Turkcell, a leading mobile phone operator was seeking to reduce their data footprint and improve performance. By implementing Hitachi Data Systems enterprise and file storage, and software solutions, Turkcell was able to significantly reduce the number of disks and systems. As a result, the company was able to reduce floor space and power consumption, while enhancing performance and improving response times.

**About Turkcell**
Global System for Mobile Communications (GSM)-based mobile communication began in Turkey when Turkcell commenced operations in 1994. Turkcell signed a 25-year GSM license contract with the Ministry of Transportation in 1998. Since then, it has continuously increased the variety of its services based on mobile audio and data communication, as well as its quality levels. As a result, it has expanded its number of subscribers. In June 2012, Turkcell made US$8.5 billion worth of investments (including 2G and 3G licenses) in Turkey and reached 34.7 million subscribers. This success makes Turkcell one of the leading technology and communication companies in Turkey.

Turkcell's shares have been traded on the Istanbul (IMKB) and New York Stock Exchanges (NYSE) since July 2000, and it is the 1st and only Turkish company ever to be listed on the New York Stock Exchange.

**Turkcell Technology Refreshment and Consolidation Project**
Turkcell was looking for a storage solution to address high-performance requirements of its applications and to control rapidly rising operating expenditure (opex). To consolidate storage systems more than 5 years old, Turkcell started a Technology Replacement Project, which included 17 storage systems. The main objectives of the Replacement Project were:

- Optimized processing time.
- Space and power savings.
- Monitoring and reporting capabilities.

**Benefits at a Glance**
- Optimized processing time.
- Space and power savings.
- Monitoring and reporting capabilities.

**Turkcell**

**INDUSTRY**
Telecommunications: Mobile Phone Operator

**SOLUTION**
Enterprise Platform, File and Content, Virtualization

**HARDWARE**
Hitachi Virtual Storage Platform
Hitachi NAS Platform

**SOFTWARE**
Hitachi Command Suite, Hitachi Universal Volume Manager, Hitachi Dynamic Tiering for Mainframe, Hitachi Dynamic Provisioning, Hitachi Tiered Storage Manager, Hitachi Tuning Manager, Hitachi Command Director

"With the help of HDS solutions, we are able to fulfill our consolidation goal, and we benefit from the performance improvement in the environment. The Hitachi Data Systems and Turkcell teams have worked closely throughout the project. This collaboration has been key to the success of our new storage environment."

Bülent Saltürk
Infrastructure and Operations Division Head
Turkcell
■ Reduce opex by implementing new technologies.
■ Consolidate in terms of both number of storage systems and management load.
■ Increase performance.
■ Maintain current total storage capacity.
■ Reduce power consumption and footprint in 3 data centers.

To meet the technical and financial challenges, Turkcell decided to engage hardware and software solutions from Hitachi Data Systems.

By implementing Hitachi Virtual Storage Platform (VSP), Hitachi NAS Platform (HNAS), and Hitachi software, Turkcell was able to:

■ Maintain costs, as capital expenditure (capex) will compensate the opex cost in 3 years.
■ Reduce number of systems, as Turkcell replaced 17 storage systems in 3 locations with 7 VSP systems. The project includes migration of 1.7PB of storage and 200+ hosts.
■ Solve provisioning, monitoring and reporting problems with the help of Hitachi Device Manager, Hitachi Tuning Manager and Hitachi Command Director.
■ Reduce power consumption from 354 kVA to 78 kVA (with the help of 2.5-inch drives and VSP technologies).
■ Reduce total number of disk drives from 10,215 to 5,744 [with the help of mixed solid-state disk (SSD) and serial-attached SCSI (SAS) drives and Hitachi Dynamic Tiering software].
■ Reduce 63 rack spaces to 22 rack spaces (with the help of VSP systems).
■ Consolidate old file servers using the HNAS solution and replicate them to the remote site.

Enhance Performance: VSP and Fraud Application

Turkcell Fraud application is one of its most I/O-intensive applications. It requires quality of service (QoS) guarantee and defined service level agreement (SLA).

With the help of VSP, the application was migrated from 512 to 320 spindles, reducing the number of physical disks. After the migration, the average response time dropped dramatically, from 20ms to 4ms. The total number of IOPS increased from 20K to 70K, and the fraud database improved service quality by optimizing processing time in daily jobs.

In a large environment, the biggest challenges are monitoring and reporting capabilities. With the help of Hitachi Command Director, HDS was able to satisfy Turkcell's high-level expectations.
Green Storage
Turkcell IT consumes a significant amount of the power within the organization, demanding both power resources and floor space. VSP 2.5-inch disk usage addresses the data center’s high-energy requirements and space limitations. With help of SSD and Hitachi Dynamic Tiering for Mainframe, the total disk count was reduced from 10,215 to 5,744 while keeping the disk capacity the same. This reduced the rack count from 63 to 22, and Turkcell was able to re-allocate the space gained (see Figure 1).

Reporting and Monitoring
In a large environment, the biggest challenges are monitoring and reporting capabilities. With the help of Hitachi Command Director, HDS was able to satisfy Turkcell’s high-level expectations.

Within the new Hitachi solution, Hitachi Command Director allows Turkcell to define alerts and service level objectives for each application. From a global dashboard of the storage environment (see Figure 2), they can quickly organize storage assets with specific service level objectives by application. By accurately monitoring key capacity and performance statistics, the new solution enables Turkcell to watch its service levels and ensure that they are being met, now and in the future.