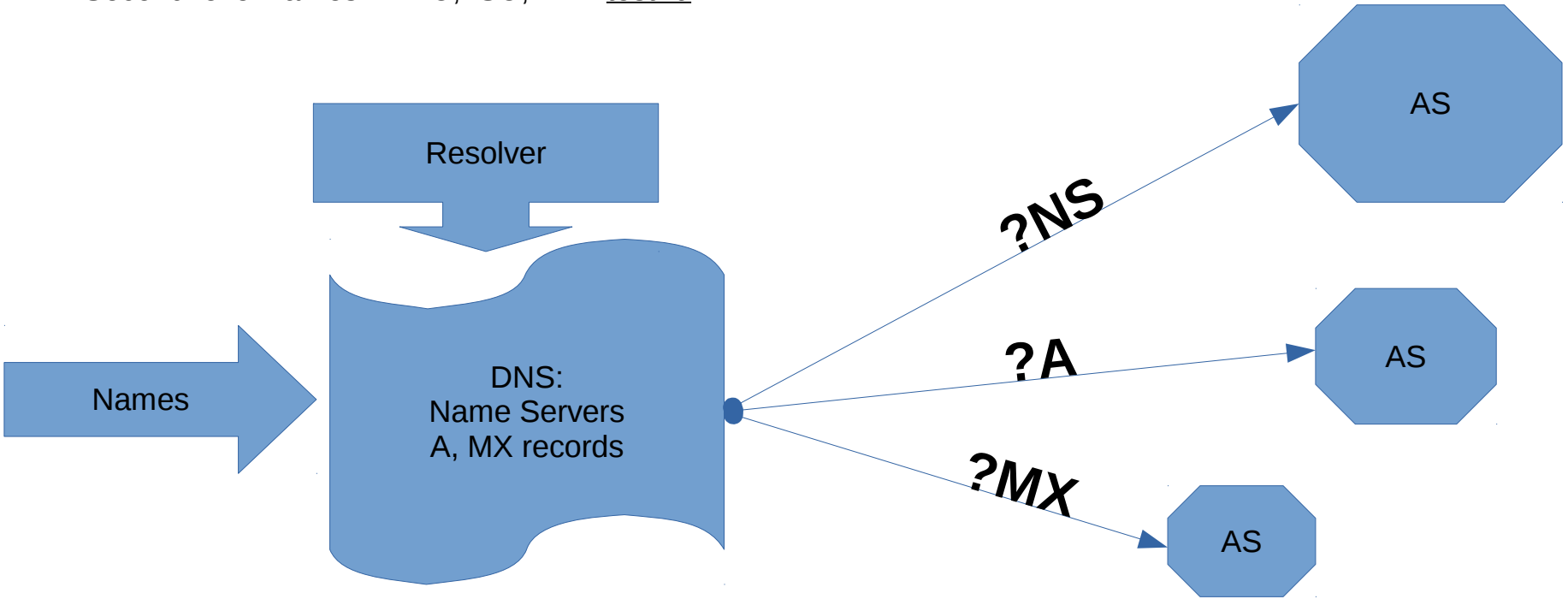
DNS and IP Addresses in RUnet

Александр Венедюхин, фонд “ИнДата”
Alexander Venedioukhin, InData Foundation

RIPE NCC Day Moscow, 2019

Scope and method

Second level names in .RU, .SU, .РФ: test.ru



Scope and method

Second level names in .RU, .SU, .РФ: test.ru

TEST.RU → NS.TEST.RU → A record → IP → AS

NS records Resolve Whois

TEST.RU → NS.EXAMPLE.COM → A record → IP → AS

EXAMPLE.COM → NS.EXAMPLE.NET → A record → IP → AS

Scope and method

Second level names in .RU, .SU, .РФ: test.ru

Hosts
NS

TEST.RU → NS.TEST.RU → A record → IP → AS

NS records

Resolve

Whois

TEST.RU → NS.EXAMPLE.COM → A record → IP → AS

EXAMPLE.COM → NS.EXAMPLE.NET → A record → IP → AS

Scope and method

Second level names in .RU, .SU, .РФ: test.ru

Hosts NS

TEST.RU → NS.TEST.RU → A record → IP → AS

NS records

Resolve

Whois

TEST.RU → NS.EXAMPLE.COM → A record → IP → AS

EXAMPLE.COM → NS.EXAMPLE.NET → A record → IP → AS

Indirect dependency

Scope and method

Second level names in .RU, .SU, .РФ: test.ru

TEST.RU → **A record** → **IP** → **AS**

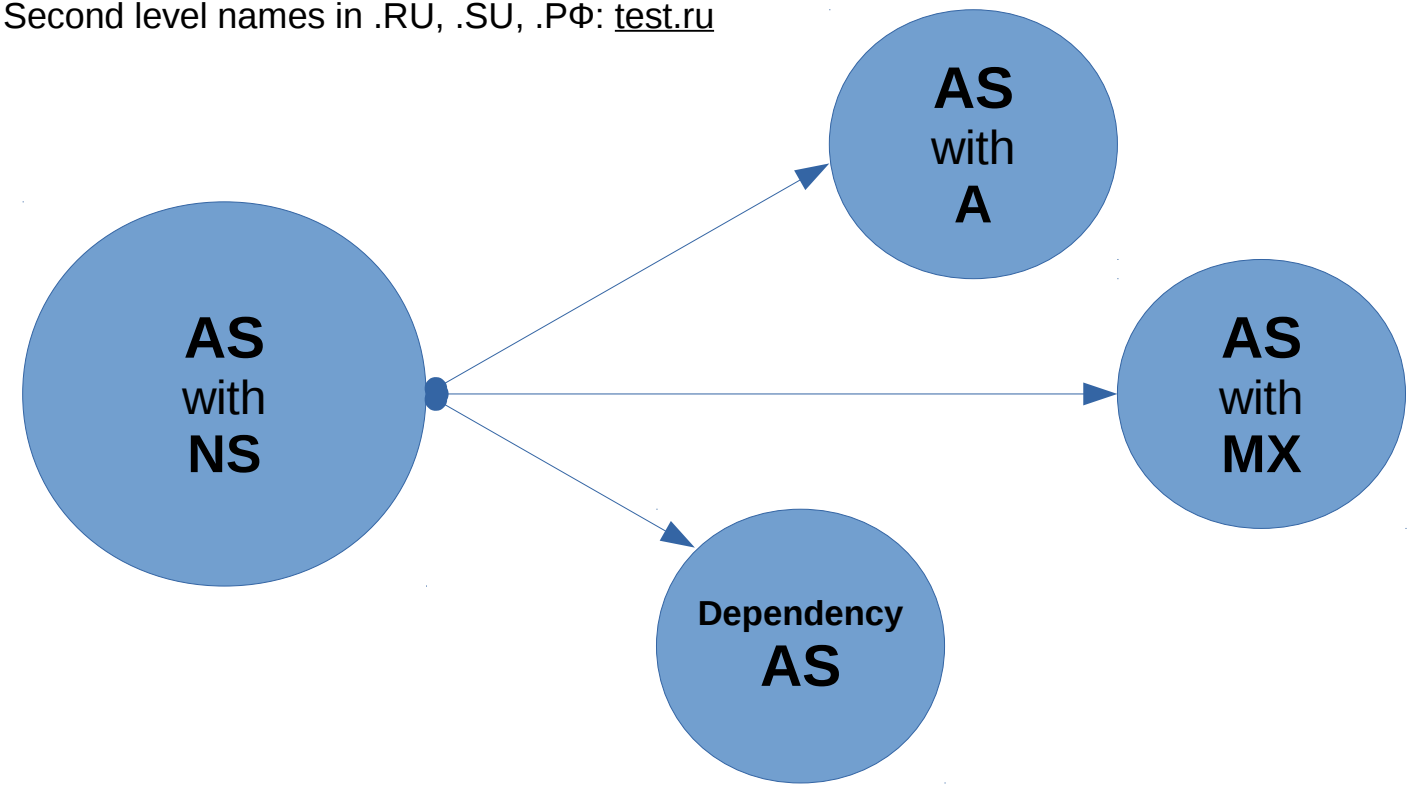
Resolve Whois

TEST.RU → **MX record** → **MX name** → **IP** → **AS**

Resolve Resolve Whois

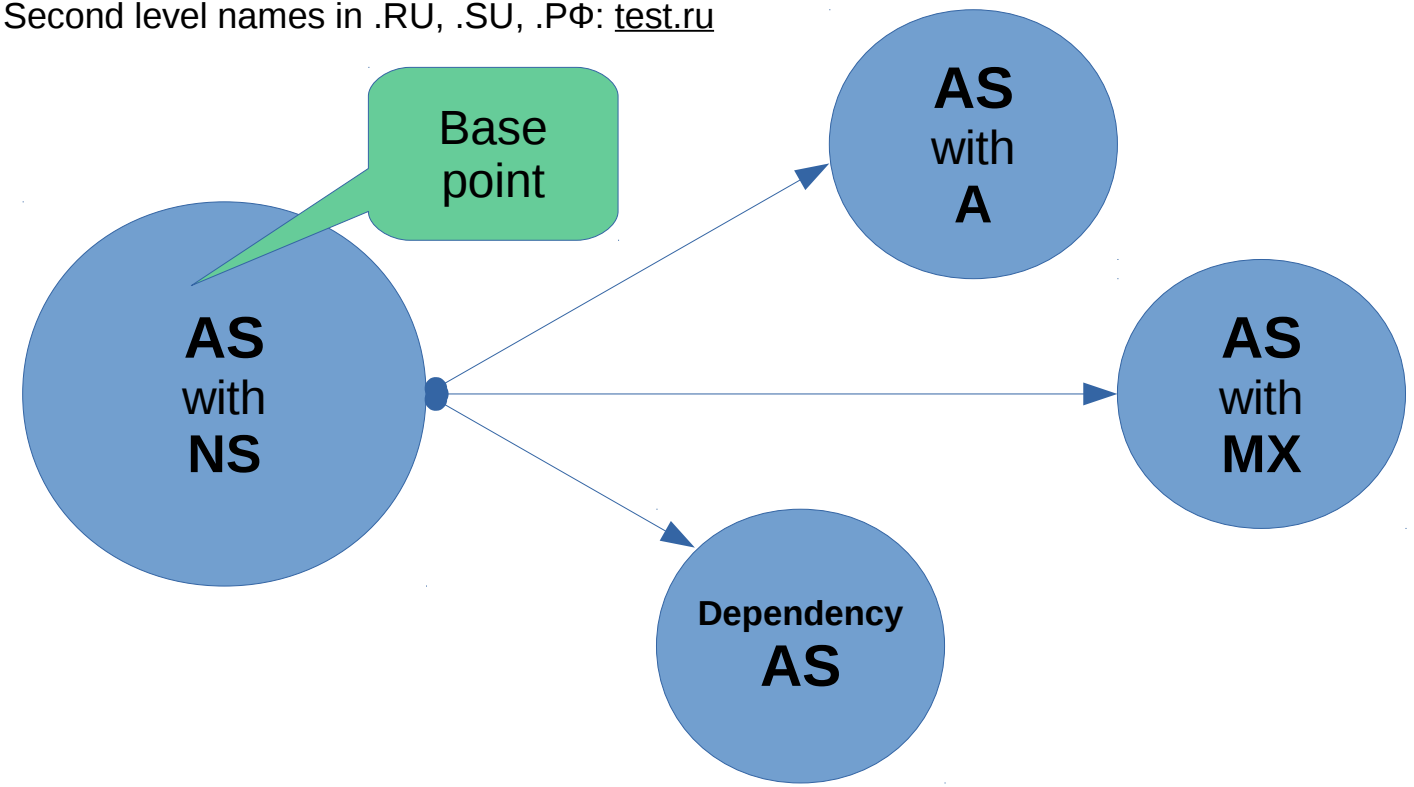
Scope and method

Second level names in .RU, .SU, .РФ: test.ru



Scope and method

Second level names in .RU, .SU, .РФ: test.ru



Scope and method

Data (not so big, **IPv4 only**):

- ~ **5.5 mln** zones (resolved to some records);
- ~ **471000** distinct IPs (**v4**, NS, MX, A records);
  about 11 names per IP (~ 280000 adrs for A records)
- ~ ***8500 AS;***
- ~ **100** *CountryCodes seen* (by Whois)*.*

AS rating 1 (TOP-13) by Name Servers

03/2019

by zones*NS count

	AS (description)	*Global routes / IX, RS routes (ididb.ru)*
1.	AS198610 (BEGET-AS)	10/8
2.	AS197695 (AS-REG)	31/15
3.	AS9123 (TIMEWEB-AS)	15/7
4.	AS48287 (RU-SERVICE-AS)	18/14
5.	**AS197540 (NETCUP-AS netcup GmbH)**	11/**nil**
6.	AS8342 (RTCOMM-AS)	14/10
7.	AS25532 (MASTERHOST-AS Moscow, Russia)	6/3
8.	AS5537 (RU-CENTER-AS)	6/4
9.	**AS16276 (OVH)**	10/1
10.	**AS24940 (HETZNER-AS)**	9/**nil**
11.	**AS13335 (CLOUDFLARENET - Cloudflare, Inc.)**	**358/6**
12.	AS50113 (SUPERSERVERSDATACENTER)	31/15
13.	AS13238 (YANDEX)	21/11

AS rating 2 (TOP-13) by Name Servers

03/2019

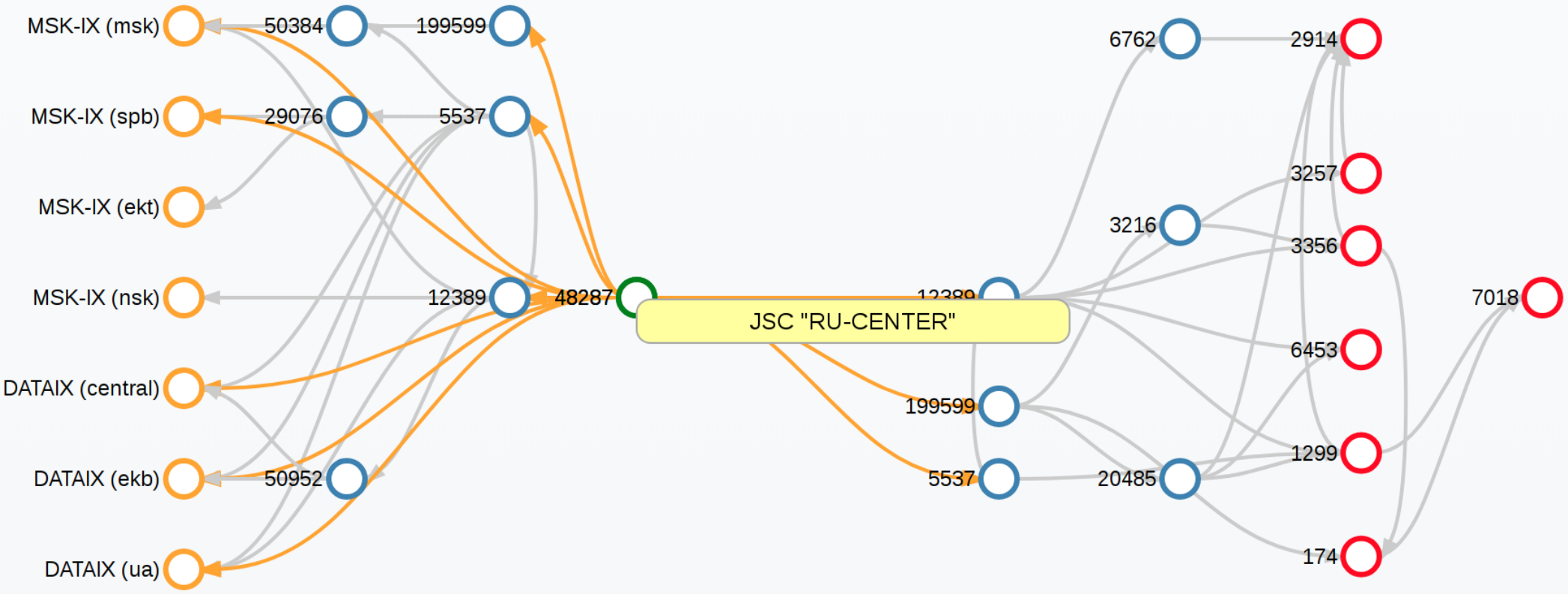
by zones

	AS (description)	*Zones, Global routes / IX, RS routes (ididb.ru)*
1.	AS197695 (AS-REG)	769777, 31/15
2.	AS48287 (RU-SERVICE-AS)	394637, 18/14
3.	AS198610 (BEGET-AS)	355902, 10/8
4.	AS50113 (SUPERSERVERSDATACENTER)	326542, 31/15
5.	**AS50245 (SERVEREL-AS)**	**296688, 7/nil**
6.	**AS197540 (NETCUP-AS netcup GmbH)**	**296144, 11/nil**
7.	AS9123 (TIMEWEB-AS)	294800, 15/7
8.	**AS24940 (HETZNER-AS)**	**282416, 9/nil**
9.	AS16276 (OVH)	270762, 10/1
10.	AS25532 (MASTERHOST-AS Moscow, Russia)	219825, 6/3
11.	AS5537 (RU-CENTER-AS)	201014, 6/4
12.	AS8342 (RTCOMM-AS)	184343, 14/10
13.	**AS13335 (CLOUDFLARENET - Cloudflare, Inc.)**	**174541, 358/6**

AS rating – BGP example: AS48287

04/2019

as seen on IDIDB.RU



AS rating (TOP-13) by indirect NS dependency

03/2019

dependent res.

AS (description)

1. AS198610 (BEGET-AS)
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3. AS9123 (TIMEWEB-AS)
4. AS197695 (AS-REG)
5. **AS13335 (CLOUDFLARENET - Cloudflare, Inc.)**
6. AS8342 (RTCOMM-AS)
7. **AS8391 (KNIPP-AS Martin-Schmeisser-Weg 9)**
8. **AS48519 (KNIPP-AMS-AS)**
9. AS25532 (MASTERHOST-AS Moscow, Russia)
10. AS5537 (RU-CENTER-AS)
11. AS49505 (SELECTEL)
12. **AS16276 (OVH)**
13. AS13238 (YANDEX)

AS rating (TOP-13) by indirect NS dependency

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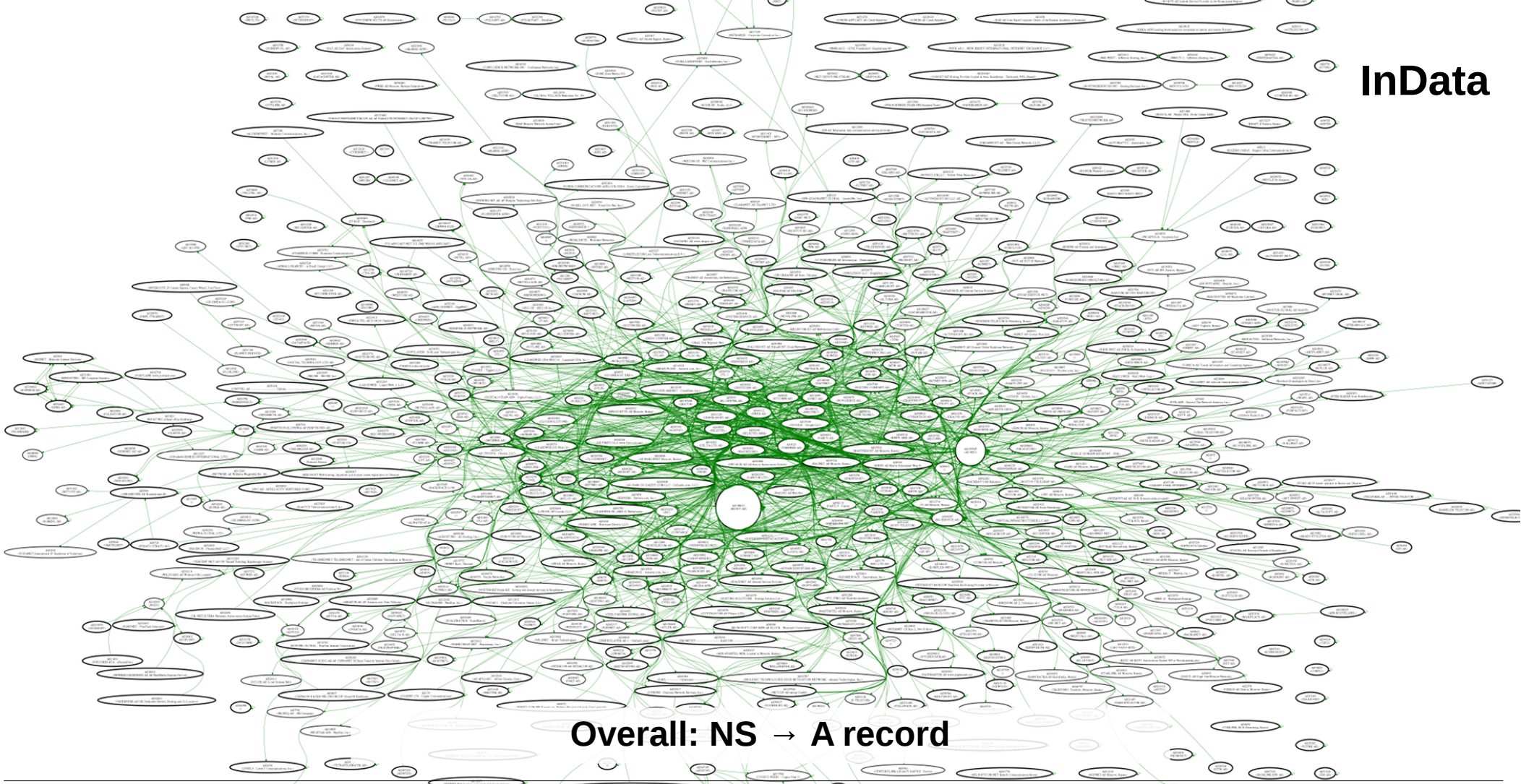
13. AS13238 (YANDEX)

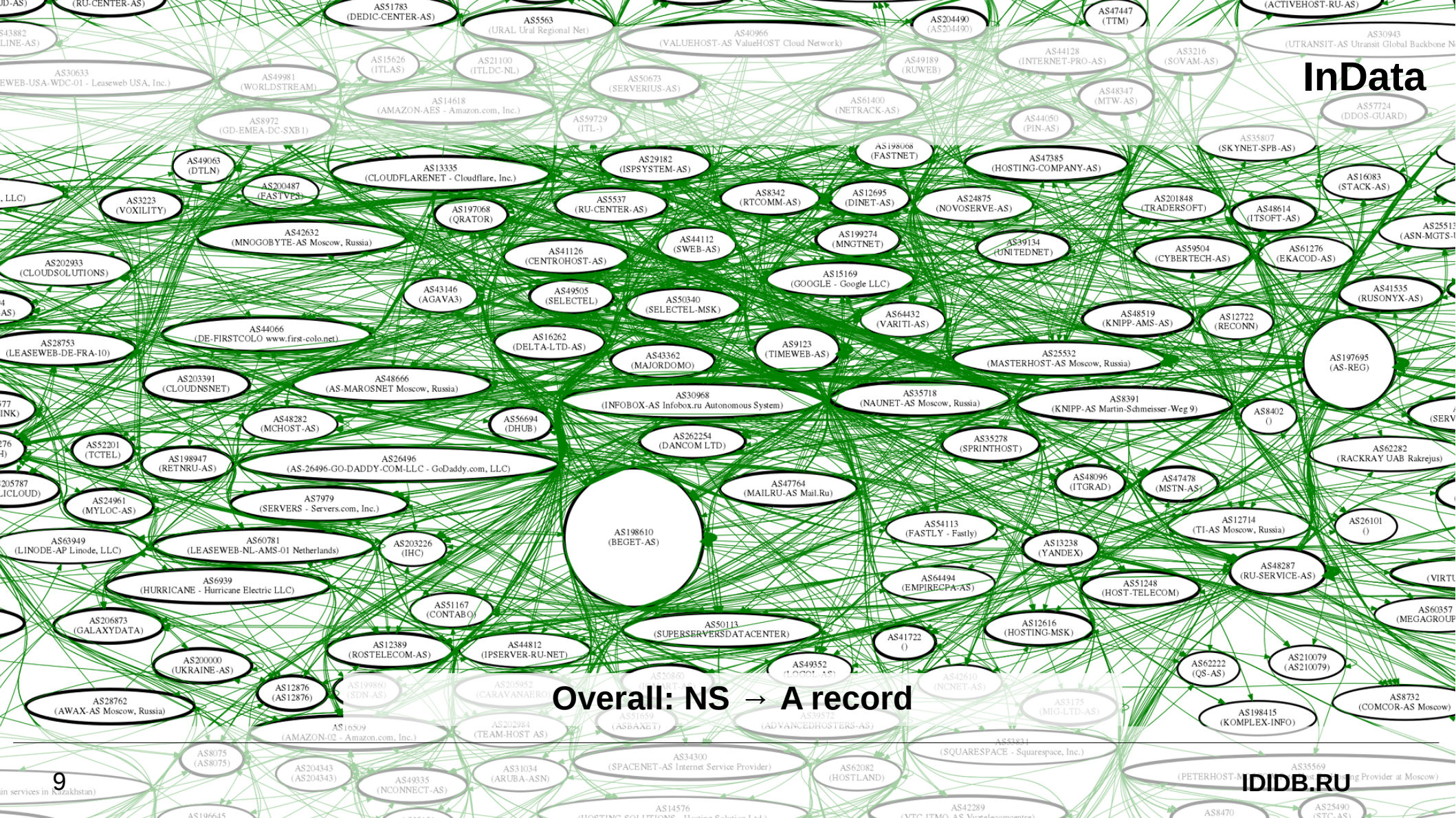
Mostly due to DNS hostings,
like:
ns1.example.com.,
ns2.example.com.,

- where example.com. is NS-hosted in target AS



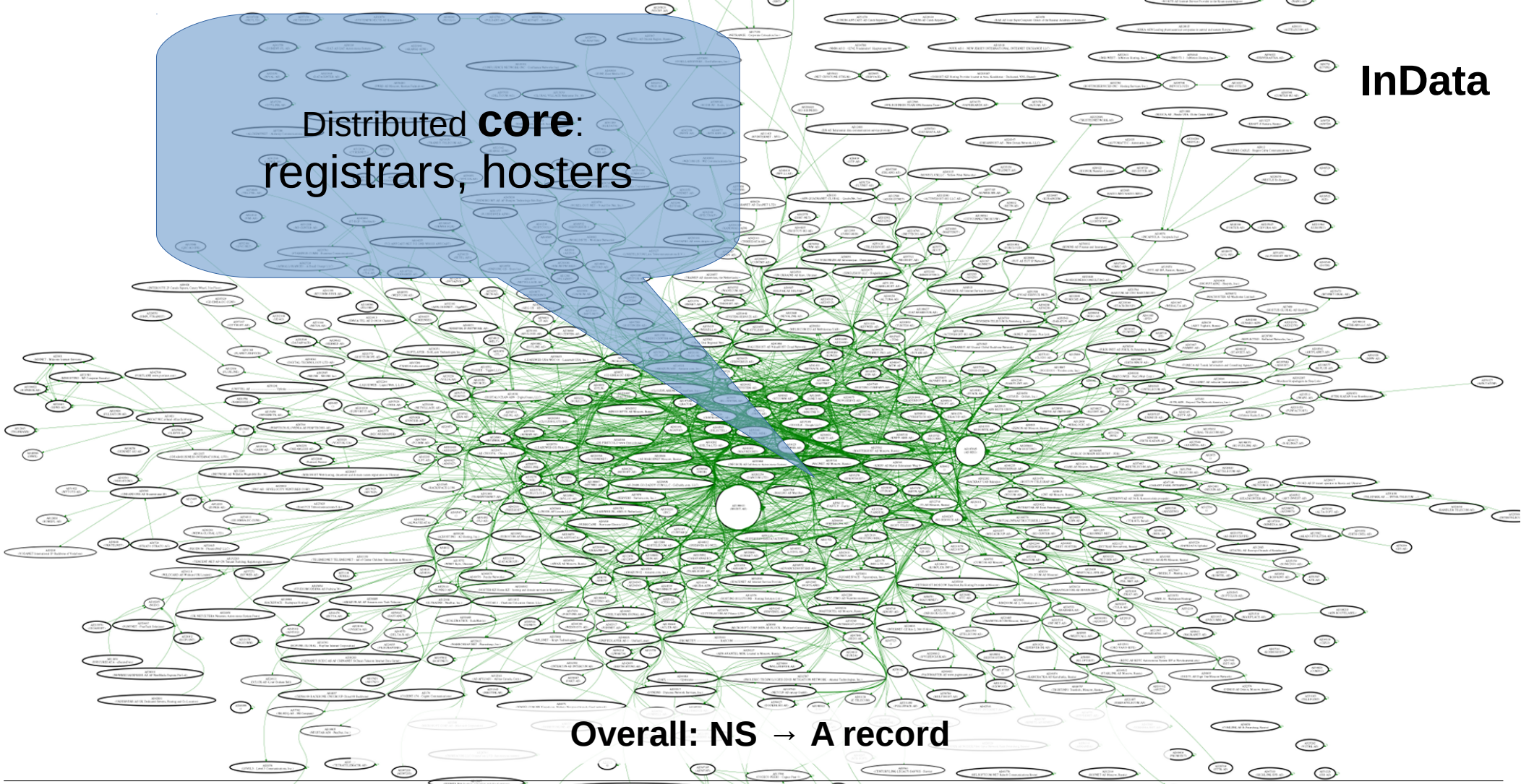
InData

Overall: NS → A record



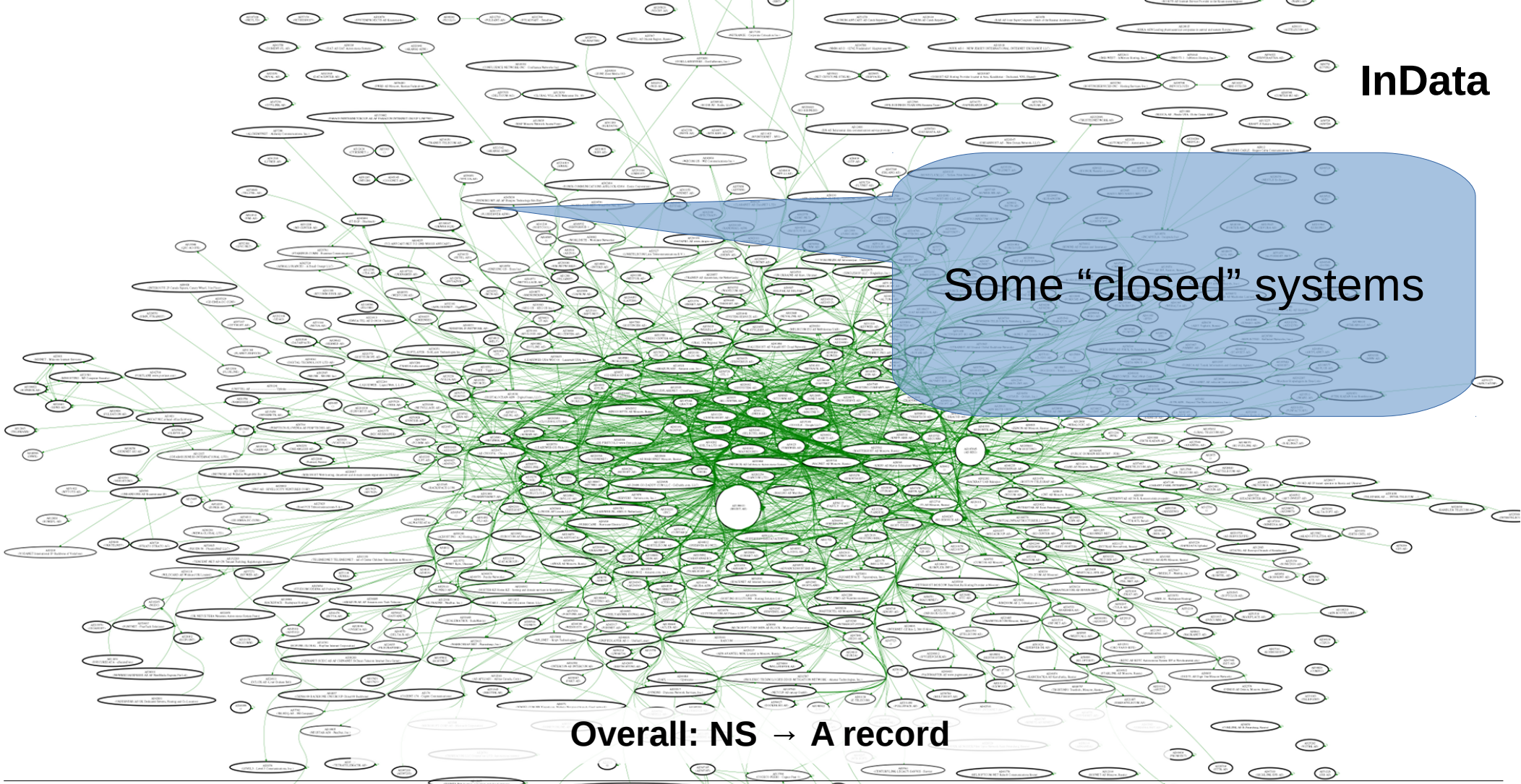
InData

Overall: NS → A record

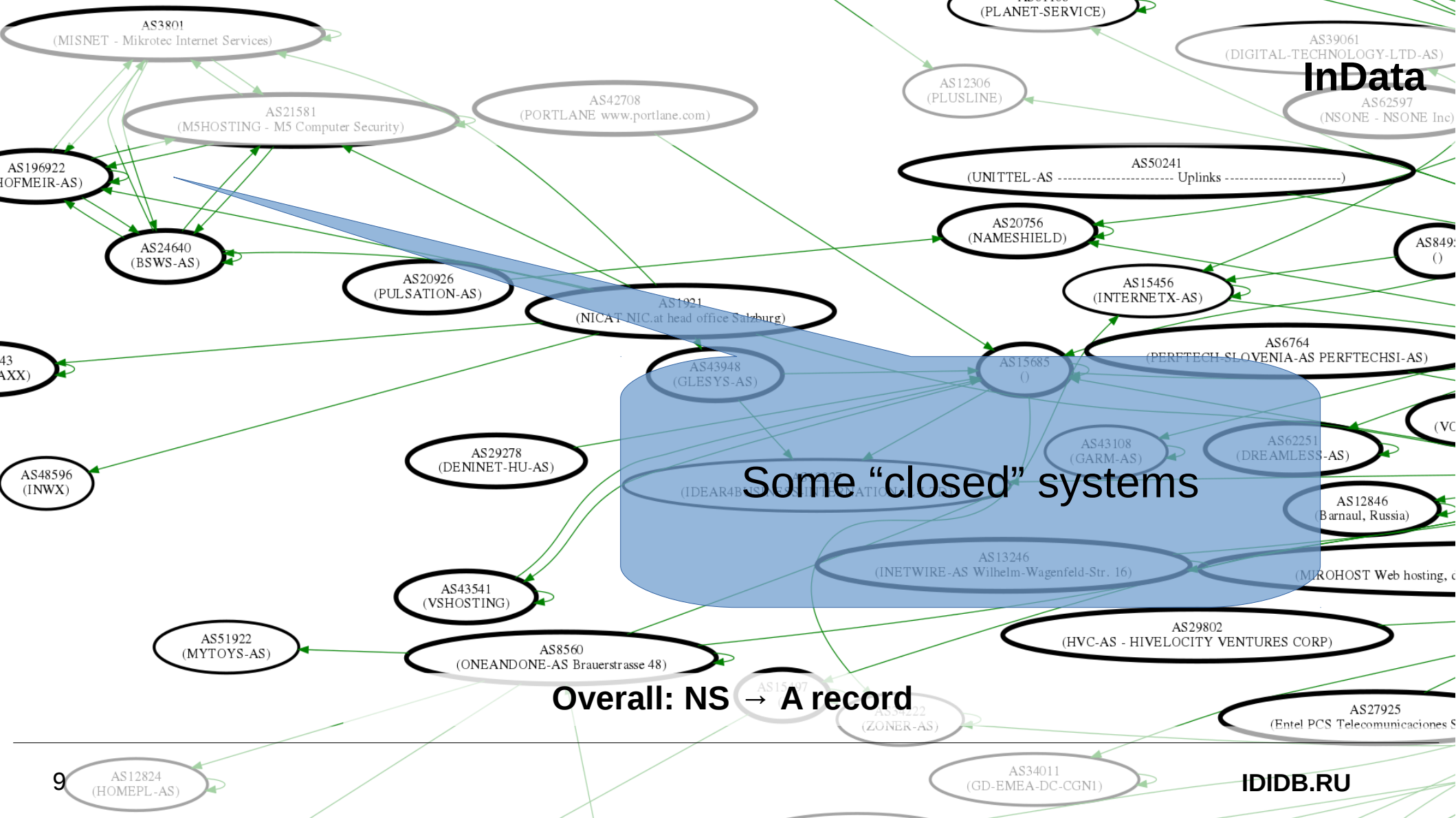


InData

Overall: NS → A record



Overall: NS → A record



InData

Some “closed” systems

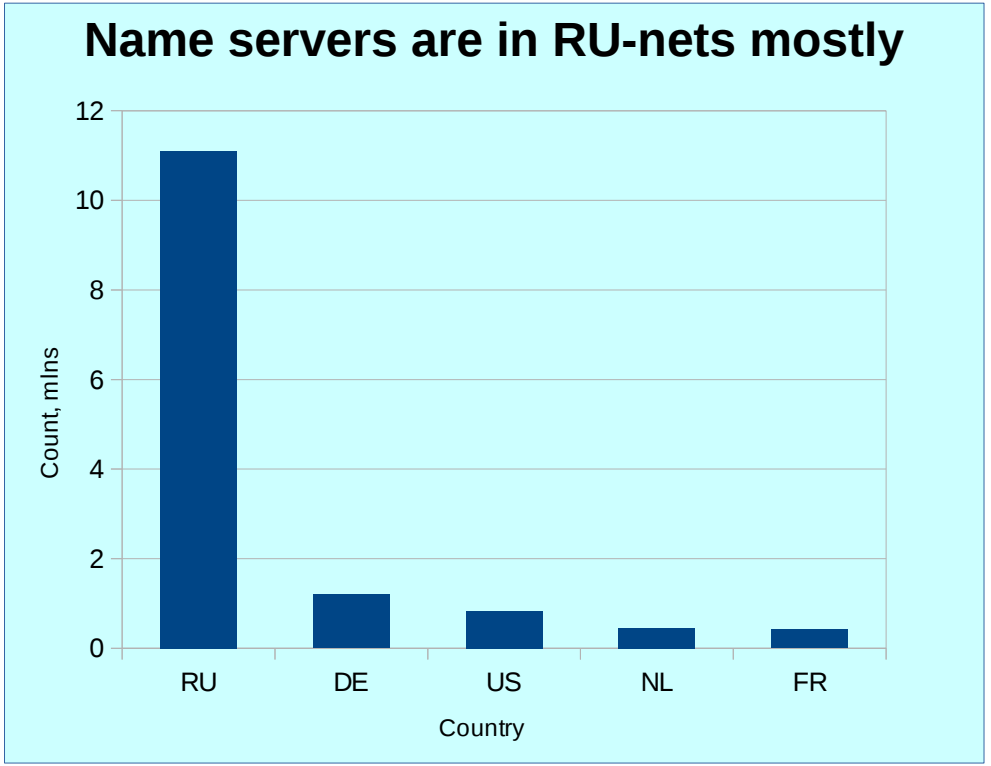
Overall: NS → A record

NS hosting by country (TOP-10)

Zones*AS*IP_count

~ 1.5 mln zones with foreign NS (27%)

1. RU, 11188595
2. DE, 1250465
3. US, 830429
4. NL, 458100
5. FR, 419867
6. UA, 126451
7. GB, 116229
8. BZ, 97929
9. BG, 67212
10. LT, 54639

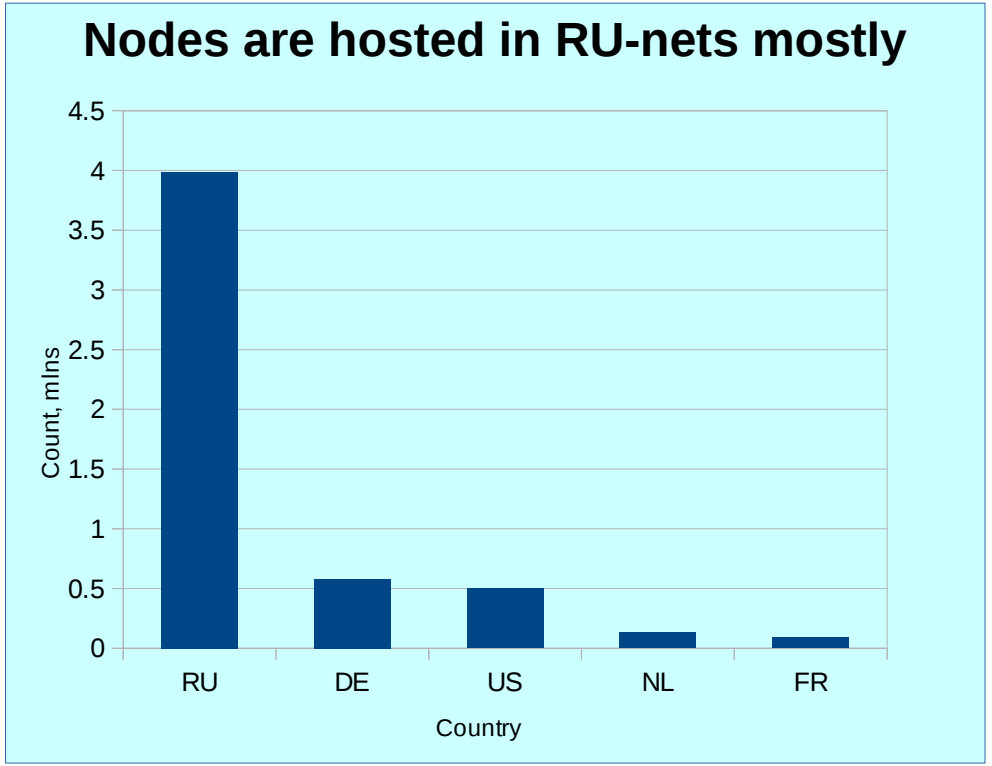


Hosting (DNS A) by country (TOP-10)

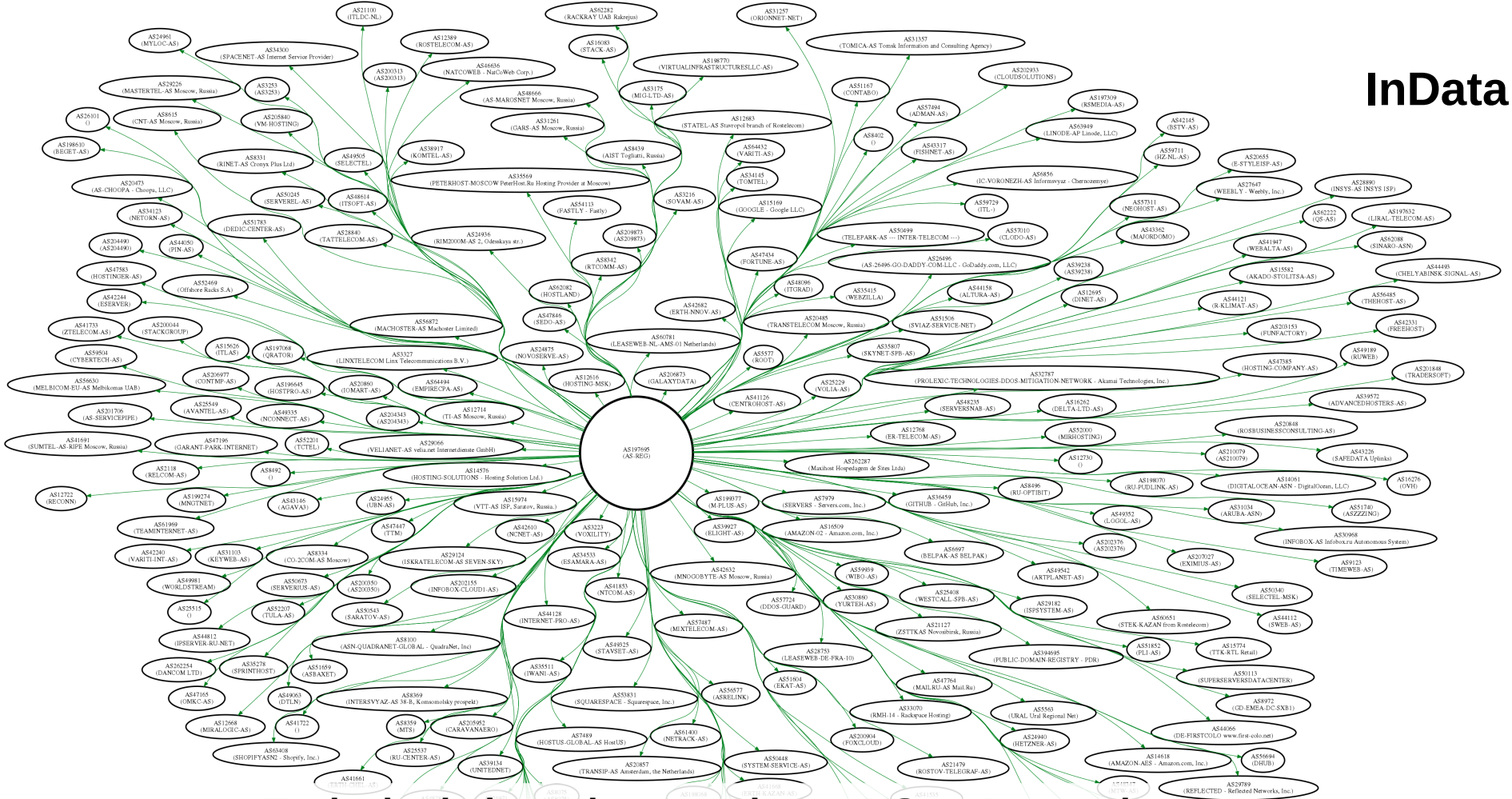
Zones*AS*IP_count

~ 1.2 mln zones with foreign A-target (22%)

1. RU, 3992486
2. DE, 577200
3. US, 501416
4. NL, 128963
5. FR, 87104
6. UA, 48764
7. EE, 36065
8. LT, 20630
9. GB, 16426
10. BG, 7110

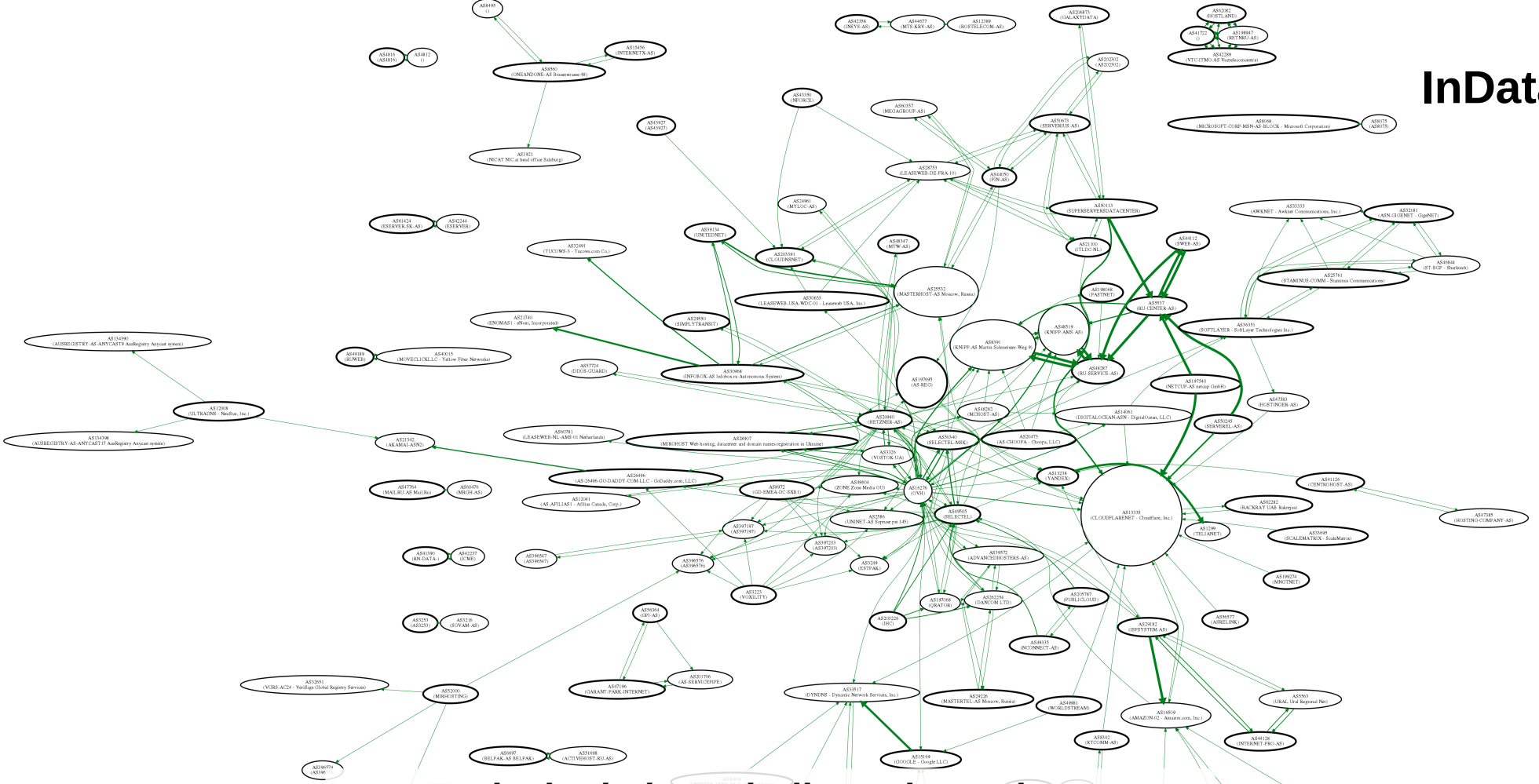


InData



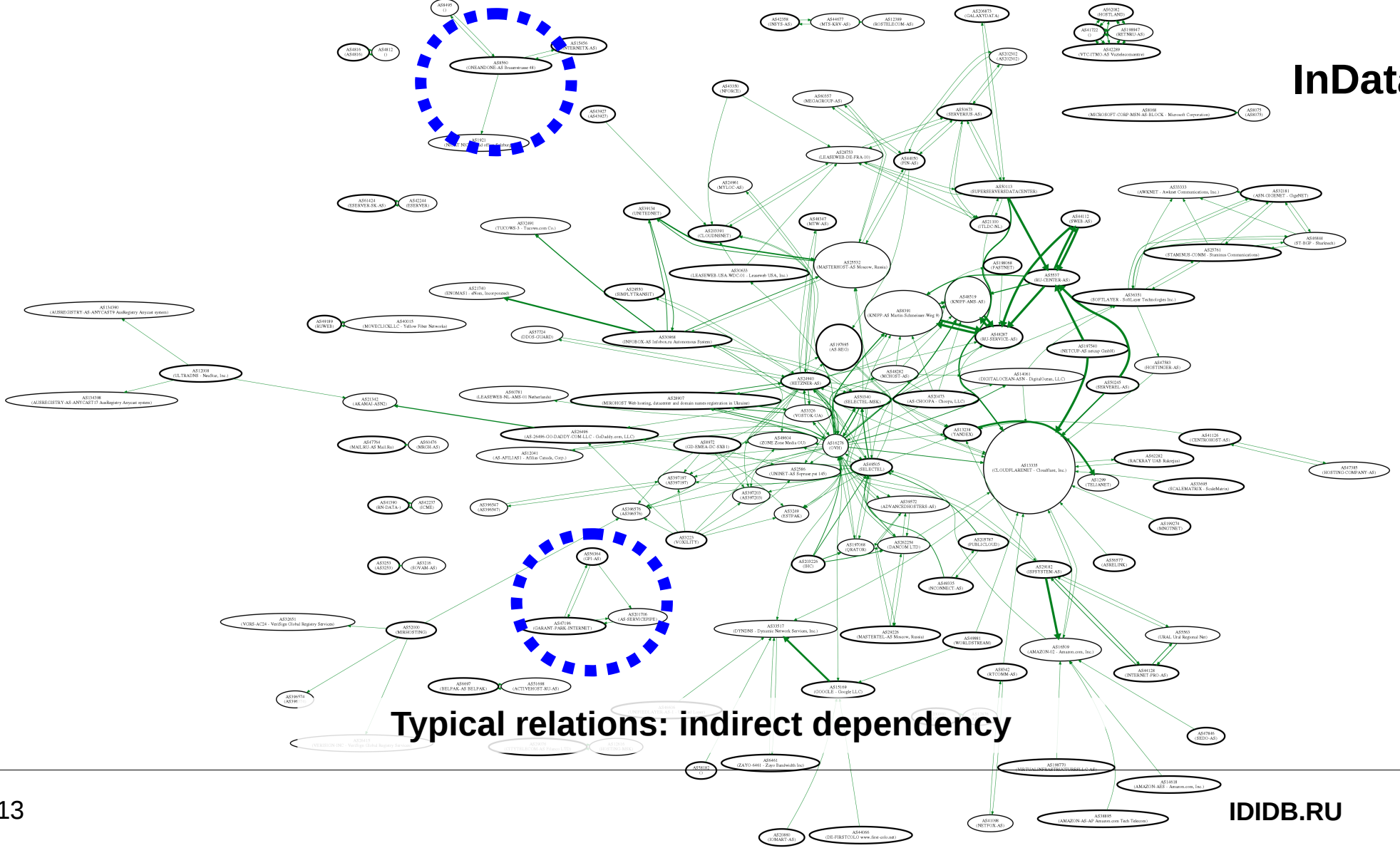
Typical relations: large registrar, NS → A record

InData



Typical relations: indirect dependency

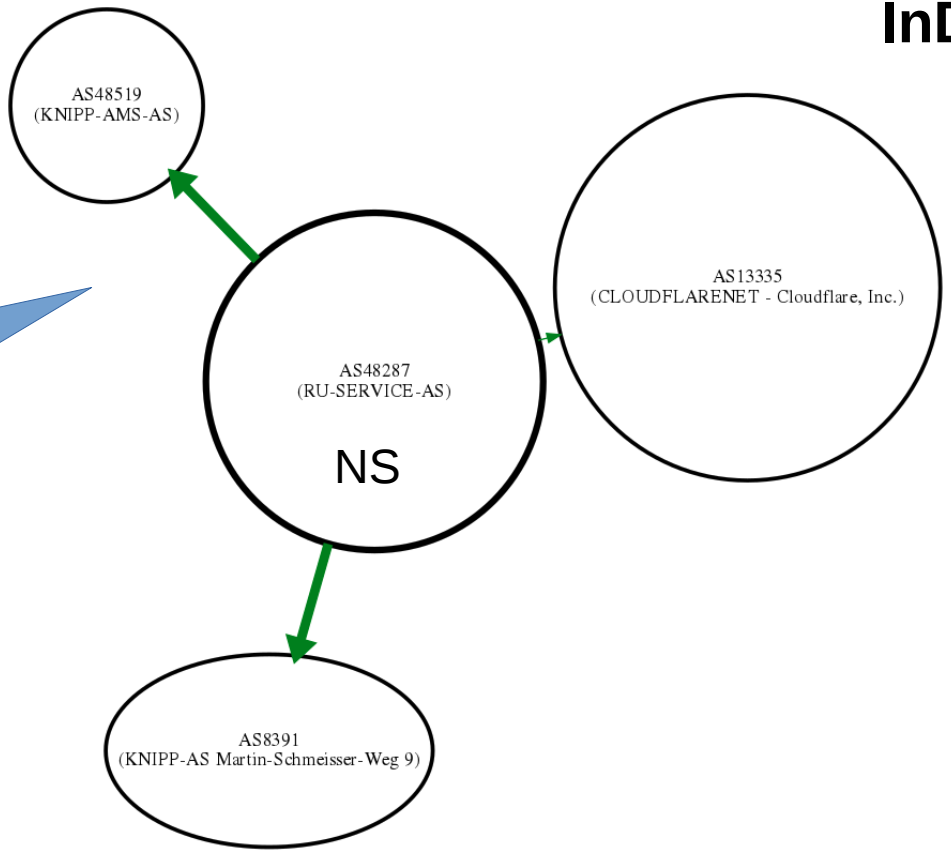
InData



Typical relations: indirect dependency

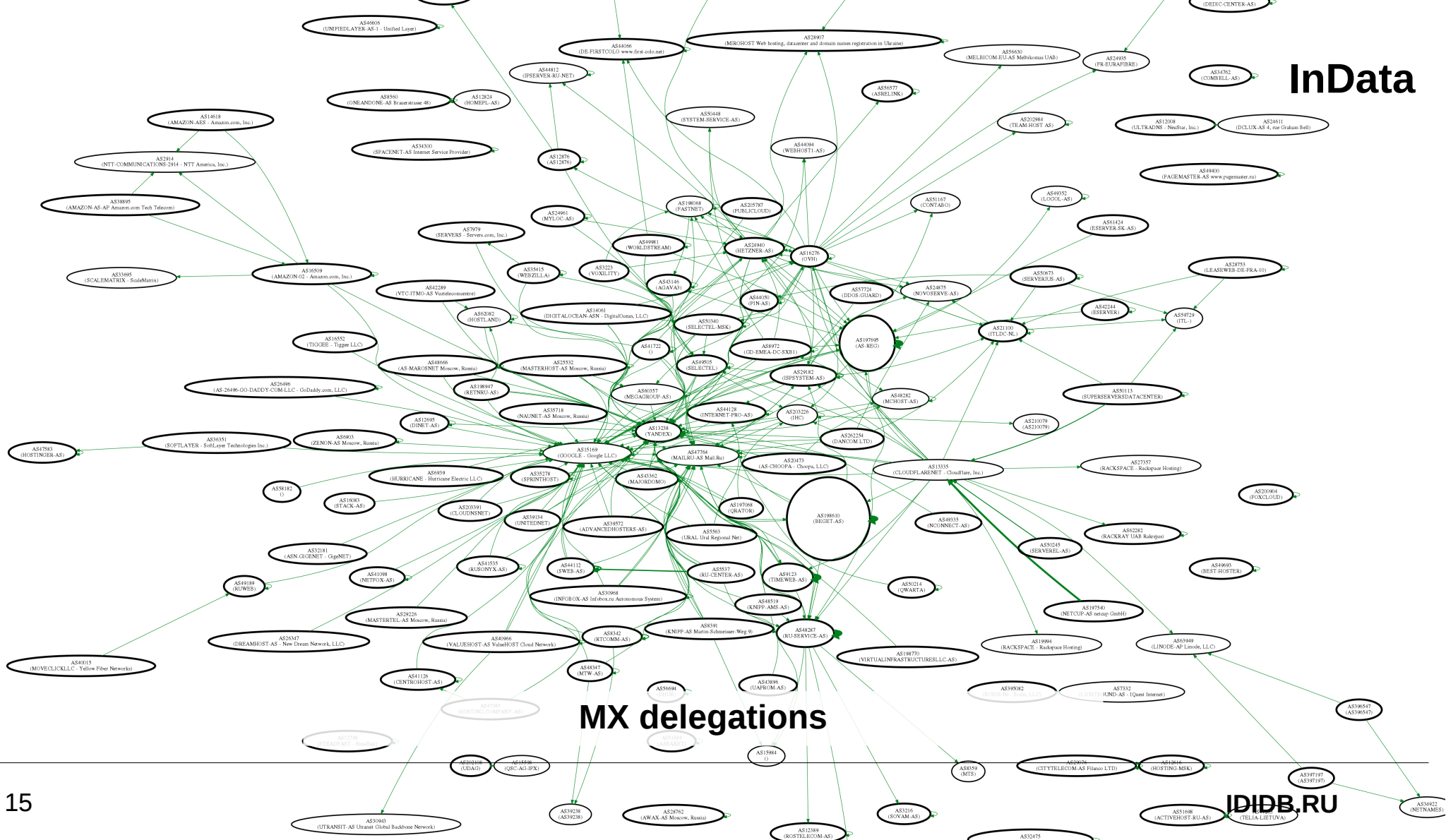
Hypothesis:

this is due to distributed/fail-over DNS



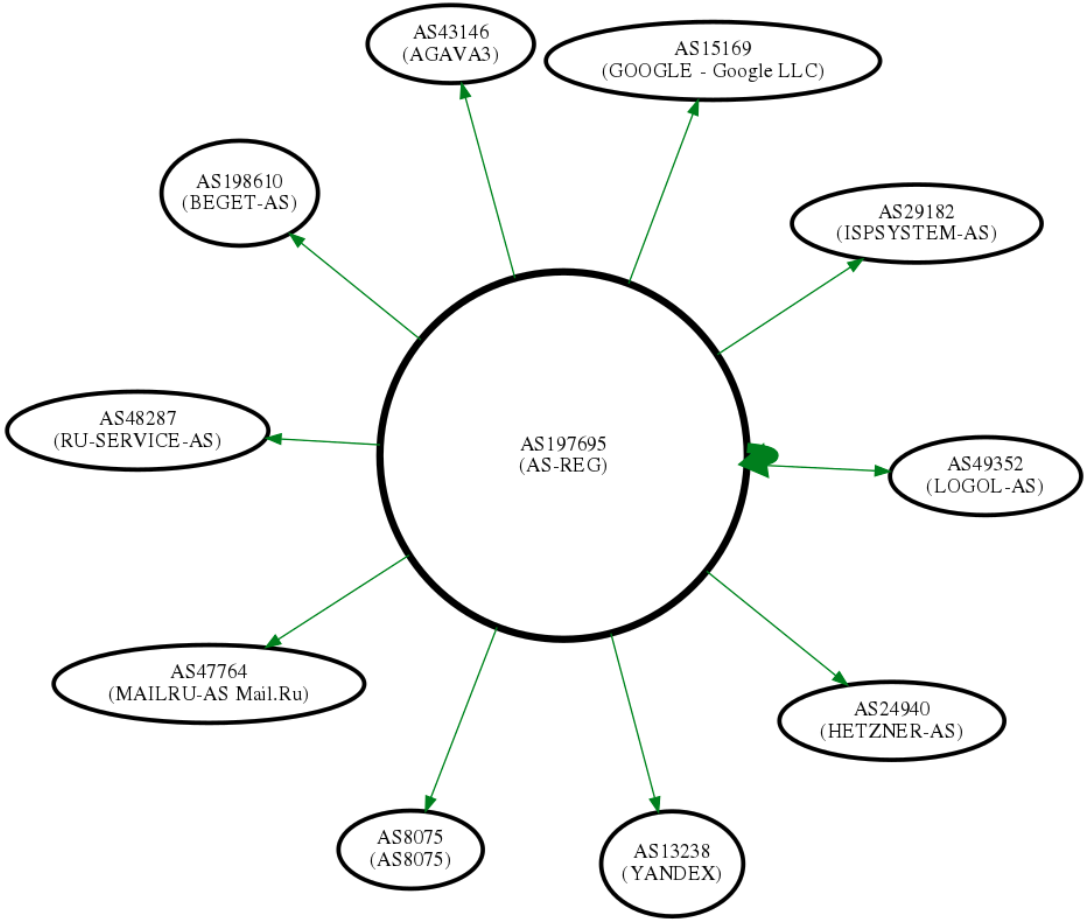
Simple indirect dependency example

InData



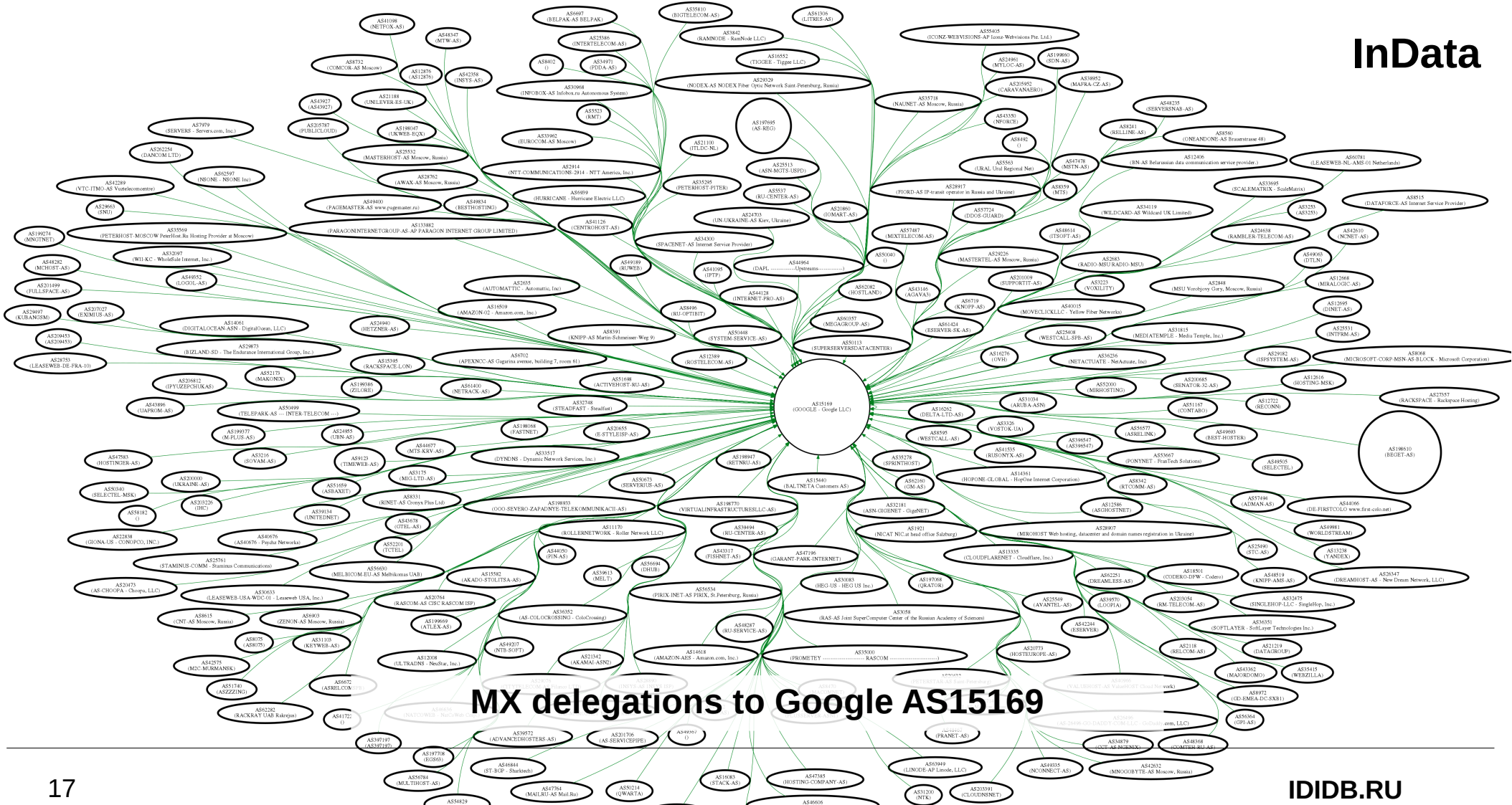
MX delegations

IDIDB.RU



MX delegations

InData


AS15169 (GOOGLE - Google LLC)
AS41098 (NETFOX-AS)
AS48347 (MTW-AS)
AS8732 (COMCOR-AS Moscow)
AS12876 (AS12876)
AS42358 (INSYS-AS)
AS21188 (UNILEVER-ES-UK)
AS43927 (AS43927)
AS205787 (PUBLICLOUD)
AS198047 (OKWEB-EQX)
AS7979 (SERVERS - Servers.com, Inc.)
AS262254 (DANCOM LTD)
AS52597 (NSONE - NSONE Inc)
AS42289 (VTC-ITMO-AS Vozteleocentre)
AS29663 (SNG)
AS199274 (MNGTNET)
AS35569 (PETERHOST-MOSCOW PeterHost.Ru Hosting Provider at Moscow)
AS32097 (WII-KC - WholeSale Internet, Inc.)
AS48282 (MCHOST-AS)
AS49552 (LOGOL-AS)
AS201699 (FULLSPACE-AS)
AS29497 (KUBANGSM)
AS207027 (EXIMIUS-AS)
AS28753 (LEASEWEB-DE-FRA-10)
AS209453 (AS209453)
AS29873 (BIZLAND-SD - The Endurance International Group, Inc.)
AS206812 (IPYUZEPCHUKAS)
AS43890 (UAPROM-AS)
AS47583 (HOSTINGER-AS)
AS50340 (SELECTEL-MSK)
AS58182 ()
AS22838 (GIONA-US - CONOPCO, INC.)
AS20473 (AS-CHOOPA - Choopa, LLC)
AS8615 (CNT-AS Moscow, Russia)
AS8075 (AS8075)
AS42575 (M2C-MURMANSK)
AS51741 (ASZZZING)
AS62282 (RACKRAY UAB Rakrejus)
AS6672 (ASREL.COM)
AS41722 ()
AS56697 (BELPAK-AS BELPAK)
AS25386 (INTERTELECOM-AS)
AS8402 ()
AS34971 (PDDA-AS)
AS30968 (INFOBOX-AS Infobox.ru Autonomous System)
AS5523 (RMT)
AS53962 (EUROCOM-AS Moscow)
AS25532 (MASTERHOST-AS Moscow, Russia)
AS28762 (AWAX-AS Moscow, Russia)
AS49400 (PAGEMASTER-AS www.pagemaster.ru)
AS49834 (BESTHOSTING)
AS133882 (PARAGONINTERNETGROUP-AS-AP PARAGON INTERNET GROUP LIMITED)
AS2914 (NTT-COMMUNICATIONS-2914 - NTT America, Inc.)
AS6939 (HURRICANE - Hurricane Electric LLC)
AS41126 (CENTKOHOST-AS)
AS49189 (RUWEB)
AS2635 (AUTOMATTIC - Automattic, Inc)
AS16509 (AMAZON-02 - Amazon.com, Inc.)
AS8496 (RU-OPTIBIT)
AS24940 (HETZNER-AS)
AS15395 (RACKSPACE-LON)
AS52175 (MAKONIX)
AS199385 (ZILORE)
AS61400 (NETRACK-AS)
AS51698 (ACTIVEHOST-RU-AS)
AS32748 (STEADFAST - Steadfast)
AS20655 (E-STYLEISP-AS)
AS198084 (FASTNET)
AS199377 (M-PLUS-AS)
AS24955 (UBN-AS)
AS44677 (MTS-KRV-AS)
AS9123 (TIMEWEB-AS)
AS3216 (SOVAM-AS)
AS3175 (MIG-LTD-AS)
AS230000 (UKRAINE-AS)
AS51659 (ASBAXET)
AS203226 (IHC)
AS39134 (UNITEDNET)
AS43678 (GTEL-AS)
AS40676 (AS40676 - Psychz Networks)
AS52201 (TCTEL)
AS25761 (STAMINUS-COMM - Staminus Communications)
AS56630 (MELBICOM-EU-AS Melbikomas UAB)
AS30633 (LEASEWEB-USA-WDC-01 - Leaseweb USA, Inc.)
AS20764 (RASCOM-AS CJSC RASCOM ISP)
AS9003 (ZENON-AS Moscow, Russia)
AS31103 (KEYWEB-AS)
AS12208 (ULTRADNS - NeuStar, Inc.)
AS35000 (PROMETEY ---------- RASCOM ----------)
AS14618 (AMAZON-AES - Amazon.com, Inc.)
AS21342 (AKAMAI-ASN2)
AS49207 (NTB-SOFT)
AS8287 (RU-SERVICE-AS)
AS199669 (ATLEX-AS)
AS36352 (AS-COLOCROSSING - ColoCrossing)
AS6058 (RAS-AS Joint SuperComputer Center of the Russian Academy of Sciences)
AS56534 (PIRIX-INET-AS PIRIX, St.Petersburg, Russia)
AS56694 (DHUB)
AS30613 (MELT)
AS15582 (AKADO-STOLITSA-AS)
AS44050 (PIN-AS)
AS43317 (FISHNET-AS)
AS39494 (RU-CENTER-AS)
AS47196 (GARANT-PARK-INTERNET)
AS30083 (HEG-US - HEG US Inc.)
AS197068 (QRATOR)
AS111170 (ROLLERNETWORK - Roller Network LLC)
AS198933 (OOO-SEVERO-ZAPADNYE-TELEKOMMUNIKACII-AS)
AS198770 (VIRTUALINFRASTRUCTURESLLC-AS)
AS33517 (DYNDNS - Dynamic Network Services, Inc.)
AS198947 (RETNRU-AS)
AS50673 (SERVERIUS-AS)
AS8331 (RINET-AS Oniyx Plus Ltd)
AS15440 (BALTNETA Customers AS)
AS35810 (BIGTELECOM-AS)
AS3842 (RAMNODE - RamNode LLC)
AS16552 (TIGGEE - Tiggee LLC)
AS29329 (NODEX-AS NODEX Fiber Optic Network Saint-Petersburg, Russia)
AS197695 (AS-REG)
AS21100 (ITLDC-NL)
AS25513 (ASN-MGTS-LSPD)
AS35295 (PETERHOST-PITER)
AS5537 (RU-CENTER-AS)
AS24703 (UN-UKRAINE-AS Kiev, Ukraine)
AS3300 (SPACENET-AS Internet Service Provider)
AS44964 (DAPL ----------Upstreams----------)
AS41095 (IPTP)
AS44128 (INTERNET-PRO-AS)
AS56357 (MEGAGROUP-AS)
AS50448 (SYSTEM-SERVICE-AS)
AS12389 (ROSTELECOM-AS)
AS51113 (SUPERSERVERSDATACENTER)
AS20860 (IOMART-AS)
AS62082 (HOSTLAND)
AS34146 (AGAVA3)
AS57487 (MIXTELECOM-AS)
AS50040 ()
AS29182 (ISPSYSTEM-AS)
AS8068 (MICROSOFT-CORP-MSN-AS-BLOCK - Microsoft Corporation)
AS12616 (HOSTING-MSK)
AS57757 (RACKSPACE - Rackspace Hosting)
AS198610 (BEGET-AS)
AS44066 (DE-FIRSTCOLO www.first-colo.net)
AS49981 (WORLDSTREAM)
AS13238 (YANDEX)
AS26347 (DREAMHOST-AS - New Dream Network, LLC)
AS48519 (KNIPP-AMS-AS)
AS32475 (SINGLEHOP-LLC - SingleHop, Inc.)
AS36351 (SOFTLAYER - SoftLayer Technologies Inc.)
AS21219 (DATAGROUP)
AS35415 (WEBZILLA)
AS8972 (CD-EMEA-DC-SXB1)
AS56564 (GPI-AS)
AS48368 (COMTEH-RU-AS)
AS42632 (MNOGOBYTE-AS Moscow, Russia)
AS49335 (NCONNECT-AS)
AS203391 (CLOUDINSENET)
AS31200 (NTK)
AS63949 (LINODE-AP Linode, LLC)
AS34879 (FOTE-AF-NCHENNY)
AS55405 (ICONZ-WEBVISIONS-AP Iconz-Webvisions Pte. Ltd.)
AS24961 (MYLOC-AS)
AS199861 (SDN-AS)
AS205952 (CARAVANAERO)
AS38952 (MAFRA-CZ-AS)
AS35718 (NAUNET-AS Moscow, Russia)
AS43350 (NFORCE)
AS48235 (SERVERSNAB-AS)
AS8241 (BELLINE-AS)
AS8560 (ONEANDONE-AS Brauerstrasse 48)
AS8492 ()
AS12406 (BN-AS Belarussian data communication service provider.)
AS60781 (LEASEWEB-NL-AMS-01 Netherlands)
AS5563 (URAL Ural Regional Net)
AS47478 (MSTN-AS)
AS29917 (FIORD-AS IP-transit operator in Russia and Ukraine)
AS8359 (MTS)
AS33695 (SCALEMATRIX - ScaleMatrix)
AS8515 (DATAFORCE-AS Internet Service Provider)
AS34119 (WILDCARD-AS Wildcard UK Limited)
AS3253 (AS3253)
AS57724 (DDOS-GUARD)
AS48614 (ITSOFT-AS)
AS24638 (RAMBLER-TELECOM-AS)
AS42610 (NCNET-AS)
AS32926 (MASTERTEL-AS Moscow, Russia)
AS2083 (RADIO-MSU RADIO-MSU)
AS49203 (DTLN)
AS201009 (SUPPORTIT-AS)
AS3223 (VOXILITY)
AS2848 (MSU Vorobjovy Gory, Moscow, Russia)
AS12668 (MIRALOGIC-AS)
AS6719 (KNOPP-AS)
AS40015 (MOVECLICKLLC - Yellow Fiber Networks)
AS12695 (DINET-AS)
AS61424 (ESERVER-SK-AS)
AS25408 (WESTCALL-SPB-AS)
AS31815 (MEDIATEMPLE - Media Temple, Inc.)
AS25531 (INTFRM-AS)
AS10270 (OVH)
AS35236 (NETACTUATE - NetActuate, Inc)
AS52000 (MIKHOSTING)
AS200685 (SENATOR-32-AS)
AS17722 (REONN)
AS11107 (CONTABO)
AS31034 (ARUBA-ASN)
AS16262 (DELTA-LTD-AS)
AS3326 (VOSTOK-UA)
AS8595 (WESTCALL-AS)
AS56577 (ASRELINK)
AS49693 (BEST-HOSTER)
AS396547 (AS396547)
AS14535 (RUSONYX-AS)
AS35278 (SPRONTHOST)
AS55667 (PONYNET - PranTech Solutions)
AS49505 (SELECTEL)
AS14361 (HOPONE-GLOBAL - HopOne Internet Corporation)
AS62160 (GM-AS)
AS8342 (RTCOMM-AS)
AS57494 (AJMAN-AS)
AS32181 (ASN-GIGENET - GigeNET)
AS12586 (ASGHOSTNET)
AS1921 (NICAT NIC at head office Salzburg)
AS28907 (MIROHOST Web hosting, datacenter and domain names registration in Ukraine)
AS13335 (CLOUDFLARENET - Cloudflare, Inc.)
AS25490 (STC-AS)
AS62551 (DREAMLESS-AS)
AS18501 (CODERO-DFW - Codero)
AS203054 (RM-TELECOM-AS)
AS39570 (LLOPIA)
AS25549 (AVANTEL-AS)
AS42244 (ESERVER)
AS20773 (HOSTEUROPE-AS)
AS118 (RELCOM-AS)
AS43362 (MAJORDOMO)
AS39572 (ADVANCEDHOSTERS-AS)
AS201706 (AS-SERVICEPIPE)
AS49367 ()
AS197197 (AS197197)
AS197708 (EG563)
AS46844 (ST-BGP - Sharktech)
AS56784 (MULTIHOST-AS)
AS54829 (NYITX - NYITX)
AS47764 (MAILRU-AS Mail.Ru)
AS50214 (QWARTA)
AS19083 (STACK-AS)
AS47385 (HOSTING-COMPANY-AS)
AS46606 (UNIFIEDLAYER-AS-1 - Unified Layer)
AS201826 (ERA-TELECOM)
MX delegations to Google AS15169

AS rating (TOP-13) by NS with **valid** **DNSSEC**

Names*NS

1. AS8342 (RTCOMM-AS), 7425
2. **AS13335 (CLOUDFLARENET - Cloudflare, Inc.), 1090**
3. **AS16509 (AMAZON-02 - Amazon.com, Inc.), 488**
4. AS48287 (RU-SERVICE-AS), 388
5. AS197695 (AS-REG), 196
6. **AS8391 (KNIPP-AS Martin-Schmeisser-Weg 9), 64**
7. **AS48519 (KNIPP-AMS-AS), 63**
8. **AS15169 (GOOGLE - Google LLC), 62**
9. **AS14061 (DIGITALOCEAN-ASN - DigitalOcean, LLC), 52**
10. **AS8315 (AMSIO), 44**
11. **AS24940 (HETZNER-AS), 41**
12. AS49810 (KTTRADE-AS), 40
13. AS50113 (SUPERSERVERSDATACENTER), 24

.RU, .SU, .РФ
DNSSEC

Zones:	**3821**
Valid:	**3512**

DATA SOURCES:

RIPE DB – AS data, IP prefixes, Whois, descriptions;

IDIDB.RU – IP ranges, routing, AS-related data, AS “geolocation”, DNS-data;

STATDOM.RU – Domain stats (Technical Center of Internet);

IP2ASN.COM – ASNs, Country Codes, IP ranges;

TOOLS:

Go, Perl, GraphViz.

DNS and IP Addresses in RUnet

THANK YOU!

Questions?

Александр Венедюхин, фонд “ИнДата”
Alexander Venedioukhin, InData Foundation

https://ididb.ru/

vened@indata.org.ru.