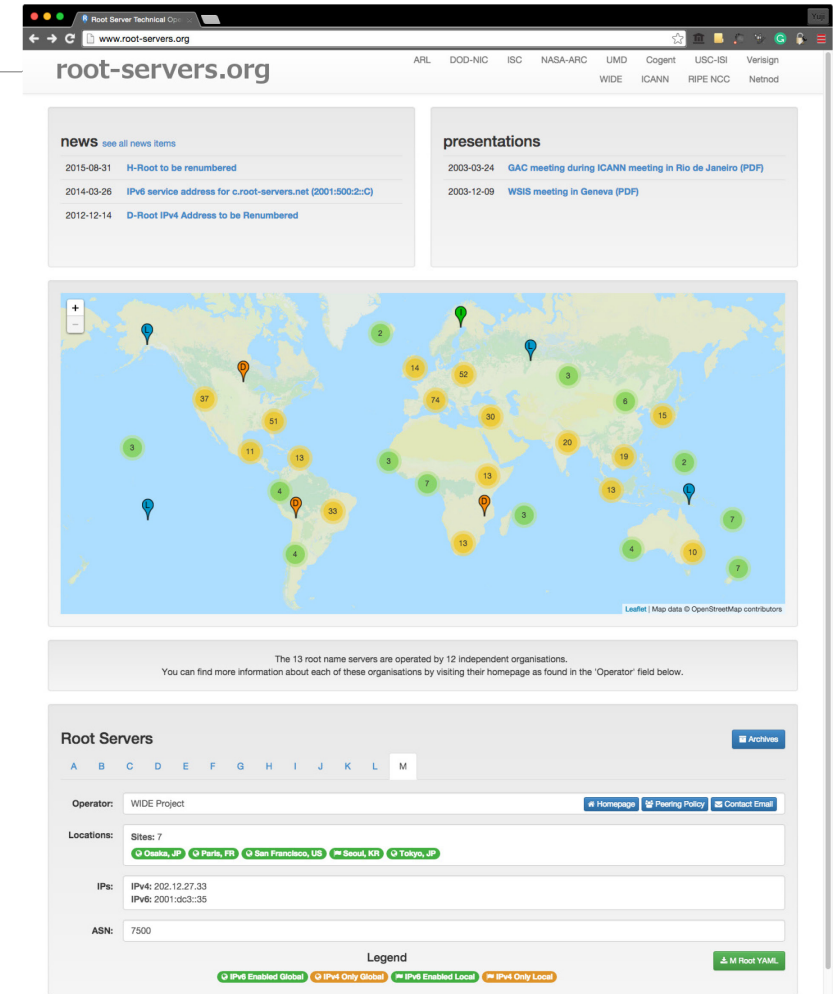
M : WIDE Project / JPRS

# Root DNS 運用組織情報

<http://www.root-servers.org/>

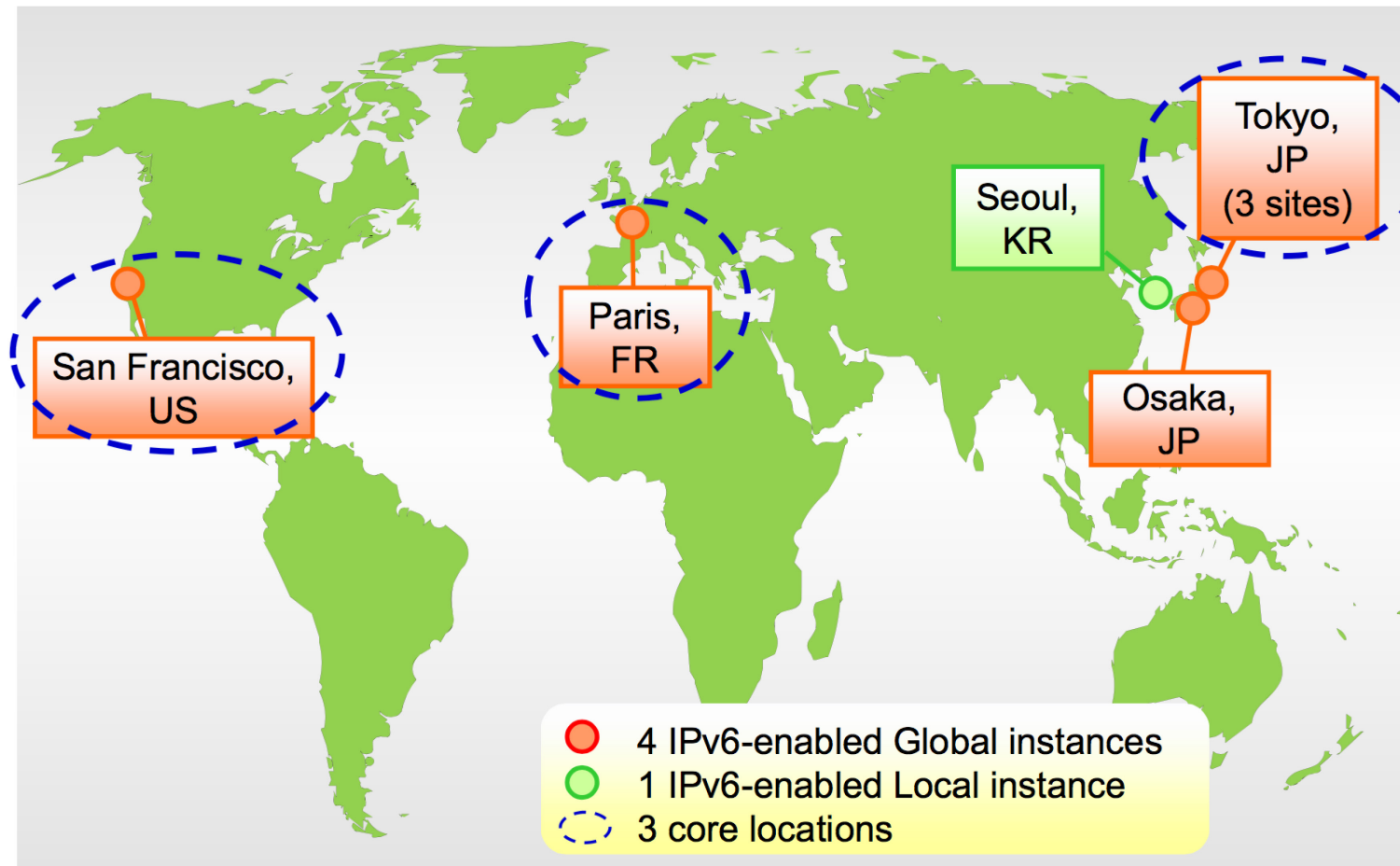
各組織が世界中の多地点で Root DNS サーバを運用しています

- BGP Anycast と呼ばれるサービス手法です
- これにより、Root DNS サーバのサービス拠点が飛躍的に増加しました

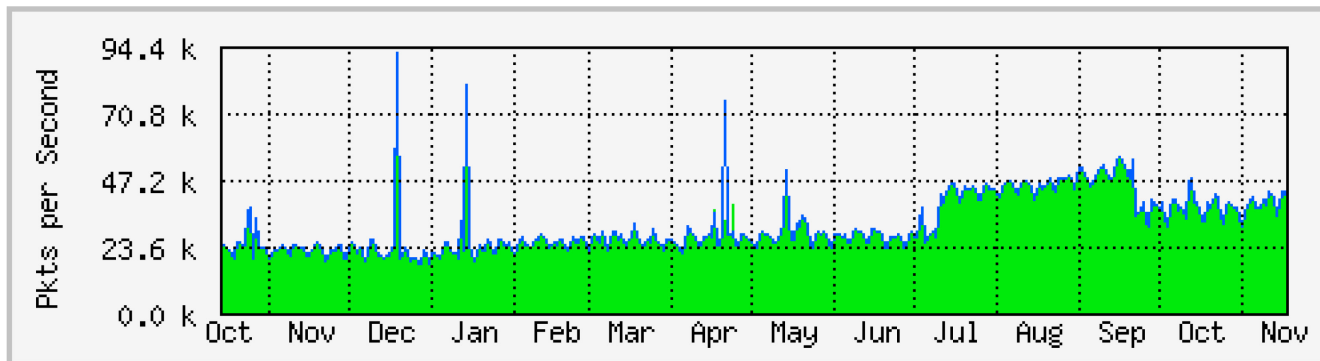
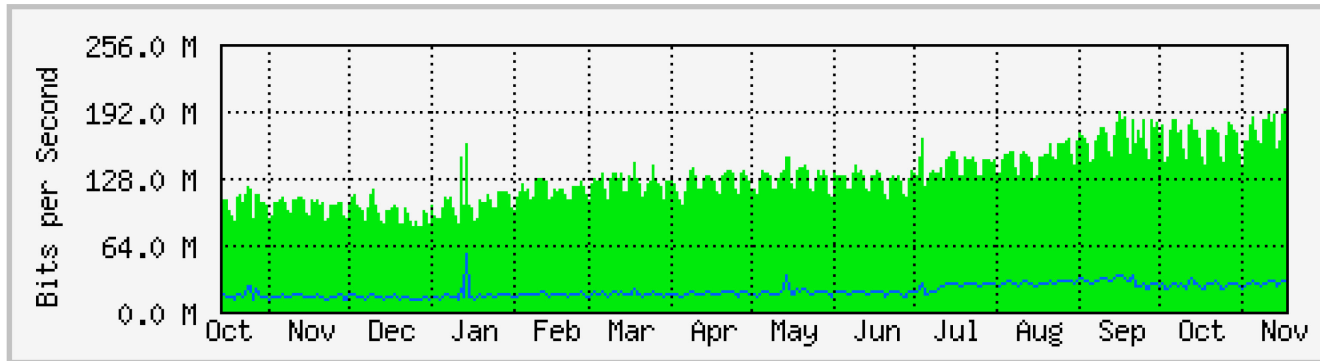


The screenshot shows the website [www.root-servers.org](http://www.root-servers.org/). At the top, there are navigation links for various regional root servers: ARL, DOD-NIC, ISC, NASA-ARC, UMD, Cogent, USC-ISI, Verisign, WIDE, ICANN, RIPE NCC, and Netnod. Below the navigation, there are sections for "news" and "presentations". The "news" section lists three items: "H-Root to be renumbered" (2015-08-31), "IPv6 service address for c.root-servers.net (2001:500:2::C)" (2014-03-26), and "D-Root IPv4 Address to be Renumbered" (2012-12-14). The "presentations" section lists two items: "GAC meeting during ICANN meeting in Rio de Janeiro (PDF)" (2003-03-24) and "WSIS meeting in Geneva (PDF)" (2003-12-09). Below the text is a world map with 13 numbered pins indicating the locations of the root servers. Below the map, a text box states: "The 13 root name servers are operated by 12 independent organisations. You can find more information about each of these organisations by visiting their homepage as found in the 'Operator' field below." Below this is a section titled "Root Servers" with a list of operators: A, B, C, D, E, F, G, H, I, J, K, L, M. The "M" operator is selected, showing details for the WIDE Project. The details include: Operator: WIDE Project; Sites: 7 (Osaka, JP; Paris, FR; San Francisco, US; Seoul, KR; Tokyo, JP); IPs: IPv4: 202.12.27.33, IPv6: 2001:dc3:35; ASN: 7500. A legend at the bottom indicates the status of IPv6 support for each operator: IPv6 Enabled Global (green), IPv6 Only Global (orange), IPv6 Enabled Local (red), and IPv4 Only Local (blue).

# M-ROOT の拠点

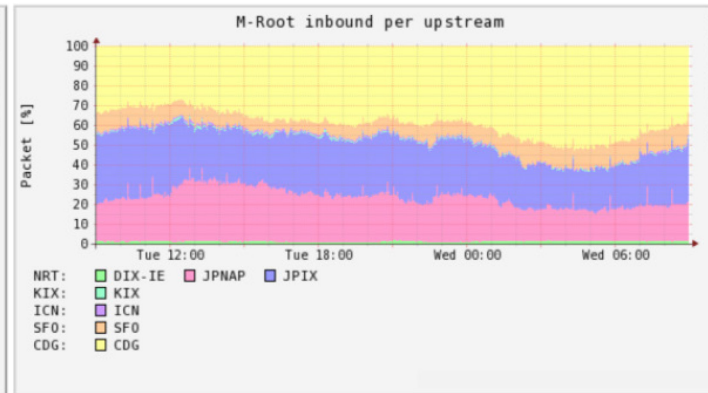
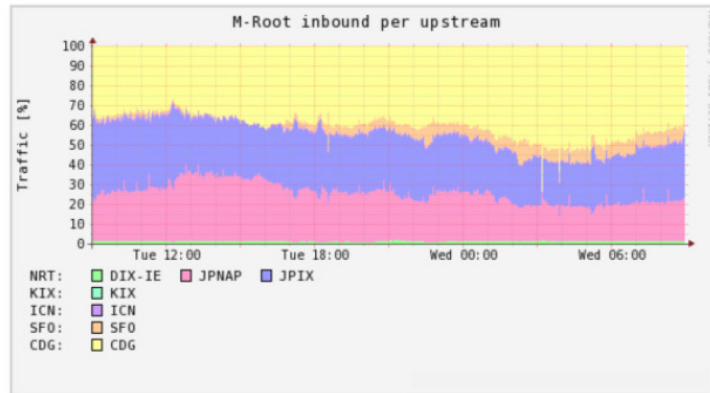


# 今年のトラフィック傾向 (M-ROOT)

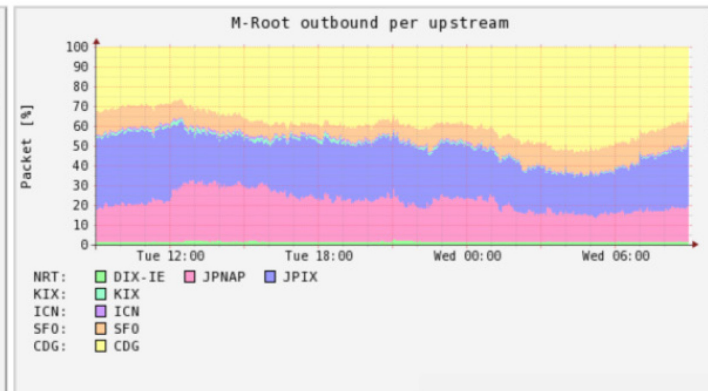
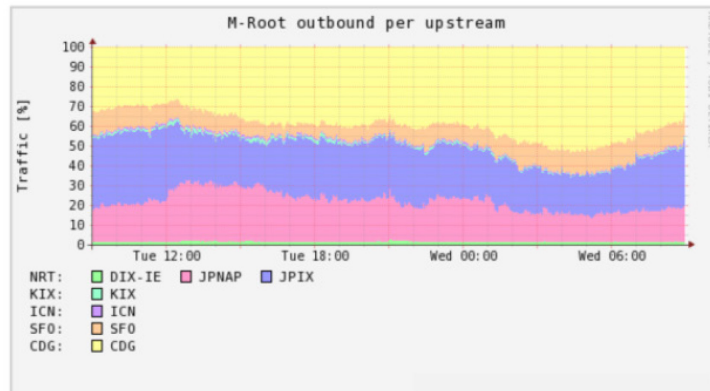


# 拠点ごとのトラフィック割合 by JPRS

## inbound traffic



## outbound traffic





# 最近のニュース

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あまり大きな動きはありません

攻撃とか来ることがありますが具体的には言えませんし

- XXX.www.null とか

直近では以下のニュース

- H-ROOT will change its addresses on 1 December 2015
  - <http://h.root-servers.org/renumber.html>

# DNS 用の mitigation software (d4c)

まだファーストバージョンですが

- d4c : <https://github.com/upa/d4c>
- Developed by NECOMA Project
- QNAME のパターンマッチによる filtering や QoS を目指す



SDN-IX (PIX-IE) との組み合わせによるインフラ防御

- IX レベルでの L7 mitigation
- PIX-IE (Programmable Internet eXchange)
- 11月中にプレオペレーション開始

