Netflix Open Connect
Nigeria
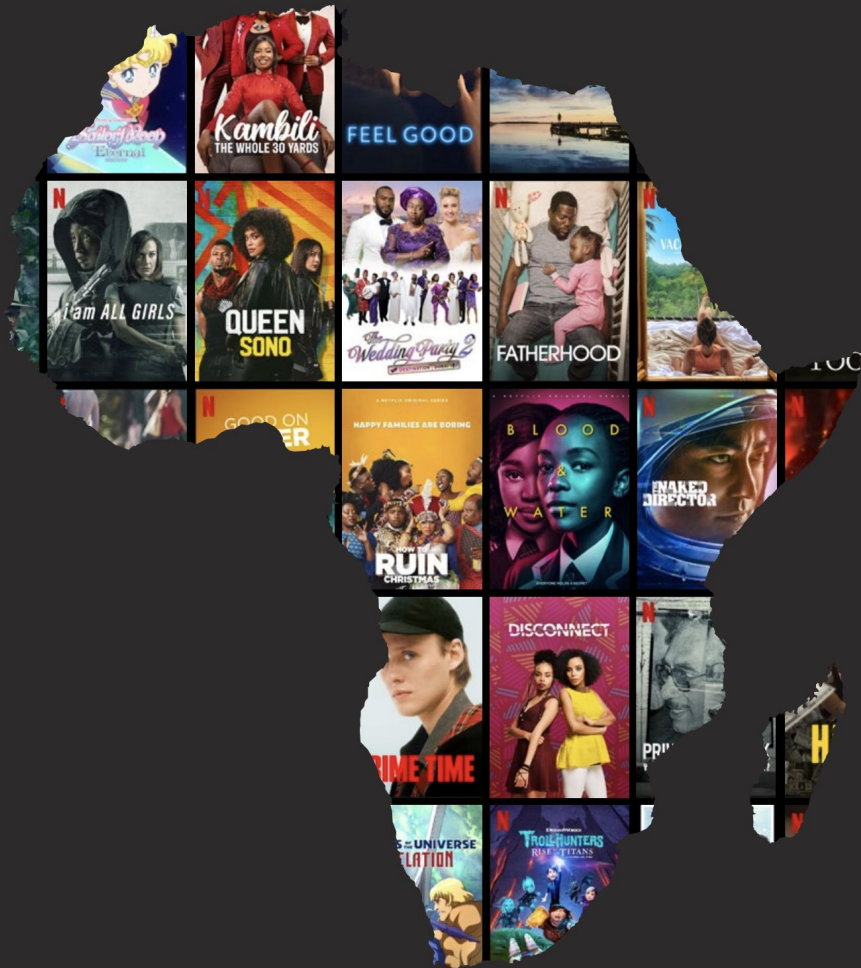
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25 October 2023

AGENDA

1 Global Launch

190 Countries

32 Languages

230M+
Members worldwide

450M
Viewers / Profiles
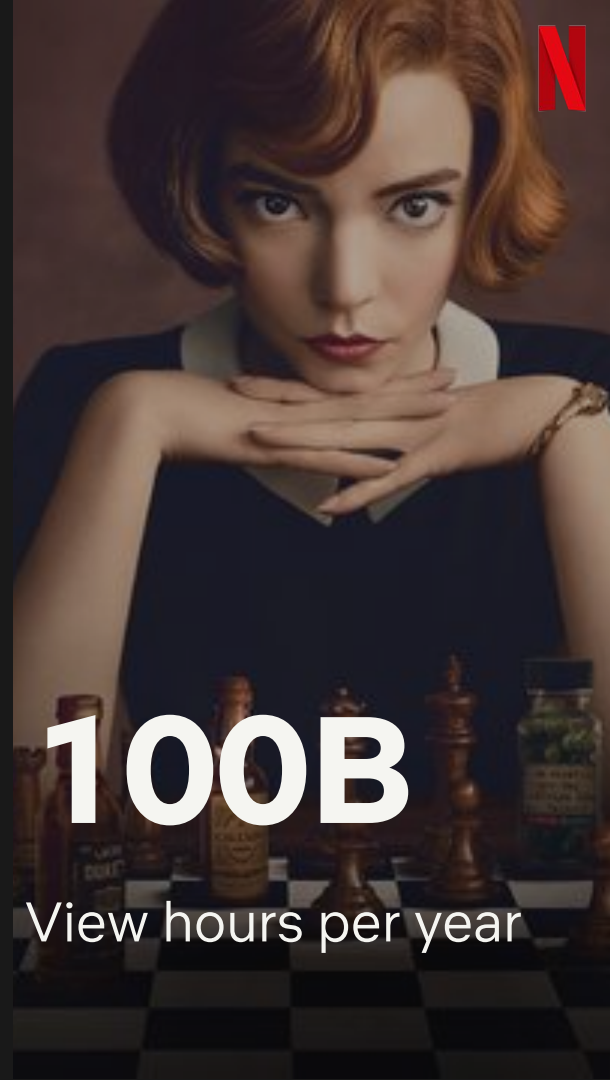
100B
View hours per year

The building blocks of Netflix streaming

Production → **Encoding** → **Open Connect** (Internet) → **Streaming**
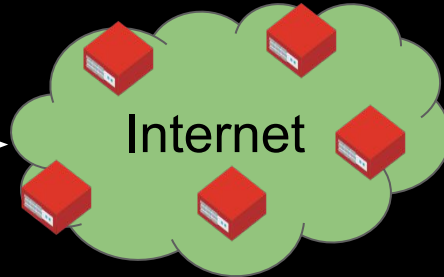
High quality watching experience while sending the least amount data

OCA Efficiencies

Power Efficient
It takes just 5.6kW to power a half rack

Cost Savings
Bring content closer to the member
Avoid paid transit or long haul connections

Small but mighty
A country's entire Netflix library fits into about half a rack of servers
A half rack can serve 200,000 streams simultaneously

Open Connect

Best in-class Encoding
5 Mbps to stream one movie
200% increase in number of hours streamed with 1 Gbps over 5 years

Fault tolerance and Resiliency
Localization limits impact of incidents and eliminates single point of failure

Timing is everything
Take advantage of the off-peak hours to load content which saves time, congestion and cost

A Naija Christmas

Open Connect in Nigeria

AFRICA Points of Presence

Public Peering - IXPs
    KIXP Nairobi
    NAPAfrica Johannesburg
    JINX Johannesburg
KINIX Kinshasa (RIX)
LUBIX Lumbashi (RIX)
RIXP Kigali (RIX)
UIXP Kampala (RIX)
TIX Dar es Salam (RIX)
MIXP Port Louis (RIX)
IXPN Lagos and Abuja (RIX)
BFIX Ouagadougou (RIX)
CINX Cape Town (RIX)
DINX Durban (RIX)

Private Peering - PNI
Africa Data Centres, Nairobi
Teraco Johannesburg
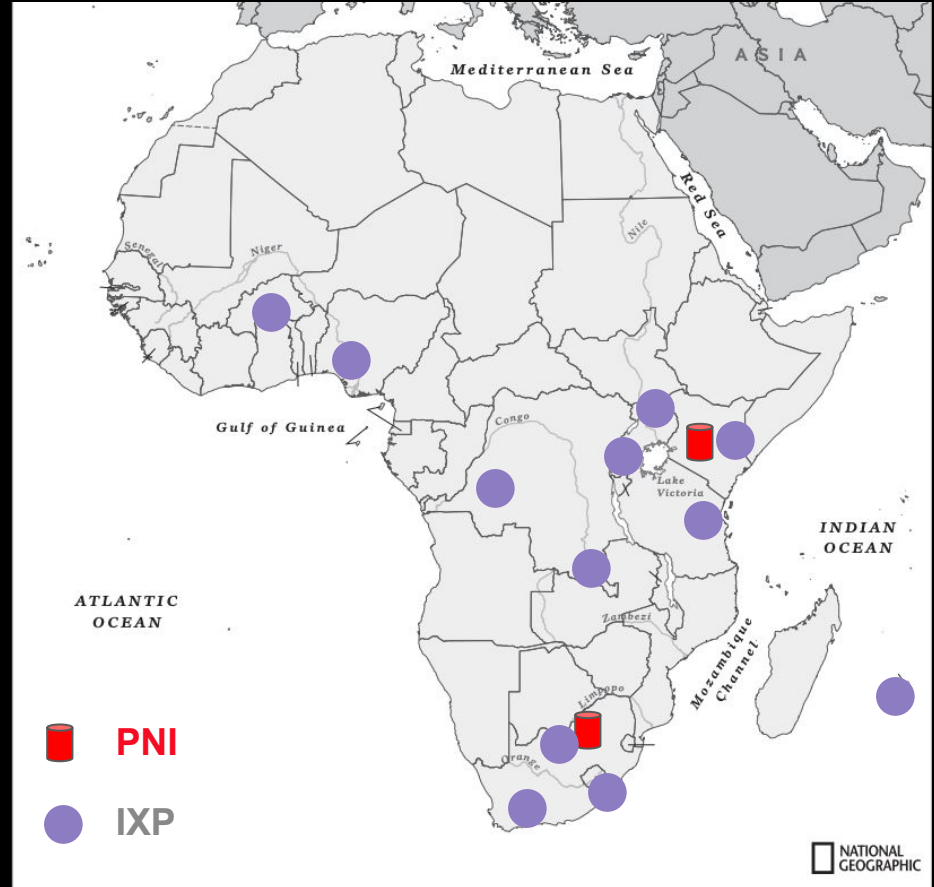
More RIXes coming soon to Africa…

PNI

IXP

NATIONAL GEOGRAPHIC

A Look at Traffic Delivery in Nigeria

Public Peering
8.7%
(split Europe & JNB)

Transit
4.75%
(USA)

Private Peering (PNI)
3.7% (Europe)

**82%
of Netflix traffic delivered locally
from Nigeria
(embedded and RIX)**
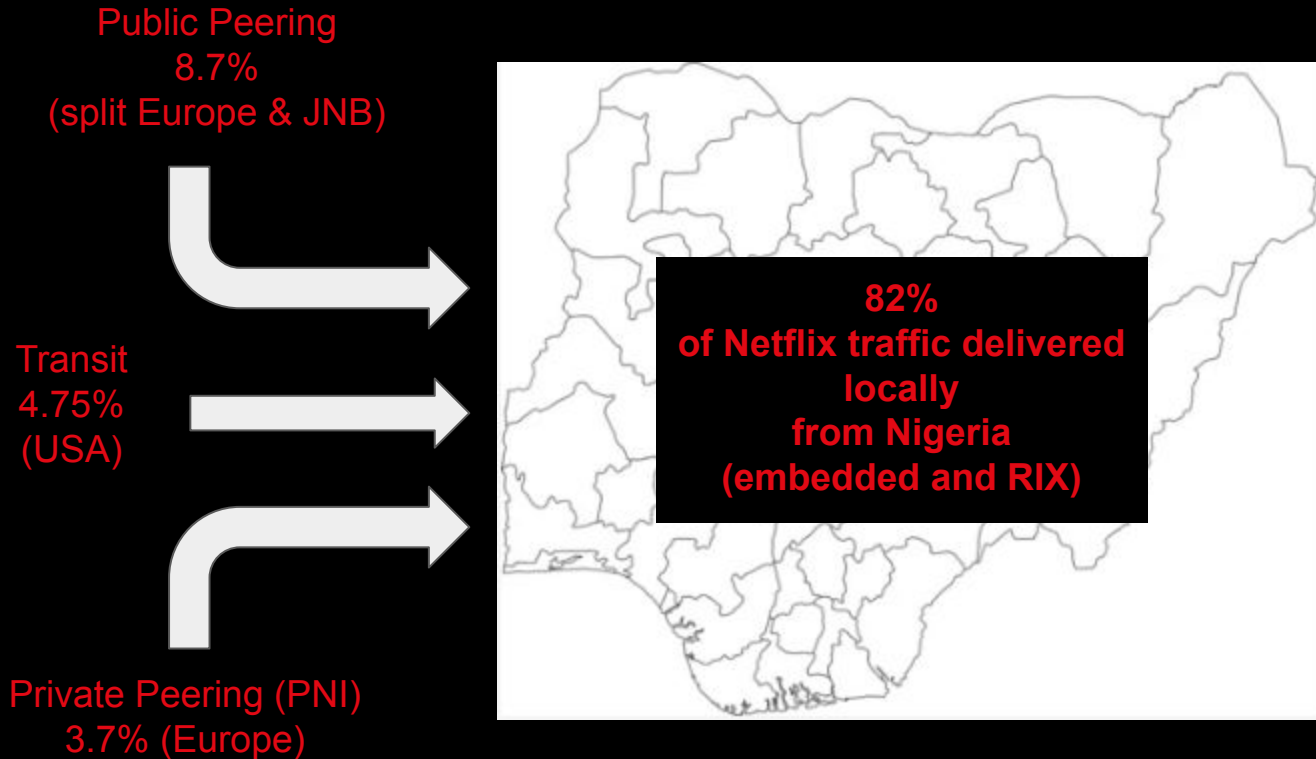
For more information about steering Netflix traffic, read this article
"Network Configuration, Routing and Content Steering using BGP"

ANÍKÚLÁPÓ

New Interconnection
Model (RIX)

Introduction

- Historically, the Netflix Open Connect had only ISP partnership options (see openconnect.netflix.com)
  - Embedded OCAs
  - SFI peering (private and public)
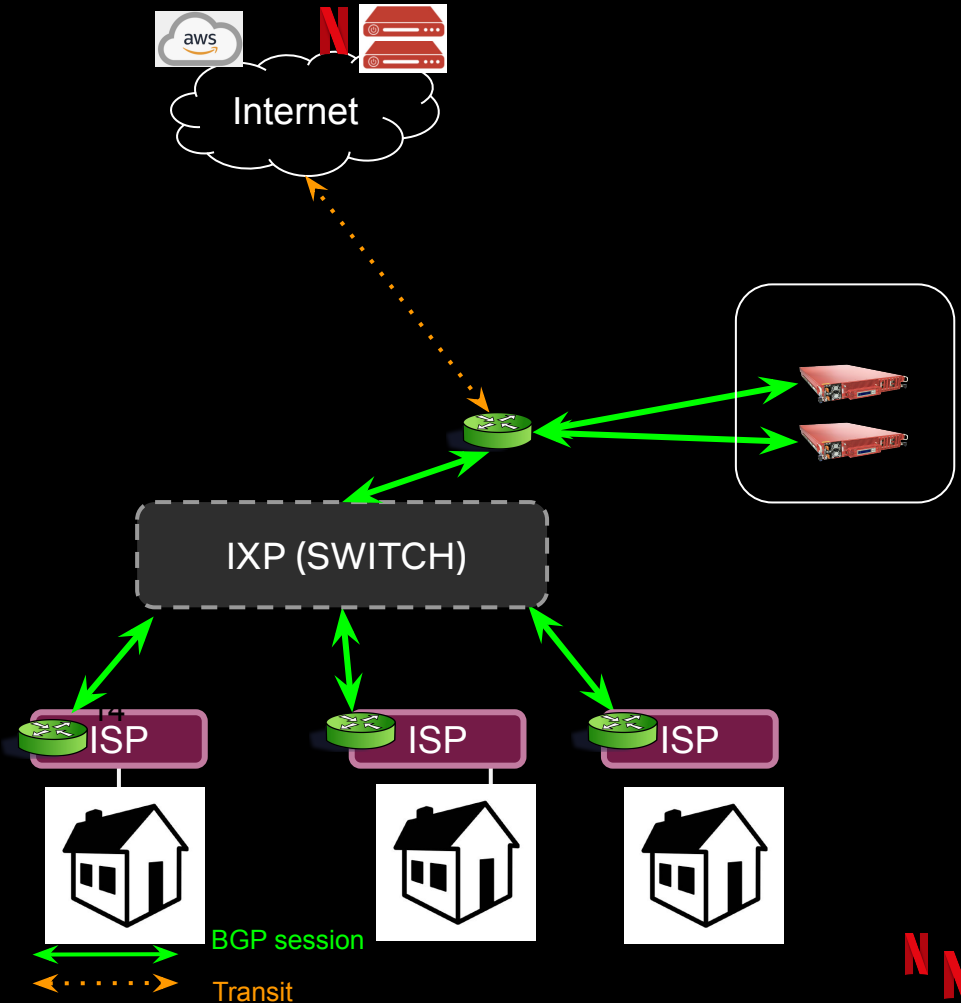- Recently, we added a new partnership option with IXPs called Routerless IX or **RIX**
  - Building a traditional SFI peering site may not be viable
  - Expand Open Connect presence in public Internet Exchange Points Partner2Connect pledge
  - Boost local streaming of content
  - Help local interconnection ecosystems and bring Netflix content servers closer to the local ISP community
- RIXes in Africa Update:
  - 12 committed; 9 active

Routerless IX (RIX) - Set Up

- Transit for fill and control only. No assets are served to members via transit
- IXP needs to inform the participants that they need to Opt-in in order to receive Netflix service by using the BGP Community 40027:40000.
- The IXP can neither Opt-in participants nor change this community. This is a major requirement as it will not work well otherwise.

Internet

IXP (SWITCH)

ISP

ISP

ISP

BGP session

Transit

RIX Configuration

2. IXP router with example ASN 64511.
Path becomes ^64511_64496$.
MED and communities unchanged.

AS40027

ASN 64511

Internet

IXP (SWITCH)

3. Routes without 40027:40000 dropped. OCA adds 100 to MED. Path sent to steering becomes ^64511_64496$

1. Sample route from ISP: 192.0.2.0/24 with origin BGP AS-path ^64496$, MED 0, and community 40027:40000 present.

ASN 64496

ISP   ISP   ISP

BGP session
Transit

Lessons Learned from RIX Deployments
1. Fill Traffic

- Fill Traffic remains the #1 hurdle to deploying RIXes given the high price of International Bandwidth in some African countries

- Best Practices from around the world
  - Non-for-profit cost sharing structure divided equally among members
  - Donations from larger ISPs, International NGOs, etc.
  - Variations on above

Lessons Learned from RIX Deployments
2. Netflix Steering Algorithm

- Assuming ISPs prefixes are /24 (smallest accepted by RIX)
  - Will not be served by RIX if ISP has its own embeds

Reminder: Netflix Steering
- *Longest match (A longest, most specific matching prefix wins)*
- *AS PATH Length (When Prefix Lengths are equal, lower (shorter) AS Path Length wins)*
- *MED (lower MED wins: 0-OCA, 50-PNI, 100-IXP)*
- *Geo-location (when all above is equal, we use coordinates to compute distance)*

For more information, read this article "Network Configuration, Routing and Content Steering using BGP"

Thank you!

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