NETWORK PERFORMANCE
An Operator’s Competitive Differentiator

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CONSUMER DEMAND TRENDS
GREATER DEMAND THAN EVER

8.4B
mobile broadband subscriptions
2020

700M
WhatsApp users

1.3B
Smartphones shipped 2014

1.2B
mobile Facebook users
70% OF THE WORLD’S POPULATION WILL BE USING SMARTPHONES IN 2020

90% of the world’s population will have a mobile phone by 2020

Almost 10% of smartphones will be added from LATAM
LATAM: 3G AND 4G REPRESENT 90% OF SUBSCRIPTIONS BY 2020

Source: Ericsson Mobility Report, June 2015
MOBILE DATA TRAFFIC WILL BE MULTIPLIED BY 9X BY END OF 2020

Monthly consumption per device type

<table>
<thead>
<tr>
<th>Year</th>
<th>Laptop</th>
<th>Smartphone</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>4.2 GB</td>
<td>1.9 GB</td>
<td>1.0 GB</td>
</tr>
<tr>
<td>2020</td>
<td>17.3 GB</td>
<td>8.4 GB</td>
<td>4.9 GB</td>
</tr>
</tbody>
</table>

Global mobile traffic (monthly ExaBytes)

- Data: mobile PCs, tablets and mobile routers
- Data: smartphones
- Voice

Mobile data traffic by application type

- 7X Mobile Data Traffic in LATAM
- 15% of mobile data traffic in 2014 came from social networking
- 13x growth

60% of all mobile data traffic will be from video by 2020. It will grow by 55% annually during this period.
GROWING DEMAND FOR EXPERIENCE
GROWING DEMAND FOR EXPERIENCE

Social experience

Premium experience

Professional experience

1 Mbps

3 Mbps

10 Mbps

Demand drives need for speed
Differentiation & segmentation opportunity
HD VIDEO DRIVES NEED FOR SPEED

Progressive video streaming (Android)

Adaptive video streaming (Apple)

Source: IOS8 YouTube measurements by Ericsson Smartphone Lab (2014)

Before: IOS7 cellular YouTube speed max 250 kbps
APP EXPERIENCE REALITY

- 42%: More time spent by satisfied users on streaming online videos compared to unsatisfied users.
- 33%: Stopped using apps due to poor coverage.
- 56%: Of power users stopped using apps due to poor coverage.

Source: Ericsson ConsumerLab Embracing data sharing (2015) & Smart Citizens (October 2014)
USERS FOCUS ON A FEW APPS – WITH MARKET VARIATIONS

Barbados

- WhatsApp: 27%
- Other: 36%
- ShowBox: 12%
- Facebook: 9%
- Instagram: 11%
- Tumblr: 1%

Dominican Republic

- WhatsApp: 32%
- Other: 34%
- Chrome: 7%
- Instagram: 11%
- Facebook: 11%
- Dolphin B: 1%

Puerto Rico

- Facebook: 42%
- Other: 27%
- Facebook: 13%
- WhatsApp: 7%
- Instagram: 7%
- YouTube: 7%

Source: Mobidia, 2015

Android Smartphone App Usage [MBB / Month]

- 10% Cellular traffic
- 26% Cellular traffic
- 43% Cellular traffic

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THE VALUE OF PERFORMANCE
Value of performance recognized by financial analysts.
IMPORTANCE OF NETWORK QUALITY
Recognized by consulting firms

› McKinsey & Company, Q1 2015 report:
  - “Mobile broadband has made network quality a priority and differentiator for operators(…)
  - Off the 11 decision factors used in a McKinsey consumer survey, network quality now occupies spots 2 through 5
  - Operators need a new approach to network quality, one that optimizes customer experience

› Financial and industry analysts (Phil Goldstein):
  - Removal of unlimited plans unlikely to happen while network quality doesn’t improve
IMPORTANCE OF NEW TECHNOLOGY IN PERFORMANCE
HOW DOES AN OPERATOR ADDRESS $/GB?

Leveraging spectrum & technology to lower cost, optimize spend & differentiate experience
ENSURING SMARTPHONES ARE ALWAYS BEST CONNECTED

Traffic management principles
› Aim for “Highest G”
  - 4G when coverage is good
  - 3G at cell edge or LTE congestion
  - 2G ONLY when 3G does not exists

› Avoid inter-layer handovers
  - All services in all layers
  - Load sharing primarily in idle mode
  - Stay at coverage layer even when radio condition is poor

Key insights
› Use 3G as fallback to 4G, speech and data
› 2G is not good enough for Smartphones
› Inter-layer handovers risk dropped calls & promotes poor user experience.
YOU HAVE A TOP END iPhone 6
THIS IS WHAT YOU GET

› All users will be trapped if connecting using
› AVOID R99 or EDGE

HSDPA/EUL

<table>
<thead>
<tr>
<th>Speed</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTE from DCH</td>
<td></td>
</tr>
<tr>
<td>LTE from Idle</td>
<td></td>
</tr>
<tr>
<td>EUL2ms / HS</td>
<td></td>
</tr>
<tr>
<td>EUL10ms / HS</td>
<td></td>
</tr>
<tr>
<td>64kbps / HS R99</td>
<td></td>
</tr>
<tr>
<td>EDGE</td>
<td></td>
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Download of KEPLER webpage from etsi.org
TIME TO CONTENT IS CRITICAL

- Proactively remove end-to-end bottlenecks
- At minimum deploy HSPA 21 / 5.8 Mbps everywhere
- Connect to highest G, apply flow of users recommendations

10 seconds
- 40% Video abandoned
- 50% Web page abandoned

4 seconds
- 10% Video abandoned
- 25% Web page abandoned

Keys to success

Video abandoned

Web page abandoned
VALUE OF NETWORK

› Network performance improvement…
  - Time on 3G up from 90% to 98%
  - Downlink speed improved 50%
  - Triple uplink speed

› … higher customer satisfaction
  - NPS up 4 points
  - Churn indicator improved 2 points
HELPING OPERATORS BECOME PERFORMANCE LEADERS

Dimension Network
- High traffic scenarios
- Forecast Traffic scenarios
- License, Densify (Carrier Expansion, New Sites (Small Cells))

Activate
- Latest SW Releases
- Improve Flow of users
- High Capacity and performance Features

Optimized Network
- RF Tuning
- Parameter Tuning
- IRAT Tuning
  * E2E Monitoring
  * Focus on End User KPI

Evolved Network
- Evolve to new Technology
- Evolve Network to Enhance User Experience

Terminal Strategy
- Terminal Strategy MUST be aligned with Network Strategy

High Performance Network Checklist

Evolved Network

Optimized Network

Activate

Dimension Network