

CASE STUDY

MARKET: TELCO OPERATOR

REGION: TURKEY

COMPANY: TURKCELL SUPERONLINE

TURKCELL SUPERONLINE: HIGH-SPEED OPTICAL HIGHWAY

TRANSFORMING THE SILK ROAD INTO THE FIBER ROAD
WITH AGILE OPTICAL NETWORKING

Turkcell started Turkey's 'mobile phone era' in 1994, and by 2012 the company had 50 percent of the domestic mobile market. Turkcell achieved and maintains its leadership position by continuously increasing the variety of services it offers on its high-quality mobile voice and data networks.



Turkcell Superonline is a wholly owned subsidiary that provides the fiber network infrastructure for the Turkcell Group. As of August, 2013, Turkcell Superonline's fiber network stretched in excess of 32,000 km in length, with international fiber access provided through many peering links to neighboring countries. With this network, Turkcell Superonline is the only company in Turkey able to offer ultra-broadband services: 1000 Mb/s Internet access for residential customers and 10+ Gb/s access for enterprises.



Turkcell Superonline is an innovative telecom operator providing data, voice and video (triple play) communication solutions to telecom operators, corporations and households.

www.superonline.net

"Five years ago, Turkcell Superonline's aim was to transform the Silk Road into the Fiber Road. Today, this is a reality thanks to our fiber network."

Murat Erkan , General Manager of Turkcell Superonline

CHALLENGES

- To provide the Turkcell Group with the infrastructure to compete in a mature mobile market.
- To help Turkcell differentiate its offer by:
 - Maintaining its leadership position in high-speed broadband access.
 - Introducing new, revenue-generating services for the enterprise and international markets.

SOLUTIONS

Alcatel-Lucent high-speed 'Agile Optical Networking', providing:

- Operational synergy across the Turkcell Group.
- Service differentiation, with an increase in international operations.
- Enhanced customer experience, with ultra-broadband access capabilities.
- Minimized total cost of ownership.

BENEFITS

- Immediate return on investment through operational expense reductions.
- Sustainable long-term investment, with the most advanced technology to protect long-term revenues.
- Growth – through differentiation – in newly emerging markets that are less competitive than pure mobile.

THE CHALLENGES

Turkcell strategically invests in their network infrastructure to allow them to compete effectively in Turkey's mature mobile market.¹ Turkcell Superonline's investment in a high-capacity optical network supports this strategy, as shown in Figure 1. This network supports Turkcell's mobile broadband services by providing high-speed backhaul for 3G services. It allows for expanded fixed-broadband access coverage and enables new services to be delivered to the enterprise market. In 2011, Turkcell Superonline was one of the first providers in the world – and the only provider in Turkey – to offer 1000 Mb/s fiber access to residential customers.

"We want to maintain our leadership in 'light-speed access' by expanding broadband access coverage, but we would like also to introduce new services based on the same network," says Murat Erkan, General Manager of Turkcell Superonline.

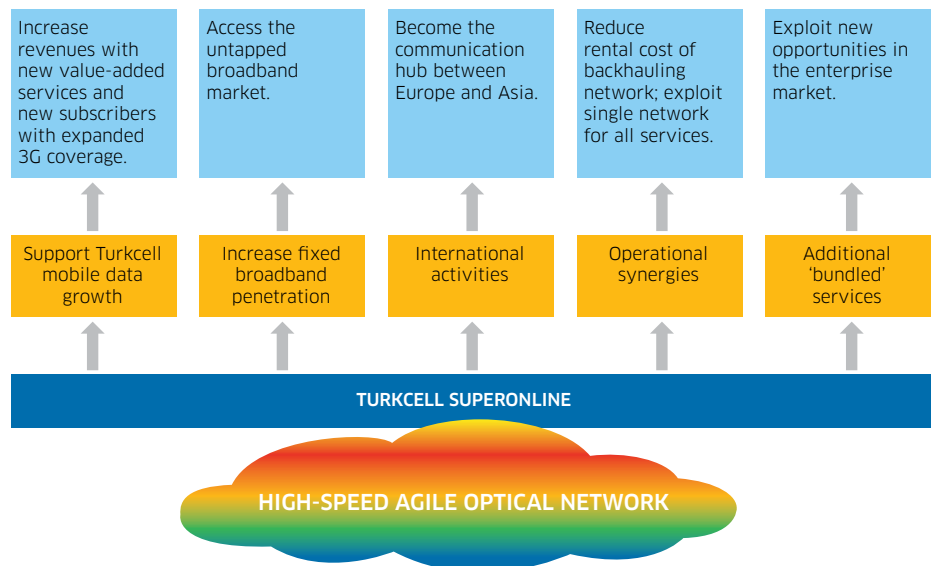
The investment in a new, high-capacity optical network allows Turkcell Superonline to reduce operational costs and increase

revenue. A single transport platform for the entire Turkcell Group maximizes network synergies and reduces operational costs. Costs are further reduced by optimizing the platform for mobile backhaul, which minimizes the rental costs for these services. Existing revenue streams are increased by using the network to expand coverage for high-speed residential services and offering enterprises new high-speed services. Finally, new revenue opportunities are created for international operations, supported by a high-speed optical network that bridges the Turkish network to the rest of Europe and Asia.

WHY ALCATEL-LUCENT?

Alcatel-Lucent was selected for a number of reasons. Of primary importance was the fact Alcatel-Lucent has successfully deployed its 100G coherent solution in many customer networks. These customers are located around the world and have diverse requirements and solving their needs gave Alcatel-Lucent the reputation of market leader for 100G coherent solutions.

Figure 1. High Speed Agile Optical Networking is the foundation of Superonline strategies.



1. Ovum - Turkcell: Strengthening Existing Operations - March 2012

Turkcell Superonline aims to be “the operator of choice”, which company management believes can only be achieved by building and owning an independent network in the current market conditions.

www.superonline.net

Alcatel-Lucent used its experience in 100G coherent technology to work together with Turkcell Superonline to define the solution that best met their needs. The network needed to be capable of adapting to future requirements, be high-capacity, flexible and reconfigurable while reducing the total cost of ownership. Defining the solution to meet these requirements required developing a very close relationship between Alcatel-Lucent and Turkcell Superonline.

“Our expectation was to introduce 100G transport with OTN switching as a new layer over an existing infrastructure, rather than alien lambda solutions. Alcatel-Lucent demonstrated that this is not only available but feasible with the current solution,” said Mr. Erkan.

Alcatel-Lucent used its leadership and industry experience to introduce capabilities that drive down the cost of the network while meeting technical requirements. The high-performance 100G Soft-Decision Forward Error Correction (SD-FEC) allows the number of regenerators to be reduced, thereby bringing down network costs. A field-proven protection solution based on

both Layer 0 Generalized Multi-Protocol Label Switching (GMPLS) restoration and Layer 1 optical transport network (OTN) switching was a clear technical differentiator.

“We had different experiences in the past with GMPLS for Layer 0, but we were not able to exploit the advantages of this technology in the backbone network. With the solution designed with Alcatel-Lucent, we are able to use GMPLS flexibility and fast reconfiguration in the optical domain without losing the very fast protection achievable via electrical switch,” said Mr. Erkan.

THE SOLUTION

Agile Optical Networking provides the foundation for the Alcatel-Lucent solution. The heart of this solution is the Alcatel-Lucent 1830 Photonic Service Switch (PSS), with the 1830 PSS-64 shelf providing electrical aggregation and protection. 100G coherent technology with SD-FEC is used on each of the 80 wavelengths to achieve the capacity and reach required. Network flexibility is achieved with a colorless and directionless reconfigurable optical add-drop

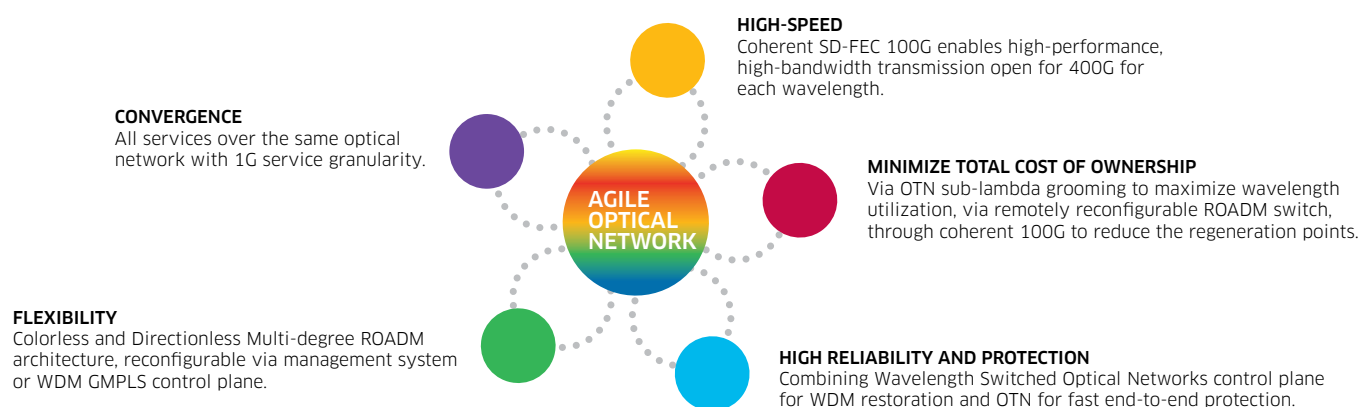
multiplexer (ROADM) architecture that can be configured through a management system or a GMPLS control plane. Wavelength filling is maximized by integrating Layer 0 (WDM) and Layer 1 (OTN) technology on the same platform.

“Flexible optical architecture is a key requirement to use the same network to provide the needed connectivity for current and future services,” says Ataç Tansuğ, Director, Network, Turkcell Superonline. “We are deploying a solution that allows us to start with the 100G wavelength needed for our current traffic by maximizing the usage of the lambdas, and allows us to add new lambdas only when traffic grows.”

Protection is provided by integrating a fully protected architecture for Layer 1 with a distributed GMPLS restoration for Layer 0 in the same system.

“We would like to insure the maximum protection of our network to provide a unique service to our customers. Restoration based on distributed GMPLS with an optional fast electrical switch is an excellent solution to achieve our target,” said Mr. Tansuğ.

Figure 2. Alcatel-Lucent Agile Optical Networking summary



“Our new multi-layered network structure will definitely increase Turkcell Superonline’s services to a quality level unmatched in the Turkish market and it will meet all telecommunication needs in the region.”

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THE BENEFITS

Alcatel-Lucent Agile Optical Networking provides operational cost savings to Turkcell Superonline in a number of ways. The high-performance 100G SD FEC minimizes the number of regenerators and reduces the power required per transported bit. The ROADM architecture provides the flexibility required for a single network to support the different types of service required by Turkcell Superonline. The integration of WDM with sub-lambda grooming provided by the OTN switching fabric minimizes the number of lambdas required in the network. Use of 100G coherent technology means that dispersion compensation modules (DCMs) are not required.

The network reliability provided by integrating GMPLS restoration with OTN switching allows Turkcell Superonline to guarantee their customers a high-level customer experience.

The network is ready to support Turkcell Superonline’s ability to offer new, differentiated, high-capacity services, such as high-speed broadband access and data center connect services. The network architecture allows smooth expansion to 400G per lambda when needed.

SUMMARY

Alcatel-Lucent Agile Optical Networking allows Turkcell Superonline to offer high-value services to its customers at the lowest total cost of ownership, both today and in the future. It provides the flexibility required to support all service types on a single transport network and the reliability that Turkcell Superonline requires to guarantee these services to its customers.

Agile Optical Networking allows Turkcell Superonline, in partnership Alcatel-Lucent, to drive innovation in optical network capabilities in Turkey. Agile Optical Networking allows for smooth introduction of new, advanced features as-and-when-required to drive down network costs or open up new revenue opportunities or lines of business for Turkcell Superonline.

“Cooperation with Alcatel-Lucent to get access to the latest technologies is extremely important for competing in a market like Turkey while maintaining high profitability,” conclude Mr. Erkan and Mr. Tansuğ.

ABOUT TURKCELL

Turkcell is the leading communications and technology company in Turkey, with 34.7 million subscribers as of June 30, 2013. Turkcell is a leading regional player, with market leadership in five of the nine countries in which it operates with its approximately 69.5 million subscribers as of June 30, 2013. It was one of the first among global operators to have implemented HSPA+. It has achieved up to 43.2 Mbps speed using the Dual Carrier technology, and is continuously working to provide the latest technology to its customers. Turkcell Superonline, a wholly-owned subsidiary of Turkcell, is the one and only telecom operator to offer households fiber broadband connection at speeds of up to 1,000 Mbps in Turkey. As of June 30, 2013, Turkcell’s population coverage is at 99.35% in 2G and 85.43% in 3G. Turkcell reported a TRY2.9 billion (US\$1.5 billion) revenue with total assets of TRY19.6 billion (US\$10.2 billion) as of June 30, 2013. It has been listed on the NYSE and the ISE since July 2000, and is the only NYSE-listed company in Turkey.

Read more at www.turkcell.com.tr



ABOUT TURKCELL SUPERONLINE

Turkey’s innovative telecom operator, Turkcell Superonline, continues to invest heavily in fiber optic infrastructure. Turkcell Superonline is the first telecom operator to offer residential internet connection at speeds of up to 1000 Mb/s. It offers its corporate and individual customers voice, data, broadband Internet access, wholesale voice traffic, transmission, datacenter, cloud computing, and value-added services.

Read more at www.superonline.net

