



Penguatan Jejaring Riset kolaborasi IDREN dan ARENA-PAC

Koordinasi awal rencana penempatan perangkat
17 November 2023 – Tim IDREN





Regional

Regional

Regional

What is REN?

A Specialized Network Infrastructure

a specialized network infrastructure (*usually separated from commercial networks*) designed/destined to serve the needs of the research and education communities with a high-speed network that connects universities and research institutions, and other academic and research organizations globally.

REN facilitates the seamless exchange of data, collaboration, and communication among researchers, educators, and students, enabling them to access and share resources, conduct experiments, and collaborate on projects that contribute to advancements in various fields of knowledge.

Why REN?



Localize traffic among R&E institutes

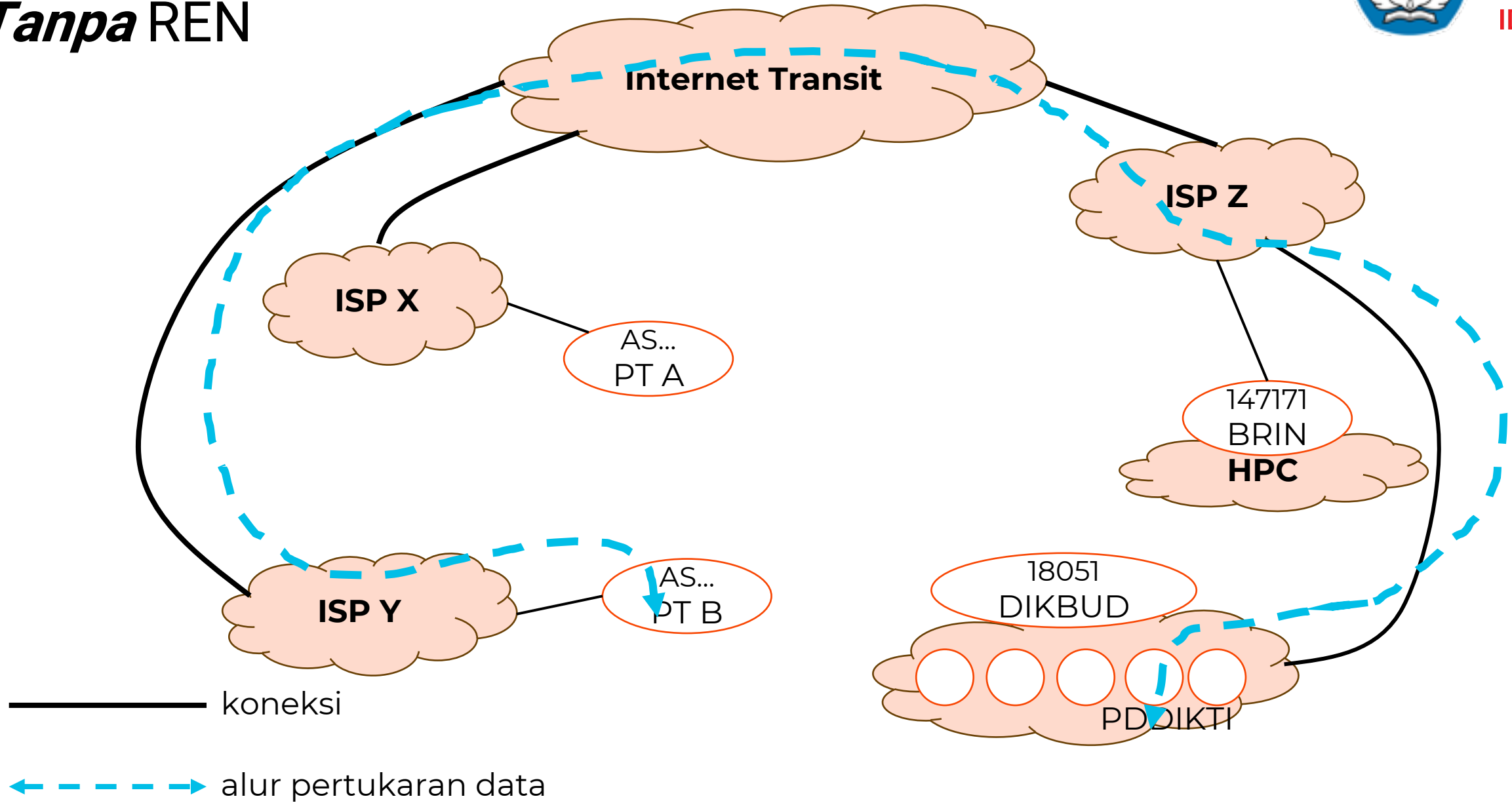
Traffic exchange without competing with commercial Internet traffic, enlarging national exposure



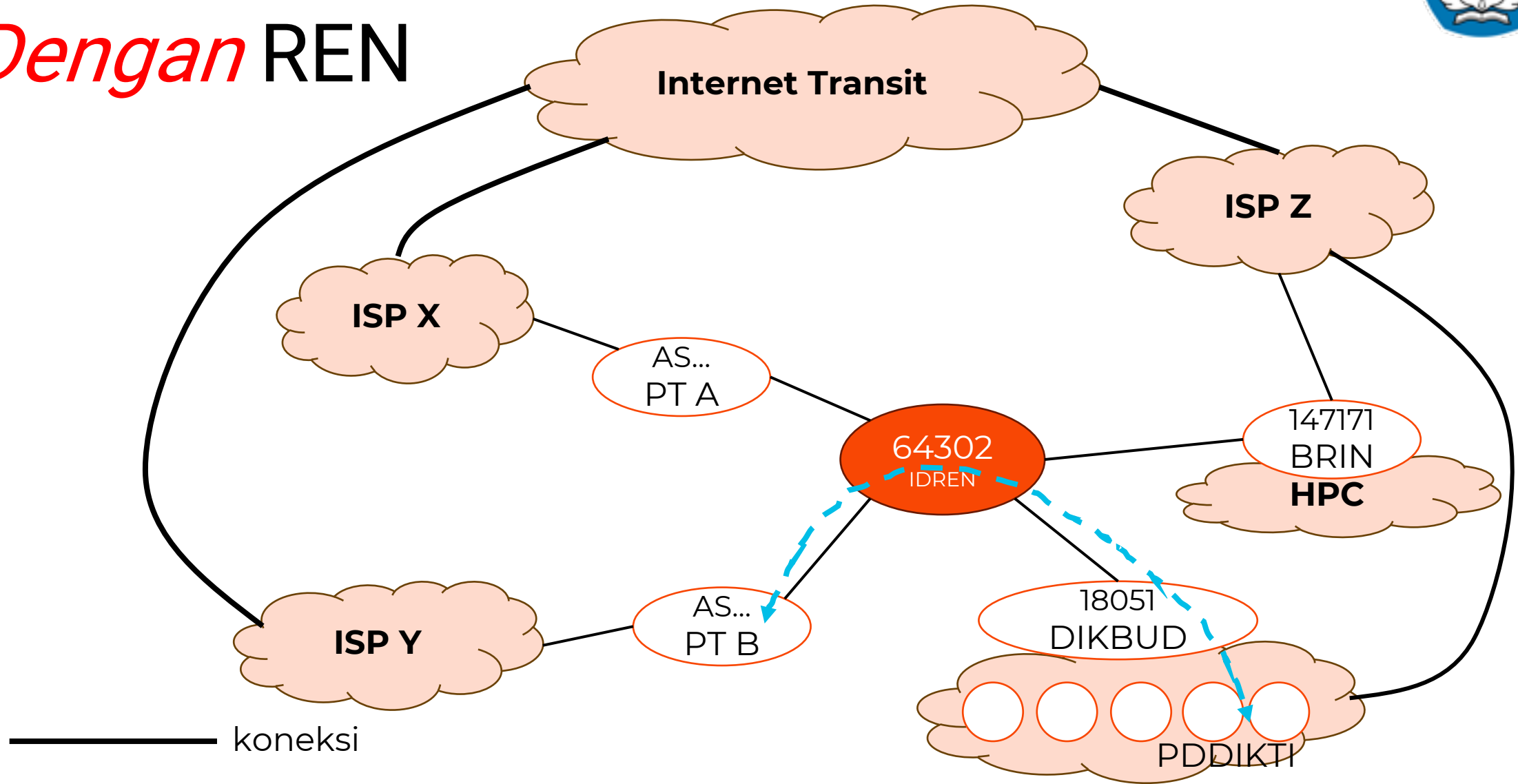
Transit traffic to global R&E institutes

Reachability to global REN, generating international exposure

Ilustrasi Pertukaran Data *Tanpa* REN



Ilustrasi Pertukaran Data *Dengan* REN



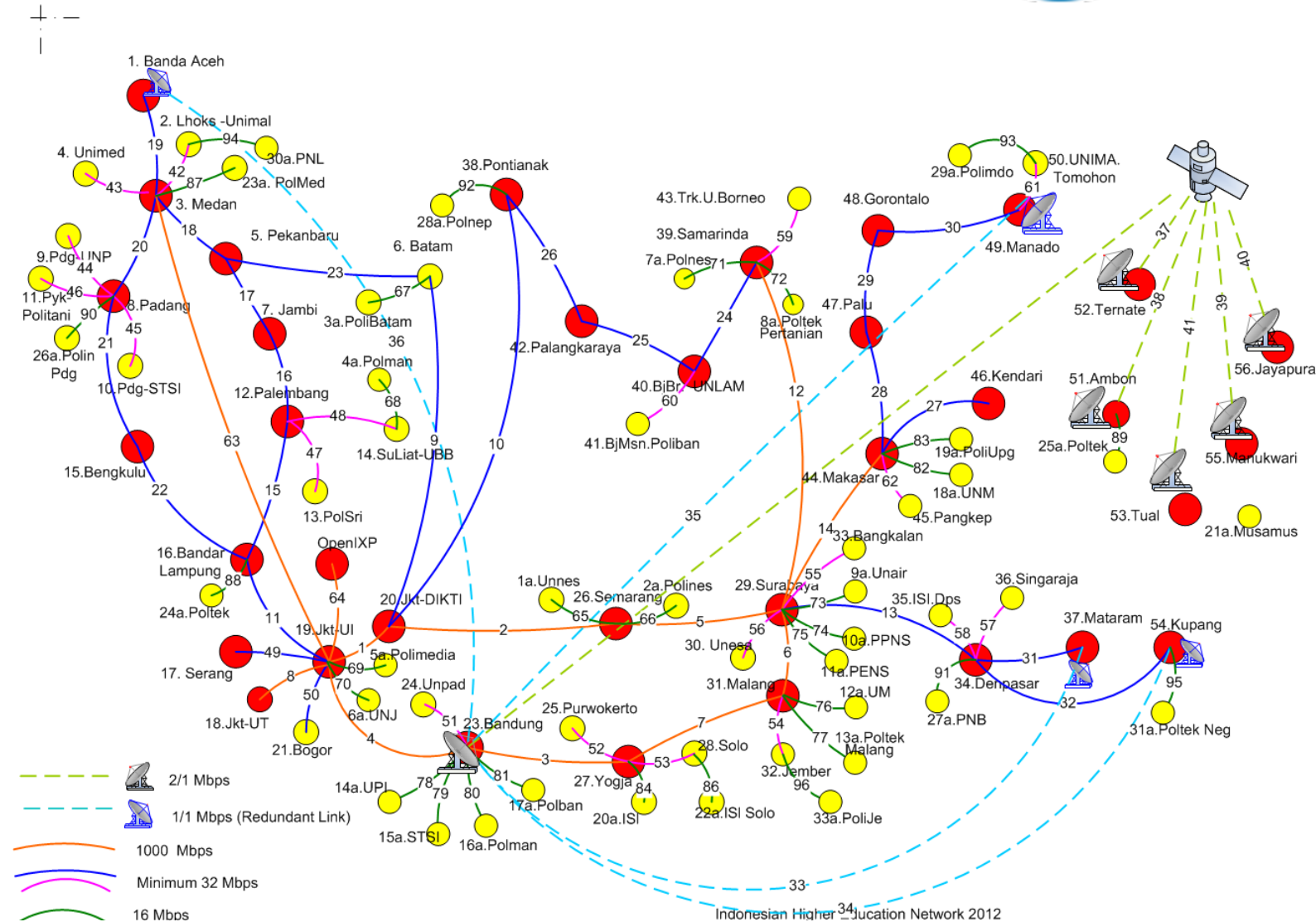
———— koneksi
← - - - - → alur pertukaran data



INHERENT 2006 - 2012

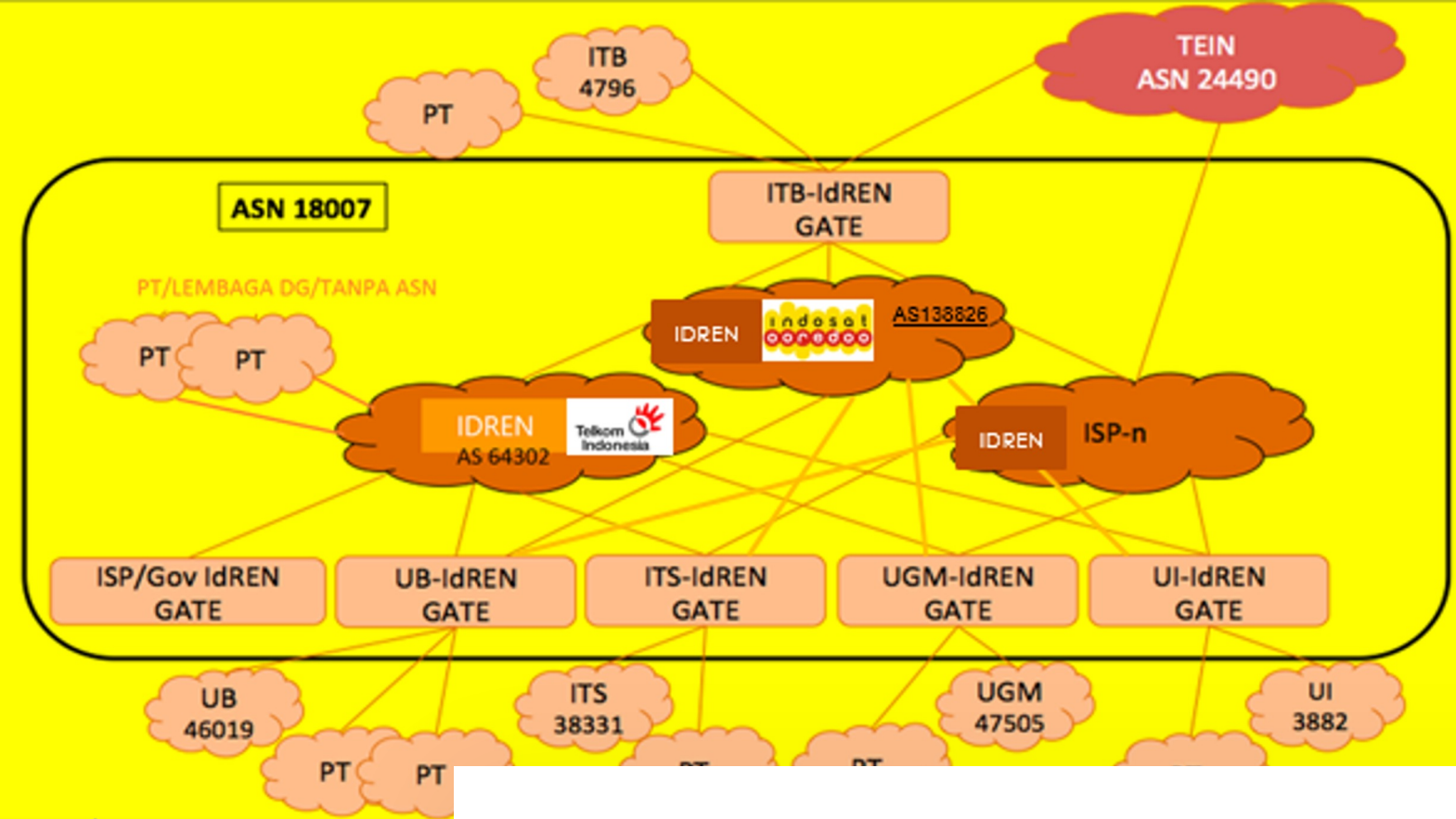
01 Government funded, but then stopped in 2013 due to a change in financial policy

02 Reachability to global REN via TEIN by ITB





IDREN 1.0



Introduced in 2015

A concept of multiple IDREN's ASN to distinct the contribution of collaborated ISP/Telco.

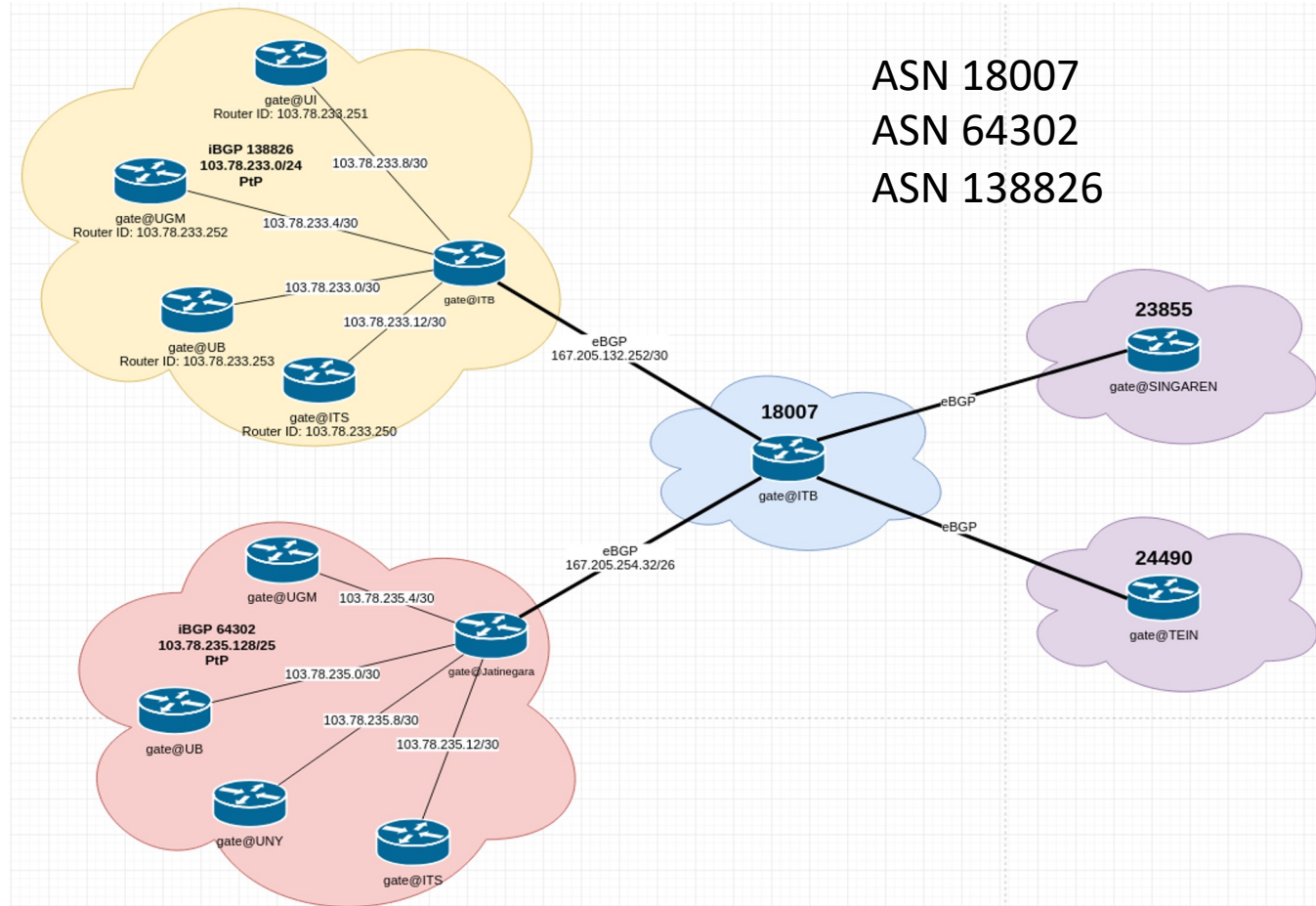
Initial experiment was supported by TELKOM

Initiative by 5 Universities

ITB, ITS, UI, UGM, and UB

IDREN 1.0 (2015 – 2022)

- As a design consequences, need to separate each ISP network contribution:
- AS 64302 (L2 net from TELKOM)
- AS 138826 (L2 net from INDOSAT)
- AS 18007 (to interconnect with Global REN)
- With the growing numbers of ISP to collaborate, previous design is not appropriate anymore.





2021-2022

9 ISP/Telco agree to collaborate with IDREN





IDREN 2.0

01 Single IDREN ASN

Integrate into one IDREN ASN: 64302, easy to manage and recognized globally

02 Adapt to more Collaborator

Formalizing into MoU between each ISP /Telco with Asosiasi Jejaring Siber Lembaga Edukasi dan Inovasi Indonesia

03 New high speed Global REN link

Arterial Research and Educational Network in the Asia Pacific (**ARENA-PAC**) supporting 100 Gbps link via Guam (long-term commitment).

04 Researching, Educating

Network operation that facilitates researches/experiments conducted utilizing the REN, while also educating more IT engineers.

Momentous Events

ARENA-PAC Indonesia 100 Gbps

A high-speed circuit that will undoubtedly pave the way for unparalleled advancements in research, education, and innovation, benefiting not only Indonesia but also the global academic community as well.

31 Aug 2022
MoU Signing

1 Feb 2023
Kick-Off Operation

9 Aug 2023
Operational Inauguration

Agreement:
UB – IDREN – ARENA-PAC



MoU signing during G20
Indonesia Summit 2022, in Bali.

First Operation: ARENA-PAC Guam - Malang

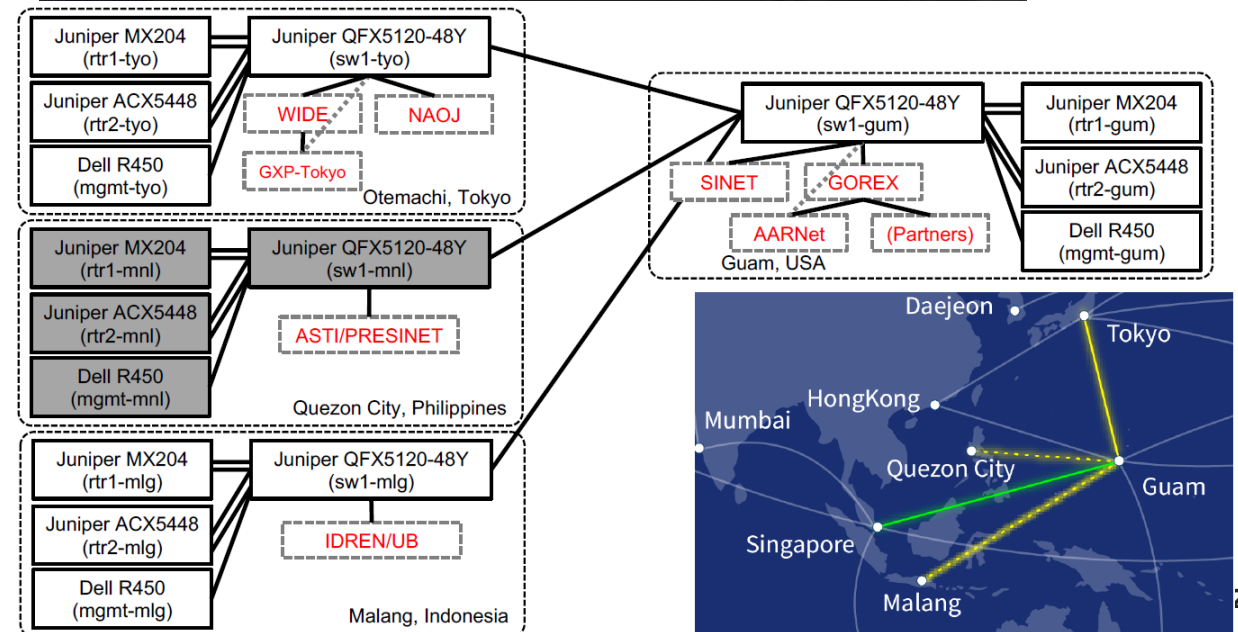
ARENA-PAC Indonesia Segment starts to be
operated as a new high-speed path to
institutions connected via IDREN

The first 8K uncompressed video
conference in Indonesia

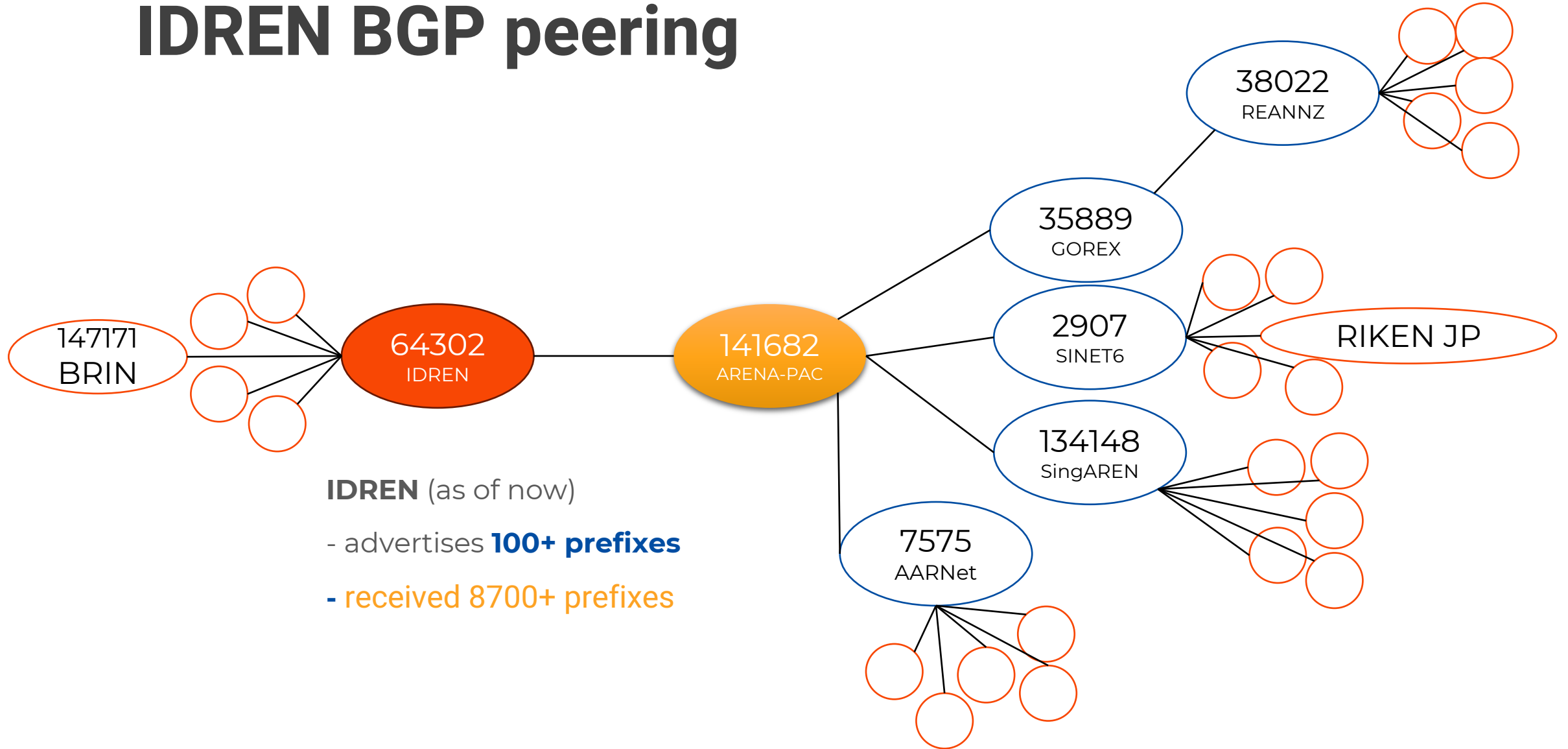
ARENA-PAC Indonesia 100
Gbps is used for the first time
for 8K Uncompressed A/V Bi-
directional Streaming

ARENA-PAC Equipment

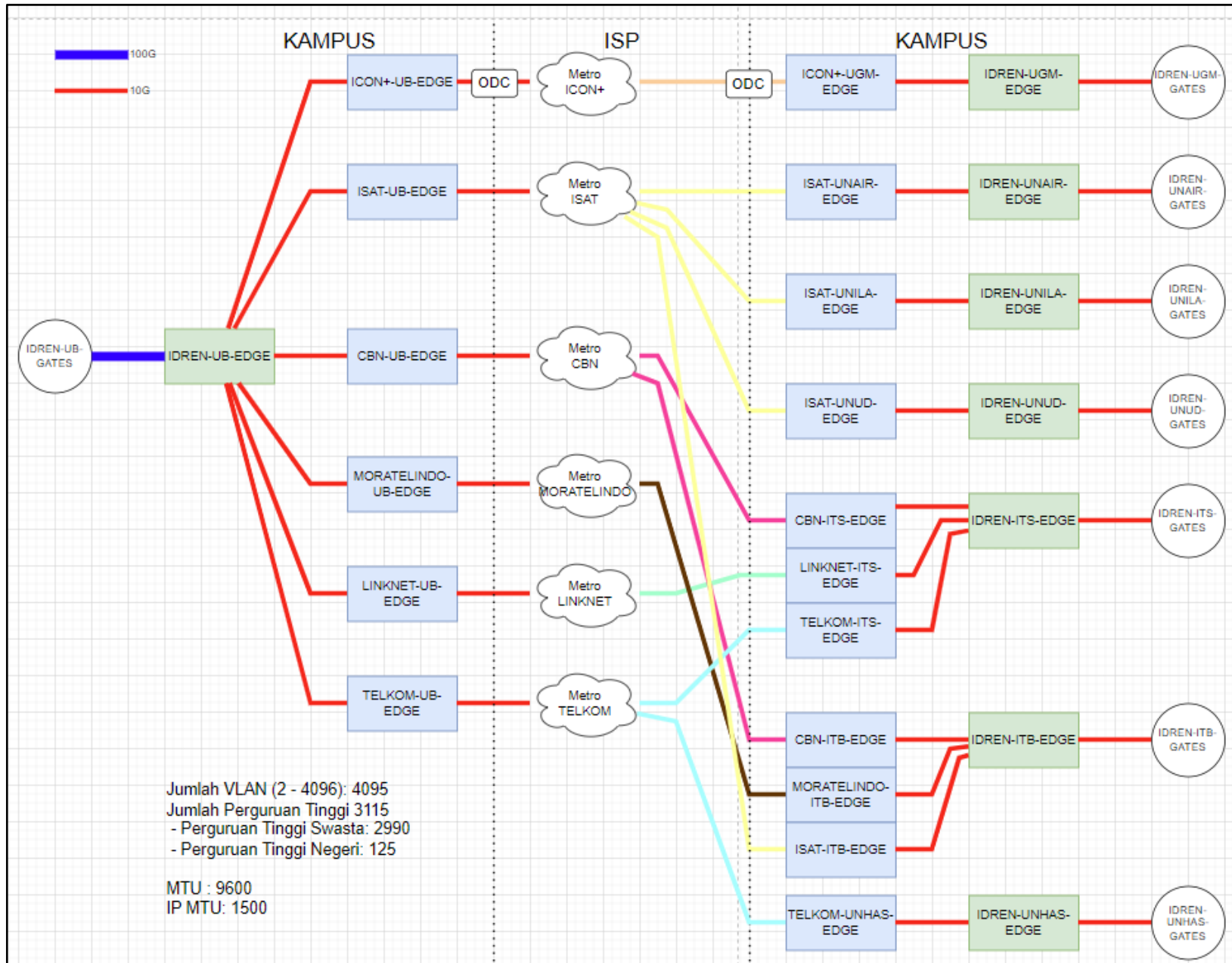
© In March 2023, all equipment from ARENA-PAC have been installed and activated



IDREN BGP peering



@UB: on-going build-up of L2 network to other gates



No	Gate 1	Gate 2	Nama ISP	Bandwidth (Mbps)
1	UB	ITB	CBN	1000
2	UB	ITS	CBN	1000
3	UB	ITB	Moratelindo	1000
4	UB	UI	Moratelindo	1000
5	UB	ITS	ICON+	1000
6	UB	UNEJ	ICON+	1000
7	UB	ITS	TELKOM	1000
8	UB	UNAND	TELKOM	1000
9	UB	UNTAN	TELKOM	500
10	UB	UNILA	INDOSAT	500
11	UB	UNUD	INDOSAT	500
12	UB	ITS	Link Net	1000

Experiment on 100 Gbps link

All 8K equipment were temporarily imported from Japan to Indonesia for the event



OPERATIONAL INAUGURATION OF

ARENA-PAC INDONESIA 100 Gbps

Tech Demo of 8K Uncompressed Audio-Video Bi-directional Streaming ~ 50 Gbps
August 9th, 2023

KBRI TOKYO **UNIVERSITAS SAMARANG** **Keio University** **COLLEGIUM CLAUDIO FORTIS** **IDREN** **PRENN-PPC**

IDREN PARTNERS
Telkom Indonesia **Telin** **indosat** **Moretelindo** **ICON+** **lintasarta** **CBN**
pgn.COM **linknet** **SUMBER DATA INDONESIA** **IFORTE** **INS** **XL AXIATA**

SUPPORTED BY: **WIDE** **ASIA PACIFIC INTERNET DEVELOPMENT TRUST** **APNIC** **GXP-TOKYO** **SINET6** **ASTRO** **SEIKO** **JUNIPER NETWORKS** **ARISTA**

Auditorium Algoritma
Fakultas Ilmu Komputer
Universitas Brawijaya

Collaboration Complex
Hiyoshi Campus
Keio University

Guam

8K CAMERA

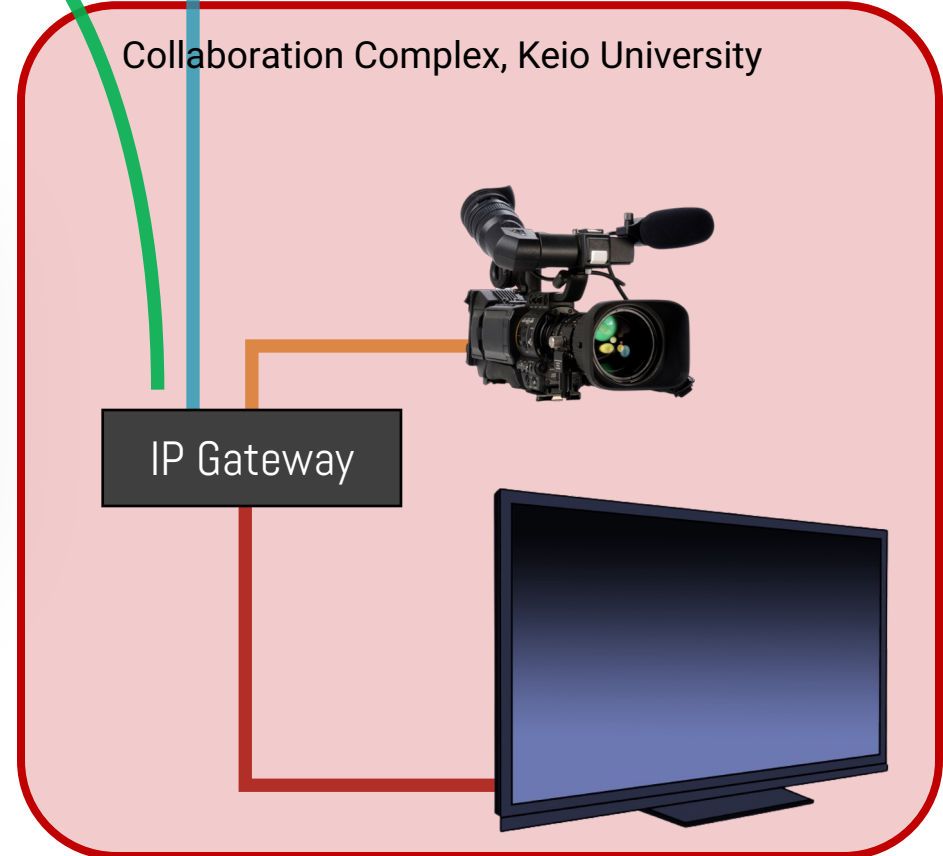
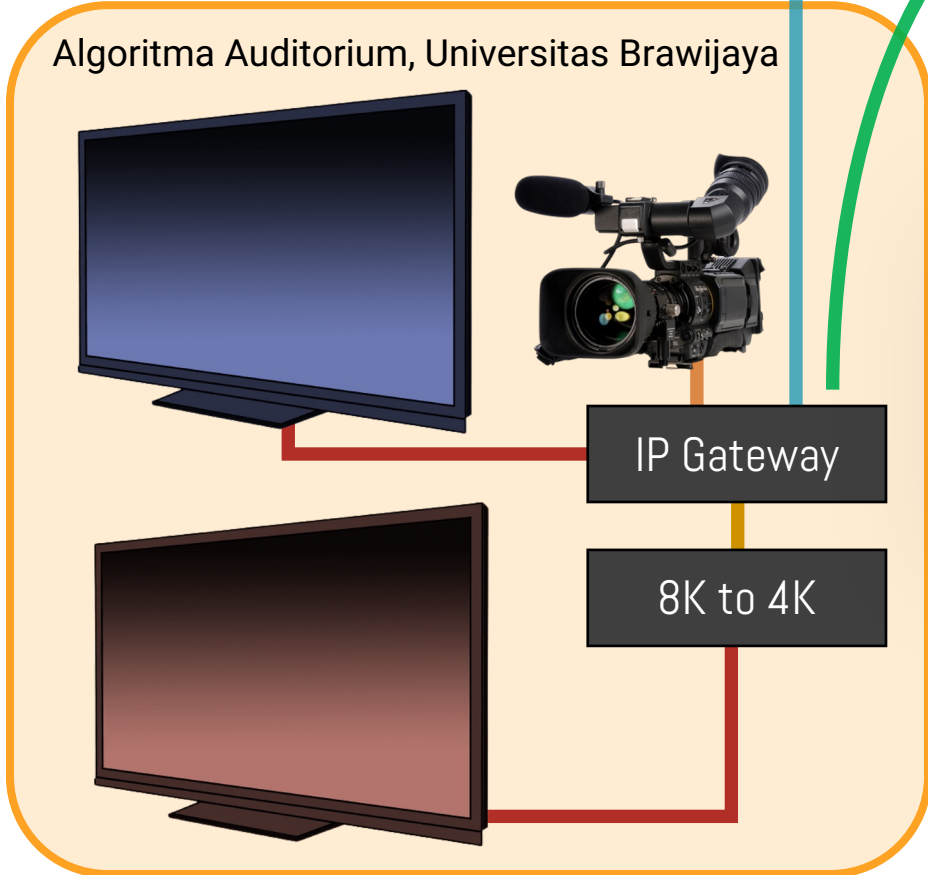
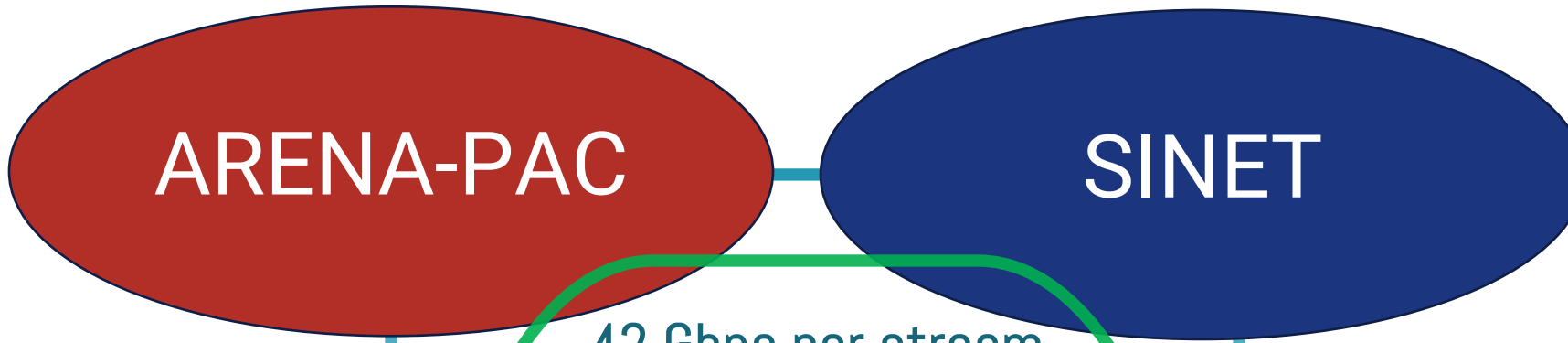
8K DISPLAY

8K CAMERA

8K DISPLAY

100 Gbps

100 Gbps



Experiment on 100 Gbps link

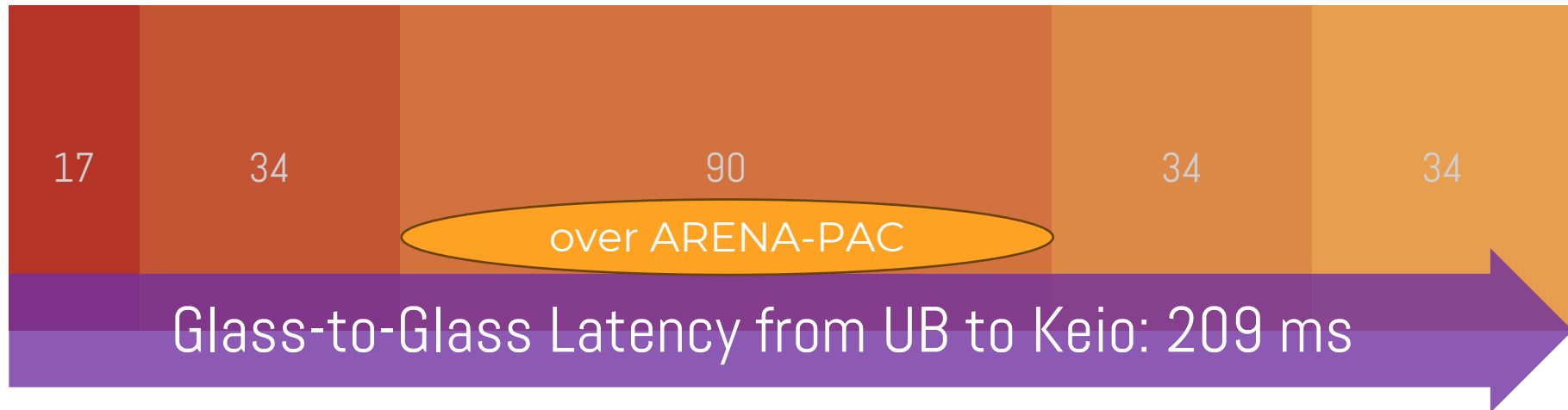
All 8K equipment were temporarily imported from Japan to Indonesia for the event



42 Gbps 8K Uncompressed vs

12 Gbps	4K uncompressed
100 Mbps	8K satellite tv broadcast in Japan
52 Mbps	4K satellite tv broadcast in Japan
25 Mbps	4K Netflix
5 Mbps	FHD Netflix
3 Mbps	FHD YouTube
1 Mbps	SD YouTube

8K Uncompressed Latency





This can be achieved only on REN

Routing and switching coordination

- extending VLANs between organizations
- steer traffic on networks when needed

Bandwidth coordination

- reserve bandwidth for events etc.

Let's watch these videos



<https://youtu.be/JfT4xaPbG3U>



<https://youtu.be/CgZiZs0bYWU>

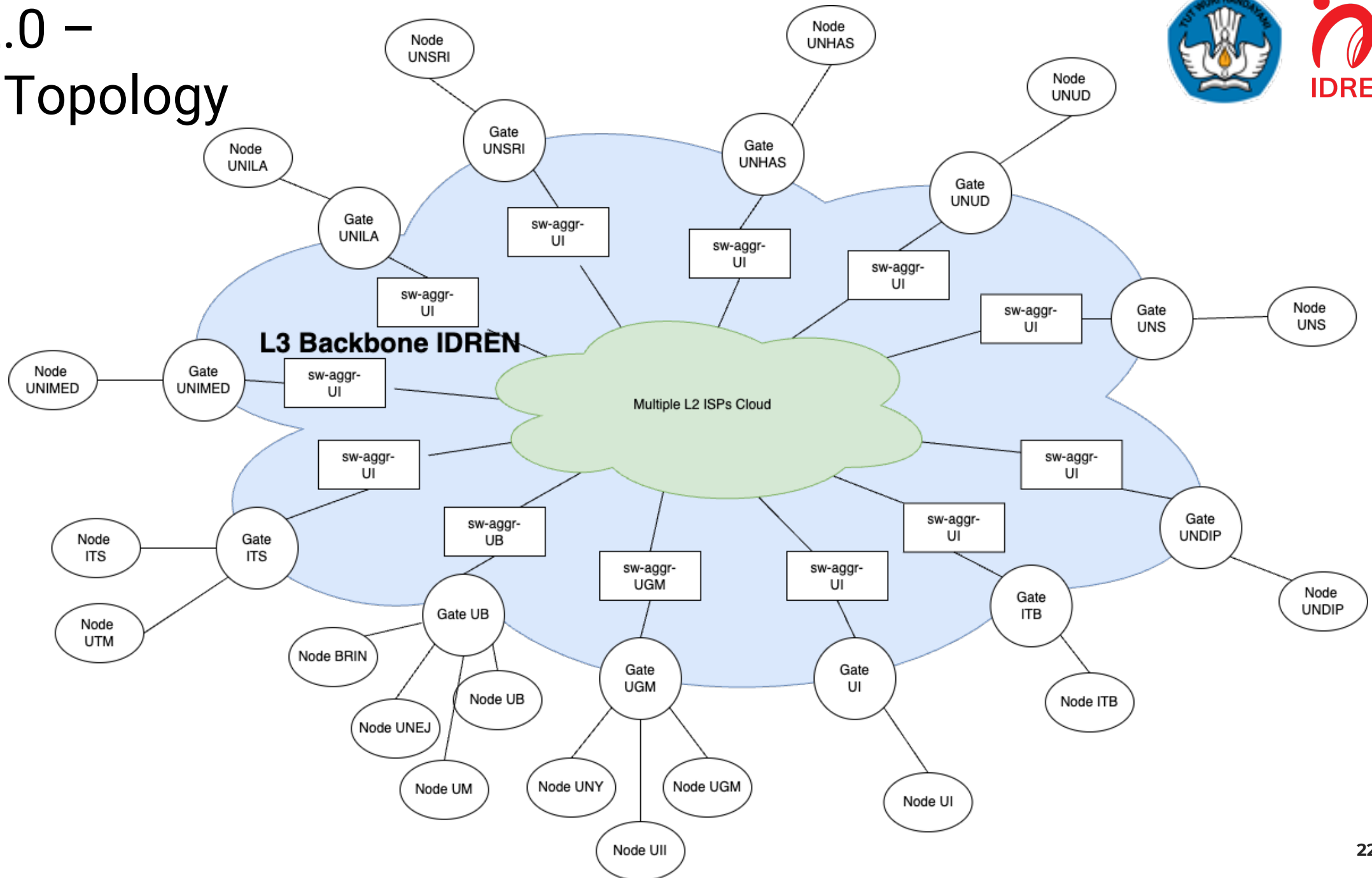


Rencana Penempatan Perangkat – 2023

- © Router IDREN
- © Switch IDREN
- © Server (Penguatan PDDIKTI/Blockchain)
- © Isi Form Survey: <https://s.id/idren>

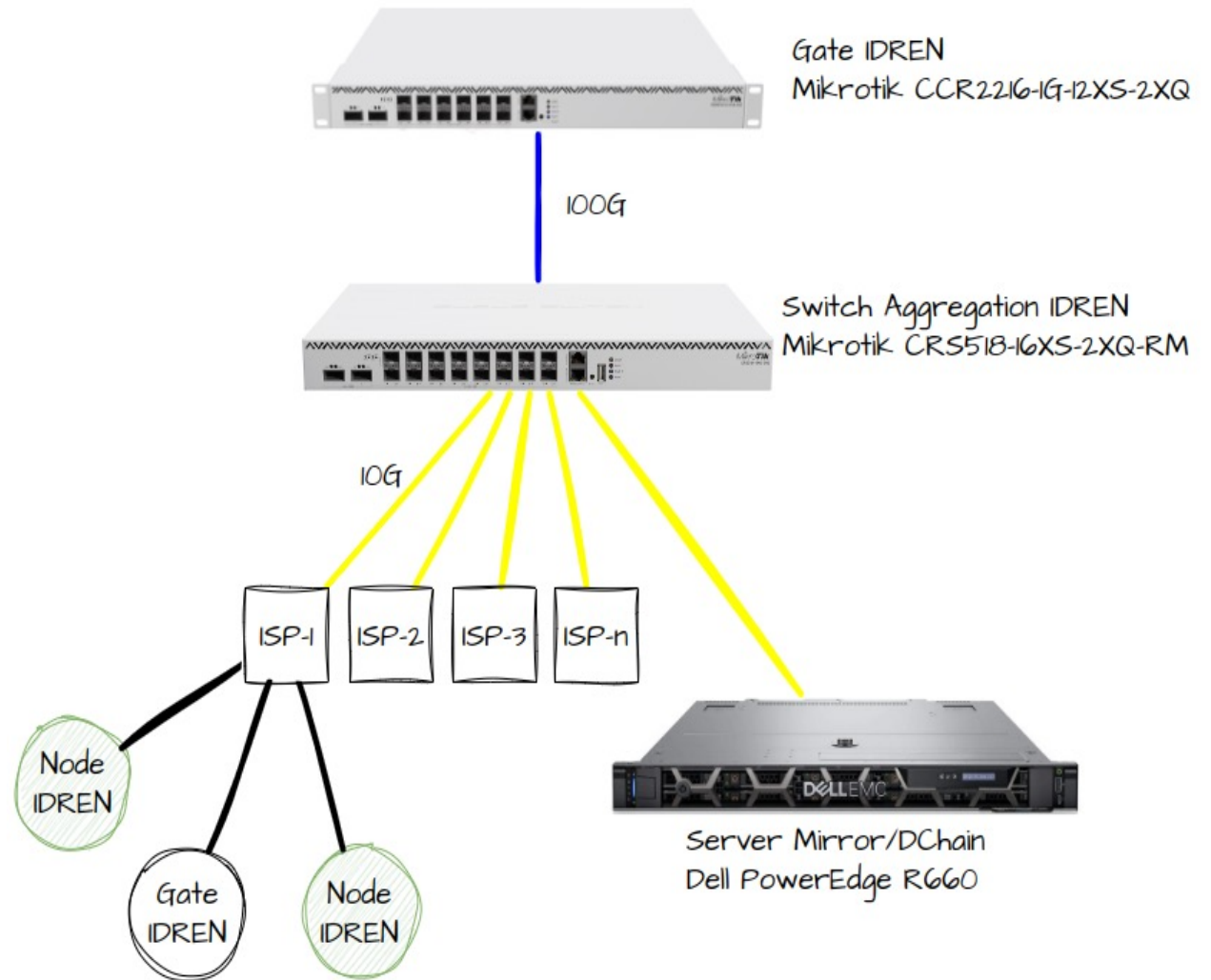


IDREN 2.0 – General Topology



IDREN Gateway

- © Menjadi gerbang konektivitas IDREN dari PT lainnya
- © Berpartisipasi dalam Penguatan PDDIKTI/Blockchain



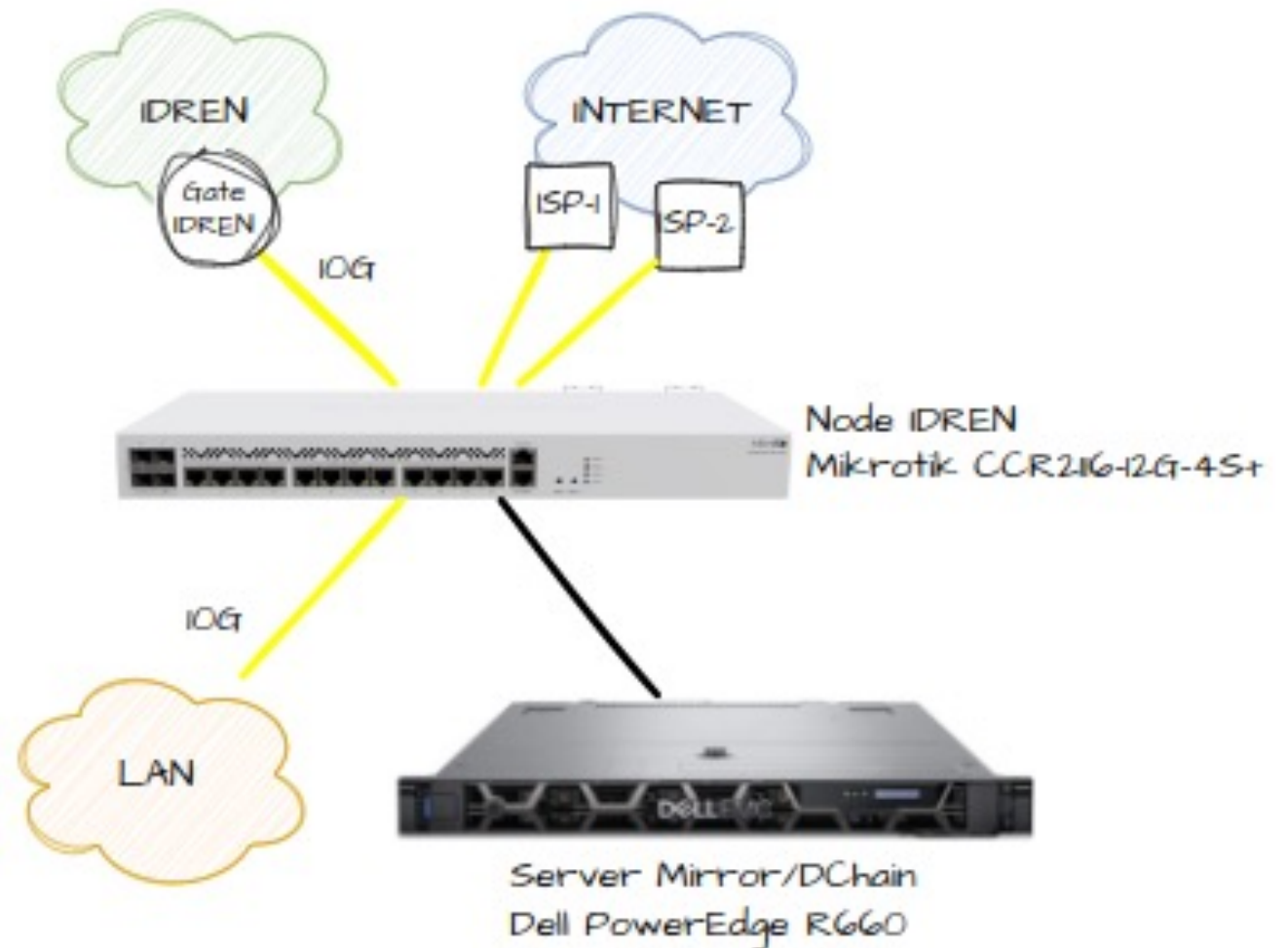


IDREN Gateway

- © 1. Universitas Brawijaya - UB (sekaligus DChain validator)
- © 2. Universitas Indonesia - UI (sekaligus DChain validator)
- © 3. Institut Teknologi Bandung - ITB (sekaligus DChain validator)
- © 4. Institut Teknologi Sepuluh Nopember ITS (sekaligus DChain validator)
- © 5. Universitas Gadjah Mada UGM (sekaligus DChain validator)
- © 6. Universitas Diponegoro UNDIP
- © 7. Universitas Sebelas Maret UNS
- © 8. Universitas Negeri Medan UNIMED
- © 9. Universitas Lampung UNILA
- © 10. Universitas Sriwijaya UNSRI
- © 11. Universitas Hasanuddin UNHAS (sekaligus DChain validator)
- © 12. Universitas Udayana UNUD

IDREN Node

© Berpartisipasi dalam Penguatan PDDIKTI/Blockchain





IDREN Node – Blockchain

- © 1. DIKTI (sekaligus DChain validator)
- © 2. Universitas Terbuka - UT (sekaligus DChain validator)
- © 3. Universitas Gunadarma - UG (sekaligus DChain validator)
- © 4. Universitas Muhammadiyah Surakarta - UMS (sekaligus DChain validator)



IDREN Node – 16 Titik 3T

- ◎ 1. Universitas Timor
- ◎ 2. LLDikti XV (Kota Kupang)
- ◎ 3. Universitas Cendrawasih
- ◎ 4. Universitas Musamus Merauke
- ◎ 5. LLDikti XIV (Kota Biak)
- ◎ 6. Universitas Pattimura
- ◎ 7. Universitas Mulawarman
- ◎ 8. LLDikti XII (Kota Ambon)
- ◎ 9. Universitas Negeri Manado
- ◎ 10. Universitas Borneo Tarakan
- ◎ 11. LLDikti XI (Kota Banjarmasin)
- ◎ 12. LLDikti XVI (Kota Gorontalo)
- ◎ 13. Universitas Syah Kuala
- ◎ 14. Universitas Maritim Raja Ali Haji
- ◎ 15. Universitas Bengkulu
- ◎ 16. LLDikti XIII (Kota Banda Aceh)



Thank You

For Your Listening