



African Route Collectors Data Analyzer: a compass to support peering growth in the region

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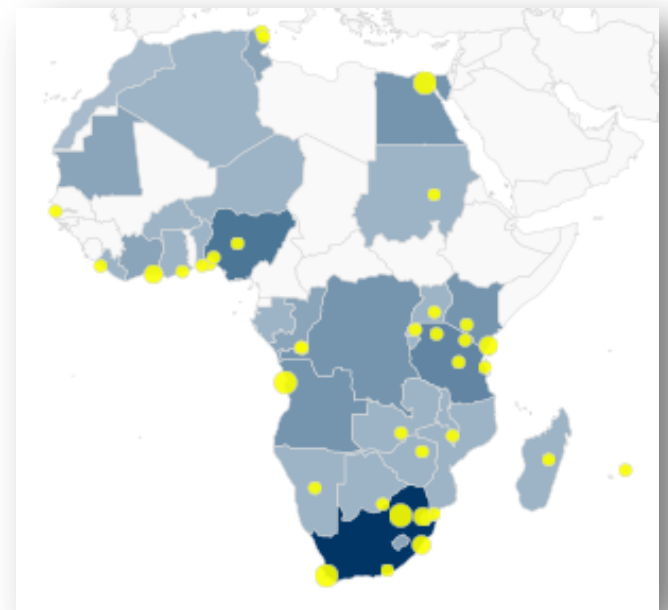
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Problem Statement

- 37 IXPs in the African region
- 12+ IXPs host 65 PCH Route collectors in total
- **Only 2 have RouteViews collectors** (JINX, KIXP)
- **Less than 50%** provide publicly available data on
 - Current traffic statistics
 - Peering ASNs and IP prefixes



IXPs in the African region,
<http://www.ixptoolkit.org/ixps/africa>, August 16, 2016



65 PCH Route Collectors at African IXPs,
<https://www.pch.net/ixp/dir>, August 16, 2016

Problem Statement

- **What if there was an open-source tool which constantly**
 - collects BGP feeds from all existing African IXPs' route collectors ?
 - **assesses the growth** of those IXPs with pre-defined metrics ?
- **Such a compass will**
 - Prove the existence and the operation of each IXP (for researchers)
 - guide ISPs operators while taking peering decisions (for Network operators)
 - Inform the Internet community, supporting organizations and decision-makers on gaps and scope of IXP development needed in the region (for decision-makers)
 - Complement measurements studies done among RIPE Atlas probes in the region (for all)



Problem Statement

Number of Origin ASNs

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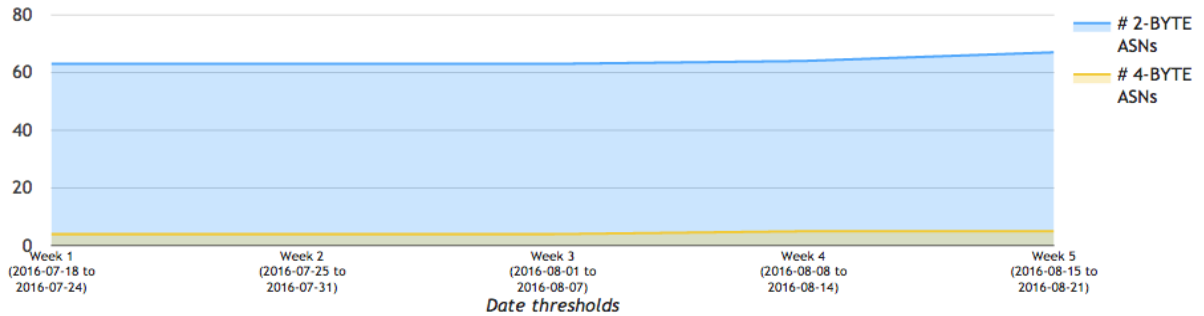
Number of Origin ASNs

DINX (ZA)

CAIX (EG)

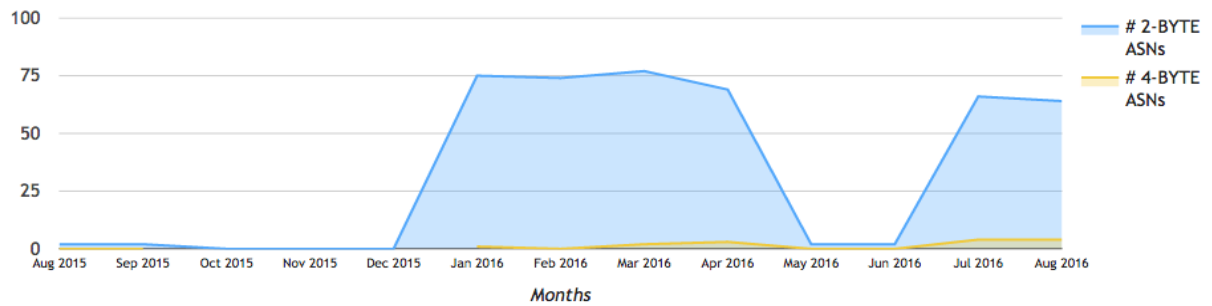
NIXP (NG)

Number of 2/4 BYTES ASNs at NIXP
 Per week over the last month



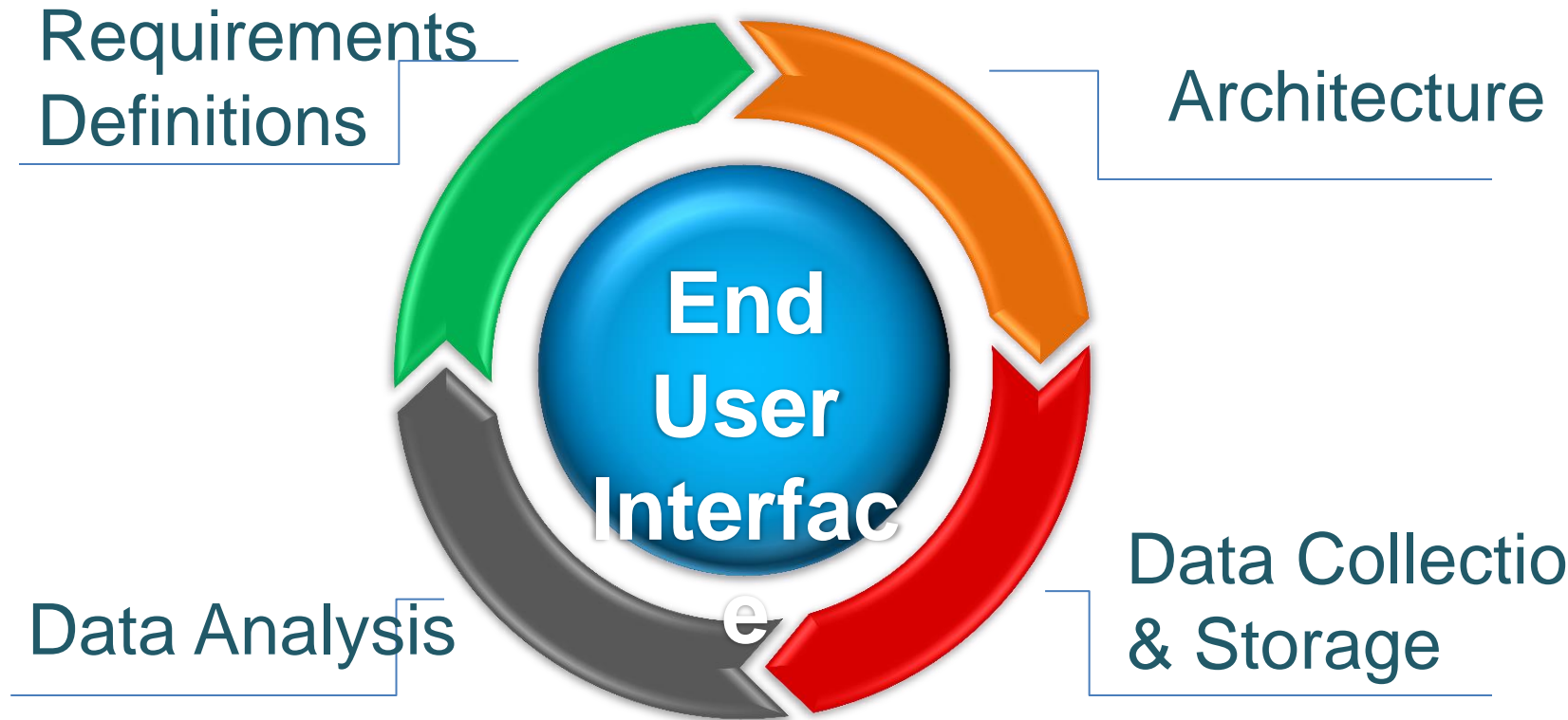
[DOWNLOAD](#)

Number of 2/4 BYTES ASNs at NIXP
 Per month over the last year



[DOWNLOAD](#)

Methodology Overview: 5 steps

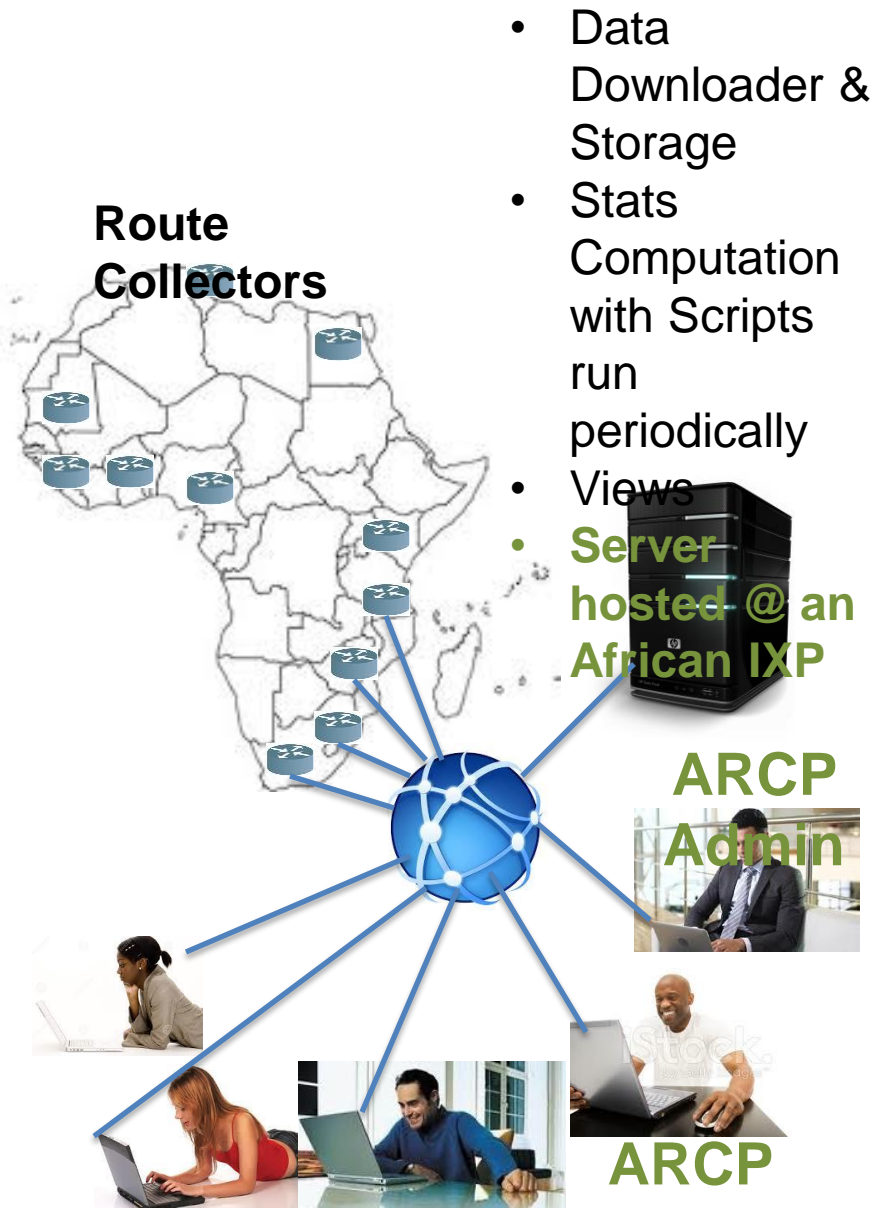


Requirements Definition

- **Develop an open source web platform**
 - Provide an IXP data collection system
 - Define a common structure to store existing Route collectors data
 - Define and periodically compute statistics under different points of view
 - **IXP View**
 - **National View**
 - **Regional View**
- **Possibility to support Route-Collectors from other regions**



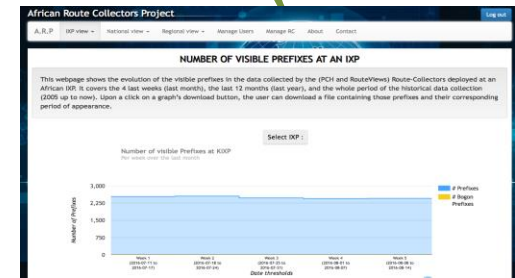
Methodology: Architecture(1)



- Data Downloader & Storage
- Stats Computation with Scripts run periodically
- Views
- Server hosted @ an African IXP

Views

IXP View (10 items)



National View (13 items)

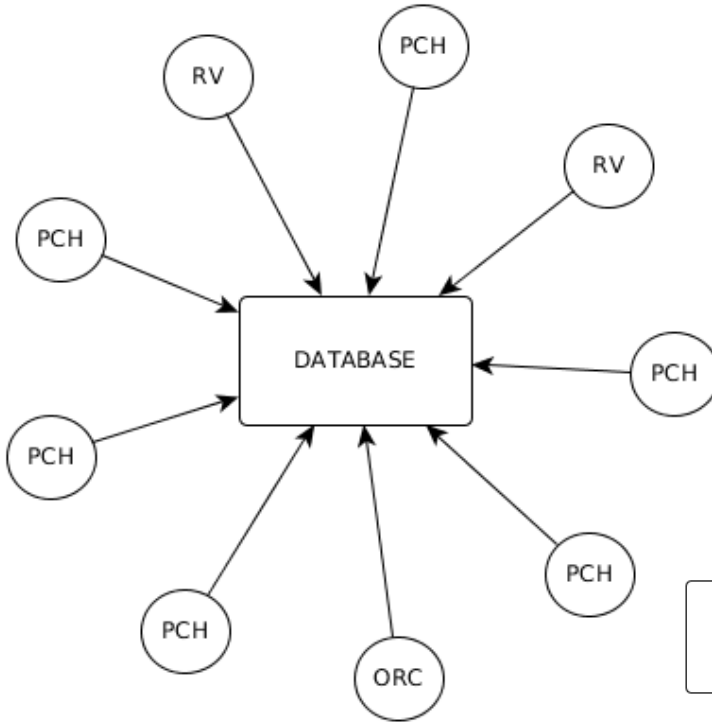


Regional View (9 items)

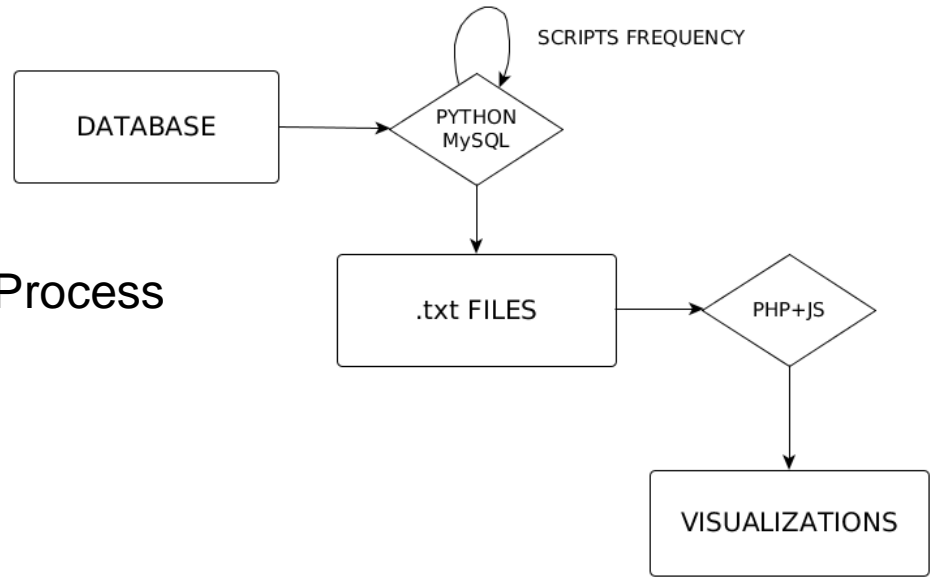


Methodology: Architecture (2)

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Data collection and Storage Process



Computation & Visualization Process

Data Collection & Storage (1)

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- **Programming languages**
 - Python, HTML5, CSS, PHP, Javascript, MySQL, Google charts.
- **Data Sources**
 - Geolocation databases: OIM, MM, RDNS, TC.
 - Geolocalized PCH collectors, RouteViews collectors, Any other Route collectors (all deployed at African IXPs)
 - AFRINIC [1], ARIN [2], LACNIC [3], APNIC [4], RIPE NCC [5] assignments databases
 - Philip Smith, BGP Routing Table Analysis, July 2016 [7]
- **Data Collection**
 - (v4 & v6) historical & Daily snapshots (show IP bgp on PCH route collectors)
 - (v4 & v6) historical & daily RouteViews data collected with open-source CAIDA's BGPstream [6] framework



Data Collection & Storage (2)

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- **PCH & RV Daily download & parsing run everyday**
 - 24mn – 240mn for daily RV data (2 col.)
 - Around 60mn for daily PCH data (12 col. + sleeping)
- **Current size of the DB: 112,9GB**
- **Some Issues**
 - PCH website constantly changing
 - PCH collectors are not publicly associated with an IXP (information not available on the website)
 - New list of PCH route collectors and corresponding IXP waiting to be released
 - Historical data of big amount (especially for JINX).

Data Analysis (Metrics Definitions)

- **All metrics enumerated**
- **IXP View metrics discussed & defined with ISOC**
- **IXP View Metrics Structure**
 - For every item: Statistics computed over the data
 - 4 last weeks (Last month) splitted into weeks
 - 12 last months (Last year) splitted into months
 - from 2005 up to current date (Multi-year) splitted into years
 - Frequency of execution: Period of 2–7 days for each script

Data Analysis (Impact of the study)

- **IXP growth and Business potential**
 - Graphical view of the visible networks at an IXP
 - Market your IXP features
 - Identify regions that are connected to a particular IXP
- **Interconnection development progress & Gaps**
 - Monitor local and regional interconnection growth
 - Identify IXPs that are facing potential challenges
- **Technical support**
 - Report on networks that are likely to have routing inefficiencies at the IXP



End User Interface (5min Demo)

[A.R.D.A Home](#) [IXP view](#) [National view](#) [Regional view](#) [About](#) [Contact](#)

African Route Collectors Data Analyzer

Welcome on the homepage of African Route Collectors Data Analyzer platform.

You can appreciate our work by browsing through our pages. We thank you for the trust you have given us.

[Log in](#)

Conclusion

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- Building an open-source application that assesses African IXPs growth using Route collectors data
- 26 PCH route collectors & 2 RouteViews collectors involved; 12 African IXPs currently covered (32%)
- **Operation**
 - ARDA automatically detects new col. & geolocate them
 - Admin confirms the geolocation before the data gets added to the DB
 - Statistics automatically generated & displayed under 3 Views
- Algorithms and more details will be given in a paper while releasing the application
- Opened to comments & feedbacks

References

- [1] AFRINIC, AFRINIC database, <ftp://ftp.afrinic.net>, 2016
- [2] ARIN, ARIN database, <ftp://ftp.arin.net/>, 2016
- [3] APNIC, APNIC database, <ftp://ftp.apnic.net/>, 2016
- [6] CAIDA, BGPstream, <https://bgpstream.caida.org>, 2016
- [9] D. Meyer, University of Oregon, <https://routeviews.org>, 2016
- [4] LACNIC, LACNIC database, <ftp://ftp.lacnic.net/>, 2016
- [8] Packet Clearing House (PCH), Daily Routing Snapshots, https://www.pch.net/resources/Routing_Data/, 2016
- [7] Philip Smith, BGP Routing Table Analysis, <http://thyme.rand.apnic.net>, 2016
- [5] RIPE NCC, RIPE NCC database, <ftp://ftp.ripe.net/>, 2016

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**Internet
Society**

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Thank you! Questions?





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