NPRG’s Service Provider Market Opportunities Series:

Low Latency Services

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Agenda

1. Explaining Low Latency
2. Market Evolution & Development
3. Critical Drivers & Trends
4. Key Service Providers
5. Questions Addressed Along the Way
WHAT IS LATENCY?

Latency (n.): The time it takes for information to travel from source to destination and back again.

- 1 millisecond (ms) = 0.001 seconds = 1/1000 second
- 1 microsecond (µs) = 0.00001 seconds = 1/1,000,000 second

Common latency offering:
- Chicago to New York and back = 17 ms
- Blink of an eye = 300 – 400 ms
Defining The Market: What are Low Latency Services?

- Telecom data services whose most important (to the customer) characteristic is latency
- Current demand by enterprises in the financial vertical for securities trading applications
DEMAND FOR LOW LATENCY SERVICES

- Historic demand for low latency
- Algorithmic trading
- High-frequency trading
MARKET SIZE INDICATORS

- Financial services firms’s spending for connectivity in 2010*
  - $2.2 billion (total)

- Managed low-latency connectivity between New York and Chicago*
  - $225 million per year

* TABB Group, June 2010

Does not include deployment of private networks.
The Low Latency Ecosystem: Addressing End-User Requirements

- Colocation
- Proximity hosting
- Dark fiber
- “Dim” fiber services
- Managed waves
- Gigabit Ethernet links (1-Gbps, 10-Gbps)
## Low Latency Services

### KEY PROVIDERS

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>Service Providers</th>
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<tbody>
<tr>
<td><strong>Top-tier carriers</strong></td>
<td>• Level 3 Communications</td>
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<tr>
<td></td>
<td>• Verizon Business</td>
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<td></td>
<td>• XO Communications</td>
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<td><strong>Regional CLECs &amp; Startup Carriers</strong></td>
<td>• Allied Fiber</td>
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<td></td>
<td>• First Telecom</td>
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<td></td>
<td>• Intellifiber (being acquired by Paetec)</td>
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<td></td>
<td>• Spread Networks</td>
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<td></td>
<td>• Zayo Bandwidth</td>
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<td><strong>Metro optical network providers</strong></td>
<td>• AboveNet</td>
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<td></td>
<td>• Anova Technologies</td>
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<td>• CFN Services</td>
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<td>• Optimum Lightpath</td>
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<td></td>
<td>• Wall Street Network Solutions</td>
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<tr>
<td><strong>Colocation/Proximity Hosting</strong></td>
<td>• Equinix</td>
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<td>• Savvis</td>
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<td>• Telx</td>
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<td><strong>Extranational carriers</strong></td>
<td>• BT</td>
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<td>• COLT</td>
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<td>• Hibernia Atlantic</td>
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Source: New Paradigm Resources Group, Inc.
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HIGH DEMAND ROUTES

Chicago · New York/New Jersey · Washington, D.C.

Toronto · London · Paris · Frankfurt
SECTION 1: THE MOBILE BACKHAUL ARENA: DRIVERS, PROJECTIONS & CHALLENGES

Informed Direction Within a Changing Landscape

Low Latency Services

Local Destinations

New York/Jersey

- Carrier hotels
- Colocation centers
- Data centers
- Financial Exchange facilities
SECTION 1: THE MOBILE BACKHAUL ARENA: DRIVERS, PROJECTIONS & CHALLENGES

Informed Direction Within a Changing Landscape

KEY MARKET DRIVERS

- Increased use of algorithmic, high-frequency trading
- Creation of new data centers
- Creation of new financial firms
- Changes in market landscape (e.g. M&A)
- Adoption in European, Asian markets
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SERVICE PROVIDER CHALLENGES

- Reducing latency
  - Eliminating network nodes
  - Reducing latency within equipment
  - Straightening routes

- Competitive pressures
  - Investments are risky
  - Customers are single-minded
  - Differentiation opportunities scarce
Low Latency Services

MARKET DYNAMICS

- Unique contract terms – SLAs, lifespan
- Direct link to customers’ bottom line
- Demand for dark fiber, “dim” services
- Participation of specialty providers
Low Latency Services

FUTURE DEVELOPMENTS

- Migration to other geographies
- Potential regulatory changes?
- Demand for lower latencies among other apps:
  - Rich media/entertainment
  - Telemedicine
  - Cloud computing