Fastweb FTTH
A 10-years success story
## Fastweb

| The 2nd wireline network in Italy | Founded in September 1999, FASTWEB is the leading alternative operator of fixed broadband telecommunications services in Italy  
|                                | FASTWEB created a fully IP-based network totally independent from the incumbent’s infrastructure |
| Technological leadership        | Recognised pioneer in broadband and triple-play  
|                                | World first fully IP based network  
|                                | Trusted supplier for mission critical application |
| Integrated triple play offer    | FASTWEB provides voice, Internet connectivity, data transmission and TV services over a single connection by using Fiber-to-the-Home/Office and DSL access technologies  
|                                | The company offers its services to both companies and families |
| Highly attractive market        | Italy broadband penetration lags its European peers but is now among the fastest growing in EU  
|                                | No cable operators in Italy, weak infrastructure-based competition |
| Successful business model       | Leader or co-leader with the incumbent in the covered areas  
|                                | Highest residential ARPU in the sector  
|                                | Impressive revenue and margin growth since inception |
Fastweb revenue growth
Fastweb milestones

- **Fastweb’s Foundation**: Oct 1999
- **First Business Customers**: Jan 2000
- **Consumer Services Launch**: Oct 2000
- **VoD Services**: Jan 2001
- **xDLS Services**: Jul 2001
- **Multicast Services**: Oct 2001
- **Internet PPU over ADSL**: Jan 2002
- **VoIP Class5 Service**: Jun 2002
- **VoD over ADSL**: Mar 2003
- **Multicast over ADSL**: Aug 2003
- **UM Services**: Jan 2004
- **6Mb/s over ADSL**: March 2005
- **The 2nd wireline operator in Italy**: June 2005
- **New unified decoder**: 2006
- **IPDSLAM, ADSL2+, 1Mbps up**: 2006
- **Replay TV**: 2006
- **New HAG**: 2007
- **New VoIP Infrastructure**: 2007
- **HDTV & DVBT**: 2007
- **Backup Voce**: 2008
- **100 Mbps over FO for Business**: 2008
- **Mobile offer**: 2008

**Backup Voce**: 100 Mbps over FO for Business 2008

**Mobile offer**: 2008

**Fastweb milestones**
Fastweb is the Italian telco operator that offers FTTH accesses to Residential and Business customer.

Thanks to Fastweb’s huge investments, Italy is the UE “best in class” country for FTTH access diffusion.

FTTH in Italy:
- 50% of overall UE home passed
- 32% of overall UE customers
Network overview

Fastweb network is based on a national fiber backbone across the country and metropolitan area networks in the main cities.

Access technology depends on fiber/xDSL coverage and Customer type (Business, Residential).

Fastweb network enables different services to all Customer segments:
- Residential
- SME
- Executive

4 € Billions invested since 1999
Coverage:
- 50% population
- 11.400.000 potential Customers
- 25.000 km fiber network
FTTH access

- FTTH network architecture is different for Residential/SME Customers and Executive Customers.

  - **Executive** Customers are directly connected to core network (PoP) through a fiber or SDH link.

  - **Residential/SME** Customers are connected to core network (PoP) through a concentration layer (MiniPoP).

  "Metro Ethernet solution"
FTTH access – Residential/SME

- **Access Layer Cluster Area**
- **Concentration Layer Mini-PoP**
- **Core Layer PoP**

- **Residential/SME Customers**
- **Gigabit Ethernet**
- **STM16**
- **Collapsed physical ring**
- **Logical ring**

- **PoP**
- **Mini-PoP**
FTTH access – Executive

Core Layer
PoP

Access Layer

STM16

physical ring/collapsed physical ring

Customer
FTTH network creation

- Fastweb’s first MAN deployed: Milano

- Infrastructure: 2.350 km
- Cable: 4.300 km
- Fiber: 197.000 km
- Building passed: 57.000
- Home passed: 760.000
- Building conn.: 42.000
Operational issues

- **Local PA permission**
  
  => time needed to obtain permission for digging

  **Actions**
  - Cooperation with PA through specific procedures (board for civil works)

- **Digging coordination**
  
  => constraints by PA in order to minimize impacts of civil works

  **Actions**
  - Strict control of timing
  - Sub-contractors operational management
FTTH building connection process

- During network creation
  - Project for access hole to the building

- After 1st Customer subscription
  - Building administrator contact
  - Building survey and project
  - Letter to building administrator
  - Electric meter request
Operational issues

Building administrator opposition

=> time needed to connect Customer causes churn

Actions
- Formal letter with start date of civil works
  Reference to law: telecommunication service is an essential right
- Legal action if needed

Vertical cabling

Actions
- Use of existing ducts
- New pipes only if strictly needed
Operational issues 2/2

- Electric meter request.
  - Actions
    - Specific agreement with providers

- Damage claim due to civil works
  - Actions
    - Site survey with company responsible for civil works
FTTH future development

FTTH

- Medium term scenario
  - Network Sharing
    - Fastweb-Telecom Agreement
- Long term scenario
  - NGN
    - New infrastructure deployment
Fastweb-Telecom agreement

Agreement: cooperation for network sharing & development
- exchange, under reciprocal conditions, of the rights to use infrastructure
- joint planning for realization of civil infrastructure

**Increased use of available infrastructure by means of new technical solutions**

Opportunity for Fastweb to exploit **additional network portion**

**Cost reduction** for implementation up to 70%

**Customers “get closer”** to network
FTTH: which architecture?

- **METRO ETHERNET**
  - Ethernet switch
  - Ethernet switch

- **G-PON**
  - PON OLT
  - Optical splitter

- **POINT-TO-POINT**
  - FAN
  - Optical splitter
FTTH: architectures comparison

<table>
<thead>
<tr>
<th>Available Bandwidth</th>
<th>Metro Ethernet</th>
<th>GPON</th>
<th>Point-to-Point</th>
</tr>
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<tbody>
<tr>
<td>Up to 100Mb/s</td>
<td></td>
<td>Up to 1Gb/s</td>
<td>No limits</td>
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<tr>
<td>&quot;Bitstream&quot; Service</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Full ULL</td>
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<td>NO</td>
<td>YES</td>
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<td>Network Architecture</td>
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<td>Open</td>
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<td>OF Consumption</td>
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<td>High</td>
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<td>Optical Technology</td>
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<tr>
<td>Scalability</td>
<td>Limited</td>
<td>Limited</td>
<td>No limits</td>
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<tr>
<td>Operational Complexity and costs</td>
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<td>Low</td>
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<tr>
<td>Standardization</td>
<td>Low</td>
<td>Low</td>
<td>Complete</td>
</tr>
</tbody>
</table>

**Metro Ethernet and GPON are closed solution and do NOT allow Full ULL**

Open technology for NGN accesses
„Swiss fibre“ develops network competition:

Have competition wherever the customer can benefit from it!

**Principles:**
- Have competition, where market- or customer value can be generated
- No unnecessary duplication of ducts or infrastructure without customer benefit
- Open to partners with or without own duct infrastructure; we expect the same from our partners.

**Implementation:**
- Cooperation with partners with duct infrastructure
- Deploy one multi-fiber cable and subsequently share/split the fibers
- Offerings for Co-investors and service providers
98% of new houses built in Switzerland in 2009 are FTTH ready with a hybrid cable.

- **Swisscom FTTH plan**
  - 2009: about 14,000 building connected (100,000 potential households)
  - 2015: 1/3 of the population (over 1 million households connected)

- **FTTH extension**
  - * from autumn 2008
  - from 2009

- **Cities**
  - Basel (148 buildings)
  - Zurich (1,230 buildings)
  - Berne
  - St. Gallen
  - Lausanne (426 buildings)
  - Geneva (426 buildings)
  - Fribourg
Investments for fiber dominated by civil works in last meters and in in-house cabling. Overall investments until 2015 likely to amount to 1.5 to 2 bln Euro.

- **Swisscom FTTH P2P**

- **Central office (10 – 16 per city)**

- **Inhouse cabling**
  - Drop cabling: ~150m
  - Feeder cabling: ~1000m

- **Drop cabling**
  - 43% CAPEX
  - 7% CAPEX

- **Feeder cabling**
  - 42% CAPEX
  - 8% CAPEX

- **CO cabling**
  - 7% CAPEX

- **Equipment**

- **Manhole**
Swisscom as a Market Maker

- Publish a clear & transparent collaboration proposal with multiple options for bigger and smaller players
- Liaise with Authorities and present them first hand the collaboration portfolio
- Discuss individually with EWs, tuning our collaboration offerings to their individual situation
- The multifiber model promoted by Swisscom is even ported in the European community.
- COMCOM called three working groups
  - Technical standardization of in-house wiring
  - Service harmonization of layer 2 services (wholesale offering), offering
  - Legal aspects on customer binding clauses

- The major battle still to win is the landlords, who are currently not keen to invest in a costly in house infrastructure as long as a) no standards are available and b) the access to their buildings is not properly settled (EWZ / Swisscom)
Thanks for your attention

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