Opportunities for Growth in a Difficult Interconnect Market

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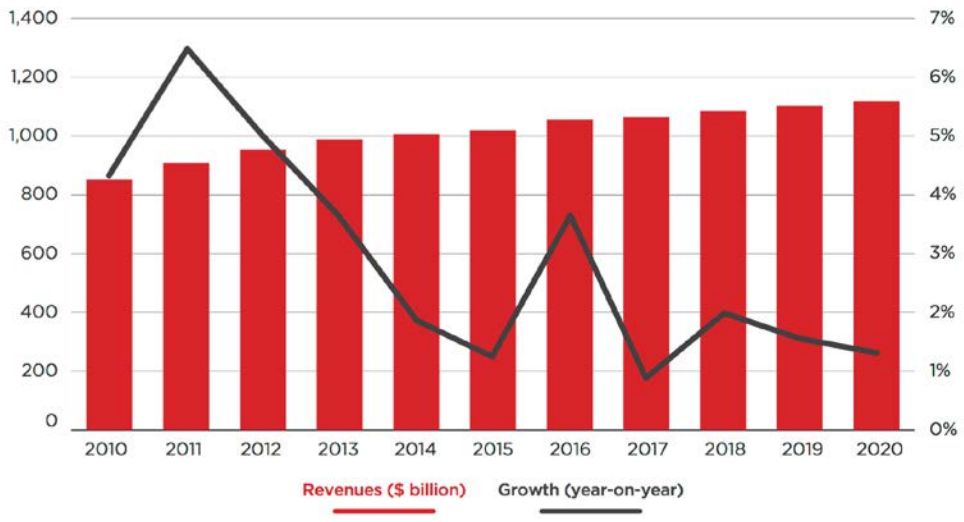
16 Major IPX Providers use TITAN

IPX Provider	Solution	IPX Provider	Solution
Belgacom (BICS)	CRE, NP	SAP (former Sybase356)	GDS
BT	ENUM,DNS, SIP, IWF	Syniverse	ENUM, WIN, AIN, IS 41, NP
CITIC International Telecom	CRE, ENUM	TATA Communications	NP, IN-SCP
Comfone	CRE, NP	TeliaSonera (TSIC)	CRE
DT ICSS	STP	Telstra Global	CRE+STP
iBasis	GDS	Telenor	CRE
Vodafone IVC	CRE, NP, ENUM	Liberty Global (IVU)	CRE

Today’s Difficult Situation

- Interconnect revenue growth has slowed (< 2%/year)
  - New service provider growth has slowed
  - Mobile subscriber growth has slowed
  - ARPU is generally declining as everyone competes for same users
  - Interconnect revenues are under attack
    - Governments working to drive down roaming cc
    - OTT messaging providers are limiting text messaging revenue
- We need new models for growth



Global Mobile Revs & Annual Growth Rates 2010–2020, *Source: GSMA Intelligence*

Real World Ideas

- New models for growth
  - *Compete with each other to steal market share*
  - *Innovate new products for existing customers*
  - *Expand into new markets*
- Infrastructure requirement
  - *Migrate to a software infrastructure that can evolve quickly*

Technology trends are going in our direction:

- *Signaling*: NFV is a gift that has made signaling a software service
- *Media*: SDN is a gift that has made media a software defined service

Compete to Capture Market Share

- Seems like an unlikely path to success
- Big percentage of retail customers are “captive” to existing IPX/Wholesale network.
- Has nasty tendency to lead to “price wars” that drive down margin.

Looking for ways to cooperate on end-to-end services might be a much more successful path for our wholesale industry.

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Innovate New Services

- Win by saying “yes” to every customer-specific request
  - Every customer-specific request for a “tweak” is a gift.
  - Customer-specific requests are only a problem if you have an inflexible infrastructure
  - Software empowers us to make changes quickly. Win by testing out new ideas quickly
    - Software STP can be quickly modified
    - Software DSC can be quickly modified
    - Software Signaling Firewall can be quickly modified
    - Software Centralized Routing Engine can be quickly modified

Real-world Example: IPX provider running 50+ versions of an ENUM routing service on a common infrastructure. Every customer gets to define its own “special sauce”

Enter New Markets

- Signaling Security
  - *Mobile operators want to secure their SS7/C7 and Diameter networks against roaming-related attacks*
- Big Data Analytics
  - *Store every message that traverses your network and use the data to make insights available to your customers*
- Enterprise Customers
  - *Every enterprise will re-think their communications infrastructure with NFV/SDN*
- M2M/IoT
  - *We know this is going to be big, but fast innovation is needed in early days*
  - *We know that IoT traffic is mostly signaling. Needs new price-point.*

Software is the Key

- Why is transition to a software network a requirement?
  - Deployment of silo-solutions is too slow
    - *Slow to deploy, slow to scale, slow to upgrade.*
    - *The real cost of a silo-solution (STP, DSC, HSS, CRE) is the cost of living with the silo.*
    - *Purchase cost is a small portion of the total cost*
  - Innovation at Internet speed is based on software model
    - *Build a narrow-path, deploy the functionality, let customers test and provide feedback, kill it if it doesn’t work*
    - *We all compete with the Internet model of innovation*

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How do you Move Forward?

- Signaling-control is an opportunity, not a cost
  - *View your signaling-control infrastructure as a resource*
  - *Empower your sales team to say "yes" to any customer request*
- Migrate to a pure software-based signaling-control solution
  - *Only way to support customer specific requests is via software*
- Migrate to one signaling-control solution, not many silos
  - *Silo solutions are more expensive to buy, scale, monitor*
  - *Silo solutions prevent fast innovation*

CSRC – Centralized Signaling & Routing Control: The NetNumber TITAN is a multi-protocol CSRC supporting SS7/C7, SIGTRAN, SIP, ENUM/DNS, Diameter, RADIUS, HTTP on a common software platform

NetNumber Industry Recognition

February 2017 & 2016
Finalist, **“Best Mobile Infrastructure”**

November 2016
Winner, **“Best Core Network Product”**

June 2016
Finalist, “**Best Core Network Product**”

May 2016
Winner, IMS World Forum
“**One to Watch**”

May 2015
Finalist, **“Private Company of the Year”**

April 2015
“Cool Vendor in CSP Infrastructure 2015”

July 2014
Finalist, “**Nokia Silicon Valley Open Innovation Challenge**”

September 2016
Finalist **“Best Signaling Solution”**

More awards @ http://www.netnumber.com/newsroom/awards/

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