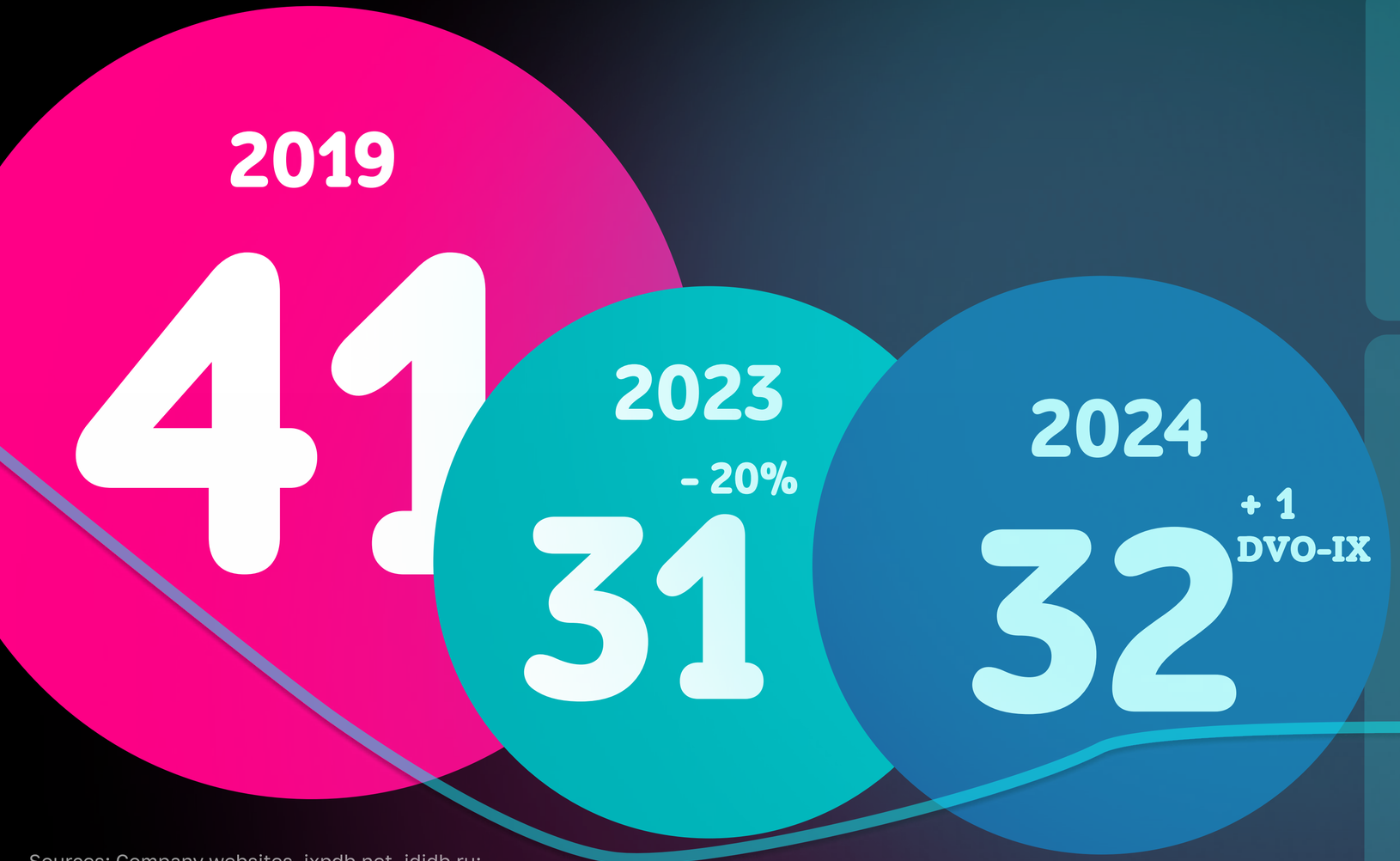
New IXP as an option to improve regional connectivity. DVO-IX born story.

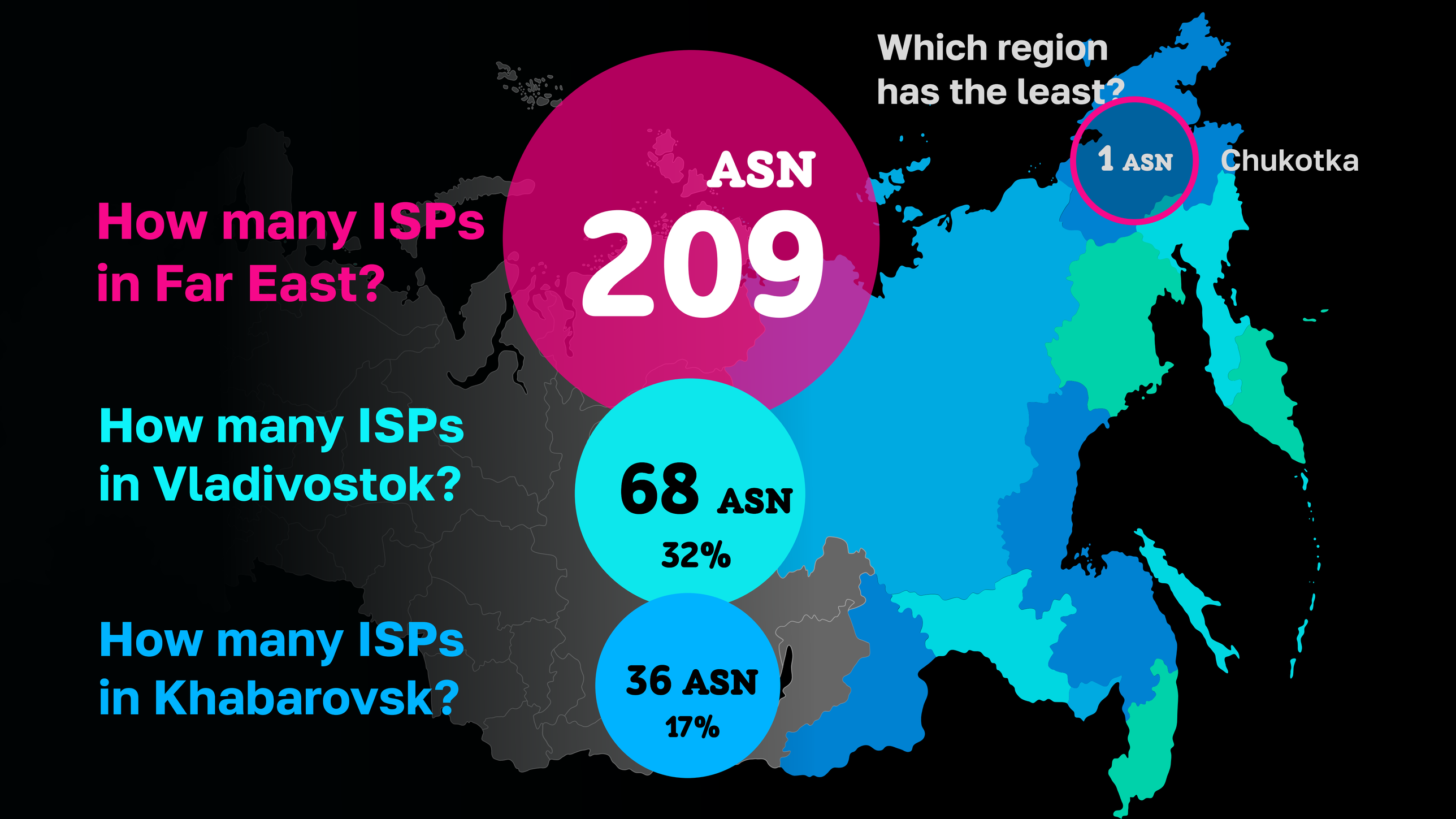
Roman Zelinsky, IHome

IXPs of the Russian Federation



Allocated IXP	1	Data-IX	St Petersburg
	2	Piter-IX	St Petersburg
	3	W-IX (Home IX)	Moscow
	4	Cloud-IX	Moscow
Region IXP	5	Eurasia-Peering IX	Moscow
	6	SFO-IX	Barnaul
	7	Sea-IX	Krasnodar
	8	SIBIR-IX	Krasnoyarsk
	9	M-IX	Simferopol
	10	RED-IX (KRS-IX)	Krasnoyarsk
	11	BAIKAL-IX	Irkutsk
	12	RB-IX	Yekaterinburg
	13	Crimea-IX	Simferopol
	14	**DVO-IX**	Vladivostok/Khabarovsk
Local IXP	15	MSK-IX	Moscow
	16	SPB-IX	St Petersburg
	17	EKT-IX	Yekaterinburg
	18	NSK-IX	Novosibirsk
	19	TSK-IX	Tomsk
	20	RND-IX	Rostov-on-Don
	21	TSKIX – Томский	Tomsk
	22	PIRIX	St Petersburg
	23	SMR-IX	Samara
	24	ULN-IX	Ulyanovsk
	25	VLV-IX	Vladivostok
	26	IX-NNOV	Nizhny Novgorod
	27	Omsk-IX	Omsk
	28	PERM-IX	Perm
	29	VOLGA-IX	Yaroslavl
	30	KZN-IX	Kazan
	31	YAR-IX	Yaroslavl
	32	STW-IX	Stavropol

Sources: Company websites, ixpdb.net, ididb.ru;
data for 2017 – article by D. Samsonov for nag.ru


How many ISPs in Far East?
ASN
209
How many ISPs in Vladivostok?
68 ASN
32%
How many ISPs in Khabarovsk?
36 ASN
17%
Which region has the least?
1 ASN
Chukotka

Why another exchange point?

Russia	Far East
5 855 ASN	209 ASN
31 IXP ~0.5%	~ 4%

Primorsky Krai	Khabarovsk Krai	Sakhalin
68 ASN	36 ASN	26 ASN
~ 32%	~ 17%	~ 13%

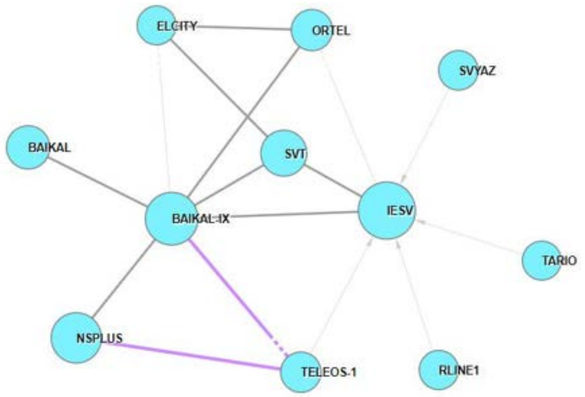
The Far East is the most distance and isolated region that has strong potential to develop

209 AS in the Far Eastern District

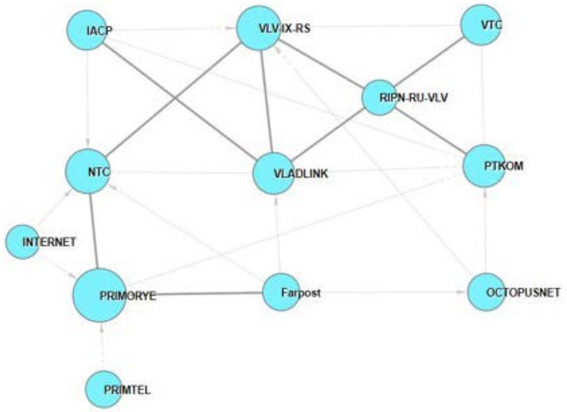
Active development of data center infrastructure

Primorsky Krai. Connectivity

Irkutsk - 60 ASN



Vladivostok - 68 ASN



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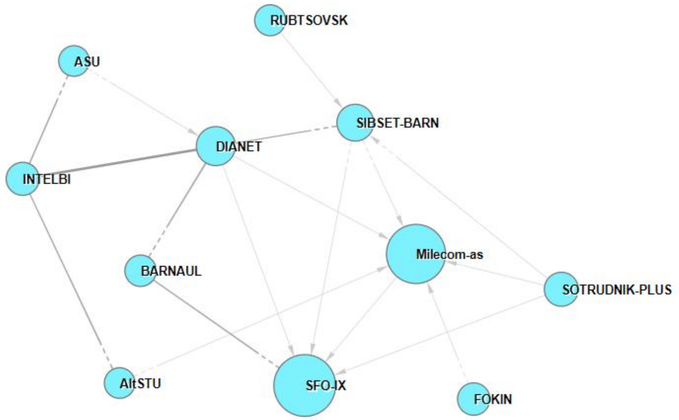
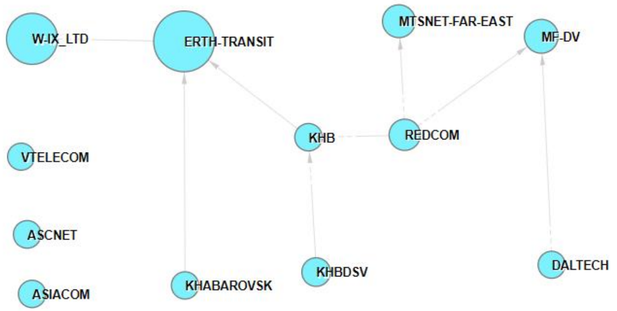
MACROSCOPIC RESEARH OF INTERNET INFRASTRUCTURE

Khabarovsk Krai. Connectivity

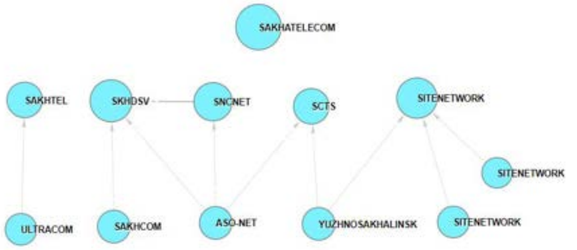
Barnaul - 33 ASN



Khabarovsk - 36 ASN



Sakhalin - 26 ASN



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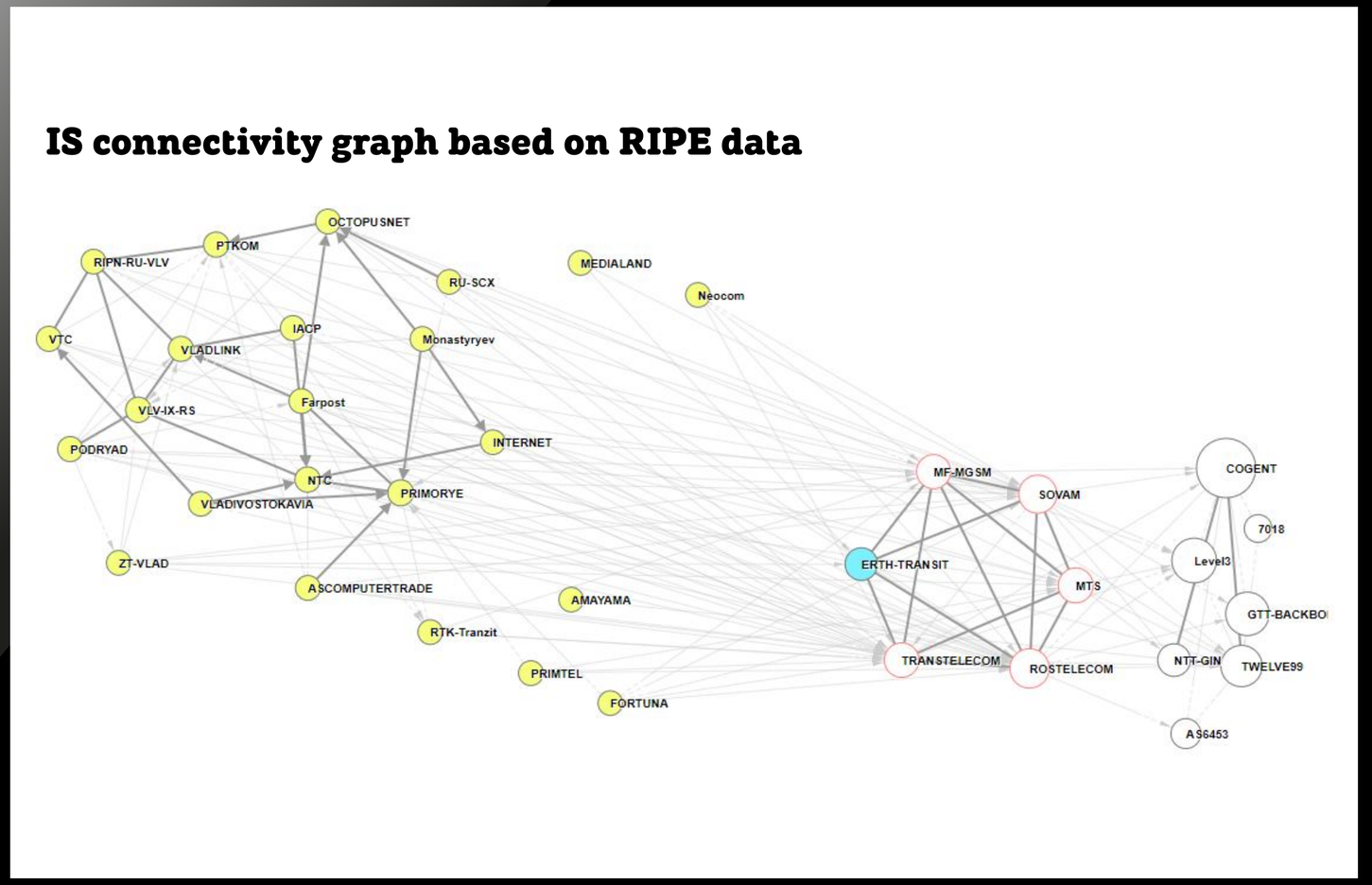
Far East. A look from the rest Internet



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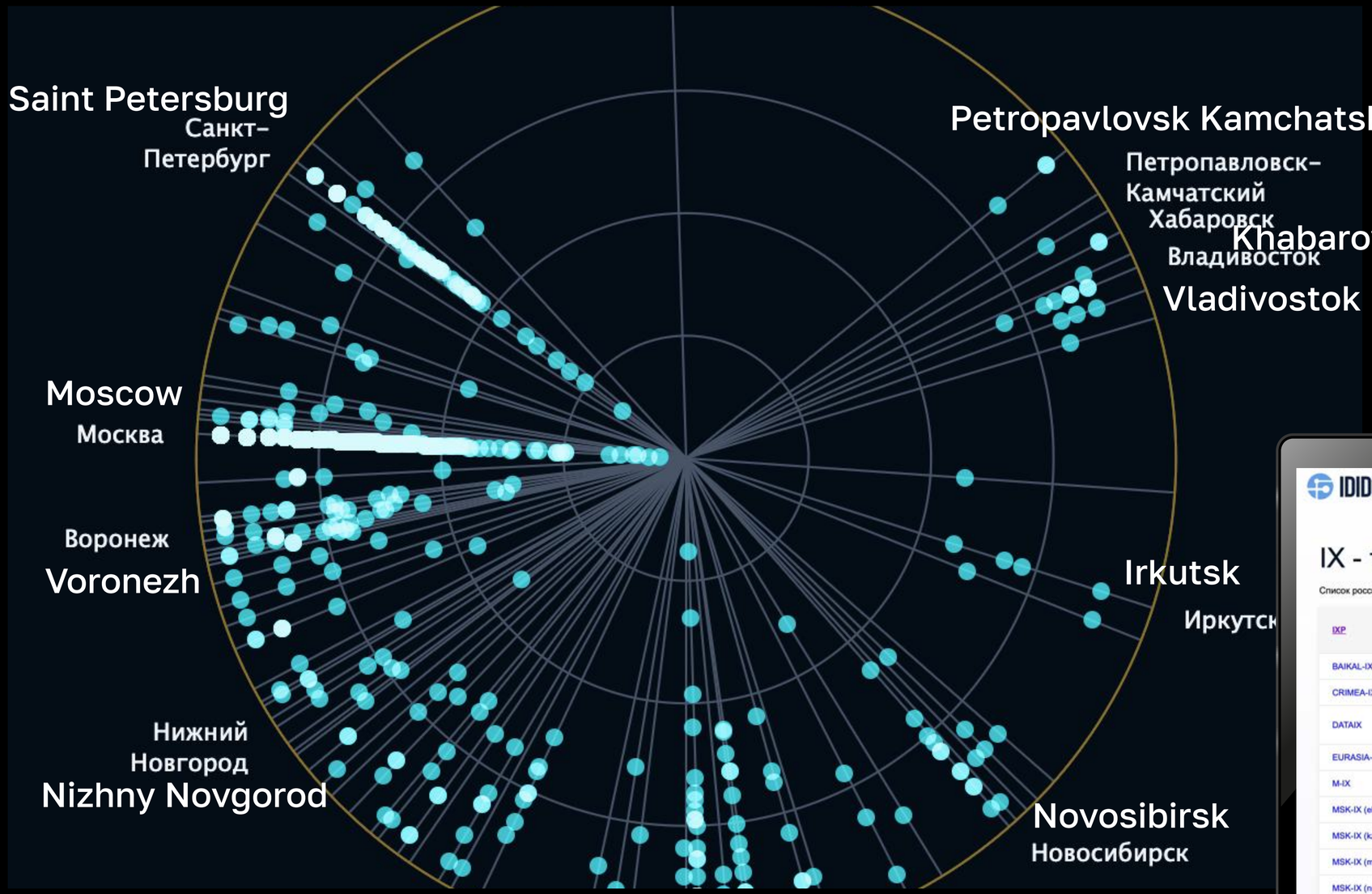
MACROSCOPIC
RESEARH OF
INTERNET
INFRASTRUCTURE

Why another exchange point?



The polar radius corresponds to the number of BGP neighbors

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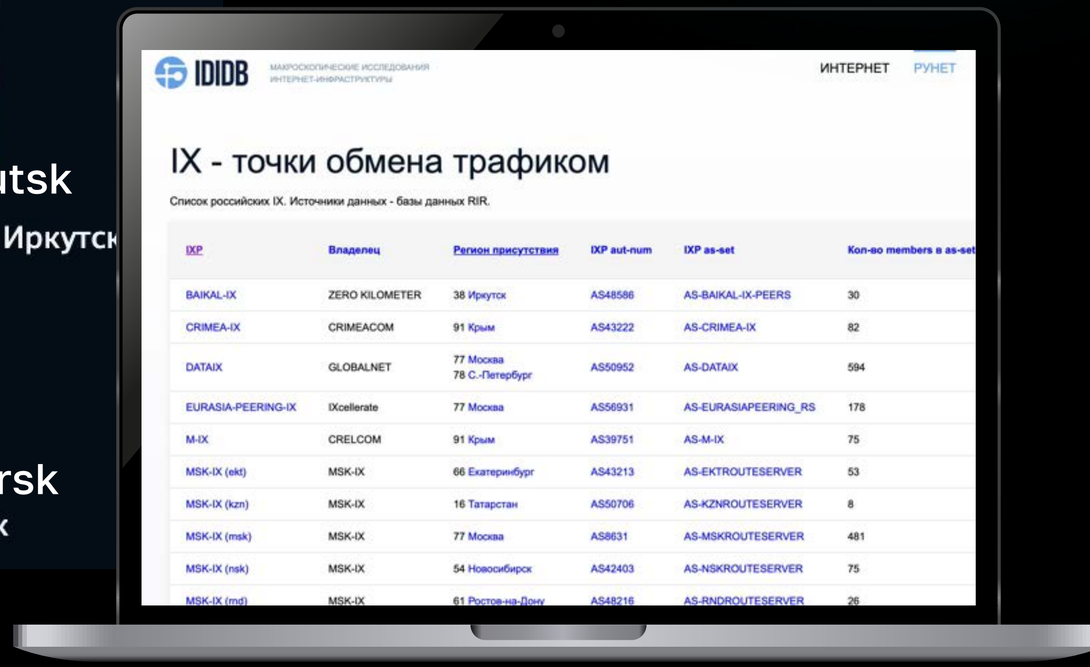
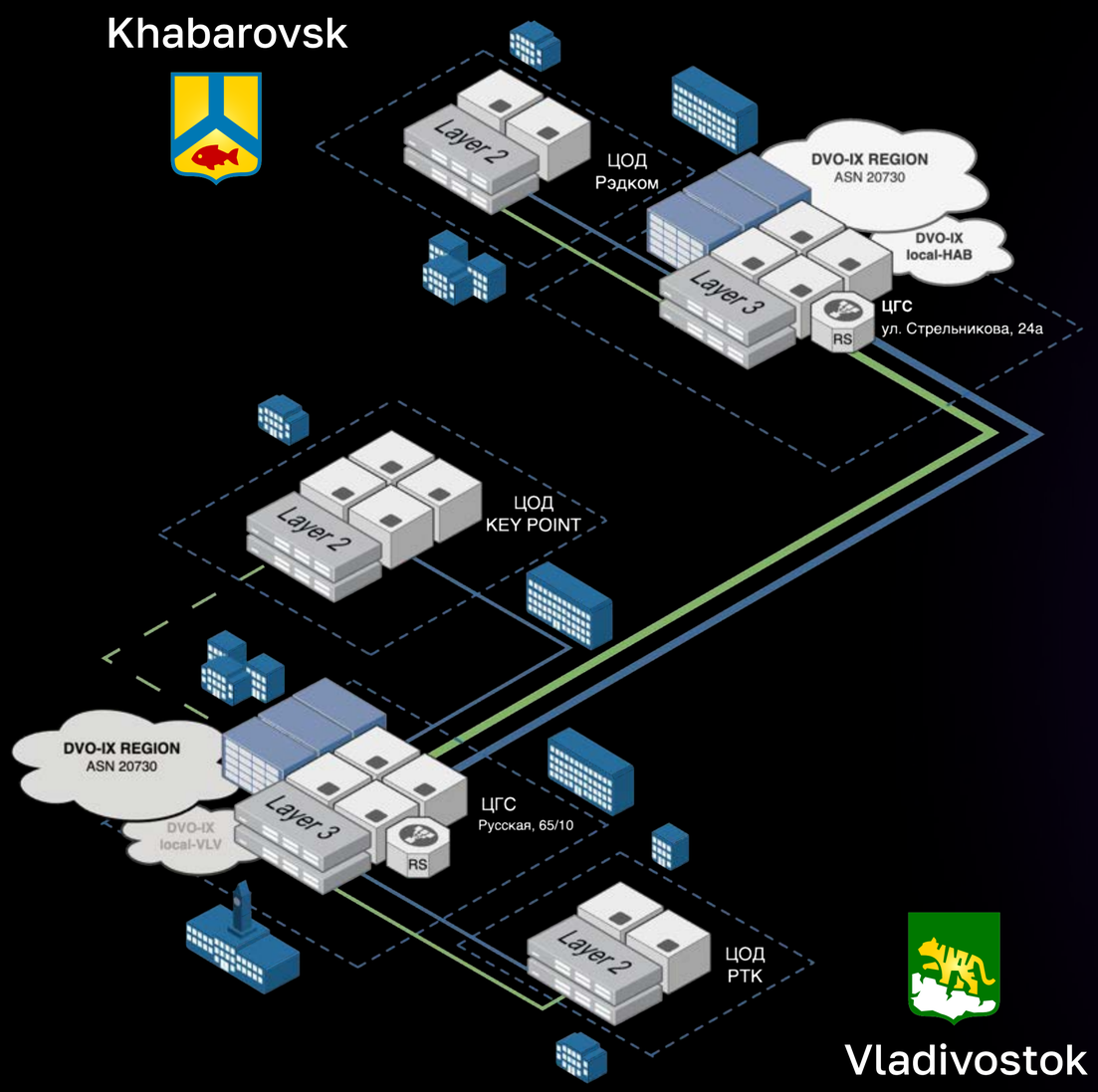
MACROSCOPIC RESEARH OF INTERNET INFRASTRUCTURE



DVO-IX: IXP implementation scheme



Allocated DVO-IX

- 2 geo-distributed route servers, united by trunk channels between Khabarovsk and Vladivostok
- Connection points in 6 cities

Local DVO-IX local

Vladivostok

- 1 route server
- 3 geo-distributed connection points

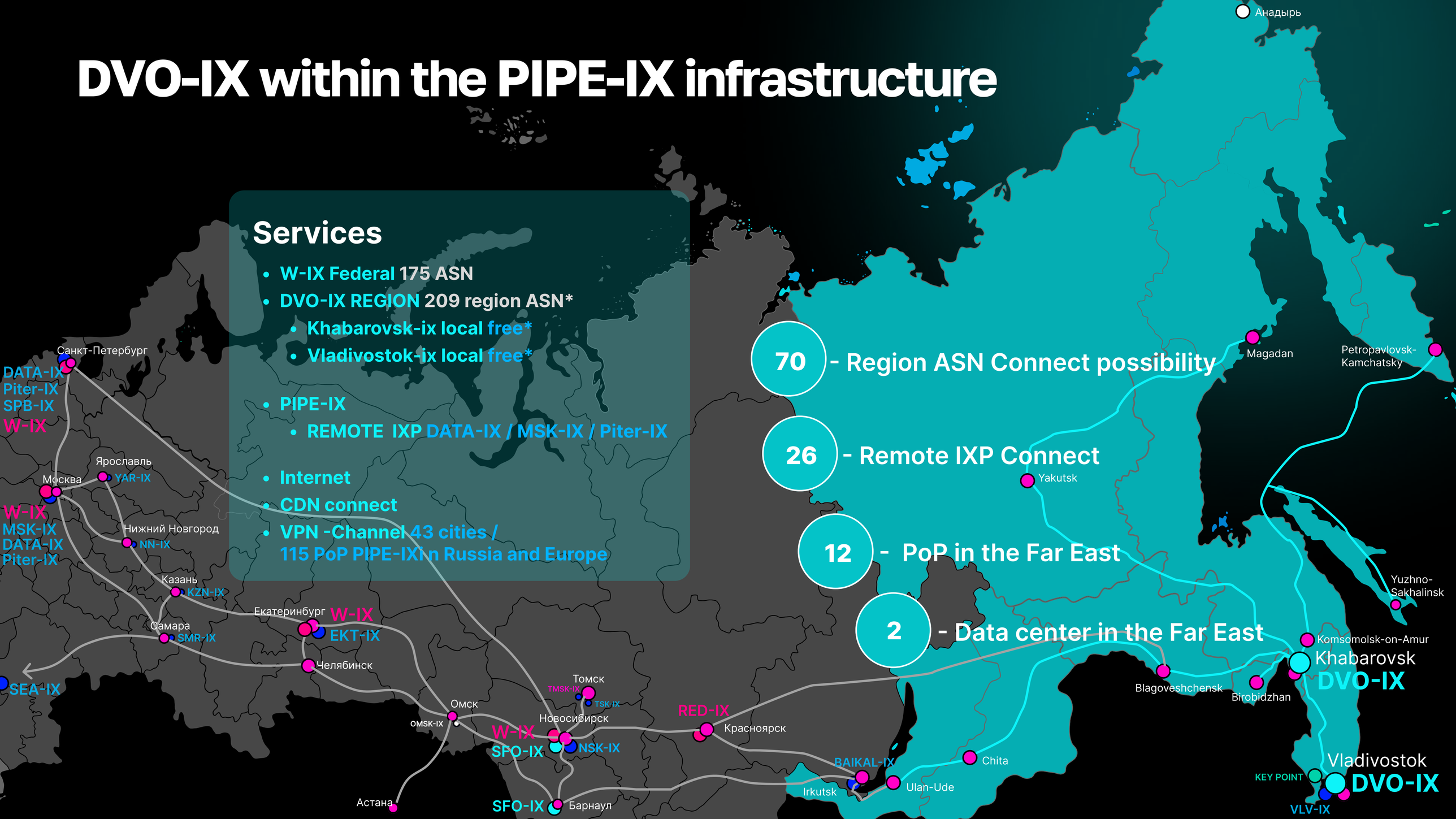
Khabarovsk

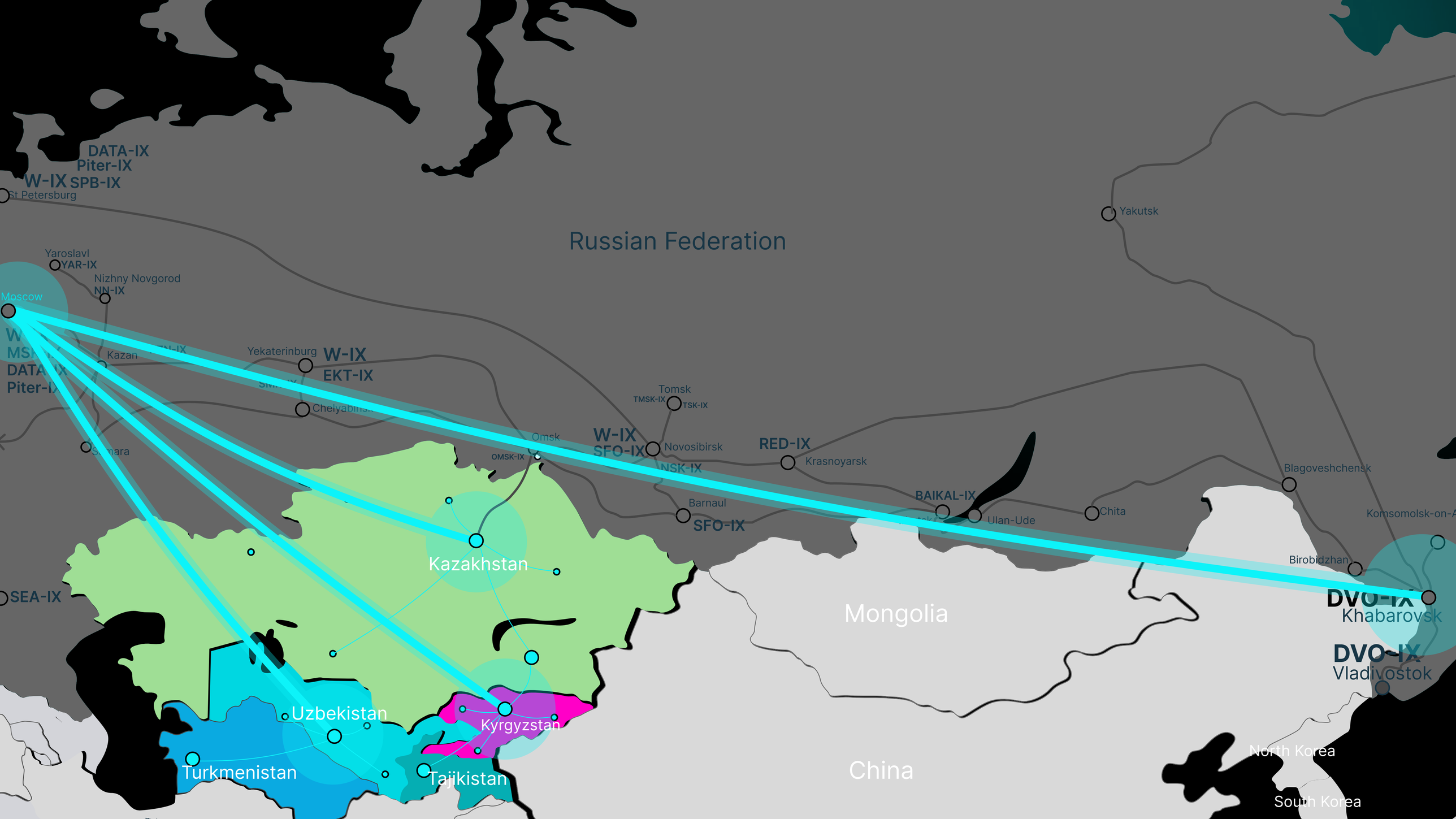
- 1 route server
- 2 geo-distributed connection points

CDN-hub

- CDN solution - server per region
- Consolidation of content provider hosting sites and computing power

DVO-IX within the PIPE-IX infrastructure




DATA-IX
Piter-IX
W-IX SPB-IX
St Petersburg
Russian Federation
Yakutsk
Yaroslavl
YAR-IX
Nizhny Novgorod
NN-IX
Moscow
Kazan
Yekaterinburg
W-IX
EKT-IX
Tomsk
TMSK-IX
TSK-IX
Omsk
OMSK-IX
W-IX
SFO-IX
Novosibirsk
NSK-IX
RED-IX
Krasnoyarsk
Blagoveshchensk
BAIKAL-IX
Ulan-Ude
Chita
Barnaul
SFO-IX
Komsomolsk-on-A
Birobidzhan
Kazakhstan
SEA-IX
Mongolia
DVO-IX
Khabarovsk
DVO-IX
Vladivostok
Uzbekistan
Kyrgyzstan
Turkmenistan
Tajikistan
China
North Korea
South Korea

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All IXPs in one place,
communication,
incident analysis, information
exchange